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Leveraging genomic and genetic diversity to gain insights into viral evolution and spread

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Leveraging genomic and genetic diversity to gain insights into viral evolution and spread

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M.S.., Harvard T.H. Chan School of Public Health, 2018

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Abstract

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By Michael A. Martin

As viral pathogens replicate within host species, errors by the viral polyermase introduce differences between the original and replicated genomes. Even when these errors do not alter viral function, their accumulation over time leaves characteristic patterns representative of the biological context in which they arose. Fitting quantitative models to these data provides a way for researchers to interrogate these patterns. Here, we analyze influenza A and SARS-CoV-2 sequence data to better understand the dynamics of these pathogens across biological scales. We show that the within- ost evolution of influenza genomic diversity is highly stochastic, that transmission bottlenecks of SARS-CoV-2 between hosts are extremely small, and that population level SARS-CoV-2 transmission is characterized by rapid undetected geographic dispersion and a high degree of transmission heterogeneity between infected hosts. Our results as a whole add to the growing body of literature regarding the ecology and evolution of human RNA viruses and in particular highlight how these populations are shaped by cross-scale dynamics.

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Chapter 1

Introduction

Viral pathogens are a significant cause of human morbidity and mortality worldwide [1, 2, 3, 4]. While there are a number of viral life history characteristics which exacerbate their ability to readily spread between humans, RNA viruses with short generation times and high mutation rates pose a particular challenge because the ecological and evolutionary processes acting on these populations occur on similar time scales and often on time scales observable by humans [5]. Consequently, evolution can act to evade the ecological constraints on viral fitness and changing ecological contexts can simultaneously shift the fitness landscape on which evolution acts.

Because viruses require a host species to replicate, the primary ecological processes acting on viral populations concern the interaction between viruses and their corresponding host species. These include the transmission mode for a given viral pathogen in a given host population [6], heterogeneity in host susceptibility to infection (due to e.g. immunity) [7], spatial or contact structure in the host population [8, 9], and viral life history traits in a given host species [10]. Many viral species are able to infect multiple host species, which introduces yet another layer of ecological interactions to consider [11]. Here I will primarily be considering the circulation of viral pathogens amongst human hosts.

Evolution is able to interact with these ecological processes due to the diversity in vi-

ral populations that is generated when the RNA polyermase makes mistakes during viral replication. The fate of this diversity depends, in part, on its impact on viral fitness. Laboratory studies have attempted to quantify the so-called distribution of fitness effects in model systems [12]. These studies have found that 40% of mutations in viral genomes are so deleterious to fitness that selection will readily purge them from the population. These mutations, therefore, are unlikely to be observed in natural systems. On the contrary, roughly 4% of mutations are beneficial, that is, they increase viral fitness. Selection will act to increase the frequency of these mutations in the viral population, so long as they continue to be beneficial in a given ecological context. Finally, the majority (>50%) of mutations are neutral or slightly deleterious, meaning they have no or limited impact on viral fitness. Selection will not act strongly on this subset of mutations, however, genetic drift may alter their frequency in a given population over time. As viral populations evolve, the fixation of beneficial mutations may act to counteract ecological constraints in viral fitness (e.g. the acquisition of mutations which evade host immunity [13] or improve transmissibility [14]) and these ecological process will leave characteristic patterns in the viral population diversity [15]).

Consequently, there is considerable interest in monitoring changes in viral genomes as they spread throughout host populations. There is interest in both early detection of mutations which increase fitness and in interrogating the patterns of acquired neutral or nearly-neutral mutations to uncover the ecologic contexts governing their evolution. Viral genome sequencing, in which the genomic diversity of viral pathogens within a given host can be measured, is a crucial tool in monitoring these changes. These data are generated from individual hosts and can be compared in a longitudinal fashion to determine the relative contributions of selection and drift during single infections [16, 17], between transmission pairs to determine how transmission bottlenecks shape diversity [16, 18], and at the host population scale to observe e.g. selective sweeps of lineages with fitness advantages (such as SARS-CoV-2 variants of concern [19]) and to estimate the impact of epidemiological inter-

ventions on viral spread [20]. As evidenced by these examples, fitting quantitative models to deep sequencing data can be particularly insightful to test competing biological hypotheses about the forces acting on viral populations.

1.1 Generation of viral diversity

As stated above, the diversity in viral populations is generated due to mistakes in the viral polymerase. These mistakes, however, can take multiple forms. These forms are generated through distinct biological processes and have distinct consequences for viral fitness.

Point mutations, in which one nucleotide in the genome is replaced by another, are the most commonly studied. These are commonly categorized as either non-synonymous, which affect the translated amino acid sequence, and synonymous which do not affect the makeup of viral proteins. While changes in translated potein sequences have clear potential fitness implications, it is increasingly being recognized that even the synonymous mutations in coding regions can affect viral fitness [21]. Furthermore, synonymous mutations in non-coding regions that are involved in e.g. genome packaging into virions can have significant fitness effects [22]. Some viruses feature proof-reading mechanisms which help to correct for the introduction of errors into the replicated viral genome by the viral polymerase [23]. For example, the exonuclease capabilities of the Nsp14 protein in SARS-CoV as well as other coronaviruses has been shown to reduce the number of accumulated mutations by more than an order of magnitude [24]. Other viral families, such as the Orthomyxoviridae family, to which influenza viruses belong, lack this proof reading capability. These families therefore generally generate more mistakes during viral replication. Importantly, observing mutations in empirical data depends on both the rate at which mutations are generated as well as their impact on viral fitness. As an extreme example, the roughly 40% of lethal mutations described above are never observed because they are readily purged from the viral population.

Additionally, larger-scale mistakes made by the viral polymerase during genome replication can also occur. One of these, recombination, occurs when the viral polymerase jumps between template strands during replication [25]. Homologous recombination, in which the portion of the genome from one template strand is swapped for a template strand from the same species (and in the case of segmented viruses, the same segment) can occur when a single cell is co-infected with multiple progenitor viruses. This process produces a distinct novel genotype, with genetic material from both donor genptypes. Often this novel genotype includes the same set of genes as the progenitor viruses however this process can also produce genomes with the deletion and duplication of genetic material. Evolutionary important recombination (e.g. those which produce functionally novel progeny viruses) is a function both of how likely a given virus is to recombine as well as the likelihood of co-infection of a single host with two distinct parental genomes. Thus, the rate at which homologous recombinant genomes are generated may provide a signal as to the epidemiological context in which a virus is circulating. Non-homologous, or heterologous, recombination occurs when the polymerase either skips between host and viral template strands leading to viral integration into the host genome [26]. However, we expect heterologous recombination to be much rarer than homologous recombination and will not consider it further here.

Genome deletions generated by polymerase skipping can be functionally categorized by the number of deleted nucleotides. Small deletions of only one or a handful of amino acids are observed relatively frequently in both influenza [27] and SARS-CoV-2 [28] and often do not result in non-viable viral progeny. In fact, the ΔH69/V70 deletion in SARS-CoV-2 may actually increase viral infectivity [29]. Additionally, polymerase skipping can generate large (on the order of hundreds of nucleotides) deletions in the viral genome. When these deletions render the virus incapable of replicating without the presence of a helper virus they are commonly referred to as defective viral genomes (DVGs). In influenza, deletion DVGs of this type retain the 5' and 3' ends of the DVG segment, as those regions are crucial for packaging into new virions [30]. In rare cases, specific DVGs can actually interfere with the

replication of wild type virus, acting as genomic parasites of their wild-type counterparts. These are referred to as defective interfering particles (DIPs) and were first described by Von Magnus in 1954 [31, 32]. Since then they have been recognized as common features of influenza viral populations during high multiplicity of infection (MOI) passage studies and have previously been identified during natural human infections [33], although their role in disease dynamics in natural infections is largely unknown. In influenza, DIPs are commonly found on the three polymerase segments and have been proposed as a putative antiviral therapy due to their predatory nature on wild-type virus [34].

Changes in the genomic make up of viral populations can also be generated even when no replication mistakes are made. This is particularly common in the case of segmented viruses, such as influenza, in which the genome is broken up into multiple segments. In such cases, when two virions coinfect the same host cell, progeny virion can harbor genetic material from both parental viruses in a process known as reassortment [35]. This process is responsible for the generation of novel influenza sub-types, such as the pandemic H1N1 sub-type, which harbored segments from multiple parental sub-types [36]. Influenza reassortment which results in novel sub-types is much more likely to occur in host species which can be infected with many subtypes (e.g. swine). While it is generated in the absence of polyermase errors, it is evolutionary analogous to homologous recombination in that it shuffle portions of the genome from multiple donor viruses without changing the gene composition of the progeny virus.

1.2 Processes which shape viral diversity

Once genetic and genomic diversity has been generated during viral genome replication and packaged into progeny virions, the ultimate fate of that diversity is governed by the contrasting forces of selection and genetic drift and gene flow between distinct viral and host populations.

These processes first act within single-hosts, where viral diversity is originally generated. As the process of transmission inherently introduces a significant bottleneck in the viral population size (see below), the impact of genetic drift will be exacerbated early in infection [16]. Selection, primarily in well-adapted endemic viruses with large amounts of pre-existing population immunity such as influenza, is largely due to the host immune response. However, in acute infections this immune response is lagged relative to rapid viral population growth [37], such that selection is relatively weak on immune-escape mutations. Thus, the analysis of deep sequencing data from acute infections does not reveal positive selection acting on immune escape variants [16, 38]. Specifically, known antigenic sites in the influenza A genome do not appear to have an elevated number of non-synonymous mutations or an elevated number of high frequency minor variants during acute infections. Similarly, within-host evolutionary dynamics are similar between vaccinated and non-vaccinated hosts, even when looking specifically at known antigenic mutations. On the contrary, longitudinal analyses of chronically infected hosts has revealed the parallel fixation of specific putatively-antigenic mutations in multiple hosts, strongly indicative of positive selection. These same mutations have also been observed to be under positive selection at the host population scale, providing further evidence that they confer a fitness advantage, likely through antigenic escape, to the virus [17]. Selection will also act on variants that increase the inherent transmissibility of a given virus, particularly in viruses that are poorly adapted to their host. For example, the SARS-CoV-2 D614G mutation which increase between-host transmissibility [39] evolved within hosts multiple times soon after the viruses spillover into human populations [40]

Regardless of the dynamics within individual hosts, the viral population is shaped by the process of transmission between hosts [41]. This process limits the amount of genetic diversity that seeds infection in the new host, relative to what is present in the donor host. If the bottleneck is sufficiently small this provides an opportunity for rare variants in the donor host or *de novo* variants which arise soon after transmission to fix in the recipient host. On the contrary, under a large bottleneck the genetic diversity in the recipient will more closely

mimic that in the donor host, allowing selection to more efficiently act across transmission chains. As such, the transmission bottleneck is an important quantity that modulates the strength of genetic drift during transmission and the degree to which transmission itself promotes the fixation of novel mutations. Estimates of the bottleneck size in influenza virus are on the order of one to three virions [16], implying that very little of the within host diversity is transmitted to recipient hosts.

Finally, as viruses transmit throughout host populations, processes which act on this scale shape the diversity that was generated within single hosts. Selection at this scale will primarily act to fix mutations which either increase the ability of a virus to transmit between hosts (e.g. those which increase transmissibility given infection) or increase the size of the susceptible host population (e.g. immune escape variants). A poignant example of evolution acting at this scale can be seen in pandemic influenza A H1N1 [42]. This virus emerged following zoonotic spillover into human hosts and therefore in the years following its emergence most observed mutation is attributed to host adaptation, not antigenic evolution. However, as immunity to the virus built in the human population, selection began to act primarily on immune escape variants, which replenish the susceptible host population. How selection shapes a viral population therefore depends both on the biology of a given viral species as well as the ecological context in which it is circulating. Genetic drift may also shape diversity at the host population scale and its impact is amplified by epidemiological factors. Seasonality, for example in influenza [43], often results in reduced viral population sizes and genetic bottlenecks during the epidemiological troughs. Assuming the lineages which persist through the trough are selected at random from the preceding peak, this will exacerbate genetic drift and may lead to the fixation of neutral mutations in the viral population. Superspreading, in which certain infected individuals or certain types of social contacts are particularly prone to transmission [44], will also amplify genetic drift at the host population scale. This process skews the offspring distribution of infected hosts, which reduces the effective population size (N_E) [45], accentuating drift.

As an additional level of complexity, host populations are often not well mixed and more closely resemble a metapopulation, or a population of populations. This metapopulation can either be a spatial one (e.g. countries [9]) or an epidemiological one (e.g. contact networks [8]). Host, and therefore pathogen, flow between subpopulations introduces yet another ecological force that shapes viral populations. The evolution of influenza A H3N2 presents a relevant example [46]. Seasonality of influenza in temperate regions and annual epidemics are thought to be reseeded by continual transmission in tropics. This process introduces a bottleneck in the circulating genetic diversity which seeds seasonal epidemics in temperate regions and there is limited reseeding of these drifted populations back to the source regions. As such, the metapopulation structure of influenza evolution exacerbates transient effects of genetic drift within a given season, however, selection is efficient at fixing beneficial mutations in the temperate regions over longer time scales. Metapopulation structure therefore can have disparate effects on shaping viral diversity, dependent on the movement between demes, seasonal dynamics within demes, and selective landscape within and between demes.

1.3 Characterizing viral diversity

Genome sequencing data from infected hosts is a transformative tool for characterizing viral diversity within host populations. These technologies generate thousands of sequenced fragments of the input genetic material [47]. To make inferences about the biological sample these fragments must be either aligned to a given reference genome by finding the region of the reference with the best match to each read or assembled into a contiguous genome in a *de novo* manner. By comparing the assembled genome to a known reference, changes relative to that reference can be identified. Deep sequencing data, in which there are on the order of 10^3 reads aligned to each site in the genome can be used to measure the genetic and genomic diversity within a clinical sample. The accuracy of these estimates, however, depends critically on the quality of the input sample, particular the quantity of input viral

RNA [48].

The relative impacts of selection and drift acting on viral populations within host can be teased apart by comparing viral populations within single hosts across multiple time points. Mutations in the viral genome which are under positive selection will increase in frequency over time, often leading to an elevated ratio of the number of non-synonymous to synonymous substitutions [17, 16]. The accumulation of neutral or mildly deleterious mutations, as is expected under genetic drift, is not expected to produce an elevated number of non-synonymous mutations. Computational models of this process can be used to provide a quantitative estimate of the selection coefficient of specific viral mutations [49, 50].

Deep sequencing data can also provide insight into the presence of recombinant genomes within hosts. In practice, recombination is often identified by comparing a sampled virus to a reference set of viral genomes (e.g. using [51]). Canonically, recombinant genomes harbor genome portions most similar to multiple distinct viral lineages. For example, by identifying the defining mutations for the major circulating clades of SARS-CoV-2, viruses which simultaneously harbored subsets of the clade defining mutations from distinct clades were identified early in the pandemic as recombinant viruses [52]. The resolution to identifying recombinants therefore depends in part on how genetically similar the coinfecting viruses are. One cannot identify recombinant genomes between two identical parental genomes using sequence data alone.

Similarly, the presence of DVGs within hosts also leave characteristic signatures in deep sequencing data. These signatures are found in the reads which span the deletion site in a given DVG. When these reads are aligned to the reference genome they align either to one end of the genome or another with the remainder of the read clipped, or are aligned in a "split" fashion, depending on the mapping algorithm used. The development of algorithms specifically for the purpose of identifying genomic variants which iteratively align chunks of the read to the reference genome have significantly aided in the bioinformatic analysis of DVGs [53, 54]. Additionally, samples with large amounts of DVGs relative to wild-type

virus will characteristically have much higher sequencing depth on the 5' and 3' ends of the segments harboring DVGs, with very few reads coming from the deleted internal nucleotide of the segments. This produces a so-called "bat ear" pattern in the sequencing depth across the genome (e.g. [33]). Differentiating between DVGs and DIPs from sequencing alone is not possible and laboratory experiments must be conducted to confirm the interfering nature of genuine DIPs (e.g. [55]).

Finally, reassortant viral genomes can be identified by comparing the sample from a single host to a set of reference samples. This is often done by comparing the independent evolutionary history of each segment of the genome. Evolutionary histories which are inconsistent may indicate the presence of historical reassortment [56]. These analyses are occasionally visualized using a "tanglegram" in which the order of tips in multiple genealogies are directly compared (e.g. [57]). However, tanglegrams can be misleading as they only show differences in the evolutionary history if those difference affect the ultimate ordering of the tips [58].

By comparing deep sequencing data between epidemiologically linked donors and recipients, the size of the transmission bottleneck can be estimated. In general, under a large transmission bottleneck the viral population in the recipient host will more closely mimic that of the donor host than under a tight bottleneck. While a number of methods for this procedure exist, the most commonly used method is known as the beta-binomial approach [18]. This approach accounts for binomial sampling of the mutations within the donor host, stochastic replication within the recipient host, and the presence of variants which may be present but are unable to be identified due to limitations in the resolution of the sequence data.

Across many individual hosts, the processes of selection and drift within hosts, drift between hosts, and selection and drift at the host population scale all leave characteristic signatures in viral genomes. We can leverage the signal in this diversity to make inferences about virus ecology and evolution from collections of viral sequences. These methods most commonly rely on phylogenetic and phylodynamic approaches. In short, by combining se-

quence and epidemiological data with models for evolution and spread, we can identify the processes which gave rise to the data that are best supported by that model. Specifically, with a model of sequence evolution, i.e. a transition rate matrix between nucleotide states we can identify the genealogical relationships between sampled viruses [59]. Through a process called ancestral state reconstruction (ASR) the nucleotide states of unsampled ancestral viruses can be estimated [60].

Furthermore, the branch lengths of this estimated genealogy can be scaled to be in unit of calendar time, instead of genetic distance, using an estimate for the rate at which substitutions are accumulated [61, 62]. When population sizes change over time, an underlying model for the demographic history of the population can be jointly considered using either a coalescent [63] or a birth-death [64] prior. Under a coalescent prior, the rate at which two lineages merge, or coalesce, looking backwards in time depends on the inverse of the population size. Parametric (e.g. constant, exponential growth/decline) or non-parametric (e.g. skyline [65], skyride [66], or skygrid [67]) models for changes in the population size over time can be fit to the sequence and sampling date data. Recent developments in so-called structured coalescent models allow users to define dynamical models for the underlying population structure (e.g. susceptible - infectious - recovered (SIR) models) and assign each sampled sequence to a given deme [68, 69, 70]. These models therefore allow epidemiological parameters (e.g. R_0) to be directly fit to the data. Alternatively, birth-death models for the underlying demographic dynamics take a forward-in-time approach in which lineages in the tree transmit (branching events), are sampled (tips), or go extinct (unobserved) at certain rates [64]. These rates can then be used to derive parameters of epidemiological interest.

By incorporating additional metadata about the sampled sequences (e.g. sampling location) ASR can also be used to reconstruct changes in a given trait over the genealogy. This process is often used to estimate the spatial location of ancestral sequences either in a discrete [71] or continuous [72] fashion. Looking over the phylogeny as a whole, the relative rates of transmission between different deems can also be quantified. This process allows for

the identification of source and sink populations in e.g. influenza [73].

Implementing these methods in a Bayesian framework [74, 75] provides users with posterior distributions for estimated parameters and genealogical histories. These posterior estimates can be interrogated to test biological hypothesis such as the time to most recent common ancestor (tMRCA) of a given clade, changes in the local substitution rate throughout the genealogical history, and the number of introductions of a given population into a specific geographic region.

1.4 Cross-scales analysis of acute viral diversity

Here, I (M.A.M) present a comprehensive analysis of acute viral diversity across biological scales. I start by analyzing within host deep sequencing data from natural infections of influenza A H3N2 (**Chapter 2**). Previous analyses have revealed that genetic diversity in the form of point mutations is extremely limited in this context [16]. As a result, I focus on the dynamics of genomic diversity in the form of defective viral genomes, a largely unstudied aspect of influenza diversity in natural infections. As the remainder of the chapters focus on the analysis of SARS-CoV-2 sequence data, **Chapter 3** provides the reader with a primer on the insights which have been gained about the SARS-CoV-2 pandemic using sequencing data and open questions and challenges in conducting these analyses. In **Chapter 4** I fit a model of the transmission process to deep sequencing data from epidemiologically linked SARS-CoV-2 transmission pairs to estimate the size of the transmission bottleneck. Finally, in **Chapter 5** and **Chapter 6** I use phylogenetic and phylodynamic analyses to better understand the spread of SARS-CoV-2 into Israel and Georgia, USA, respectively. I attempt to summarize over arching findings from these works with an eye towards future studies in **Chapter 7**.

My specific contributions for each chapter are listed according to the CRediT author statement guidelines (https://casrai.org/credit/), with additional detail where applicable.

As multiple chapters are made up of published works, a separate **References** section is listed for each chapter. Supplementary data files are not included, however, they are readily available from the publisher or online repositories.

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Chapter 2

Leveraging genomic diversity to gain insights into within host influenza dynamics

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Conceptualization, Methodology, Validation, Formal analysis, Investigation, Data Curation, Writing - Original Draft, Writing - Review & Editing, Visualization, Supervision

2.1 Abstract

Infection with influenza virus results in considerable public health and economic impacts each year. One of the contributing factors to influenza's continued spread within the human population is its ability to evade acquired immunity through continual antigenic evolution. Understanding the evolutionary forces that act within and between hosts is therefore crucial to understanding the generation of new antigenic variants. Many studies have analyzed the longitudinal patterns of genetic diversity within individual hosts to assess the relative contributions of selection and drift on evolution. However, most infected individuals harbor very few point mutations in their infecting viral genomes, limiting our resolution in understanding the forces acting on these populations. Further, because of this limited within host genetic diversity we have limited resolution to infer the extent of drift across transmission events. We here propose to use genomic diversity as an alternative signal to better understand the within and between host evolution of influenza virus. Specifically, we focus on the dynamics of defective viral genomes (DVGs), or those genomes harboring a large internal deletion in at least one segment, in natural human infections. By comparing DVG populations across time points and between donor and recipient hosts we show that DVG populations are highly dynamic within hosts and rarely appear to be transmitted along with wild-type virus. Our findings are consistent with the predominance of genetic drift shaping within host populations of influenza A virus and the presence of tight bottlenecks occuring at the point of transmission.

2.2 Introduction

Influenza A virus is one of the most common viral pathogens worldwide. Despite relatively widespread vaccination, influenza infection results in over 20,000 deaths and $3.7 billion in direct medical costs each year in the United States alone [1]. One of the contributing factors to the virus's continued widespread circulation is its ability to rapidly evolve to

evade natural and vaccine-derived immunity [2, 3, 4, 5, 6] . This so-called "antigenic drift" allows the virus to continually replenish its pool of susceptible hosts by reinfecting hosts who harbor immunity to previously circulating strains. Understanding how new antigenic variants evolve within single hosts and ultimately sweep the population is important for vaccine strain selection [7, 8, 9] and informing the development of vaccines that are more robust to viral evolution [10].

The evolution of antigenically diverse lineages of influenza virus is possible because there is diversity in the viral population on which selection can act. This diversity exists because of errors made by the viral polymerase during replication within single hosts. This diversity is shaped by the evolutionary forces within hosts and the population bottlenecks that occur during transmission between hosts [11]. Analyzing the dynamics of this diversity, therefore, can provide insights into the evolution acting within- and between hosts.

Deep sequencing data can be used to quantify the diversity of viral populations within hosts. Sequencing reads generated from a single host can be aligned to the reference genome and used to estimate the frequency of each nucleotide at each site of the viral genome. By comparing variant frequencies across multiple time points one can determine whether selection is acting on specific mutations or whether genetic drift dominates within host evolution [12]. Finally, by comparing variant frequencies in donor and recipient hosts in transmission pairs one can estimate how many virions seeded infection in the recipient [13].

Previous analyses of this type have revealed that selection during natural influenza infection within individual human hosts is relatively weak. For example, it has been shown that there is no signal of elevated dN/dS within hosts, no evidence for selection on known antigenic escape mutants, and the presence of prior immunity has little impact on the amount of observed within host diversity [14, 11]. It has been suggested that this may be due to mismatch in the timing between viral population growth and the immune response [15]. Alternatively, during chronic infections in which there are more viral generations for selection to act, the within host generation of beneficial antigenic variants is readily observed [16].

However, within any given acute infection, there is a relatively limited amount of genetic diversity in the form of single nucleotide polymorphisms (SNPs). In any individual host, there are generally fewer than 15 sites in the viral genome with detectable diversity and those mutations that are present are present at low frequency, rarely shared between hosts, and often not shared between multiple time points from the same subject [14, 11]. This limited diversity hinders our ability to robustly characterize the evolutionary forces acting on these populations and results in considerable uncertainty in our inferred contributions of selection and drift to within and between host evolution. Here we propose using an alternative signal to study the evolutionary dynamics of viral populations within and between hosts. Specifically, we propose focusing on the *genomic* diversity that is generated during infection, in the form of influenza defective viral genomes (DVGs).

DVGs (here used synonymously with deletion-containing viral genomes, DelVGs [17]) harbor a large internal deletion in at least one of the eight segments of the influenza genome. As a result, virions with a DVG are incapable of replicating on their own. However, through coinfection of a cell with wild-type virus, they can proliferate throughout an infection [17]. The process by which coinfection rescues cellular infection with DVGs is similar to the process by which coinfection can rescue infection by virions with incomplete genomes [18, 19] except that instead of missing them entirely, DVGs harbor truncated copies of some segments. Due to this reliance on coinfection, we expect the evolutionary forces acting on DVG populations to mirror those acting on the wild-type viral population. For example, if positive selection is acting on a specific viral mutations, then DVG species that coinfect with wild-type viruses harboring this mutation will appear to have an evolutionary advantage over the DVG species which coinfect with cells lacking this beneficial mutation. This is roughly analogous to the process of genetic hitchhiking, in which neutral loci that co-occur with beneficial ones will increase in frequency due to this linkage [20].

We know from theoretical models of hitchiking that the apparent selective advantage of a neutral gene linked to a beneficial one is dependent on the rate of recombination, or in the case

of influenza, reassortment, between the neutral and beneficial gene. Given viral reassortment occurs readily during cellular coinfection [21], we might expect the linkage between DVGs and their co-infecting helper viruses to be quite weak. However, within host influenza infections are highly spatially structured [22] and this spatial structure may help to counteract the effects of reassortment by increasing the likelihood that a given DVG species coinfects the same cells with a given wild-type genome over multiple cellular replication cycles. Thus, DVGs may offer a complimentary signal to that which is present in the dynamics of SNPs on wild-type viral genomes.

It has been proposed that DVGs may also be transmitted between hosts [23], although these findings have not yet been substantiated elsewhere. Similarly to at the within-host scale, this process in theory relies on coinfection of recipient hosts cells by both wild-type and DVG virions. *A priori*, this is expected to be unlikely if you assume wild-type and DVG virions infect host cells at random during transmission, given the large number of susceptible host cells. However, it is thought that some viruses, influenza included, may form so-called collective infectious units [24]. In these collective units, virions aggregate together, presumably increasing the probability of cellular coinfection. This may play a role in how influenza viruses are able to transmit at all, given the high prevalence of virions harboring incomplete genomes [18, 19]. While their role in between-host transmission remains putative, it has been shown *in vitro* that influenza viruses can in fact form aggregates [25]. If viral aggregates play a role in host to host transmission, we might expect that they act to increase the probability of coinfection early in infection. In addition to physical aggregation with a wild-type virus, the putative transmission of DVGs is made more likely by the fact that DVG RNA can persist in cells for more than two weeks [26]. This finding increases the chance that DVG RNA from a donor host coinfects with wild-type virus in the recipient host as wild-type virus spreads throughout the susceptible recipient host cells.

A subset of DVGs are able to interfere with the replication of wild-type virus during coinfection. This subset of the larger collection of DVGs are referred to as defective interfering

particles (DIPs). DIPs were first identified due to the fact that their interfering properties result in cycles of wild-type virus population expansion and contraction in high-multiplicity of infection passages [27, 28]. For that reason exogenous DIPs have been proposed as potential therapeutic for viral pathogens [29, 30]. It is not well understood which of the many possible DVGs harbor interfering capabilities and if there are any common features of the DVGs which are interfering [28]. In some viral species the presence of DVGs may actually be beneficial for establishing persistent infection [31]. Influenza DIPs have been intensively studied in cell culture [32, 33, 17], and, to a lesser extent, animal models [34, 35]. They have been identified directly from human clinical samples [23]., however, their longitudinal and host to host dynamics in natural human infections is still under investigation. Thanks to recent bioinformatic developments, DVGs can be reliably identified from short read sequencing data. The identification of DVG reads hinges on the fact that when these read are aligned to a wild-type reference genome, each end of the read will best align to distinct portions of the reference genome. Depending on the algorithm used this will either result in the read not being aligned at all, being heavily "clipped," or aligning in a "split" fashion which allows for many deleted reference nucleotides in the alignment. We here use a slightly modified version of a recently developed pipeline [36] that uses the ViReMa algorithm [37] to identify DVG supporting reads. By iteratively aligning portions of the read, the ViReMa algorithm allows distinct portions of a given sequencing read to align to different locations in the reference gnome.

Here, we apply this workflow to previously published deep sequencing data from 217 clinical samples of influenza A H3N2 infections taken from 168 patients [11]. Within these data there are 49 subjects with samples from multiple time points and 47 epidemiologically linked transmission pairs allowing us to look at aggregate dynamics across all subjects, longitudinal dynamics within single-subjects, and dynamics between transmission pairs. This analysis therefore provides a comprehensive view of the generation, evolution, and transmission of influenza DVGs during natural human infections.

2.3 Materials and methods

2.3.1 Data source

All clinical and sequencing data were previously published as part of [11] and all epidemiological and laboratory methods are described in detail in the original publication. In short, the HIVE cohort at the UM School of Public Health queries participating households weekly during the months of October through May for symptoms of respiratory illness. Individuals with symptoms were sampled via a combined nasal and throat swab by the research team. During the 2014-2015 season individuals were also instructed to take a self- or parent-collected nasal swab at symptom onset.

cDNA was amplified from samples testing positive for influenza virus using the SuperScript III ONe-Step RT-PCR Platinum Taq HiFi Kit and the universal influenza A primers [38]. Sequencing libraries were prepared from 300-400bp sheared cDNA fragments and barcoded libraries were further purified by isolation of a 300-500 bp band using gel isolation. Sequencing reads were generated on an Illumina HiSeq 2500 with 2×125 nucleotide paired end reads. Samples with input titers between 10^3 and 10^5 genomes/μl were sequenced in replicate. For each sequencing run PCR amplicons derived from eight clonal plasmids of the circulating strain were sequenced on the same HiSeq flow cell as the patient samples.

Influenza A H3N2 (as identified by a library labelled "perth," "hk," or "vic") sequencing reads were downloaded from the National Library of Medicine (NLM) National Center for Biotechnology Information (NCBI) Sequencing Read Archive (SRA) BioProject PRJNA412631 using the fasterq-dump utility available as part of the SRA Toolkit (https://github.com/ncbi/sra-tools).

2.3.2 Transmission analyses

We used the same household and community pairings reported in [11]. Pairs of epidemiologically unlinked samples ("community pairs") were generated by randomly assigning pairs of

samples within each season, excluding samples from the same household. Epidemiologically linked pairs ("transmission pairs") were identified as in [11] from pairs of individuals from the same household who were infected with influenza viruses more similar than 95% of random community pairs, as measured by the L1-norm.

2.3.3 DVG identification

DVGs were identified using a modified version of the pipeline presented in [36]. Reference genomes were used in accordance with those used in [11]: GenBank CY121496-503 was used for samples collected as part of the 2010-2011 or 2011-20112 season, GenBank KJ942680-8 was used for samples collected during the 2012-2013 season, and GenBank CY207731-8 used for samples collected during the 2014-2015 season. To aid in the identification of DVGs with breakpoints near the 5' or 3' end of a segment we added a 210nt poly-A pad to the 5' and 3' end of each segment. The analysis pipeline was run in Nextflow v19.01.0 [39].

For quality control sequencing reads were first trimmed using Trimmomatic v0.39 [40] in Phred33 mode using the TruSeq3-PE-2 adapters allowing for 2 seed mismatches, a palindromeClipThreshold of 15, and a simpleClipThreshold of 10, scanning the read with a 3 base sliding window and cutting when the average quality falls below 20, removing leading and trailing bases with quality less than 28, and removing reads less than 75 nucleotides in length. Next Kraken2 v.2.0.7-beta [41] with the k2_pluspf_16gb database in paired end mode was used to categorize each read. The extract_kraken_reads.py script from Kraken Tools (https://github.com/jenniferlu717/KrakenTools) was used to filter only for reads assigned to influenza A virus (taxonomic id 11320) or any children taxa. Quality control on the filtered reads was conducted with FastQc v0.11.9 [42].

The paired end reads were concatenated into a single fastq file and aligned using Bowtie2 v.2.4.2 [43] in end-to-end mode with a minimum scoring scheme of L,0,-0.3. End-to-end mode disallows soft-clipping of reads which is needed to align reads that span DVG junction sites. Therefore, reads which do align in end-to-end mode include all wild-type viral reads

as well as reads from the 5' and 3' ends of DVGs which do not span the deletion junction site (hereby referred to as non-DVG supporting reads). The number of reads that aligned to each segment in the step was calculated using Samtools v1.13 with htslib v.1.13 [44] by first sorting by name, then adding mate score tags with fixmate, sorting again by coordinates, marking and removing duplicates with markdup and finally tabulating reads using idxstats.

Sequencing reads which did not align in end-to-end mode include the DVG deletion spanning reads and were thus used as input to ViReMa v0.25 [37] with a seed length of 25 nucleotides, tolerating 1 mismatch in the seed alignment, and allowing up to 8 mismatches at the 5' and 3' end of an alignment. To exclude small indels we removed any DVG-supporting reads which support a deletion of less than 20 nucleotides. Duplicate DVG supporting reads were also removed with ViReMa. Bowtie v1.0.0 [45] was used within ViReMa.

As discussed in [36] identifying the precise DVG breakpoint from sequencing data can be impossible when there are nucleotide repeats on either side of the deletion junction, as is prone to occur [17]. ViReMa includes a "DeFuzz" feature which allows users to force the reported junction site to either the 5' or 3' end of a given read. However, because DVGs may be supported by reads either in the forward or reverse direction, this behavior results in disparate reporting for the same DVG depending on the supporting read direction. Therefore, we slightly modified ViReMa's underlying AddToDict function to force the reported junction sites to the 5' or 3' end of the reference genome, instead of the supporting read. All DVG junctions reported here have been DeFuzz'd to the 3' end of the reference genome. ViReMa results were parsed in Perl v5.26.2 using the summary scripts included as part [36].

2.3.4 DVG quality filtering

DVGs for each clinical sample as well as the plasmid control for each sequencing run were further parsed using Python v3.9.4 [46] with Pandas v1.1.4 [47] and Numpy v1.19.4 [48]. The reported junction breakpoints from the three sets of reference genomes were reconciled by pairwise aligning the segments from each reference using MAFFT v7.6.4 [49] and creating

a mapping between the coordinates for each individual reference and a universal coordinate system. DVGs breakpoints are reported in the universal coordinate system. For each identified DVG we calculated its relative read support by normalizing the number of DVG supporting reads by the sum of the DVG supporting reads and the non-DVG supporting reads for that segment.

Notably, this relative measure is imperfect because reads from the 5' and 3' portions of the genome which are conserved in DVGs cannot be reliably assigned to having been derived from a DVG or wild type viral genome. Furthermore, because longer segments harbor more internal coding nucleotides that can be deleted by DVGs without affecting packaging, this metric may bias the relative support of DVGs on longer segments downwards. Nevertheless, this measure should be a reasonable means of adjusting for variable sequencing depth, particularly when comparing segments of similar length (such as the three polymerase segments).

For each sequencing run, we first excluded any DVG species (as identified by their junction breakpoints) observed in their respective plasmid control. Where technical sequencing replicates from the same biological sample were available we included only DVGs present in both replicates. In these cases, the mean of the relative support values from each replicate was used in downstream analyses. Based on the read support of DVGs present in the plasmid controls, we included only DVGs supported by at least 10 sequencing reads in downstream analyses.

2.3.5 BlastN analysis

Nucleotide Blast (BlastN) analysis [50] was run on the NLM NCBI website (https://blast.ncbi.nlm.nih.gov/Blast.cgi) on May 16th, 2022 using the standard database with the nucleotide collection optimized for highly similar sequences (megablast [51]).

2.3.6 Statistical analyses and visualization

All statistical analyses were done in Python. Statistical tests were conducted using Scipy v1.8.0 [52] and regression modeling was done using statsmodels v0.13.2 [53]. All visualization was done in Python using Matplotlib v3.5.1.

2.4 Results

2.4.1 Limited DVGs in plasmid controls

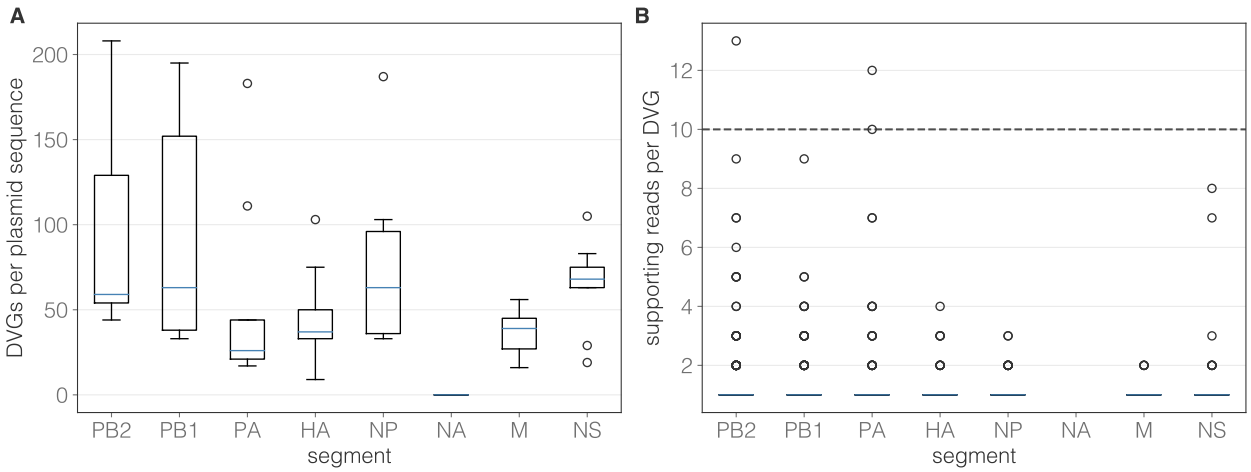


Figure 2.1: DVGs identified in the plasmid controls. Blue line represents the median value for a given dataset, box extends to the limits of the inter-quartile range (IQR), and whiskers extend to 1.5 IQR below and above the 1st and 3rd quartile, respectively. Outliers are shown as dots beyond the range of the whiskers. A) Number of unique DVGs identified per sequenced plasmid per genome segment. B) Number of supporting reads per DVG per sequenced plasmid per genome segment. Dotted horizontal line at $N = 10$ reads represent threshold used for downstream analyses.

To determine the number of spurious DVGs introduced by the sequencing protocol, we first queried the reads generated from the plasmid controls for each sequencing run for DVGs. This analysis acts as a negative control as these DVG reads are generated from clonal plasmids containing full-length viral genome segments and thus should not contain any DVGs. While we observed many (median [sd]: 44.00 [49.54]) unique DVGs in each plasmid control, encouragingly, these DVGs were almost exclusively present at very low read

support (**Figure 2.1**, 1.00 [0.52]). The vast majority (>99.9%) of DVGs identified in plasmid controls are supported by <10 reads. Consequently, we required DVGs to be supported by a minimum of 10 sequencing reads for all downstream analyses to remove spurious DVGs introduced by the sequencing protocol.

2.4.2 DVGs observed readily in clinical samples

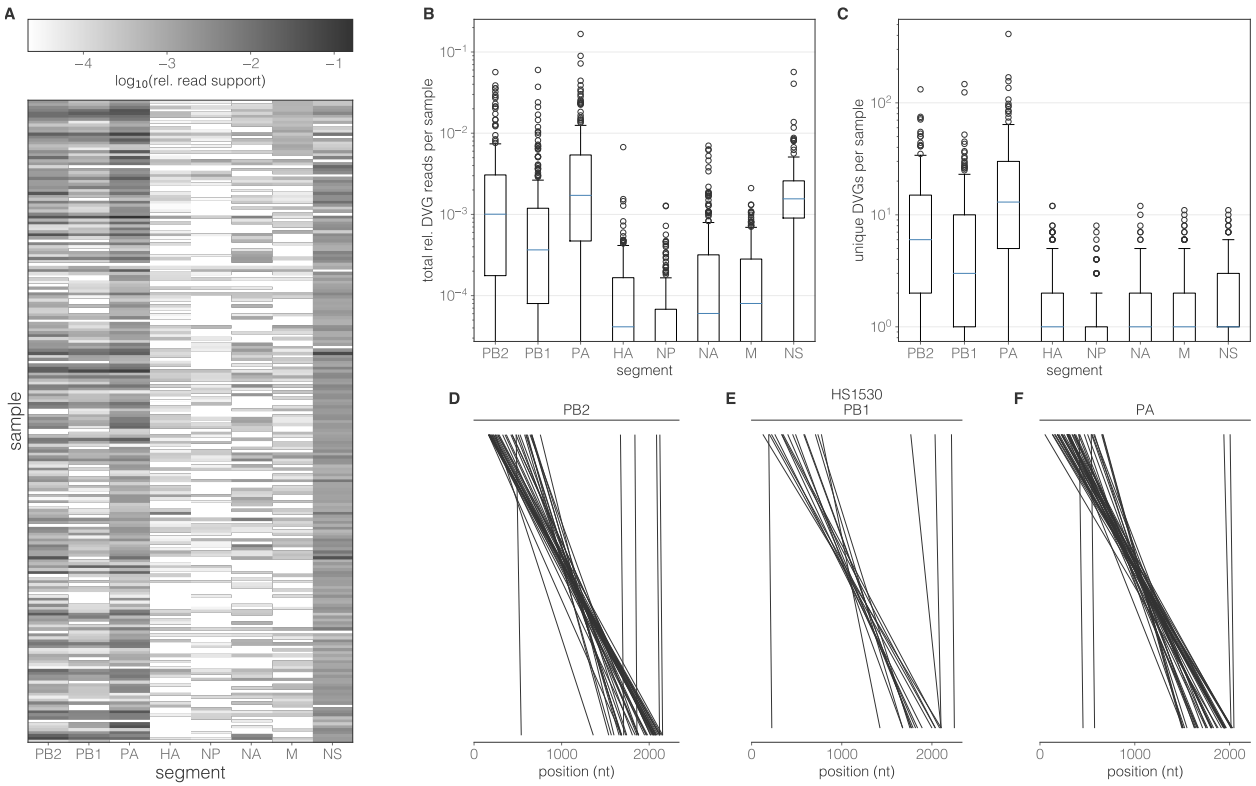


Figure 2.2: DVGs identified in clinical samples. In all boxplots (B, C) blue line represents the median value for each segment, box extends to the limits of the IQR, and whiskers extend to 1.5 IQR below and above the 1st and 3rd quartile, respectively. Outliers are shown as dots beyond the range of the whiskers. A) Heatmap showing the total relative DVG reads in each sample (rows) in each segment (columns). B) Total relative DVG reads per sample per segment. C) Number of unique DVGs per sample per segment. D,E,F) Breakpoints of all PB2 (D), PB1 (E), and PA (F) DVGs identified in representative sample HS1530. Each line connects the last undeleted base on the 5' end of the DVG and the first undeleted base on the 3' end of the DVG.

As opposed to the plasmid controls described above, DVGs are observed readily in the clinical samples (**Figure 2.2**). We observe at least one quality filtered DVG in all 217 of the clinical samples (**Figure 2.2A**). DVGs are observed most abundantly on the PB2, PB1,

PA, and NS segments (**Figure 2.2A,B**, unequal variance T-test with 1000 permutations comparing the relative read support of PB2, PB1, PA, and NS DVGs v. HA, NP, NA, and M DVGs p value<1e−4). However, when looking at the number of unique DVGs (**Figure 2.2C**), as defined by their junction breakpoints, we see a slightly different pattern: PB2, PB1, and PA harbor many more unique DVG species than other segments. NS, compared to the relative read support analysis, contains very few unique DVGs (unequal variance T-test with 1000 permutations comparing the number of DVGs per sample observed on the PB2, PB1, PA segments v. on the HA, NP, NA, M, and NS segments p value<1e−4). This pattern is consistent with the presence of one or very few unique NS DVGs which are abundantly supported (**subsection 2.4.3**). Our finding that DVGs primarily proliferate on the polymerase segment is consistent with previous *in vitro* [17, 33] and *in vivo* [23] analyses. Based on our finding that (with the exception of NS), most observed DVGs are on the polymerase segments and previous work in the field, we here focus only on DVGs observed in the polymerase segment for downstream analyses.

Canonically, the generation of influenza DVGs results in the deletion of the internal coding region for each segment and the conservation of the 5' and 3' regions of each segment, which are thought to be needed for virion packaging [30]. To assess whether our identified DVGs followed this pattern we mapped the deletion junction sites onto the reference genome (**Figure 2.2D,E,F**, **Figure S2.6**). This analysis reveals that the majority of observed DVGs do in fact result in the deletion of the internal portion of each segment, providing confidence that our analysis pipeline is accurately identifying defective genomes, that is, those which are incapable of establishing productive infection in the absence of wild-type virus. Nevertheless, despite our small indel filter which removes any reads supporting a deletion of less than 20 nucleotides, our analysis identified a small number of polymerase DVGs harboring relatively small deletions. A comprehensive analysis of the number of deleted nucleotides in each of the observed polymerase DVGs reveals a highly bi-modal pattern (**Figure S2.7**). To ensure that our analyses were based solely on truly defective genomes and not those harboring small

indels with minimal fitness effects we implemented an additional empirical filtering step to remove any DVGs which support the deletion of less than 500 nucleotides.

Importantly, these identified DVG patterns are likely influenced by the sequencing protocol used to generate these data. The universal influenza A primers [38] used to amplify the input genetic material are designed to amplify based on binding to the conserved regions at the 5' and 3' termini. As such, any genetic material in the input sample lacking these regions would not be amplified. Furthermore, size filters in the sequencing protocol limited our resolution to identify DVGs with less than 300 nucleotides in the resulting segment.

2.4.3 Nearly ubiquitous NS DVG

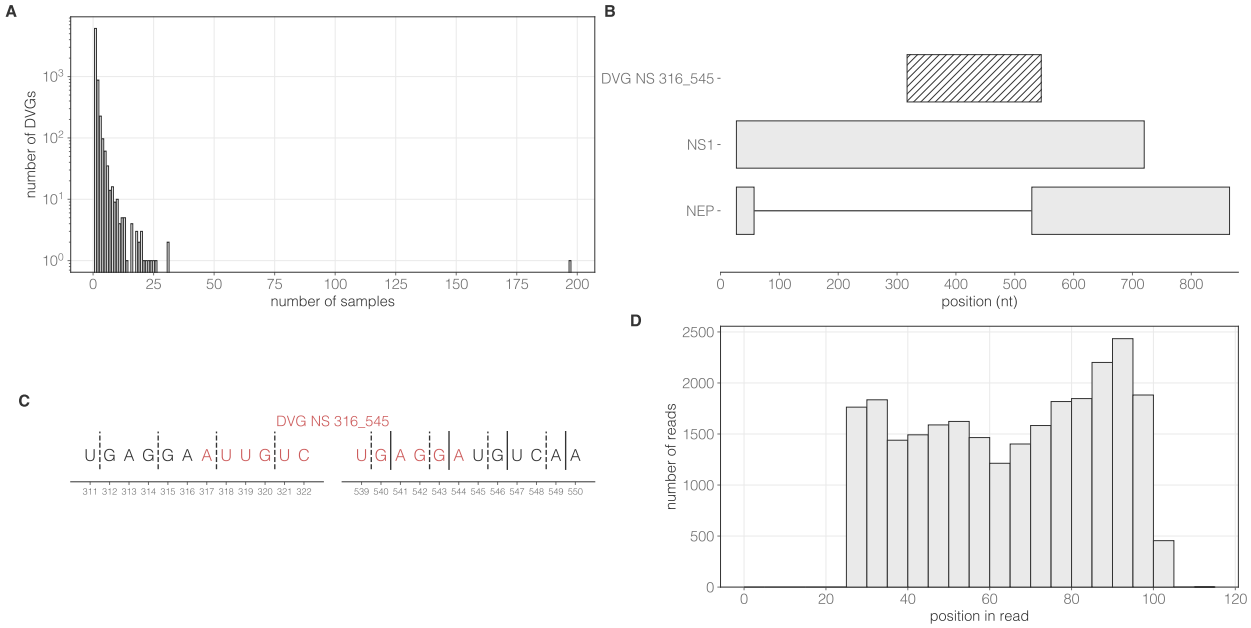


Figure 2.3: Nearly ubiquitous NS DVG. A) Number of DVGs (y-axis) observed in N samples (x-axis). DVG NS 316_545 is found in 197/217 clinical samples. B) Mapping of DVG NS 316_545 onto a schematic of coding portions of the NS segment. The DVG spans the 3' NEP splice site. C) Mapping of DVG NS 316_545 onto the NS segment. Nucleotides in red are deleted as part of DVG NS 316_545. Dashed vertical lines delineate the codons of NS1 in the wild-type protein and dashed solid lines delineate the codons of NEP in the wild-type protein. D) Break point position in the supporting sequencing read for all reads supporting DVG NS 316_545.

In our analysis most individual DVG species were unique, with 99% of all identified DVGs observed in seven or fewer or clinical samples. However, a single NS DVG, DVG NS

316_545 was observed in 197/217 samples (**Figure 2.3A**). This DVG tends to be present at slightly higher relative read support than others in NS (1.1e−3 [9.2e−4] v. 3.1e−4 [3.8e−3]), although the difference is non-significant (unequal variance T-test with 1000 permutations p value=0.09). The breakpoints of this DVG occur within a 11 nucleotide repeat that is present twice in NS: once between nucleotides 306 and 316 and once between 534 and 544 which spans the splice site of NEP (**Figure 2.3B**). Notably, we can not identify the precise breakpoint within this 11-nucleotide region and reported breakpoints were artificially pushed to the 3' end of the reference genome. Because NEP splicing occurs prior to translation [54], we would therefore not expect proper splicing of the DVG mRNA to occur. An analysis of where the DVG breakpoints occur in relation to the codons of NS1 reveals that this DVG would maintain the open reading frame of this protein (**Figure 2.3C**).

To ensure that this DVG is not a computational artifact we first used BLASTN ([50]) optimized for highly similar sequences to query a DVG NS 316_545 supporting read against the NCBI's standard nucleotide database. The top 100 matches (sorted by E-value) were to influenza A NS segments with nucleotide alignments consistent with the DVG alignment reported here. Furthermore, when mapping the DVG breakpoint onto the supporting reads we did not observe any bias in the read position of the DVG breakpoint on supporting reads **Figure 2.3D**. Nevertheless, we cannot rule out for certain that the reads supporting this breakpoint are not due to contamination or bioinformatic artifact.

2.4.4 DVG populations are dynamic

Our primary goal in this study was to assess how polymerase DVG populations change over time during the course of single infections and during transmission between hosts. To assess the former of these two goals, we first analyzed both the total relative polyermase DVG read support as well as the number of unique polymerase DVGs on a per sample basis as a function of the days post symptom onset, which is used in the absence of data on time since infection (**Figure 2.4A,B**). Our results indicate that both the total relative DVG reads and

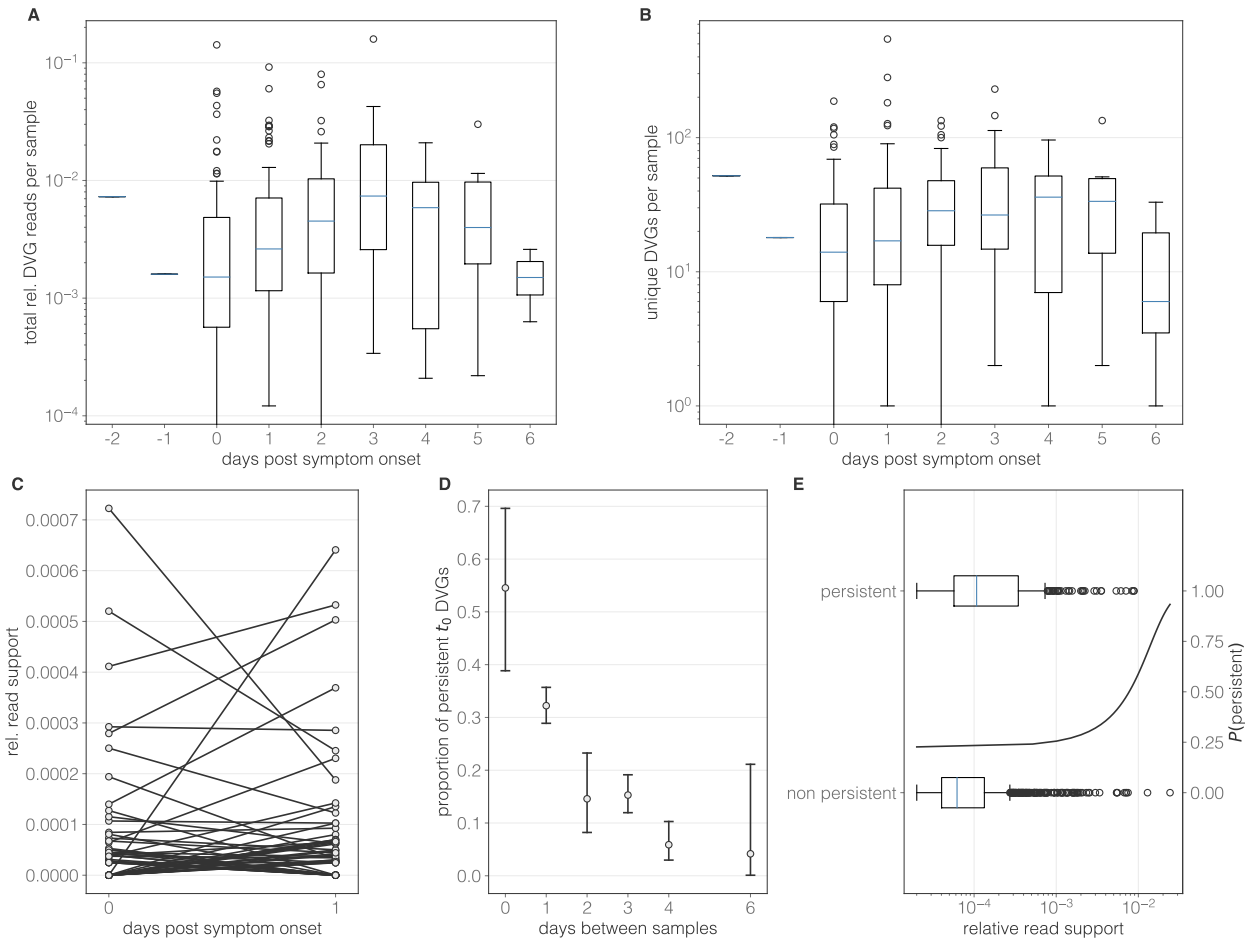


Figure 2.4: Polymerase DVG dynamics over the course of infection. In all boxplots (A, B, E) Blue line represents the median value for each segment, box extends to the limits of the IQR, and whiskers extend to 1.5 IQR below and above the 1st and 3rd quartile, respectively. Outliers are shown as dots beyond the range of the whiskers. A) Total relative polymerase DVG reads per sample as a function of the number of days post symptom onset that a given sample was taken. B) Number of unique polymerase DVGs per sample as a function of the number of days post symptom onset that a given sample was taken. C) Longitudinal DVG dynamics in a representative sample. Lines connect the relative read support of a given polymerase DVG in each of the two samples taken. D) Proportion of all DVGs observed in a given t_0 sample which is also observed in the corresponding t_1 sample as a function of the number of days between when those samples were taken. Whiskers extend to the exact binomial confidence intervals for a given proportion. E) Relative read support of t_0 DVGs which do and do not persist in the t_1. Solid line represents the estimated probability of a DVG with a given read support persisting from a logistic regression.

the number of unique DVG reads per sample do not vary based on the number of days post symptom onset (Kruskal-Wallis H-test p value=0.08 and 0.06, respectively). Qualitatively, samples taken six days post symptom onset appeared to harbor fewer DVG reads and fewer unique DVG reads compared to samples taken earlier in the course of infection (1.50e−3

[8.05e−4] v. 3.18e−3 [1.94e−2] and 6.00 [14.06] v. 19.00 [53.52], respectively). However, there are only three samples taken six days post symptom onset.

This lack of temporal pattern indicates that either DVG populations are generated prior to the earliest samples in this dataset and then persist throughout infection or that there is continual turn over (generation and loss) of novel DVG species throughout infection. This lack of temporal pattern in the quantity of DVGs is consistent with observed in the number of SNPs in these data [11].

To specifically analyze how DVG populations change over time within single hosts, we compared the DVG populations present at multiple time points, when those data were available. In general, DVG populations are highly dynamic over time (**Figure 2.4C, Figure S2.8**) and many DVGs do not persist across time points. This implies that there is continuous *de novo* DVG generation and extinction of previously generated DVGs during infections. To assess the factors which may influence the probability that DVGs are able to persist across time points, we first looked at the proportion of DVGs present at the first time point (t_0 DVGs) with those present at the second time point (t_1 DVGs). This analysis reveals that the proportion of DVGs present at t_0 that are also observed at t_1 is significantly dependent on the number of days which have elapsed between t_0 and t_1 (χ^2 test of independence p value=1.20e−22). Specifically, DVG populations are more similar between samples which were taken at similar time points. Samples taken on the same day share roughly 55% of DVGs whereas those which were taken six days apart tend to share less than 5% of DVGs (**Figure 2.4D**). As genetic drift predicts that the probability of a given mutation fixing within a population depends on the frequency of that mutation in the given population, we next tested whether the probability that a t_0 DVG is also present at t_1 depends on the relative read support of that DVG at t_0. Our analyses reveal that DVG persistence does depend on its relative read support: t_0 DVGs supported by more reads were more likely to be observed at t_1 (logistic regression of persistence as a function of relative read support coefficient p value=0.01, **Table S2.1**). However, we do note that the modeled

fit to our data is relatively flat over the range of relative read supports in which most DVGs are observed. In other words, the 99th percentile of observed relative read support (3.33e−3) would be predicted to only have a 33% probability of persisting between time points based on our regression coefficients. These results were further supported by a multivariate logistic regression model incorporating both relative read support and categorical time between samples (relative read support coefficient p value=1e−3, t=1,2,3,4,6 p value=2e−3, <1e−3, <1e−3, <1e−3, <2e−3, respectively, **Table S2.2**, **Figure S2.9**). Based on the modeled coefficients a DVGs with relative read support of 1e−3 from samples taken 0,1,2,3,4,6 is predicted to have a probability of persisting between samples of 0.60, 0.36, 0.17, 0.17, 0.7, 0.5, respectively. Similarly, a DVG from samples taken 3 days apart with read supports of 1e−4, 1e−3, and 1e−2 would have probabilities of persisting of 0.14, 0.17, and 0.61.

Taken together, our results are consistent with a model of genetic drift dominating within host DVG dynamics. There appears to be continual generation of novel DVGs and loss of existing ones in a manner that is both time dependent and dependent on the quantity of a DVG within a given host.

2.4.5 Limited evidence for the transmission of DVGs

Viral evolution is shaped not just by the dynamics which operate within hosts but also by those which operate between hosts, including at the stage of transmission. Previous analyses based on genetic variation have revealed that the transmission bottleneck of influenza A is quite small, on the order of one to three virions [11]. This results in a significant loss of genetic diversity during transmission such that nearly all genetic variation observed within a host is generated *de novo* following transmission.

To determine whether genomic diversity supports these conclusions, we wished to evaluate how DVG populations compare between known donor and recipient pairs. To do this, for each identified transmission pair we identified all DVGs present in both donor and recipient and determined which are present in both hosts. When multiple time points were available

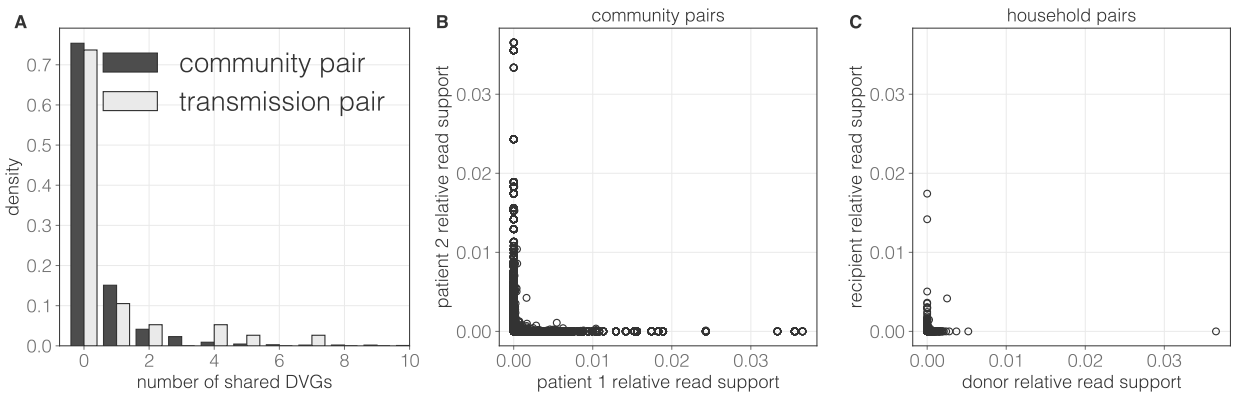


Figure 2.5: Polymerase DVGs shared between pairs of patients. A) Histogram showing the number of DVGs shared between epidemiologically unlinked community pairs (dark grey) and epidemiologically linked transmission pairs (light grey). X-axis has been truncated to 10 for visualization purposes, despite a long tail on the community pair distribution. B) Relative read support in patient 1 (x-axis) and patient 2 (y-axis) of all DVGs identified in at least one patient in all random community pairs. C) Relative read support in the donor patient (x-axis) and recipient patient (y-axis) of all DVGs identified in at least one patient in all epidemiologically linked transmission pairs.

for a given host, we included all DVGs identified at all time points to account for the fact that DVGs present at earlier time points may be present, but at sufficiently low frequency that they can not be identified in the later sample. We compared this to a null distribution generated from community pairs to account for the *de novo* generation of identical DVGs within each host.

We found that epidemiologically unlinked samples generally share very few polymerase DVGs, on the order of zero to one (0.39 [1.03] (**Figure 2.5A**). This indicates that *de novo* DVG generation on polymerase segments is likely random and there is no evidence for preferential generation of specific DVG species. Amongst transmission pairs, we similarly found that generally very few DVGs are shared between individuals (0.54 [1.22]). In a negative binomial regression with the type of pair (unlinked/linked) as a predictor and number of shared DVGs as an outcome, the coefficient on the type of pair was non-significant (p value=0.727), indicating that epidemiologically linked transmission pairs are no more likely to share DVGs than unlinked random community pairs. Finally, to determine whether DVGs that were shared between known transmission pairs were distinct from those shared between commu-

nity pairs we compared the relative read support of DVGs shared between these two groups of pairs. For each DVG shared between each pair, we took the maximum read support from all samples for both patients in the pair. We found no significant difference between these two distributions (**Figure 2.5B, C**, **Table S2.3**, unequal variance T-test with 1000 permutations comparing the maximum relative read support of polyemrase DVGs shared between community pairs and known transmission pairs p value=0.424).

Taken together, these results indicate that there is no discernible difference between how often DVGs are shared, and the relative read frequency of the small number of DVGs which are shared by transmission pairs and community pairs. Therefore, because known transmission pairs do not share more DVGs than community pairs we can conclude that there is no supporting evidence for the transmission of DVGs in these data, implying that there is a very small bottleneck size for genomic diversity.

2.5 Discussion

Understanding how influenza viral populations evolve within and between hosts is key to understanding how viral evolution proceeds on the host population scale. This is relevant, for example, in learning how new antigenic variants arise and ultimately sweep the host population. Previous work has used genetic diversity, or diversity in the form of single nucleotide polymorphisms, to better understand the evolutionary forces acting within hosts, i.e. the relative contribution of selection and drift in shaping viral populations. These analyses have found that selection is weak within hosts, e.g. known antigenic escape mutants do not appear to be under selection, and drift in the form of transient low frequency SNPs predominates [14, 11]. Furthermore, the size of the transmission bottleneck, or the number of virions transmitted between donor and recipient hosts, has been estimated to be on the order of one to three virions [11], which will introduce an additional source of genetic drift at the point of transmission. However, the resolution of these studies is inherently limited

by the low levels of genetic diversity which exist within acute human infections of influenza: generally less than 15 observable mutations per host at any given time [14, 11].

Analyses based solely on SNPs do not incorporate the *genomic* diversity that is generated during infection in the form of defective viral genomes. These genomes feature large internal deletions in at least one segment and are therefore incapable without of establishing productive infection without coinfection of a cell with a wild type virus. Due to this reliance on coinfection and the spatial structure of within-host infections that may retain linkage between specific wild-type genotypes and their corresponding DVG species, we expect the ecological and evolutionary dynamics of DVGs to mirror those of the wild-type viral population.

At present, little is known about the *in vivo* dynamics of influenza DVGs. The vast majority of our understanding of influenza DVGs come from *in vitro* studies [32, 33, 17] and existing *in vivo* studies offer only a cross sectional view of DVGs within a host population [23]. How DVG populations change over time, and what those dynamics tell us about the forces shaping the entire collection of influenza viral particles within and between hosts in natural human infections therefore remains an open question.

Here, we attempt to address this gap in the literature by identifying DVGs from deep sequencing data collected as part of a longitudinal influenza household cohort study [11]. We identify at least some quality-filtered DVGs in all samples in the dataset, primarily on the PB2, PB1, PA, and NS segments. These DVGs largely harbor the canonical motif in which the majority of the coding portion of each segment is deleted but the packaging signals at either end of the segment are maintained. These large deletions almost certainly render the affected segments incapable of replicating without a wild-type helper virus.

We observe a novel NS DVG that is nearly ubiquitous in our data. This DVG contains a smaller deletion than many others, only 228 of NS's 879 nucleotides. It's formation looks to be driven by the repetition of an 11 nucleotide motif in two places within NS, within which the DVG breakpoints fall. Based on a BlastN analysis as well as an analysis of supporting

read alignment we feel confident that this DVG is not a bioinformatic artifact. However, its biological importance and whether this DVG is also observed in other human deep sequencing is an avenue for future research.

Our primary interests in this study was in assessing changes in DVG populations over the course of infection and across transmission chains. From a cross sectional perspective we do not observe any significant changes in the quantity of DVGs relative to the quantity of wild-type virus. This implies that either DVG populations are relatively stable over the course of infection or that DVGs are continually being lost and regenerated are similar relative rates. Importantly, we know based on previous analyses of these data [11] that viral titers are the highest in the earliest available time points. Therefore, the relative quantity of DVGs early in infection, when viral population sizes are growing rapidly is unobserved in these data.

To differentiate between the two possible explanations for the relative stability of DVG quantity over the range of days post infection included in this study, we turned to longitudinal samples from single patients within the dataset. When looking at specific DVGs over time within single hosts, we observe highly dynamic populations. Between time points there is considerable loss of DVGs which were present at one time and *de novo* generation of novel DVG species at the following sampling time. We find that this process is dependent on at least two factors: the time between samples and the relative read support of a given DVGs. DVGs are more likely to persist between time points when samples are taken at more similar time points and DVGs are present at a higher relative frequency.

The strength of genetic drift acting on a given population can be quantified by the effective population size, N_E. Regardless of census population sizes, drift will be stronger in populations with small N_E whereas the ability of stochastic changes to considerably affect evolutionary dynamics will be minimal in populations with large N_E. Quantifying the within-host N_E of influenza A using genetic data is difficult, given the rapidly changing population sizes, noise in the SNP frequency estimates, and the number of evolutionary assumptions required of existing models. When it has been attempted, the estimates tend to be on the

order of $<$ 1e2 [55]. While here we do not attempt to quantify N_E, our observations that DVG populations are highly dynamic and change rapidly between time points is consistent with a relatively small N_E as populations with a large N_E would be expected to be more stable. Given the apparent lack of intrinsic differentiating characteristics between DVGs which persistent across time points and those which do not we would not expect selection to be responsible for these rapid changes in DVG population composition. Furthermore, we do not observe selection acting on any specific polymerase DVGs given the fact that most random pairs of samples share almost no DVG species.

As discussed above, the viral diversity which is present within host is also shaped by the process of transmission between hosts. The size of the transmission bottleneck can be quantified to guide our understanding of how this process shapes viral diversity. To guide our knowledge of the transmission bottleneck based on the DVGs within a sample we compared DVG populations between known transmission pairs. We find that known transmission pairs, on average, share almost no DVGs and do not share more than random community pairs. This finding indicates that any DVGs which are shared are likely due to *de novo* generation.

This finding is unsurprising given the small estimated bottleneck size from genetic diversity and the fact that DVGs require coinfection with wild-type virions to establish infection. Thus, the probability that a wild-type and DVG virion coinfect the same cell early in infection when is rare. However, non-replicating DVGs can persist in cells *in vitro* for several weeks [26], increasing the likelihood that theoretically transmitted DVGs are able to find a wild-type helper virus sometime during the course of infection. Furthermore, it is thought that viruses may transmit not independently, but in collective infectious units of multiple viral particles, which would make it more likely that a DVG and a wild-type virus from the same collective infectious unit find the same host cell [24]. Our findings, therefore, are insightful in reconciling these conflicting *a priori* expectations regarding the transmission of DVGs.

We believe, based on that fact that there is limited to no evidence of DVG transmission

between known transmission pairs that human to human transmission of natural influenza infection is likely mediated by a very small bottleneck. This finding implies that the vast majority of the within host genetic and genomic diversity is not transmitted and is generated *de novo* within each infected hosts. This process constrains the ability of selection to act across transmission chains and accentuates the force of genetic drift on host population level evolution.

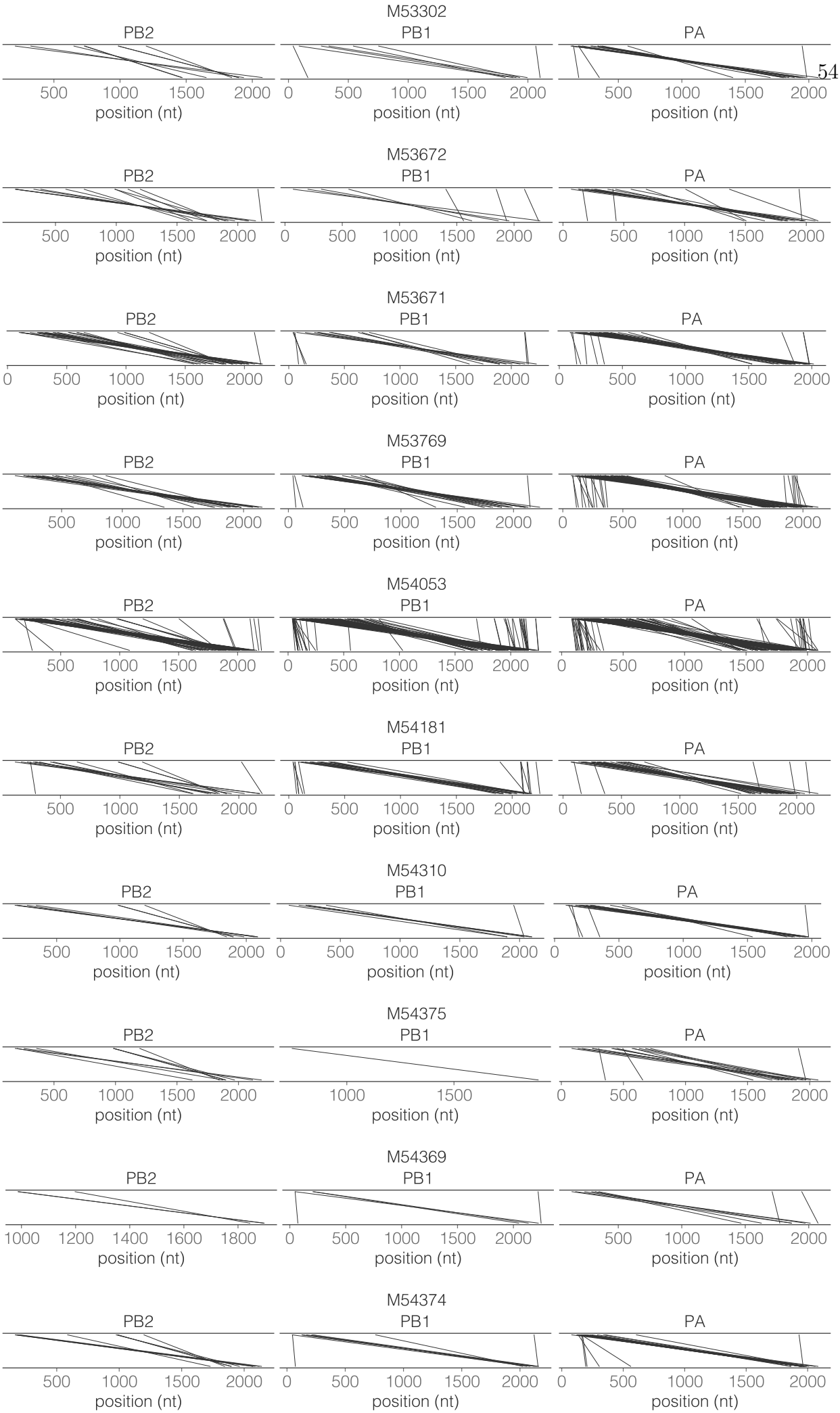
There are some important limitations to this work. Primarily, it is difficult to reliably quantify the amount of DVGs within a sample using sequencing data. Here we have relied on a relative measure of the number of reads spanning a given junction site to the total number of reads mapped to a given segment. This method is slightly biased, however, because we cannot assign reads from the 5' and 3' termini as belonging to either a wild type or DVG segment. Furthermore, this metric will be biased downwards in longer segments as there are more coding nucleotides which can be deleted in a DVG without affecting the packaging signals. However, without additional laboratory measurements, we feel this metric represents a suitable attempt to account for varying sequencing depth between samples. Furthermore, our set of identified DVGs will be affected by the amplification and sequencing protocol used to generate these data. Genetic material was amplified based on primers which bind to the terminal regions of the wild-type segments and there are several size-filtering steps which eliminate smaller DVG segments. But, there is reason to expect that DVGs without the terminal packaging signals would be unlikely to be efficiently packaged into virons, even if they were generated by the polymerase [56]. Nevertheless, the fact that the plasmid controls harbor very low relative amounts of DVGs provides confidence that the DVGs reported here represent a subset of true biological DVGs. Additionally, we are unable to computationally determine which, if any, of our DVGs genuinely have interfering properties with regards to their effect on wild-type viral populations. Identifying interference requires monitoring the relative quantity of DVG and wild-type material through cell culture passages (e.g. [57]). Finally, as with any *in vivo* deep sequencing based analysis we are unable to determine the

extent to which are measured viral populations mirror the genuine population within a host. Sub-compartmentalization of the within host viral population may bias the viral diversity which is detected in throat and nasal swabs.

Despite these caveats our our results further add to the growing body of evidence that viral populations harbor considerable diversity beyond what is observed in SNPs. This diversity is accentuated in a segmented virus such as influenza as virions can, in addition to wild-type virions and DVGs, also harbor genomes with segments that are missing segments entirely [18]. Fully understanding the ecological and evolutionary dynamics within natural systems requires analyzing how these forces shape the full suite of genetic and genomic diversity that is generated during replication.

2.6 Supplementary

2.6.1 Supplementary Figures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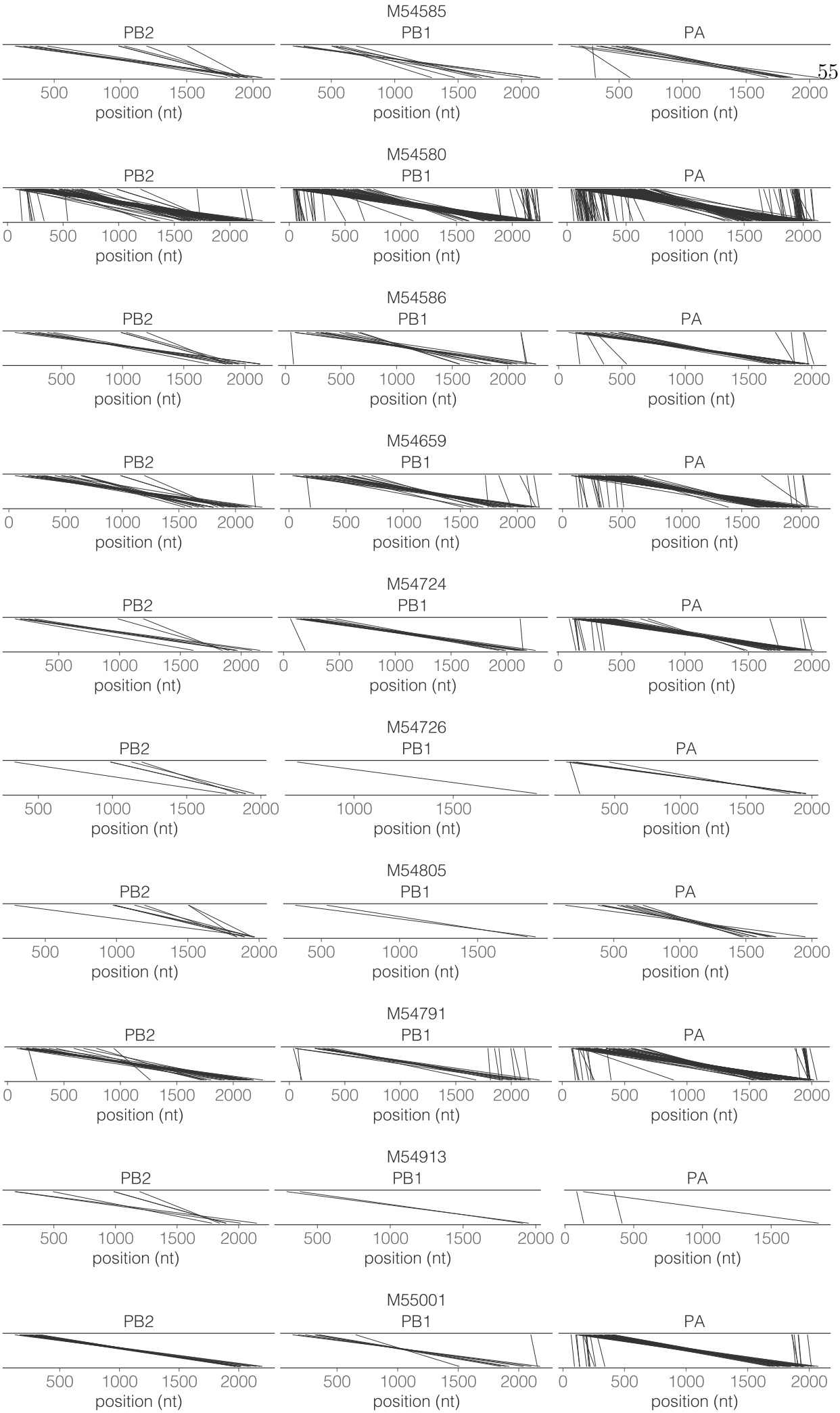
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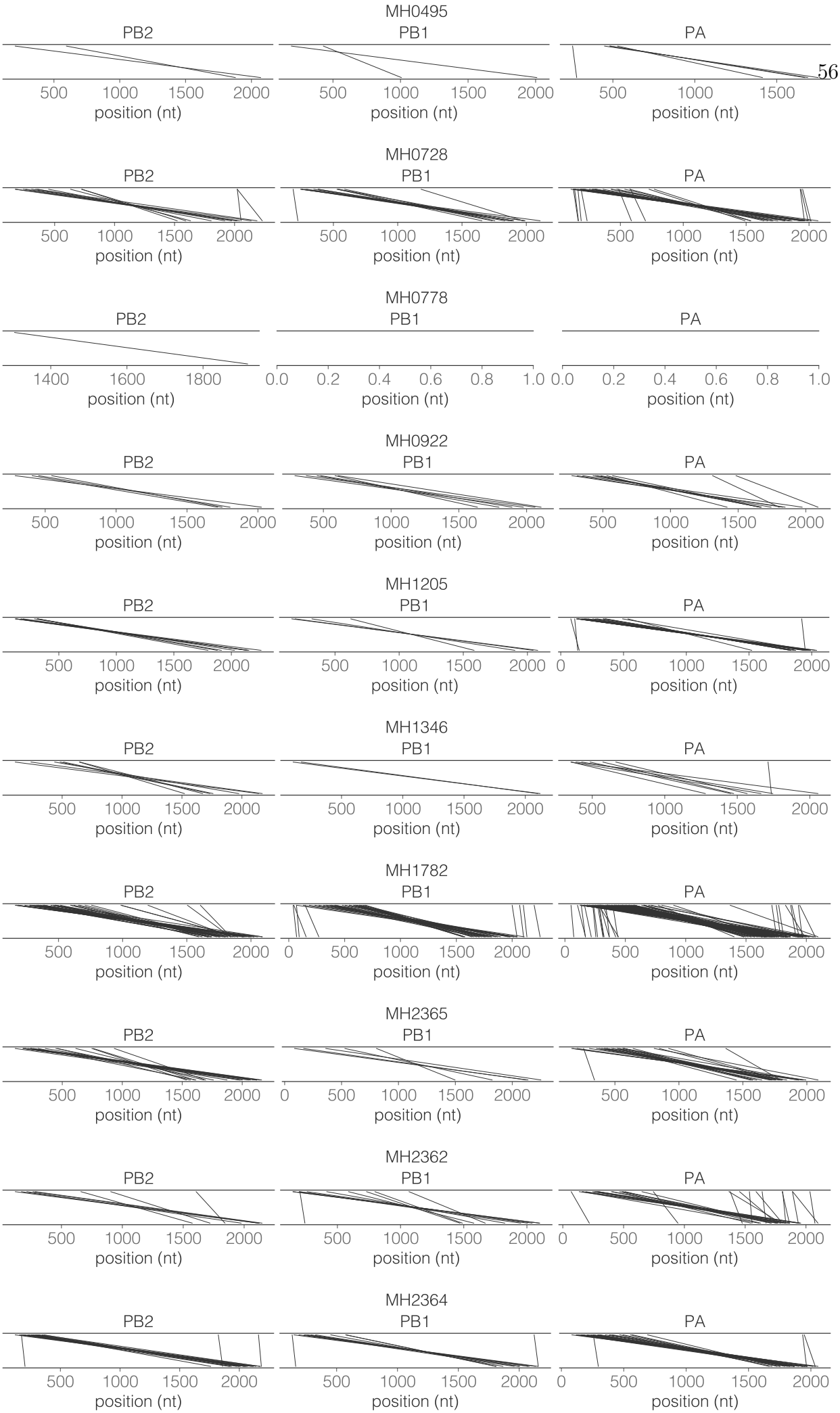
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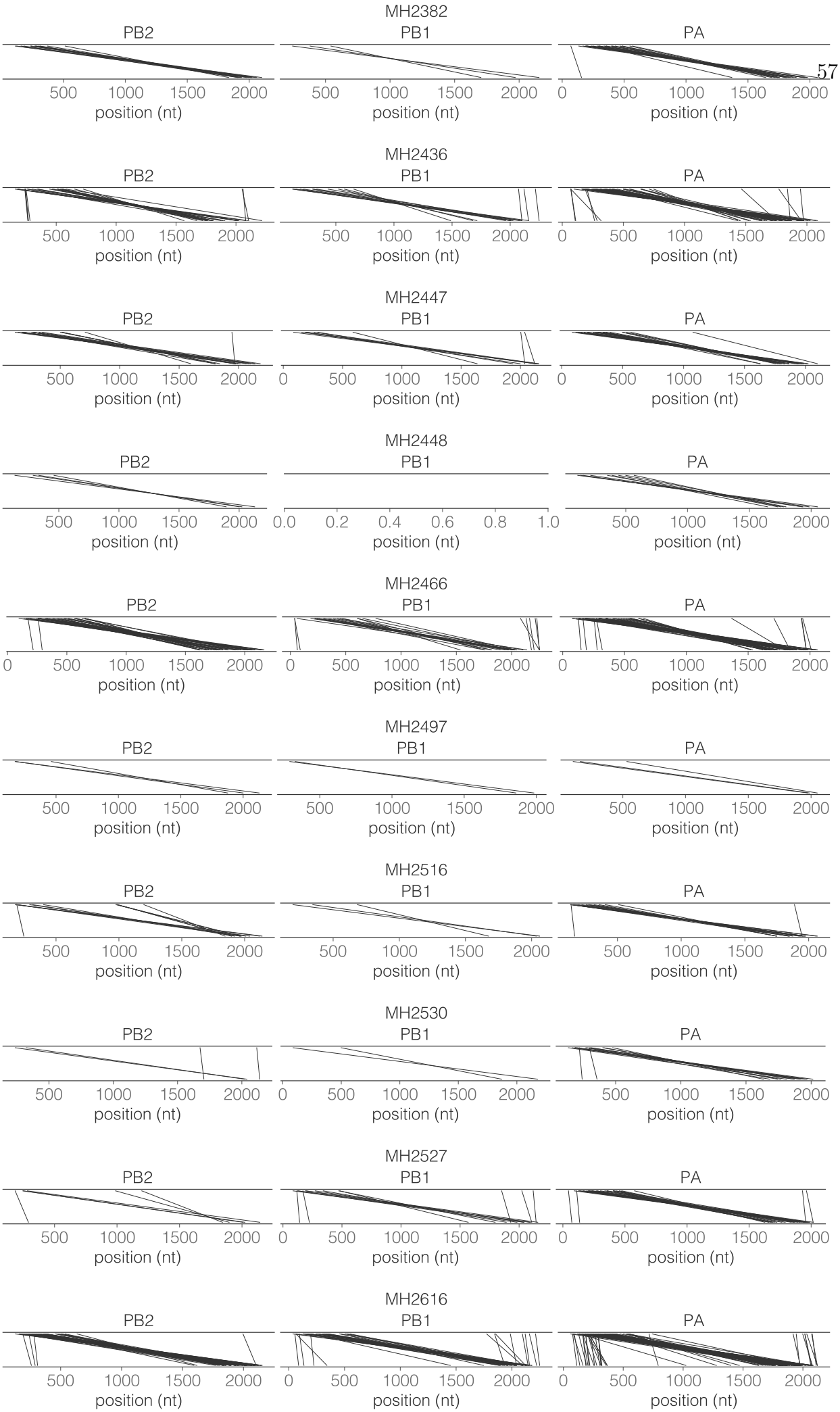
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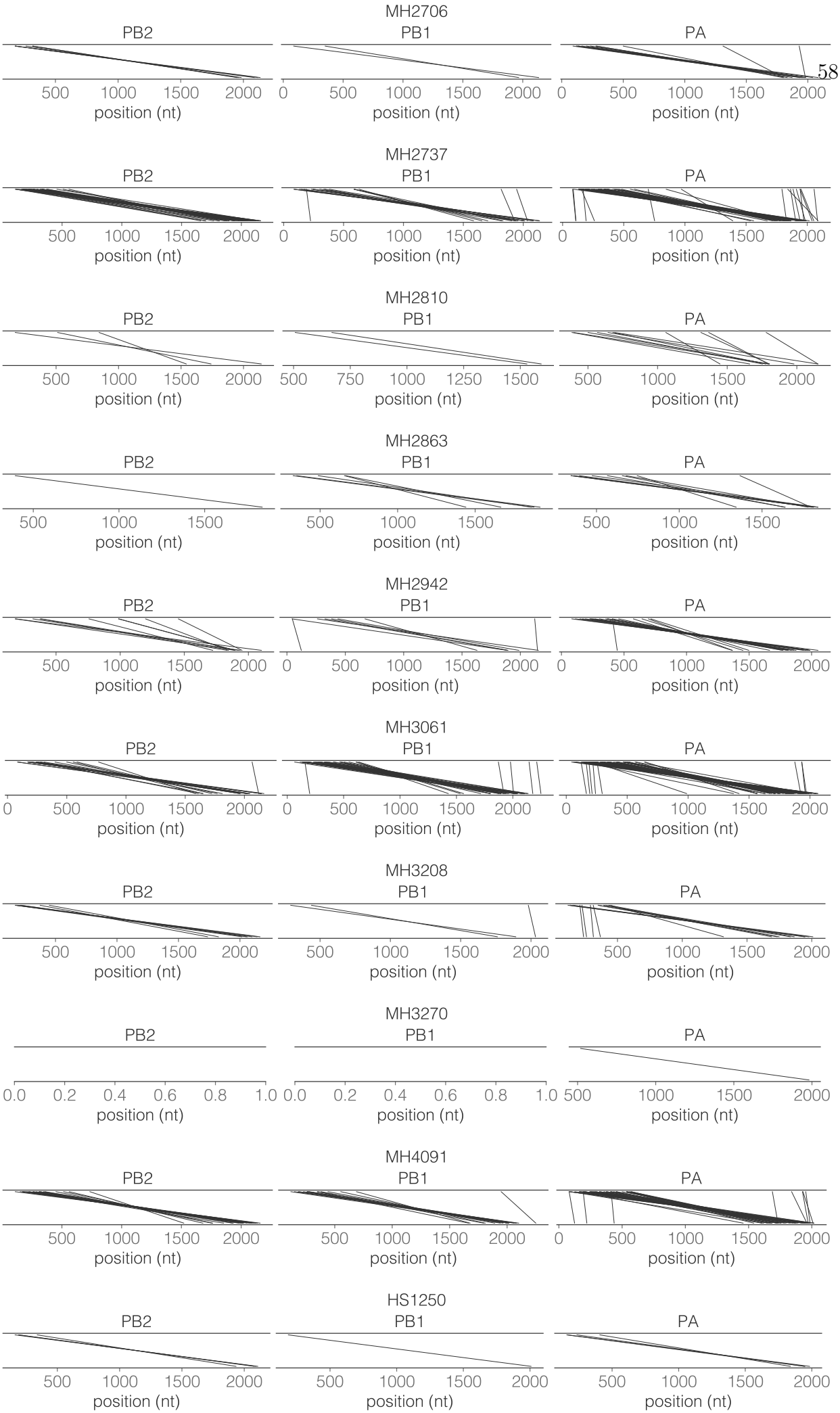
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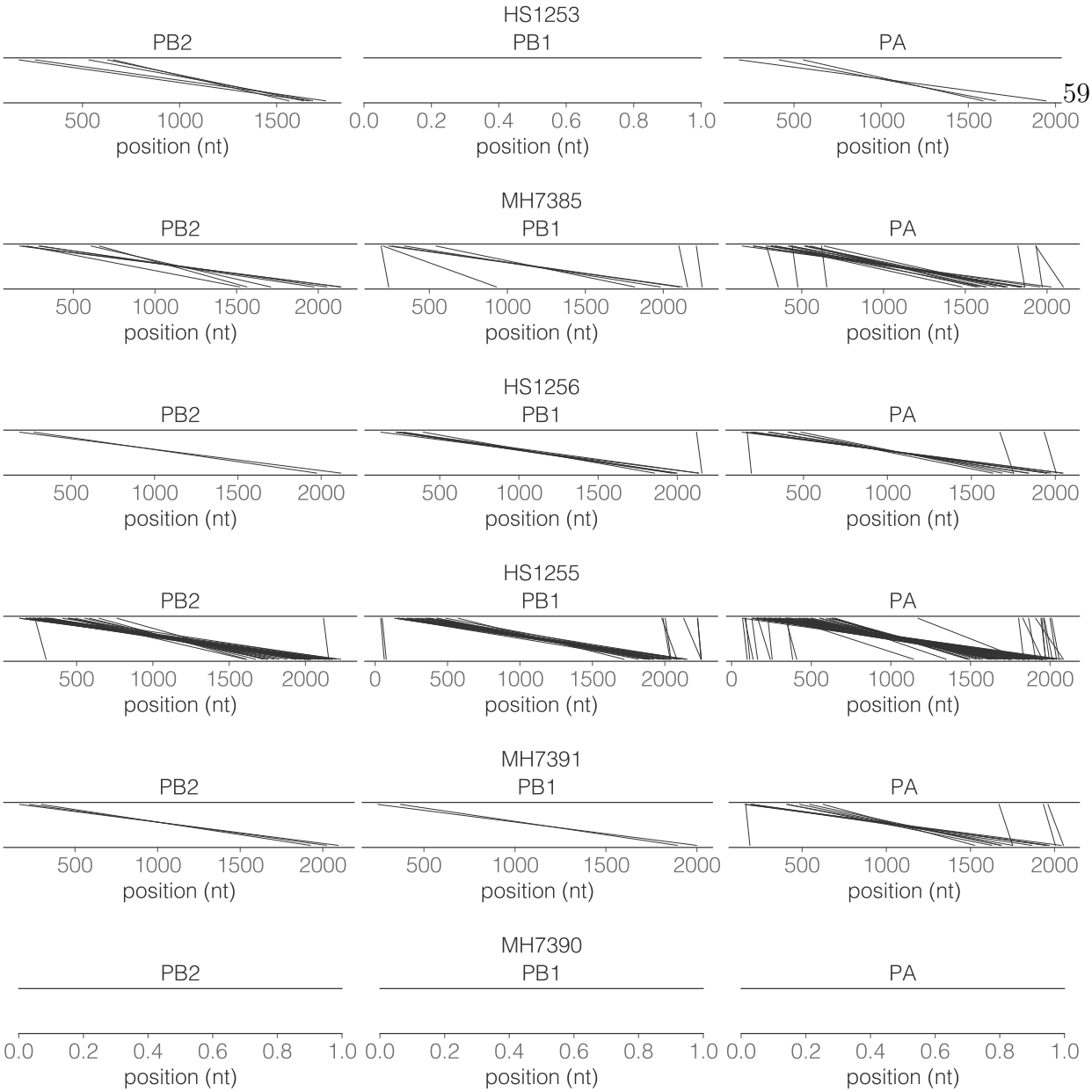
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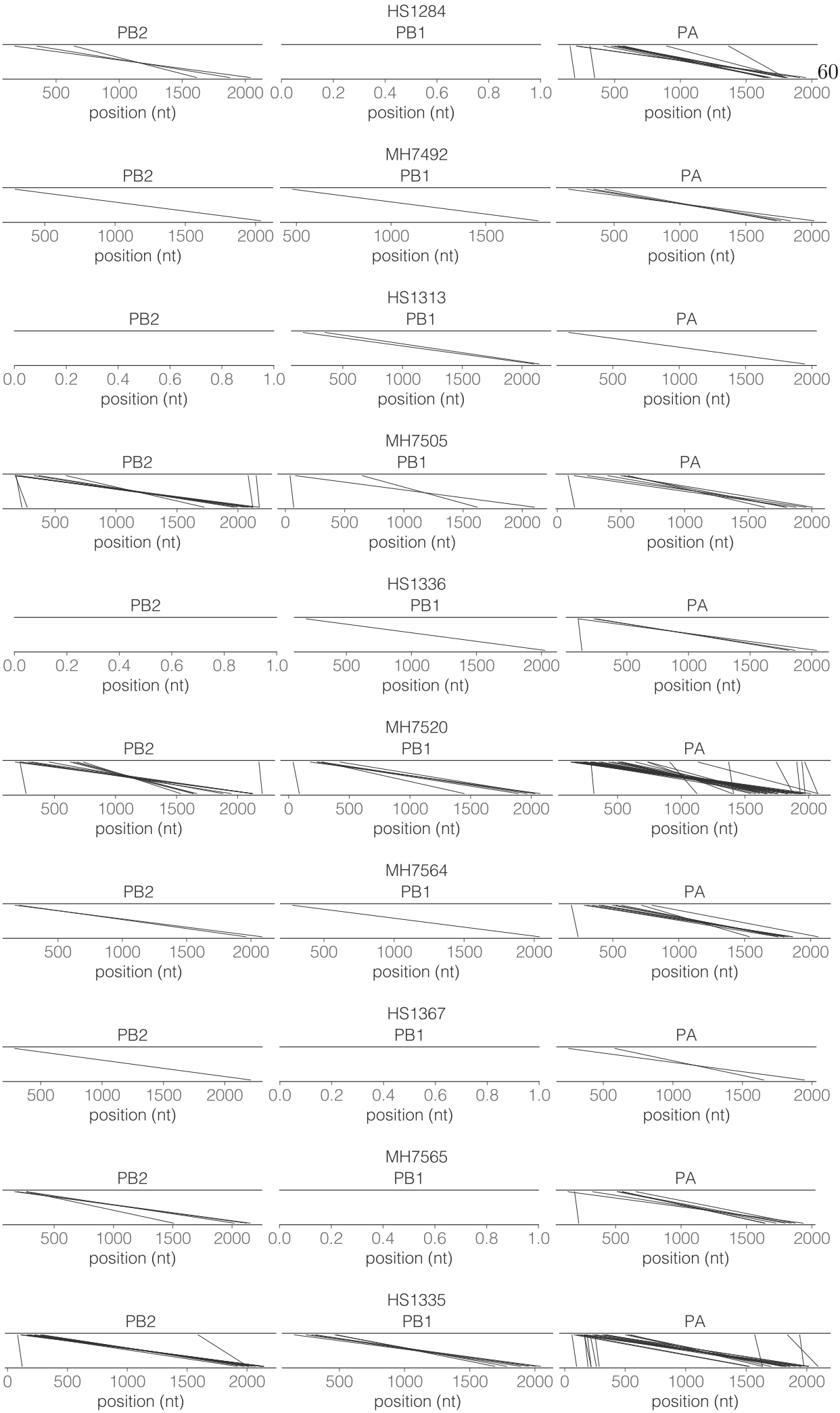
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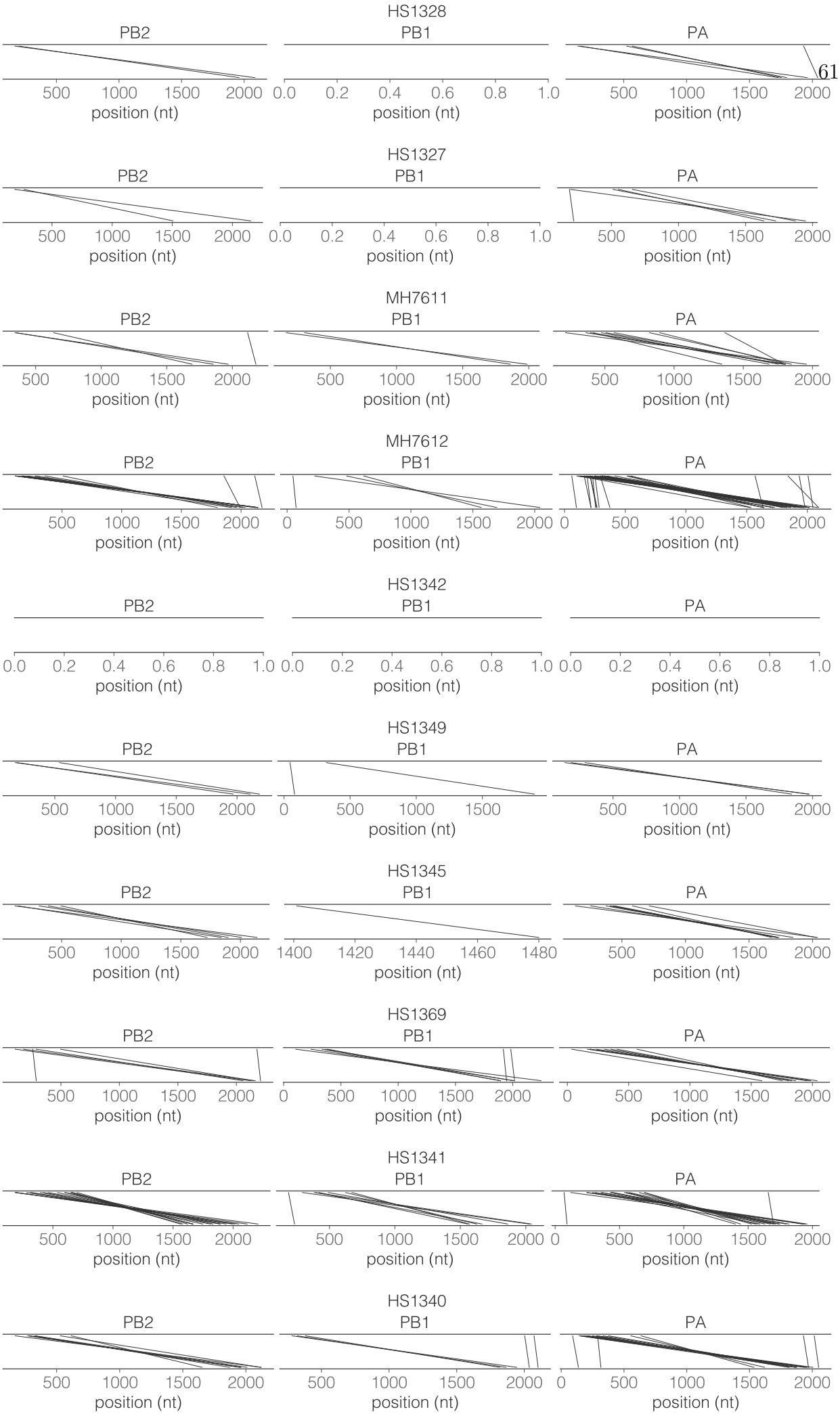
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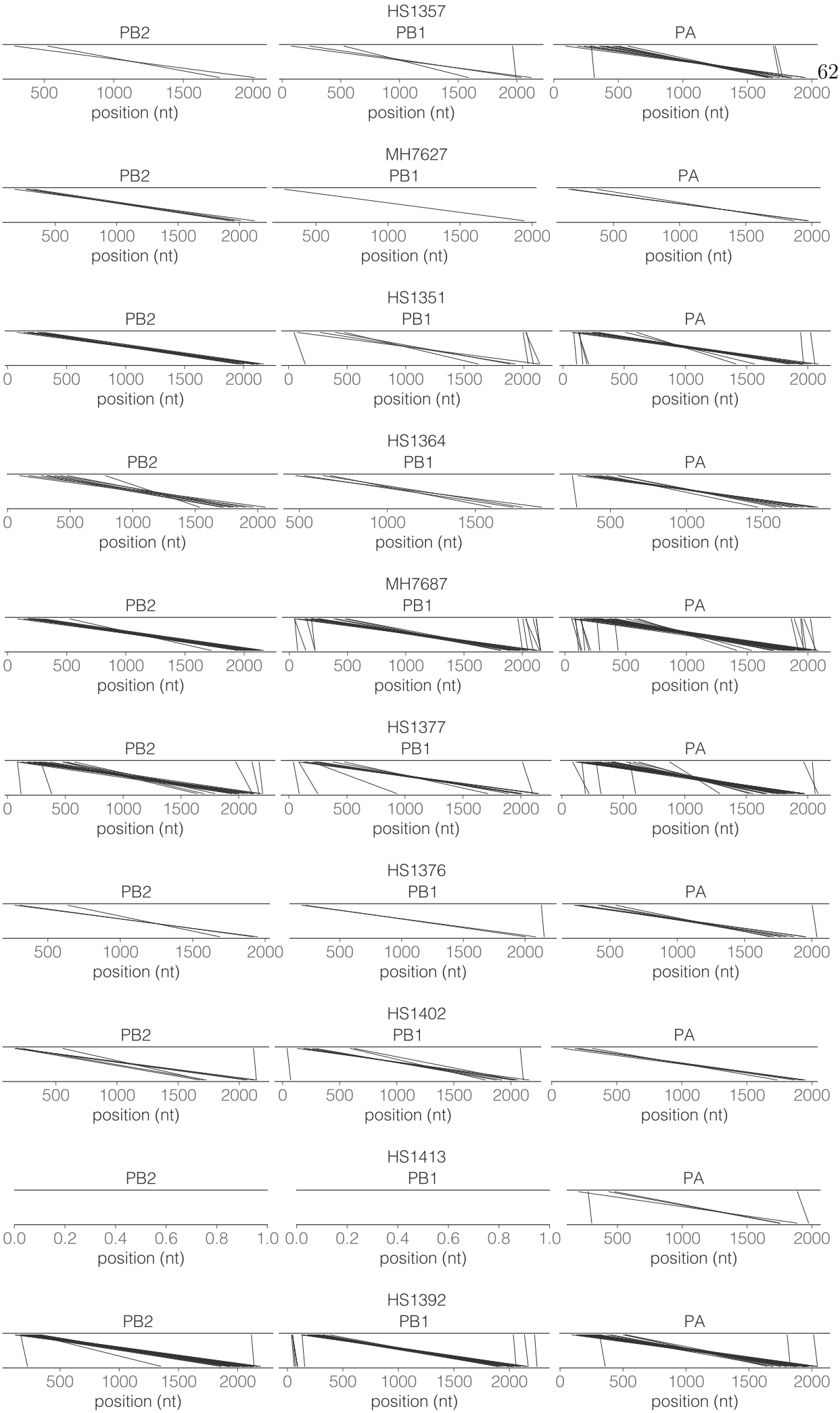
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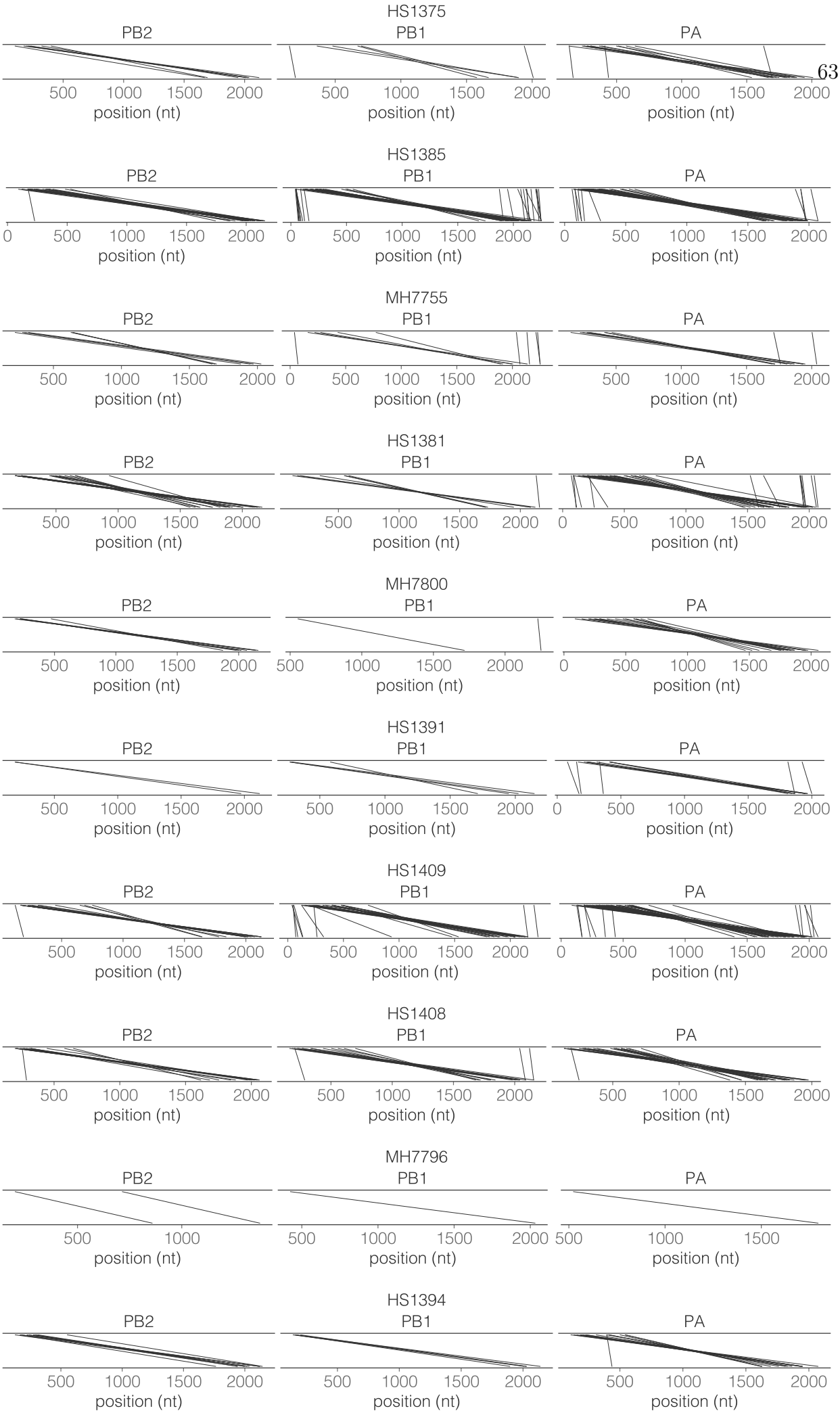
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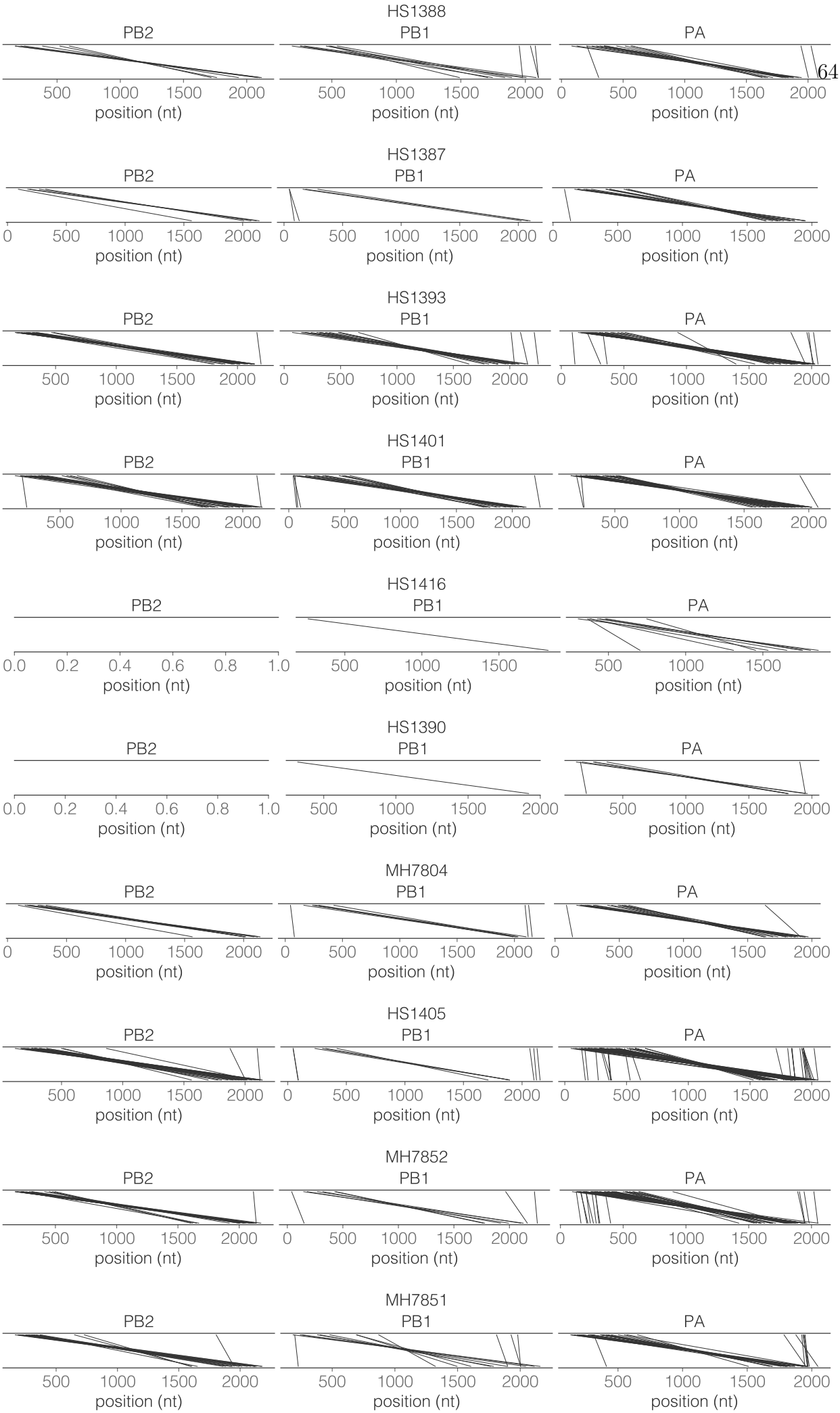
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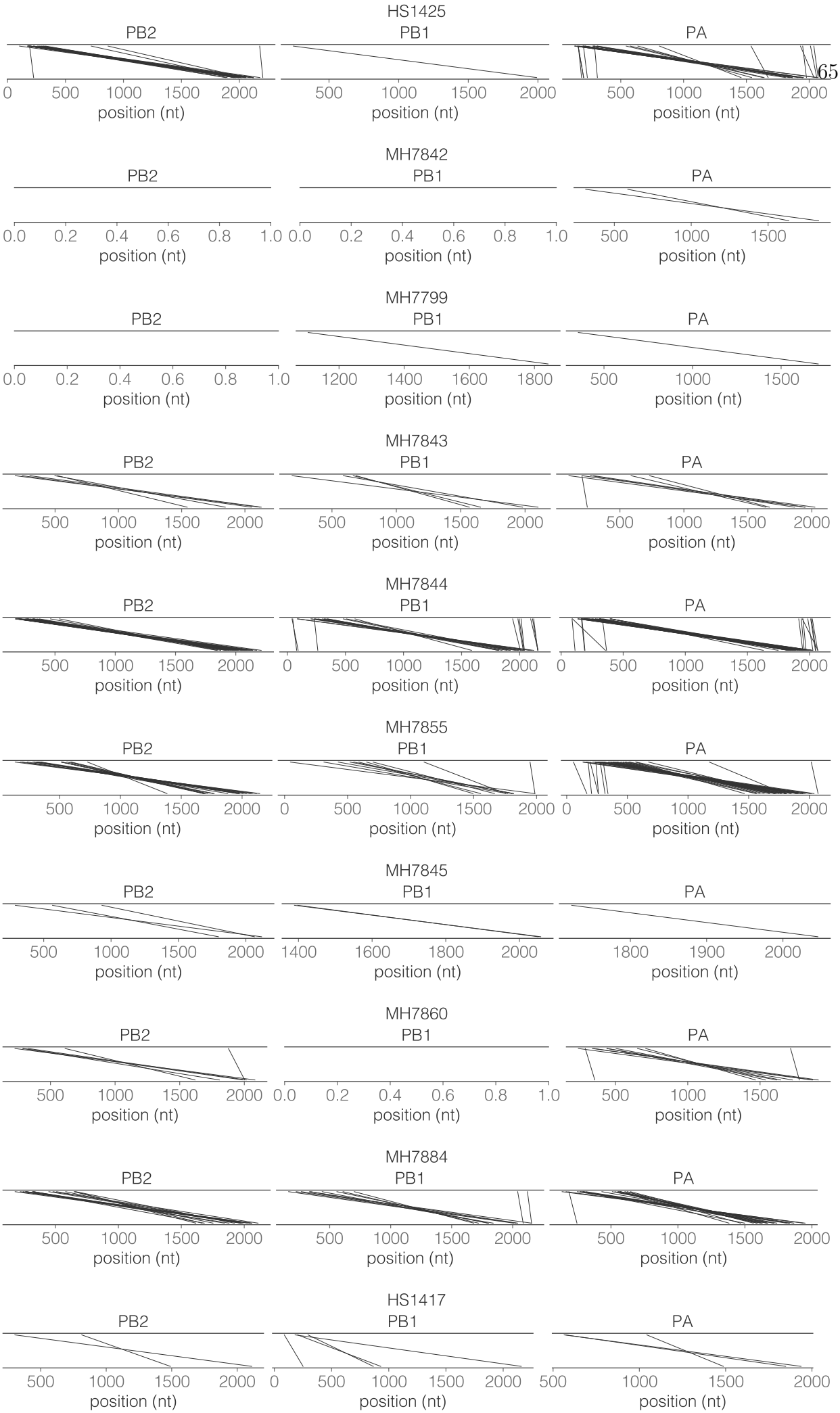
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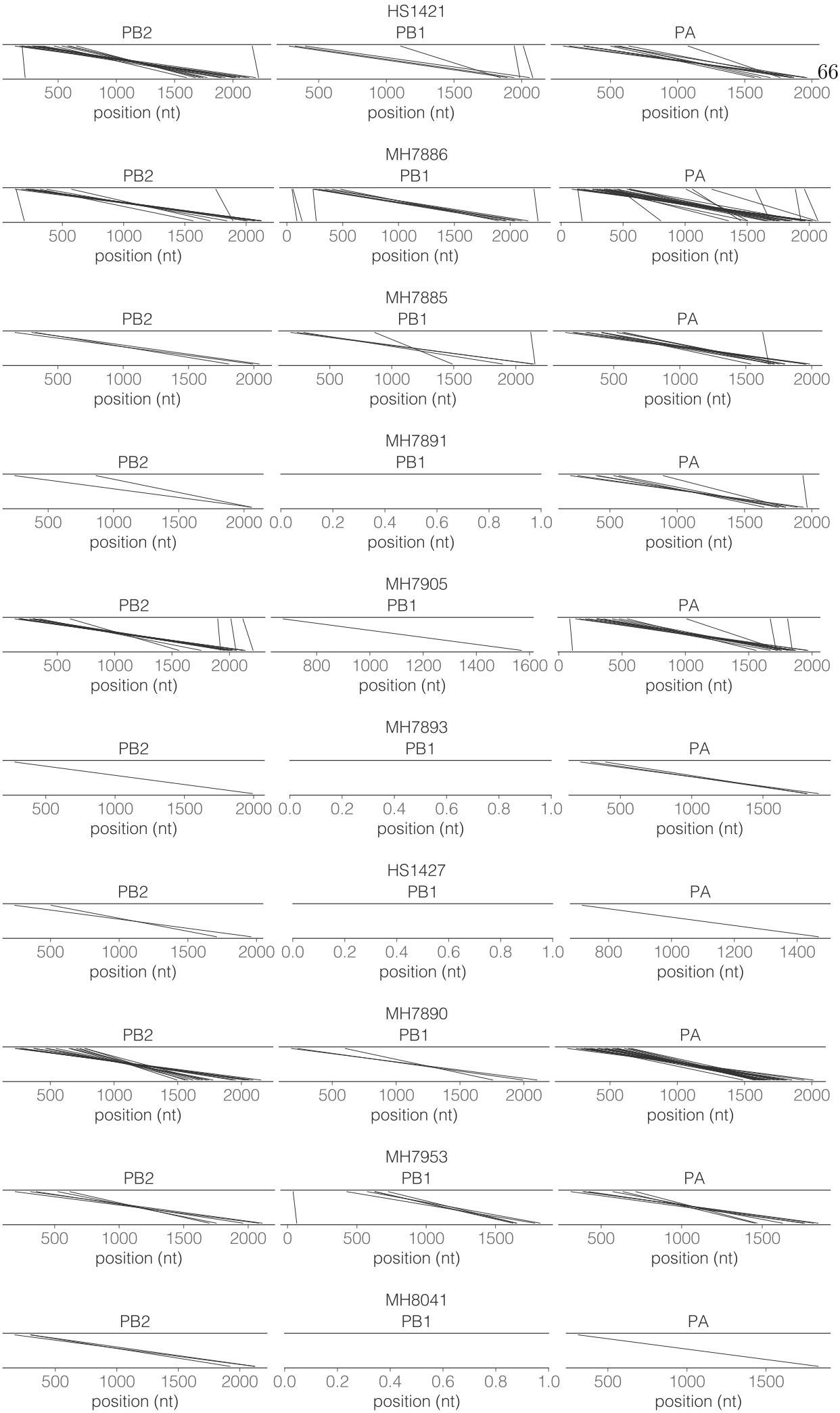
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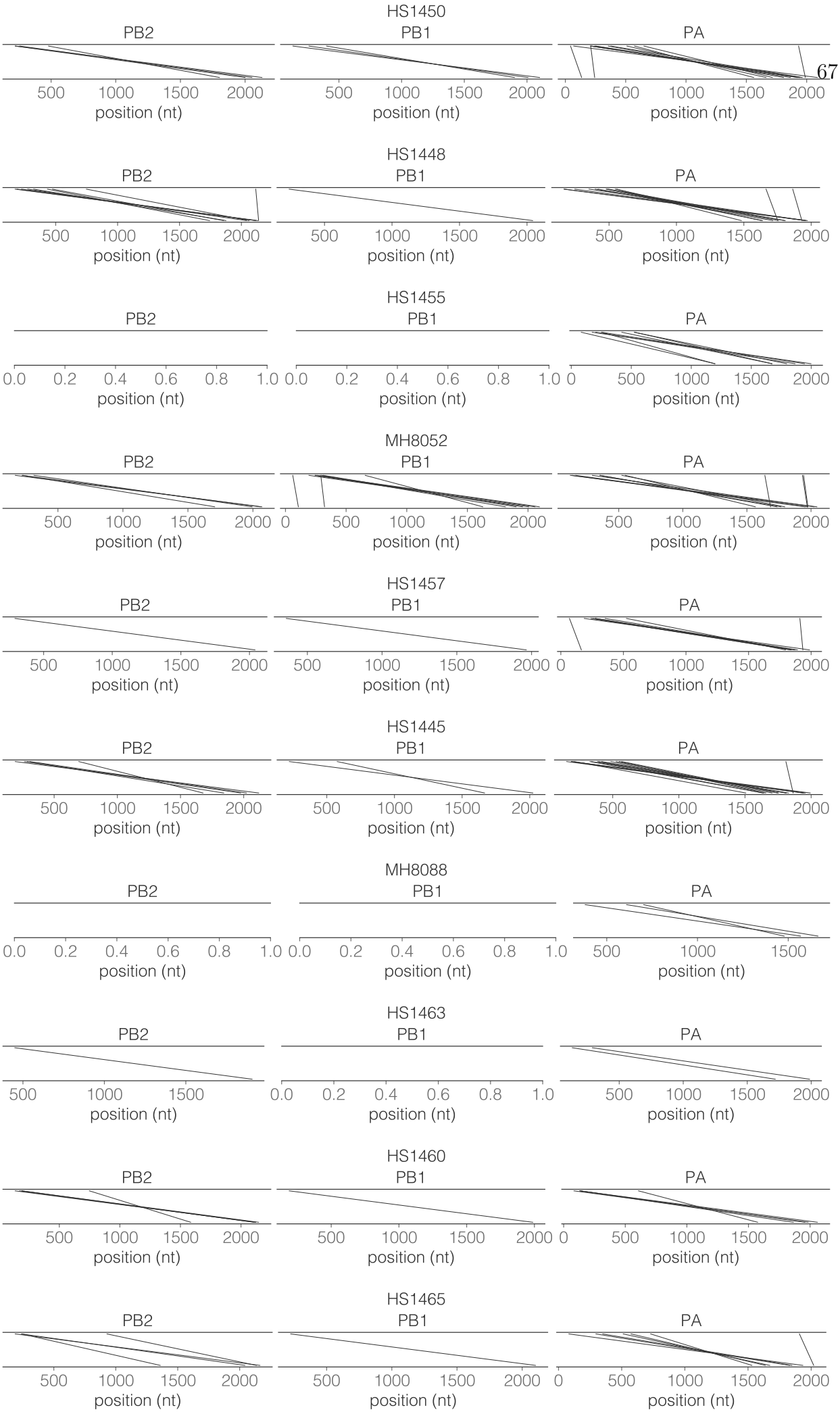
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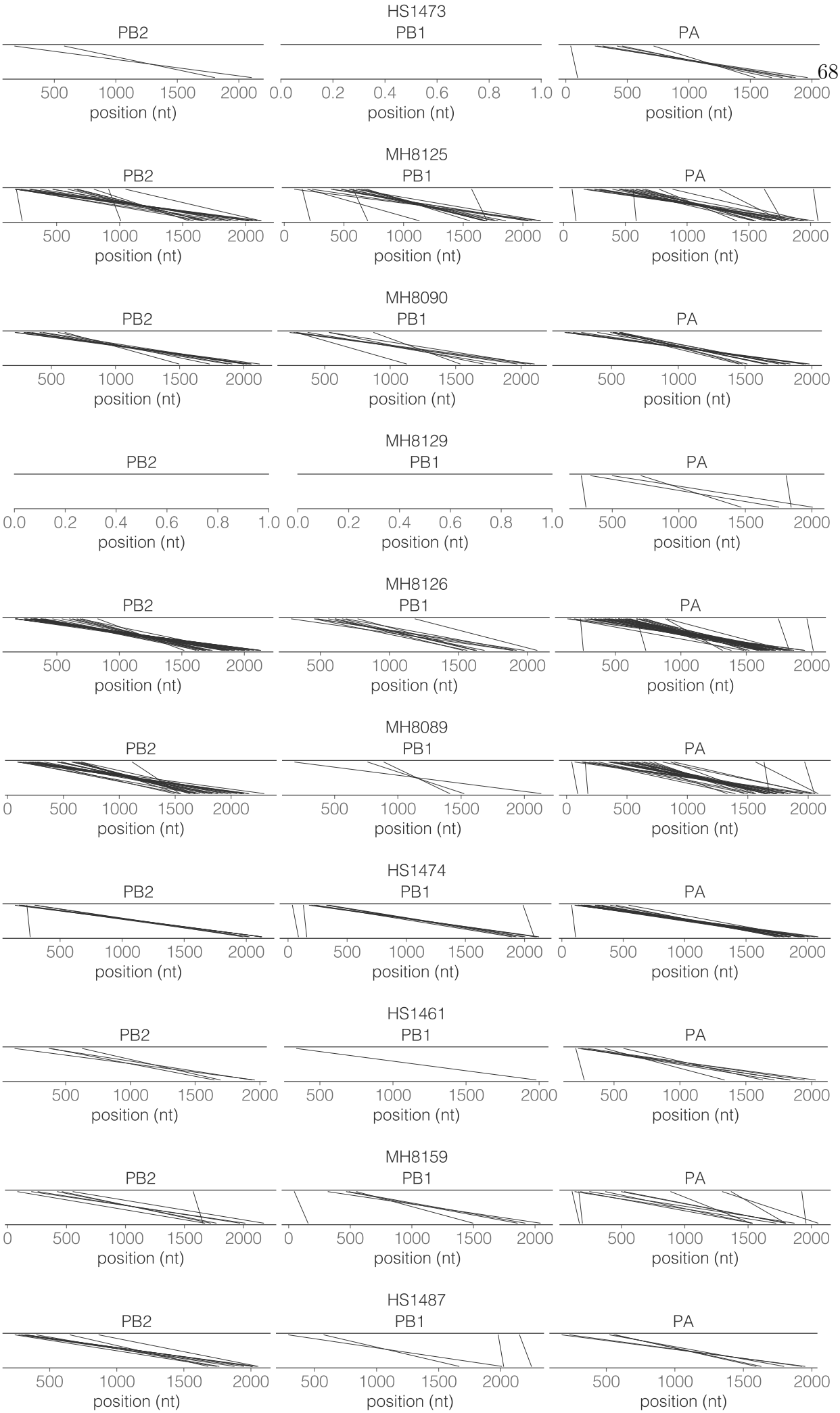
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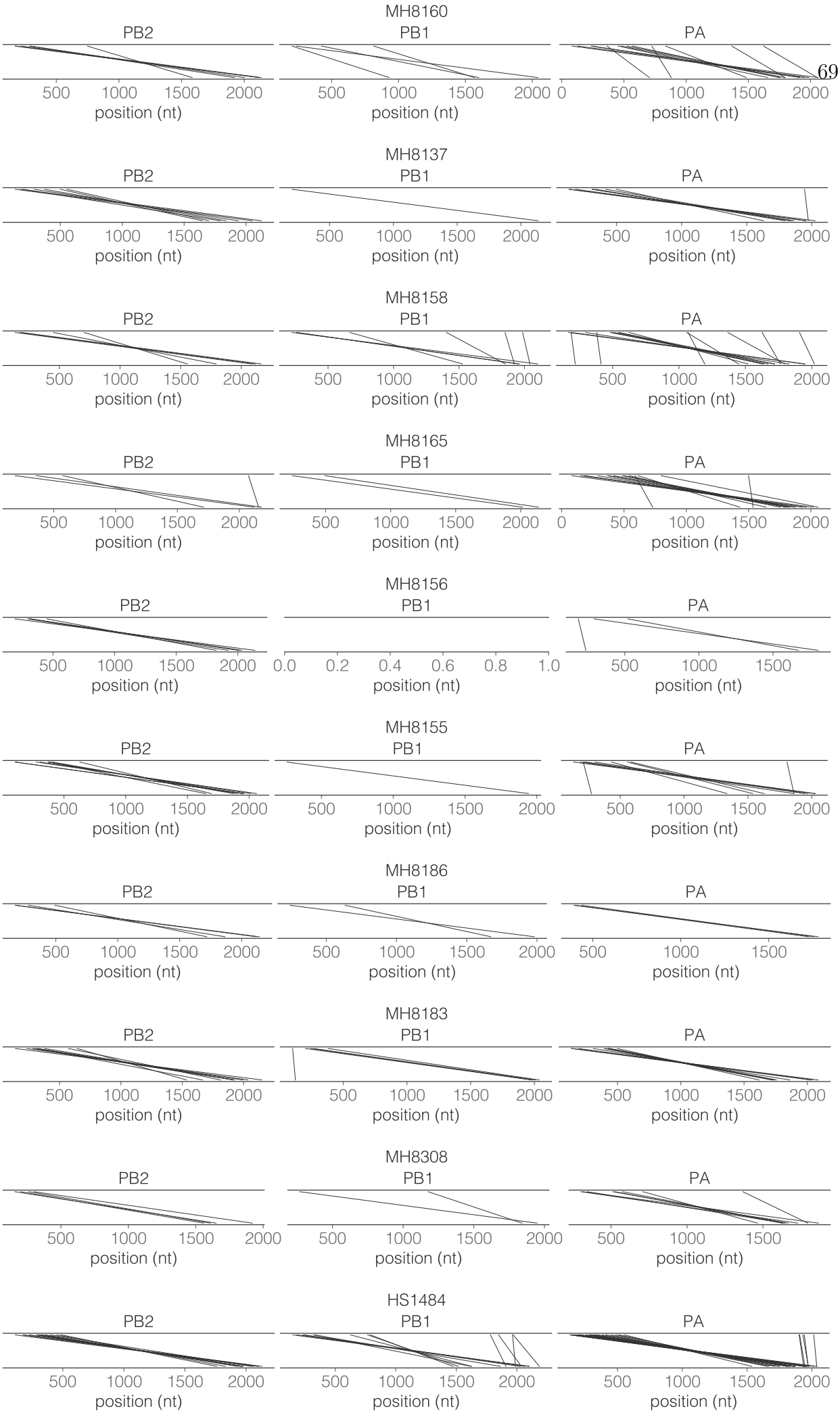
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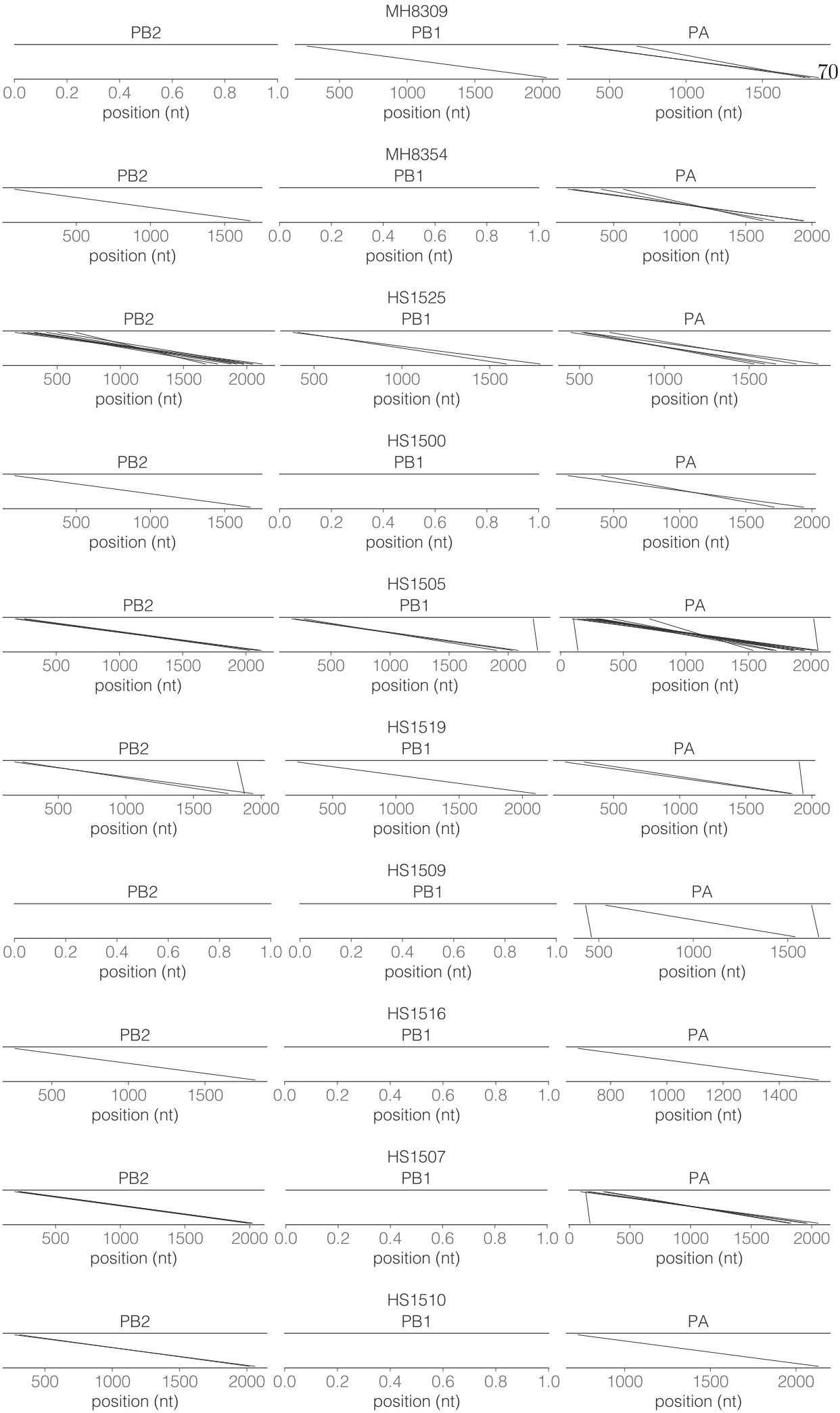
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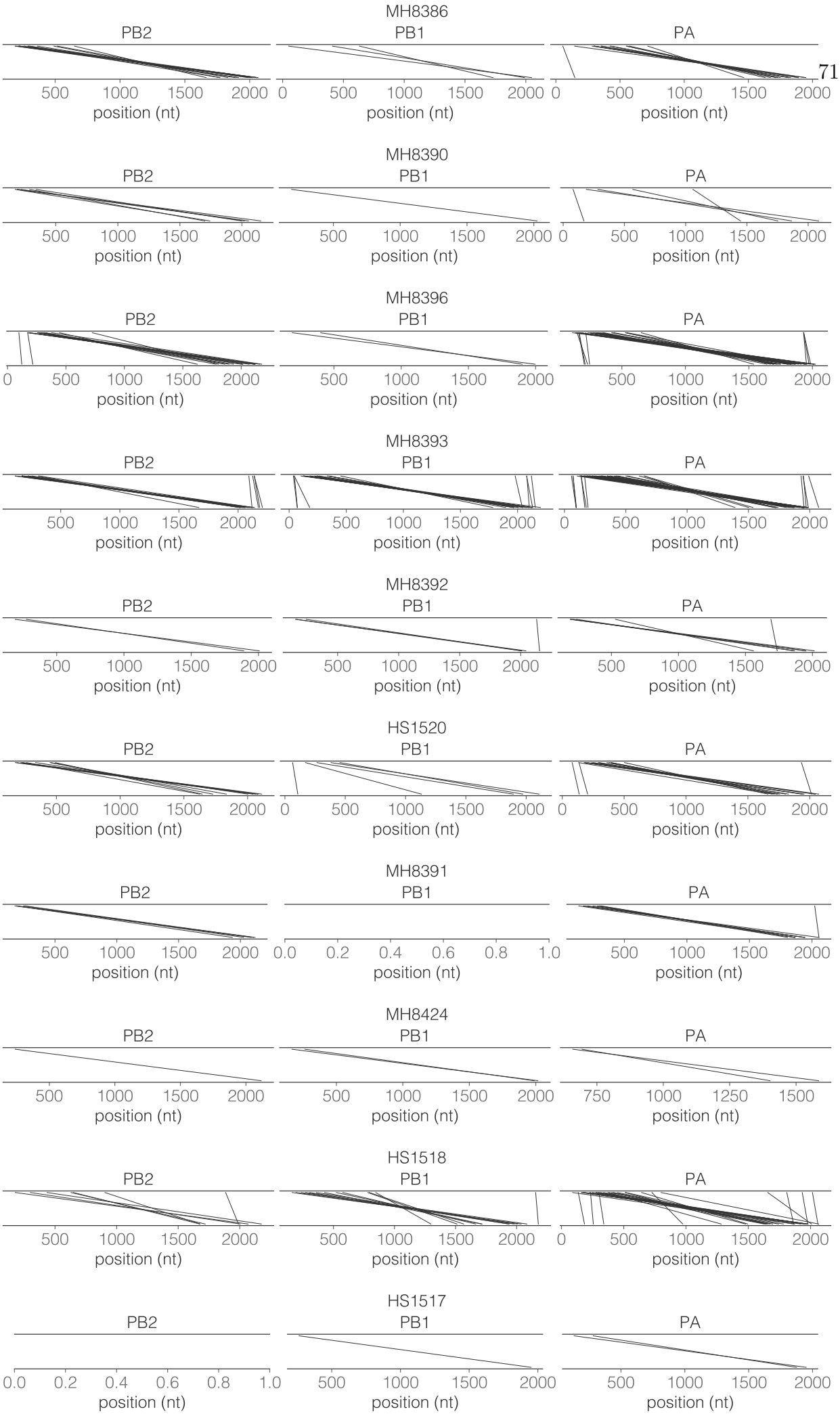
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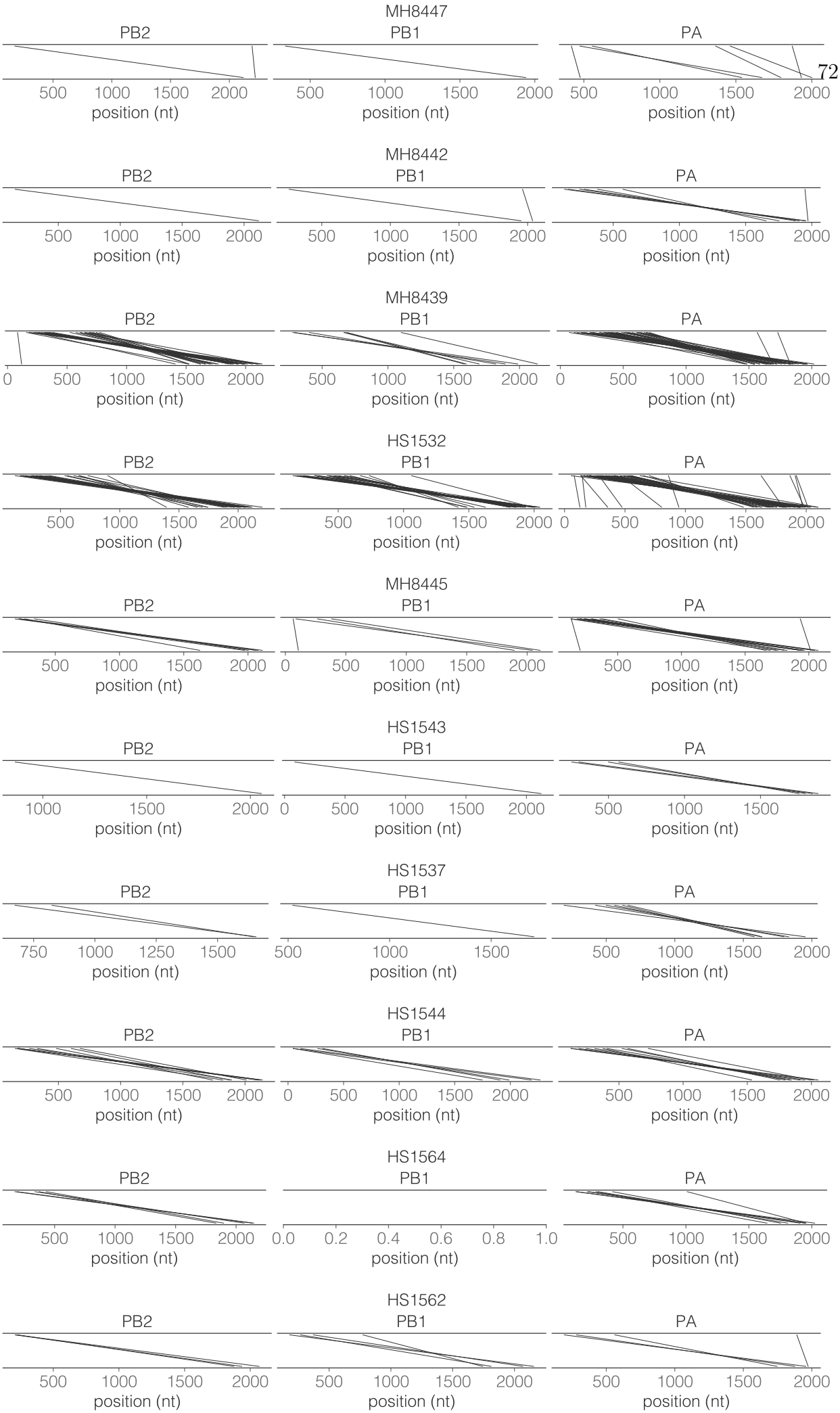
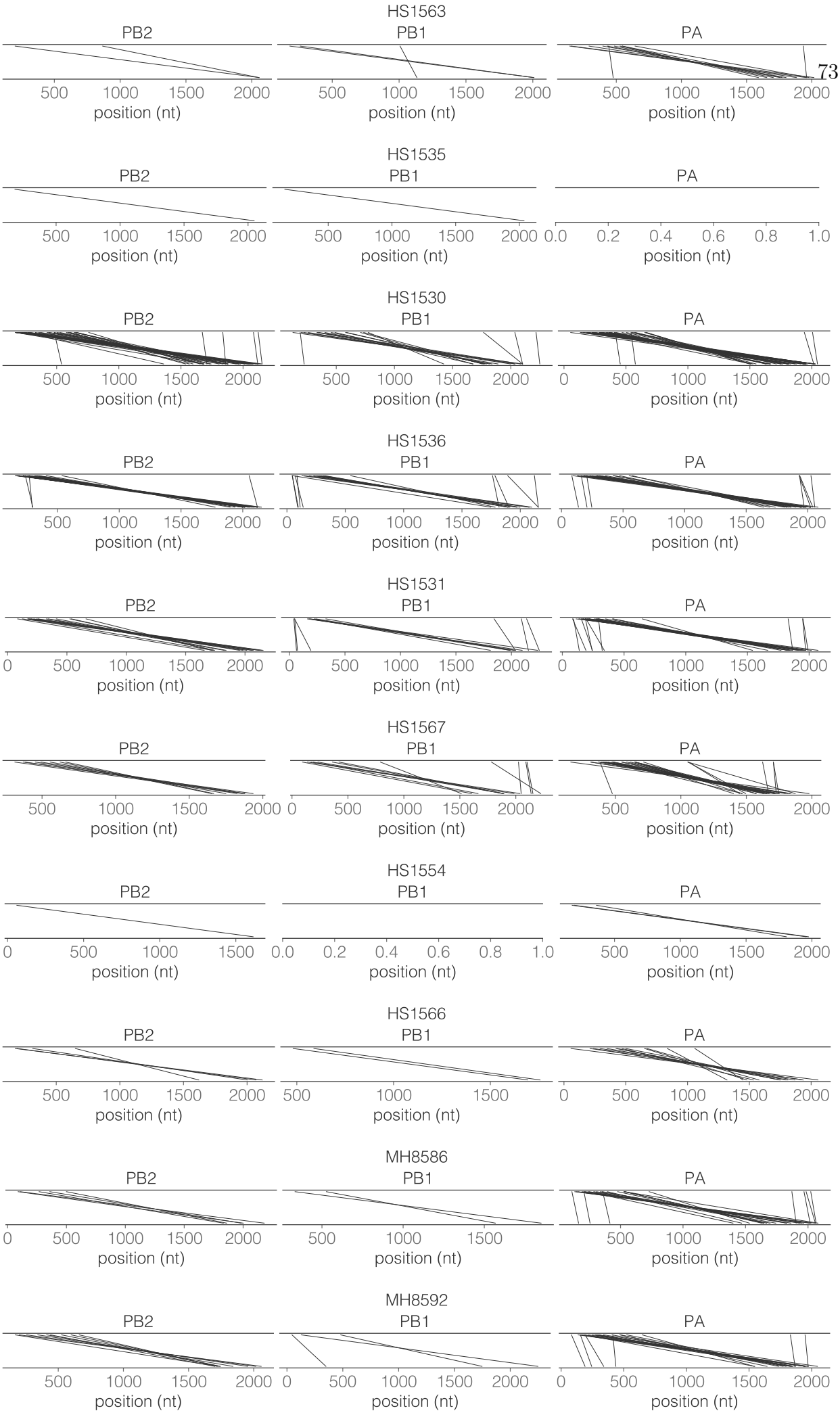
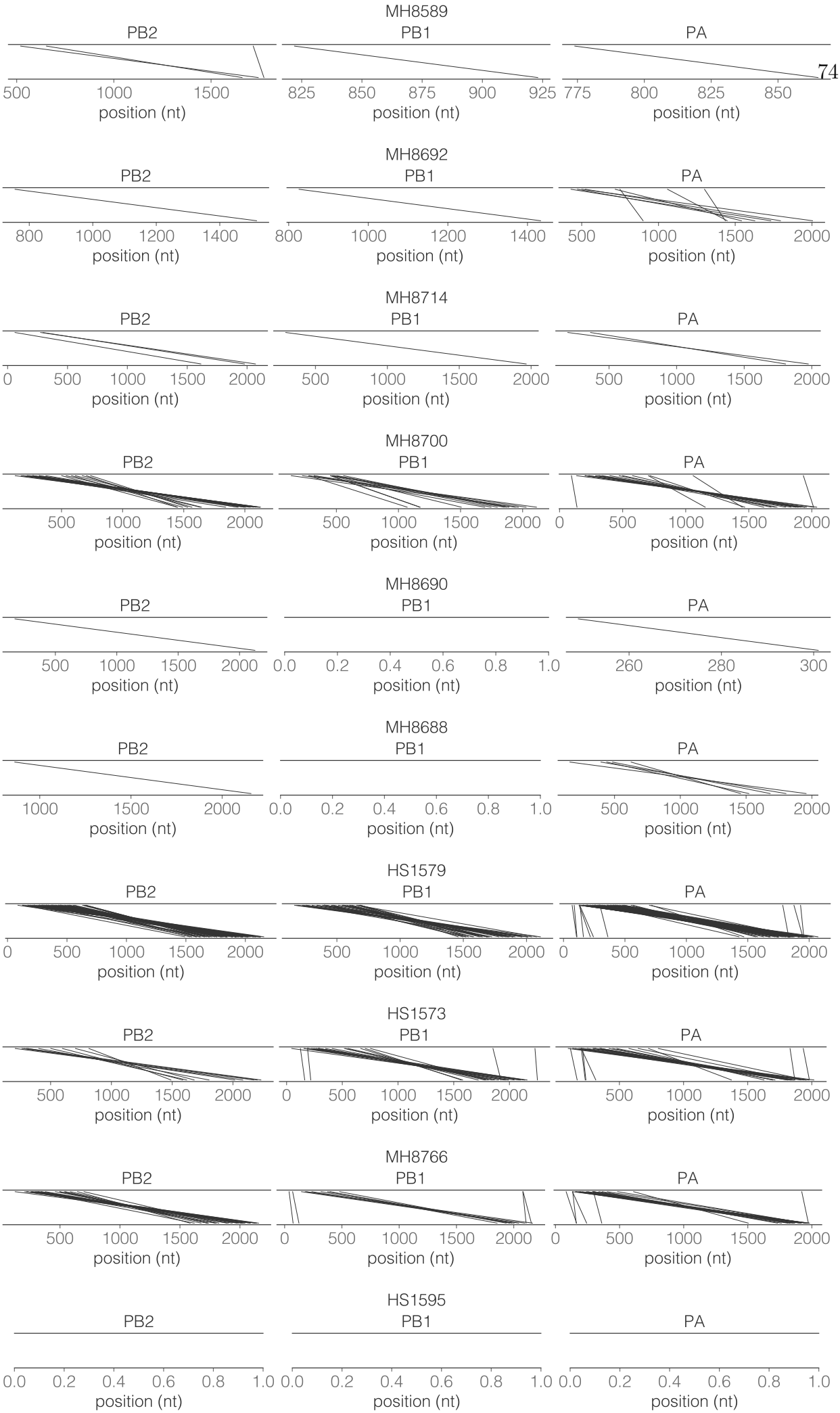
PB2
PB1
PA
MH8391
PB2
PB1
PA
MH8424
PB2
PB1
PA
HS1518
PB2
PB1
PA
HS1517
PB2
PB1
PA
position (nt)


MH8447
PB2
PB1
PA
MH8442
PB2
PB1
PA
MH8439
PB2
PB1
PA
HS1532
PB2
PB1
PA
MH8445
PB2
PB1
PA
HS1543
PB2
PB1
PA
HS1537
PB2
PB1
PA
HS1544
PB2
PB1
PA
HS1564
PB2
PB1
PA
HS1562
PB2
PB1
PA
position (nt)


HS1563
PB2
PB1
PA
HS1535
PB2
PB1
PA
HS1530
PB2
PB1
PA
HS1536
PB2
PB1
PA
HS1531
PB2
PB1
PA
HS1567
PB2
PB1
PA
HS1554
PB2
PB1
PA
HS1566
PB2
PB1
PA
MH8586
PB2
PB1
PA
MH8592
PB2
PB1
PA
position (nt)


MH8589
PB2
500 1000 1500
position (nt)
PB1
825 850 875 900 925
position (nt)
PA
775 800 825 850
position (nt)
MH8692
PB2
800 1000 1200 1400
position (nt)
PB1
800 1000 1200 1400
position (nt)
PA
500 1000 1500 2000
position (nt)
MH8714
PB2
0 500 1000 1500 2000
position (nt)
PB1
500 1000 1500 2000
position (nt)
PA
500 1000 1500 2000
position (nt)
MH8700
PB2
500 1000 1500 2000
position (nt)
PB1
500 1000 1500 2000
position (nt)
PA
0 500 1000 1500 2000
position (nt)
MH8690
PB2
500 1000 1500 2000
position (nt)
PB1
0.0 0.2 0.4 0.6 0.8 1.0
position (nt)
PA
260 280 300
position (nt)
MH8688
PB2
1000 1500 2000
position (nt)
PB1
0.0 0.2 0.4 0.6 0.8 1.0
position (nt)
PA
500 1000 1500 2000
position (nt)
HS1579
PB2
0 500 1000 1500 2000
position (nt)
PB1
500 1000 1500 2000
position (nt)
PA
0 500 1000 1500 2000
position (nt)
HS1573
PB2
500 1000 1500 2000
position (nt)
PB1
0 500 1000 1500 2000
position (nt)
PA
500 1000 1500 2000
position (nt)
MH8766
PB2
500 1000 1500 2000
position (nt)
PB1
0 500 1000 1500 2000
position (nt)
PA
0 500 1000 1500 2000
position (nt)
HS1595
PB2
0.0 0.2 0.4 0.6 0.8 1.0
position (nt)
PB1
0.0 0.2 0.4 0.6 0.8 1.0
position (nt)
PA
0.0 0.2 0.4 0.6 0.8 1.0
position (nt)

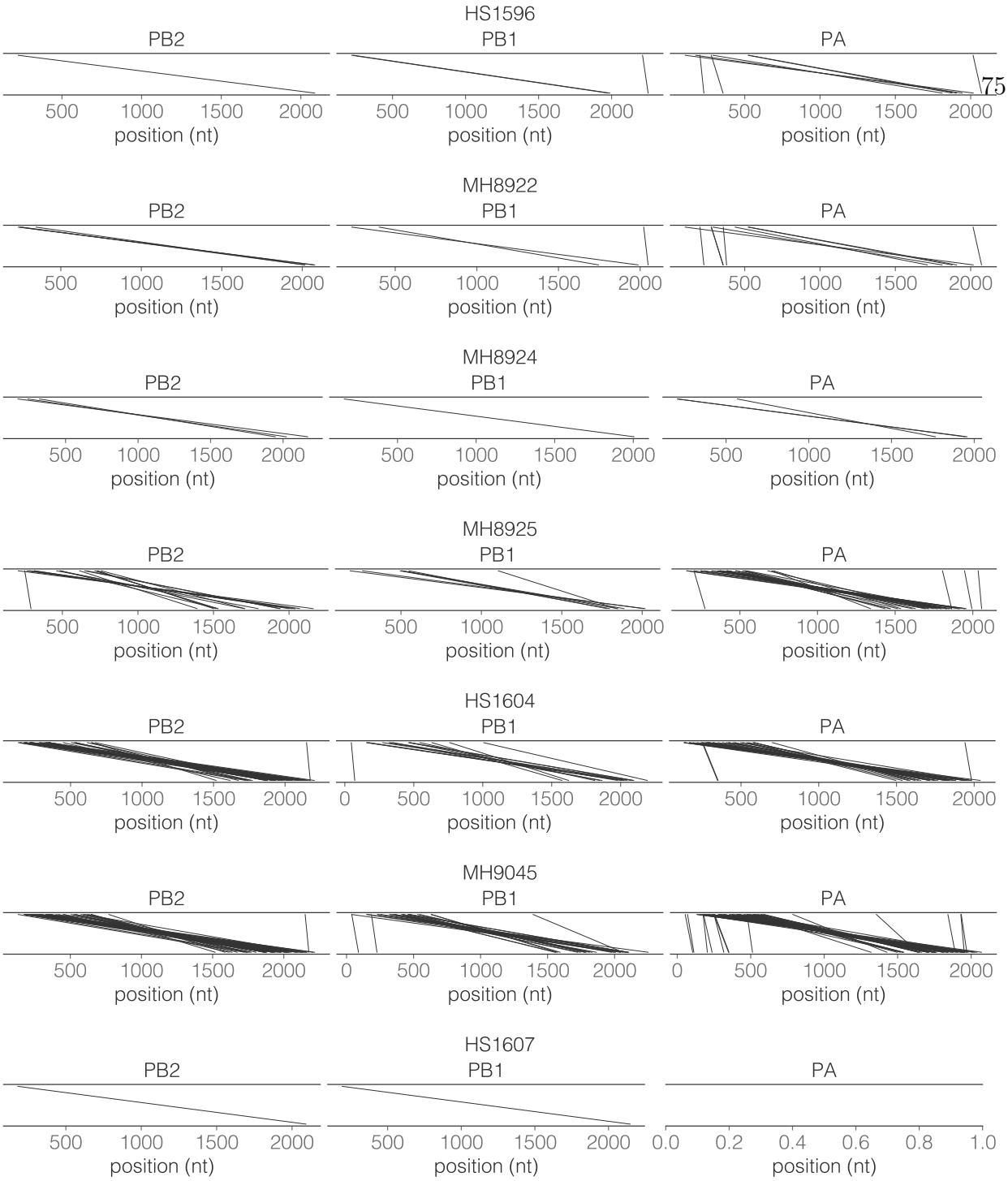

HS1596
PB2
PB1
PA
500 1000 1500 2000
position (nt)
MH8922
PB2
PB1
PA
500 1000 1500 2000
position (nt)
MH8924
PB2
PB1
PA
500 1000 1500 2000
position (nt)
MH8925
PB2
PB1
PA
500 1000 1500 2000
position (nt)
HS1604
PB2
PB1
PA
0 500 1000 1500 2000
position (nt)
MH9045
PB2
PB1
PA
0 500 1000 1500 2000
position (nt)
HS1607
PB2
PB1
PA
500 1000 1500 2000
0.0 0.2 0.4 0.6 0.8 1.0
position (nt)

Figure S2.6: Observed junction locations for all PB2, PB1, and PA DVGs observed in all clinical samples. Lines connect the nucleotides flanking the deleted nucleotides for each identified DVG.

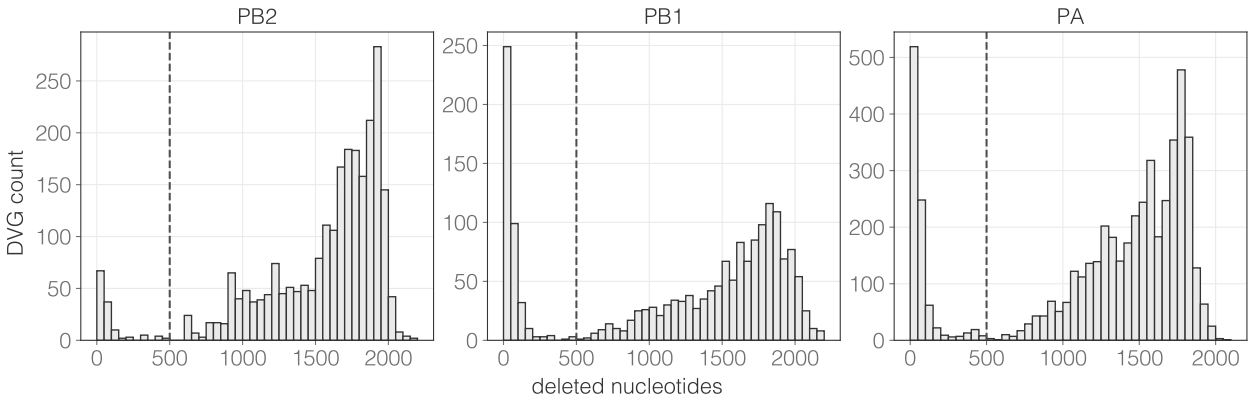
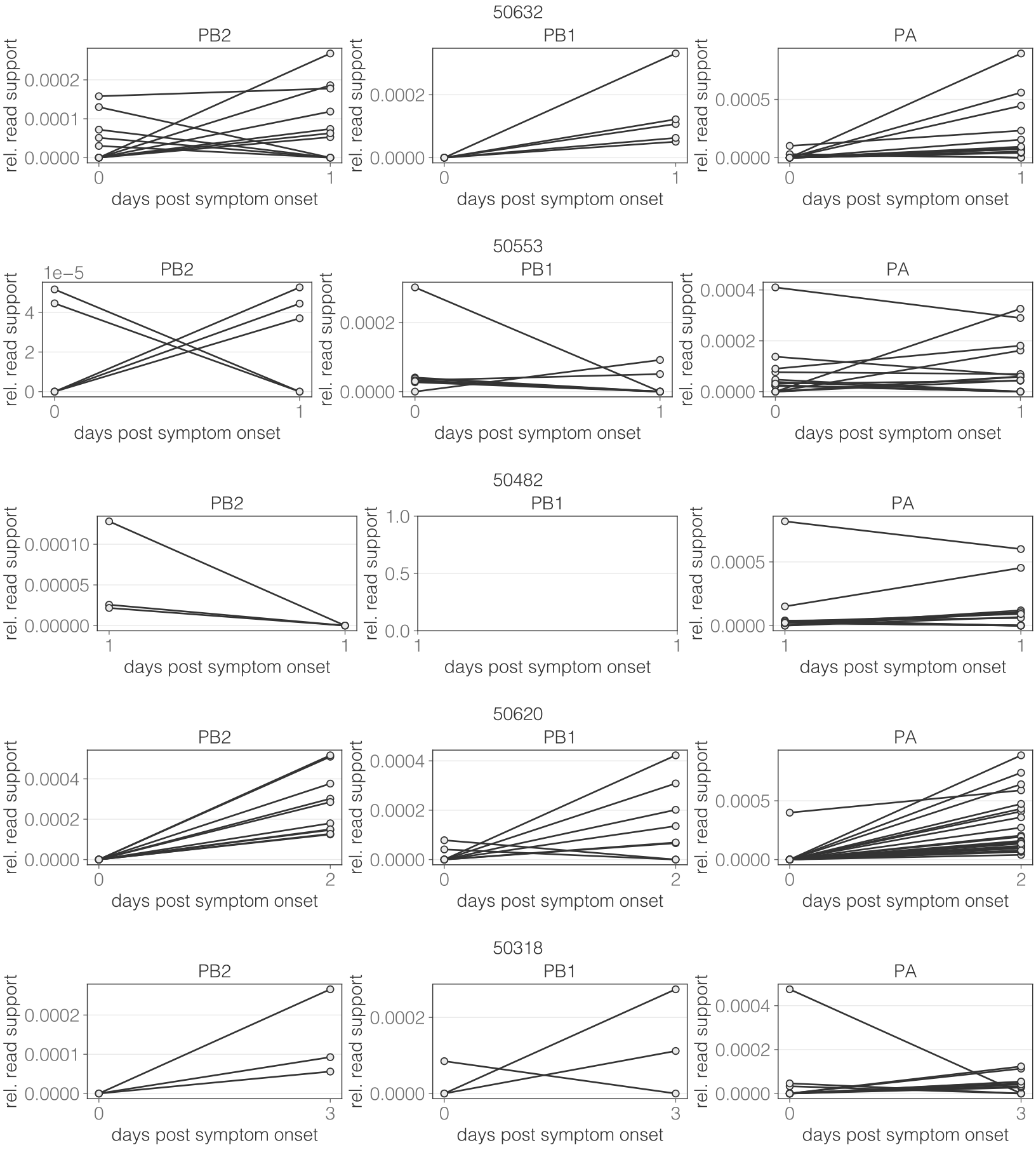
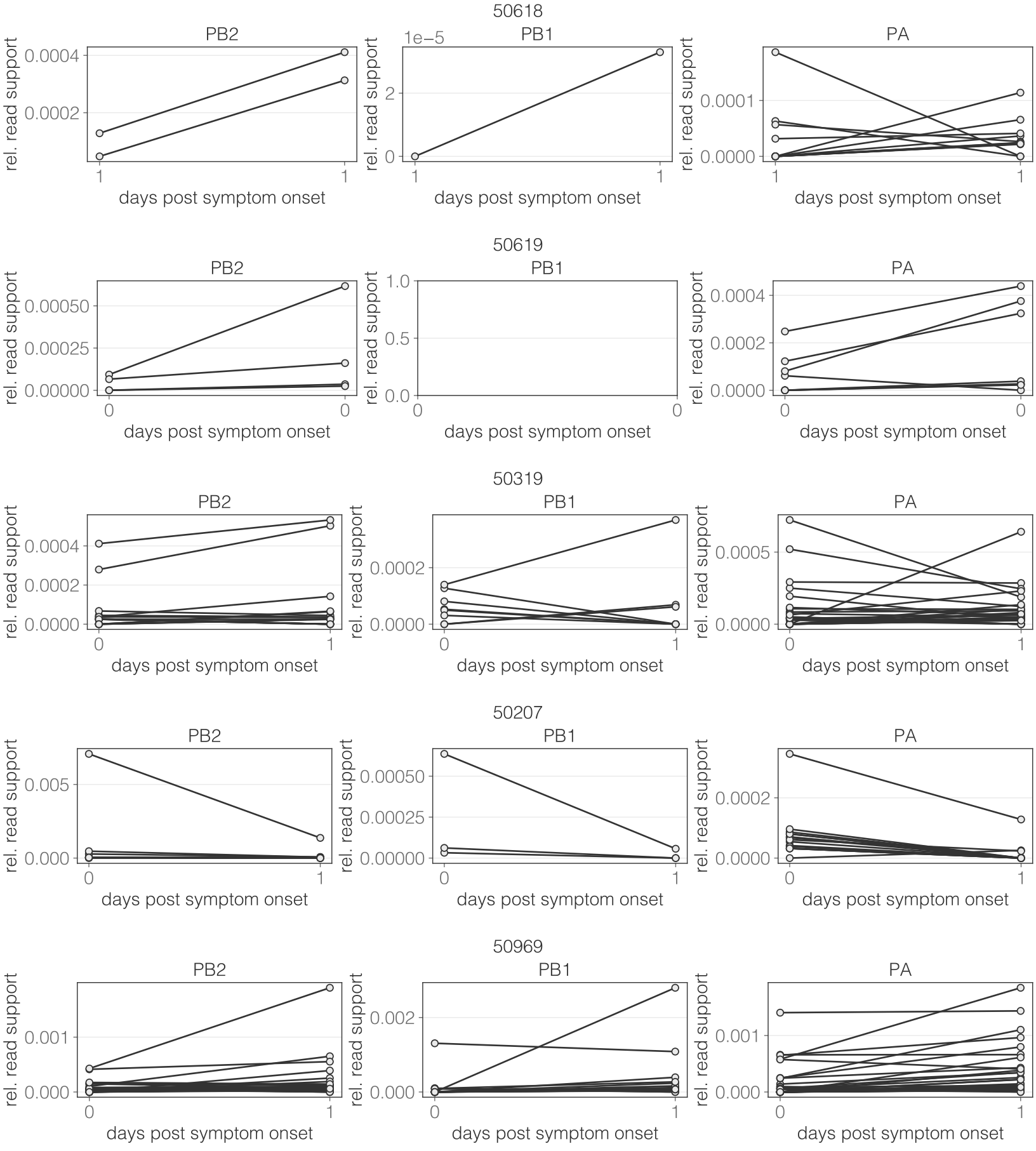
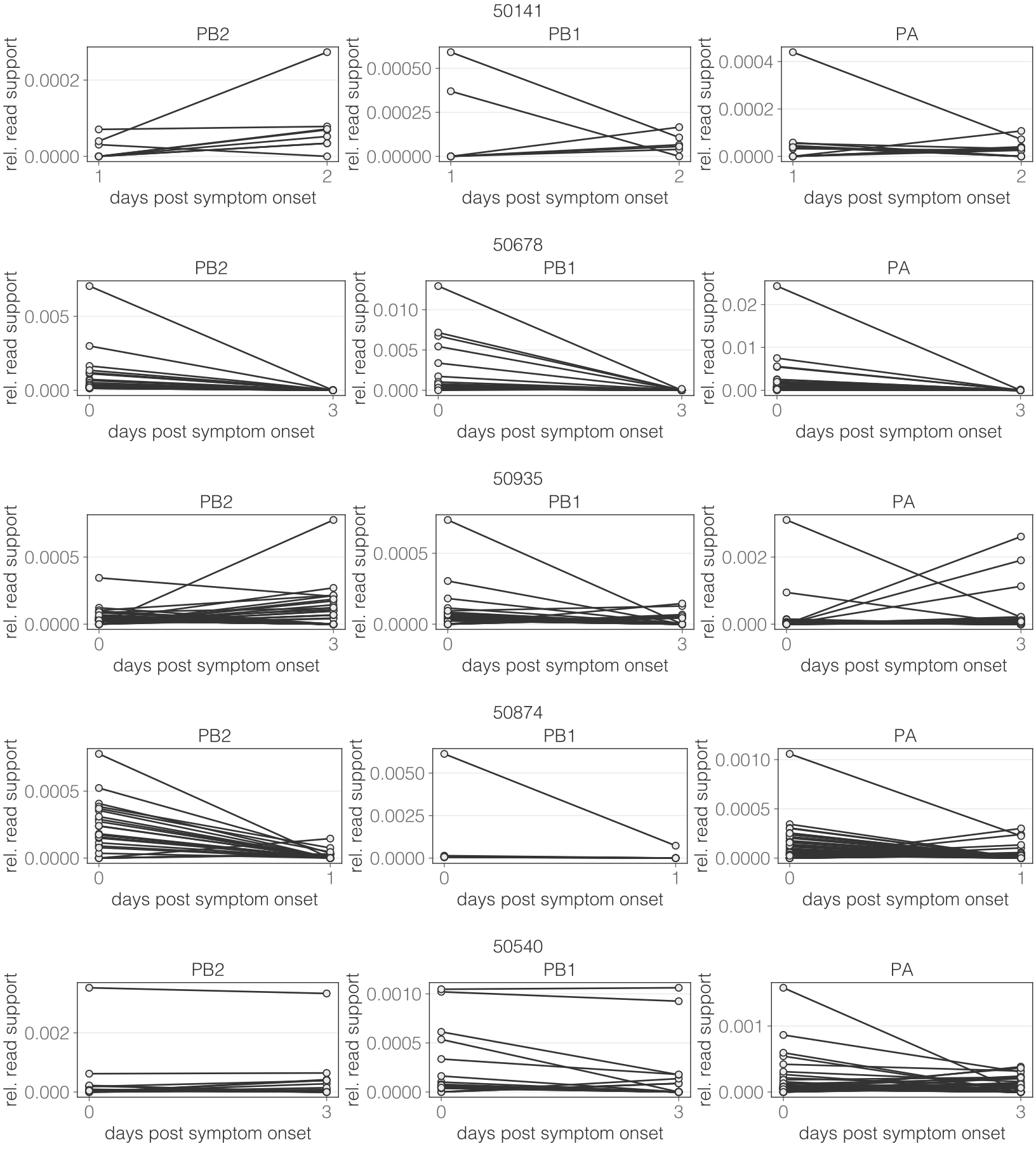
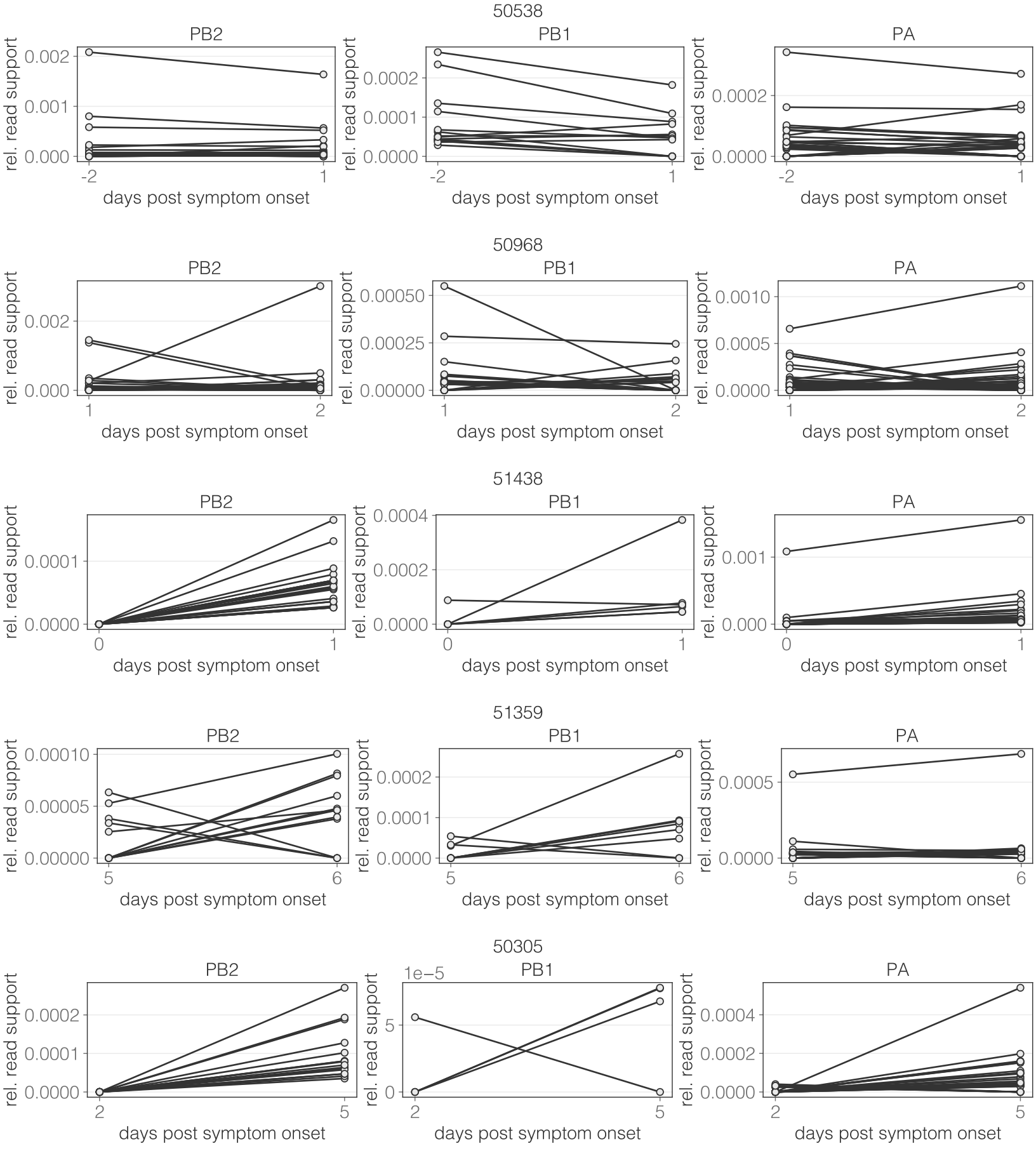


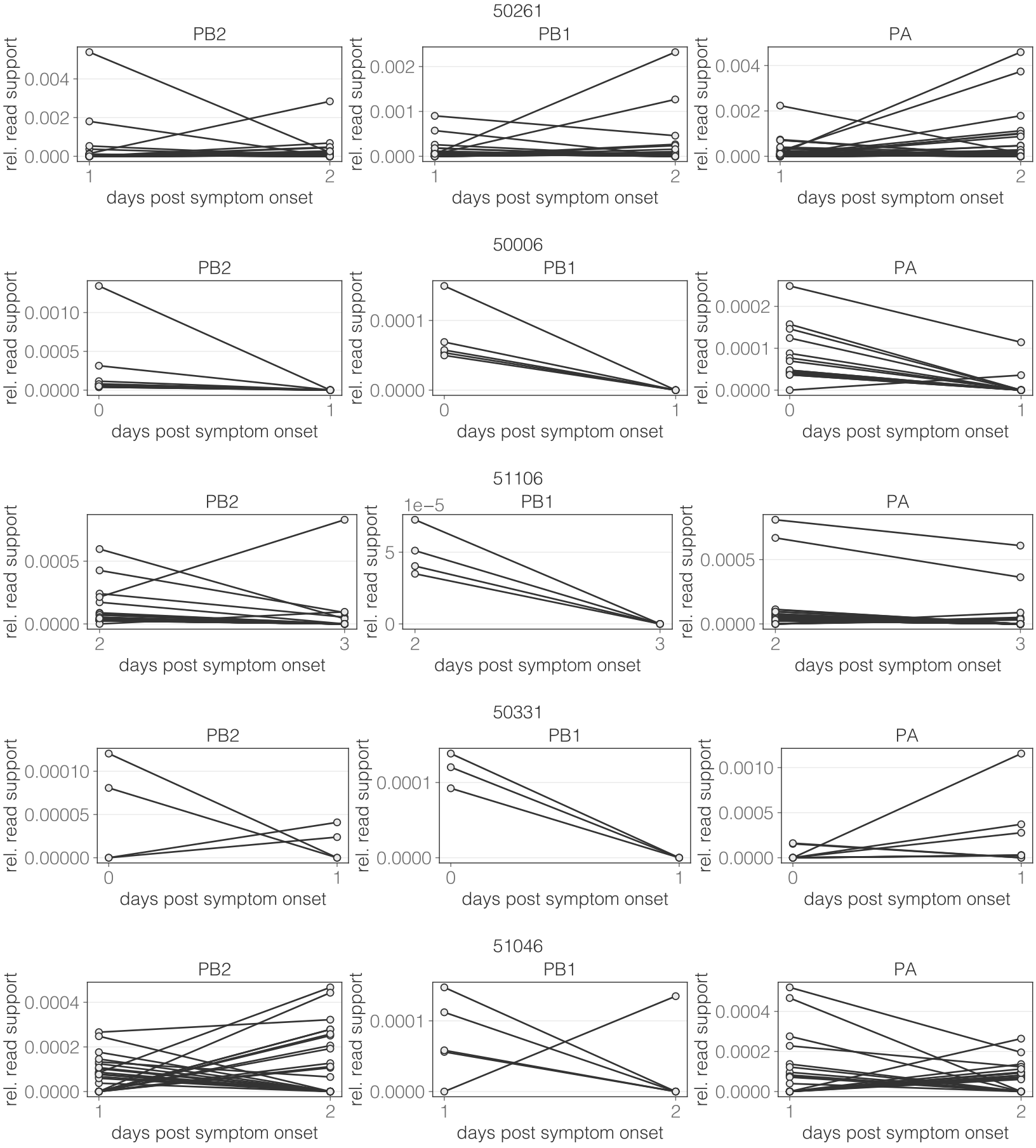
Figure S2.7: Number of deleted nucleotides for each DVG identified in the PB2 (A), PB1 (B), and PA (C) segments. Dashed line at 500 nucleotides represents our empirical filtering threshold.

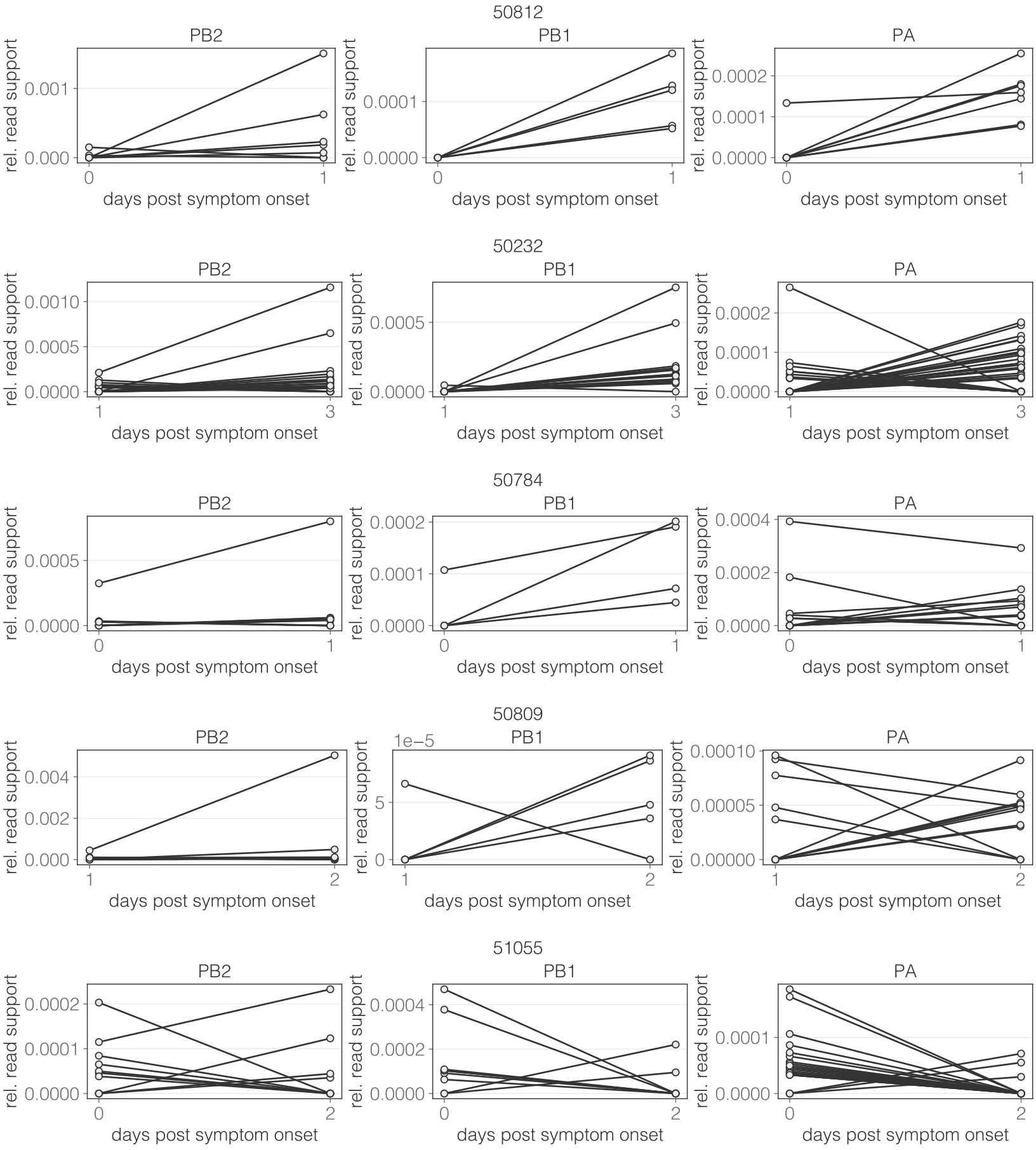

50632
PB2
PB1
PA
rel. read support
0.0002
0.0001
0.0000
0.0002
0.0000
0.0005
0.0000
0
1
days post symptom onset
50553
PB2
1e−5
4
2
0
PB1
0.0002
0.0000
PA
0.0004
0.0002
0.0000
50482
PB2
0.00010
0.00005
0.00000
PB1
1.0
0.5
0.0
PA
0.0005
0.0000
1
50620
PB2
PB1
PA
0.0004
0.0002
0.0000
0.0005
2
50318
PB2
PB1
PA
3

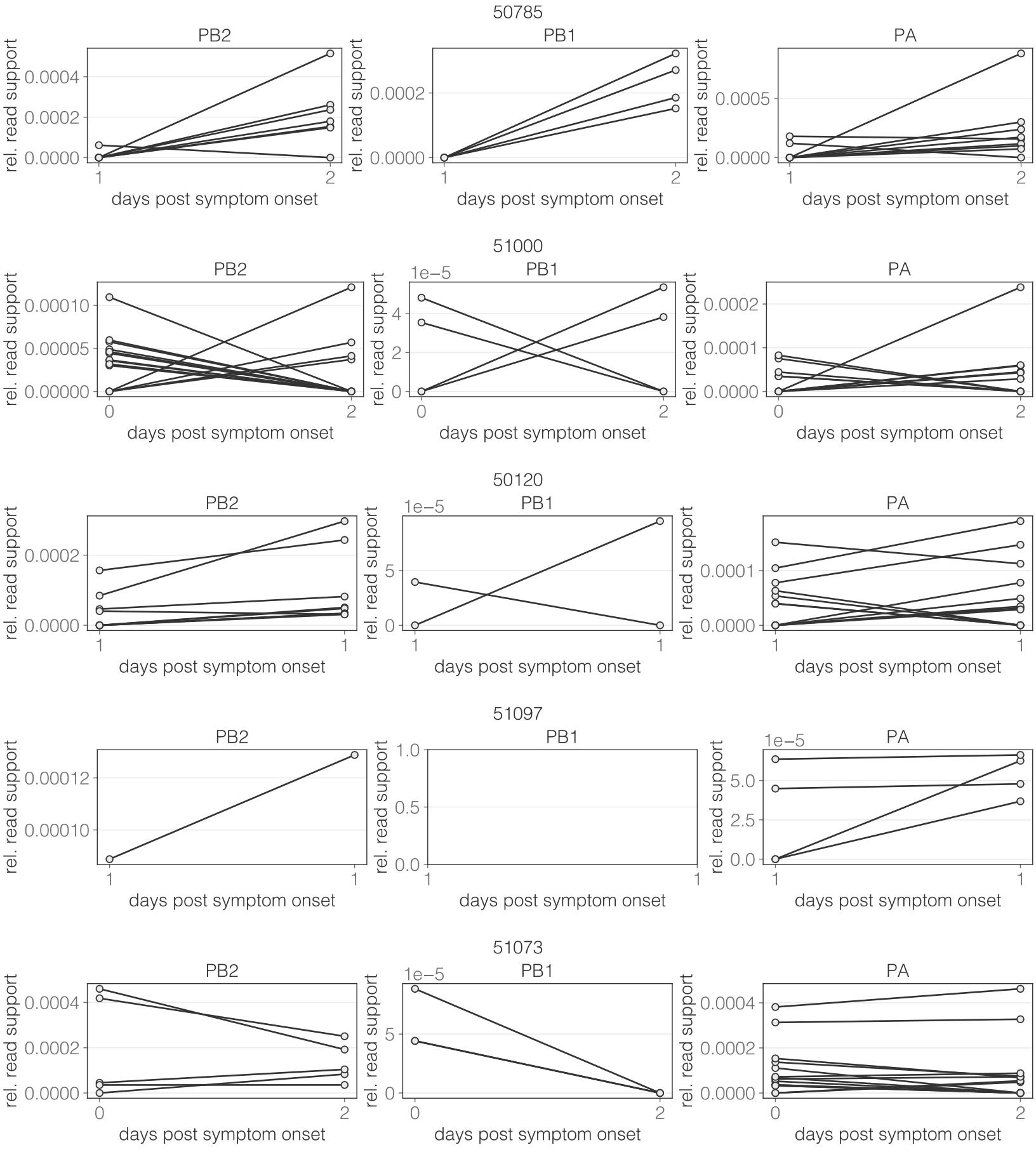

50618
PB2
PB1
PA
50619
PB2
PB1
PA
50319
PB2
PB1
PA
50207
PB2
PB1
PA
50969
PB2
PB1
PA
rel. read support
days post symptom onset

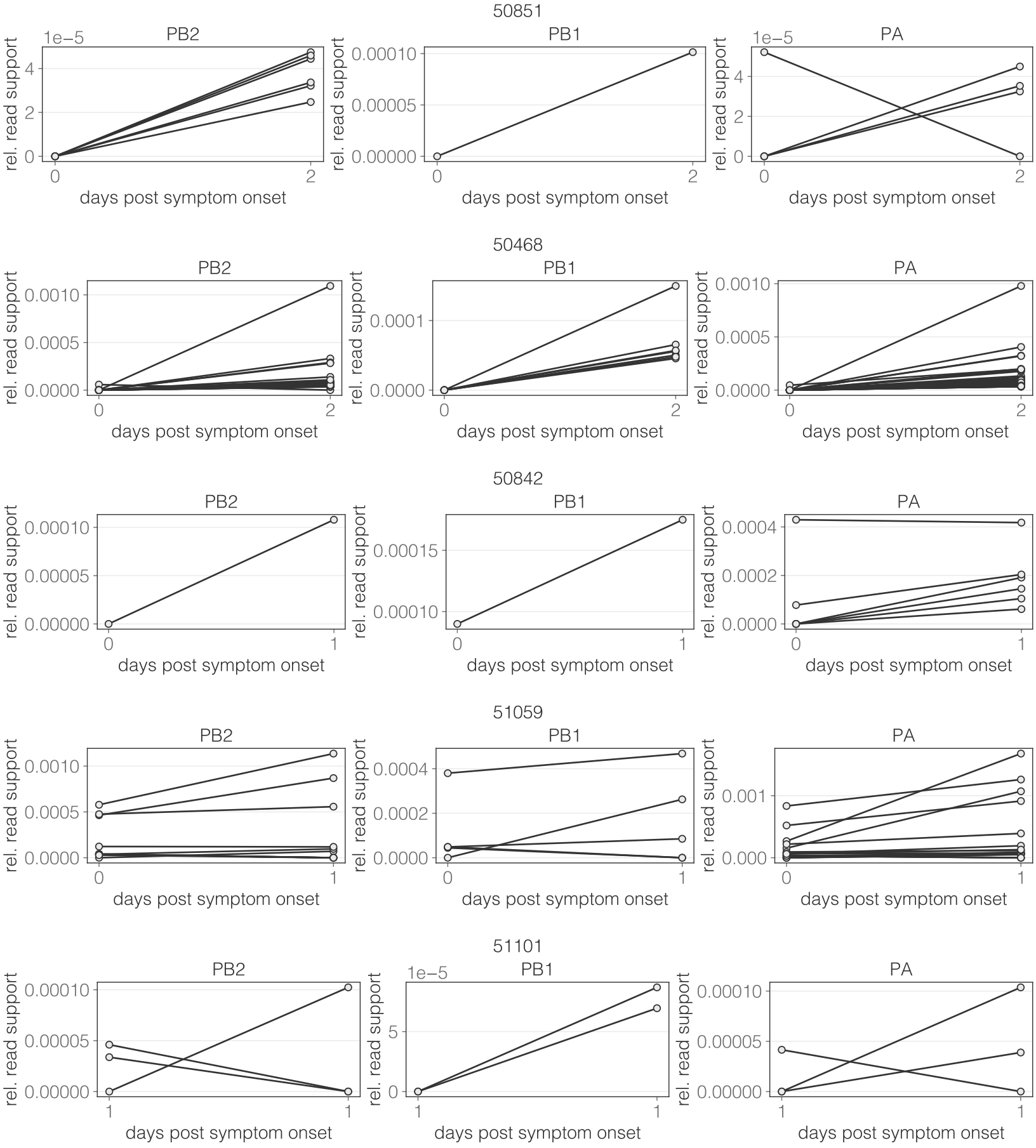

50141
PB2
PB1
PA
rel. read support
0.0002
0.0000
0.00050
0.00025
0.00000
0.0004
1
2
days post symptom onset
50678
0.005
0.000
0.010
0.02
0.01
0.00
0
3
50935
0.0005
0.0000
0.002
50874
0.0050
0.0025
0.0010
1
50540
0.001

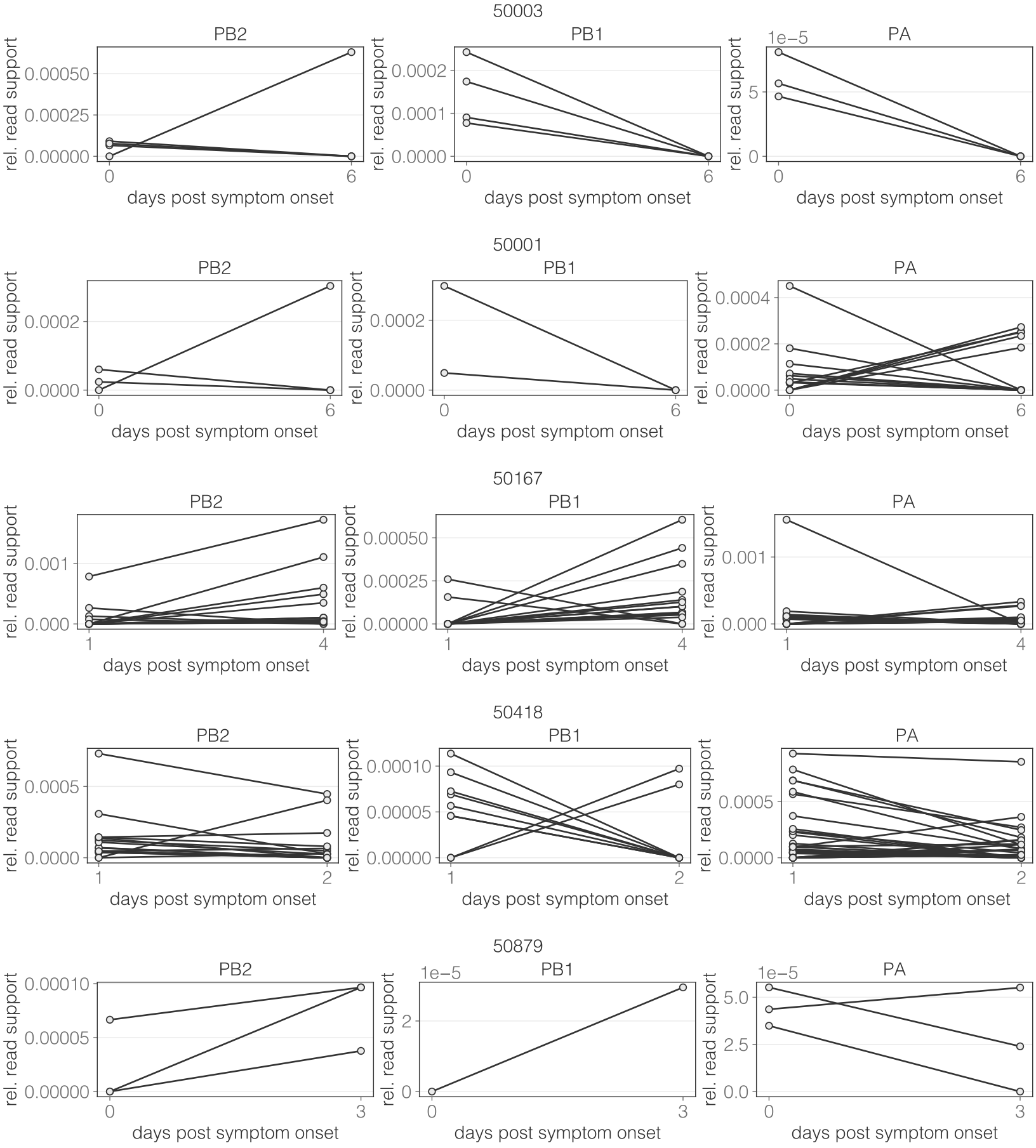

50538
PB2
PB1
PA
rel. read support
0.002
0.001
0.000
0.0002
0.0001
0.0000
-2
1
days post symptom onset
50968
0.00050
0.00025
0.00000
0.0010
0.0005
2
51438
0.0004
51359
0.00010
0.00005
5
6
50305
1e−5


50261
PB2
PB1
PA
rel. read support
0.004
0.002
0.000
0.002
0.001
0.000
0.004
0.002
0.000
1
2
days post symptom onset
50006
PB2
PB1
PA
0.0010
0.0005
0.0000
0.0001
0.0000
0.0002
0.0001
0.0000
0
1
51106
PB2
PB1
PA
0.0005
0.0000
1e−5
5
0
0.0005
0.0000
2
3
50331
PB2
PB1
PA
0.00010
0.00005
0.00000
0.0001
0.0000
0.0010
0.0005
0.0000
51046
PB2
PB1
PA
0.0004
0.0002
0.0000
0.0001
0.0000
0.0004
0.0002
0.0000


50812
PB2
PB1
PA
rel. read support
0.001
0.000
0.0001
0.0000
0.0002
0.0001
0.0000
0
1
days post symptom onset
50232
PB2
PB1
PA
rel. read support
0.0010
0.0005
0.0000
0.0005
0.0000
0.0002
0.0001
0.0000
1
3
days post symptom onset
50784
PB2
PB1
PA
rel. read support
0.0005
0.0000
0.0002
0.0001
0.0000
0.0004
0.0002
0.0000
0
1
days post symptom onset
50809
PB2
PB1
PA
rel. read support
0.004
0.002
0.000
1e−5
5
0
0.00010
0.00005
0.00000
1
2
days post symptom onset
51055
PB2
PB1
PA
rel. read support
0.0002
0.0001
0.0000
0.0004
0.0002
0.0000
0.0001
0.0000
0
2
days post symptom onset


50785
PB2
PB1
PA
rel. read support
0.0004
0.0002
0.0000
0.0002
0.0000
0.0005
0.0000
1
2
days post symptom onset
51000
PB2
PB1
PA
rel. read support
0.00010
0.00005
0.00000
1e−5
4
2
0
0.0002
0.0001
0.0000
0
2
days post symptom onset
50120
PB2
PB1
PA
rel. read support
0.0002
0.0000
1e−5
5
0
0.0001
0.0000
1
1
days post symptom onset
51097
PB2
PB1
PA
rel. read support
0.00012
0.00010
1.0
0.5
0.0
1e−5
5.0
2.5
0.0
1
1
days post symptom onset
51073
PB2
PB1
PA
rel. read support
0.0004
0.0002
0.0000
1e−5
5
0
0.0004
0.0002
0.0000
0
2
days post symptom onset


50851
PB2
PB1
PA
1e−5
rel. read support
days post symptom onset
50468
PB2
PB1
PA
rel. read support
days post symptom onset
50842
PB2
PB1
PA
rel. read support
days post symptom onset
51059
PB2
PB1
PA
rel. read support
days post symptom onset
51101
PB2
PB1
PA
1e−5
rel. read support
days post symptom onset


50003
PB2
PB1
PA
rel. read support
0.00050
0.00025
0.00000
0.0002
0.0001
0.0000
1e−5
5
0
0
6
days post symptom onset
50001
0.0004
0.0002
50167
0.001
0.000
1
4
50418
0.00010
0.00005
2
50879
3

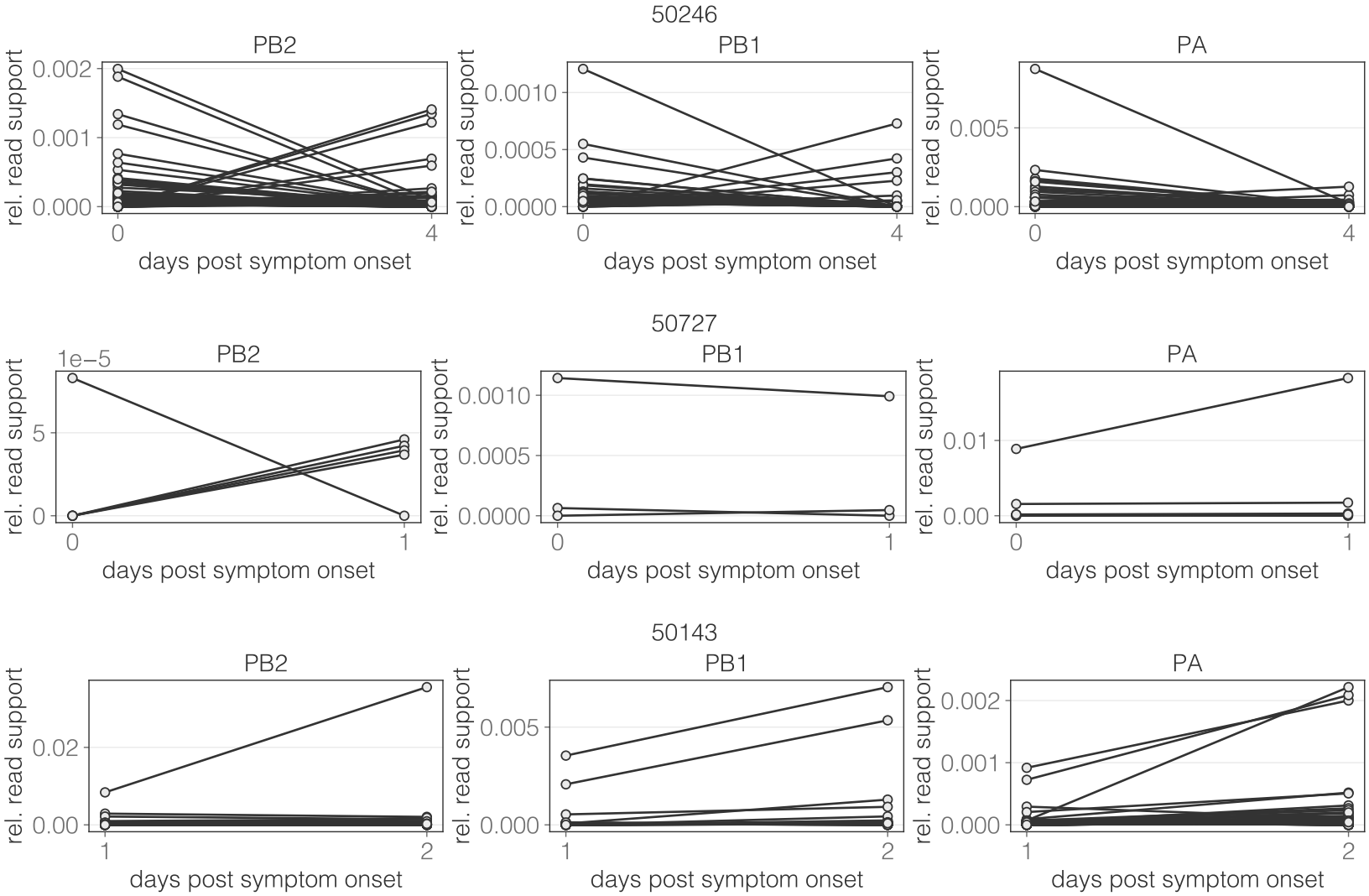

50246
PB2
PB1
PA
rel. read support
0.002
0.001
0.000
0.0010
0.0005
0.0000
0.005
0
4
days post symptom onset
50727
1e−5
5
0
1
0.01
0.00
50143
0.02
2

Figure S2.8: Relative read support of DVGs identified in the PB2, PB1, and PA segments of all patients with longitudinal samples.

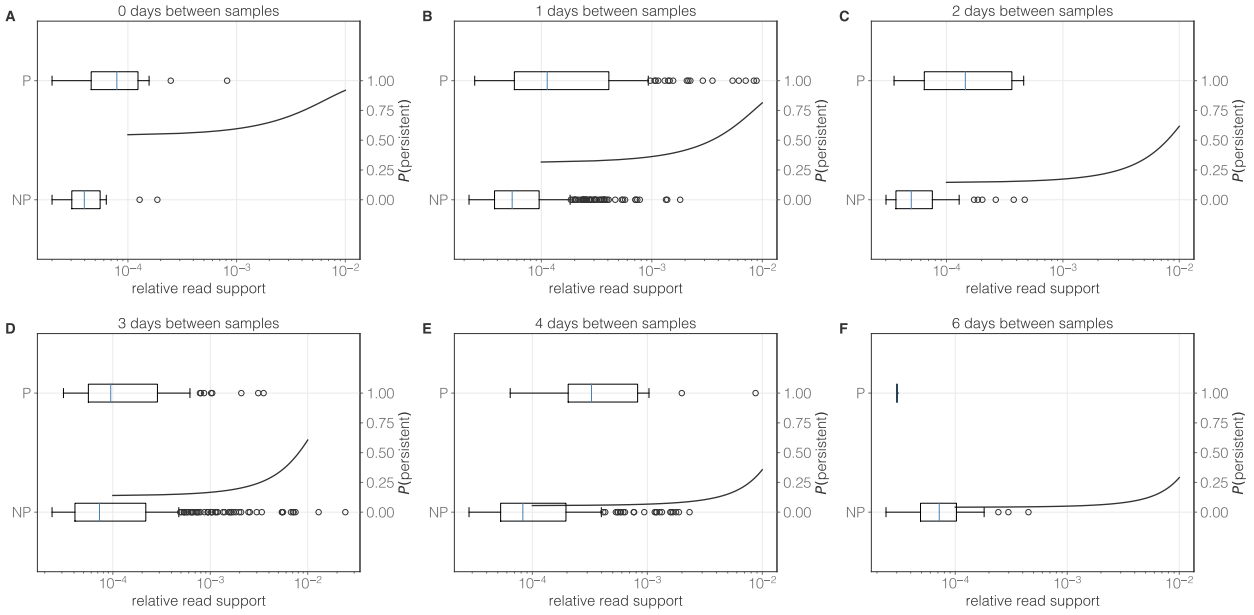


Figure S2.9: Relative read support of all DVGs identified in longitudinal samples taken 0, 1, 2, 3, 4, and 6 days apart, stratified by whether those DVGs are persistent (P) or non persistent (NP) between t_0 and t_1. In all box plots blue line represents the median value for a given dataset, box extends to the limits of the inter-quartile range (IQR), and whiskers extend to 1.5 IQR below and above the 1st and 3rd quartile, respectively. Outliers are shown as dots beyond the range of the whiskers. Curve is the predicted probability of persistence from a multivariate logistic regression with relative read support and time between samples (categorical) as predictors.

2.6.2 Supplementary Tables

Table S2.1: Logistic Regression of the probability of polymerase DVG persistence between t_0 and t_1 as a function of relative DVG read support

Variable	Coefficient	Std Err	p value	0.025	0.975
Intercept	-1.2295	0.064	0.000	-1.354	-1.105
Relative support	159.0822	62.526	0.011	36.534	281.630

Table S2.2: Logistic Regression of the probability of polymerase DVG persistence between t_0 and t_1 as a function of time between samples and relative DVG read support

Variable	Coefficient	Std Err	p value	0.025	0.975
Intercept	0.1628	0.303	0.591	-0.431	0.756
C($t_span = 1$)	-0.9543	0.313	0.002	-1.568	-0.341
C($t_span = 2$)	-1.9514	0.419	0.000	-2.772	-1.131
C($t_span = 3$)	-1.9988	0.335	0.000	-2.655	-1.343
C($t_span = 4$)	-3.0189	0.435	0.000	-3.872	-2.166
C($t_span = 6$)	-3.3221	1.065	0.002	-5.410	-1.234
Relative support	226.5670	70.198	0.001	88.981	364.153

Table S2.3: Logistic Regression of the number of shared DVGs between sample pairs as a function of the type of pair

Variable	Coefficient	Std Err	p value	0.025	0.975
Intercept	-0.9545	0.022	0.000	-0.998	-0.911
C(type)	0.3354	0.272	0.217	-0.197	0.868

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Chapter 3

Insights from SARS-CoV-2 sequences

The following *Perspectives* piece, published in *Science* in January 2021, was written to provide an overview of key insights that have been derived from sequence data as well as to identify key areas of future research where sequence data may prove to be illuminating. The relatively short piece (∼1,900 words) aimed to provide a high level overview of these methods and analyses and direct the reader to more detailed pieces in the literature.

3.1 M.A.M Contributions

Conceptualization, Investigation, Writing - Original Draft, Writing - Review & Editing

3.2 Published Manuscript

VIEWPOINT: COVID-19

Insights from SARS-CoV-2 sequences

Analysis of viral sequences can tell us how SARS-CoV-2 spreads and adapts

By **Michael A. Martin[1,2], David VanInsberghe[1], Katia Koelle[1,3]**

As severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has spread across the globe, so have efforts to sequence its RNA genome. More than 260,000 sequences are now available in public databases, about a year after the viral genome was first sequenced (*1*). These sequences and their associated metadata have allowed researchers to estimate the timing of SARS-CoV-2 spillover into humans, characterize the spread of the virus, and gauge virus adaptation to its new host. Such analyses rely on interpreting patterns of nucleotide changes that have occurred in the virus population over time and are brought into focus through the reconstruction of genealogical relationships between sampled viruses that are depicted in phylogenetic trees.

Analysis of phylogenetic trees allows for conclusions to be drawn about epidemic and pandemic viruses that are important for public health (see the figure). After the emergence of a new virus, viral sequence data and sampling dates can be used to infer the rate at which the virus population evolves, along with the time of the most recent common ancestor (TMRCA) of all sampled viruses. For SARS-CoV-2, these analyses have revealed that the virus evolves at a rate of ~1.1×10^{-3} substitutions per site per year (*2*)—corresponding to one substitution every ~11 days—and a TMRCA of around late November 2019. However, owing to limited sampling early in the COVID-19 outbreak, this date likely lags behind the spillover into humans by several weeks.

Once virus circulation becomes widespread, phylodynamic analyses can give insight into how a virus spreads both spatially and temporally. Viruses from a given region can be placed in the context of those circulating globally, allowing for the number of independent virus introductions into a region to be estimated through phylogeography. These methods rely on assigning geographical states to unsampled ancestral viruses through a process called ancestral state reconstruction. Multiple applications of this approach have consistently shown that regional SARS-CoV-2 spread was ignited not by one, but by many independent introductions. This is likely due to slow or imperfect implementation of screening efforts at borders in the early stages of the pandemic. Similar types of analyses are conducted in local outbreak investigations, in what is often called genomic epidemiology. This has been used, for example, to link multiple transmission chains to a motorcycle rally in South Dakota (*3*).

Care must be taken, however, when interpreting phylogeographic analyses of this virus owing to the limited extent of its circulating genetic diversity. Given the evolutionary rate of SARS-CoV-2, viruses sampled weeks apart on different continents can have identical nucleotide sequences, making robust inferences more challenging. Additionally, sampling efforts are geographically heterogeneous, which can bias phylogeographic analyses. Methods have recently been developed to better accommodate the degree of undersampling across regions and the known travel history of sampled cases (*4*). Application of these methods has shown that later, rather than earlier, virus introductions established the first sustained transmission networks in the United States and Europe (*5*), highlighting the utility of genomic data in epidemiological investigations.

Once viral lineages have been introduced into a region, phylodynamic methods can also be used to infer the rate of viral spread through a host population and the basic reproduction number R_0, defined as the average number of infections generated by an infected host in a susceptible host population. This inference can be done using coalescent-based methods, which infer changes in the underlying population size of infected individuals using the time points at which viral lineages "coalesce" (merge) backward in time. Epidemiological models can also be fit directly to viral phylogenies based on the timing of coalescent events (*6*). Another approach to infer R_0 from sequence data relies on a forward-in-time birth-death process, with a "birth" corresponding to a transmission event (resulting in the birth of an infected individual) and a "death" corresponding to a removal of an infected individual (*7*). Both methods have been applied to SARS-CoV-2 sequence data, with relatively consistent results across methods and regions: At the beginning of the pandemic, R_0 fell between 2 and 3.5 (*8*, *9*) but decreased substantially after the implementation of nonpharmaceutical interventions. Although R_0 can be, and usually is, estimated from epidemiological case data, these estimates can be biased by changes in reporting rates. The relative contributions of new introductions versus local spread are often also indistinguishable in tabulated case data. Thus, analysis of sequence data provides an alternative approach to infer R_0 that may be particularly useful in the early stages of virus circulation when a large proportion of identified cases may be new introductions and when reporting rates are likely to be low. The development of methods that integrate both epidemiological time series and sequence data is an area of active research that will improve parameter estimation.

Phylodynamic analyses can also be used to identify instances of viral adaptation. Adaptation is a particular concern because SARS-CoV-2 only recently spilled over into humans and thus may still adapt to its new host through substitutions that facilitate its spread. One emerging variant that has been implicated as being more transmissible is 614G, which replaces aspartic acid (D) with glycine (G) at amino acid site 614 in the cellular entry (spike) protein of SARS-CoV-2. This variant likely arose in China in January 2020 and has since become dominant worldwide. The D-to-G substitution results in more efficient infection and replication in vitro and enhances transmission in animal models (*10*). Coalescent-based phylodynamic analyses using densely sampled genomes from infections in London found trends toward higher transmissibility of 614G clusters relative to 614D clusters (*11*). More recently, a new SARS-CoV-2 lineage, B.1.1.7, has rapidly spread from southeast England around the globe, and early analyses indicate that it has a substantial fitness advantage over other currently circulating lineages. These recent evolutionary events indicate that SARS-CoV-2 still has the capacity to develop more efficient transmission between human hosts.

When considering viral adaptation, a commonly held fear is that a virus may evolve to become more virulent, that is, cause more severe disease and host mortality. However, natural selection acts on variation in viral transmission potential, not variation in virulence per se. More virulent strains could have

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higher transmission potential if infection with a more virulent strain resulted in infected hosts shedding more virus. However, a more virulent infection may reduce contact rates of infected individuals, limiting the opportunity for viral transmission. Therefore, it is not clear whether more virulent SARS-CoV-2 strains are likely to evolve.

As SARS-CoV-2 continues to spread, the virus will begin to face new evolutionary pressures. Other respiratory viruses can provide insight into how SARS-CoV-2 evolution may manifest. For example, the 2009 pandemic H1N1 influenza virus started to evolve antigenically a couple of years after its emergence (*12*) and recent work has identified signatures of adaptive evolution in the spike protein of seasonal coronaviruses, consistent with antigenic evolution (*13*). Emerging evidence suggests that some SARS-CoV-2 variants may already be exhibiting antigenic evolution, and this is likely to continue as population immunity (through natural infection or vaccination) builds. Efforts by public health agencies to monitor emergent SARS-CoV-2 lineages, particularly those that may escape vaccine or natural immunity, are under way. Additionally, widespread infection of farmed mink has recently been observed, and there is evidence of transmission of mink lineages back into humans (*14*). Animal reservoirs may therefore contribute to the dynamics of SARS-CoV-2 evolution and adaptation.

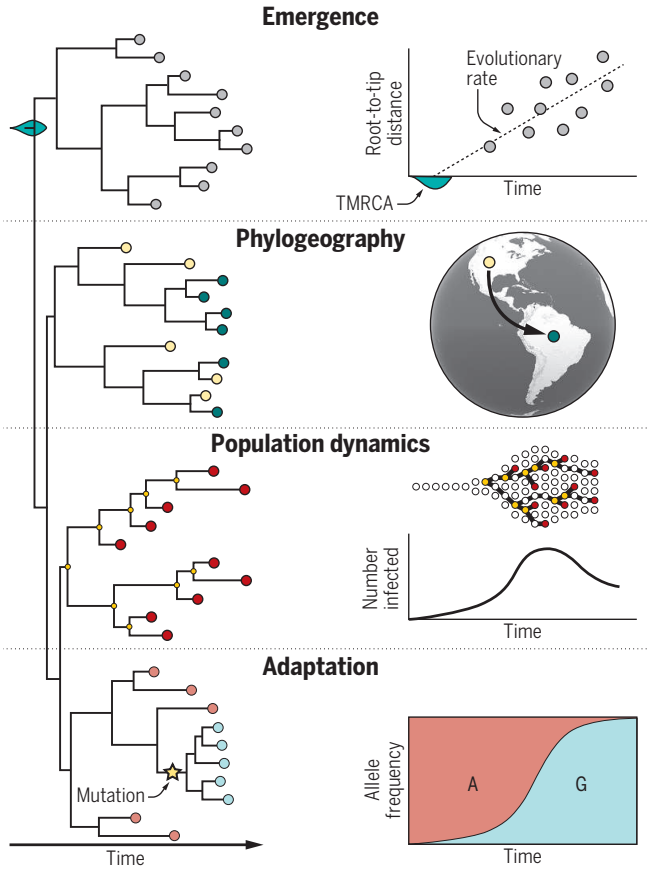
For viral adaptation to be possible, be it through the evolution of immune escape or other viral traits, genetic (and phenotypic) variation needs to be present. Although nucleotide substitutions are the primary source of genetic variation in SARS-CoV-2, insertions and deletions of nucleotides have also been observed. Furthermore, recombination is common in coronaviruses and may potentially give rise to new SARS-CoV-2 lineages. A small number of SARS-CoV-2 recombinant genomes have already been detected (*15*). Because of their potential phenotypic effects, circulation of genomic insertions, deletions, and recombinants should be monitored.

The number of available SARS-CoV-2 sequences is, like many things during this pandemic, unprecedented. Gaining understanding from these data does not come without challenges. Many current methods rely not just on the sequence itself but on associated metadata that provide additional information about viral samples. Research laboratories are often limited in the metadata that can be released owing to patient privacy regulations. For similar reasons, some government health agencies, such as the U.S. Centers for Disease Control and Prevention (CDC), receive only limited metadata from state health departments. Although privacy is an important concern, the routine release of more detailed metadata would improve the power of phylodynamic methods to describe viral dynamics and evolution. Notably, sequences are often released with only coarse sampling location data. However, viral dynamics may be heterogeneous even between locations that are geographically close. Furthermore, the incorporation of travel history can improve the accuracy of phylogenetic methods (*4*), but this information is not commonly reported. Because phylodynamic methods often require an assumption of random sampling, when samples from individuals belonging to the same transmission chain are sequenced, it is crucial that this information be labeled in the sequence metadata to avoid biasing analyses. Despite these challenges, a tremendous amount of SARS-CoV-2 sequence data is publicly available on GISAID's EpiCov database. Phylogenetic analyses of these sequences are conducted in near–real time and available on platforms such as Nextstrain and Microreact, allowing the ongoing evolution of SARS-CoV-2 genomes to be viewed in detail.

In many ways, the SARS-CoV-2 pandemic offers a distinct opportunity for the field of phylodynamics. Methods development over the past 10 to 15 years, the widespread availability of sequencing technologies, open data sharing, and the tireless efforts of clinicians and scientists who collect these data mean that more can be learned from viral genomes than ever before. As viral diversity continues to accumulate, SARS-CoV-2 sequence data and associated metadata can be used to answer questions focused on the longer-term evolution and adaptation of SARS-CoV-2. The volume of sequence data also presents an opportunity for methods development, because most current methods are computationally intractable when applied to hundreds of thousands of genomes. Continued efforts to collect viral sequence data and the development of efficient and scalable computational inference methods will help to further cement evolutionary analyses as a cornerstone of the public health response to viral spread and adaptation. ■

Uses for viral sequence data

Viral phylogenies, rooted at the most recent common ancestor (TMRCA), are inferred on the basis of genetic differences. These phylogenies can be used to estimate viral emergence, characterize the geographic spread of the virus, reconstruct epidemiological dynamics of viral spread within a region, and identify instances of adaptation.



GRAPHIC: A. KITTERMAN/*SCIENCE*

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Science

Insights from SARS-CoV-2 sequences

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Chapter 4

Comment on "Genomic epidemiology of superspreading events in Austria reveals mutational dynamics and transmission properties of SARS-CoV-2"

The following *Technical Comment*, published in *Science Translational Medicine* in October 2021 was written with the goal of reconciling disparate estimates of the SARS-CoV-2 transmission bottleneck in the literature at the time. We reanalyzed deep sequencing data from 39 epidemiologically linked transmission pairs which had previously been published and used to infer a large (∼1000 virions) transmission bottleneck. However, the original analyses did not sufficiently account for shared, non-transmitted, variants between transmission pairs. These likely spurious shared variants artificially inflate the estimated transmission bottleneck.

4.1 M.A.M Contributions

Conceptualization, Validation, Formal analysis, Investigation, Data Curation, Writing - Original Draft, Writing - Review & Editing, Visualization

4.2 Published Manuscript

CORONAVIRUS

Comment on "Genomic epidemiology of superspreading events in Austria reveals mutational dynamics and transmission properties of SARS-CoV-2"

Michael A. Martin[1] and Katia Koelle[2,3]*

A reanalysis of SARS-CoV-2 deep sequencing data from donor-recipient pairs indicates that transmission bottlenecks are very narrow (one to three virions).

In their recent research article (*1*), Popa *et al.* combined epidemiological and viral genetic data to characterize the transmission dynamics of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in Austria between February and April 2020. The genetic data they analyzed comprised >500 deep-sequenced virus samples. Beyond using consensus-level SARS-CoV-2 sequences to infer transmission clusters within Austria and to examine the role that Austria played in seeding regional epidemics elsewhere in Europe, the authors used their sequenced samples to characterize mutational dynamics within hosts and along short transmission chains. Although we believe that the findings from their consensus-level genetic analysis are robust, we here revisit their analyses of mutational dynamics at the below-the-consensus level. Specifically, we consider their estimates of the viral transmission bottleneck size, defined as the number of virions that successfully seed infection in a recipient individual following infection from a donor individual. Equivalently, it is the number of viral particles from a person who transmits the infection that contribute genetically to the viral population in the recipient who contracts it. From our reanalysis, we conclude that transmission bottleneck sizes for SARS-CoV-2 are not on the order of 1000 virions as concluded by the authors but instead much smaller.

Our decision to revisit Popa *et al.*'s conclusions on transmission bottleneck sizes stems from certain patterns present in some of their figures. First, inferred bottleneck size estimates using a 3% variant calling threshold were bimodal, with 14 of the 39 transmission pairs having an inferred bottleneck size (N_b) of <10 and the remaining 25 pairs having N_b estimates of 115 to 5000 (their fig. S4G). Further, when a 1% variant calling threshold was used, only a single transmission pair retained an N_b estimate of <10 (their figure 5B). In an attempt to understand these patterns, we first reanalyzed their deep sequencing data and recalled variants using their pipeline. In the analyses presented below, we use these recalled variant frequencies, which appear to be highly similar to those presented in Popa *et al.* based on the plots published as part of their article that show the frequencies of called variants in donor individuals against those in recipient individuals in their identified transmission pairs (10.5281/zenodo.4247401).

As expected, re-estimation of transmission bottleneck sizes at variant calling thresholds of 1 and 3% yielded similar results to those shown in (*1*) (Fig. 1A, fig. S1, A and B, and data file S1). During this analysis, we noticed that bottleneck size estimates dropped, sometimes precipitously, when going from a 1 to a 3% cutoff for each of the 13 transmission pairs that had donors with a maximum intra-host single-nucleotide variant (iSNV) frequency of >6% ($P = 0.004$, paired t test; Fig. 1A). Because increasing the variant calling threshold would remove low-frequency iSNVs from the analysis, these consistent decreases in N_b estimates could come about if low-frequency donor iSNVs pointed toward bottleneck sizes being large, whereas high-frequency donor iSNVs instead pointed toward bottleneck sizes being small. Examination of low-frequency iSNVs across donor-recipient pairs indicates a high degree of congruence between their frequencies (Fig. 1B, inset, and fig. S2 in data file S2), which would suggest wide transmission bottlenecks. In contrast, high-frequency donor iSNVs rarely appeared to be transmitted to their corresponding recipient (fig. S2), suggesting narrow transmission bottlenecks.

To come to terms with these conflicting patterns, we considered genetic variation that appeared de novo in recipient hosts. This genetic variation appears in the donor-against-recipient variant frequency plots as iSNVs that are absent from a donor but present in a corresponding recipient. When a de novo variant is observed as fixed in a recipient sample, we should not observe any shared iSNVs between a donor and a recipient that are present in the recipient at subclonal (that is, not fixed) frequencies unless within-host recombination occurred extremely rapidly or the fixed de novo variant arose multiple times in different genetic backgrounds. However, in the transmission pairs analyzed in Popa *et al.*, shared subclonal iSNVs are observed in several transmission pairs where there is also a fixed de novo variant present in the recipient. The transmission pair CoV_162 ➔ CoV_161 provides an example (Fig. 1B). This means that the low-frequency iSNVs shared between CoV_162 and CoV_161 are either spurious or that they arose independently in the recipient (that is, they are homoplasies). Although iSNV homoplasies have been documented in a number of recent SARS-CoV-2 studies (*2*, *3*), we believe that these low-frequency iSNVs in the Popa *et al.* transmission pairs are likely spurious, potentially arising from systematic issues related to the sequencing protocol. This is because these low-frequency iSNVs occur at extremely similar frequencies between the donor sample and the recipient sample (Fig. 1B, inset, and fig. S2), which is unlikely if the iSNVs were homoplasies. In either case, however, the low-frequency shared iSNVs in transmission pair CoV_162 ➔ CoV_161 and in other transmission pairs with fixed de novo variants in the recipient could only constitute transmitted genetic variation under scenarios that are highly implausible from a biological perspective and as such

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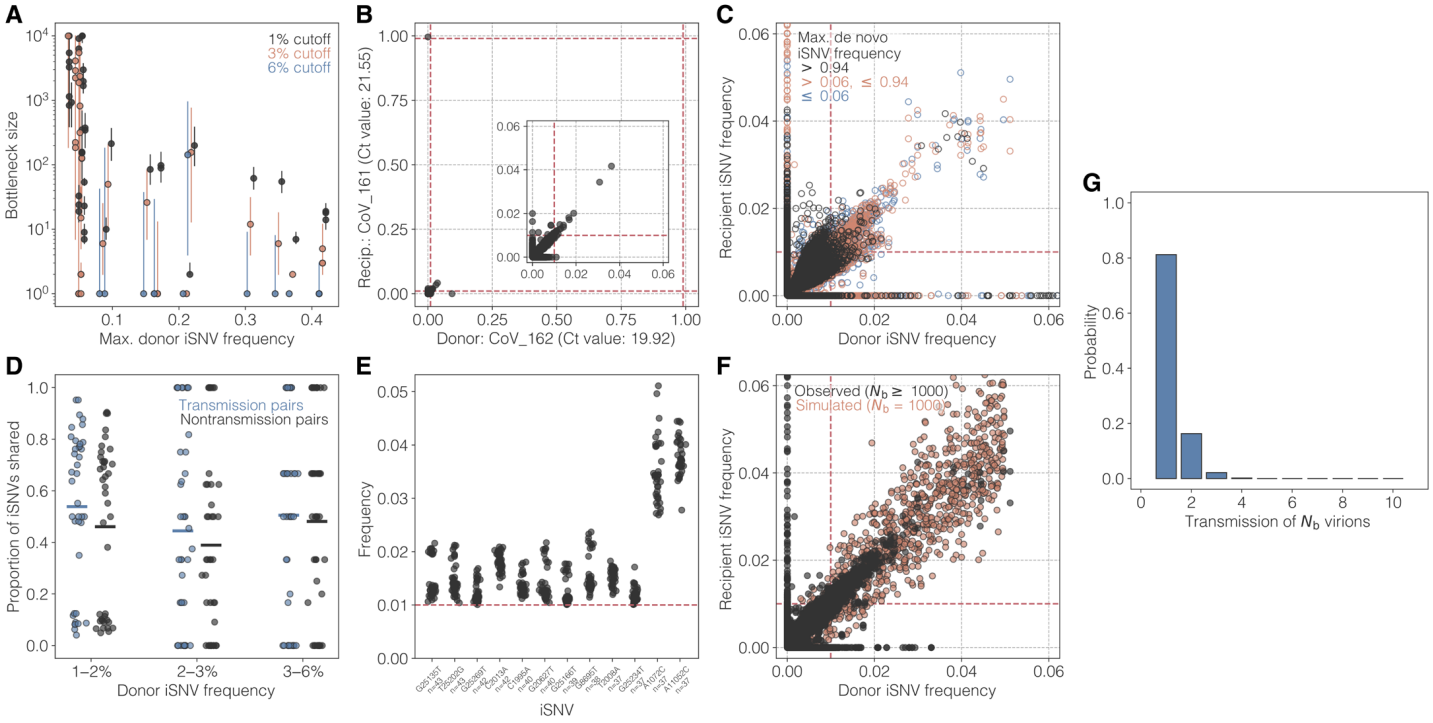

Fig. 1. Transmission bottleneck sizes and patterns of shared viral genetic diversity between the transmission pairs studied in Popa *et al.* (**A**) Bottleneck size estimates for 39 epidemiologically confirmed SARS-CoV-2 transmission pairs using variant calling thresholds of 1% ([0.01, 0.99]), 3% ([0.03, 0.97]), and 6% ([0.06, 0.94]). Estimates are based on all iSNVs that passed the quality-filtering thresholds. Maximum likelihood estimates are indicated by a colored circle and vertical lines show 95% CIs. Estimates are plotted according to the maximum iSNV frequency observed in the donor of the transmission pair. Estimates from the same transmission pair are offset slightly on the *x* axis to aid in visualization. iSNV frequencies are based on variant calling relative to donor-specific reference sequences. (**B**) All iSNVs observed in either the donor or the recipient of the epidemiologically confirmed CoV_162 ➔ CoV_161 transmission pair. Note the de novo variant in the recipient (C26894U) that is fixed within individual 161 and absent from individual 162. Inset highlights low-frequency iSNVs. Red dashed lines show the 1% variant calling threshold. iSNV frequencies are based on variant calling relative to donor-specific reference sequences. Here, all iSNVs that passed quality filtering thresholds are shown, regardless of whether they fell above or below the 1% variant calling threshold. (**C**) Low-frequency iSNVs observed across transmission pairs. Transmission pairs are classified as belonging to one of three groups according to the maximum de novo iSNV frequency observed in the recipient. Red dashed lines show the 1% variant calling threshold, and iSNV frequencies are based on variant calling relative to donor-specific reference sequences. (**D**) Proportion of iSNVs identified in a donor that are shared with a recipient host. Blue dots show proportions for epidemiologically linked pairs, whereas black dots show proportions for random, epidemiologically unlinked donor-recipient pairs. Random pairs were generated such that the random recipient was not a member of the same family as the focal donor or recipient and was not a known recipient of that donor sample. iSNVs were binned on the basis of their frequency in the donor: [0.01, 0.02), [0.02, 0.03), and [0.03, 0.06). Allele frequencies are based on variant calling relative to Wuhan/Hu-1 (*9*). Differences between the epidemiologically linked and unlinked distributions were assessed using the Kolmogorov-Smirnov test. This test failed to find significant differences between these distributions in the 1 to 2% donor frequency group ($P = 0.389$), 2 to 3% donor frequency group ($P = 0.752$), and 3 to 6% frequency group ($P > 0.999$). (**E**) Top 12 most abundantly shared iSNVs among the 43 samples involved in the 39 transmission pairs. iSNVs are ordered by the number of samples in which they were found (*n*). Each dot represents the allele frequency of that iSNV in a given sample. Red dotted line shows the 1% variant calling threshold. Allele frequencies are based on variant calling relative to Wuhan/Hu-1. (**F**) Patterns of shared viral genetic diversity between transmission pairs under the assumption of a large bottleneck of $N_b = 1000$ (red dots). Black dots show all iSNVs observed in either the donor or recipient for all transmission pairs with an estimated bottleneck size of ≥1000 at a variant calling threshold of 1%. (**G**) Probability of a transmission bottleneck of size N_b based on bottleneck size estimation using a variant calling threshold of 6% and data from all 13 transmission pairs with one or more iSNVs above this 6% threshold. The probability that a transmission involves a bottleneck size of 1, 2, or 3 virions exceeds 99%.

should be excluded from a transmission bottleneck analysis involving these transmission pairs.

A comprehensive analysis of all transmission pairs identified in Popa *et al.* indicates that patterns of low-frequency shared genetic variation are quantitatively highly similar across transmission pairs. To illustrate this, we categorized transmission pairs into three groups: transmission pairs with de novo fixed variants in the recipient (here defined as >94% in frequency), transmission pairs with de novo high-frequency (6–94%) variants in the recipient, and transmission pairs with only low-frequency de novo variants (≤6%). Figure 1C shows that the shared low-frequency iSNVs across these three groups are quantitatively extremely similar: Most shared iSNVs in each of these groups have frequencies falling between 1 and 2% in the donor, although some have frequencies of up to 6%. Whereas we should expect no transmitted subclonal genetic variation for the transmission pairs falling in the first group, we expect any shared iSNVs between transmission pairs belonging to the second group to have markedly different frequencies between the donor and the recipient because of genetic linkage with the high-frequency de novo variant in the recipient. The third group in principle could have very similar iSNV frequencies if bottleneck sizes were sufficiently large. In contrast to these expectations, Fig. 1C shows that all shared iSNVs (regardless of which group is being considered) are highly congruent in their frequencies between donors and recipients, indicating

again that these iSNVs are very likely spurious. When we calculate the proportion of the low-frequency donor iSNVs that are observed in a corresponding recipient (at ≥1%) versus observed in an epidemiologically unlinked recipient, we find that the distribution of these proportions are highly similar (Fig. 1D). This finding again suggests that these shared low-frequency iSNVs do not constitute true shared genetic variation within transmission pairs; if these shared iSNVs were transmitted, we would expect the proportion of shared low-frequency variants to be higher for the corresponding recipient compared to an epidemiologically unlinked one.

Given these findings that shed doubt on low-frequency iSNVs constituting transmitted genetic variation, we decided to quantify the extent to which particular iSNVs were present across the samples used in the transmission pair analyses. We found that 5 iSNVs were present in ≥40 of the 43 samples analyzed at frequencies that fell into a very narrow range (1 to 2.2%) (Fig. 1E). Many other iSNVs were also present across numerous samples (Fig. 1E, fig. S3 in data file S3, and fig. S4), with the frequencies of any particular iSNV being highly similar across the samples that it appears in. This similarity in iSNV frequencies again argues against these low-frequency iSNVs being homoplasies and strongly argues for these iSNVs being spurious. To assess the evidence for this, we plotted the genome location of all variants observed in between 1 and 99% of reads in at least 10 samples against the read depth at those positions (fig. S5). Although these variants do not tend to appear in areas of particularly low sequencing coverage, they do cluster within a small number of sequenced amplicons, which are distributed across the genome (fig. S6).

Last, a comparison between observed patterns of iSNV frequencies between donors and recipients versus those expected under large transmission bottleneck sizes as inferred in Popa *et al.* further argues against the transmission of the low-frequency shared iSNVs. Specifically, observed iSNV frequencies from transmission pairs with inferred bottleneck sizes of $N_b \geq 1000$ show that iSNVs are present in both donor and recipient at highly similar frequencies or are observed exclusively in the donor or recipient (Fig. 1F). On this figure, we overlaid simulated iSNV frequencies under the assumption of a bottleneck size of $N_b = 1000$. Juxtaposition of the observed versus theoretically predicted iSNV frequencies highlights an inconsistency: at N_b values of ~1000, we should expect almost all (at least 96.1%) of the iSNVs present in the donor at ≥2% to be transmitted and also observed above the variant calling threshold of 1% in the recipient. However, only 77.5% of donor iSNVs within the 2 to 6% frequency range were observed in the corresponding recipients at ≥1% frequency. This inconsistency indicates that the low-frequency iSNVs themselves show patterns that cannot be parsimoniously explained by large transmission bottleneck sizes. Moreover, bottleneck sizes of around $N_b = 3000$ are needed to quantitatively reproduce patterns of shared iSNV frequencies (fig. S7); at this bottleneck size, nearly 100% of iSNVs present in the donor at ≥2% should be transmitted to the recipient, but this is not the case.

Given our finding that the shared low-frequency iSNVs called in Popa *et al.* are likely spurious, we re-estimated transmission bottleneck sizes using the beta-binomial method (*4*) at a conservative variant calling threshold of 6% (Fig. 1A, fig. S1C, and data file S1). Increasing the variant calling threshold does not bias bottleneck size estimates, but it does increase statistical uncertainty in the estimated values. At this 6% cutoff, only 13 transmission pairs had one or more donor iSNVs remaining, such that bottleneck sizes could only be estimated for these pairs. The maximum likelihood estimate for N_b was 1 for 12 of these 13 transmission pairs [with the largest upper bound of the 95% confidence interval (CI) being $N_b = 181$ virions]; for the remaining transmission pair (CoV_198 ➔ CoV_230), the estimate was $N_b = 143$ virions (95% CI = 4 to 951). This transmission pair was the only one where a donor iSNV (at a frequency of ~22%) was transmitted to a recipient but remained subclonal (at a frequency of ~17%). Because the confidence intervals around these estimates were large, we also estimated an overall transmission bottleneck size using the data from these 13 transmission pairs. We arrived at an estimate of a mean bottleneck size of 1.21, with three or fewer viral particles successfully seeding infection in >99% of successful transmissions (Fig. 1G). Of note, this estimate depends on patterns of genetic variation observed between donors and recipients of transmission pairs. We here relied on the transmission pairs specified in Popa *et al.*; misspecification of these pairs could result in erroneously small bottleneck estimates.

Our finding of a very tight transmission bottleneck from a reanalysis of the viral deep sequencing data from Popa *et al.* is consistent with conclusions from other recent studies that have quantified SARS-CoV-2 transmission bottleneck sizes in humans (*3*, *5*) and other mammals (*6*). These results indicate that SARS-CoV-2 has a narrow transmission bottleneck, similar in size to that of influenza A viruses (*7*). Small bottleneck sizes also mean that infections generally start off with very little, if any, viral genetic diversity, such that acute infections will likely be characterized by low levels of viral diversity except in instances of superinfection, consistent with other recent studies (*2*, *8*). Our reanalysis thus parsimoniously adds to a growing understanding of SARS-CoV-2 evolution between and within infected individuals.

SUPPLEMENTARY MATERIALS

www.science.org/doi/10.1126/scitranslmed.abh1803
Materials and Methods
Figs. S1 to S7
Data files S1 to S3

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Science Translational Medicine

Comment on “Genomic epidemiology of superspreading events in Austria reveals mutational dynamics and transmission properties of SARS-CoV-2”

Michael A. MartinKatia Koelle

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4.3 Supplement

Science Translational Medicine
AAAS

Supplementary Materials for

Comment on "Genomic epidemiology of superspreading events in Austria reveals mutational dynamics and transmission properties of SARS-CoV-2"

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The PDF file includes:

Other Supplementary Material for this manuscript includes the following:

Materials and Methods

Aligned viral reads in the form of BAM files for all samples involved in the 39 transmission pairs described in Popa *et al*. *(1)* were downloaded from the National Center for Biotechnology Information (NCBI) Sequencing Read Archive (SRA) BioProject #PRJEB39849. Variants were called from these BAM files using a modified version of the variant calling pipeline used in *(1)* which was downloaded from https://github.com/Bergthalerlab/SARSCoV2_Code. Modified ARTIC (https://artic.network/) v2 primers were trimmed using iVar v. 1.3 with a four base sliding window, no minimum quality threshold, and a minimum length of 20. Overlapping read pairs were clipped using the clipOverlap utility available in bamUtil v. 1.0.14. SAMtools v. 1.10 depth was used to calculate the read depth of each viral BAM file after adjusting for overlapping read pairs. LoFreq v. 2.1.5 was used to realign reads to correct mapping errors with the viterbi function and to insert indel quality scores using the indelqual function. Last, LoFreq was used to call variants relative to Wuhan/Hu-1 (NC_045512.2) *(9)* requiring a minimum of 75 reads. Variant positions with a phred quality score < 90 were marked with LoFreq filter and indels with with an HRUN > 4 were marked with BCFtools v. 1.10.2 (using HTSlib v. 1.10.2) filter. BCFtools norm was used to left-align and normalize indels and split bi-allelic records. The variant calling pipeline was run in Python v. 3.7.3 (http://www.python.org) using PyPiper v. 0.12.1 (Databio; http://pypiper.databio.org/en/latest/faq/).

For each donor sample, BCFtools view and BCFtools consensus were used to generate a donor-specific reference sequence based on the Wuhan/Hu-1 reference and any variants identified with an allele frequency > 50%. SAMtools v. 1.10 was used to sort the viral BAM files by name and generate FASTQ files. FASTQ files for each transmission pair were realigned to the donor specific reference sequence using bwa mem v. 0.7.17-r1188 (http://bio-bwa.sourceforge.net) with a seed length of 17, looking for internal seeds longer than 17×1.25, and marking shorter split hits as secondary as in *(1)*. The same pipeline as above was used to recall variants relative to the donor reference sequences.

For each transmission pair we identified the variants present in the donor at frequencies of ≥1%, ≥3% and ≥6%. These donor allele frequencies and the corresponding recipient allele frequencies were used to estimate the transmission bottleneck as described in *(10)* using MATLAB R2020A. Estimated transmission bottleneck sizes at these variant calling thresholds are shown in Figure S1.

Transmission pairs in Figure 1C were categorized based on the maximum *de novo* (that is, present in less than 1% of the reads in the donor) allele frequency in the recipient.

We further calculated the transmission for these low frequency alleles by first identifying all variants present in donor samples at the following frequencies: [0.01, 0.02), [0.02, 0.03), and [0.03, 0.06) and then identifying the proportion of these variants that were identified in the recipient samples (at a frequency ≥0.01). To generate a comparison distribution, we sampled non-epidemiologically linked (i.e. not a known recipient of the focal donor sample and not in the same family as the focal donor or recipient) "recipients" for each donor sample without replacement and calculated the proportion of shared variants belonging to each category. The proportions of shared variants between transmission pairs, as well as between epidemiological unlinked samples, are shown in Figure 1D.

To compare patterns of observed iSNV frequencies against those expected under bottleneck sizes of 1000 and 3000 (Figure 1F, S7), we first generated a large set (n = 1000) of low-frequency donor iSNVs by drawing their frequencies from a uniform distribution of 0 to 6%. For each of these donor iSNVs, we create a stochastic realization of the iSNV's frequency in the recipient based on the forward model on which the beta-binomial method that estimates transmission bottleneck sizes is based. Specifically, for each iSNV, we first drew a random variable k from a binomial distribution with N_b = 1000 or N_b = 3000 number of

trials and success probability given by the donor iSNV frequency. This random variable k gives a stochastic realization of the number of virions in the founding population size of N_b that carrying the variant allele. We then determined the frequency of the iSNV in the recipient by drawing a random variable from a beta distribution with parameters k and ($N_b - k$). Following this procedure for each of the 1000 iSNVs gives rise to the data points shown in orange in Figure 1F and S7.

Overall transmission bottleneck sizes were estimated based on the assumption that transmission bottleneck sizes were distributed according to a zero-truncated Poisson-distribution. To arrive at a maximum likelihood estimate for the mean N_b, given the available iSNV frequency data for the 13 transmission pairs that had donor iSNVs that exceeded 6%, we first use the beta-binomial method to infer, for each of the 13 transmission pairs, log-likelihood values for each bottleneck size from 1 to 50. We then considered a broad range of λ values (0 to 10) for this Poisson distribution. At any value of λ, the mean N_b is given by $\frac{\lambda}{(1-e^{-\lambda})}$. At each value of λ considered, we calculated the probability mass of k virions initiating an infection, with $p_k = \frac{\lambda^k}{(e^{\lambda}-1)k!}$, and k = 1, 2, 3, etc. The likelihood of any given value of λ was evaluated via the following equation:

$$L(\lambda) = \sum_{n=1}^{13} \sum_{k=1}^{\infty} p_k e^{logL_{n,k}}$$

where n indexes the transmission pairs and k indexes the number of virions initiating infection. $logL_{n,k}$ is the log-likelihood of a bottleneck size of k in transmission pair n. The likelihood of λ peaked at a value of 0.402, corresponding to a mean N_b of 1.21. Figure 2 shows the probability mass function of the zero-truncated Poisson distribution parameterized with a λ of 0.402.

Two out of the 13 transmission pairs have donor samples with an unusually large number of high-frequency iSNVs. These are donor CoV_187 and donor Cov_273 (see figure S2). Both of these donors also have high Ct values (>34). Due to the possibility of transmission pairs associated with these donors biasing the mean N_b to a low value, we re-estimated the mean N_b again after removing these two transmission pairs. Based on the remaining 11 transmission pairs, we find that the maximum likelihood estimate for λ = 0.659, for the mean N_b = 1.37, yielding a similar conclusion that over 99% of successful SARS-CoV-2 infections result from 3 or fewer virions.

Unless otherwise noted, data were analyzed in Python v. 3.9.1 (http://www.python.org) using Pandas v. 1.1.4 (https://pandas.pydata.org) and Numpy v. 1.19.4 and all figures were generated using MatPlotLib v. 3.3.3. All code to replicate the analysis is available at https://doi.org/10.5281/zenodo.5224640. All data are also available at this repository, accessible in the supplementary data from *(1)*, or accessible from NCBI SRA BioProject # PRJEB39849.

Supplementary Figures

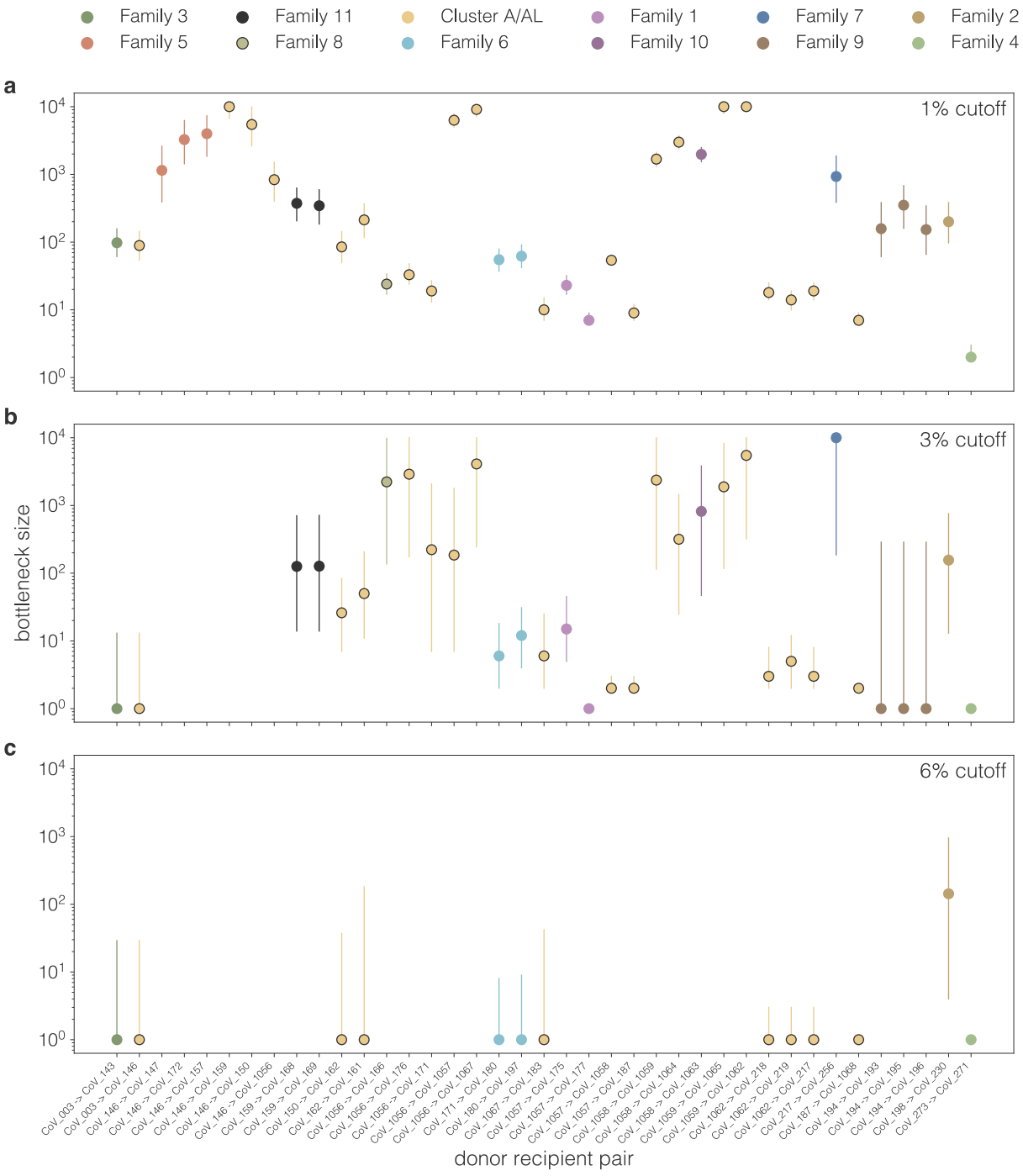

Figure S1. Transmission bottleneck size estimates for each of the 39 transmission pairs analyzed in Popa *et al*. Bottleneck sizes were estimated using A) a 1% variant calling threshold [0.01 0.99], B) a 3% variant calling threshold [0.03 0.97], and C) a 6% variant calling threshold [0.06 0.94]. Frequencies of iSNVs are based on variant calling relative to donor-specific reference sequences. Color coding of transmission pairs is as in Popa *et al*. for ease of comparison. Maximum likelihood estimates are indicated by a colored circle and vertical lines show the 95% confidence intervals. (We allowed a maximum bottleneck size of 10,000

virions, whereas Popa *et al.* allowed a maximum bottleneck size of 5,000 virions, but this difference was inconsequential to the interpretation of the results.) Note that in (B), we do not have transmission bottleneck size estimates for pairs with individual 146 as donor because the maximum iSNV frequency we found in this sample was 0.0299.

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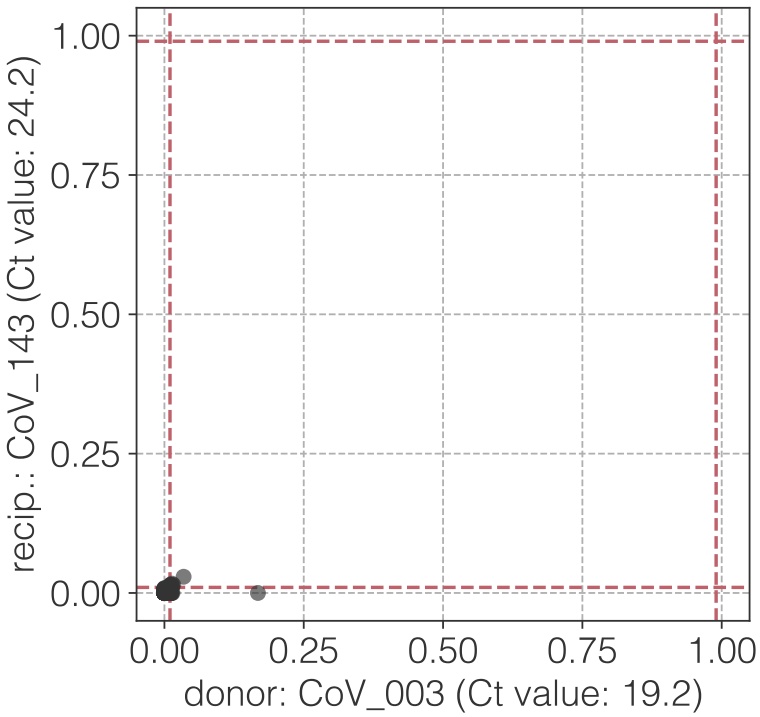
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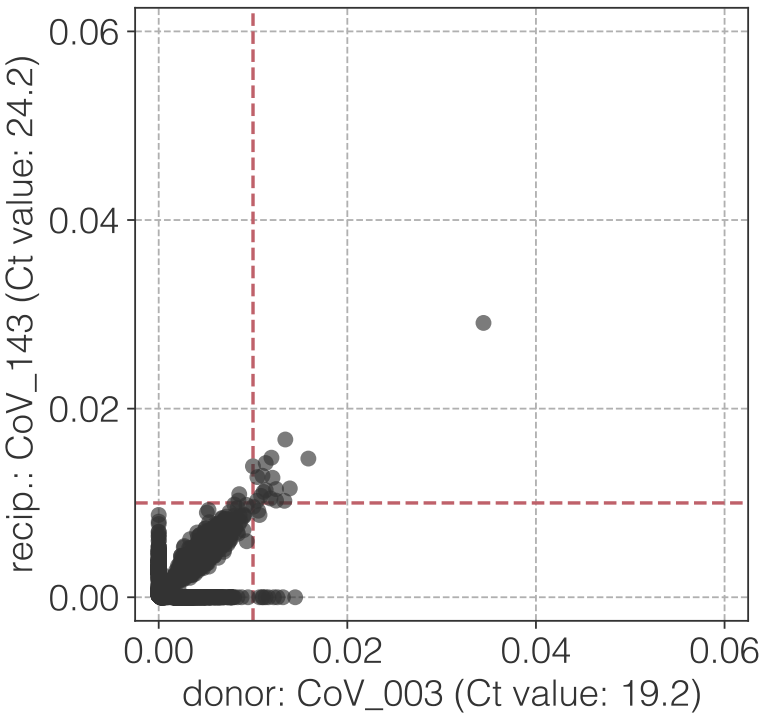
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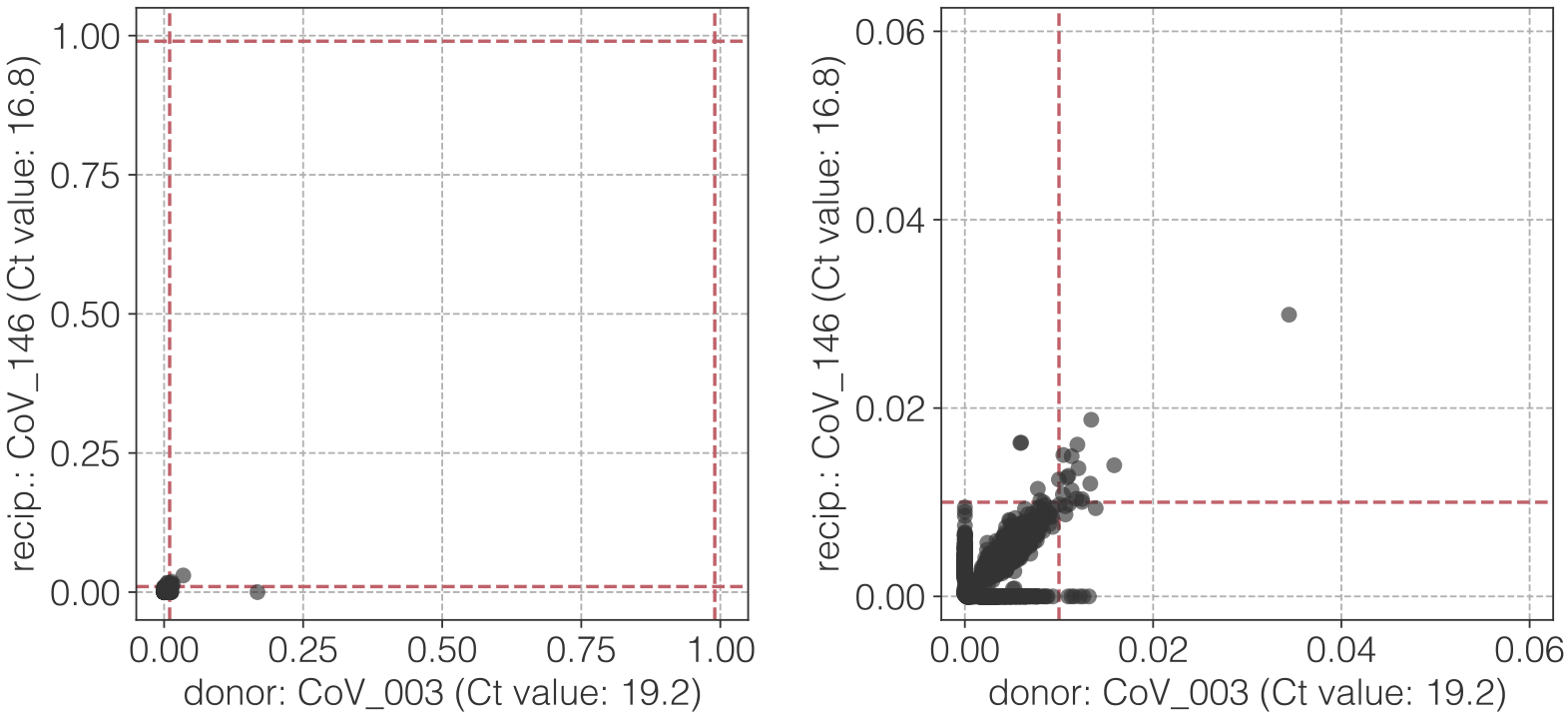
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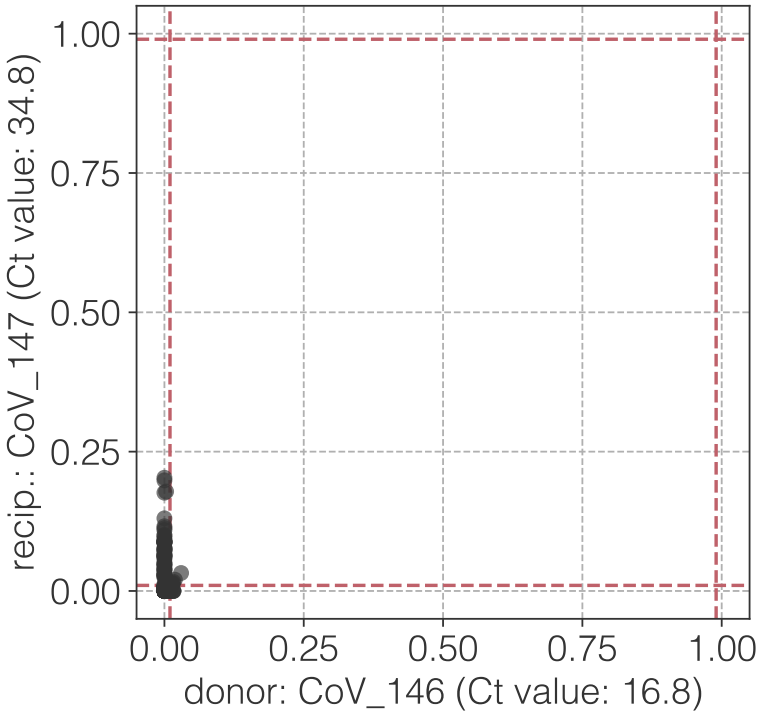
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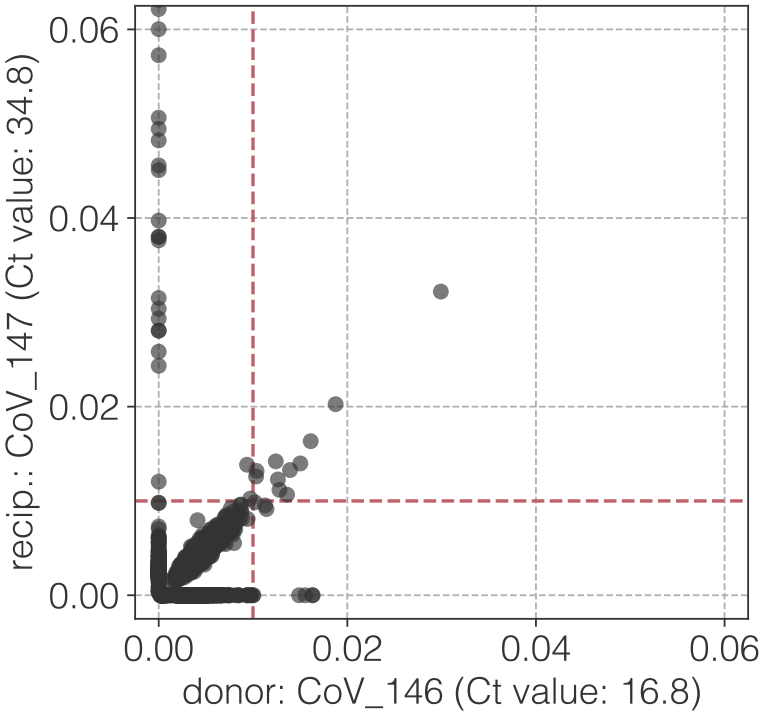
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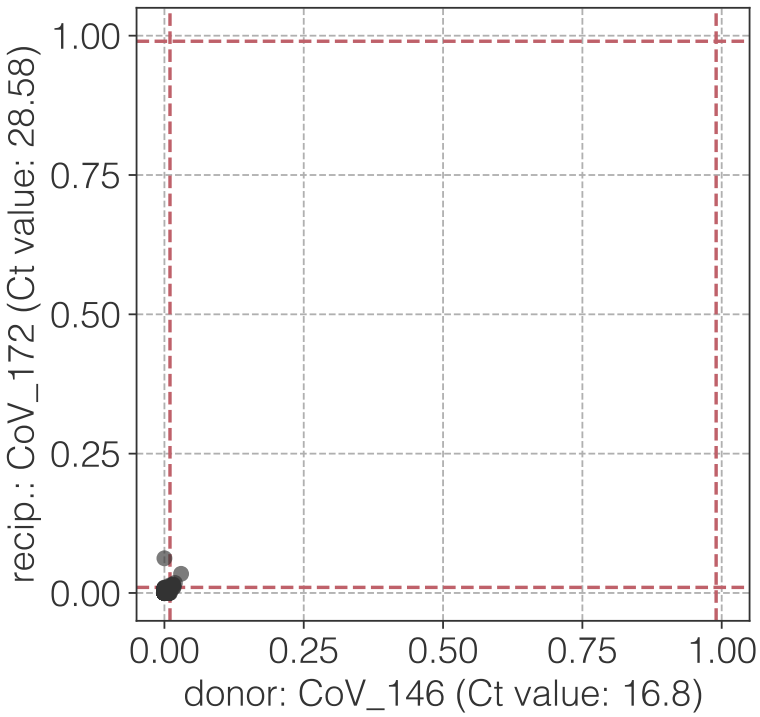
ad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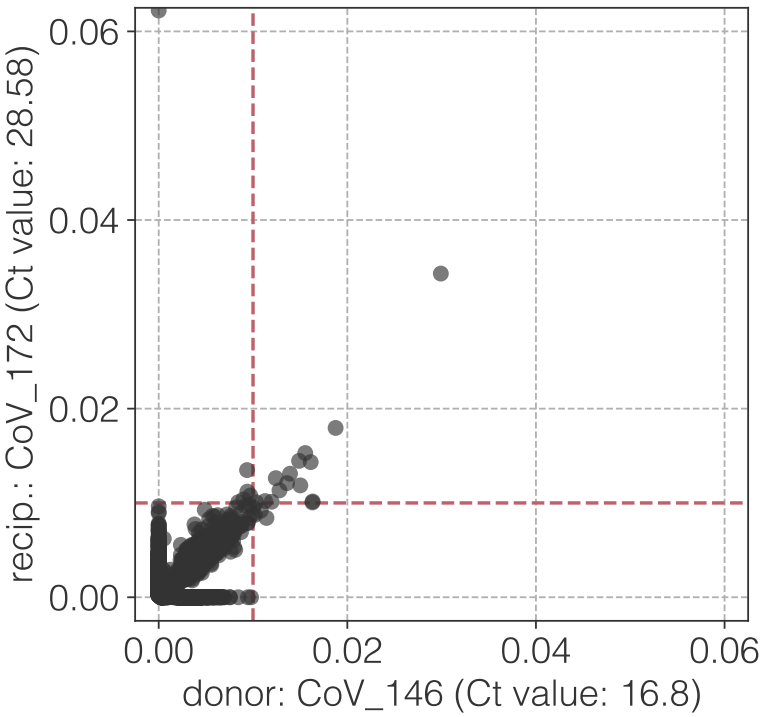
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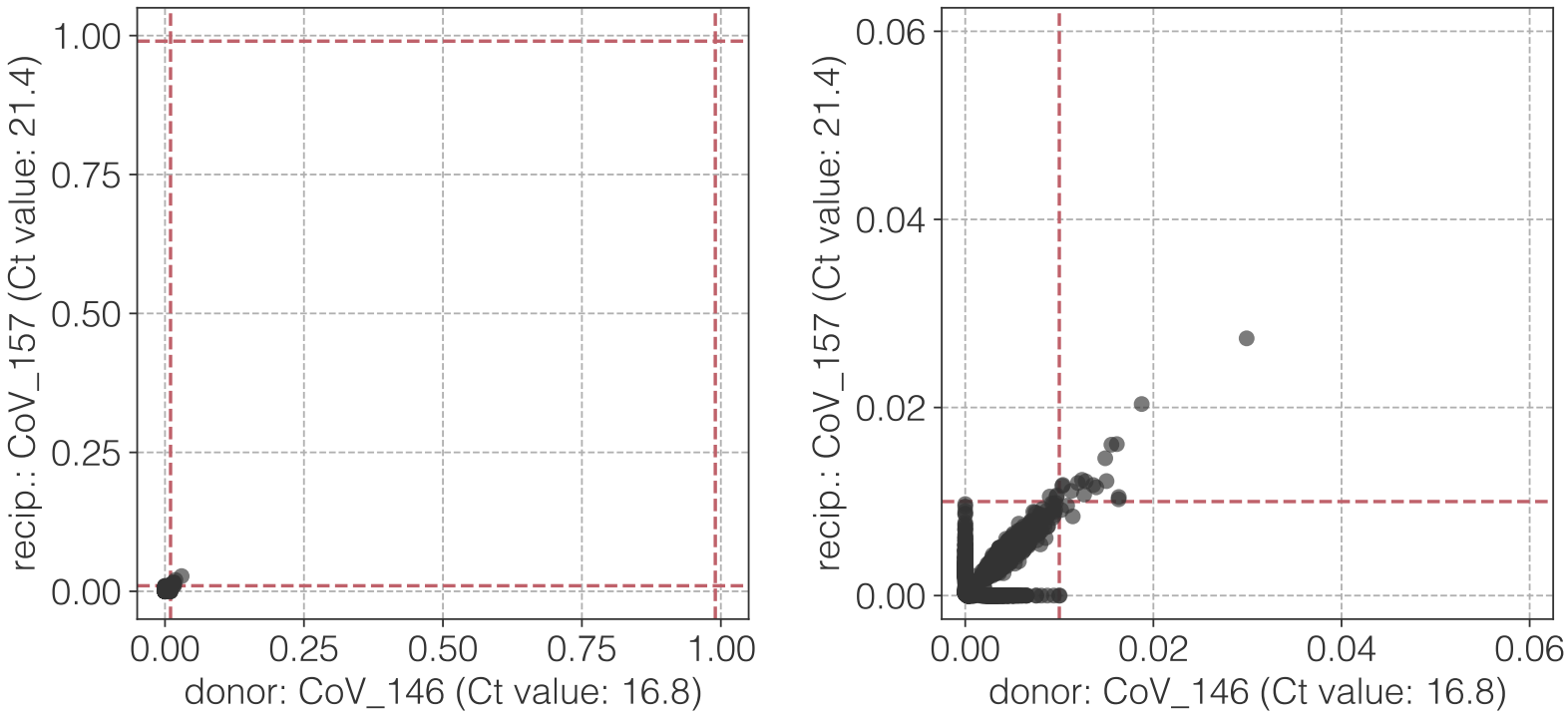
ae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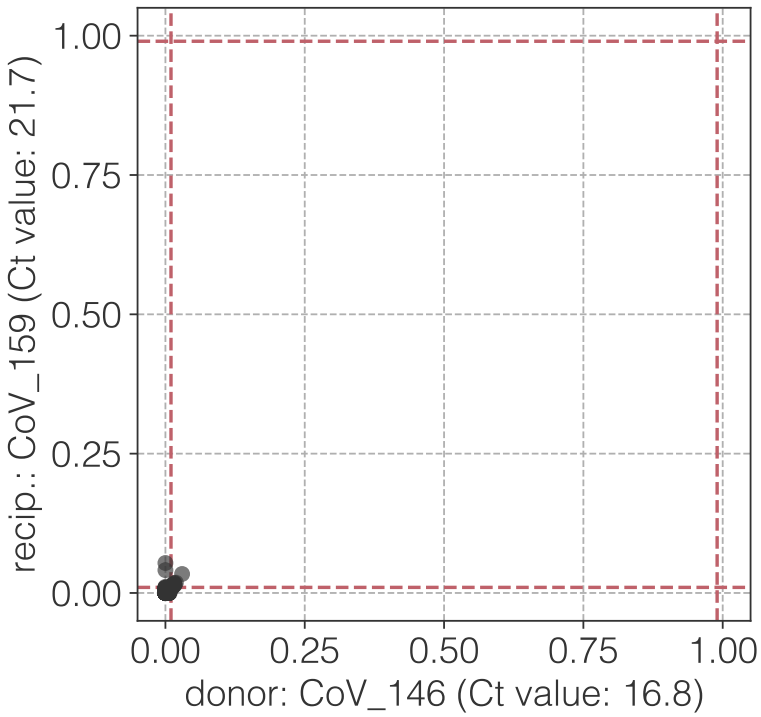
af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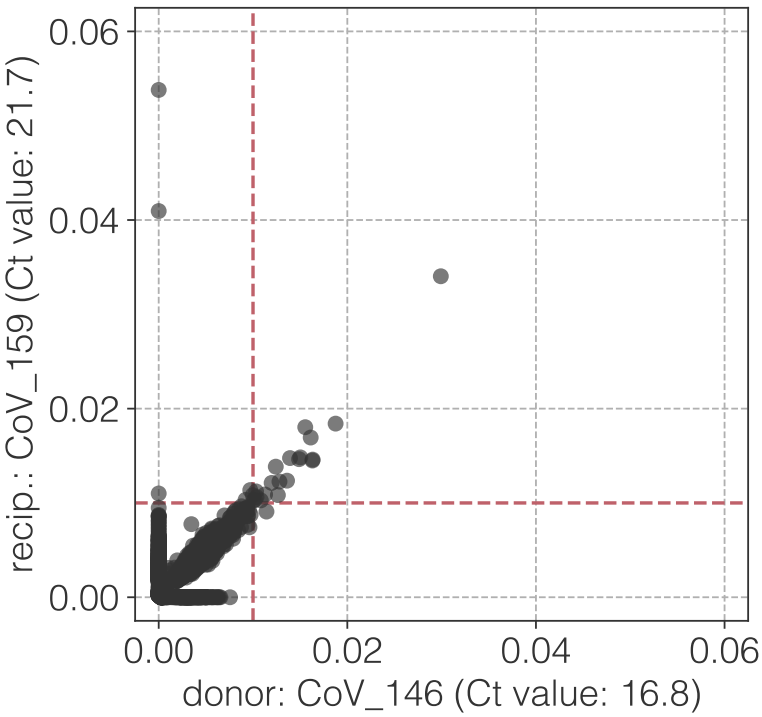
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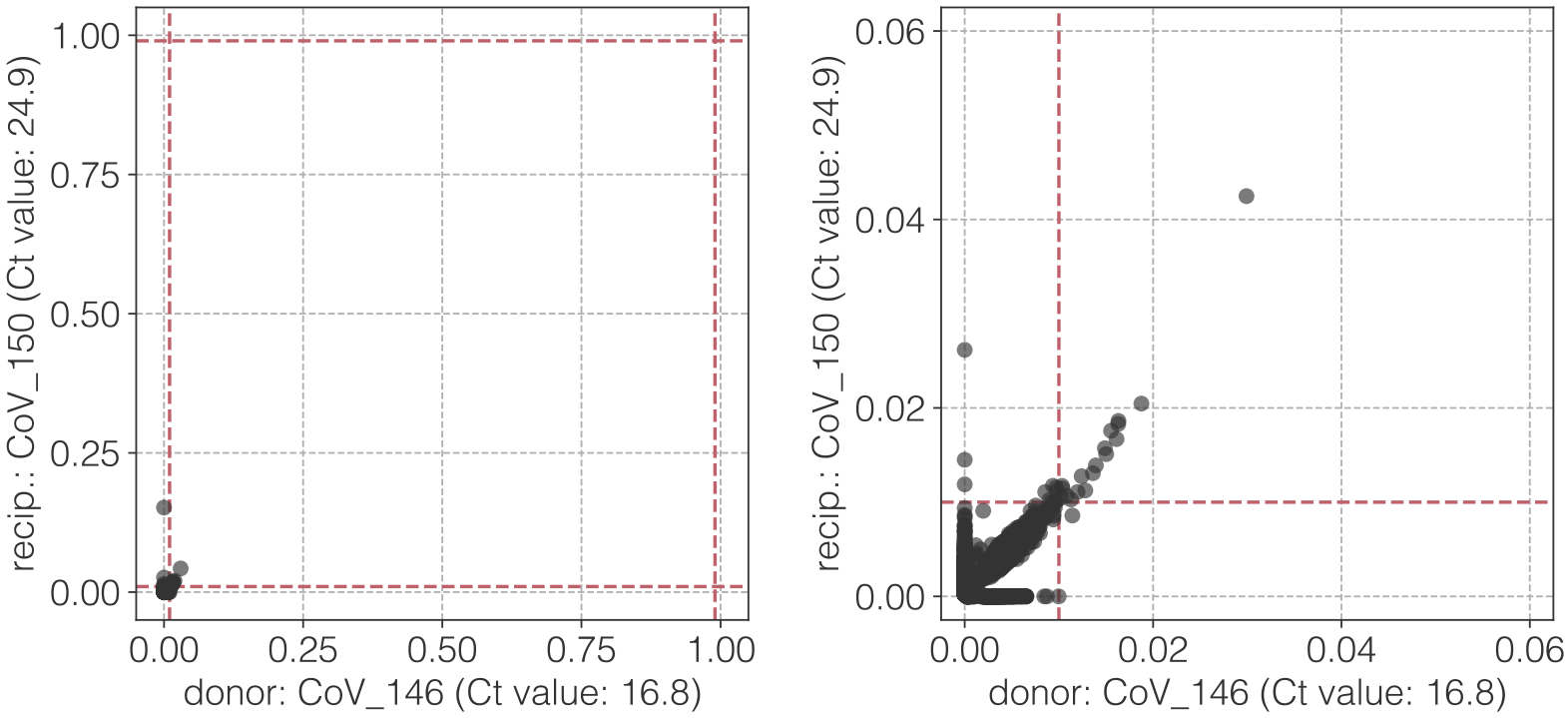
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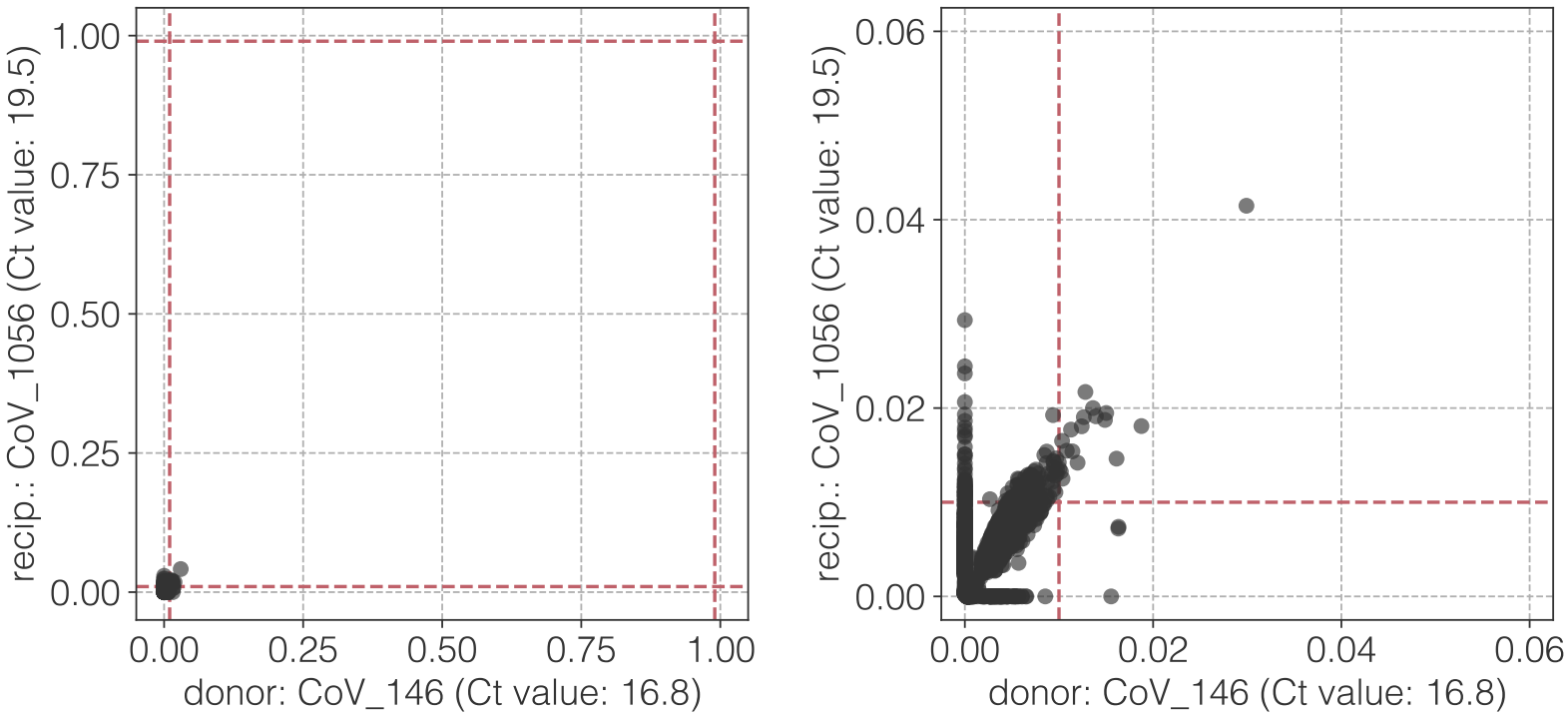
ah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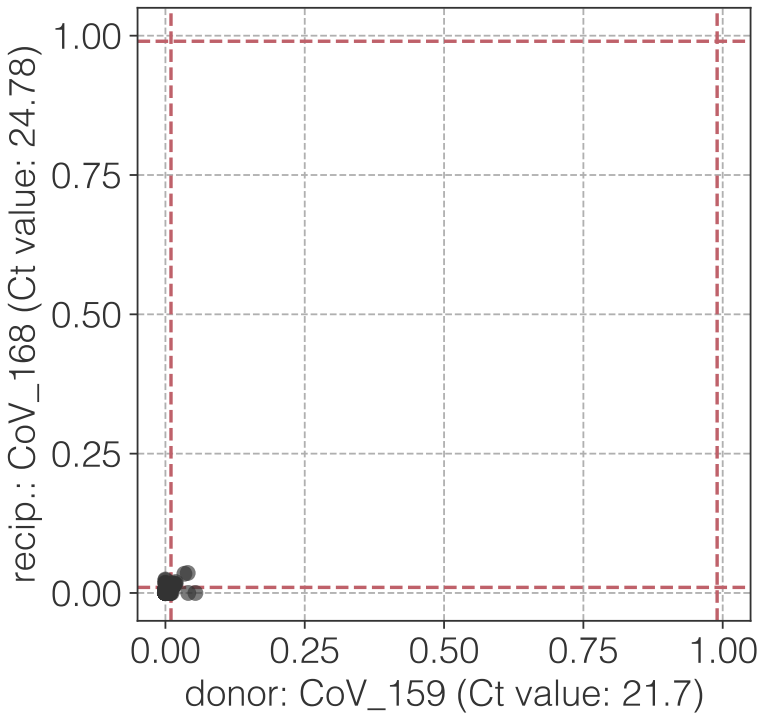
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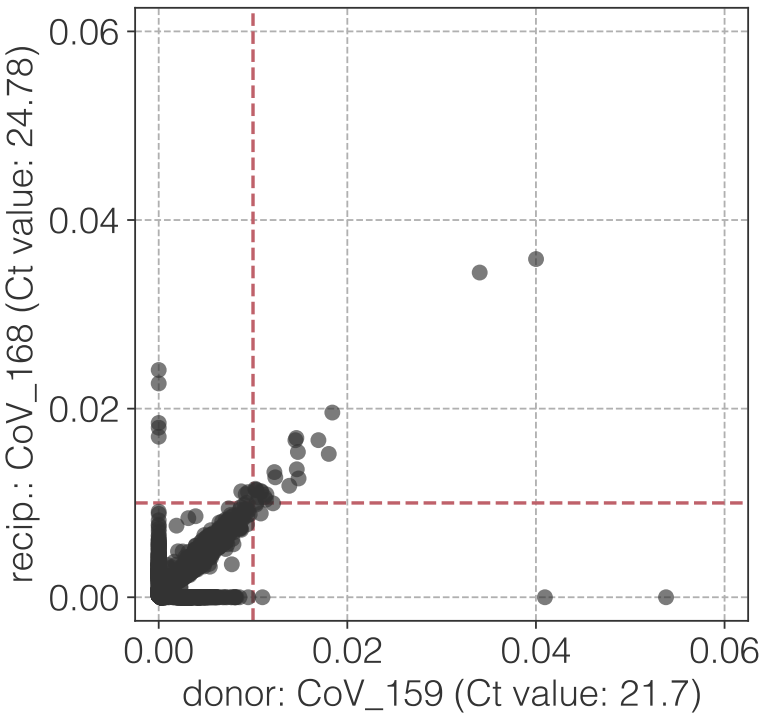
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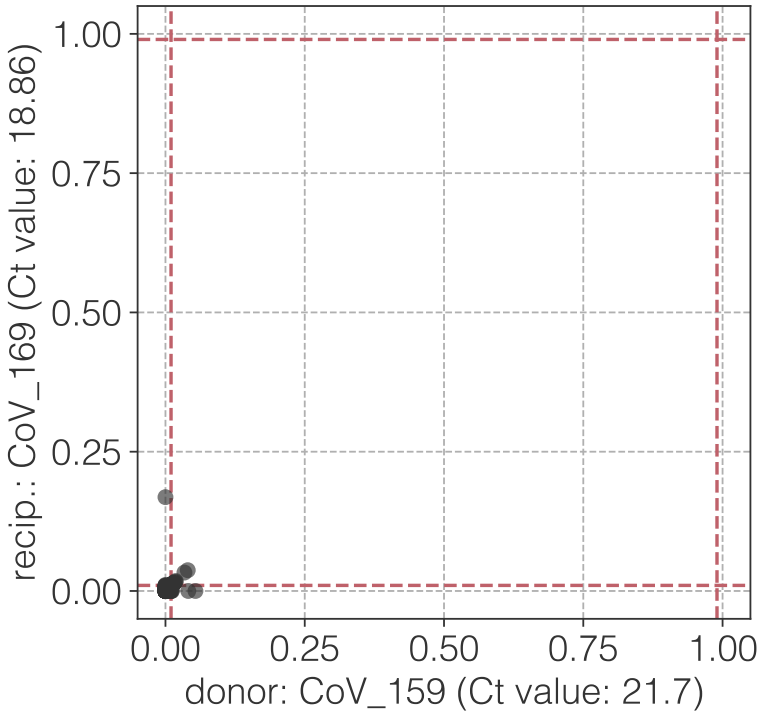
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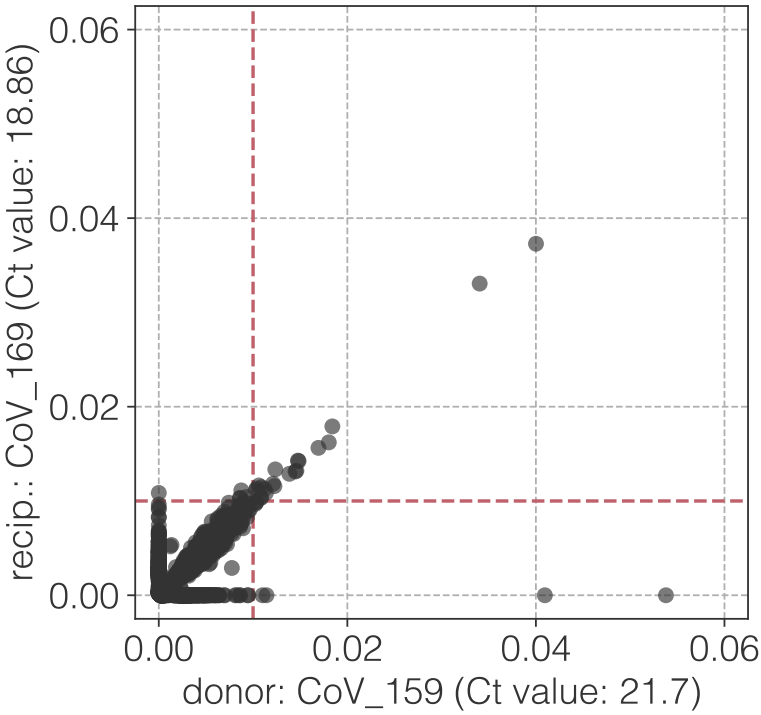
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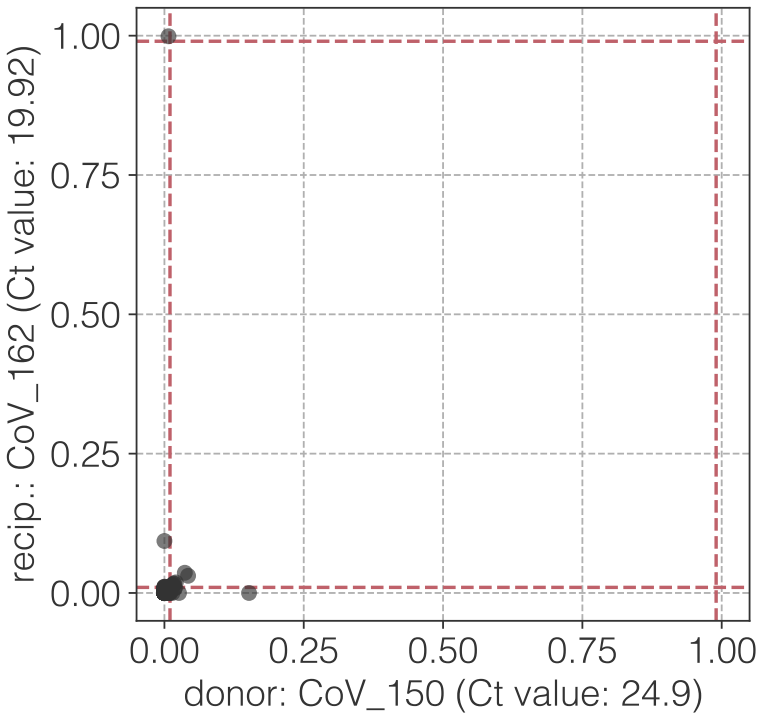
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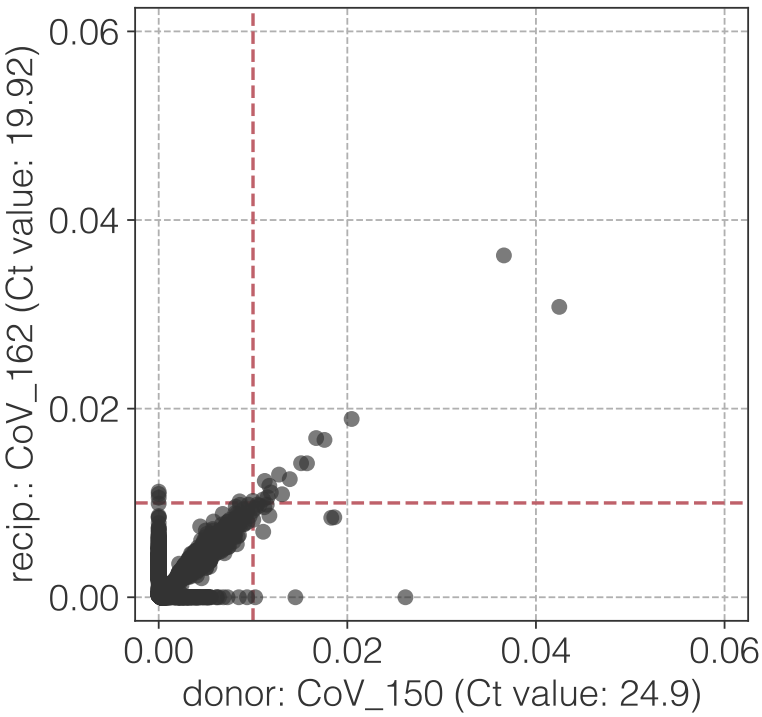
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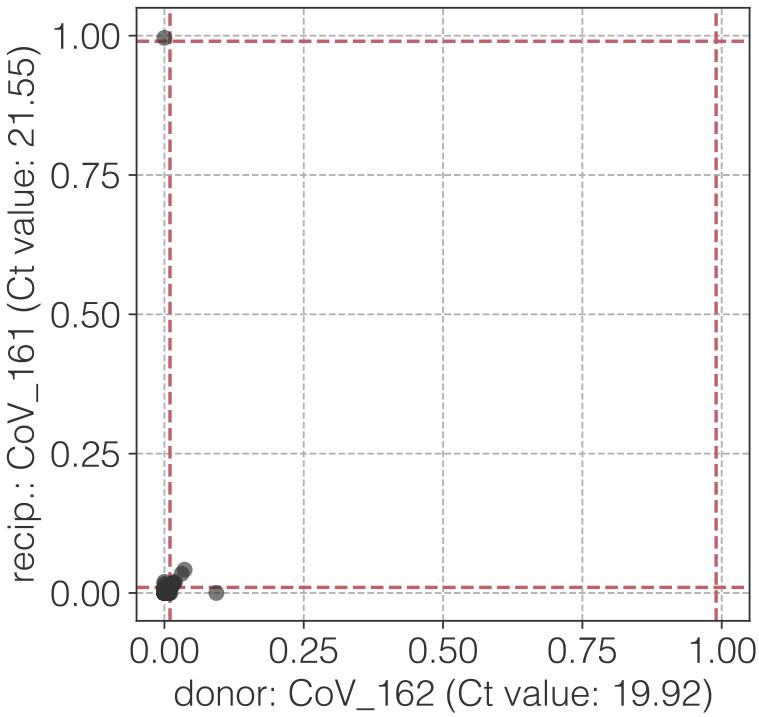
al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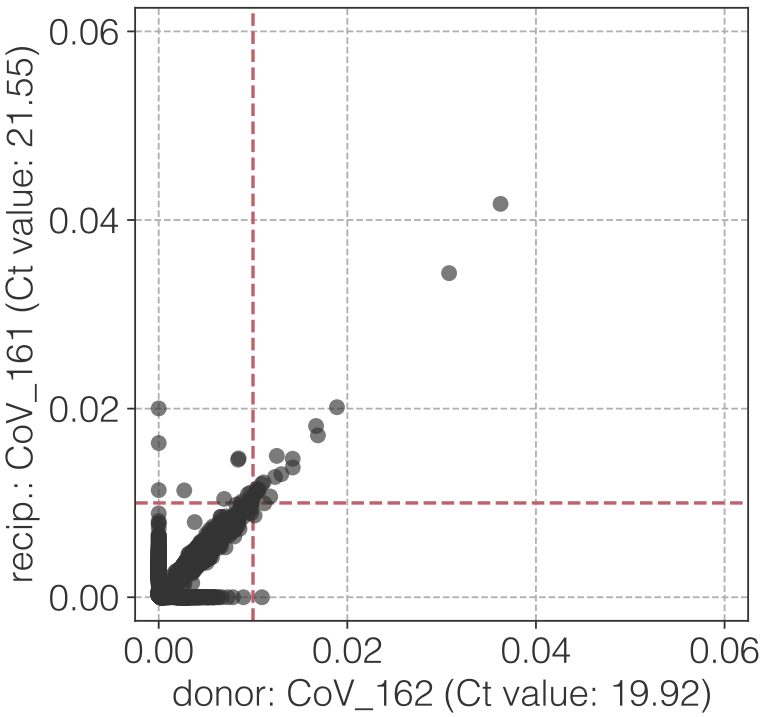
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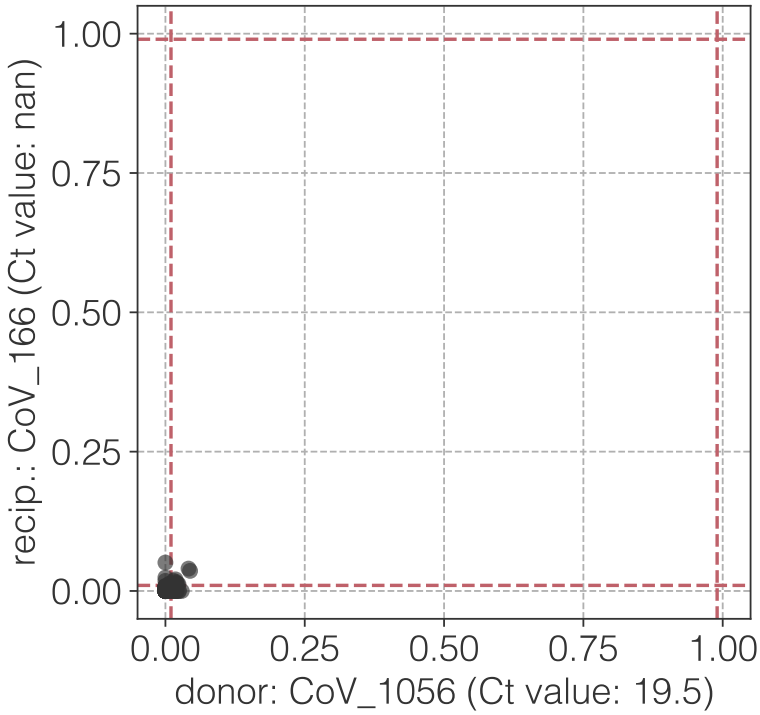
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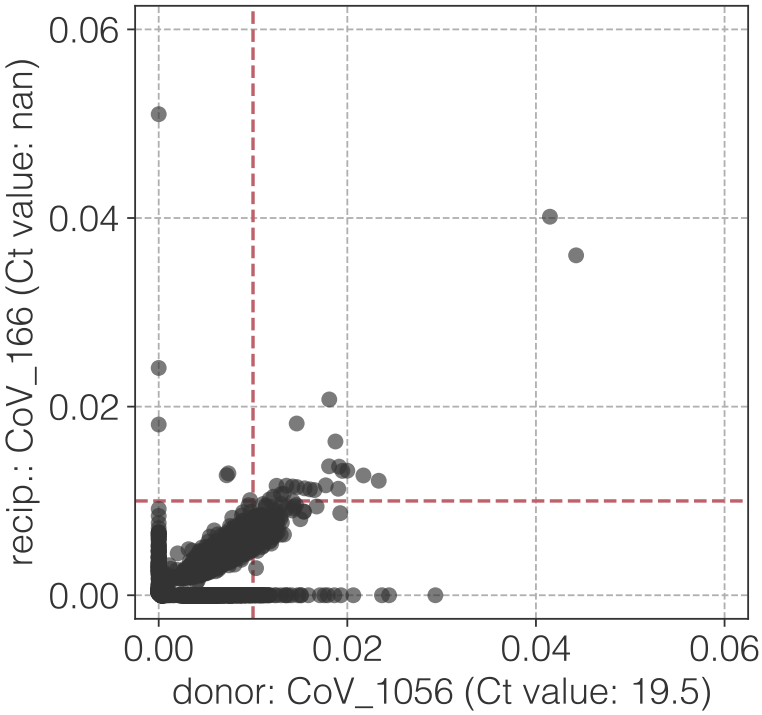
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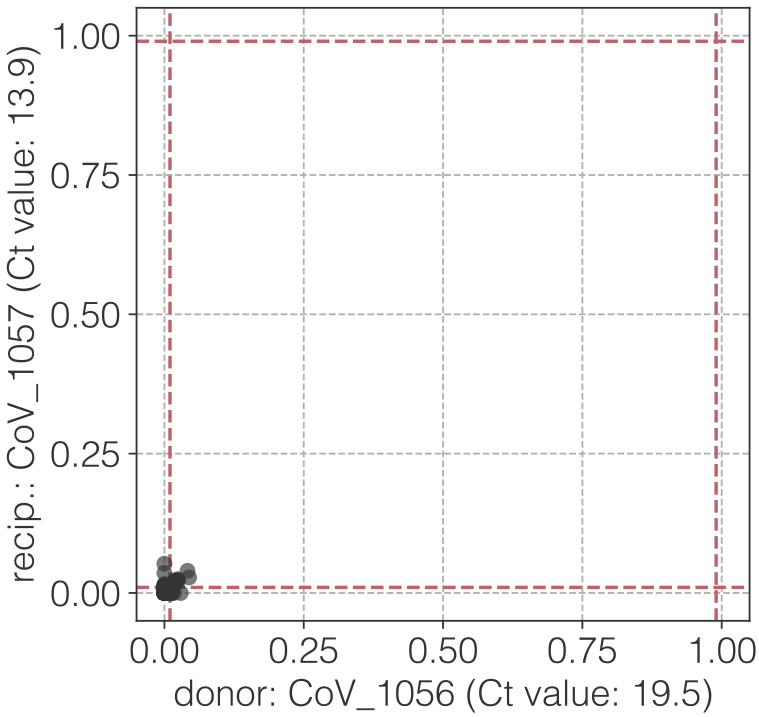
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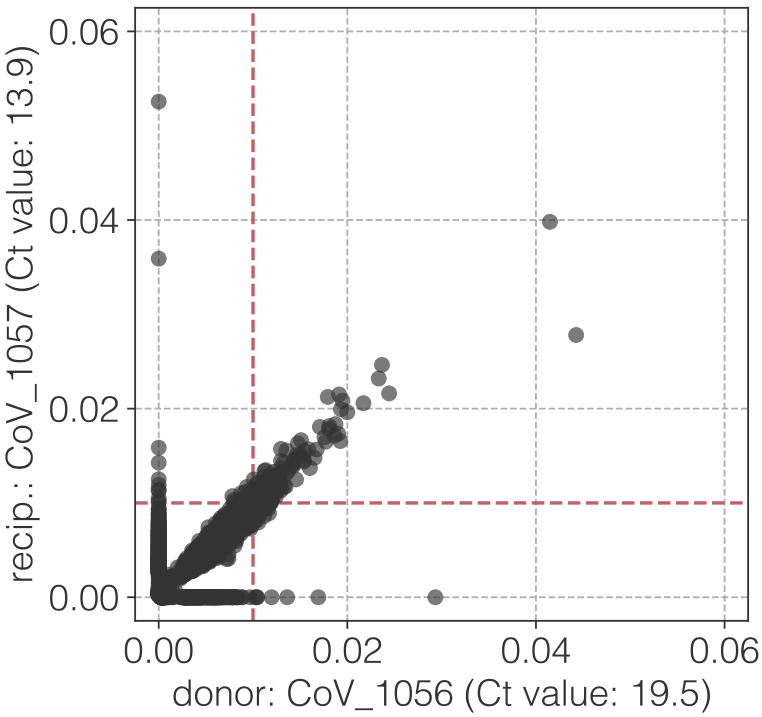
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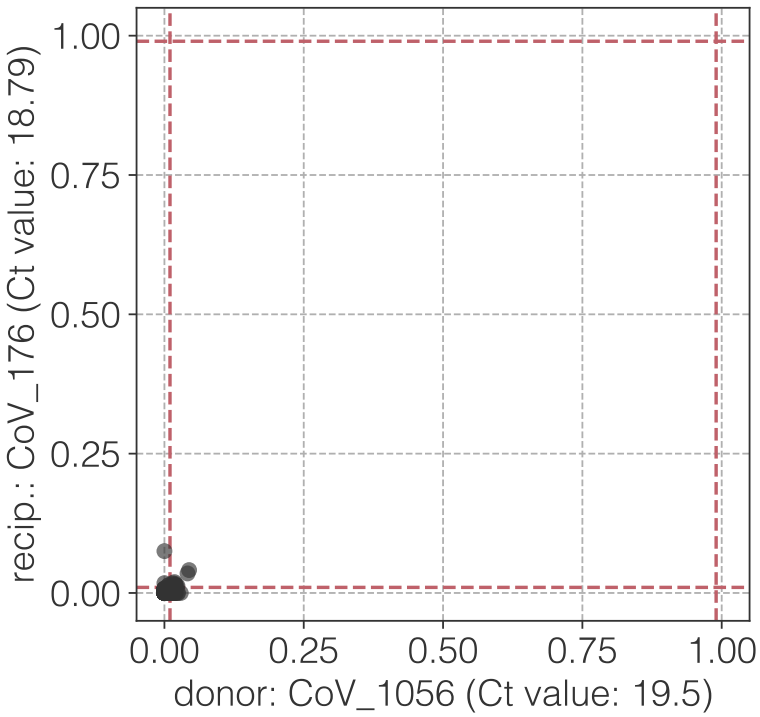
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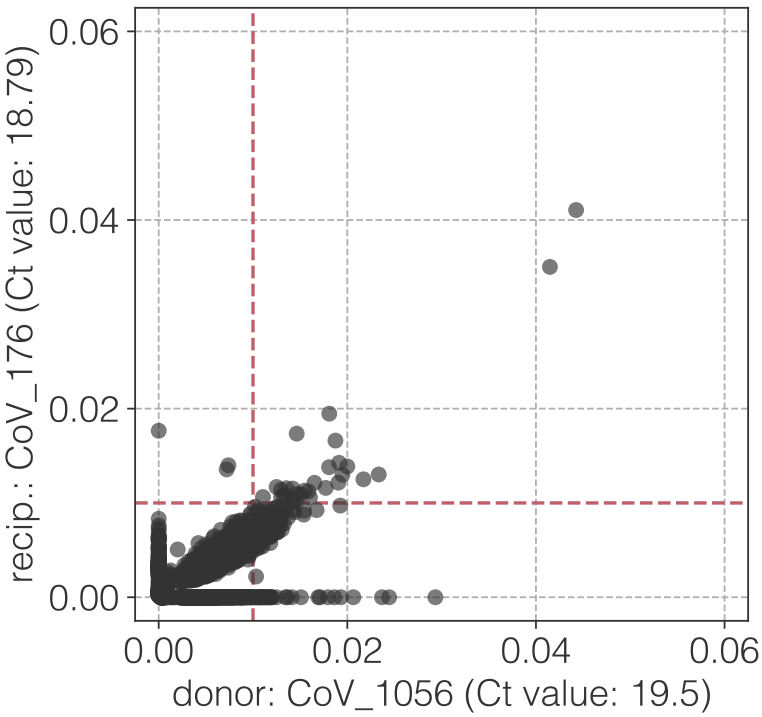
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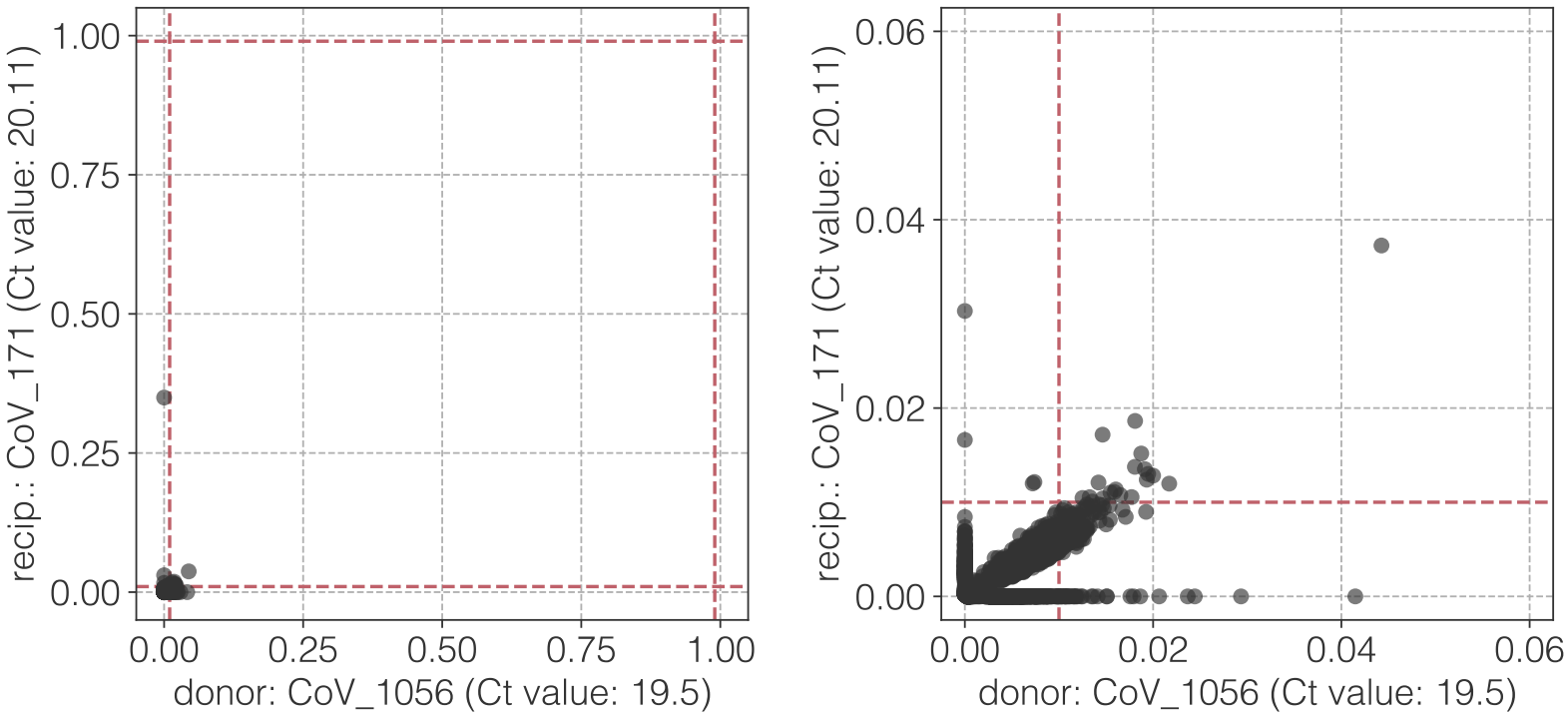
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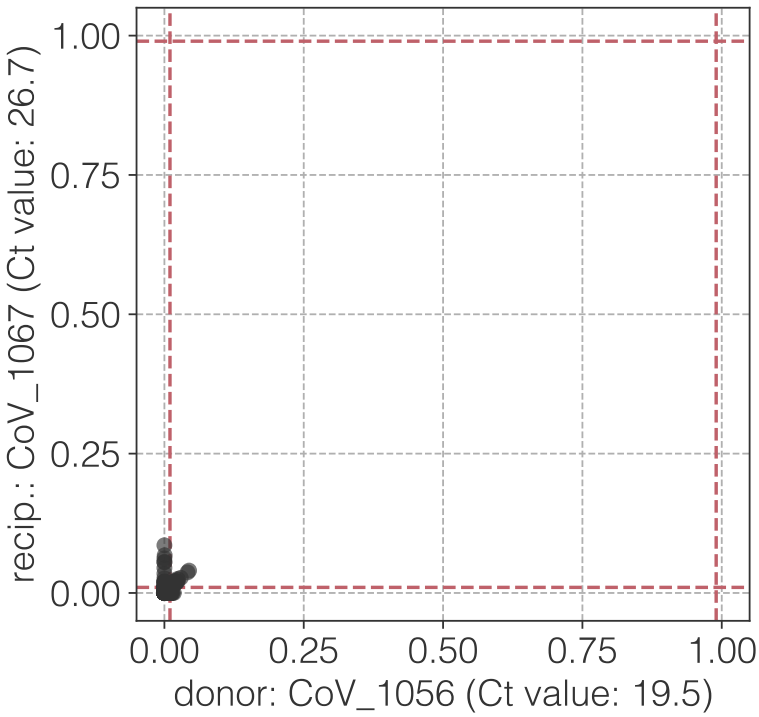
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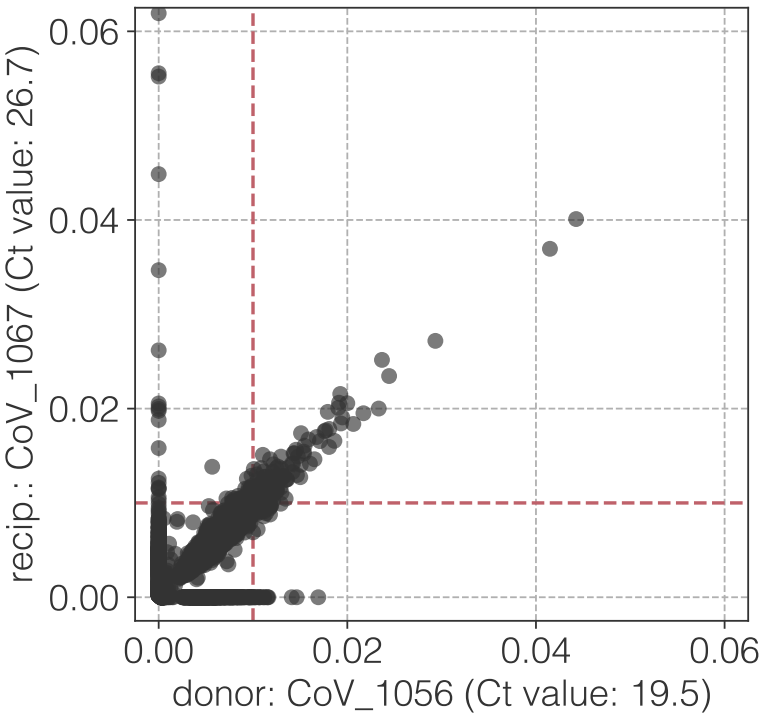
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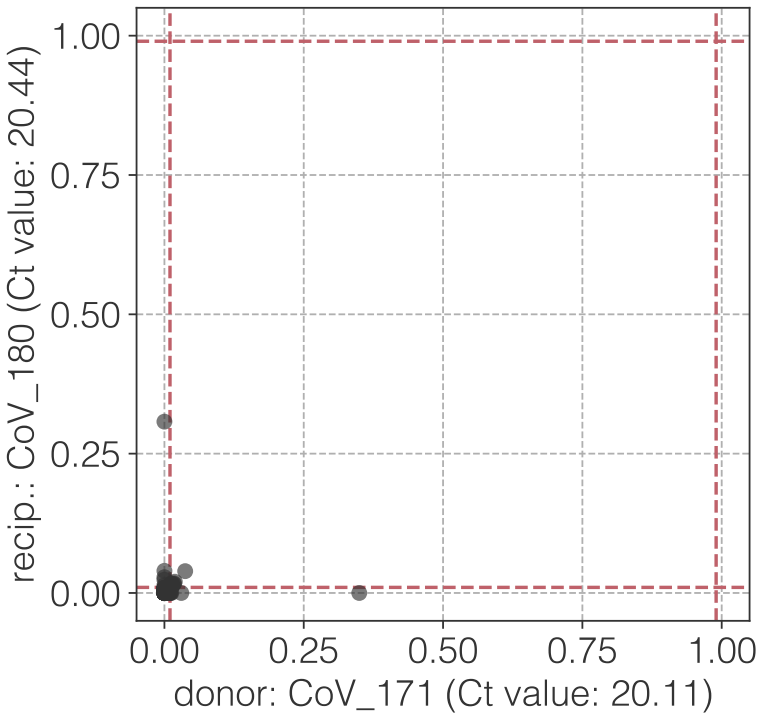
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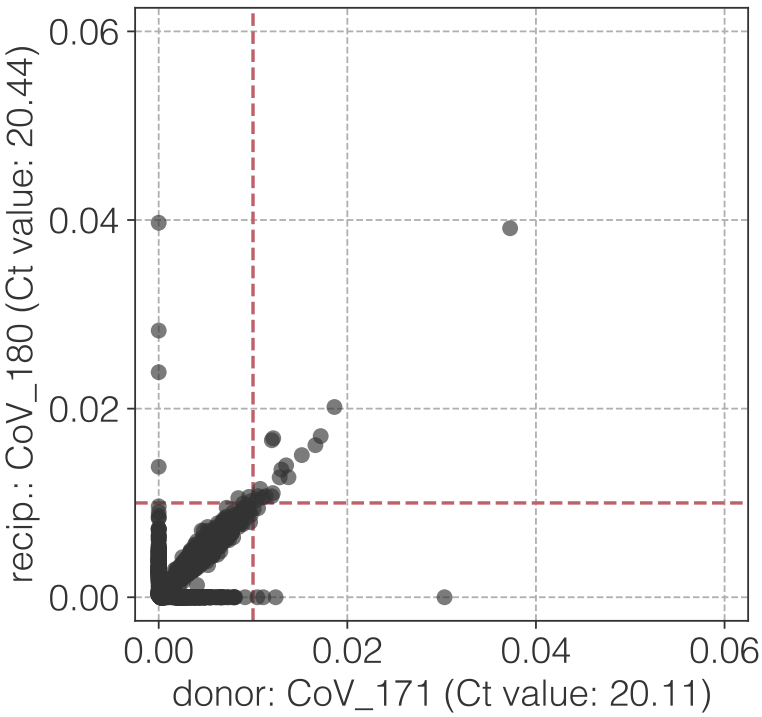
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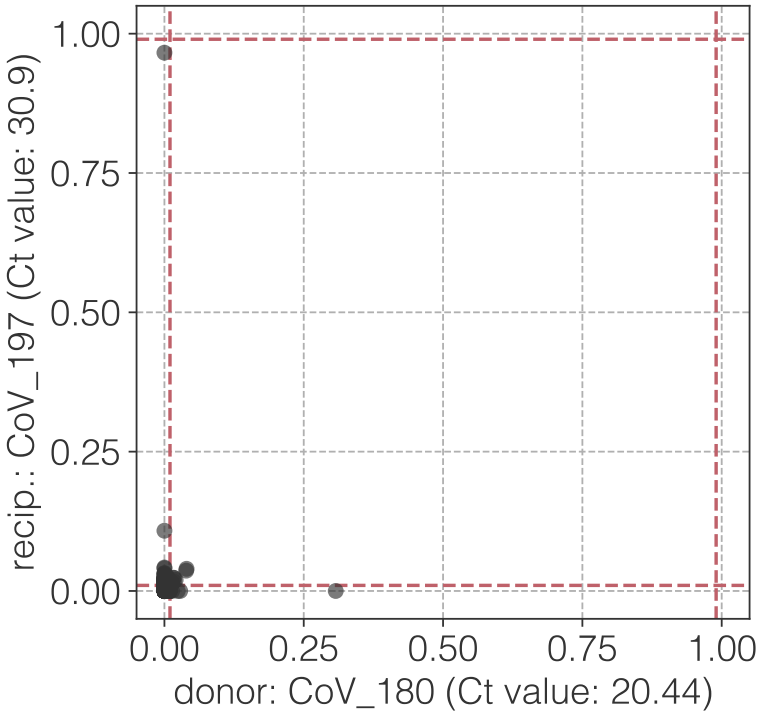
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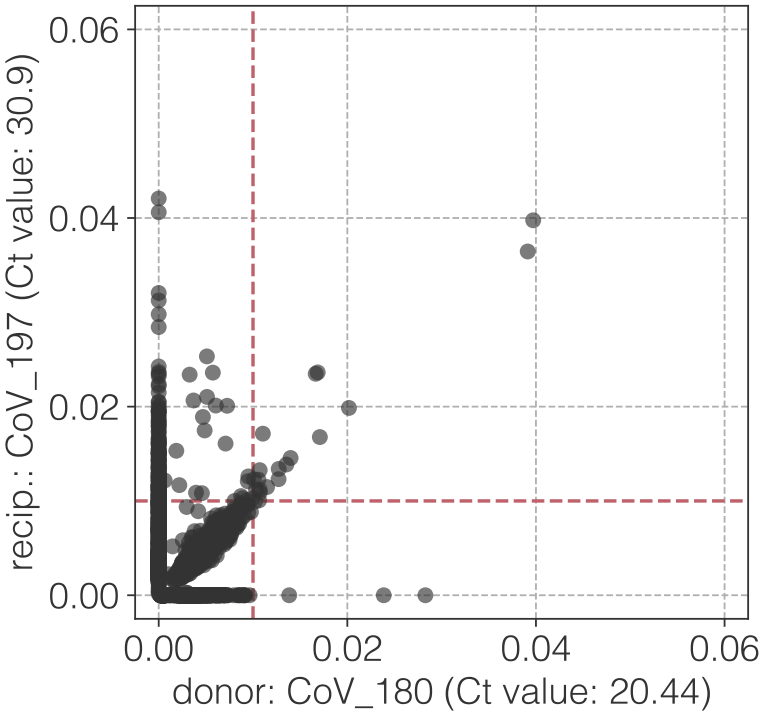
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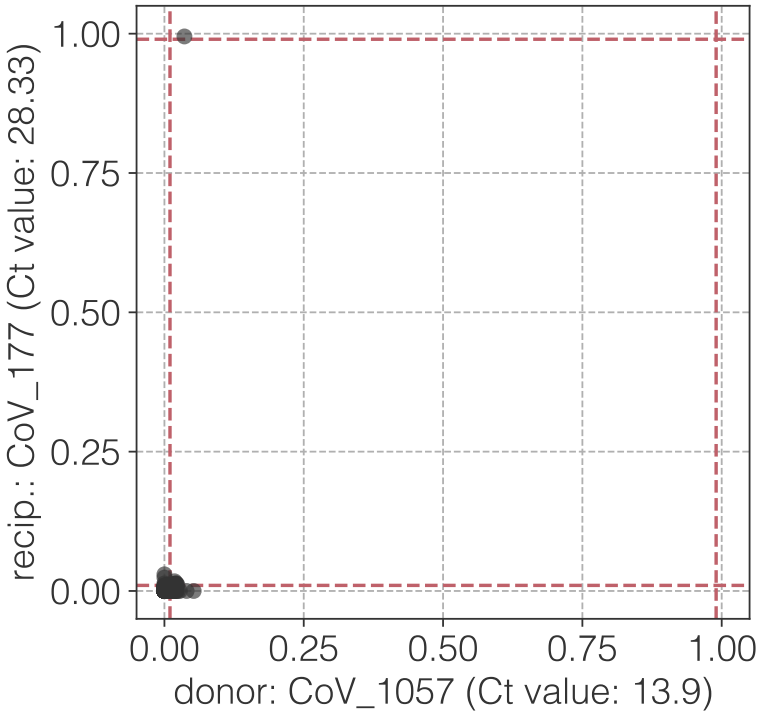
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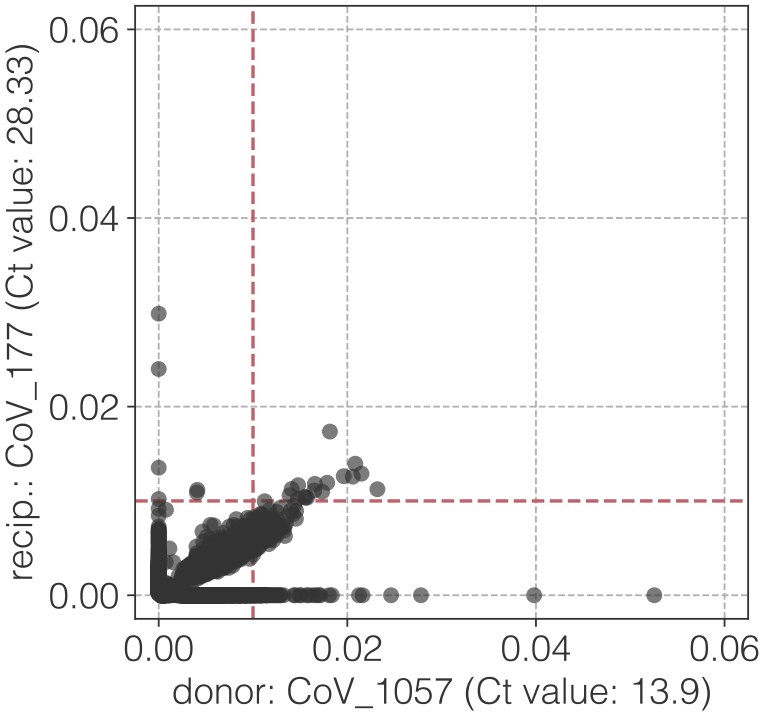
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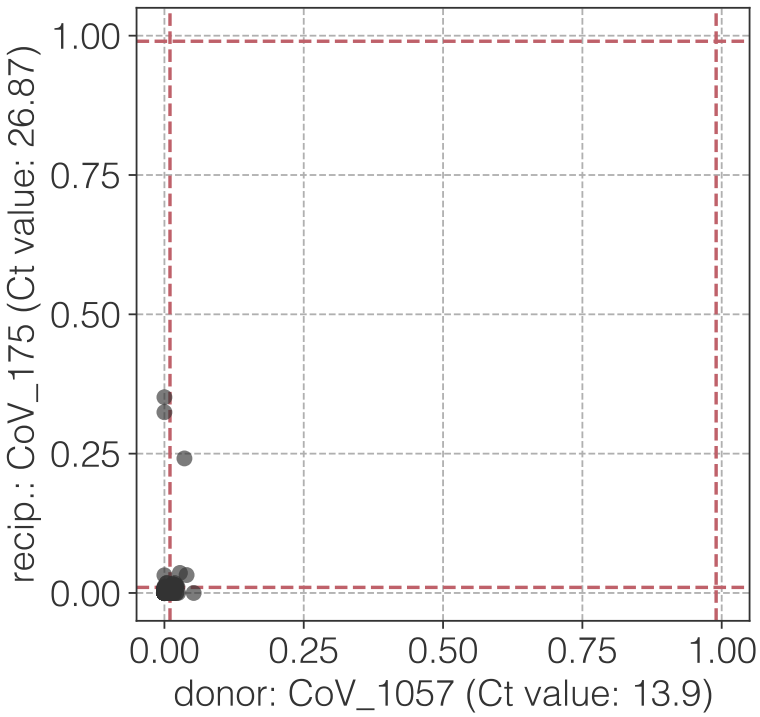
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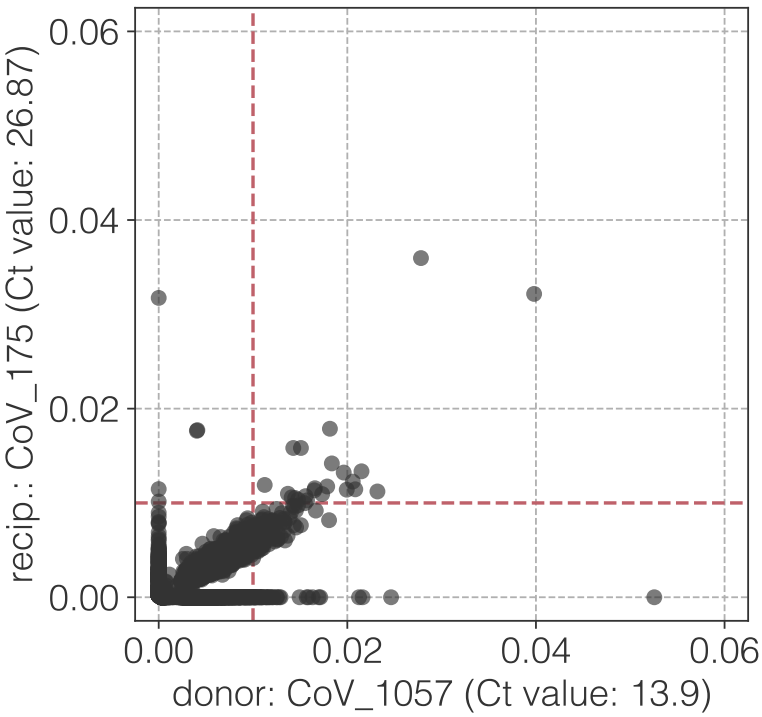
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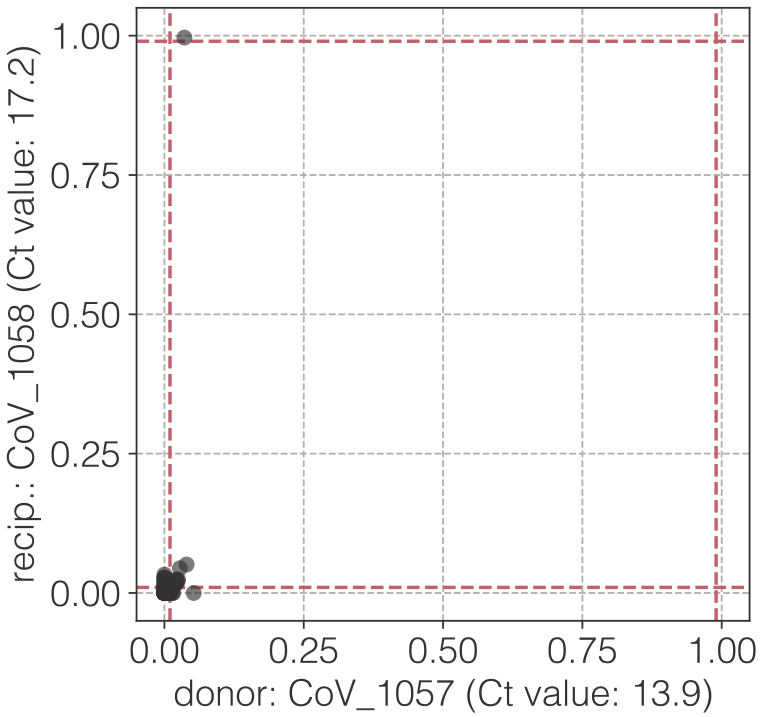
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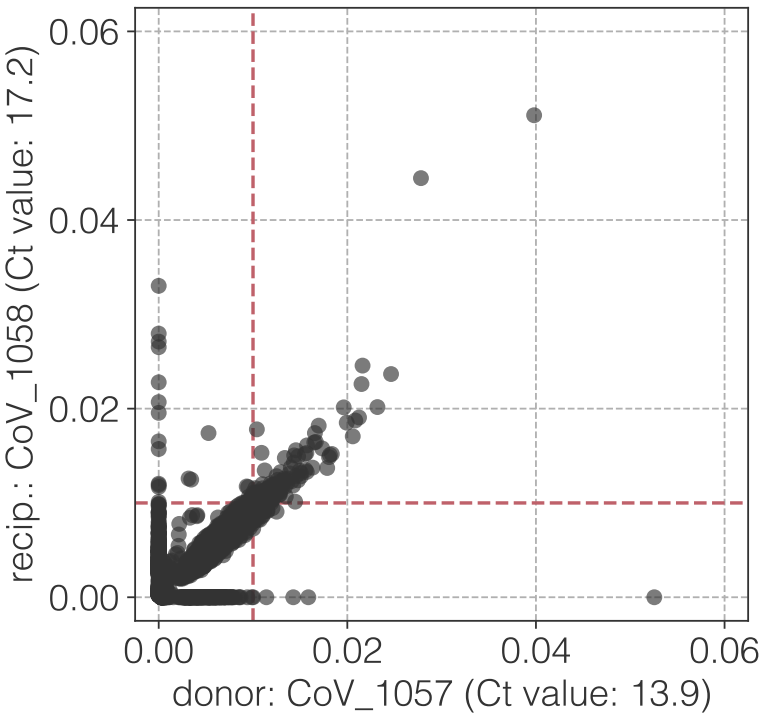
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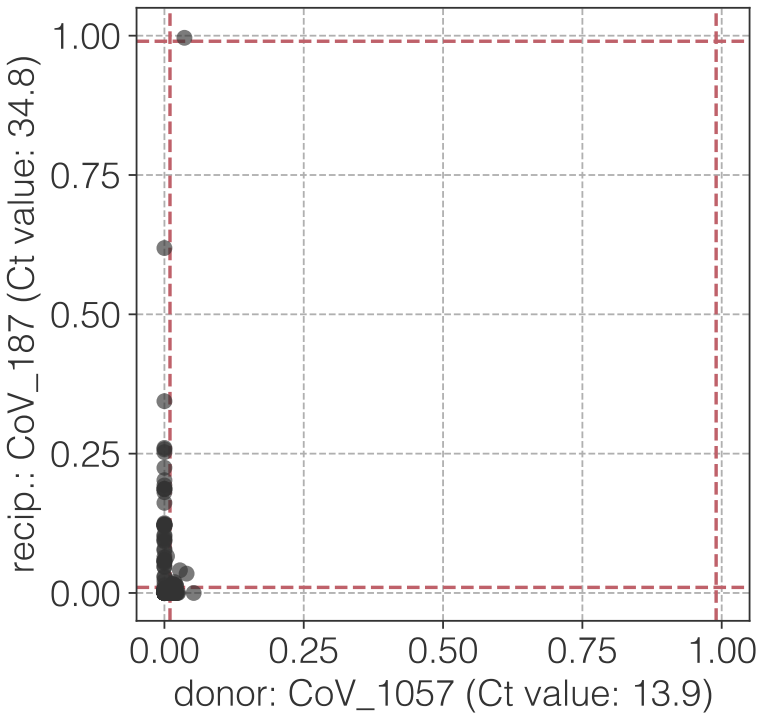
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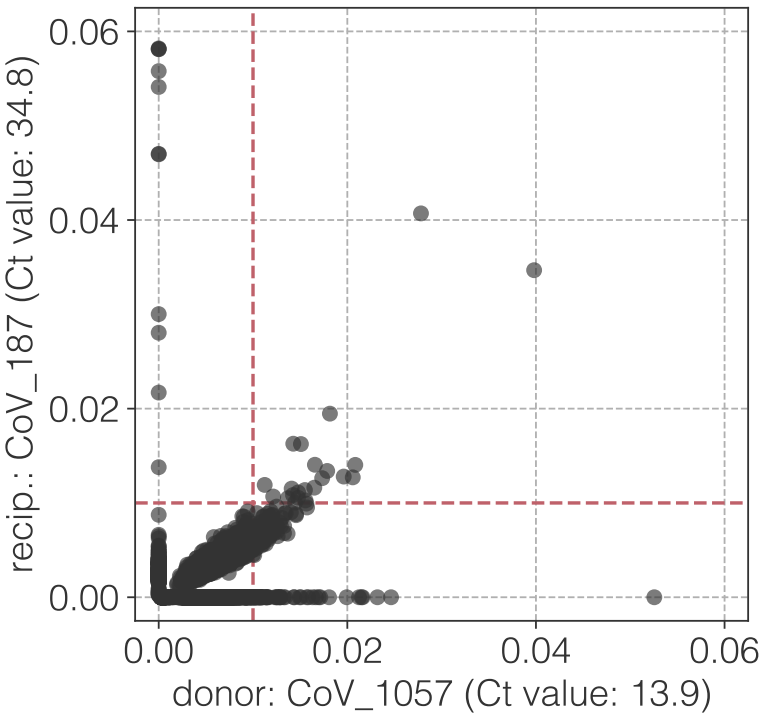
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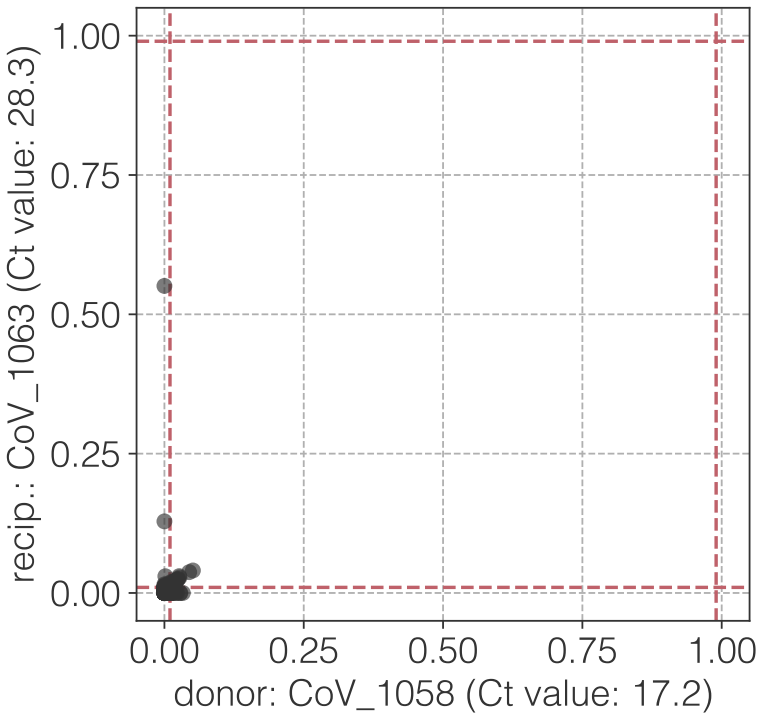
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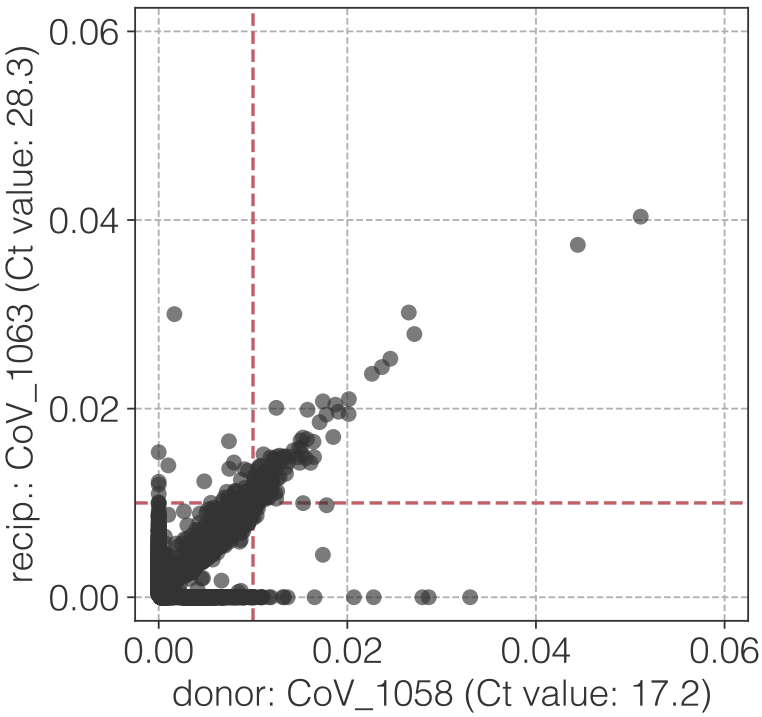
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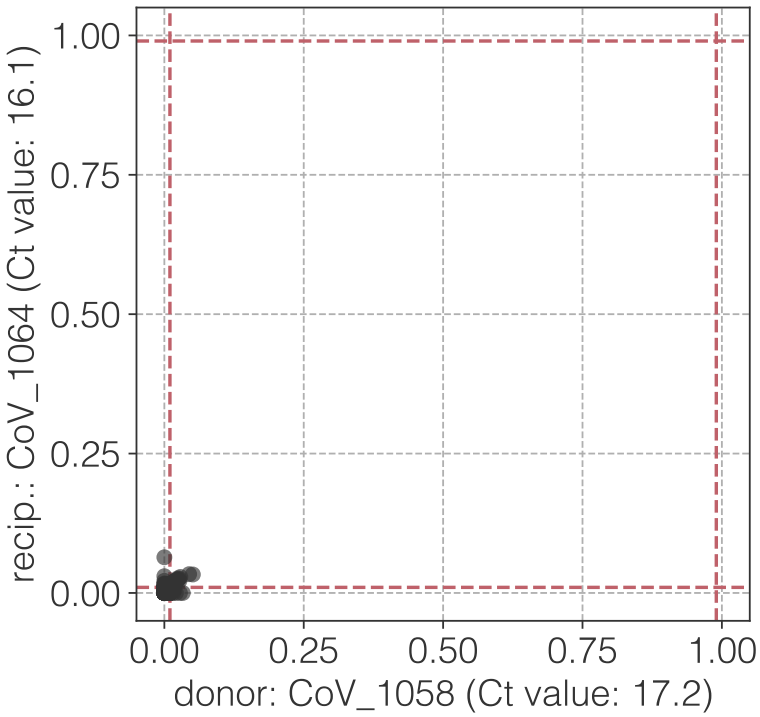
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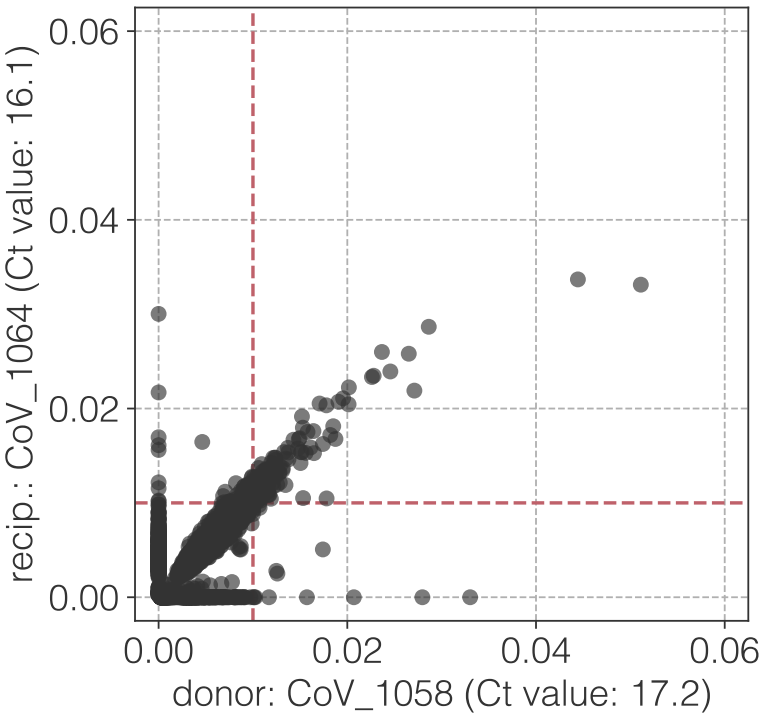
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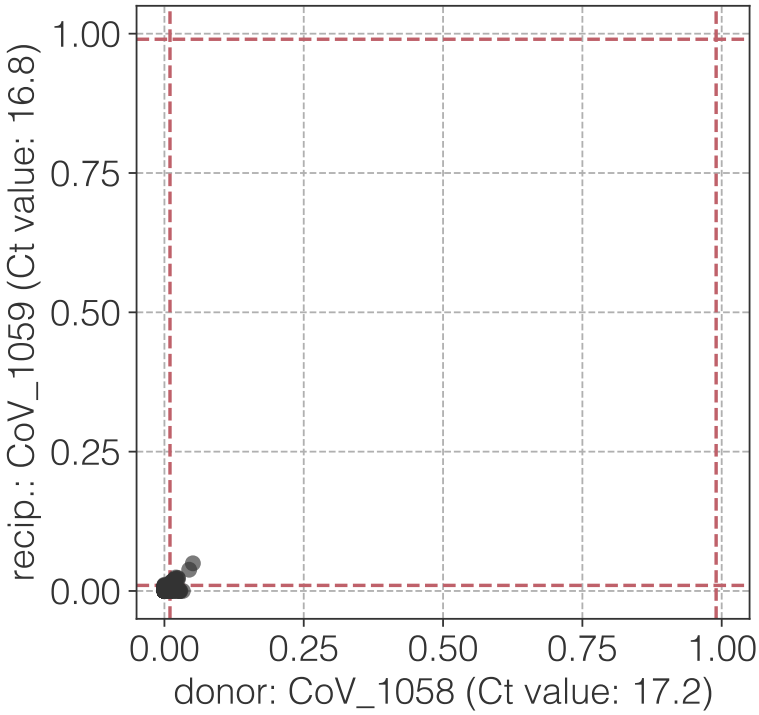
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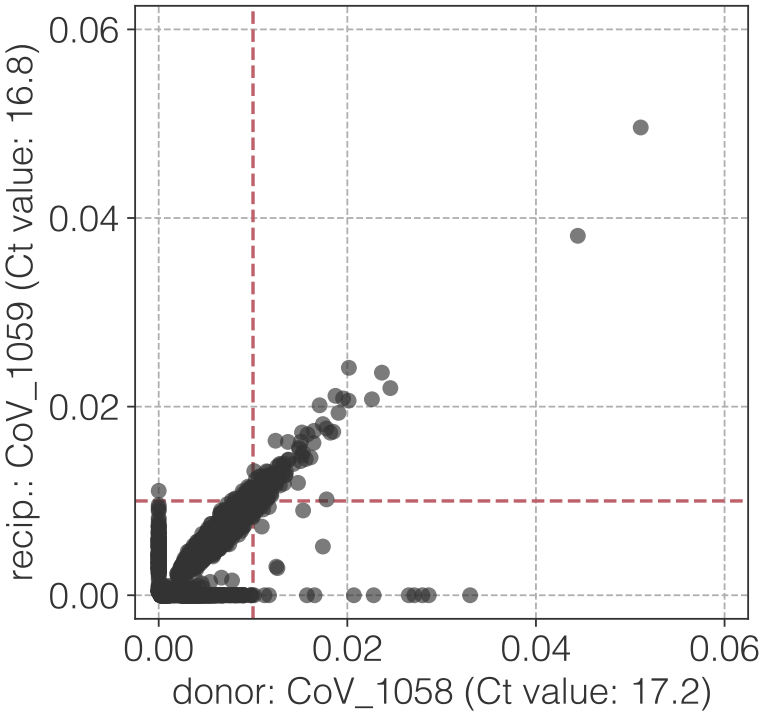
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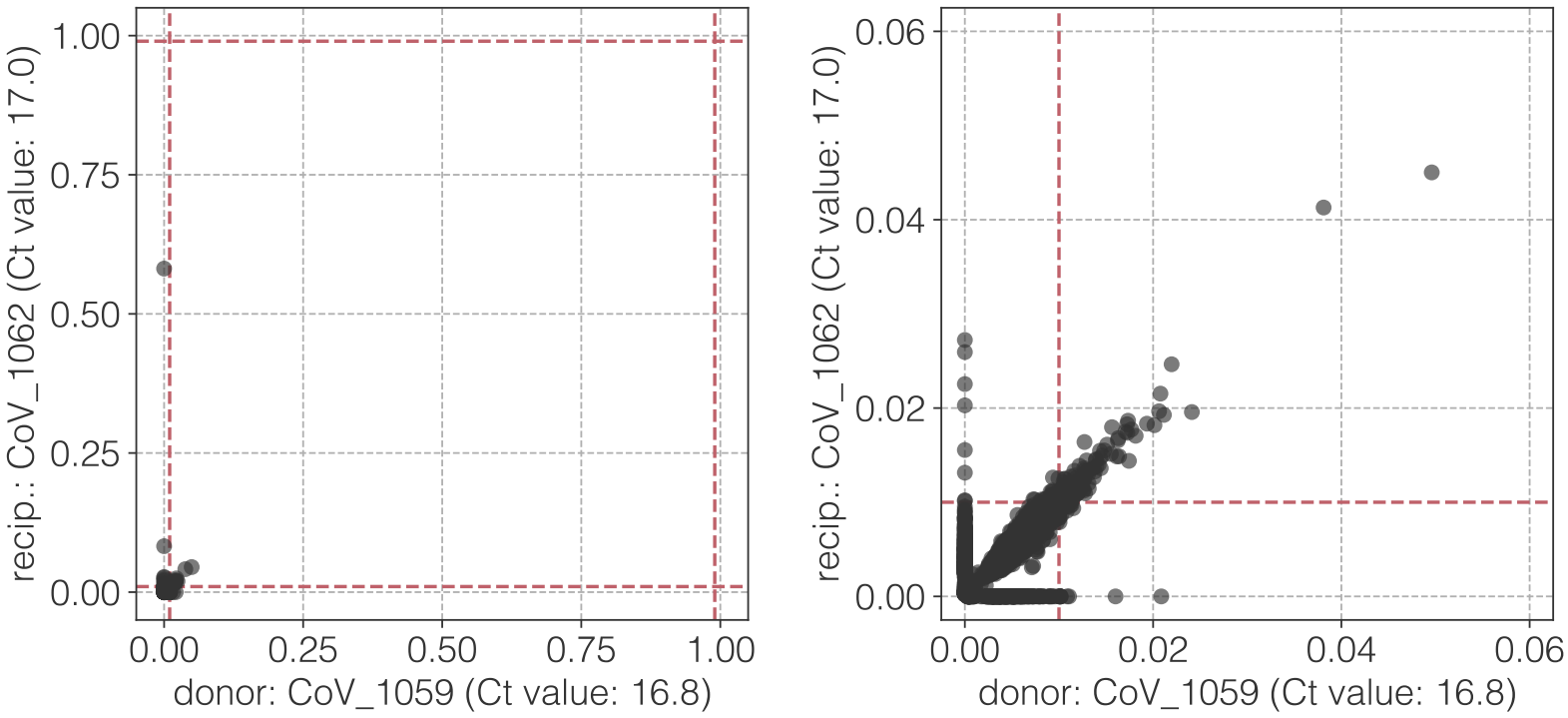
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0.25
0.50
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1.00
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recip.: CoV_1062 (Ct value: 17.0)
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0.00
0.02
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0.06
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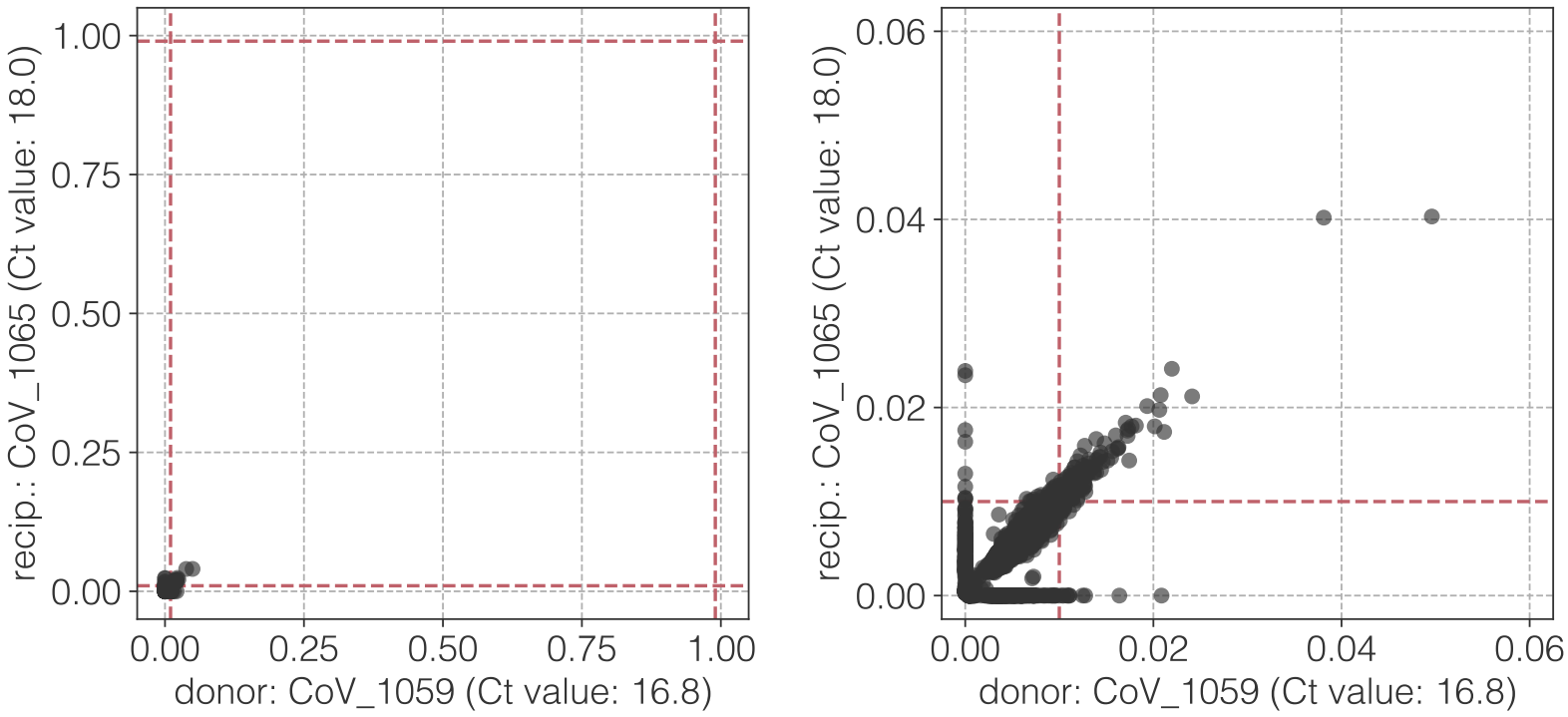
bb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0.25
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1.00
donor: CoV_1059 (Ct value: 16.8)
recip.: CoV_1065 (Ct value: 18.0)
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0.02
0.00
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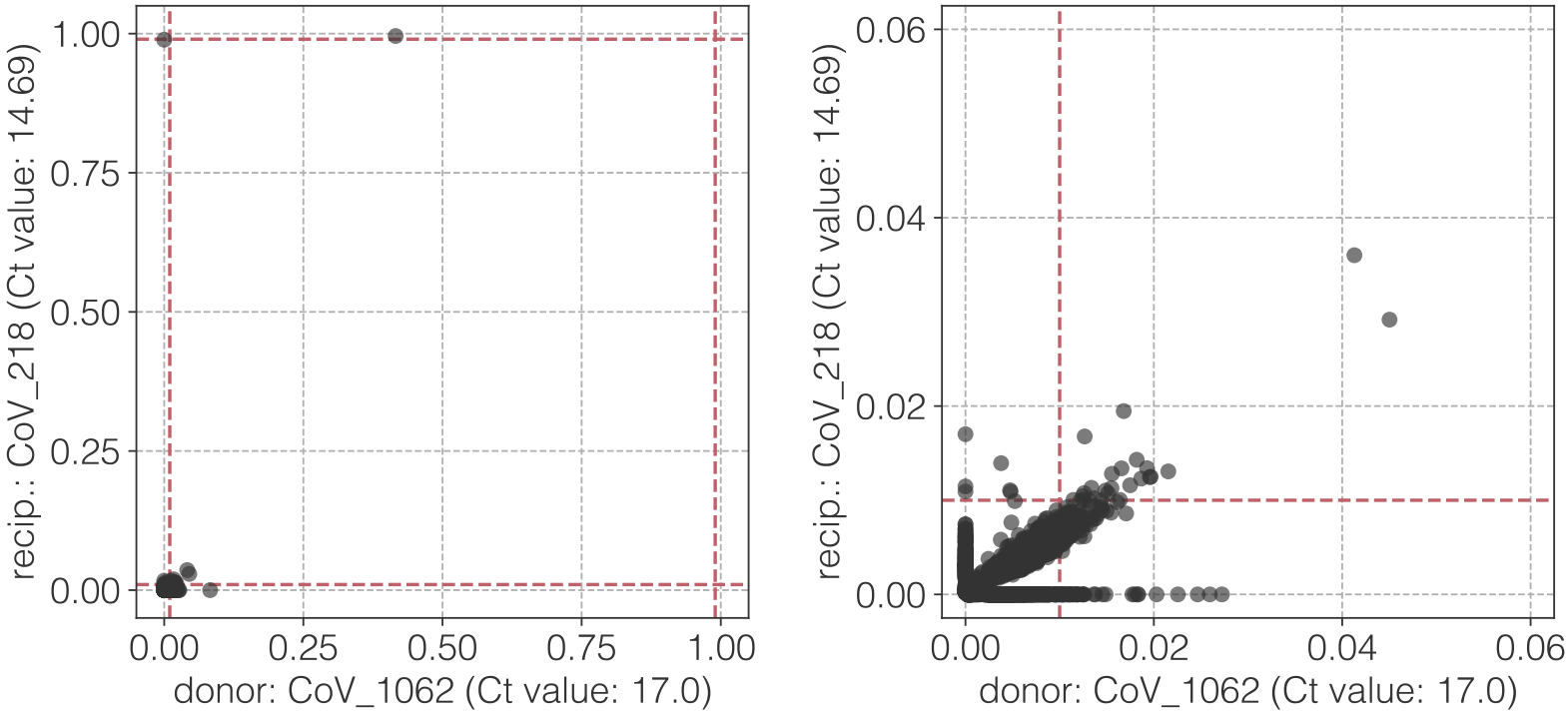
0.04
0.06
donor: CoV_1059 (Ct value: 16.8)

bc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0.06
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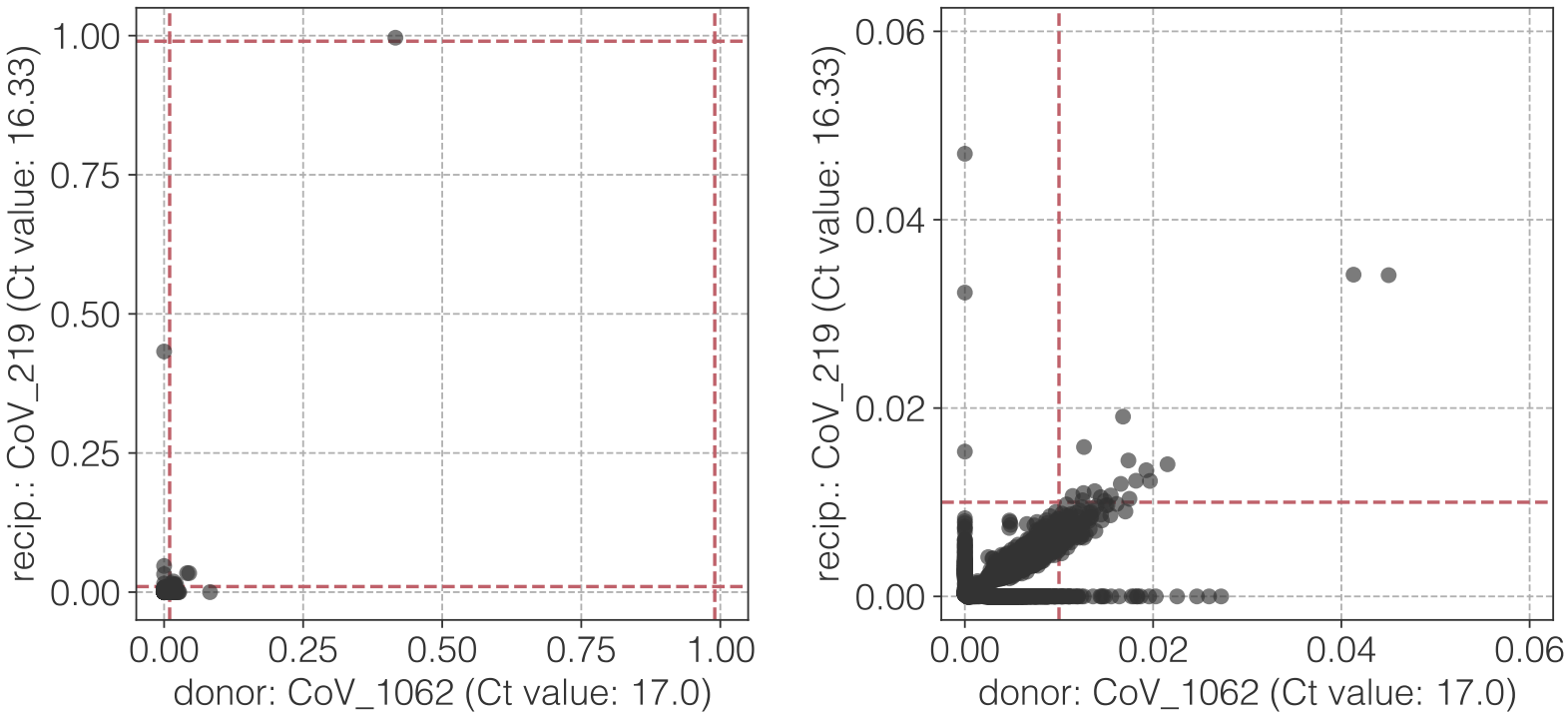
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0.06
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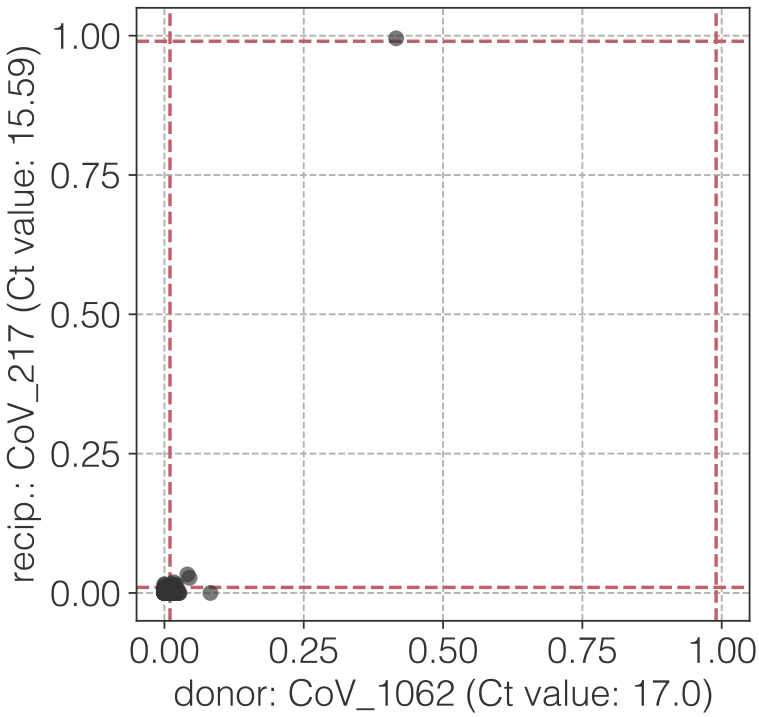
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1.00
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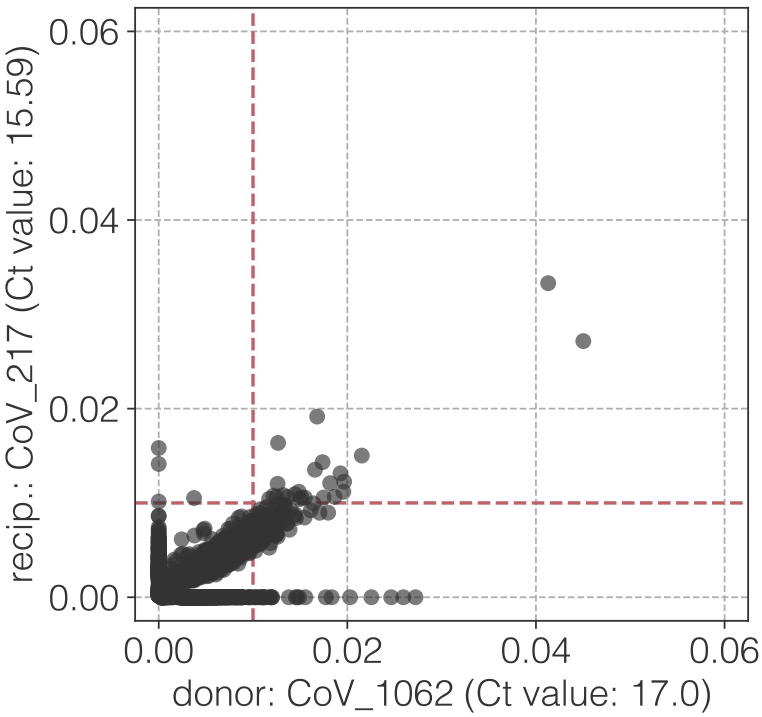
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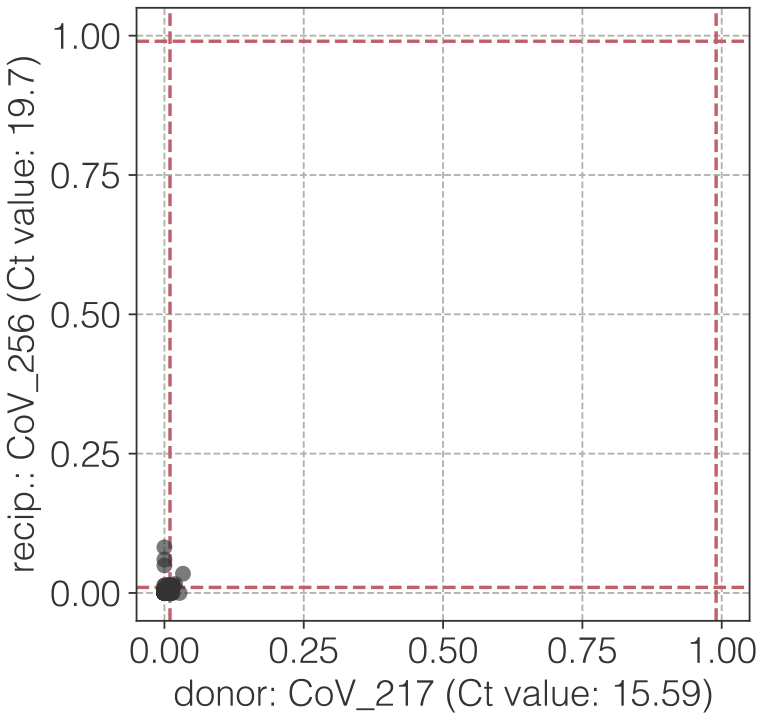
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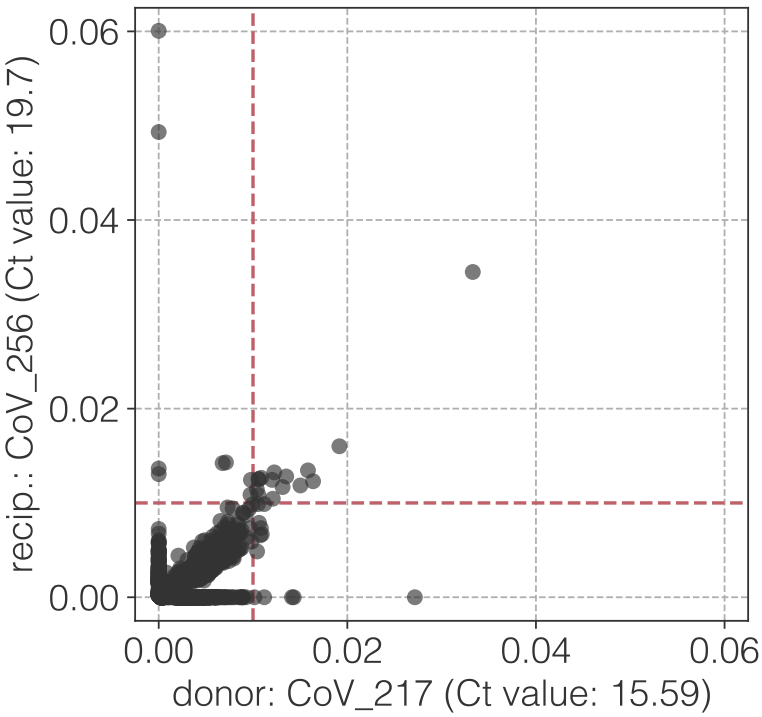
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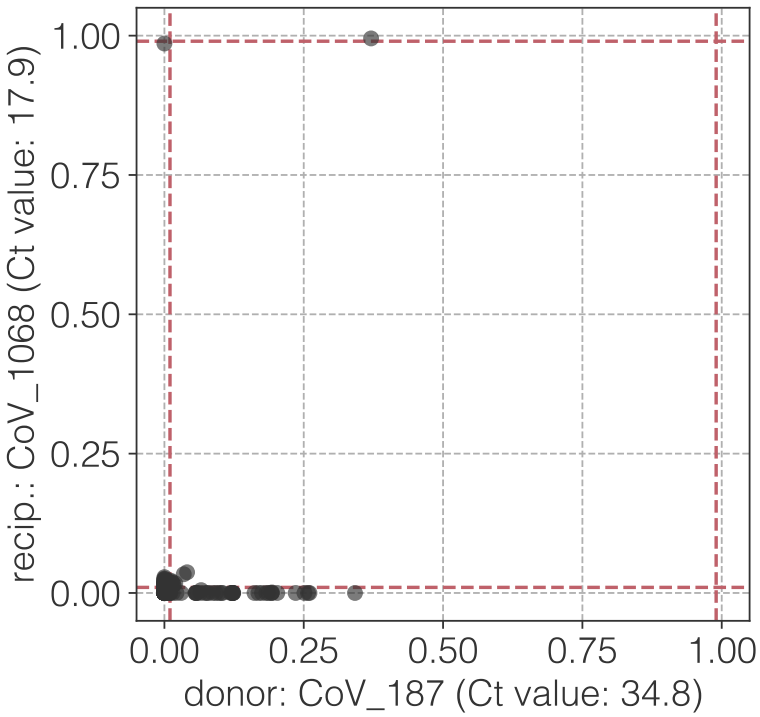
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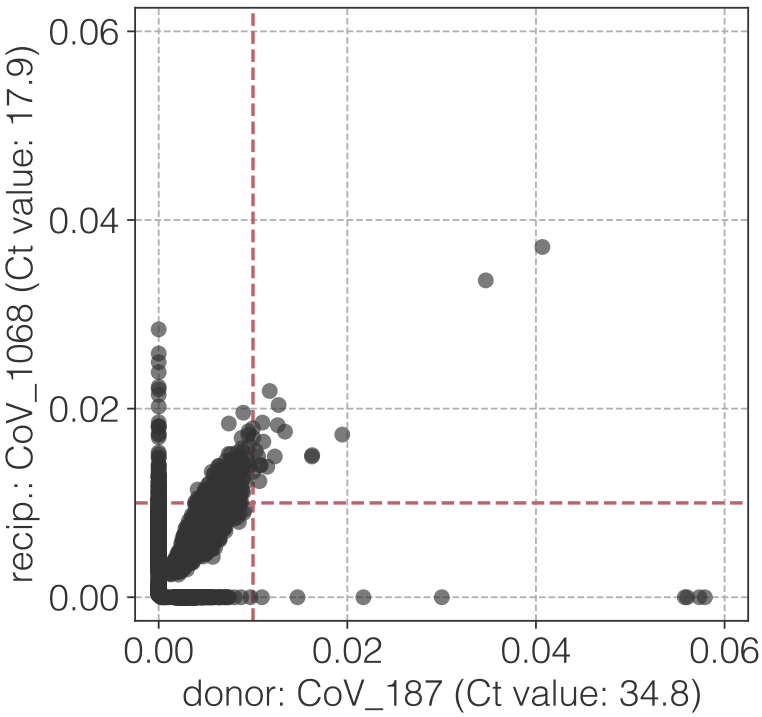
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0.06
donor: CoV_187 (Ct value: 34.8)

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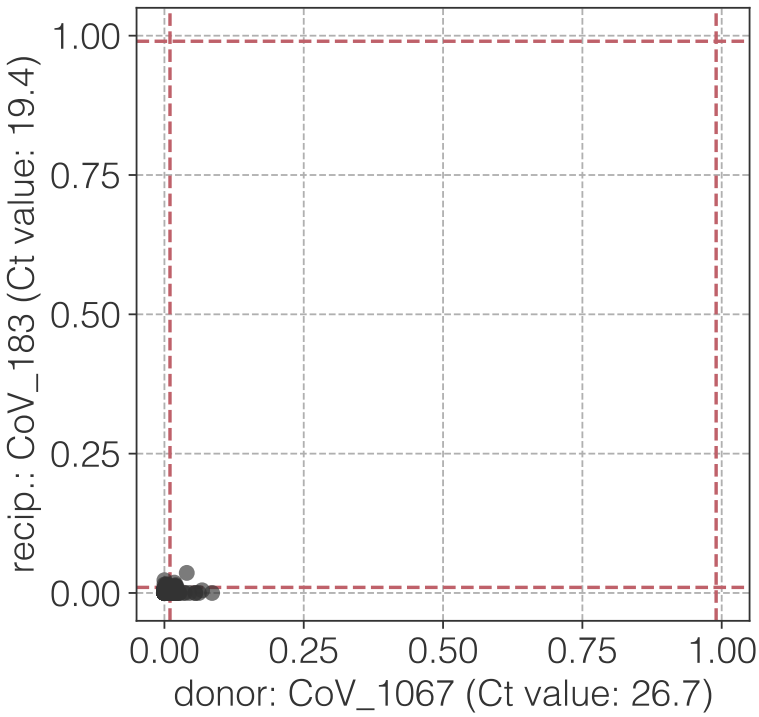
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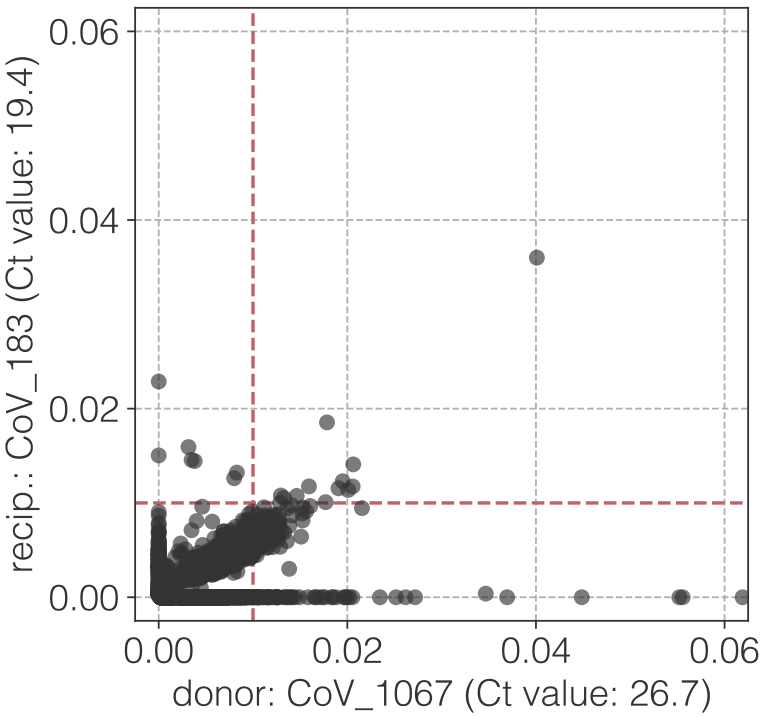
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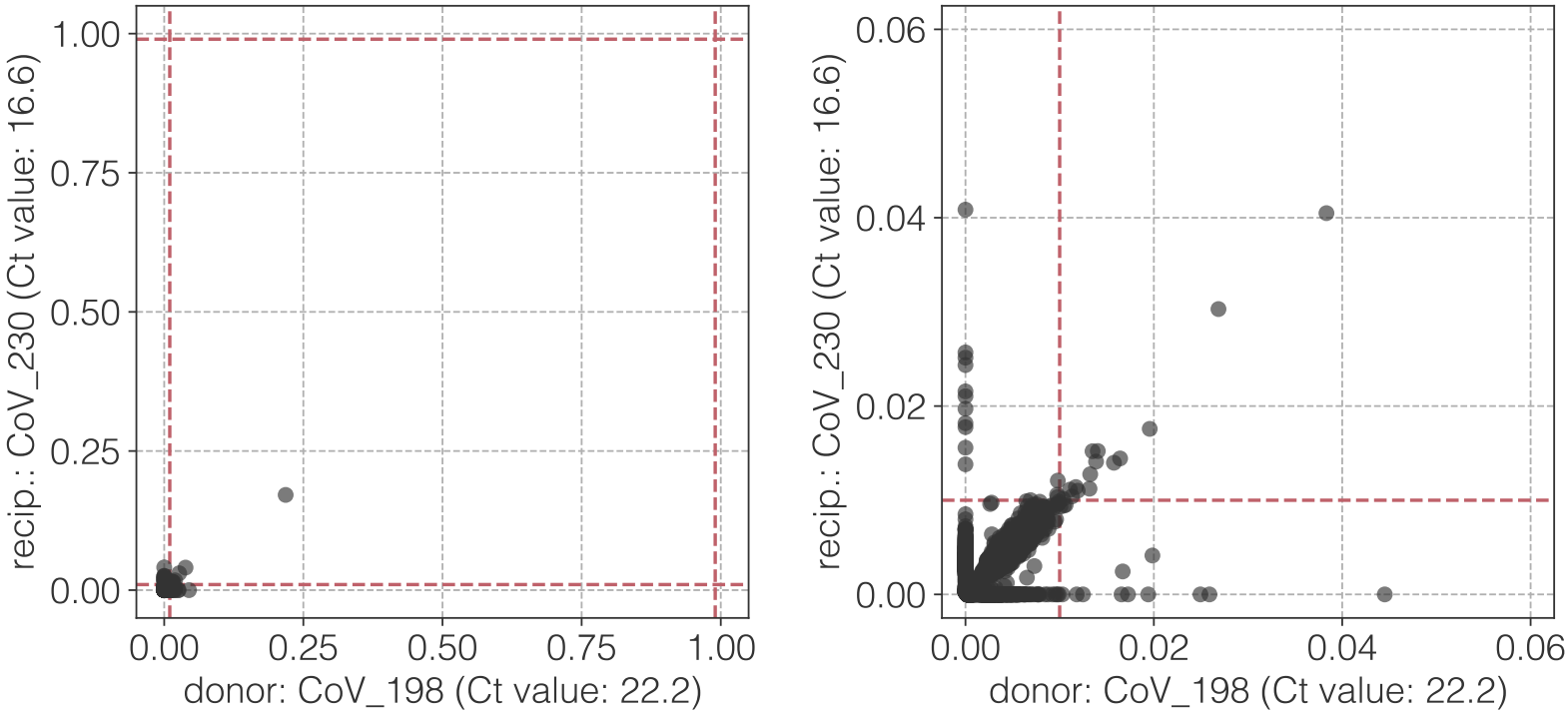
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1.00
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recip.: CoV_230 (Ct value: 16.6)
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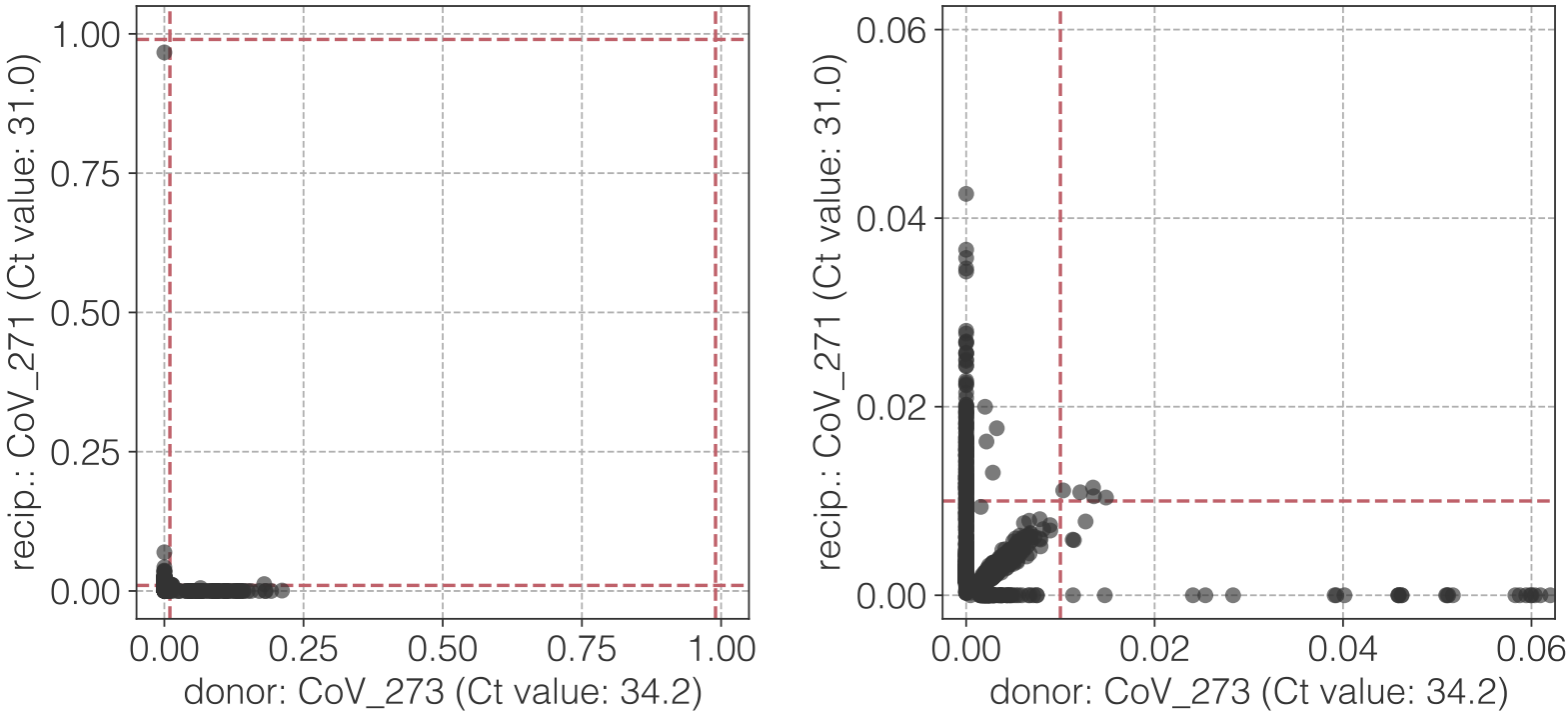
0.00
0.02
0.04
0.06
donor: CoV_198 (Ct value: 22.2)

bj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1.00
donor: CoV_273 (Ct value: 34.2)
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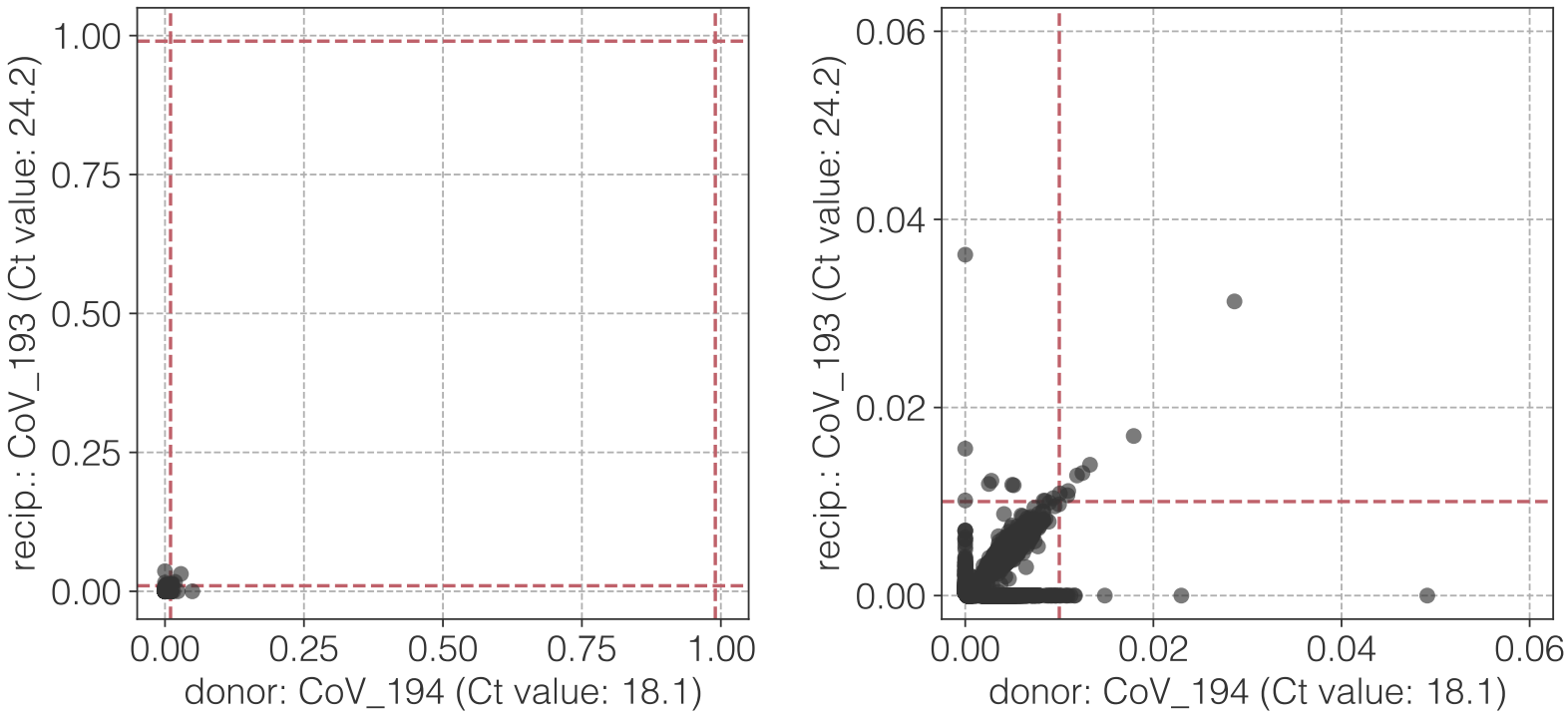
0.06
donor: CoV_273 (Ct value: 34.2)

bk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1.00
donor: CoV_194 (Ct value: 18.1)
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0.04
0.02
0.00
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donor: CoV_194 (Ct value: 18.1)

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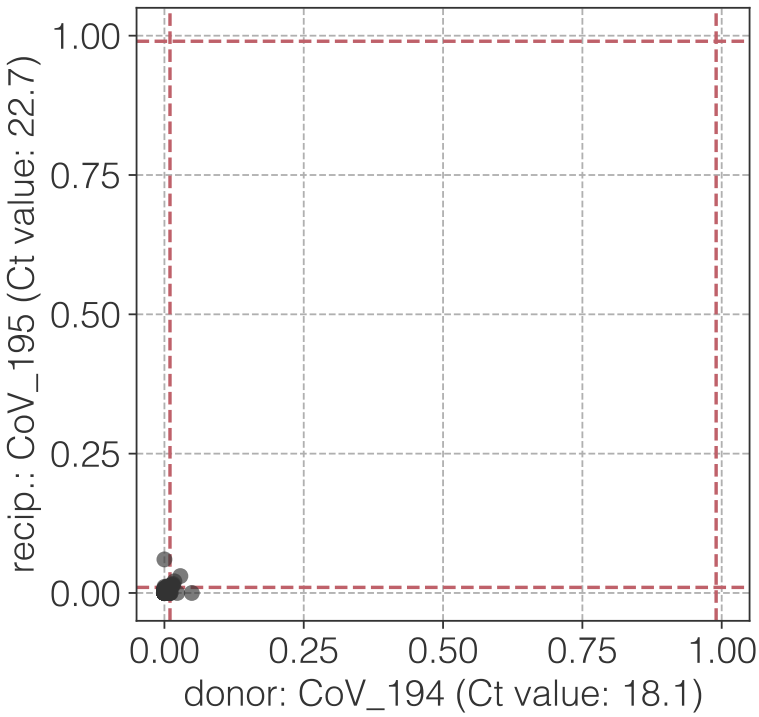
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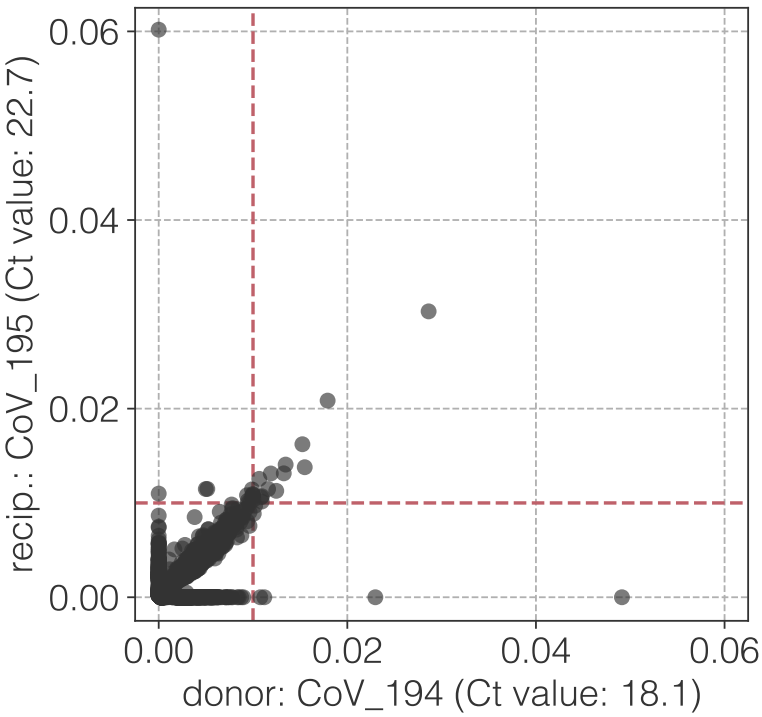
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0.06
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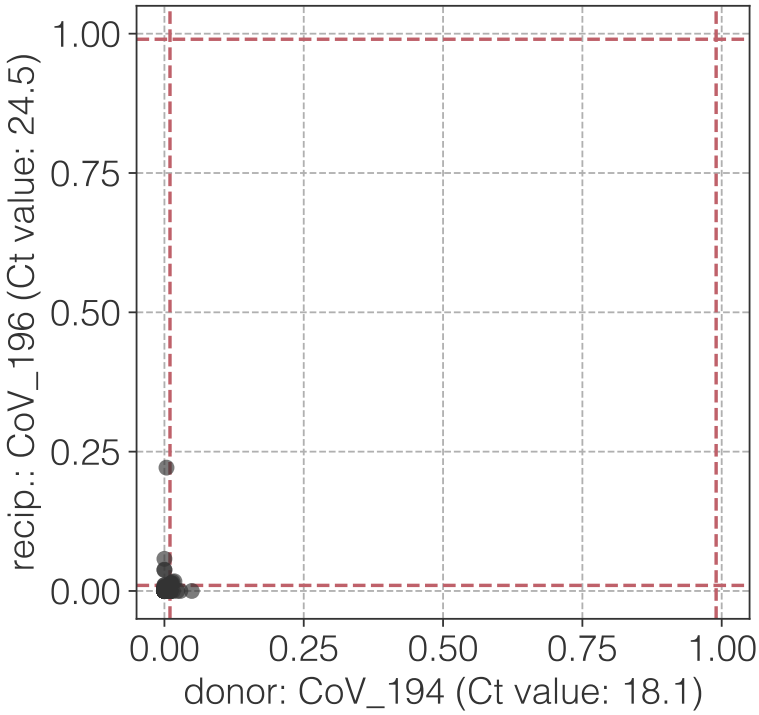
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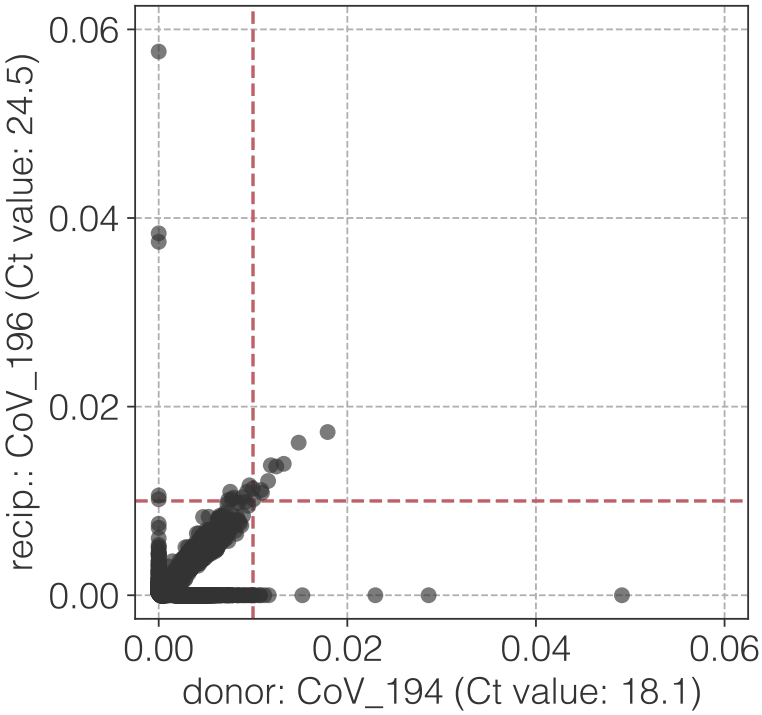
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0.04
0.06
donor: CoV_194 (Ct value: 18.1)

Figure S2. All iSNVs observed in either donor and/or recipient of all 39 epidemiologically confirmed transmission pairs. Donor iSNV frequency is shown on the x-axis and recipient iSNV frequency is shown on the y-axis. Low-frequency iSNVs are highlighted in the panels on the right. Red-dashed lines show the 1% variant calling threshold. iSNV frequencies are based on variant calling relative to donor-specific reference sequences. Cycle threshold (Ct) values associated with the donor and recipient samples are provided when available. Note that high Ct samples tend to have a large number of high-frequency iSNVs, while low Ct samples only have few, if any iSNVs that exceed 6%.

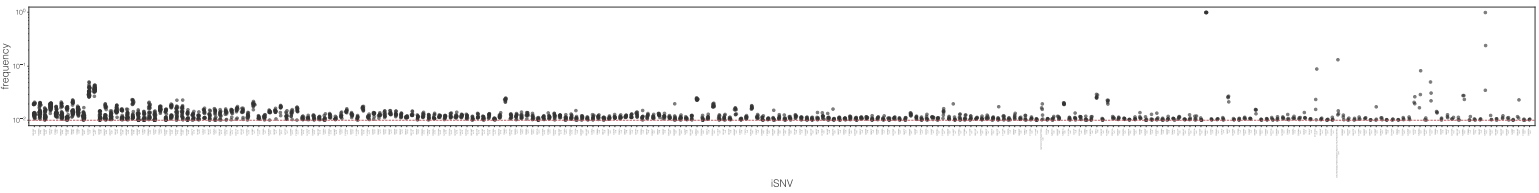
frequency
iSNV

Figure S3. Allele frequencies for all iSNVs observed in at least 3 of the 43 samples involved in the 39 transmission pairs. iSNVs are ordered by the number of samples they are found in. Each dot shows the allele frequency of that iSNV in a given sample. Red dashed line shows the 1% variant calling threshold. Allele frequencies are based on variant calling relative to Wuhan/Hu-1.

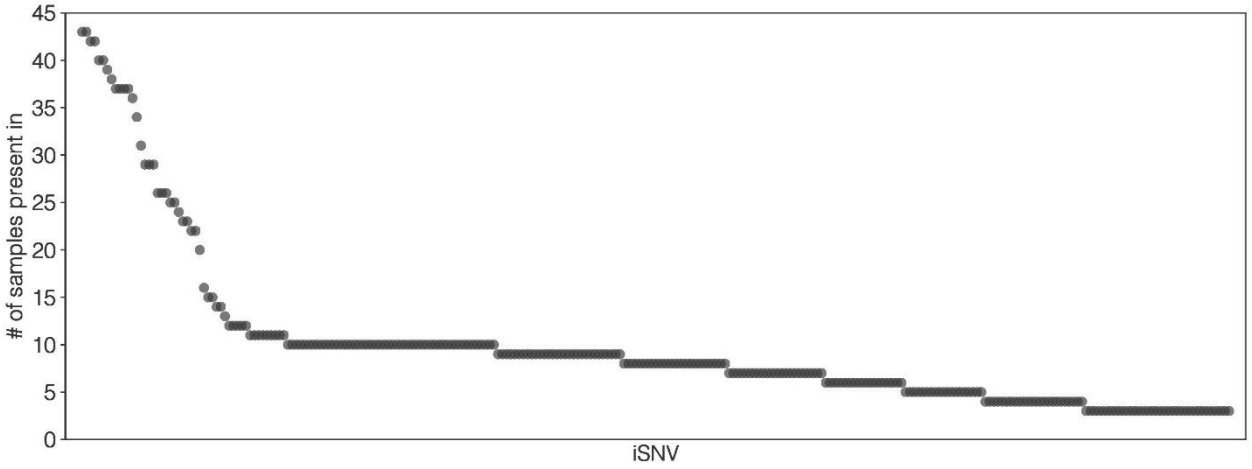

Figure S4. Number of occurrences for all iSNVs observed in at least 3 of the 43 samples involved in the 39 transmission pairs. Each dot shows a unique iSNV. iSNVs are ordered by decreasing number of occurrences.

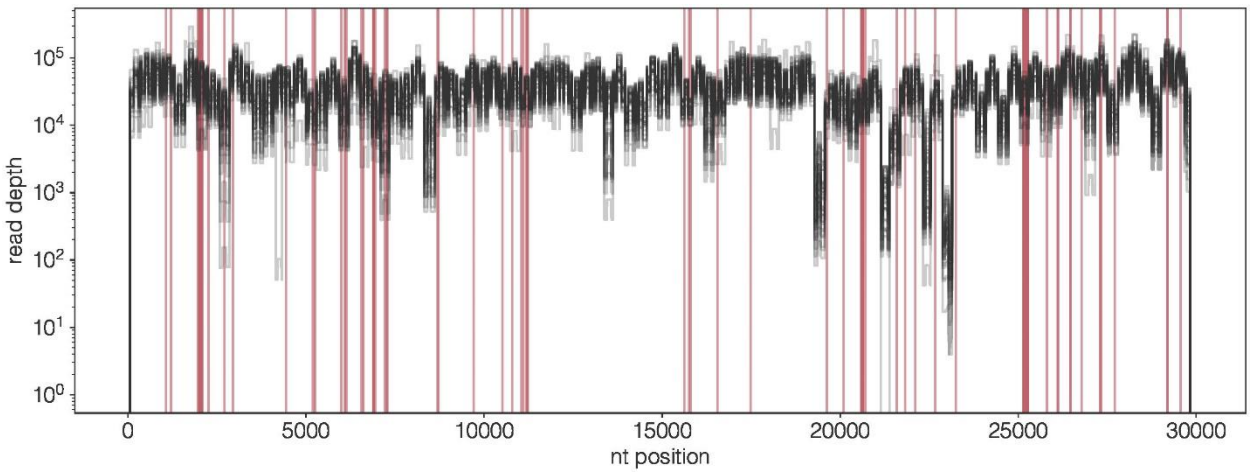

Figure S5. Read depth across the SARS-CoV-2 genome (Wuhan/Hu-1) for each of the 43 samples involved in the 39 transmission pairs calculated after adjusting for overlapping reads and trimming amplicon primers from the publicly available BAM files (black lines). Vertical red lines indicate the position in the genome of each iSNV (read frequency 1-99%) observed in at least 10 of the 43 samples.

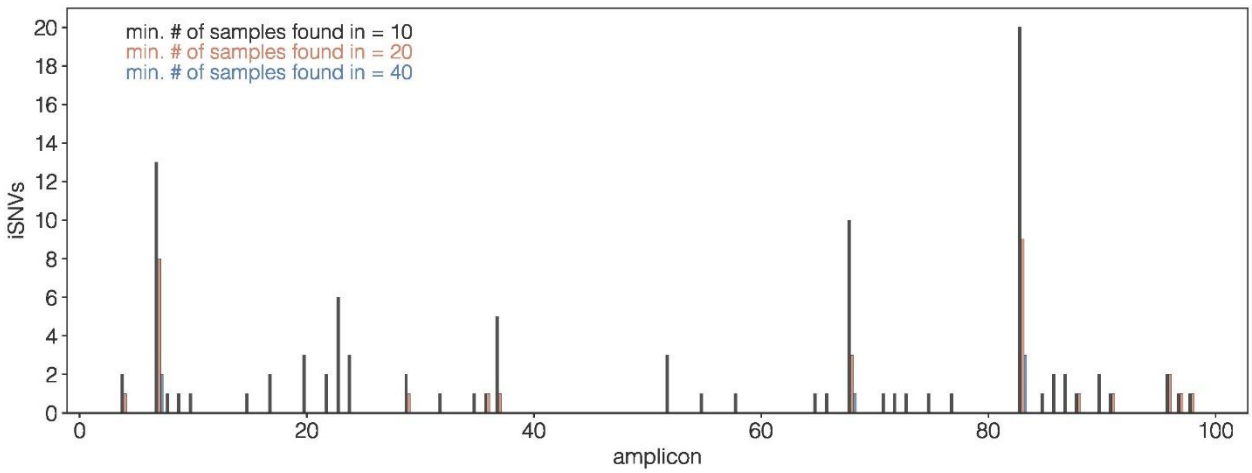

Figure S6. Number of iSNVs (read frequency 1-99%) per amplicon that were observed in at least 10 (black), at least 20 (red), or at least 40 (blue) of the 43 samples involved in the 39 transmission pairs. Amplicon assignments were based on the genome region between the end of the positive strand amplicon and the beginning of the negative strand amplicon. Variants falling in a genome region assigned to multiple amplicons were counted in both.

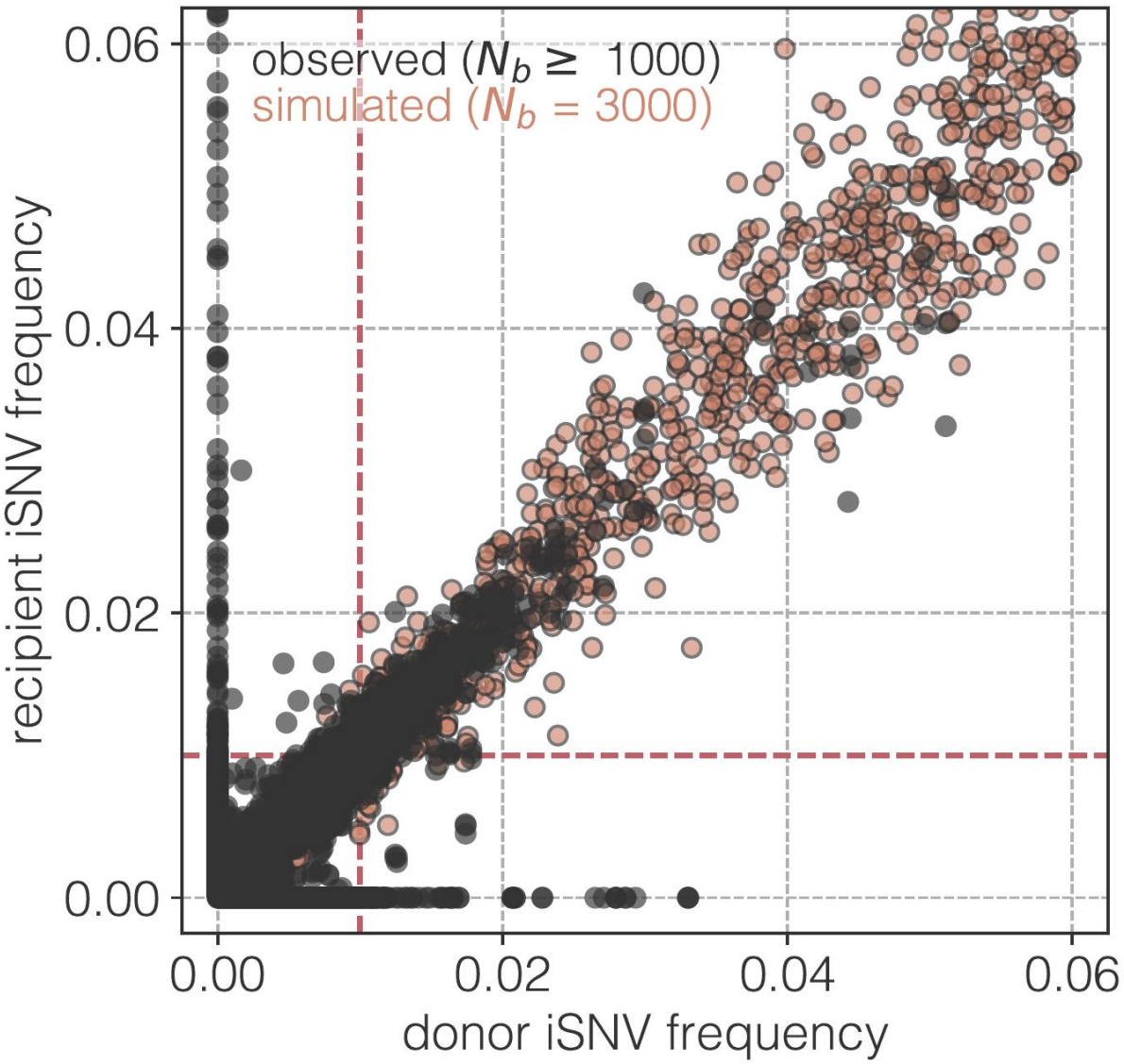

Figure S7. Patterns of shared viral genetic diversity between transmission pairs under the assumption of a large bottleneck of $N_b = 3000$ (red dots). As in Figure 1F, black dots show all iSNVs observed in either the donor and/or recipient for all transmission pairs with an estimated bottleneck size of ≥1000 at a variant calling threshold of 1%.

donor	recipient	1%BottleneckSize_mle	1%BottleneckSize_lower95	1%BottleneckSize_upper95	3%BottleneckSize_mle	3%BottleneckSize_lower95	3%BottleneckSize_upper95	6%BottleneckSize_mle	6%BottleneckSize_lower95	6%BottleneckSize_upper95
3	143	98	61	157	1	1	13	1	1	29
3	146	89	54	144	1	1	13	1	1	29
146	147	1147	390	2605	NaN	NaN	NaN	NaN	NaN	NaN
146	150	5457	2619	9864	NaN	NaN	NaN	NaN	NaN	NaN
146	157	3988	1856	7358	NaN	NaN	NaN	NaN	NaN	NaN
146	159	10000	6765	10000	NaN	NaN	NaN	NaN	NaN	NaN
146	172	3268	1438	6250	NaN	NaN	NaN	NaN	NaN	NaN
146	1056	835	403	1519	NaN	NaN	NaN	NaN	NaN	NaN
150	162	85	50	143	26	7	83	1	1	37
159	168	374	206	628	126	14	706	NaN	NaN	NaN
159	169	345	185	593	127	14	715	NaN	NaN	NaN
162	161	213	117	366	50	11	206	1	1	181
171	180	55	37	79	6	2	18	1	1	8
180	197	62	42	91	12	4	31	1	1	9
187	1068	7	6	9	2	2	2	1	1	1
194	193	158	61	385	1	1	287	NaN	NaN	NaN
194	195	351	160	681	1	1	287	NaN	NaN	NaN
194	196	153	66	341	1	1	287	NaN	NaN	NaN
198	230	200	97	384	156	13	760	143	4	951
217	256	931	388	1864	10000	186	10000	NaN	NaN	NaN
273	271	2	2	3	1	1	1	1	1	1
1056	166	24	17	34	2228	137	9773	NaN	NaN	NaN
1056	171	19	13	27	222	7	2076	NaN	NaN	NaN
1056	176	33	24	48	2897	175	9999	NaN	NaN	NaN
1056	1057	6304	5021	7792	185	7	1790	NaN	NaN	NaN
1056	1067	9109	7158	9999	4105	244	9999	NaN	NaN	NaN
1057	175	23	17	32	15	5	45	NaN	NaN	NaN
1057	177	7	6	9	1	1	1	NaN	NaN	NaN
1057	187	9	7	12	2	2	3	NaN	NaN	NaN
1057	1058	54	48	62	2	2	3	NaN	NaN	NaN
1058	1059	1681	1305	2125	2370	115	9999	NaN	NaN	NaN
1058	1063	1978	1538	2497	818	47	3830	NaN	NaN	NaN
1058	1064	2994	2372	3719	317	25	1447	NaN	NaN	NaN
1059	1062	10000	8600	10000	5483	322	9999	NaN	NaN	NaN
1059	1065	10000	7892	10000	1885	117	8267	NaN	NaN	NaN
1062	217	19	14	25	3	2	8	1	1	3
1062	218	18	14	25	3	2	8	1	1	3
1062	219	14	10	19	5	2	12	1	1	3
1067	183	10	7	15	6	2	25	1	1	42

Data file S1. CSV file providing transmission bottleneck size estimates for each of the 39 transmission pairs analyzed by Popa *et al*. Transmission bottleneck size estimates are provided using a 1% variant calling threshold, a 3% variant calling threshold, and a 6% variant calling threshold. At each threshold, the maximum likelihood estimate for N_b is provided, along with the lower and upper bounds of the 95% confidence interval.

Chapter 5

Full genome viral sequences inform patterns of SARS-CoV-2 spread into and within Israel

The following *Article*, published in *Nature Communications* in November 2020 was written in collaboration with Dr. Adi Stern at Tel Aviv University. Our goal was to leverage consensus sequence data to better understand the spread of SARS-CoV-2 into and within Israel. Primarily, our role in the project was to conduct the phylodynamic analyses used to infer the epidemiological parameters of SARS-CoV-2 in Israel in early 2020. Particularly, we highlighted the association between the implementation of non-pharmaceutical interventions and a decrease in the reproductive number in the region. Additionally, we showed that the epidemiological dynamics were dominated by superspreading, such at <10% of infected individuals were responsible for 80% of observed transmissions.

5.1 M.A.M. Contributions

Conceptualization, Validation, Formal analysis (**Figure 4-6**, **Figure S4-S7, S9-11**, **Table S3-S12**), Investigation (**Figure 4-6**, **Figure S4-S7, S9-11**, **Table S3-S12**), Writing -

Original Draft, Writing - Review & Editing, Visualization (**Figure 4-6**, **Figure S4-S7, S9-11**).

5.2 Published Manuscript

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Full genome viral sequences inform patterns of SARS-CoV-2 spread into and within Israel

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Full genome sequences are increasingly used to track the geographic spread and transmission dynamics of viral pathogens. Here, with a focus on Israel, we sequence 212 SARS-CoV-2 sequences and use them to perform a comprehensive analysis to trace the origins and spread of the virus. We find that travelers returning from the United States of America significantly contributed to viral spread in Israel, more than their proportion in incoming infected travelers. Using phylodynamic analysis, we estimate that the basic reproduction number of the virus was initially around 2.5, dropping by more than two-thirds following the implementation of social distancing measures. We further report high levels of transmission heterogeneity in SARS-CoV-2 spread, with between 2-10% of infected individuals resulting in 80% of secondary infections. Overall, our findings demonstrate the effectiveness of social distancing measures for reducing viral spread.

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In December 2019, an outbreak of severe respiratory disease was identified in Wuhan, China[1]. Shortly later, the etiological agent of the disease was identified as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)[2,3], and the disease caused by the virus was named coronavirus disease 19 (COVID-19). The virus has since spread rapidly across the globe, causing a WHO-declared pandemic with social and economic devastation in many regions of the world[4]. The infectious disease research community has quickly stepped up to the task of characterizing the virus and its replication dynamics, describing its pathogenesis, and tracking its movement through the human population. Parameterized epidemiological models have been particularly informative of how this virus has spread with and without control measures in place, e.g., ref. [5], and have been used to project viral spread both in the short-term[6] and in the more distant future[7].

Along with epidemiological analysis based on case reports and COVID-19 death data, sequencing of viral genomes has become a powerful tool in understanding and tracking the dynamics of infections[8,9]. So-called genomic epidemiology allows for effective reconstruction of viral geographical spread as well as estimation of key epidemiological quantities such as the basic reproduction number of a virus, its growth rate and doubling time, and patterns of disease incidence and prevalence. Such insights have been used to inform policy makers during various pathogen outbreaks, as occurred for example in the 2014–2016 outbreak of Ebola virus in West Africa[10,11] and during this current SARS-CoV-2 pandemic[12,13].

Here, we set out to sequence SARS-CoV-2 from samples across the state of Israel, with the aim of gaining a better understanding of introductions of the virus into Israel, spread of the virus inside the country, and the epidemiology of the disease, including (a) the basic reproduction number of the virus before and after social distancing measures were implemented, and (b) the extent of viral superspreading within Israel. As pointed out recently[14], caution should be exercised when interpreting viral dynamics based on genetic data only. We thus incorporated here extensive, high-resolution epidemiological data that exist regarding the outbreak in Israel.

The first confirmed cases of SARS-CoV-2 infection in Israel were reported in mid-February, followed by many identified SARS-CoV-2 cases in travelers returning to Israel mainly from Europe and the United States. Growth in the number of verified cases rapidly ensued, which led to increased measures of social distancing, including the cessation of passenger flights to Israel, school closure, and eventually a near complete lockdown across the entire state of Israel. Quarantining of returning travelers from Europe was implemented between February 26 and March 4, 2020, and subsequently all incoming travel to Israel (including from the U.S.) was arrested on March 9. In the meantime, the rate of testing was ramped up, eventually reaching a rate of more than 1500 tests per million people per day. The reported daily incidence and reported numbers of daily severe cases peaked around mid-April and dropped steadily up to the time of this manuscript's initial submission (May 2020). Despite this knowledge, many questions remain: Which of the multiple SARS-CoV-2 introductions resulted in sustained local transmission? How did the virus spread across the state? What was the magnitude of the virus's reproduction potential within Israel, and to what extent did control measures mitigate its spread through March–April?

Here, through a comprehensive set of phylogenetic and phylodynamic analyses, we quantitatively address these questions. We show that travelers from the U.S. contributed significantly more to viral spread as compared to their proportion in incoming infected travelers. We use a phylodynamic approach to estimate the basic reproduction number of the virus, and show a substantial reduction in viral spread following the implementation of social distancing measures. Finally, we report high levels of transmission heterogeneity in SARS-CoV-2 spread, with between 2% and 10% of infected individuals resulting in 80% of secondary infections.

Results and discussion

To gain a better understanding of the dynamics of SARS-CoV-2 spread into and within Israel, we sequenced the virus from a cohort of patients representing a random sample across Israel, resulting in 212 full-genome SARS-CoV-2 sequences (Methods). A total of 224 unique single nucleotide variants (SNVs) were identified between the Wuhan reference sequence and this set of sequences from Israel. Figure 1 shows the distribution of identified SNVs along the genome and their counts in the sequenced samples. Of these SNVs, 141 were non-synonymous, 72 were synonymous, and the remaining 11 were in non-coding regions. One of the most abundantly detected SNVs was a non-synonymous variant D614G found in the spike protein, which

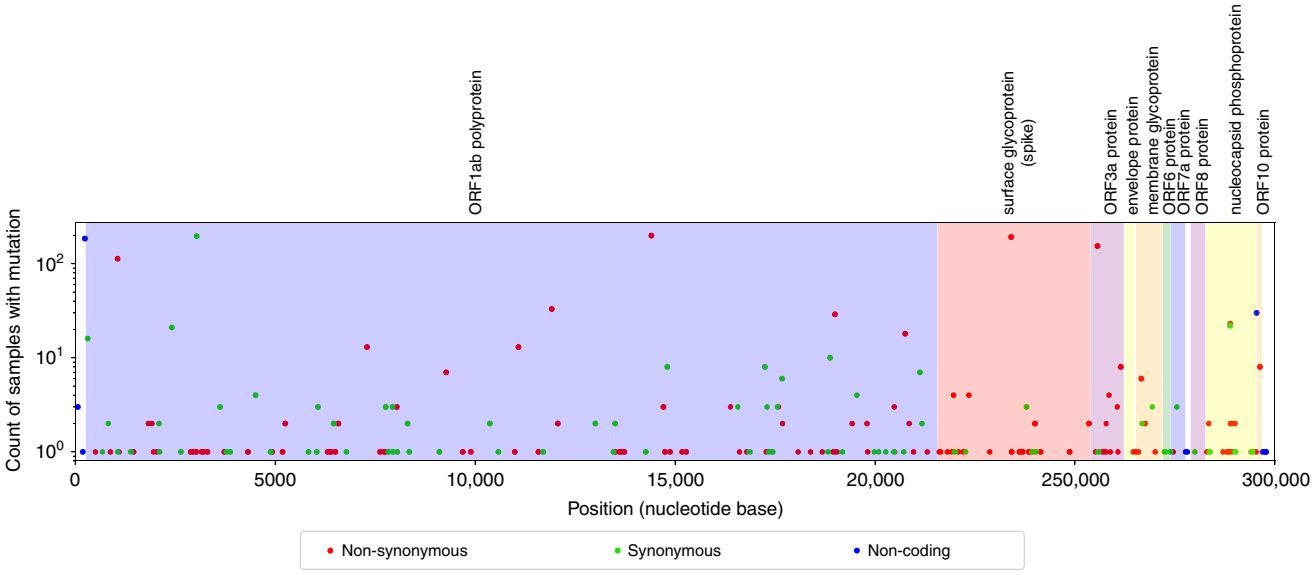
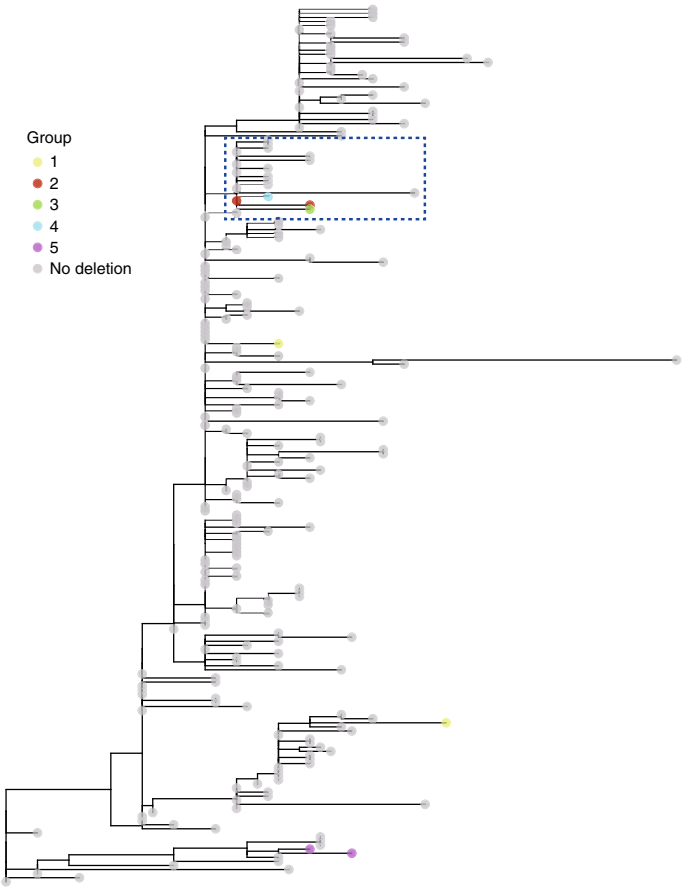


Fig. 1 Variation found in sequenced samples from Israel. The *x*-axis corresponds to the SARS-CoV-2 genome and the *y*-axis provides counts of identified SNVs across the viral genome. Source data are provided as a Source Data file.

a



b

#	Genome sites	Length (nt)	ORF/Genomic location	Putative effect	# samples found in	Sample IDs	Number of reads supporting deletion	Geographic location (district)	# non-Israeli samples found in refs.[1,2]
1	686–694	9	ORF1ab polyprotein	Deletion of 3 amino acids	2	, 2086008 130710157	, 3575 1852	Jerusalem, Tel Aviv	222
2	3882–3899	18	ORF1ab polyprotein	Deletion of 6 amino acids and an additional single amino acid mutation	2	,2089839 2089852	605 ,427	Jerusalem	--
3	27387-27396	10	End of ORF6 and start of ORF7a	Stop codon of ORF6 is recreated. Start codon of ORF7a is deleted with no in-frame replacement	1	13077726	3801	Tel Aviv	--
4	28254	1	End of ORF8	Last amino acid is replaced by a 5 amino acid addition	1	2086033	2849	Jerusalem	15
5	29746–29748	3	UTR ′3	Non-coding, unknown	2	,51137844 51141225	42,147	South	--

[1]Based on >50,000 SARS-CoV-2 sequences downloaded from GISAID, July 17 2020, and also reported in https://virological.org/t/common-microdeletions-in-sars-cov-2-sequences/485

[2]We note that these are underestimates as deletions are sometimes masked in reported sequences.

Fig. 2 Deletions found in Israeli samples. a Maximum-likelihood tree of Israeli sequences highlighting sequences found with deletions. Sequences are color-coded by the groups described in **b**. A clade with three independent deletions occurring in four samples is boxed. Source data are provided as a Source Data file.

was present in 90% of the sequences. This variant has generated much interest as it has been reported to potentially increase the transmissibility of the virus[15]. However, additional analyses have suggested that the observed increase in this variant's frequency may be due to stochastic effects[16].

We also found five different high confidence genomic deletions, spanning between 1 and 18 nucleotides (Fig. 2) (Methods). Each of these deletions was found in one to two samples. Three of the five deletions occur in multiples of three and are in-frame deletions or affect non-coding regions. Of the remaining two

deletions, deletion #3 spans ten nucleotides, and likely prevents the translation of ORF7a. Deletion #4 occurs at the end of ORF8 and causes the replacement of the last amino acid with an additional five amino acids. Notably, an 81-nucleotide in-frame deletion in ORF7a has been previously reported[17], as has a 382-nucleotide deletion in ORF8 (ref. [18]), suggesting that the virus is to some extent tolerant to deletions in these ORFs.

When focusing on deletions that occurred in two samples, we noted that deletion #5 was present in two related samples that were sampled 5 days apart from each other. Deletion #1, on the other hand, appeared in two samples located in very remote clades of the phylogeny. This deletion has been observed multiple times in various sequences with diverse genetic backgrounds, including sequences from many different countries across the world, suggesting that it has arisen multiple independent times (Fig. 2b). Deletions #2, #3, and #4 revealed an intriguing pattern: three independent deletions (one of which was present in two samples) were all part of the same clade that included 18 samples (Fig. 2). One non-synonymous SNV defined this clade: S2430R in ORF1b, which affects the non-structural protein NSP16. This protein has been reported to be a 2′*O*-methyltransferase that enhances evasion of the innate immune system[19]. To follow up on our finding of deletions in this clade, we examined a set of over 50,000 global sequences, and found that 137 sequences likely belong to the clade defined by S2340R, with eight of these sequences bearing short deletions (Supplementary Table 1). Interestingly, we found that the proportion of these unique deletions observed in the S2340R-defined clade was 5%, significantly higher than the proportion of unique deletions observed across the entire global tree (1.8%) ($P = 0.01$; hypergeometric test), leading us to cautiously suggest that S2340R is associated with a higher rate of deletions.

While further in-depth investigation of SARS-CoV-2 indels is clearly needed, at this point we conjecture that the deletions we detected are neutral or to some extent deleterious, and that deletions in SARS-CoV-2 are likely to occur frequently given the number of deletions detected in our samples.

Origins and transmission patterns in Israel. We next set out to explore patterns of SARS-CoV-2 introduction into Israel. Figure 3 shows the time-resolved phylogeny inferred using 214 Israeli sequences (the 212 sequenced here and two additional ones sequenced previously) in addition to 4693 representative sequences from across the world. This phylogeny allowed us to characterize the major viral clades circulating within Israel and to infer the geographic sources and timing of virus introductions into the state. We found multiple introductions into Israel from both the U.S. and Europe, the latter including mainly the U.K., France, and Belgium. Over 70% of the clade introductions into Israel were inferred to have occurred from the U.S., while the remaining were mainly from Europe. To rule out that this result is due to biases in geographic sampling, we first note that in our sample, the number of sequences from Europe ($n = 1991$) was higher than the number from the U.S. ($n = 1195$). We further quantified sampling noise by bootstrapping the Israeli samples and exogenous samples, leading to confidence intervals ranging between 50% and 80% for U.S. clade importations (Methods). We noted considerably lower proportions of importations from the U.S. into other countries we examined (Supplementary Fig. 1), making it unlikely that our results arise from systematic biases of U.S. sequences relative to sequences from other regions. We validated the robustness of our inference to changes in underlying evolutionary model parameters and possible biases in ancestral state assignments, and found that any biases stemming from uncertainty in phylogenetic reconstruction are negligibly small (Supplementary Fig. 2). Finally, we note that attribution of an Israeli sequence to a U.S. clade was normally based on two to four shared mutations, making it exceedingly unlikely that parallel independent substitutions occurred that could alternatively explain these patterns. However, we acknowledge that additional sequencing may change some of the inferences we make here, as has been shown elsewhere[20].

Throughout the epidemic in Israel, very close monitoring of all incoming infected travelers was imposed, and reports show that only ~27% of infected returning travelers were from the U.S. (Supplementary Fig. 3). There is a strong discrepancy between this 27% estimate and the 70% estimate for clade introductions, and this discrepancy holds even when considering our lower bound bootstrap estimate of 50% for clade importations (mentioned above). This suggests that the travelers returning from the U.S. contributed substantially more to the spread of the virus in Israel than would be proportionally expected. This may have occurred due to the gap in policy that allowed returning non-European travelers to avoid quarantine until March 9, or due to different contact patterns of those who returned from the U.S. Moreover, by examining the timing of viral importation events from the U.S. into Israel, we found that up to 55% of the transmission chains in Israel (118 out of 214; Methods) could have been prevented had flights from the U.S. been arrested at the same time that flights from Europe were arrested (between February 26 and March 4, instead of by March 9).

As the pandemic spread, entry into Israel was restricted, and local transmission became dominant. Transmission patterns into and between five geographical regions in Israel (North district, Tel Aviv district, South coast district, Jerusalem district, and South district) are shown in Fig. 4. While most transmission occurred inside defined regions, transmission between distinct regions was also observed, such as, for example, movement between Jerusalem and the north district of Israel.

Phylodynamic modeling of viral spread in Israel. To estimate the basic reproduction number of SARS-CoV-2 in Israel initially and then following the implementation of social distancing measures, we performed coalescent-based phylodynamic inference using the PhyDyn program implemented in BEAST2 (Methods). We note that existing phylodynamic analyses of SARS-CoV-2, focusing on a number of different geographic regions across the world, have shown that the effective reproduction number of the virus has decreased over time, as quarantine and social distancing measures have been implemented[21–23]. However, many of these analyses have to date modeled reductions in the reproduction number as stemming from the depletion of susceptible individuals[23], rather than from reductions in the basic reproduction number R_0, the latter of which would be consistent with lowering of contact rates. Other analyses, particularly those that use the birth–death model approach for phylodynamic inference, have allowed for changes in R_0 over time[21,22], but cannot as easily accommodate structure in the infected host population (e.g., that some individuals are exposed but not yet infectious, and that transmission heterogeneity exists between infected individuals). Our phylodynamic analysis here, based heavily on existing coalescent-based model structures that have been applied to SARS-CoV-2[24], instead allows for this structure to be accommodated and for R_0 to change in a piecewise fashion over time.

Our phylodynamic analysis assumes an underlying susceptible–exposed–infected–recovered (SEIR)-type epidemiological model for SARS-CoV-2 transmission dynamics and explicitly incorporates transmission heterogeneity (Supplementary Fig. 4, Methods). Recent epidemiological analyses have estimated considerable

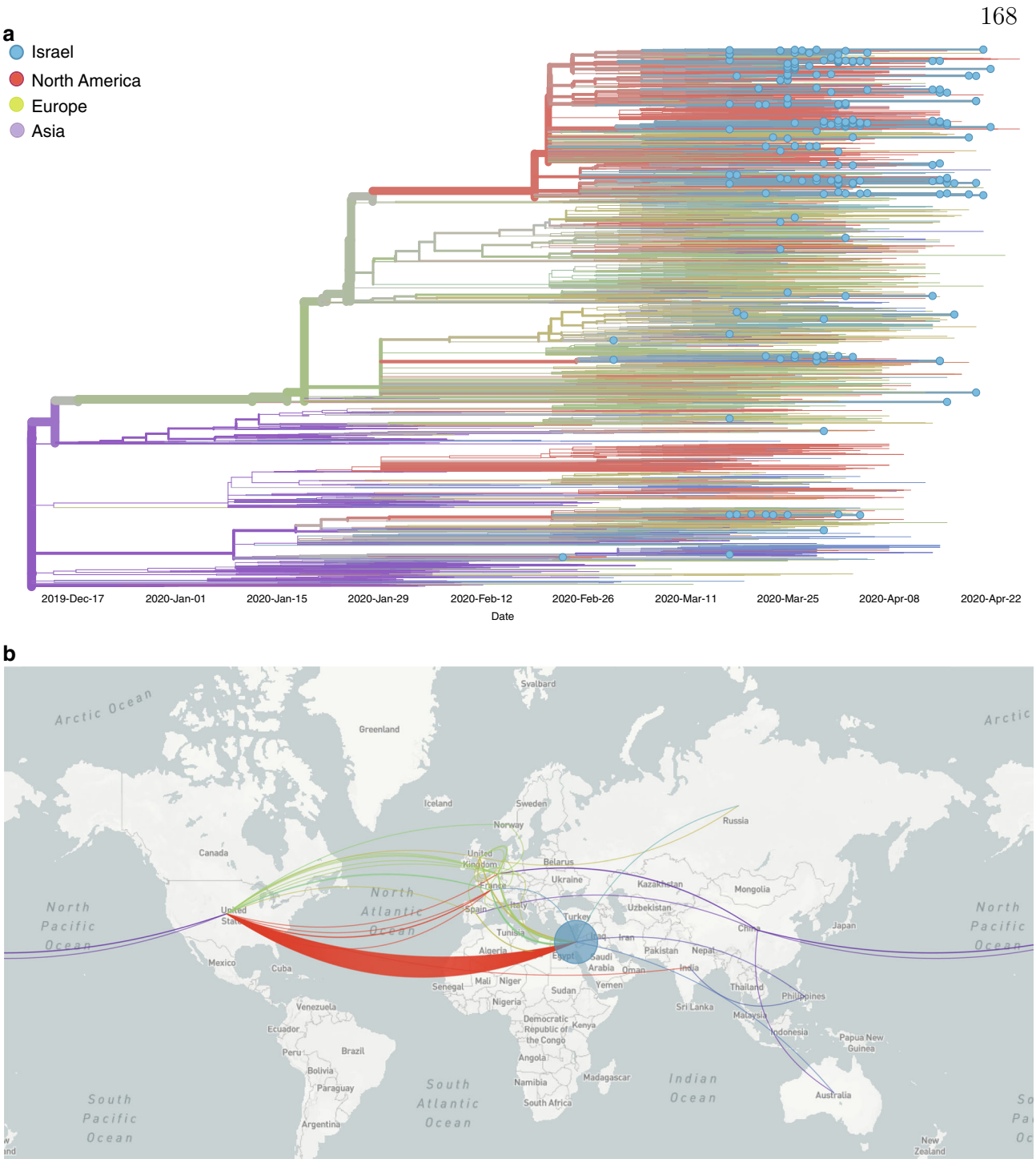


Fig. 3 Patterns of SARS-CoV-2 introduction into Israel. a Time-resolved phylogeny inferred using viral sequences from Israel (blue tips) and around the world (tips without dots). Lineages are colored by inferred region of circulation. Phylogeographic analysis reveals multiple introductions into Israel, mainly from the U.S. **b** Map of phylogenetically inferred introductions into Israel highlighting the dominance of the U.S. and to a lesser extent Europe as the geographic sources of SARS-CoV-2 introductions into Israel. Figure (including map) generated using NextStrain[32]. Source data are provided as a Source Data file.

levels of SARS-CoV-2 transmission heterogeneity, with ~7–10% of infected individuals estimated to be responsible for 80% of secondary infections[25,26]. Instead of assuming a given level of transmission heterogeneity for Israel, we instead performed phylodynamic inference for the SEIR model across a range of transmission heterogeneities. Specifically, the SEIR-type model implemented two classes of infectious individuals, corresponding to a highly infectious subset of individuals (I_h) and a less infectious subset of individuals (I_l). Exposed (E) individuals transitioned to I_h with a probability given by the parameter p_h, and transitioned to I_l with a probability given by $(1 - p_h)$. The relative transmission rate of I_h to I_l individuals was set such that the highly infectious class (I_h) was responsible for 80% of secondary cases. As such, we were able to modify the extent of transmission heterogeneity by modifying p_h. A p_h value of 0.8 implements a model with no transmission heterogeneity (as 80%

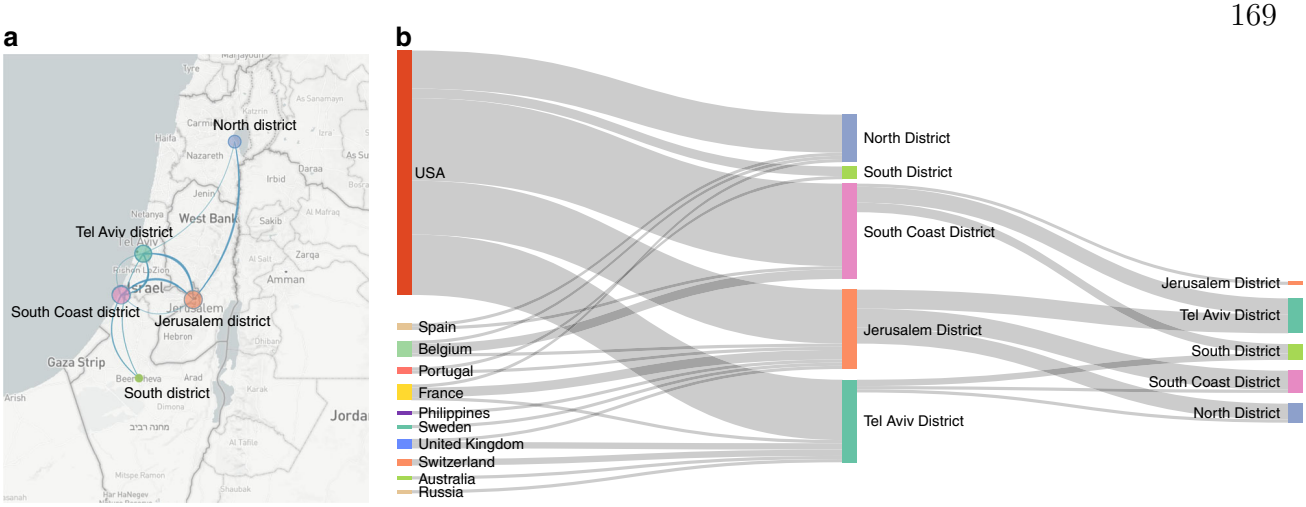


Fig. 4 Spread of SARS-CoV-2 into and within Israel. a Map of Israel with geographic locations of samples, and inferred spread inside Israel (blue lines). Figure generated using NextStrain[32]. **b** Inferred viral spread into and inside Israel, with directionality (left to right). Each line represents a transmission event inferred based on the phylogeny. Thicker lines indicate multiple transmission events. Source data are provided as a Source Data file.

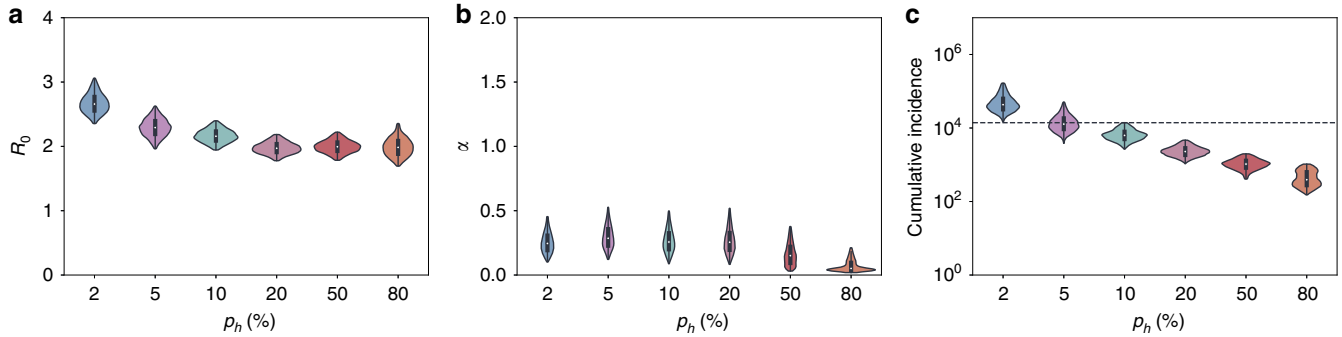


Fig. 5 Estimated epidemiological parameters and cumulative incidence across different levels of transmission heterogeneity. The parameter p_h gives the fraction of infected individuals that are responsible for 80% of secondary infections. Higher p_h values correspond to less transmission heterogeneity. **a** Estimated R_0 in Israel prior to March 19, 2020. **b** Estimated factor by which R_0 in Israel changed after March 19. **c** Estimated cumulative number of infected individuals in Israel on the date of the last sampled sequence (April 22, 2020). Horizontal dotted line at $N = 13{,}942$ shows the cumulative number of reported cases on April 22, 2020, as given by the ECDC (https://opendata.ecdc.europa.eu/covid19/casedistribution/csv). In **a**–**c**, only values that fall within the 95% highest posterior density intervals from the main MCMC chain are shown (total of 4751 data points). Violin plots show the kernel density estimation of the underlying distribution. The median value is denoted by a white dot and the black bar in the center of the violin defines the interquartile range. The black line stretched from the bar extends to the range of data that are not more than 1.5 times the interqaurtile range above the upper or below the lower quartile. Density is only plotted over the range of observed values. Results shown assume a time-varying migration rate estimated from a global maximum-likelihood phylogeny. Source data are provided as a Source Data file.

of the infected individuals are responsible for 80% of secondary infections), whereas a p_h value of 0.2 implements a model consistent with the 20/80 superspreading rule[27] with 20% of individuals being responsible for 80% of secondary infections. Values of p_h under 0.2 implement a model with even more extreme levels of transmission heterogeneity. The SEIR-type model we implemented further included terms for migration into and out of Israel; these terms enabled lineages in the phylogeny to transition out of Israel going backward in time (as would happen, in forward time, during an importation event). We considered two different functional forms for this migration term, one based on phylogenetically inferred timing of importations and the other assuming a simpler, constant rate of migration (Methods).

Using the migration rate form based on inferred importation times, we estimated R_0 prior to March 19 to be between 2.1 and 2.3 across the range of $p_h = 0.1$–0.8 (that is, 10–80%) with estimates increasing toward $R_0 = 3.0$ at high levels of superspreading ($p_h = 2\%$) (Fig. 5a). Across the full range of $p_h =$ 2–80%, we robustly estimated that quarantine measures had the effect of reducing R_0 by more than two-thirds ($\alpha = \sim 25\%$, where R_0 following quarantine measures was given by α times R_0 prior to the implementation of these measures; Fig. 5b).

Figure 5c shows the cumulative number of SARS-CoV-2 cases by April 22, estimated by our phylodynamic analyses across the considered range of transmission heterogeneity. Estimates of the cumulative number of cases is highly sensitive to the level of assumed transmission heterogeneity, particularly at high levels of superspreading ($p_h = 2$–10%). Comparison between these inferred cumulative cases and reported case numbers (dotted lines in Fig. 5c) indicates that SARS-CoV-2 transmission dynamics were driven by a high level of viral superspreading. Specifically, if we assume almost complete case reporting, our phylodynamic analysis indicates that between 5% and 10% of infections are responsible for 80% of secondary infections. With lower assumed levels of case reporting, less than 5% of infections would be responsible for 80% of secondary infections. Findings from the phylodynamic analyses were shown to be robust to the specific functional form of the migration rate that was assumed, as well as to the overall magnitude of migration across a broad range of values (Supplementary Figs. 5 and 6).

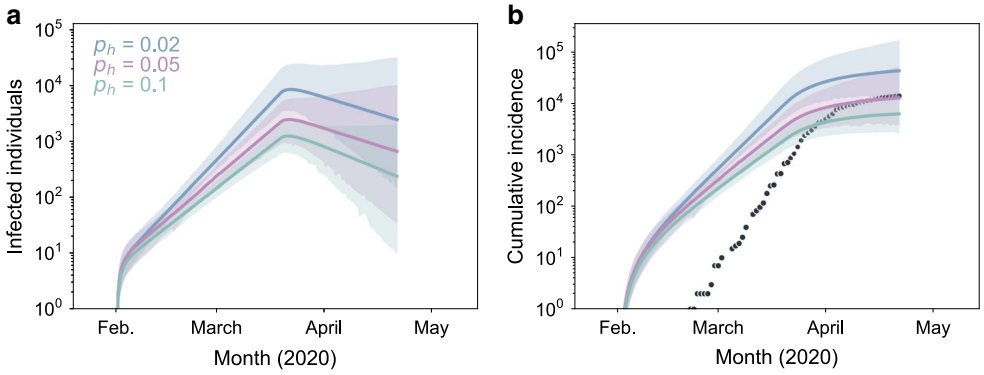


Fig. 6 Epidemiological dynamics inferred using phylodynamic analysis. a Estimated number of currently infected individuals ($I_l + I_h$) over time. **b** Estimated cumulative number of infected individuals. An infected individual is assumed to contribute to cumulative incidence at the end of their infectious period. Black dots show the cumulative number of reported cases in Israel over time. In **a** and **b**, lines show median estimates of models with different levels of transmission heterogeneity. Shaded regions represent the 95% highest posterior density region. Source data are provided as a Source Data file.

Phylodynamic analysis further allows us to visualize inferred epidemiological dynamics. In Fig. 6, we show inferred patterns of prevalence (Fig. 6a) and incidence (Fig. 6b) for three different assumed levels of viral superspreading. Inferred patterns of prevalence corroborate epidemiological findings that the number of cases started to decline in early April. Inferred patterns of cumulative incidence indicate that reporting rates were initially low but improved considerably over the time course of viral spread. The leveling off of cumulative incidence around late March/early April is observed in both the reported case data and in our inferred epidemiological dynamics, ground-truthing the results of our phylodynamic analyses.

Overall, our findings highlight the use of genomic data to effectively track the spread of an emerging virus using phylogenetic and phylodynamic approaches that have been developed to study viral outbreaks. We have found a relatively high proportion of genomes with short deletions, suggesting that such deletions arise frequently during SARS-CoV-2 replication and are to some extent tolerated by the virus. We succeeded in tracking the main transmission chains that led to SARS-CoV-2 spread in Israel, and applied phylodynamic analysis to infer the key epidemiological parameters governing its spread. Our results indicate that superspreading events drive the transmission dynamics of SARS-CoV-2, suggesting that focused measures to reduce contacts of select individuals/social events could mitigate viral spread. Finally, our results highlight how global connectivity allows for massive introductions of a virus and emphasize how border control and shelter-in-place restrictions are crucial for halting viral spread. Addendum September 2020: the authors would like to note that unfortunately, following the relaxation of social distance measures in May, case counts have substantially climbed and Israel has entered a second lockdown.

Table 1 Summary of samples successfully sequenced.

a

Age group

Age group	Number of samples
0–9	8
10–19	17
20–29	42
30–39	28
40–49	26
50–59	29
60–69	31
70–79	15
80–89	11
90 and up	3
Unknown	2

b

Location and hospital

Hospital	Geographic region	Number of samples
Barzilai Medical Center	South coast district	30
Samson Assuta Ashdod University Hospital	South coast district	23
Hadassah University Hospital - Ein Kerem	Jerusalem district	62
Poria Medical Center	North district	26
Sheba Medical Center	Tel-Aviv district	51
Soroka Medical Center	South district	20

c

Sex	Number of samples
Female	101
Male	111

The table is divided by metadata information (a–c). Source data are provided as a Source Data file.

Methods

Ethics statement. An exemption from institutional review board approval was determined by the Israeli Ministry of Health as part of an active epidemiological investigation, based on the use of retrospective anonymous data only and no medical intervention. This included exemption from informed consent. The study was further approved by the Tel-Aviv University ethics committee (approval 0001274-1).

Details of samples and virus genome sequencing. With the aim of generating a random sample of viral infections across the entire country, a total of 213 samples were retrieved from six major hospitals in Israel spanning the entire geography of Israel from south to north (Table 1 and Supplementary Table 2).

We obtained RNA extracted from nasopharyngeal samples. Sequencing was performed based on the V3 Artic protocol (https://artic.network/ncov-2019). Briefly, reverse transcription and multiplex PCR of 109 amplicons was performed, and adapters were ligated to allow for sequencing. All samples were run on an Illumina Miseq using 250-cycle V2 kits in the Technion Genome Center (Israel). Supplementary Table 13 contains all primer names and sequences as described in the Artic protocol.

Determining genome consensus sequences. Sequencing reads were trimmed using pTrimmer, a multiplexing primer trimming tool[28], and then aligned to the reference genome of SARS-CoV-2 (GenBank ID MN908947) using our AccuNGS pipeline[29], which is based on BLAST[30], using an e-value of 10^{-9}. The pipeline allows for consensus determination and variant calling. We considered substitutions at the consensus sequence (as compared to the reference) only if a given base was present in 80% of the aligned reads, and five or more reads aligned to the reference; bases where the majority of reads showed a substitution but that did not fulfill these two conditions were deemed uncertain. Similarly, positions to which no reads were mapped were also deemed uncertain, and such positions were assigned with an "N". All deletions were manually verified: (a) over 98% of the reads covering the deletion site mapped to both ends of the deletion (i.e., bore evidence of the deletion), (b) the deletion was based on over 40 independent reads (on average >1000 reads), and (c) coverage was high at both ends of the deleted region. Only sequences that spanned 90% of the reference genome were retained, leading to the removal of one sequence (Supplementary Table 2), and hence a new set of 212 Israeli sequences was generated here. Another two Israeli sequences already available on GISAID were added to the phylogenetic analysis, leading to a total of 214 sequences from Israel.

The collection dates of the 214 Israeli sequences used in our analysis ranged from February 23 through April 22, 2020. The number of sequences is thus ~1.5% of the total number of reported cases on April 22.

Phylogenetic analyses. All available full-length SARS-CoV-2 genomes from outside of Israel (a total of 16,403 sequences) were retrieved from GISAID on May 5, 2020. All sequences from a non-human host as well as sequences with incomplete sampling date (YYYY-MM or YYYY-MM-XX) or a high level of uncertainty (>10% ambiguous bases marked as N) were removed. All available sequences were then down-sampled to 4693 representative sequences across the globe using the latest build of NextStrain ncov pipeline[31,32] (https://github.com/nextstrain/ncov); 1195 of these 4693 sequences were from the U.S., while 1991 were from Europe. The 212 new Israeli sequences were added to the tree.

Down-sampling of global tree for phylodynamic analysis. Following the initial sampling of the global tree described above, we applied a second sampling specifically for the phylodynamic analysis. The down-sampling was inspired by the recommended guidelines described for SARS-CoV-2 (sarscov2phylodynamics.org), and thus we applied two sampling techniques:

(i) Random time stratified sampling—We sampled a total of 100 sequences from outside of Israel across $v = 5$ time intervals such that each time interval contained ~20 sequences.
(ii) Closest sequence match—Defining S_{ISR} as the set of all sequences from Israel, we sample the exogenous set of sequences from the global tree with the minimal cophenetic distance between each Israeli sequence belonging to S_{ISR} as based on the maximum-likelihood phylogeny. This results in sequences closely related to sequences from Israel to be included in the analysis.

We next manually curated the sequences from Israel to ensure they represent a random sample across Israel. To this end, we removed samples suspected to be from the same household, samples with consecutive identifiers, or identical samples with similar identifiers and similar dates. Only one sample from a given household was chosen randomly. This led to a removal of six sequences.

Following down-sampling and manual curation, a phylogenetic tree was inferred using the NextStrain pipeline[32]. The tree topology was validated as a legitimate representative of the global tree by performing 1000 random samples containing 373 sequences from the global tree. The Kendall–Colijn metric[33] was used to assess the distance between each random sample and the original tree, allowing us to create a null distribution. The λ parameter, which determines the trade-off between topology and branch length, was set to zero, thus accounting for the tree topology alone. The significance of the topology of the down-sampled tree as compared to the global tree was thus obtained by comparing the Kendall–Colijn metric of the down-sampled tree to the null distribution ($P = 0.003$).

Timing and distribution of importations. Given a time-resolved global tree (after the initial down-sampling from GISAID database and before down-sampling for phylodynamic analysis; 4693 sequences total), we assigned a country to each internal node using NextStrain's maximum-likelihood ancestral state reconstruction. We defined an importation event into Israel as a transition from a non-Israeli node to an Israeli node. We then used the dates associated with the internal nodes to generate a distribution of importation dates, which was used to parameterize the phylodynamic migration rate (Supplementary Fig. 8), as described below. Moreover, we inferred that the first introductions to Israel occurred already in late January/early February, as further supported by data from epidemiological investigations.

The internal nodes and their associated dates were further used to infer the number of transmission chains that could have been prevented by arresting flights from the U.S. earlier. Out of a total of 214 clade importations from the U.S., 118 (55%) were inferred to have occurred between February 26 and March 9, 103 between March 1 and March 9 (48%), and 42 between March 4 and March 9 (20%).

Confidence in numbers and fractions of importation events. Confidence in the relative number of importation events from the U.S. vs. Europe was assessed using two measures of confidence intervals. These were aimed at testing whether the set of exogenous (non-Israeli) sequences was biased, or whether the set of Israeli sequences was biased. First, we generated 1000 samples of the exogenous sequences using a bootstrap approach: we sampled N sequences with replacement, where N is the number of exogenous sequences. We then determined the fraction of importation events into Israel for each set. Second, we similarly bootstrapped only the local (Israeli) sequences using a similar approach and assessed the fraction of importation events into Israel for each bootstrapped set. The reported confidence interval includes the lower bound and higher bound of both bootstrapping schemes. We describe below our approach for inferring the timing of importation events.

Phylodynamic analysis. Phylodynamic analyses were conducted using BEAST2 v2.6.2 (ref. [34]) and PhyDyn v1.3.6 (ref. [35]). An HKY substitution model with a lognormal prior for κ with mean $\log(\kappa) = 1.0$ and standard deviation of $\log(\kappa) = 1.25$ was used. We assumed no sites to be invariant and used an exponential prior for γ with a mean of 1.0. A strict molecular clock with a uniform prior between 0.0007 and 0.002 substitutions/site/year was used. A uniform prior was used for nucleotide frequencies. The down-sampled maximum-likelihood tree generated using IQ Tree was used as a starting tree.

PhyDyn is a coalescent-based inference approach implemented in BEAST2, allowing for the integration over phylogenetic uncertainty[35,36]. The program requires specification of an underlying epidemiological model, as well as any priors on parameters that will be estimated. In line with recent analyses[37], we assumed that the epidemiological dynamics of SARS-CoV-2 were governed by SEIR dynamics. Transmission heterogeneity has previously been described for viral pathogens including SARS-CoV-1 (ref. [38]) and appears to be important in the transmission dynamics of SARS-CoV-2 (refs. [25,26]). To account for the possibility of transmission heterogeneity, as in previous work[37], we modeled two classes of infected individuals: one with low transmissibility I_l and one with high transmissibility I_h. Mathematically, the epidemiological model is given by Eqs. (1)–(5):

$$\frac{dS}{dt} = -\beta_l I_l \cdot \left(\frac{S}{N}\right) - \beta_h I_h \cdot \left(\frac{S}{N}\right) \quad (1)$$

$$\frac{dE}{dt} = \beta_l I_l \cdot \left(\frac{S}{N}\right) + \beta_h I_h \cdot \left(\frac{S}{N}\right) - \gamma_E E \quad (2)$$

$$\frac{dI_l}{dt} = (1 - p_h)\gamma_E E - \gamma_I I_l \quad (3)$$

$$\frac{dI_h}{dt} = p_h \gamma_E E - \gamma_I I_h \quad (4)$$

$$\frac{dR}{dt} = \gamma_I I_l + \gamma_I I_h. \quad (5)$$

We set as fixed the host population size to the population size of Israel, according to the European Centre for Disease Prevention and Control ($N = 8{,}883{,}800$), the average duration of time an individual spends in the exposed class ($1/\gamma_E = 3$ days), and the average duration of time an individual spends in the infected (infectious) class ($1/\gamma_I = 5.5$ days). These durations are based on a study that inferred transmissibility over the course of infection using data from established SARS-CoV-2 transmission pairs[39]. R_0 in this model is given by $(\beta_h p_h + \beta_l(1-p_h))/\gamma_I$, where p_h is the fraction of exposed individuals who transition to the I_h class instead of to the I_l class. In our model, we estimated a piecewise R_0 by estimating an initial R_0 that was in effect until March 19, 2020, when strong social distancing measures were implemented, along with a factor α by which R_0 changed on March 19.

Instead of independently parameterizing β_h and β_l, we defined (as in previous work[37]) the relative transmissibility of infected individuals in the I_h and I_l classes by the parameter $\tau = \beta_h/\beta_l$, and simplify notation by defining $\beta \equiv \beta_l$. We further defined a parameter P as the fraction of secondary infections that were caused by a fraction p_h of the most transmissible infected individuals and set P to 0.8. Based on set values of P and p_h, we calculated τ as $(\frac{1-p_h}{p_h})/(\frac{1}{P} - 1)$. As such, we could easily parameterize the model across various levels of transmission heterogeneity, with a fraction p_h of infected individuals being responsible for 80% of secondary infections. Existing epidemiological analyses indicate that p_h is approximately 0.07–0.1 (7–10%)[25,26] indicative of even more transmission heterogeneity than given by the 20/80 rule[27]. We considered a range of p_h between 2% and 80% in our phylodynamic analyses to allow for a broad range of transmission heterogeneity, from extreme superspreading (p_h = 2–10%) to no transmission heterogeneity (p_h = 80%).

Again, based on existing analyses (sarscov2phylodynamics.org,[37]), we included an external reservoir in our analysis to allow for multiple introduced clades into

Israel to be jointly considered. Instead of modeling both exposed (E) and infected (I) individuals in the external reservoir, we assume a single infected class Y undergoing exponential growth. We fix the duration of infection of this class of individuals to be 8.5 days ($= 1/\gamma_E + 1/\gamma_I$). We attempted to estimate both the growth rate of the infected class Y and its initial size at time $t = 2019.7$, but found that these parameters were practically unidentifiable. We thus set the growth rate of the infected class to 24 person^{-1} year^{-1} (resulting in an R_0 of 1.56 in the reservoir) and estimated only the initial size of the infected class Y. An exponential prior with mean 1.0 was used for the initial size *of* Y.

Migration into and out of Israel occurred at an overall migration rate of $\eta(t)$ and we assumed for simplicity that all migrations involved exposed (E class) individuals, rather than also implementing migration of the infected (I_l and I_h) classes. As migration is assumed to be symmetrical into and out of Israel, it does not affect the focal SEIR model dynamics. However, it does influence the probability that a given lineage's geographic state is assigned to Israel. We considered two different functional forms of the migration rate $\eta(t)$. The first form for $\eta(t)$ was generated using the timing of inferred importation events (described above in "Timing and distribution of importations"). Inferred importation events were grouped into 3-day windows and a piecewise exponential function fit to the data using the Nelder–Mead algorithm as implemented in SciPy[40]. The curve was fixed to change from growth to decay at the end of the time window with the peak number of importations (Supplementary Fig. 9A) and assumed to be 0 until the date at which the best fit curve was ≥1. Model fitting resulted in an importation rate given by the curve $\exp(57(t - 2020.05))$ between 2020.05 and 2020.18 and declined from 2020.18 with the curve $1680\exp(-52(t - 2020.18))$. To assess the robustness of our results to the magnitude of this curve, we also scaled the growth and decay rates (57 and −52, respectively) by $\theta = 0.8$, 0.9, 1.0, 1.1, and 1.2 and modified the initial value of the importation rate at 2020.18 accordingly (Supplementary Figs. 5 and 9B and Supplementary Tables 3–7). Over the time series in our model, this translates to a total of 17, 33, 62, 118, and 228 migrations into and out of Israel that result in established clades. The second form for $\eta(t)$ assumed a constant migration rate (η = 10, 100, 1000, 2500, 5000 year^{-1} (Supplementary Fig. 5 and Supplementary Tables 8–12) which translates to 6, 61, 607, 1518, and 3037 migrations over the time course of our model.

With a given functional form for $\eta(t)$ and with the parameterization of this form, we used our parameter estimates to infer the time-varying probability that an exposed individual in Israel migrated into Israel versus became infected locally (Supplementary Figs. 10 and 11). This time-varying probability is given by $\eta(t)/\left(\eta(t) + \frac{\beta S(I_l + \tau I_h)}{N}\right)$. At high migration rates ($\theta = 1.2$, $\eta \geq 2500$), this probability remained unrealistically high throughout the epidemic. At reasonable values of θ and η (0.9–1.1 and 100–1000, respectively), the parameter estimates were relatively insensitive to η (Supplementary Figs. 5 and 6). PhyDyn simultaneously estimates model parameters and phylogenies and thus integrates over phylogenetic uncertainty. Our extensive sensitivity analysis involving the importation/exportation rate η was done to ensure the robustness of our inferred epidemiological parameters. The choice and magnitude of η will affect not only the probability that viral lineages are inside or outside of Israel but the overall topology of the phylogenies and thus has the potential to impact epidemiological parameter estimation.

Our prior on α, the factor by which R_0 changes on March 19, was a uniform prior between 0 and 2, thereby allowing R_0 to either increase, decrease, or remain unchanged after March 19. I_l and I_h were assumed to be negligibly small (1E−8) at the beginning of the SEIR dynamics. The PhyDyn t_0 parameter was set to 2019.7 and a constant population size coalescent model ($N_e = 0.1$) was used prior to this date when proposed trees had earlier root dates. SEIR dynamics were assumed to begin on February 1. Sequences sampled from Israel were randomly assigned to I_h with probability p_h and to I_l with probability $1 - p_h$. XML files to run both BEAST2 and PhyDyn were generated using a custom Python 3 script, which was designed to edit a template XML file originally generated with BEAUti and manually edited. To aid in mixing, we used Adaptive Metropolis Coupled MCMC[41] with three chains. All MCMC chains were run for 10 million steps and convergence was assessed based on visual inspection of parameter traces. The first 50% of MCMC steps were discarded as burn-in. Maximum clade credibility trees were generated using TreeAnnotator. BEAST2 and PhyDyn outputs were visualized using Python 3, Matplotlib[42], Seaborn, and Baltic (https://github.com/evogytis/baltic). The ggtree package was used to visualize the Israeli phylogeny[43]. Supplementary Fig. 7 shows the time-aligned maximum clade credibility phylogeny of the Israeli sequences along with outside-Israel sequences for the model results shown in Figs. 5 and 6.

Reporting summary. Further information on research design is available in the Nature Research Reporting Summary linked to this article.

Data availability

Data that support the findings of this study have been deposited in the relevant databases: a viral sequence per each patient sample was deposited in the GISAID database (https://www.gisaid.org) with accession numbers EPI_ISL_447258 - EPI_ISL_447469. The raw sequencing reads were deposited in the NCBI Sequence Read Archive (SRA) database under BioProject accession number PRJNA647529. The reference genome of SARS-CoV-2, ID MN908947, was downloaded from GenBank (https://www.ncbi.nlm.nih.gov/genbank/). A list of all sequence accession numbers used in this study, Beast XML configurations, and outputs are available at https://github.com/SternLabTAU/SARSCOV2NGS. Source data are provided with this paper.

Code availability

All analysis scripts, NextStrain make file and phylodynamic model configuration scripts are available at https://github.com/SternLabTAU/SARSCOV2NGS. Our local NextStrain build is also available in NextStrain community at https://nextstrain.org/community/SternLabTAU/SARSCOV2NGS?f_country=Israel.

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Author contributions

D.M., M.A.M., N.H., O.T., and T.K. performed all the analyses and drafted the paper. M.M. coordinated the sample sequencing. N.S., S.G.H., S.A., O.V., A.Sh., D.W., A.P., Y.S.A., and D.R.K. contributed clinical samples. N.M.K., A.H., and A.S. conceived and coordinated the study. A.S. and K.K. supervised and led the study.

Competing interests

The authors declare no competing interests.

Additional information

Supplementary information is available for this paper at https://doi.org/10.1038/s41467-020-19248-0.

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5.3 Supplement

Full genome viral sequences inform patterns of SARS-CoV-2 spread into and within Israel

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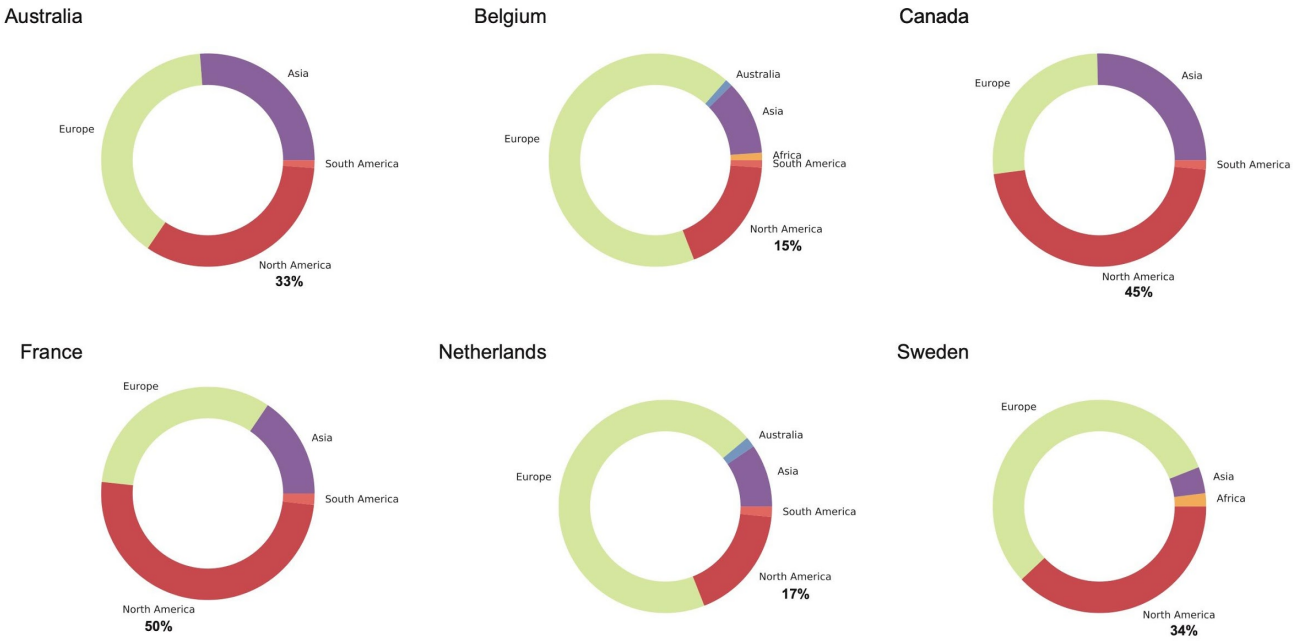
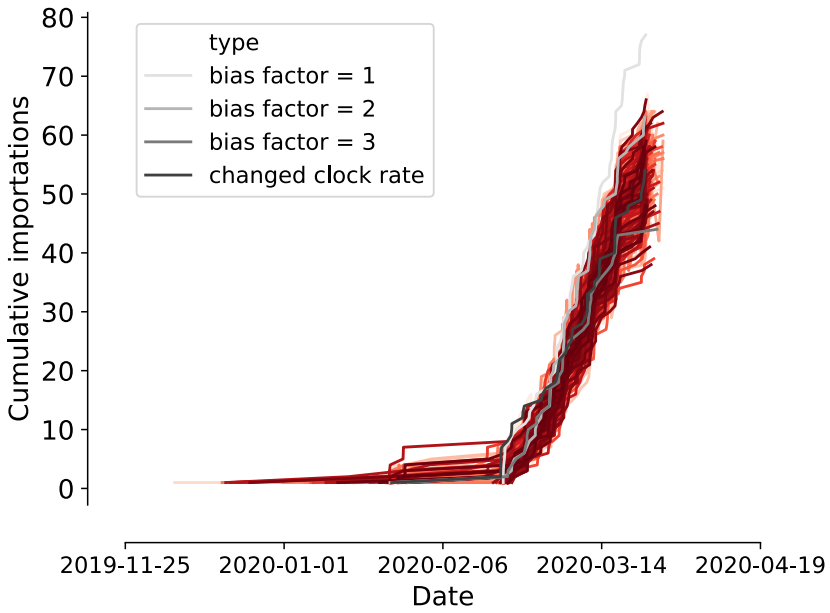
Supplementary Information

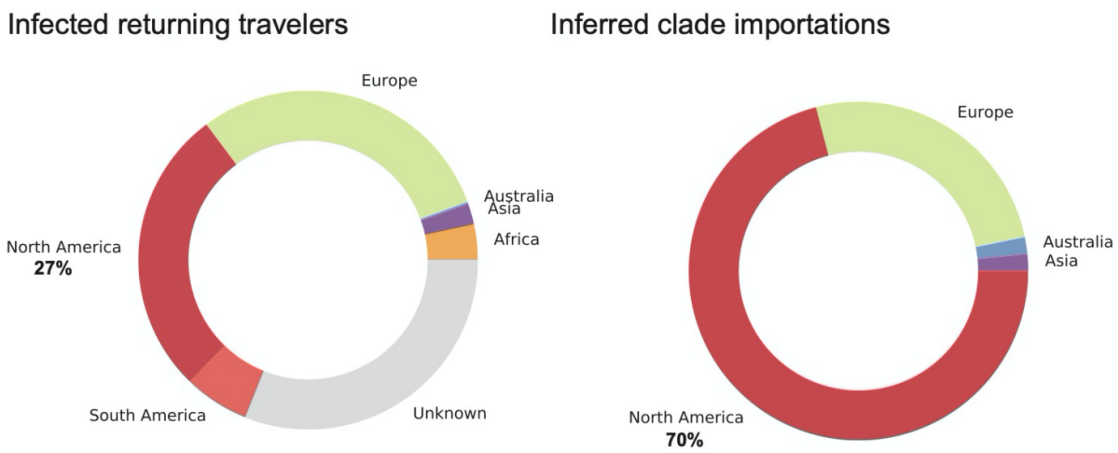


Supplementary Fig. 1. Inferred regions responsible for clade introductions into six focal countries. Each of the six countries shown had > 100 sequences available for analysis. Sectors in each pie chart show the proportion of clade introductions that were inferred to originate from the labeled regions. North America is highlighted in bold, and includes almost exclusively sequences from the U.S. For each country, we excluded local transmission (e.g., the Europe sector in the Netherlands excluded the Netherlands).

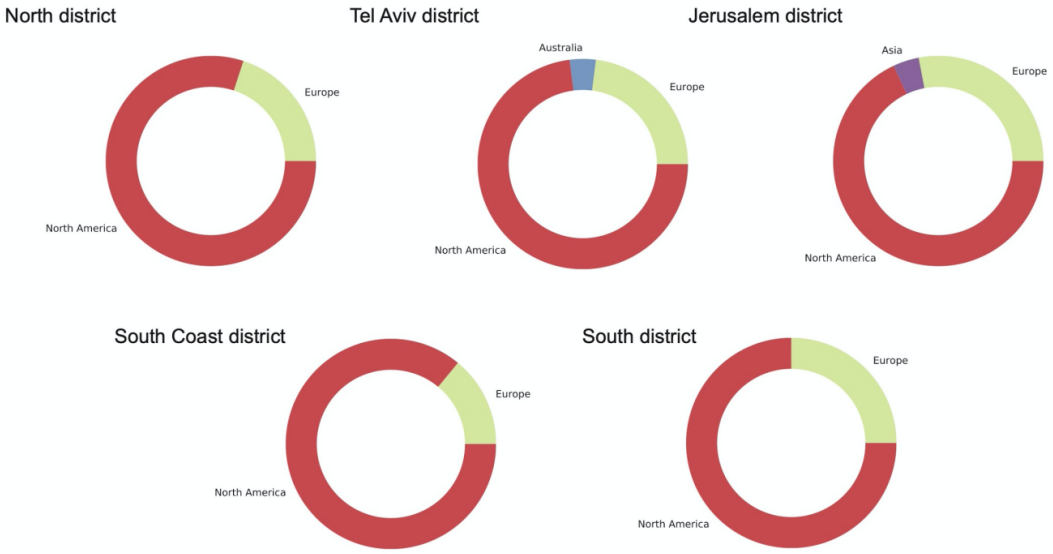


Supplementary Fig. 2. Cumulative number of importations throughout time. Cumulative sum of importation events into Israel for 1,000 bootstrap replicates are presented in red spectra. Changes in the sampling correction bias and clock rate are presented in greyscale. Bias factor of 1 means no sampling correction to the GTR matrix of the TreeTime model.

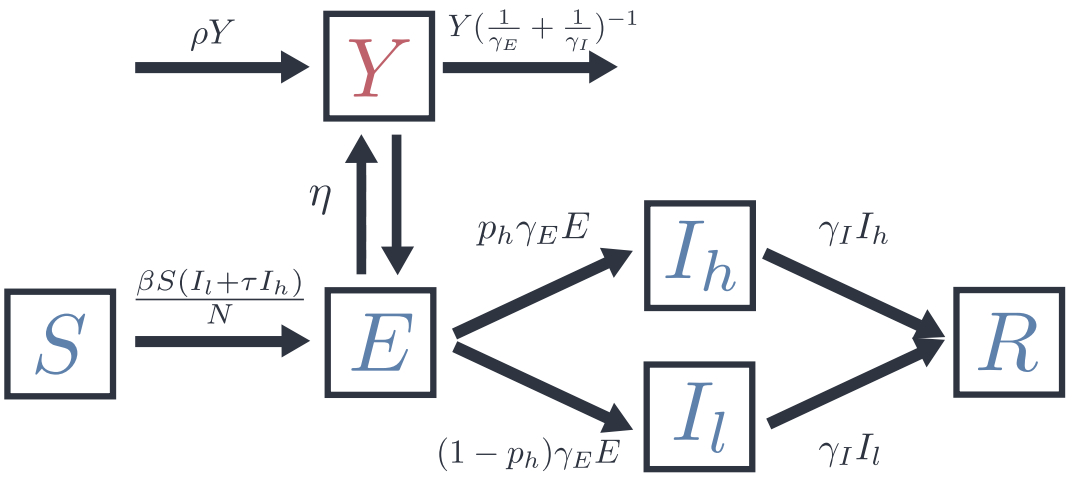
A



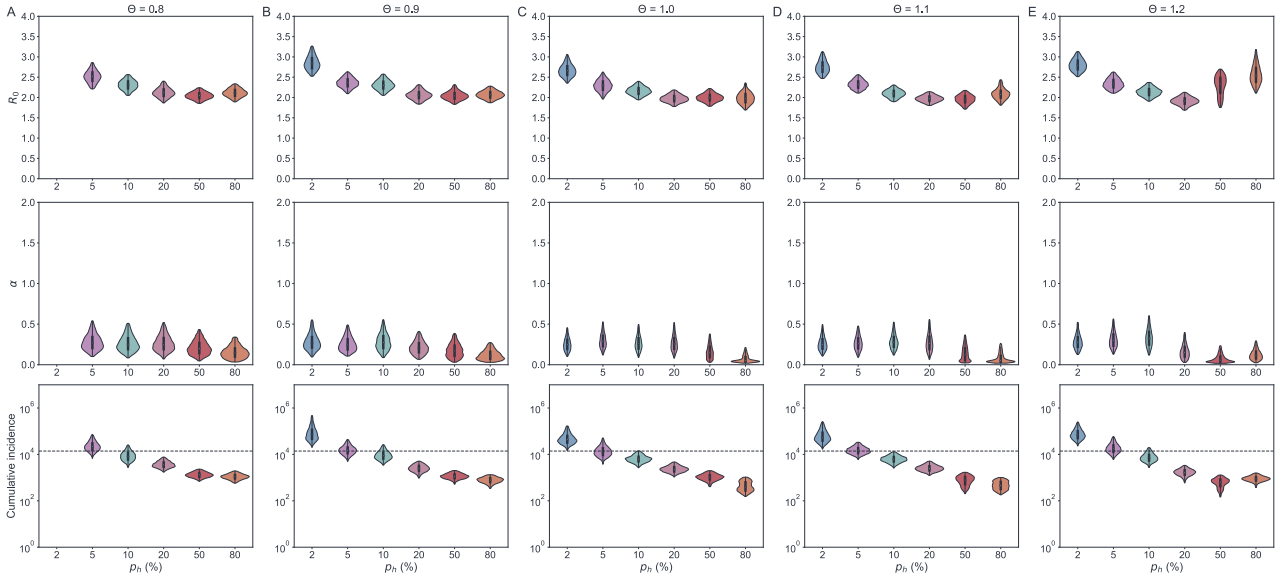
B



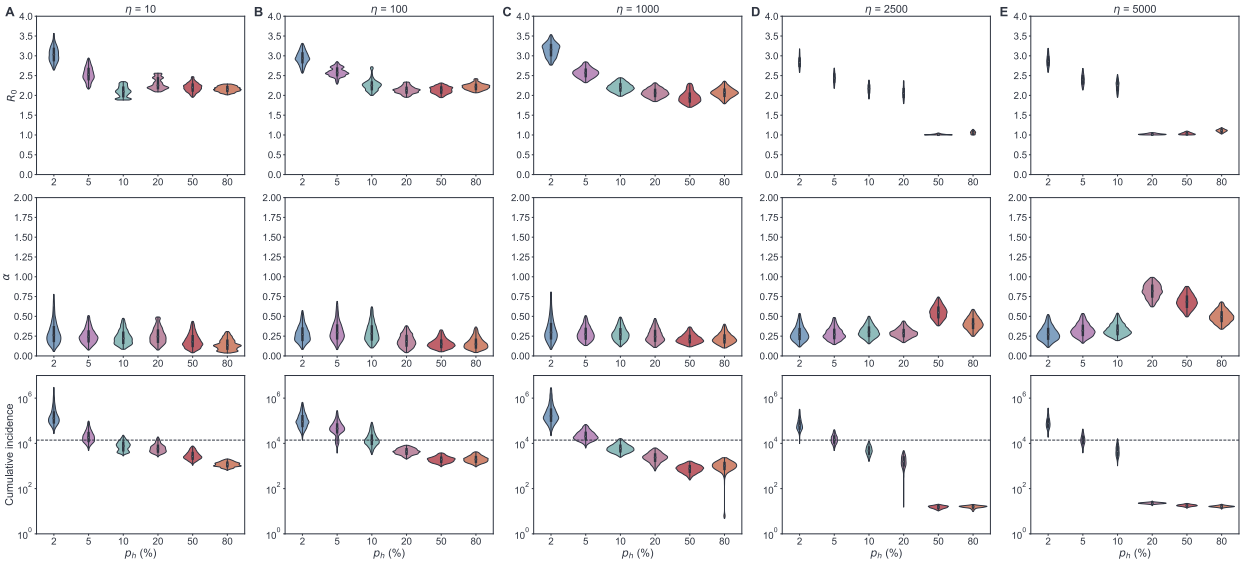
Supplementary Fig. 3. Distribution of importations into Israel. (A) Comparison of viral importations into Israel according to epidemiological data (the number of infected travelers reported) versus viral genetic data (inferred clade introductions). (B) Inferred proportion of clade introductions, by district within Israel. As in Figure S1, local transmissions were excluded from the analysis.



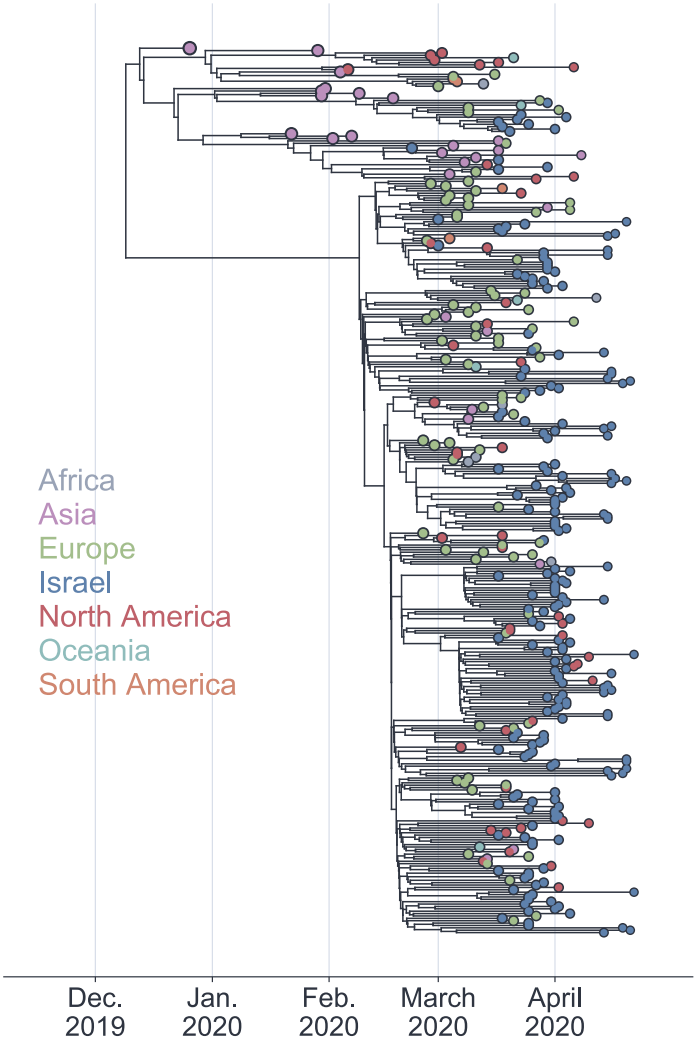
Supplementary Fig. 4. Compartmental model used in the phylodynamic analysis. Compartments shown in blue (S, E, I_h, I_l, R) represent classes of individuals within Israel. Compartment shown in red (Y) represents a single class of infected individuals outside of Israel. The transmission term within Israel is given by $\frac{\beta S(I_l+\tau I_h)}{N}$ where τ is a factor by which highly infectious individuals (I_h) are more infectious than those with lower infectiousness (I_l). The parameter p_h is the probability that an individual transition to the highly infectious (I_h) class. The parameter τ is given by $(\frac{1-p_h}{p_h})/(\frac{1}{0.8}-1)$, such that individuals in I_h are responsible for 80% of secondary infections. Infected individuals remain exposed for $\gamma_E^{-1} = 3$ days and remain infectious for $\gamma_I^{-1} = 5.5$ days. Exposed individuals migrate into and out of Israel at an overall rate of η, which we consider can change over time (discussed in more detail elsewhere in the text). Infected individuals in the exogenous reservoir (Y) reproduce at a per capita rate of ρ and individuals remain in this reservoir for and average of 8.5 days.



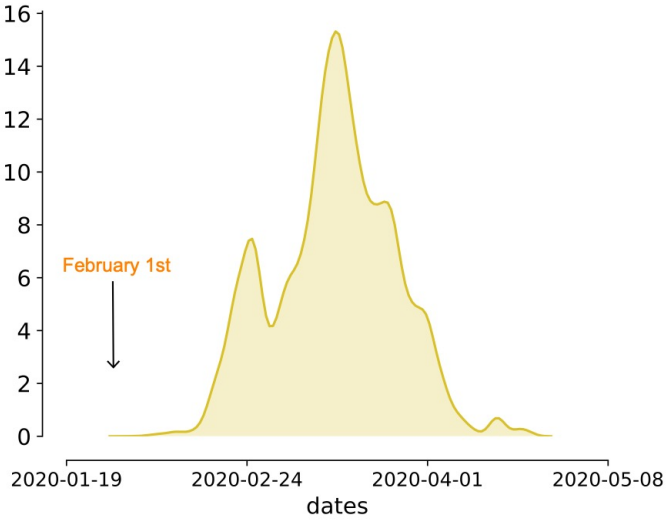
Supplementary Fig. 5. Sensitivity of phylodynamic analyses to the overall magnitude of the importation/exportation rate η. The parameter θ scales the importation/exportation rate $\eta(t)$ (see Methods). Estimated values of R_0, α, and cumulative incidence using the migration rate form based on phylogenetically-informed timing of clade introductions. Columns shown correspond to (A) θ = 0.8, (B) θ = 0.9, (C) θ = 1.0 (as shown in Figure 5), (D) θ = 1.1, (E) θ = 1.2. Horizontal dotted lines at N = 13,942 in the bottom row show the cumulative number of reported cases on April 22, 2020 as given by the ECDC. Only values which fall within the 95% highest posterior density (HPD) from the main MCMC chain are shown (total of 4,751 data points). Violin plots show the kernel density estimation of the underlying distribution. Median value is denoted by a white dot and the black bar in the center of the violin defines the interquartile range. The upper/lower adjacent values (the black line stretched from the bar) is defined as 1.5 times the width of the interquartile range past the first and third quartiles respectively. Density is only plotted over the range of observed values. Results for $p_h = 0.02,\ \theta = 0.8$ are excluded due to poor mixing of the MCMC chain for this set of parameters.



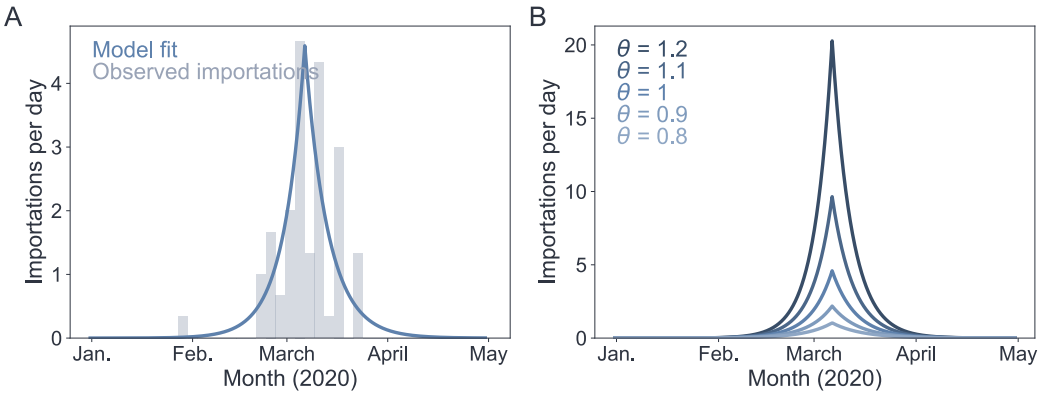
Supplementary Fig. 6. Sensitivity of phylodynamic analyses to the overall magnitude of the importation/exportation rate η, when η is assumed to be constant. Columns shown correspond to (A) η = 10 (B) η = 100, (C) η = 1000, (D) η = 2500, (E) η = 5000 . Horizontal dotted lines at N = 13,942 in the bottom row show the cumulative number of reported cases on April 22, 2020 as given by the ECDC. Only values which fall within the 95% highest posterior density (HPD) from the main MCMC chain are shown (total of 4,751 data points). Violin plots show the kernel density estimation of the underlying distribution. Median value is denoted by a white dot and the black bar in the center of the violin defines the interquartile range. The upper/lower adjacent values (the black line stretched from the bar) is defined as 1.5 times the width of the interquartile range past the first and third quartiles respectively. Density is only plotted over the range of observed values.



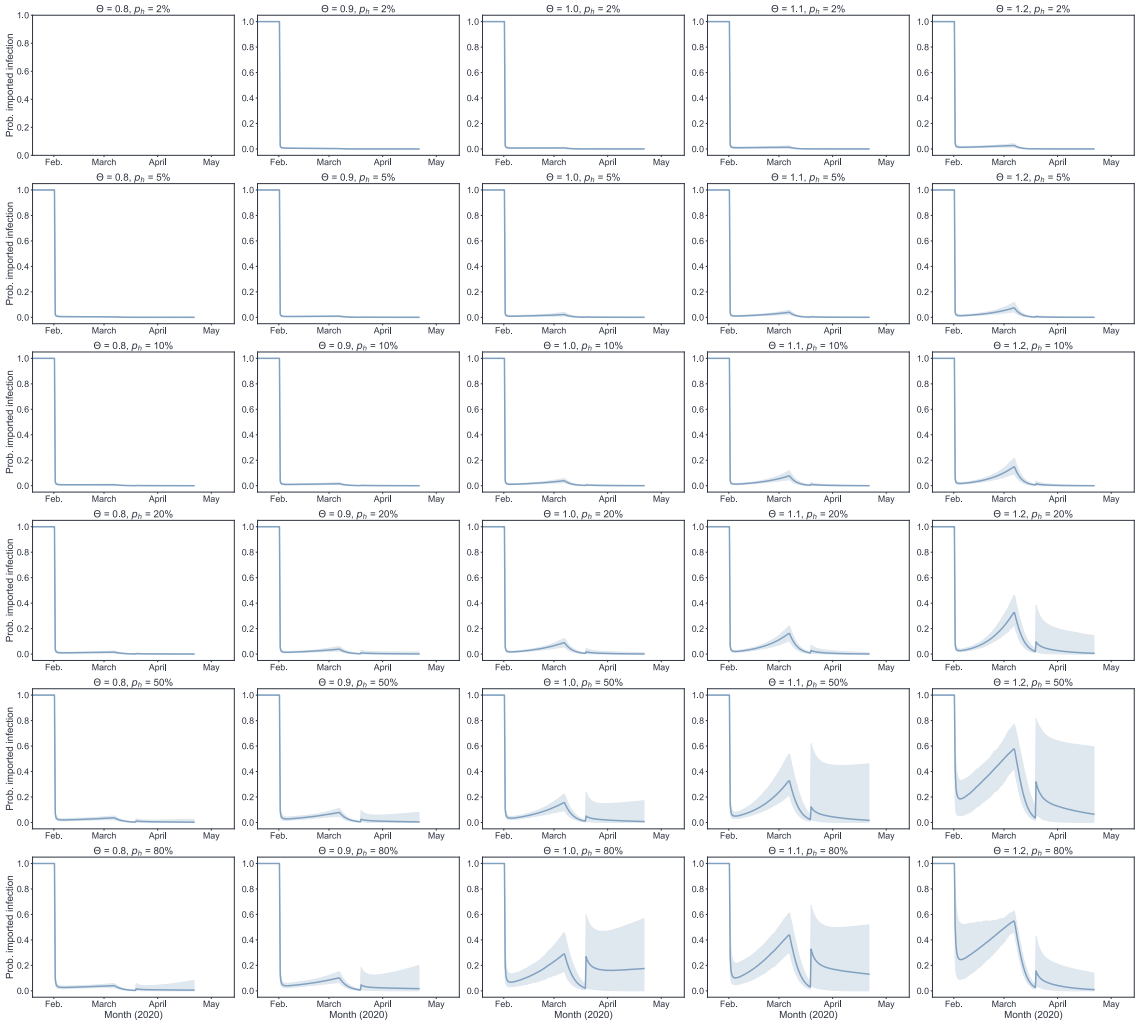
Supplementary Fig. 7. Time-aligned maximum clade credibility phylogeny. Phylogeny was estimated using both genetic and epidemiological parameters under an *SEIR* model implemented in BEAST2 and PhyDyn, under p_h = 5% and $\theta = 1.0$. Tips are colored by sampling location with Israel tips shown in blue.



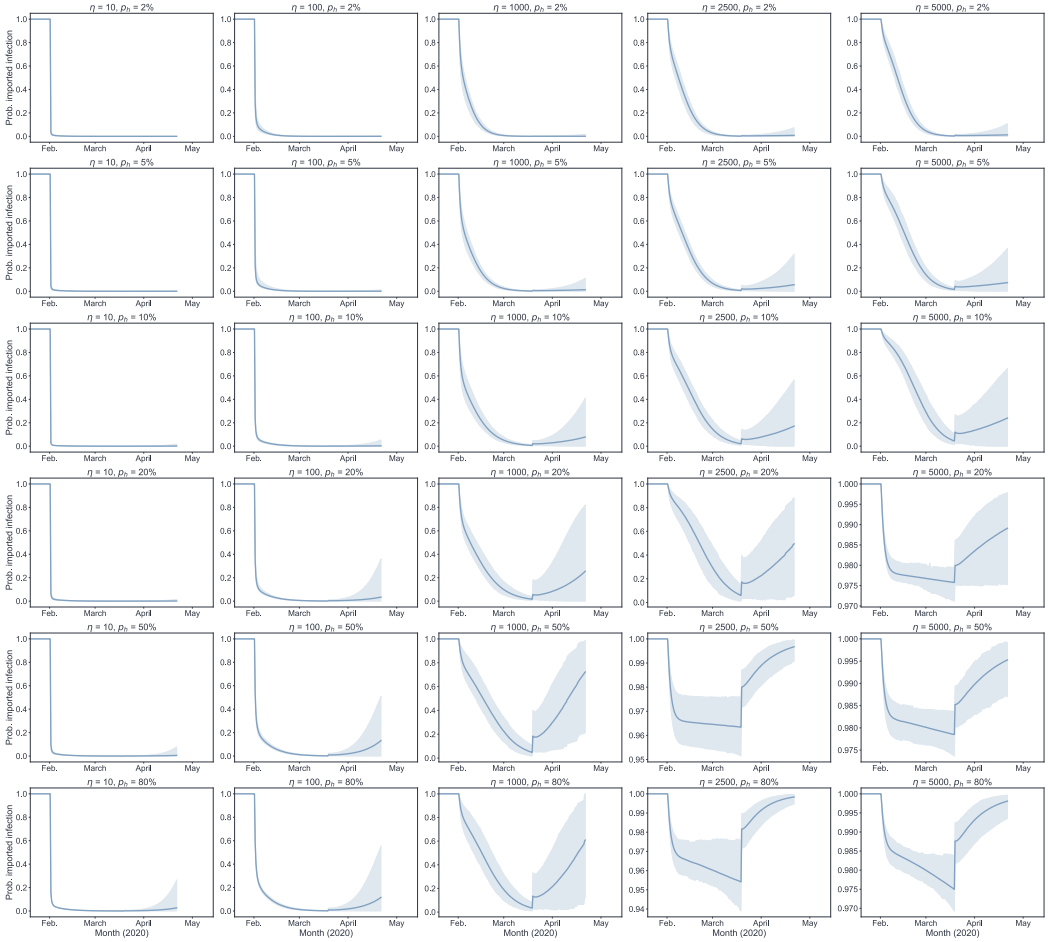
Supplementary Fig. 8. Distribution of importation dates into Israel. Density plot of all importation dates inferred from the phylogeny. Earliest importation is around February 1st (marked with an arrow). The highest peak of the distribution is around March 19th, ten days after the official date of airport closure (March 9th).



Supplementary Fig. 9. Distribution of importation dates into Israel assumed in our phylodynamic analysis. (A) Distribution of importation dates into Israel estimated using ancestral state reconstruction of a global phylogeny. Dates were grouped into non-overlapping three day windows and a piecewise exponential function fit to the data. (B) The growth and decay rates of the inferred importation curve were scaled by a range of θ values (0.8, 0.9, 1.0, 1.1, 1.2).



Supplementary Fig. 10. Probabilities of a new infection being due to importation rather than local infection under different magnitudes of the importation rate, assuming a functional form of η based on inferred timing of clade importations. Estimated state probabilities are shown across a range of θ (columns) and p_h (rows) values. Line represents the median estimate of the 95% HPD and shaded regions represent the limits of the 95% HPD. Results for $p_h = 0.02,\ \theta = 0.8$ are excluded due to poor mixing of the MCMC chain.



Supplementary Fig. 11. Probabilities of a new infection being due to importation rather than local infection under different magnitudes of the importation rate, assuming a constant η. Estimated state probabilities are shown across a range of η values (columns) and p_h values (rows). Line represents the median estimate of the 95% HPD and shaded regions represent the limits of the 95% HPD.

Supplementary Table 1: Global samples belonging to the S2430R clade that contain short unique deletions.

A sample was defined as belonging to the S2340R clade if it bore all 6 mutations that define the S2340R clade ('A20755C', 'A23403G', 'C1059T', 'C14408T', 'C3037T', 'G25563T'). The coordinates of the deletions are specified (coordinates based on the Wuhan ancestral sequences, see Methods), as is the country of origin of each sequence.

EPI_ID	deletion start	deletion end	deletion length	country
EPI_ISL_418202	26531	26531	1	USA
EPI_ISL_428377	510	518	9	USA
EPI_ISL_447362	3881	3898	18	Israel
EPI_ISL_447363	3881	3898	18	Israel
EPI_ISL_447377	28254	28254	1	Israel
EPI_ISL_447426	27387	27396	10	Israel
EPI_ISL_450084	23555	23582	28	USA
EPI_ISL_460096	29555	29602	48	Russia

Supplementary Table 2. Details of samples sequenced.

Sample ID	Ct E	Ct RdRp	Ct N	Ct average	Sex	Age	Date	Genome coverage	Geog. location of sample
1639953	28.5	30.5	32	30.18	M	10-19	26/3/20	0.996	North
1639996	23.1	24.4	26	24.45	M	20-29	26/3/20	0.996	North
2020038	22.5			22.46	F	50-59	17/3/20	0.994	Tel Aviv
2020051	30.9			30.87	M	40-49	17/3/20	0.976	Tel Aviv
2020063	28.4			28.39	F	20-29	17/3/20	0.985	Jerusalem
2020068	24.8			24.78	F	20-29	17/3/20	0.986	Jerusalem
2020069	28.2			28.24	F	30-39	17/3/20	0.987	Jerusalem
2020078	21.5			21.5	M	50-59	17/3/20	0.989	Jerusalem
2020084	24.9			24.87	M	60-69	17/3/20	0.994	Jerusalem
2020087	21.5			21.48	M	20-29	17/3/20	0.996	Jerusalem
2023920	18.6			18.56	M	40-49	17/3/20	0.996	Jerusalem
2023922	28			28	F	20-29	17/3/20	0.979	Jerusalem
2046129	23.1	24.2	27	24.88	M	20-29	31/3/20	0.996	North
2046171	29.6	30.8	33	31.24	F	50-59	31/3/20	0.954	North
2046434	19.5	20.6	24	21.28	F	50-59	1/4/20	0.996	North
2046548	28.5	31.1	34	31.01	M	40-49	1/4/20	0.991	North
2046614	24.4	26.2	28	26.24	F	30-39	2/4/20	0.996	North
2046616	20.5	22.3	25	22.47	F	70-79	2/4/20	0.996	North
2046815	13.8	16.5	18	16.08	F	80-89	4/4/20	0.994	North
2047004	23	24.5	27	24.81	M	30-39	27/3/20	0.996	North
2047011	28.5	30.2	32	30.24	M	20-29	26/3/20	0.952	North
2047016	25.7	26.7	29	26.99	F	0-9	26/3/20	0.996	North
2047145	10.3	11.8	15	12.38	F	30-39	26/3/20	0.996	North
2047188	13.6	15.3	18	15.48	M	20-29	26/3/20	0.996	North
2047189	9.75	11.7	14	11.87	M	20-29	26/3/20	0.996	North
2047364	20.8	22.8	25	22.68	F	60-69	28/3/20	0.996	North
2047392	27.6	29.9	31	29.42	F	30-39	29/3/20	0.966	North
2047418	24	25.4	28	25.67	M	0-9	29/3/20	0.996	North
2047567	26.8	28.7	31	28.97	F	30-39	29/3/20	0.978	North
2047586	22.8	24.1	27	24.71	F	20-29	29/3/20	0.996	North
2047604	22.7	24	26	24.32	M	50-59	29/3/20	0.996	North
2047738	20	22.1	25	22.21	M	10-19	30/3/20	0.996	North
2047749	19.3	20.7	23	21.03	F	40-49	30/3/20	0.996	North
2047772	23.8	25.7	26	25.3	F	30-39	30/3/20	0.996	North
2047883	21.1	22.9	25	22.87	M	60-69	31/3/20	0.996	North
2047927	32	33.7	36	33.74	F	60-69	31/3/20	0.918	North
2086001	28.4			28.4	F	10-19	1/4/20	0.988	Jerusalem
2086004	24.6			24.63	F	20-29	1/4/20	0.993	Jerusalem
2086008	20.2			20.24	M	90+	1/4/20	0.996	Jerusalem
2086012	24.4			24.39	M	20-29	1/4/20	0.988	Jerusalem
2086022	27.9			27.88	M	20-29	1/4/20	0.986	Jerusalem
2086033	28.8			28.79	F	60-69	1/4/20	0.991	Jerusalem
2086034	30			30.01	F	20-29	1/4/20	0.981	Jerusalem

2086045	20			19.99	M	50-59	1/4/20	0.996	Jerusalem
2089366	20.4			20.36	M	20-29	1/4/20	0.996	Jerusalem
2089368	25.6			25.62	M	60-69	1/4/20	0.985	Jerusalem
2089375	27.5			27.54	M	10-19	1/4/20	0.992	Jerusalem
2089380	30.1			30.14	F	60-69	1/4/20	0.979	Jerusalem
2089383	29.8			29.79	M	30-39	1/4/20	0.989	Jerusalem
2089697	28.3			28.27	F	20-29	1/4/20	0.989	Jerusalem
2089698	28.6			28.58	F	50-59	1/4/20	0.984	Jerusalem
2089712	25.5			25.52	M	20-29	1/4/20	0.989	Jerusalem
2089718	20.6			20.6	F	30-39	1/4/20	0.996	Jerusalem
2089723	28.6			28.55	M	30-39	1/4/20	0.992	Jerusalem
2089812	23.3			23.29	F	20-29	1/4/20	0.995	Jerusalem
2089839	25.5			25.5	M	60-69	1/4/20	0.989	Jerusalem
2089852	25.5			25.53	F	60-69	1/4/20	0.989	Jerusalem
2089861	18.3			18.31	M	70-79	1/4/20	0.996	Jerusalem
2089863	18.8			18.8	M	30-39	1/4/20	0.996	Jerusalem
2089866	20.7			20.7	M	30-39	1/4/20	0.996	Jerusalem
2099018	30.3			30.34	F	60-69	2/4/20	0.980	Jerusalem
2099019	27.5			27.48	M	20-29	2/4/20	0.992	Jerusalem
2099159	27.3			27.3	F	10-19	2/4/20	0.988	Jerusalem
2099251	23			22.98	F	20-29	2/4/20	0.996	Jerusalem
2099416	29			28.98	M	20-29	2/4/20	0.983	Jerusalem
2099421	20.5			20.45	M	50-59	2/4/20	0.996	Jerusalem
2107132	29.9			29.91	F	50-59	14/4/20	0.996	Jerusalem
2107137	19.6			19.6	F	10-19	14/4/20	0.996	Jerusalem
2107681	22.3			22.3	F	30-39	14/4/20	0.996	Jerusalem
2113155	25.6			25.55	M	0-9	15/4/20	0.996	Jerusalem
2113161	25.9			25.92	M	70-79	15/4/20	0.996	Jerusalem
2113173	29.8			29.78	M	10-19	15/4/20	0.996	Jerusalem
2113174	26.4			26.42	M	70-79	15/4/20	0.996	Tel Aviv
2113178	26.6			26.62	M	20-29	15/4/20	0.996	Jerusalem
2113255	29.1			29.14	F	60-69	14/4/20	0.994	Jerusalem
2113256	29.7			29.65	F	10-19	14/4/20	0.996	Jerusalem
2113601	25.1			25.07	M	0-9	15/4/20	0.996	Jerusalem
2113603	21.7			21.72	M	70-79	15/4/20	0.996	Jerusalem
2113678	29.8			29.78	M	0-9	15/4/20	0.996	Tel Aviv
2115701	26			25.96	F	10-19	16/4/20	0.996	Jerusalem
2115964	28.4			28.35	M	10-19	16/4/20	0.996	Tel Aviv
2115968	26.8			26.83	F	20-29	16/4/20	0.996	Tel Aviv
2115976	28.2			28.17	M	60-69	16/4/20	0.985	Tel Aviv
2115980	24.5			24.49	F	20-29	16/4/20	0.912	North
2115990	30.2			30.15	F	50-59	16/4/20	0.996	Jerusalem
2116859	29.6			29.6	F	10-19	20/4/20	0.953	Jerusalem
2123853	28.1			28.05	M	70-79	20/4/20	0.996	Jerusalem
2123863	27.5			27.47	M	80-89	20/4/20	0.996	Jerusalem
13075703	24	25.6	28	25.98	F	20-29	29/3/20	0.996	Tel Aviv
13075719	27.7	28.9	31	29.16	F	20-29	29/3/20	0.996	Tel Aviv
13075735	26.8	28.4	30	28.47	M	40-49	30/3/20	0.996	Tel Aviv
13075782	29.1	30.5	33	30.85	F	40-49	30/3/20	0.992	Tel Aviv

13075788	27.8	29.3	31	29.4	F	40-49	30/3/20	0.996	Tel Aviv
13075790	27.2	28.8	30	28.7	M	50-59	30/3/20	0.996	Tel Aviv
13075832	17.5	18.6	20	18.7	M	30-39	30/3/20	0.996	Tel Aviv
13075879	18.6	20	22	20.27	M	50-59	30/3/20	0.993	Tel Aviv
13075882	18.6	20.4	21	20.1	F	20-29	30/3/20	0.996	Tel Aviv
13075914	17.1	18.5	20	18.39	F	50-59	30/3/20	0.996	Tel Aviv
13077377	27	29	29	28.33	M	40-49	2/4/20	0.996	Tel Aviv
13077383	26	26	28	26.67	F	40-49	2/4/20	0.984	Jerusalem
13077413	24	25	26	25	M	70-79	3/4/20	0.996	Tel Aviv
13077494	28	29	31	29.33	M	20-29	2/4/20	0.856	South Coast
13077497	21	22	24	22.33	F	60-69	2/4/20	0.996	South Coast
13077498	17	18	21	18.67	M	20-29	3/4/20	0.996	South Coast
13077510	21	22	25	22.67	M	50-59	3/4/20	0.993	Jerusalem
13077511	25	26	28	26.33	M	20-29	3/4/20	0.986	Jerusalem
13077558	19	20	22	20.33	F	30-39	3/4/20	0.996	Tel Aviv
13077560	27	28	30	28.33	F	80-89	3/4/20	0.974	Tel Aviv
13077562	15	17	19	17	F	50-59	3/4/20	0.988	Tel Aviv
13077564	22	23	25	23.33	F	50-59	3/4/20	0.992	Tel Aviv
13077711	27	28	30	28.33	F	30-39	3/4/20	0.995	Tel Aviv
13077723	22	23	25	23.33	M	?	3/4/20	0.989	Tel Aviv
13077726	20	20	22	20.67	F	60-69	3/4/20	0.996	Tel Aviv
13077803	28	29	32	29.67	F	30-39	4/4/20	0.981	South Coast
13077823	15	17	19	17	F	10-19	4/4/20	0.996	South Coast
13077840	23	25	27	25	M	20-29	4/4/20	0.991	Jerusalem
13077846	19	20	23	20.67	F	0-9	4/4/20	0.996	Tel Aviv
13077847	24	26	27	25.67	M	10-19	4/4/20	0.986	Tel Aviv
13077875	18	19	21	19.33	F	40-49	4/4/20	0.996	Tel Aviv
13077882	24	26	27	25.67	M	40-49	4/4/20	0.987	Jerusalem
51137031				18.58	M	30-39	1/3/20	0.996	Tel Aviv
51137844				27.6	F	30-39	17/3/20	0.983	South
51140028				20.56	F	50-59	17/3/20	0.996	North
51140068				22.8	M	30-39	18/3/20	0.988	South
51140271				28.16	F	40-49	18/3/20	0.971	South Coast
51140279				25.76	F	20-29	18/3/20	0.976	South Coast
51140315				23.41	M	60-69	18/3/20	0.996	South
51140539				19.4	F	50-59	19/3/20	0.996	South
51140836				24.5	M	30-39	20/3/20	0.986	South
51141014				23.08	F	90+	22/3/20	0.996	South
51141121				29.05	M	70-79	22/3/20	0.989	South
51141225				18.58	F	40-49	22/3/20	0.996	South
51144342				25.59	M	90+	30/3/20	0.976	South
51145198				25.49	M	80-89	1/4/20	0.989	South
51145482				27.92	F	40-49	5/4/20	0.992	Tel Aviv
51146355				29.24	F	80-89	4/4/20	0.989	South
51146500				21.79	M	40-49	5/4/20	0.989	Tel Aviv
51146503				23.75	F	30-39	5/4/20	0.993	Jerusalem
51146669				24.41	M	10-19	5/4/20	0.994	Tel Aviv
51146683				24.8	M	10-19	5/4/20	0.965	Tel Aviv
130710062	28	28	28	28	M	40-49	14/4/20	0.991	Tel Aviv

130710067	23	24	24	23.67	M	60-69	14/4/20	0.996	Tel Aviv
130710097	29	31	32	30.67	M	70-79	15/4/20	0.996	Tel Aviv
130710099	33	33	34	33.33	M	60-69	15/4/20	0.979	Tel Aviv
130710157	20	21	24	21.67	M	70-79	15/4/20	0.996	Tel Aviv
130710159	27	28	29	28	F	80-89	15/4/20	0.990	Tel Aviv
130710211	18	19	20	19	F	70-79	16/4/20	0.996	Tel Aviv
130710217	22	23	26	23.67	M	50-59	16/4/20	0.996	Tel Aviv
130710390	28	29	30	29	F	30-39	17/4/20	0.996	Tel Aviv
130710414	20	21	22	21	M	20-29	17/4/20	0.996	Tel Aviv
130710643	31	31	31	31	M	40-49	19/4/20	0.986	Tel Aviv
130710644	29	30	31	30	F	80-89	19/4/20	0.985	Tel Aviv
130710716	30	31	31	30.67	F	60-69	19/4/20	0.989	Tel Aviv
130711082	18.5	20	22	20.17	F	60-69	20/4/20	0.996	Tel Aviv
130711104	27	29	29	28.33	F	80-89	20/4/20	0.993	Tel Aviv
130711112	31	32	31	31.33	F	80-89	21/4/20	0.991	Tel Aviv
130711116	25	27	25	25.67	F	60-69	21/4/20	0.996	Tel Aviv
130711367	29	27	27	27.67	F	60-69	22/4/20	0.996	North
130711417	32	31	30	31	M	60-69	22/4/20	0.974	Tel Aviv
701002313				27	M	50-59	21/3/20	0.996	South Coast
701002314				21	M	20-29	21/3/20	0.996	South Coast
701002317				25	M	50-59	21/3/20	0.996	South Coast
701002327				19	M	50-59	22/3/20	0.996	South Coast
701002334				21	M	70-79	22/3/20	0.996	South Coast
701002403				31	M	40-49	23/3/20	0.996	South Coast
701002407				27	M	40-49	23/3/20	0.959	South Coast
701002426				25	M	60-69	24/3/20	0.996	South Coast
701002431				18	M	20-29	24/3/20	0.996	South Coast
701002440				26	F	20-29	24/3/20	0.996	South Coast
701002442				18	M	30-39	24/3/20	0.996	South Coast
701002455				30	F	20-29	24/3/20	0.992	South Coast
701002456				30	F	60-69	24/3/20	0.980	South Coast
701002458				21	M	40-49	24/3/20	0.996	South Coast
701002462				21	M	70-79	24/3/20	0.996	South Coast
701002489				27	M	40-49	25/3/20	0.996	South Coast
701002504				21	M	70-79	25/3/20	0.996	South Coast
701002538				28	M	70-79	25/3/20	0.996	South Coast
701002540				21	F	40-49	25/3/20	0.996	South Coast
701002550				24	M	30-39	26/3/20	0.996	South Coast
701002555				23	F	40-49	26/3/20	0.996	South Coast
701002556				22	F	60-69	26/3/20	0.996	South Coast
701002561				28	M	50-59	26/3/20	0.996	South Coast
701002591				24	F	50-59	26/3/20	0.996	South Coast
701002666				26	M	40-49	26/3/20	0.996	South Coast
701002681				24	M	60-69	27/3/20	0.996	South Coast
701002752				27	M	10-19	28/3/20	0.987	South Coast
701002768				21	M	50-59	28/3/20	0.996	South Coast
701002786				27	M	60-69	29/3/20	0.996	South Coast
701002792				25	M	50-59	29/3/20	0.995	South Coast
990059202	26.9	28.4	27	27.4	M	60-69	25/3/20	0.996	South Coast

990059203	26.5	28.6	27	27.2	F	80-89	25/3/20	0.996	South Coast
990059204	28.4	30.1	28	28.97	F	30-39	25/3/20	0.976	South Coast
990059217	29.1	31.4	32	30.9	M	60-69	25/3/20	0.995	South Coast
990059230	26.5	29.7	29	28.5	F	0-9	25/3/20	0.972	South Coast
990059231	24.9	28	28	27	M	30-39	25/3/20	0.996	South Coast
990059232	24.5	26.7	28	26.3	M	10-19	25/3/20	0.996	South Coast
990059233	19.7	21.8	23	21.43	F	50-59	25/3/20	0.996	South Coast
990059237	28.3	30.6	32	30.23	F	0-9	25/3/20	0.989	South Coast
990059238	24.3	26.3	27	25.83	F	20-29	25/3/20	0.996	South Coast
990059244	27.9	30.8	31	29.97	F	?	25/3/20	0.938	South Coast
990059251	24.7	28	28	26.9	F	50-59	25/3/20	0.996	South Coast
990059252	24.4	26.8	28	26.27	F	20-29	25/3/20	0.996	South Coast
990300681	22.9	26.4	27	25.37	F	60-69	30/3/20	0.995	South Coast
990300691	29.3	31.7	32	31	M	20-29	31/3/20	0.970	South Coast
990300724	23.7	26.6	26	25.53	M	80-89	1/4/20	0.993	South Coast
990300860	19.3	21.9	0	20.6	M	20-29	2/4/20	0.996	South Coast
990307712	26	27.3	28	26.97	F	20-29	26/3/20	0.996	South Coast
990333068	30.1	32.7	34	32.13	M	60-69	24/3/20	0.963	South Coast
990333189	29.3	31.4	32	30.9	M	50-59	26/3/20	0.950	South Coast
990333193	20.7	22.6	24	22.43	F	40-49	26/3/20	0.996	South Coast
990333263	36.4	0	0	36.4	M	30-39	31/3/20	0.660	South Coast
990430264	29.3	31.7	33	31.17	F	40-49	29/3/20	0.970	South Coast
990430265	29.6	32.2	33	31.7	F	30-39	29/3/20	0.994	South Coast

Supplementary Table 3: Model parameter priors and estimated values (θ = 0.8)

		Posterior (Median (95% HPD))					
Parameter	**Prior**	p_h **= 0.02**	p_h **= 0.05**	p_h **= 0.10**	p_h **= 0.20**	p_h **= 0.50**	p_h **= 0.80**
Posterior			-46413 (-46465 -46358)	-46425 (-46483 -46357)	-46406 (-46469 -46343)	-46401 (-46462 -46347)	-46421 (-46481 -46360)
Tree height			0.377 (0.326 0.443)	0.384 (0.330 0.455)	0.367 (0.323 0.434)	0.356 (0.322 0.413)	0.358 (0.323 0.426)
Clock rate	Uniform(5.0e-4, 2.0e-3)		7.37e-04 (6.10e-04 8.83e-04)	7.36e-04 (6.07e-04 8.87e-04)	7.81e-04 (6.22e-04 9.26e-04)	8.09e-04 (6.84e-04 9.24e-04)	7.68e-04 (6.57e-04 8.87e-04)
κ	Lognormal(M=1.0, SD=1.25)		3.719 (3.111 4.484)	3.738 (3.076 4.463)	3.702 (3.028 4.422)	3.720 (3.125 4.499)	3.710 (3.061 4.444)
γ	Exponential(M=1.0)		3.51e-02 (1.05e-03 8.99e-02)	3.53e-02 (1.02e-03 8.85e-02)	3.90e-02 (1.08e-03 9.32e-02)	3.78e-02 (1.59e-03 8.75e-02)	3.71e-02 (1.01e-03 8.85e-02)
R_0	Lognormal(M=1.5, SD=0.5)		2.52 (2.21 2.86)	2.31 (2.05 2.56)	2.11 (1.87 2.40)	2.04 (1.86 2.24)	2.11 (1.89 2.33)
α	Uniform(0.0, 2.0)		0.27 (0.10 0.54)	0.25 (0.09 0.51)	0.25 (0.07 0.52)	0.20 (0.05 0.43)	0.15 (0.03 0.34)
E_{init}	Exponential(M=1.0)		12.06 (6.42 19.44)	10.19 (5.80 15.62)	8.80 (4.59 13.85)	4.60 (2.52 7.46)	3.25 (1.90 5.15)
Y_{init}	Exponential(M=1.0)		6.61e-03 (1.88e-03 1.64e-02)	6.72e-03 (2.34e-03 1.40e-02)	3.44e-03 (1.52e-03 1.49e-02)	2.89e-03 (1.87e-03 4.48e-03)	3.35e-03 (2.17e-03 6.23e-03)

Supplementary Table 4: Model parameter priors and estimated values (θ = 0.9)

		Posterior (Median (95% HPD))					
Parameter	**Prior**	**p_h = 0.02**	**p_h = 0.05**	**p_h = 0.10**	**p_h = 0.20**	**p_h = 0.50**	**p_h = 0.80**
Posterior		-46384 (-46439 -46323)	-46395 (-46458 -46334)	-46419 (-46473 -46363)	-46388 (-46454 -46326)	-46396 (-46466 -46335)	-46392 (-46451 -46325)
Tree height		0.361 (0.323 0.430)	0.370 (0.323 0.428)	0.380 (0.325 0.445)	0.362 (0.323 0.426)	0.360 (0.323 0.426)	0.360 (0.322 0.421)
Clock rate	Uniform(5.0e-4, 2.0e-3)	7.74e-04 (6.21e-04 8.97e-04)	7.84e-04 (6.63e-04 9.06e-04)	7.37e-04 (6.18e-04 8.63e-04)	8.13e-04 (6.91e-04 9.53e-04)	8.03e-04 (6.83e-04 9.24e-04)	7.98e-04 (6.94e-04 9.16e-04)
κ	Lognormal(M=1.0, SD=1.25)	3.738 (3.104 4.464)	3.743 (3.148 4.552)	3.704 (3.057 4.493)	3.694 (3.093 4.511)	3.732 (3.040 4.401)	3.712 (3.090 4.425)
γ	Exponential(M=1.0)	3.55e-02 (1.00e-03 8.73e-02)	3.80e-02 (1.16e-03 8.87e-02)	3.83e-02 (1.00e-03 8.83e-02)	3.55e-02 (1.01e-03 8.91e-02)	3.97e-02 (1.90e-03 8.98e-02)	3.84e-02 (1.02e-03 9.09e-02)
R_0	Lognormal(M=1.5, SD=0.5)	2.84 (2.52 3.26)	2.36 (2.10 2.63)	2.30 (2.05 2.57)	2.06 (1.84 2.31)	2.04 (1.83 2.31)	2.07 (1.87 2.28)
α	Uniform(0.0, 2.0)	0.27 (0.10 0.55)	0.24 (0.11 0.49)	0.27 (0.09 0.55)	0.21 (0.07 0.41)	0.17 (0.03 0.38)	0.11 (0.03 0.27)
E_{init}	Exponential(M=1.0)	12.47 (6.68 19.79)	15.30 (9.03 23.18)	10.47 (5.76 16.18)	8.42 (4.88 12.97)	4.27 (1.85 7.04)	2.90 (1.54 4.79)
Y_{init}	Exponential(M=1.0)	5.39e-03 (3.01e-03 1.23e-02)	4.56e-03 (2.50e-03 8.35e-03)	6.79e-03 (2.41e-03 1.45e-02)	3.26e-03 (1.70e-03 7.37e-03)	3.27e-03 (1.96e-03 5.16e-03)	3.35e-03 (2.24e-03 4.93e-03)

Supplementary Table 5: Model parameter priors and estimated values (θ = 1.0)

		Posterior (Median (95% HPD))					
Parameter	**Prior**	**p_h = 0.02**	**p_h = 0.05**	**p_h = 0.10**	**p_h = 0.20**	**p_h = 0.50**	**p_h = 0.80**
Posterior		-46363 (-46426 -46311)	-46370 (-46436 -46310)	-46392 (-46441 -46330)	-46374 (-46436 -46325)	-46396 (-46455 -46339)	-46347 (-46442 -46276)
Tree height		0.368 (0.323 0.437)	0.358 (0.323 0.429)	0.360 (0.322 0.420)	0.359 (0.322 0.414)	0.361 (0.323 0.420)	0.360 (0.323 0.420)
Clock rate	Uniform(5.0e-4, 2.0e-3)	8.01e-04 (6.49e-04 9.37e-04)	8.24e-04 (6.73e-04 9.97e-04)	7.87e-04 (6.82e-04 8.98e-04)	8.41e-04 (7.21e-04 9.55e-04)	7.98e-04 (6.82e-04 9.03e-04)	8.35e-04 (7.04e-04 9.62e-04)
κ	Lognormal(M=1.0, SD=1.25)	3.770 (3.041 4.455)	3.737 (3.055 4.444)	3.743 (3.099 4.500)	3.710 (2.982 4.388)	3.704 (3.087 4.432)	3.732 (3.067 4.526)
γ	Exponential(M=1.0)	3.76e-02 (1.01e-03 9.23e-02)	3.81e-02 (1.05e-03 9.01e-02)	3.79e-02 (1.10e-03 9.37e-02)	3.91e-02 (1.04e-03 8.88e-02)	3.89e-02 (1.14e-03 8.76e-02)	3.56e-02 (1.04e-03 8.58e-02)
R_0	Lognormal(M=1.5, SD=0.5)	2.66 (2.36 3.06)	2.29 (1.96 2.62)	2.16 (1.94 2.40)	1.97 (1.78 2.18)	1.99 (1.78 2.22)	1.98 (1.69 2.35)
α	Uniform(0.0, 2.0)	0.25 (0.10 0.45)	0.29 (0.12 0.53)	0.26 (0.09 0.50)	0.26 (0.08 0.52)	0.15 (0.03 0.38)	0.05 (0.02 0.21)
E_{init}	Exponential(M=1.0)	15.33 (7.65 24.34)	15.92 (7.50 26.28)	13.07 (7.63 19.05)	9.60 (5.76 13.70)	4.79 (2.82 7.16)	2.27 (0.44 3.94)
Y_{init}	Exponential(M=1.0)	5.77e-03 (2.51e-03 1.33e-02)	4.38e-03 (2.34e-03 9.65e-03)	4.56e-03 (2.70e-03 8.19e-03)	3.22e-03 (1.98e-03 5.29e-03)	3.64e-03 (2.42e-03 5.72e-03)	3.84e-03 (2.36e-03 5.96e-03)

Supplementary Table 6: Model parameter priors and estimated values (θ = 1.1)

		Posterior (Median (95% HPD))					
Parameter	**Prior**	**p_h = 0.02**	**p_h = 0.05**	**p_h = 0.10**	**p_h = 0.20**	**p_h = 0.50**	**p_h = 0.80**
Posterior		-46359 (-46429 -46296)	-46375 (-46426 -46320)	-46382 (-46434 -46333)	-46383 (-46439 -46335)	-46379 (-46444 -46298)	-46372 (-46434 -46305)
Tree height		0.394 (0.338 0.465)	0.375 (0.327 0.432)	0.371 (0.325 0.430)	0.363 (0.324 0.427)	0.362 (0.323 0.425)	0.369 (0.326 0.431)
Clock rate	Uniform(5.0e-4, 2.0e-3)	7.60e-04 (6.23e-04 8.93e-04)	7.83e-04 (6.87e-04 8.96e-04)	7.83e-04 (6.74e-04 9.16e-04)	8.10e-04 (6.85e-04 9.33e-04)	7.97e-04 (6.79e-04 9.12e-04)	7.72e-04 (6.74e-04 8.82e-04)
κ	Lognormal(M=1.0, SD=1.25)	3.741 (3.068 4.507)	3.739 (3.114 4.505)	3.708 (3.116 4.532)	3.704 (3.066 4.392)	3.733 (3.044 4.530)	3.765 (3.086 4.450)
γ	Exponential(M=1.0)	3.52e-02 (1.03e-03 8.89e-02)	3.61e-02 (1.02e-03 8.48e-02)	3.81e-02 (1.04e-03 8.99e-02)	3.60e-02 (1.07e-03 9.15e-02)	3.50e-02 (1.24e-03 8.81e-02)	3.51e-02 (1.02e-03 8.78e-02)
R_0	Lognormal(M=1.5, SD=0.5)	2.74 (2.47 3.13)	2.32 (2.11 2.56)	2.10 (1.90 2.31)	1.97 (1.80 2.14)	1.96 (1.71 2.17)	2.08 (1.81 2.44)
α	Uniform(0.0, 2.0)	0.25 (0.11 0.49)	0.26 (0.09 0.47)	0.28 (0.12 0.52)	0.26 (0.07 0.56)	0.12 (0.02 0.36)	0.05 (0.02 0.26)
E_{init}	Exponential(M=1.0)	14.42 (6.51 23.58)	17.19 (9.51 25.18)	16.01 (10.05 22.30)	10.34 (6.67 14.68)	4.15 (1.98 6.47)	1.77 (0.37 3.36)
Y_{init}	Exponential(M=1.0)	9.11e-03 (4.69e-03 1.67e-02)	6.40e-03 (3.83e-03 1.02e-02)	5.38e-03 (2.87e-03 8.66e-03)	4.64e-03 (2.82e-03 7.46e-03)	4.63e-03 (3.01e-03 6.83e-03)	6.03e-03 (3.66e-03 9.42e-03)

Supplementary Table 7: Model parameter priors and estimated values (θ = 1.2)

		Posterior (Median (95% HPD))					
Parameter	**Prior**	**p_h = 0.02**	**p_h = 0.05**	**p_h = 0.10**	**p_h = 0.20**	**p_h = 0.50**	**p_h = 0.80**
Posterior		-46351 (-46400 -46310)	-46378 (-46435 -46321)	-46385 (-46436 -46331)	-46355 (-46415 -46297)	-46346 (-46427 -46274)	-46406 (-46456 -46358)
Tree height		0.422 (0.368 0.488)	0.407 (0.354 0.474)	0.392 (0.337 0.456)	0.379 (0.329 0.437)	0.367 (0.327 0.422)	0.381 (0.338 0.437)
Clock rate	Uniform(5.0e-4, 2.0e-3)	7.46e-04 (6.52e-04 8.41e-04)	7.43e-04 (6.39e-04 8.65e-04)	7.60e-04 (6.55e-04 8.94e-04)	7.82e-04 (6.78e-04 9.09e-04)	7.52e-04 (6.44e-04 8.81e-04)	6.92e-04 (5.96e-04 8.01e-04)
κ	Lognormal(M=1.0, SD=1.25)	3.686 (3.062 4.395)	3.683 (3.043 4.458)	3.713 (3.091 4.422)	3.717 (3.029 4.462)	3.689 (3.012 4.392)	3.669 (3.016 4.399)
γ	Exponential(M=1.0)	3.88e-02 (1.13e-03 8.46e-02)	3.76e-02 (1.09e-03 8.78e-02)	3.67e-02 (1.04e-03 9.03e-02)	3.75e-02 (1.01e-03 9.39e-02)	3.61e-02 (1.31e-03 8.70e-02)	3.73e-02 (1.12e-03 9.24e-02)
R_0	Lognormal(M=1.5, SD=0.5)	2.80 (2.51 3.13)	2.33 (2.11 2.62)	2.14 (1.91 2.37)	1.91 (1.69 2.13)	2.33 (1.75 2.70)	2.54 (2.11 3.18)
α	Uniform(0.0, 2.0)	0.27 (0.13 0.52)	0.30 (0.13 0.56)	0.32 (0.12 0.60)	0.15 (0.03 0.40)	0.06 (0.02 0.23)	0.12 (0.02 0.29)
E_{init}	Exponential(M=1.0)	13.47 (6.82 21.96)	17.31 (9.80 26.52)	14.30 (8.12 21.25)	10.54 (6.14 15.98)	0.98 (0.28 3.87)	0.60 (0.04 1.83)
Y_{init}	Exponential(M=1.0)	1.38e-02 (9.24e-03 1.98e-02)	1.15e-02 (6.26e-03 1.91e-02)	8.82e-03 (4.80e-03 1.35e-02)	7.10e-03 (3.68e-03 1.08e-02)	8.02e-03 (4.16e-03 1.41e-02)	9.90e-03 (5.60e-03 1.88e-02)

Supplementary Table 8: Model parameter priors and estimated values (η = 10)

		Posterior (Median (95% HPD))					
Parameter	**Prior**	**p_h = 0.02**	**p_h = 0.05**	**p_h = 0.10**	**p_h = 0.20**	**p_h = 0.50**	**p_h = 0.80**
Posterior		-46404 (-46444 -46360)	-46403 (-46459 -46341)	-46376 (-46428 -46302)	-46318 (-46398 -46257)	-46355 (-46406 -46301)	-46344 (-46384 -46299)
Tree height		0.394 (0.344 0.448)	0.377 (0.330 0.438)	0.407 (0.357 0.453)	0.445 (0.387 0.500)	0.473 (0.419 0.529)	0.450 (0.403 0.496)
Clock rate	Uniform(5.0e-4, 2.0e-3)	6.75e-04 (5.60e-04 7.81e-04)	7.29e-04 (5.81e-04 8.75e-04)	6.62e-04 (5.68e-04 7.53e-04)	6.16e-04 (5.34e-04 6.91e-04)	5.46e-04 (5.00e-04 6.20e-04)	6.31e-04 (5.66e-04 7.05e-04)
κ	Lognormal(M=1.0, SD=1.25)	3.709 (3.074 4.455)	3.746 (3.119 4.534)	3.727 (3.068 4.507)	3.718 (3.045 4.478)	3.694 (3.139 4.518)	3.683 (3.090 4.525)
γ	Exponential(M=1.0)	3.56e-02 (1.10e-03 8.78e-02)	3.37e-02 (1.28e-03 8.77e-02)	3.76e-02 (1.03e-03 9.27e-02)	3.76e-02 (1.00e-03 8.98e-02)	3.46e-02 (1.23e-03 8.77e-02)	3.57e-02 (1.64e-03 9.15e-02)
R_0	Lognormal(M=1.5, SD=0.5, MIN=1.0)	3.03 (2.64 3.56)	2.52 (2.16 2.94)	2.09 (1.88 2.35)	2.25 (2.09 2.56)	2.20 (1.96 2.47)	2.16 (2.02 2.29)
α	Uniform(0.0, 2.0)	0.26 (0.06 0.78)	0.24 (0.08 0.51)	0.22 (0.08 0.47)	0.24 (0.08 0.49)	0.18 (0.04 0.44)	0.14 (0.04 0.31)
E_{init}	Exponential(M=1.0)	11.29 (5.93 18.48)	10.61 (5.33 17.85)	21.86 (17.25 25.48)	8.13 (4.73 12.73)	5.59 (3.58 8.27)	3.12 (2.83 3.66)
Y_{init}	Exponential(M=1.0)	1.14e-02 (4.64e-03 2.60e-02)	7.76e-03 (2.49e-03 2.41e-02)	1.38e-02 (6.91e-03 2.49e-02)	3.29e-02 (1.32e-02 7.50e-02)	6.82e-02 (2.18e-02 1.74e-01)	4.82e-02 (2.75e-02 8.72e-02)

Supplementary Table 9: Model parameter priors and estimated values (η = 100)

		Posterior (Median (95% HPD))					
Parameter	**Prior**	**p_h = 0.02**	**p_h = 0.05**	**p_h = 0.10**	**p_h = 0.20**	**p_h = 0.50**	**p_h = 0.80**
Posterior		-46392 (-46447 -46341)	-46339 (-46399 -46293)	-46389 (-46435 -46316)	-46373 (-46436 -46321)	-46379 (-46424 -46334)	-46379 (-46431 -46324)
Tree height		0.375 (0.329 0.431)	0.435 (0.338 0.494)	0.398 (0.344 0.483)	0.397 (0.343 0.460)	0.421 (0.362 0.488)	0.471 (0.410 0.544)
Clock rate	Uniform(5.0e-4, 2.0e-3)	7.06e-04 (5.94e-04 8.61e-04)	6.03e-04 (5.17e-04 8.14e-04)	6.20e-04 (5.00e-04 7.27e-04)	6.33e-04 (5.42e-04 7.35e-04)	6.04e-04 (5.12e-04 6.88e-04)	5.38e-04 (5.00e-04 5.97e-04)
κ	Lognormal(M=1.0, SD=1.25)	3.699 (3.055 4.405)	3.718 (3.009 4.404)	3.724 (3.077 4.515)	3.739 (3.098 4.454)	3.691 (2.991 4.433)	3.703 (3.061 4.438)
γ	Exponential(M=1.0)	3.50e-02 (1.03e-03 8.47e-02)	3.59e-02 (1.39e-03 8.92e-02)	3.53e-02 (1.06e-03 8.63e-02)	3.72e-02 (1.14e-03 8.99e-02)	3.52e-02 (1.27e-03 9.11e-02)	3.39e-02 (1.03e-03 8.23e-02)
R_0	Lognormal(M=1.5, SD=0.5, MIN=1.0)	2.94 (2.57 3.31)	2.57 (2.29 2.85)	2.25 (2.00 2.72)	2.13 (1.95 2.34)	2.14 (1.95 2.31)	2.22 (2.07 2.42)
α	Uniform(0.0, 2.0)	0.27 (0.08 0.57)	0.29 (0.08 0.69)	0.28 (0.10 0.62)	0.18 (0.04 0.38)	0.15 (0.05 0.33)	0.15 (0.04 0.37)
E_{init}	Exponential(M=1.0)	11.22 (6.25 17.19)	18.17 (8.53 24.04)	19.96 (16.05 25.55)	11.80 (7.88 14.31)	5.33 (4.11 6.61)	4.17 (3.75 4.71)
Y_{init}	Exponential(M=1.0)	8.85e-03 (2.72e-03 2.13e-02)	4.56e-02 (2.61e-03 1.35e-01)	1.78e-02 (5.16e-03 1.12e-01)	1.57e-02 (3.12e-03 5.08e-02)	2.84e-02 (8.84e-03 8.63e-02)	9.58e-02 (3.68e-02 2.90e-01)

Supplementary Table 10: Model parameter priors and estimated values (η = 1000)

		Posterior (Median (95% HPD))					
Parameter	**Prior**	**p_h = 0.02**	**p_h = 0.05**	**p_h = 0.10**	**p_h = 0.20**	**p_h = 0.50**	**p_h = 0.80**
Posterior		-46378 (-46419 -46325)	-46356 (-46409 -46309)	-46361 (-46414 -46297)	-46373 (-46435 -46296)	-46405 (-46464 -46317)	-46481 (-46545 -46395)
Tree height		0.365 (0.336 0.400)	0.351 (0.325 0.380)	0.337 (0.323 0.366)	0.338 (0.323 0.358)	0.335 (0.322 0.350)	0.342 (0.322 0.366)
Clock rate	Uniform(5.0e-4, 2.0e-3)	6.80e-04 (5.94e-04 8.04e-04)	7.55e-04 (6.50e-04 8.52e-04)	7.89e-04 (6.73e-04 9.25e-04)	7.82e-04 (6.59e-04 9.04e-04)	7.63e-04 (6.65e-04 8.81e-04)	6.63e-04 (5.53e-04 7.97e-04)
κ	Lognormal(M=1.0, SD=1.25)	3.732 (3.088 4.535)	3.710 (3.079 4.476)	3.737 (3.064 4.491)	3.724 (3.049 4.480)	3.719 (3.081 4.480)	3.726 (3.053 4.414)
γ	Exponential(M=1.0)	3.53e-02 (1.00e-03 9.50e-02)	3.64e-02 (1.28e-03 9.05e-02)	3.56e-02 (1.12e-03 8.55e-02)	3.40e-02 (1.12e-03 8.97e-02)	3.71e-02 (1.07e-03 8.64e-02)	3.57e-02 (1.11e-03 8.62e-02)
R_0	Lognormal(M=1.5, SD=0.5, MIN=1.0)	3.15 (2.77 3.53)	2.57 (2.32 2.84)	2.20 (1.98 2.44)	2.06 (1.84 2.32)	1.94 (1.70 2.30)	2.07 (1.79 2.36)
α	Uniform(0.0, 2.0)	0.30 (0.08 0.81)	0.27 (0.13 0.51)	0.27 (0.12 0.49)	0.24 (0.11 0.47)	0.21 (0.12 0.36)	0.21 (0.10 0.40)
E_{init}	Exponential(M=1.0)	8.41 (5.17 14.35)	8.98 (5.18 13.40)	10.20 (5.42 16.84)	7.38 (4.43 10.23)	3.96 (1.25 6.39)	3.43 (0.78 5.47)
Y_{init}	Exponential(M=1.0)	1.18e-02 (6.39e-03 2.03e-02)	8.61e-03 (4.53e-03 1.44e-02)	5.91e-03 (3.89e-03 1.05e-02)	5.87e-03 (3.52e-03 1.00e-02)	6.36e-03 (4.12e-03 9.45e-03)	8.74e-03 (4.48e-03 1.69e-02)

Supplementary Table 11: Model parameter priors and estimated values (η = 2500)

		Posterior (Median (95% HPD))					
Parameter	**Prior**	**p_h = 0.02**	**p_h = 0.05**	**p_h = 0.10**	**p_h = 0.20**	**p_h = 0.50**	**p_h = 0.80**
Posterior		-46338 (-46385 -46296)	-46323 (-46371 -46275)	-46335 (-46400 -46275)	-46335 (-46412 -46262)	-46452 (-46525 -46388)	-46448 (-46510 -46390)
Tree height		0.348 (0.326 0.369)	0.341 (0.323 0.362)	0.340 (0.323 0.366)	0.340 (0.325 0.359)	0.417 (0.391 0.443)	0.417 (0.391 0.444)
Clock rate	Uniform(5.0e-4, 2.0e-3)	7.70e-04 (6.52e-04 8.90e-04)	7.81e-04 (6.84e-04 8.94e-04)	7.82e-04 (6.62e-04 9.20e-04)	7.68e-04 (6.39e-04 8.91e-04)	5.19e-04 (5.00e-04 5.79e-04)	5.15e-04 (5.00e-04 5.54e-04)
κ	Lognormal(M=1.0, SD=1.25)	3.739 (3.015 4.377)	3.721 (3.105 4.471)	3.713 (3.055 4.429)	3.686 (3.076 4.435)	3.681 (3.046 4.429)	3.688 (2.975 4.359)
γ	Exponential(M=1.0)	3.53e-02 (1.17e-03 8.13e-02)	3.56e-02 (1.05e-03 9.57e-02)	3.78e-02 (1.01e-03 9.14e-02)	3.79e-02 (1.23e-03 9.21e-02)	3.68e-02 (1.02e-03 9.42e-02)	3.75e-02 (1.08e-03 8.69e-02)
R_0	Lognormal(M=1.5, SD=0.5, MIN=1.0)	2.83 (2.58 3.17)	2.44 (2.18 2.69)	2.17 (1.91 2.38)	2.05 (1.79 2.37)	1.01 (1.00 1.05)	1.06 (1.00 1.14)
α	Uniform(0.0, 2.0)	0.27 (0.11 0.54)	0.27 (0.14 0.48)	0.30 (0.15 0.50)	0.29 (0.17 0.44)	0.55 (0.38 0.74)	0.41 (0.25 0.59)
E_{init}	Exponential(M=1.0)	10.88 (6.51 15.44)	10.56 (6.93 15.36)	9.31 (4.64 13.16)	4.80 (2.38 8.79)	2.01 (1.40 2.63)	1.82 (1.27 2.39)
Y_{init}	Exponential(M=1.0)	1.46e-02 (8.50e-03 2.38e-02)	1.10e-02 (6.63e-03 1.60e-02)	1.01e-02 (5.00e-03 1.75e-02)	9.90e-03 (5.06e-03 1.87e-02)	8.67e-02 (4.53e-02 1.38e-01)	9.12e-02 (5.60e-02 1.36e-01)

Supplementary Table 12: Model parameter priors and estimated values (η = 5000)

		Posterior (Median (95% HPD))					
Parameter	**Prior**	**p_h = 0.02**	**p_h = 0.05**	**p_h = 0.10**	**p_h = 0.20**	**p_h = 0.50**	**p_h = 0.80**
Posterior		-46335 (-46377 -46289)	-46327 (-46379 -46279)	-46326 (-46382 -46263)	-46306 (-46363 -46253)	-46365 (-46424 -46315)	-46428 (-46478 -46380)
Tree height		0.355 (0.327 0.381)	0.348 (0.328 0.370)	0.344 (0.326 0.364)	0.444 (0.425 0.466)	0.436 (0.412 0.464)	0.439 (0.414 0.463)
Clock rate	Uniform(5.0e-4, 2.0e-3)	7.21e-04 (6.21e-04 8.30e-04)	7.66e-04 (6.57e-04 8.80e-04)	7.87e-04 (6.71e-04 9.08e-04)	5.07e-04 (5.00e-04 5.30e-04)	5.07e-04 (5.00e-04 5.29e-04)	5.05e-04 (5.00e-04 5.22e-04)
κ	Lognormal(M=1.0, SD=1.25)	3.712 (3.017 4.416)	3.726 (3.050 4.425)	3.725 (3.073 4.472)	3.696 (3.057 4.427)	3.682 (3.055 4.400)	3.700 (3.058 4.495)
γ	Exponential(M=1.0)	3.96e-02 (1.12e-03 9.39e-02)	3.38e-02 (1.15e-03 8.39e-02)	3.49e-02 (1.26e-03 8.90e-02)	3.69e-02 (1.16e-03 9.11e-02)	3.67e-02 (1.02e-03 8.53e-02)	3.47e-02 (1.01e-03 8.95e-02)
R_0	Lognormal(M=1.5, SD=0.5, MIN=1.0)	2.86 (2.58 3.19)	2.39 (2.14 2.68)	2.25 (1.95 2.52)	1.02 (1.00 1.06)	1.03 (1.00 1.09)	1.11 (1.03 1.18)
α	Uniform(0.0, 2.0)	0.27 (0.11 0.52)	0.32 (0.16 0.54)	0.32 (0.19 0.54)	0.82 (0.62 0.99)	0.68 (0.49 0.88)	0.49 (0.34 0.68)
E_{init}	Exponential(M=1.0)	11.61 (6.50 17.27)	10.88 (4.52 17.09)	5.95 (2.84 9.63)	2.55 (2.12 2.82)	2.04 (1.51 2.60)	1.57 (1.14 2.10)
Y_{init}	Exponential(M=1.0)	2.22e-02 (1.37e-02 3.43e-02)	1.79e-02 (9.95e-03 2.86e-02)	1.27e-02 (8.02e-03 1.83e-02)	1.65e-01 (1.09e-01 2.48e-01)	1.49e-01 (9.60e-02 2.29e-01)	1.49e-01 (9.54e-02 2.21e-01)

Supplementary Table 13. Sequencing primer list

name	seq	length
nCoV-2019_1_LEFT	ACCAACCAACTTTCGATCTCTTGT	24
nCoV-2019_1_RIGHT	CATCTTTAAGATGTTGACGTGCCTC	25
nCoV-2019_2_LEFT	CTGTTTTACAGGTTCGCGACGT	22
nCoV-2019_2_RIGHT	TAAGGATCAGTGCCAAGCTCGT	22
nCoV-2019_3_LEFT	CGGTAATAAAGGAGCTGGTGGC	22
nCoV-2019_3_RIGHT	AAGGTGTCTGCAATTCATAGCTCT	24
nCoV-2019_4_LEFT	GGTGTATACTGCTGCCGTGAAC	22
nCoV-2019_4_RIGHT	CACAAGTAGTGGCACCTTCTTTAGT	25
nCoV-2019_5_LEFT	TGGTGAAACTTCATGGCAGACG	22
nCoV-2019_5_RIGHT	ATTGATGTTGACTTTCTCTTTTTGGAGT	28
nCoV-2019_6_LEFT	GGTGTTGTTGGAGAAGGTTCCG	22
nCoV-2019_6_RIGHT	TAGCGGCCTTCTGTAAAACACG	22
nCoV-2019_7_LEFT	ATCAGAGGCTGCTCGTGTTGTA	22
nCoV-2019_7_LEFT_alt0	CATTTGCATCAGAGGCTGCTCG	22
nCoV-2019_7_RIGHT	TGCACAGGTGACAATTTGTCCA	22
nCoV-2019_7_RIGHT_alt5	AGGTGACAATTTGTCCACCGAC	22
nCoV-2019_8_LEFT	AGAGTTTCTTAGAGACGGTTGGGA	24
nCoV-2019_8_RIGHT	GCTTCAACAGCTTCACTAGTAGGT	24
nCoV-2019_9_LEFT	TCCCACAGAAGTGTTAACAGAGGA	24
nCoV-2019_9_LEFT_alt4	TTCCCACAGAAGTGTTAACAGAGG	24
nCoV-2019_9_RIGHT	ATGACAGCATCTGCCACAACAC	22
nCoV-2019_9_RIGHT_alt2	GACAGCATCTGCCACAACACAG	22
nCoV-2019_10_LEFT	TGAGAAGTGCTCTGCCTATACAGT	24
nCoV-2019_10_RIGHT	TCATCTAACCAATCTTCTTCTTGCTCT	27
nCoV-2019_11_LEFT	GGAATTTGGTGCCACTTCTGCT	22
nCoV-2019_11_RIGHT	TCATCAGATTCAACTTGCATGGCA	24
nCoV-2019_12_LEFT	AAACATGGAGGAGGTGTTGCAG	22
nCoV-2019_12_RIGHT	TTCACTCTTCATTTCCAAAAAGCTTGA	27
nCoV-2019_13_LEFT	TCGCACAAATGTCTACTTAGCTGT	24
nCoV-2019_13_RIGHT	ACCACAGCAGTTAAAACACCCT	22
nCoV-2019_14_LEFT	CATCCAGATTCTGCCACTCTTGT	23
nCoV-2019_14_LEFT_alt4	TGGCAATCTTCATCCAGATTCTGC	24
nCoV-2019_14_RIGHT	AGTTTCCACACAGACAGGCATT	22
nCoV-2019_14_RIGHT_alt2	TGCGTGTTTCTTCTGCATGTGC	22
nCoV-2019_15_LEFT	ACAGTGCTTAAAAAGTGTAAAAGTGCC	27
nCoV-2019_15_LEFT_alt1	AGTGCTTAAAAAGTGTAAAAGTGCCT	26
nCoV-2019_15_RIGHT	AACAGAAACTGTAGCTGGCACT	22
nCoV-2019_15_RIGHT_alt3	ACTGTAGCTGGCACTTTGAGAGA	23
nCoV-2019_16_LEFT	AATTTGGAAGAAGCTGCTCGGT	22
nCoV-2019_16_RIGHT	CACAACTTGCGTGTGGAGGTTA	22
nCoV-2019_17_LEFT	CTTCTTTCTTTGAGAGAAGTGAGGACT	27
nCoV-2019_17_RIGHT	TTTGTTGGAGTGTTAACAATGCAGT	25
nCoV-2019_18_LEFT	TGGAAATACCCACAAGTTAATGGTTTAAC	29
nCoV-2019_18_LEFT_alt2	ACTTCTATTAAATGGGCAGATAACAACTGT	30
nCoV-2019_18_RIGHT	AGCTTGTTTACCACACGTACAAGG	24

nCoV-2019_18_RIGHT_alt1	GCTTGTTTACCACACGTACAAGG	23
nCoV-2019_19_LEFT	GCTGTTATGTACATGGGCACACT	23
nCoV-2019_19_RIGHT	TGTCCAACTTAGGGTCAATTTCTGT	25
nCoV-2019_20_LEFT	ACAAAGAAAACAGTTACACAACAACCA	27
nCoV-2019_20_RIGHT	ACGTGGCTTTATTAGTTGCATTGTT	25
nCoV-2019_21_LEFT	TGGCTATTGATTATAAACACTACACACCC	29
nCoV-2019_21_LEFT_alt2	GGCTATTGATTATAAACACTACACACCCT	29
nCoV-2019_21_RIGHT	TAGATCTGTGTGGCCAACCTCT	22
nCoV-2019_21_RIGHT_alt0	GATCTGTGTGGCCAACCTCTTC	22
nCoV-2019_22_LEFT	ACTACCGAAGTTGTAGGAGACATTATACT	29
nCoV-2019_22_RIGHT	ACAGTATTCTTTGCTATAGTAGTCGGC	27
nCoV-2019_23_LEFT	ACAACTACTAACATAGTTACACGGTGT	27
nCoV-2019_23_RIGHT	ACCAGTACAGTAGGTTGCAATAGTG	25
nCoV-2019_24_LEFT	AGGCATGCCTTCTTACTGTACTG	23
nCoV-2019_24_RIGHT	ACATTCTAACCATAGCTGAAATCGGG	26
nCoV-2019_25_LEFT	GCAATTGTTTTTCAGCTATTTTGCAGT	27
nCoV-2019_25_RIGHT	ACTGTAGTGACAAGTCTCTCGCA	23
nCoV-2019_26_LEFT	TTGTGATACATTCTGTGCTGGTAGT	25
nCoV-2019_26_RIGHT	TCCGCACTATCACCAACATCAG	22
nCoV-2019_27_LEFT	ACTACAGTCAGCTTATGTGTCAACC	25
nCoV-2019_27_RIGHT	AATACAAGCACCAAGGTCACGG	22
nCoV-2019_28_LEFT	ACATAGAAGTTACTGGCGATAGTTGT	26
nCoV-2019_28_RIGHT	TGTTTAGACATGACATGAACAGGTGT	26
nCoV-2019_29_LEFT	ACTTGTGTTCCTTTTTGTTGCTGC	24
nCoV-2019_29_RIGHT	AGTGTACTCTATAAGTTTTGATGGTGTGT	29
nCoV-2019_30_LEFT	GCACAACTAATGGTGACTTTTTGCA	25
nCoV-2019_30_RIGHT	ACCACTAGTAGATACACAAACACCAG	26
nCoV-2019_31_LEFT	TTCTGAGTACTGTAGGCACGGC	22
nCoV-2019_31_RIGHT	ACAGAATAAACACCAGGTAAGAATGAGT	28
nCoV-2019_32_LEFT	TGGTGAATACAGTCATGTAGTTGCC	25
nCoV-2019_32_RIGHT	AGCACATCACTACGCAACTTTAGA	24
nCoV-2019_33_LEFT	ACTTTTGAAGAAGCTGCGCTGT	22
nCoV-2019_33_RIGHT	TGGACAGTAAACTACGTCATCAAGC	25
nCoV-2019_34_LEFT	TCCCATCTGGTAAAGTTGAGGGT	23
nCoV-2019_34_RIGHT	AGTGAAATTGGGCCTCATAGCA	22
nCoV-2019_35_LEFT	TGTTCGCATTCAACCAGGACAG	22
nCoV-2019_35_RIGHT	ACTTCATAGCCACAAGGTTAAAGTCA	26
nCoV-2019_36_LEFT	TTAGCTTGGTTGTACGCTGCTG	22
nCoV-2019_36_RIGHT	GAACAAAGACCATTGAGTACTCTGGA	26
nCoV-2019_37_LEFT	ACACACCACTGGTTGTTACTCAC	23
nCoV-2019_37_RIGHT	GTCCACACTCTCCTAGCACCAT	22
nCoV-2019_38_LEFT	ACTGTGTTATGTATGCATCAGCTGT	25
nCoV-2019_38_RIGHT	CACCAAGAGTCAGTCTAAAGTAGCG	25
nCoV-2019_39_LEFT	AGTATTGCCCTATTTTCTTCATAACTGGT	29
nCoV-2019_39_RIGHT	TGTAACTGGACACATTGAGCCC	22
nCoV-2019_40_LEFT	TGCACATCAGTAGTCTTACTCTCAGT	26
nCoV-2019_40_RIGHT	CATGGCTGCATCACGGTCAAAT	22
nCoV-2019_41_LEFT	GTTCCCTTCCATCATATGCAGCT	23

nCoV-2019_41_RIGHT	TGGTATGACAACCATTAGTTTGGCT	25
nCoV-2019_42_LEFT	TGCAAGAGATGGTTGTGTTCCC	22
nCoV-2019_42_RIGHT	CCTACCTCCCTTTGTTGTGTTGT	23
nCoV-2019_43_LEFT	TACGACAGATGTCTTGTGCTGC	22
nCoV-2019_43_RIGHT	AGCAGCATCTACAGCAAAAGCA	22
nCoV-2019_44_LEFT	TGCCACAGTACGTCTACAAGCT	22
nCoV-2019_44_LEFT_alt3	CCACAGTACGTCTACAAGCTGG	22
nCoV-2019_44_RIGHT	AACCTTTCCACATACCGCAGAC	22
nCoV-2019_44_RIGHT_alt0	CGCAGACGGTACAGACTGTGTT	22
nCoV-2019_45_LEFT	TACCTACAACTTGTGCTAATGACCC	25
nCoV-2019_45_LEFT_alt2	AGTATGTACAAATACCTACAACTTGTGCT	29
nCoV-2019_45_RIGHT	AAATTGTTTCTTCATGTTGGTAGTTAGAGA	30
nCoV-2019_45_RIGHT_alt7	TTCATGTTGGTAGTTAGAGAAAGTGTGTC	29
nCoV-2019_46_LEFT	TGTCGCTTCCAAGAAAAGGACG	22
nCoV-2019_46_LEFT_alt1	CGCTTCCAAGAAAAGGACGAAGA	23
nCoV-2019_46_RIGHT	CACGTTCACCTAAGTTGGCGTA	22
nCoV-2019_46_RIGHT_alt2	CACGTTCACCTAAGTTGGCGTAT	23
nCoV-2019_47_LEFT	AGGACTGGTATGATTTTGTAGAAAACCC	28
nCoV-2019_47_RIGHT	AATAACGGTCAAAGAGTTTTAACCTCTC	28
nCoV-2019_48_LEFT	TGTTGACACTGACTTAACAAAGCCT	25
nCoV-2019_48_RIGHT	TAGATTACCAGAAGCAGCGTGC	22
nCoV-2019_49_LEFT	AGGAATTACTTGTGTATGCTGCTGA	25
nCoV-2019_49_RIGHT	TGACGATGACTTGGTTAGCATTAATACA	28
nCoV-2019_50_LEFT	GTTGATAAGTACTTTGATTGTTACGATGGT	30
nCoV-2019_50_RIGHT	TAACATGTTGTGCCAACCACCA	22
nCoV-2019_51_LEFT	TCAATAGCCGCCACTAGAGGAG	22
nCoV-2019_51_RIGHT	AGTGCATTAACATTGGCCGTGA	22
nCoV-2019_52_LEFT	CATCAGGAGATGCCACAACTGC	22
nCoV-2019_52_RIGHT	GTTGAGAGCAAAATTCATGAGGTCC	25
nCoV-2019_53_LEFT	AGCAAAATGTTGGACTGAGACTGA	24
nCoV-2019_53_RIGHT	AGCCTCATAAAACTCAGGTTCCC	23
nCoV-2019_54_LEFT	TGAGTTAACAGGACACATGTTAGACA	26
nCoV-2019_54_RIGHT	AACCAAAAACTTGTCCATTAGCACA	25
nCoV-2019_55_LEFT	ACTCAACTTTACTTAGGAGGTATGAGCT	28
nCoV-2019_55_RIGHT	GGTGTACTCTCCTATTTGTACTTTACTGT	29
nCoV-2019_56_LEFT	ACCTAGACCACCACTTAACCGA	22
nCoV-2019_56_RIGHT	ACACTATGCGAGCAGAAGGGTA	22
nCoV-2019_57_LEFT	ATTCTACACTCCAGGGACCACC	22
nCoV-2019_57_RIGHT	GTAATTGAGCAGGGTCGCCAAT	22
nCoV-2019_58_LEFT	TGATTTGAGTGTTGTCAATGCCAGA	25
nCoV-2019_58_RIGHT	CTTTTCTCCAAGCAGGGTTACGT	23
nCoV-2019_59_LEFT	TCACGCATGATGTTTCATCTGCA	23
nCoV-2019_59_RIGHT	AAGAGTCCTGTTACATTTTCAGCTTG	26
nCoV-2019_60_LEFT	TGATAGAGACCTTTATGACAAGTTGCA	27
nCoV-2019_60_RIGHT	GGTACCAACAGCTTCTCTAGTAGC	24
nCoV-2019_61_LEFT	TGTTTATCACCCGCGAAGAAGC	22
nCoV-2019_61_RIGHT	ATCACATAGACAACAGGTGCGC	22
nCoV-2019_62_LEFT	GGCACATGGCTTTGAGTTGACA	22

nCoV-2019_62_RIGHT	GTTGAACCTTTCTACAAGCCGC	22
nCoV-2019_63_LEFT	TGTTAAGCGTGTTGACTGGACT	22
nCoV-2019_63_RIGHT	ACAAACTGCCACCATCACAACC	22
nCoV-2019_64_LEFT	TCGATAGATATCCTGCTAATTCCATTGT	28
nCoV-2019_64_RIGHT	AGTCTTGTAAAAGTGTTCCAGAGGT	25
nCoV-2019_65_LEFT	GCTGGCTTTAGCTTGTGGGTTT	22
nCoV-2019_65_RIGHT	TGTCAGTCATAGAACAAACACCAATAGT	28
nCoV-2019_66_LEFT	GGGTGTGGACATTGCTGCTAAT	22
nCoV-2019_66_RIGHT	TCAATTTCCATTTGACTCCTGGGT	24
nCoV-2019_67_LEFT	GTTGTCCAACAATTACCTGAAACTTACT	28
nCoV-2019_67_RIGHT	CAACCTTAGAAACTACAGATAAATCTTGGG	30
nCoV-2019_68_LEFT	ACAGGTTCATCTAAGTGTGTGTGT	24
nCoV-2019_68_RIGHT	CTCCTTTATCAGAACCAGCACCA	23
nCoV-2019_69_LEFT	TGTCGCAAAATATACTCAACTGTGTCA	27
nCoV-2019_69_RIGHT	TCTTTATAGCCACGGAACCTCCA	23
nCoV-2019_70_LEFT	ACAAAAGAAAATGACTCTAAAGAGGGTTT	29
nCoV-2019_70_RIGHT	TGACCTTCTTTTAAAGACATAACAGCAG	28
nCoV-2019_71_LEFT	ACAAATCCAATTCAGTTGTCTTCCTATTC	29
nCoV-2019_71_RIGHT	TGGAAAAGAAAGGTAAGAACAAGTCCT	27
nCoV-2019_72_LEFT	ACACGTGGTGTTTATTACCCTGAC	24
nCoV-2019_72_RIGHT	ACTCTGAACTCACTTTCCATCCAAC	25
nCoV-2019_73_LEFT	CAATTTTGTAATGATCCATTTTTGGGTGT	29
nCoV-2019_73_RIGHT	CACCAGCTGTCCAACCTGAAGA	22
nCoV-2019_74_LEFT	ACATCACTAGGTTTCAAACTTTACTTGC	28
nCoV-2019_74_RIGHT	GCAACACAGTTGCTGATTCTCTTC	24
nCoV-2019_75_LEFT	AGAGTCCAACCAACAGAATCTATTGT	26
nCoV-2019_75_RIGHT	ACCACCAACCTTAGAATCAAGATTGT	26
nCoV-2019_76_LEFT	AGGGCAAACTGGAAAGATTGCT	22
nCoV-2019_76_LEFT_alt3	GGGCAAACTGGAAAGATTGCTGA	23
nCoV-2019_76_RIGHT	ACACCTGTGCCTGTTAAACCAT	22
nCoV-2019_76_RIGHT_alt0	ACCTGTGCCTGTTAAACCATTGA	23
nCoV-2019_77_LEFT	CCAGCAACTGTTTGTGGACCTA	22
nCoV-2019_77_RIGHT	CAGCCCCTATTAAACAGCCTGC	22
nCoV-2019_78_LEFT	CAACTTACTCCTACTTGGCGTGT	23
nCoV-2019_78_RIGHT	TGTGTACAAAAACTGCCATATTGCA	25
nCoV-2019_79_LEFT	GTGGTGATTCAACTGAATGCAGC	23
nCoV-2019_79_RIGHT	CATTTCATCTGTGAGCAAAGGTGG	24
nCoV-2019_80_LEFT	TTGCCTTGGTGATATTGCTGCT	22
nCoV-2019_80_RIGHT	TGGAGCTAAGTTGTTTAACAAGCG	24
nCoV-2019_81_LEFT	GCACTTGGAAAACTTCAAGATGTGG	25
nCoV-2019_81_RIGHT	GTGAAGTTCTTTTCTTGTGCAGGG	24
nCoV-2019_82_LEFT	GGGCTATCATCTTATGTCCTTCCCT	25
nCoV-2019_82_RIGHT	TGCCAGAGATGTCACCTAAATCAA	24
nCoV-2019_83_LEFT	TCCTTTGCAACCTGAATTAGACTCA	25
nCoV-2019_83_RIGHT	TTTGACTCCTTTGAGCACTGGC	22
nCoV-2019_84_LEFT	TGCTGTAGTTGTCTCAAGGGCT	22
nCoV-2019_84_RIGHT	AGGTGTGAGTAAACTGTTACAAACAAC	27
nCoV-2019_85_LEFT	ACTAGCACTCTCCAAGGGTGTT	22

nCoV-2019_85_RIGHT	ACACAGTCTTTTACTCCAGATTCCC	25
nCoV-2019_86_LEFT	TCAGGTGATGGCACAACAAGTC	22
nCoV-2019_86_RIGHT	ACGAAAGCAAGAAAAAGAAGTACGC	25
nCoV-2019_87_LEFT	CGACTACTAGCGTGCCTTTGTA	22
nCoV-2019_87_RIGHT	ACTAGGTTCCATTGTTCAAGGAGC	24
nCoV-2019_88_LEFT	CCATGGCAGATTCCAACGGTAC	22
nCoV-2019_88_RIGHT	TGGTCAGAATAGTGCCATGGAGT	23
nCoV-2019_89_LEFT	GTACGCGTTCCATGTGGTCATT	22
nCoV-2019_89_LEFT_alt2	CGCGTTCCATGTGGTCATTCAA	22
nCoV-2019_89_RIGHT	ACCTGAAAGTCAACGAGATGAAACA	25
nCoV-2019_89_RIGHT_alt4	ACGAGATGAAACATCTGTTGTCACT	25
nCoV-2019_90_LEFT	ACACAGACCATTCCAGTAGCAGT	23
nCoV-2019_90_RIGHT	TGAAATGGTGAATTGCCCTCGT	22
nCoV-2019_91_LEFT	TCACTACCAAGAGTGTGTTAGAGGT	25
nCoV-2019_91_RIGHT	TTCAAGTGAGAACCAAAAGATAATAAGCA	29
nCoV-2019_92_LEFT	TTTGTGCTTTTTAGCCTTTCTGCT	24
nCoV-2019_92_RIGHT	AGGTTCCTGGCAATTAATTGTAAAAGG	27
nCoV-2019_93_LEFT	TGAGGCTGGTTCTAAATCACCCA	23
nCoV-2019_93_RIGHT	AGGTCTTCCTTGCCATGTTGAG	22
nCoV-2019_94_LEFT	GGCCCCAAGGTTTACCCAATAA	22
nCoV-2019_94_RIGHT	TTTGGCAATGTTGTTCCTTGAGG	23
nCoV-2019_95_LEFT	TGAGGGAGCCTTGAATACACCA	22
nCoV-2019_95_RIGHT	CAGTACGTTTTTGCCGAGGCTT	22
nCoV-2019_96_LEFT	GCCAACAACAACAAGGCCAAAC	22
nCoV-2019_96_RIGHT	TAGGCTCTGTTGGTGGGAATGT	22
nCoV-2019_97_LEFT	TGGATGACAAAGATCCAAATTTCAAAGA	28
nCoV-2019_97_RIGHT	ACACACTGATTAAAGATTGCTATGTGAG	28
nCoV-2019_98_LEFT	AACAATTGCAACAATCCATGAGCA	24
nCoV-2019_98_RIGHT	TTCTCCTAAGAAGCTATTAAAATCACATGG	30

Chapter 6

Unrecognized introductions of SARS-CoV-2 into the US state of Georgia shaped the early epidemic

The following *Research Article*, published in *Virus Evolution* in February 2022 in collaboration with research teams across Emory University led by Dr. Anne Piantadosi. Our goal was to use consensus sequence data to characterize the spread of SARS-CoV-2 into the state of Georgia, USA early in the pandemic. We show that while there were many introductions into the state, a single introduction was responsible for the majority of the sampled lineages in our data. This lineage circulated within region for roughly three weeks prior to detection. Furthermore, as travel history was available for a number of the sequenced patients we were able to compare the viral sequences sampled from individuals to the viral lineages circulating both in Georgia and in their region of travel. Unfortunately, do to the sparsity of sequence data in many locales we were unable to draw definitive conclusions from this analysis.

6.1 M.A.M. Contributions

Conceptualization, Validation, Formal analysis (**Figure 1-5**, **Figure S3-14**, **Table S3, S5-10**), Investigation (**Figure 1-5**, **Figure S3-14**, **Table S3, S5-10**), Writing - Original Draft, Writing - Review & Editing, Visualization (**Figure 1-5**, **Figure S3-14**).

6.2 Published Manuscript

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Research Article

Unrecognized introductions of SARS-CoV-2 into the US state of Georgia shaped the early epidemic

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Abstract

In early 2020, as diagnostic and surveillance responses for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) ramped up, attention focused primarily on returning international travelers. Here, we build on existing studies characterizing early patterns of SARS-CoV-2 spread within the USA by analyzing detailed clinical, molecular, and viral genomic data from the state of Georgia through March 2020. We find evidence for multiple early introductions into Georgia, despite relatively sparse sampling. Most sampled sequences likely stemmed from a single or small number of introductions from Asia three weeks prior to the state's first detected infection. Our analysis of sequences from domestic travelers demonstrates widespread circulation of closely related viruses in multiple US states by the end of March 2020. Our findings indicate that the exclusive focus on identifying SARS-CoV-2 in returning international travelers early in the pandemic may have led to a failure to recognize locally circulating infections for several weeks and point toward a critical need for implementing rapid, broadly targeted surveillance efforts for future pandemics.

Key words: SARS-CoV-2; introductions; travel; Georgia.

1. Introduction

Phylogenetic studies have been critical to investigating the introduction and spread of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) throughout the USA and globally. Understanding the source of viral introductions and the subsequent dynamics of viral spread is essential for evaluating the efficacy of public health interventions and informing the response to future outbreaks. For example, a phylogenetic analysis indicated that the first identified case of SARS-CoV-2 in the USA, in mid-January 2020, did not directly lead to the initial wave of infections in Washington State; instead, its transmission was stopped by public health interventions. By contrast, undetected introductions into Washington State, likely in early February, sparked significant downstream transmission, despite federal policies to limit travel from China beginning on 2nd February (Worobey et al. 2020).

On a broader scale, relatively uninterrupted travel in early 2020 allowed multiple introductions of SARS-CoV-2 into specific regions of the USA. For example, in New York City, the epicenter of the US outbreak in Spring 2020, multiple undetected introductions of viral lineages, likely from Europe, sparked local transmission chains (Gonzalez-Reiche et al. 2020). These undetected introductions into the USA are thought to have resulted in a significant level of unobserved infection in early 2020 (Perkins et al. 2020).

Few studies have attempted to characterize early patterns of SARS-CoV-2 introduction and circulation in the southeastern USA, and none to date have focused on the state of Georgia, a major national and international travel hub due to Hartsfield-Jackson Atlanta International Airport. The first reported SARS-CoV-2 case in Georgia was on 2 March 2020 in Fulton County (Georgia Department of Public Health 2020) and reported cases rose slowly throughout the month, topping 100 per day for the first time on 20 March 2020. By the end of March, a total of 3,929 cases had been reported in the state (Dong, Du, and Gardner 2020).

Reported cases are a function of both underlying epidemiological dynamics and detection by the public health system: healthcare-seeking behavior, frequency of diagnostic testing, and completeness of reporting to public health. From January through March 2020, there were rapid shifts in the availability of and recommendations for SARS-CoV-2 diagnostic testing in Georgia and the USA as a whole. Due to limited availability of SARS-CoV-2 diagnostic tests and the assumption that viral transmission was largely restricted to China, testing was initially limited to individuals with recent travel history to mainland China or those who had contact with a known traveler or a diagnosed case of SARS-CoV-2 (Patel et al. 2020). As large outbreaks were identified outside of China and testing through clinical laboratories became possible, testing was expanded to include high-risk individuals with compatible illness and potential community exposure (Health Alert Network 2020; Schuchat 2020). Reflecting these national trends, SARS-CoV-2 testing for patients within the Emory Healthcare (EHC) system prior to 15 March 2020 required physician request, public health agency approval, and testing via the Georgia Department of Public Health (GADPH) or the Centers for Disease Control and Prevention (CDC) (Babiker et al. 2020b). Only 176 patients were tested for SARS-CoV-2 in the EHC system between 26 January 2020 and 16 March 2020. On 29 February 2020, guidelines from the Food and Drug Administration (CDC 2020) allowed certified labs to validate testing for SARS-CoV-2, and testing volumes nationwide increased considerably. On 15 March 2020, local testing at EHC began, and in the second half of March 2020 over 2,700 tests were performed at the Emory University Hospital Molecular and Microbiology Laboratories.

Changing test volumes can obfuscate underlying epidemiological dynamics, and case data alone cannot be used to evaluate the relative importance of viral introductions versus local transmission in sustaining viral spread within a region. To better understand the early epidemic in Georgia, we analyzed SARS-CoV-2 whole genome sequences sampled in Georgia from 29 February 2020 (the first available sequence) through 31 March 2020. We assessed the changing frequencies of viral clades and, by incorporating globally sampled sequences, estimated the number and timing of viral introductions into the state. Where available, we interrogated travel history to identify the contribution of international and domestic travel to SARS-CoV-2 spread within Georgia. Finally, we combined sequence data with detailed clinical metadata to evaluate associations between viral genotype and clinical parameters. These results add to the growing body of work characterizing the spread of SARS-CoV-2 into and within the USA and provide insight into early events that shaped the outbreak in Georgia.

2. Results

2.1 One Hundred Eight (108) SARS-CoV-2 genomes from the first month of the pandemic in Georgia were sequenced

To understand the diversity and spread of SARS-CoV-2 in Georgia during early 2020, we sequenced forty-seven complete SARS-CoV-2 genomes from patients seen within the EHC system through 31 March 2020 (Supplementary Tables S1 and S2, Supplementary Figures S1 and S2) and combined them with the sixty-one publicly available SARS-CoV-2 sequences generated by other groups within this time frame (Supplementary Tables S3–S5). These 108 sequences represent 2.7 per cent of the 3,929 reported cases in Georgia through 31 March 2020 (Fig. 1A). They include two specimens from 29 February 2020, before the first officially reported case, and at least ten samples per week throughout the month of March, with the exception of the week ending 29 March 2020. Thus, this dataset provides a temporally comprehensive sampling of the circulating viruses within the state at the time. County-level sampling location data were available for fifty-six sequences (Fig. 1B, C), which were largely sampled from the Atlanta metro area, the most densely populated region of the state, in which 46 per cent of the reported cases in this period occurred. Another significant portion of the reported cases occurred in Dougherty County and were associated with a funeral (Willis 2020). Sequences from this outbreak are not known to be included in our analysis; however, half of the included sequences did not have available county-level data. Nine sampled individuals are known to have traveled within two weeks prior to symptom onset (Supplementary Table S2).

2.2 Four major SARS-CoV-2 clades were present in the state of Georgia during early 2020

To assess the genetic diversity of the SARS-CoV-2 sequences circulating within Georgia during early 2020, we assigned each of them to a phylogenetic clade (Bedford, Hodcroft, and Neher 2020) (Fig. 2A). Among these sequences, the first identified clade was 20B, which was observed in two sequences sampled on 29 February 2020. Sequences in this clade harbor the canonical substitutions C14408T, A23403G (responsible for the widely reported D614G amino acid substitution in the spike protein (Volz et al. 2020)), G28881A, and G28882A relative to Wuhan/Hu-1 (EPI_ISL_402125 (Wu et al. 2020)). Clade 20B was prominent throughout Europe (Alm et al. 2020) and a number of US states (Zeller et al. 2021) throughout early 2020. Despite being the first identified clade in Georgia, local transmission of 20B appears to have been limited, and it was only sporadically ($N = 6/108$) identified throughout March 2020.

By contrast, clade 19B, a more ancestral clade, rapidly became dominant in Georgia throughout the spring of 2020. Sequences in this clade harbor the canonical substitutions 8782T and 28144C relative to Wuhan/Hu-1. This clade was first identified in Georgia on 3 March 2020, and nearly three-quarters ($N = 77/108$) of the analyzed Georgia sequences fell within clade 19B.

The remaining twenty-three available Georgia sequences from March 2020 were assigned to clades 20A ($N = 7/108$) and 20C ($N = 16/108$). Given the genetic diversity delimiting these clades and the global diversity of the clades at the time, these findings imply that there were multiple introductions of SARS-CoV-2 into GA, likely from multiple global sources. The temporal distribution of Pango lineages (Rambaut et al. 2020) mirrored these clade distributions (Supplementary Table S1, Supplementary Figure S3).

2.3 Multiple SARS-CoV-2 introductions into Georgia occurred by the end of March 2020

We reconstructed a maximum likelihood phylogenetic tree containing the 108 Georgia sequences, along with 4,514 global sequences, which were downsampled from all available sequences over the same time period to be geographically representative of case counts and to maximize phylogenetic resolution around the Georgia sequences (weighted downsampling strategy, Section 4). Sampling dates were used to exclude eleven sequences (one from Georgia) that did not follow the expected molecular clock and to estimate the dates of internal nodes based on a time-resolved tree. A significant temporal signal in these data was confirmed using root-to-tip regression (Supplementary Figure S4). The sequences from Georgia were distributed heterogeneously throughout the tree (Fig. 2B, Supplementary Figure S5,

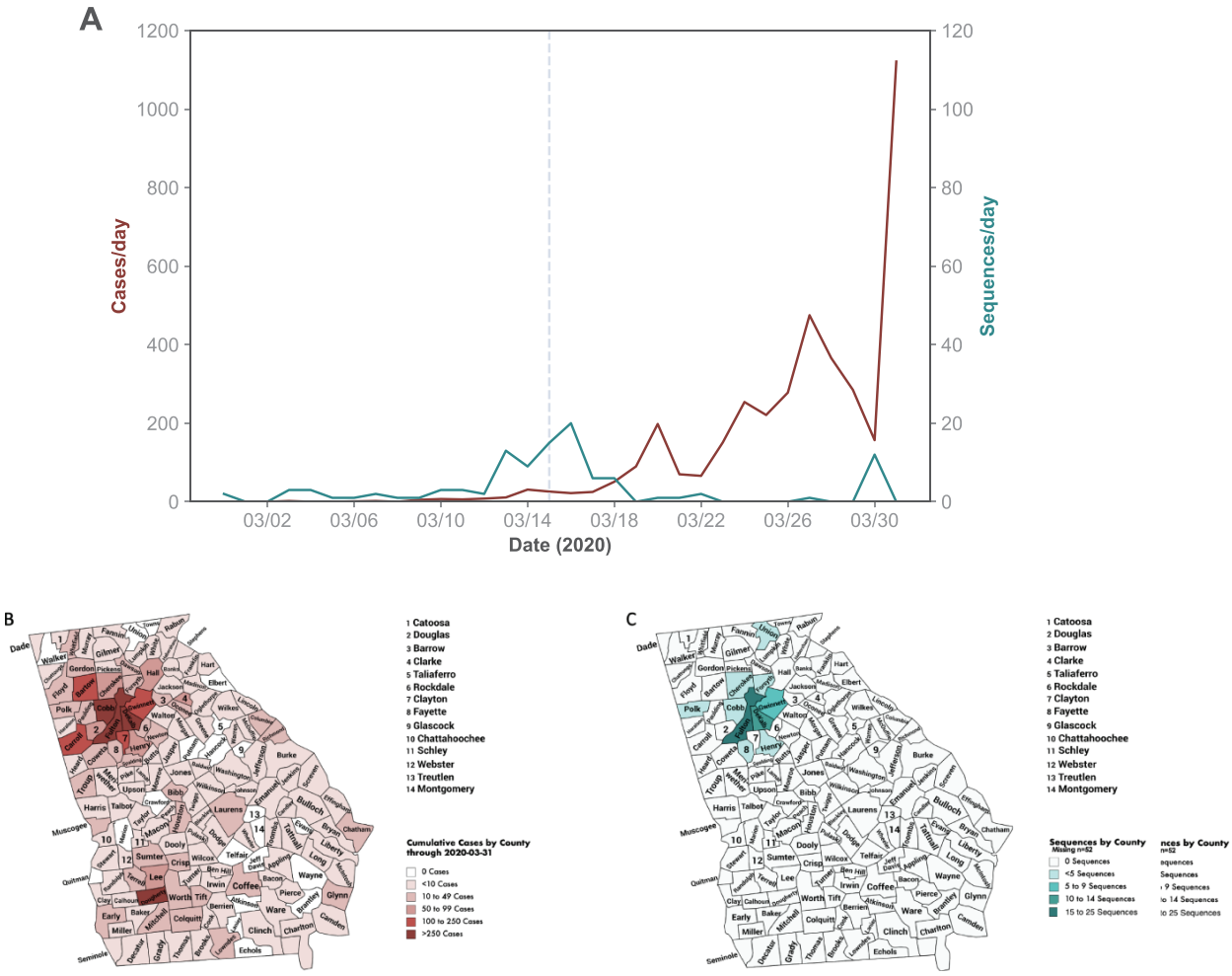

Figure 1. Temporal and spatial distribution of SARS-CoV-2 cases and sequences in the state of Georgia. (A) Daily numbers of reported cases within the state of Georgia (red) and daily number of available sequences (GISAID). The dashed line indicates 15 March 2020, the date that EHC received Emergency Use Authorization for diagnostic testing. (B) Cumulative number of reported cases as of 31 March 2020 by county. (C) County of residence for the patients from which viral sequences were sampled, where available (N = 56). County-level location data are unavailable for the remaining sequences. The Atlanta metro region comprises 10 counties within the Atlanta Regional Commission: Cherokee, Clayton, Cobb, DeKalb, Douglas, Fayette, Fulton, Gwinnett, Henry, and Rockdale.

Supplementary Table S5). The majority of Georgia sequences (N = 69) were closely related and clustered together within clade 19B (Pango lineage A), while the rest either did not cluster together or descended from highly polytomous nodes along with many other sequences.

To quantify the number of introductions into Georgia represented by this dataset, we inferred the discrete location of internal nodes using maximum likelihood ancestral state reconstruction. As undersampling of Georgia sequences can only bias the number of introductions downwards, this represents the lower limit of the number of true introductions through 31 March 2020. We conservatively estimate that there were at least 19 [95 per cent CI 17–21] introductions into Georgia in this time range (Fig. 2C). The earliest was estimated to have occurred in early to mid-February 2020 and gave rise to the sixty-nine closely related 19B sequences. Most introductions occurred in late February or early March 2020 and appear as singletons or doubletons in the tree. Highly consistent results were obtained using an alternative downsampling strategy designed to be temporally and geographically homogeneous (up to twenty sequences per country per week) (Supplement, Supplementary Figure S6).

2.4 The earliest lineage in Georgia was most likely introduced directly from Asia several weeks prior to SARS-CoV-2 detection in the state

To provide a more robust analysis of the evolutionary history of the sixty-nine closely related Georgia 19B sequences, we employed Bayesian phylogenetic reconstruction, which simultaneously estimates tree structure and discrete states of internal nodes and provides a posterior distribution of possible reconstructions. To provide context for the ancestral origins of the 19B subclade, we identified the shared mutations between it and its closest relatives (Fig. 2B, clade marked with red '+'): T26729C and G28077C (which are subclade-defining) and T28144C (which is clade 19B-defining). We then selected all available high-quality sequences that contained these mutations, which included 67 sequences from Georgia (two were removed due to the presence of ambiguous nucleotides at clade defining genome positions), 370 from other US states, and 91 from other countries (Supplementary Table S6). One sequence was excluded as it did not follow the expected molecular clock. A significant temporal signal in the remaining data was confirmed using root-to-tip regression (Supplementary Figure S7). For computational efficiency we excluded five US sequences

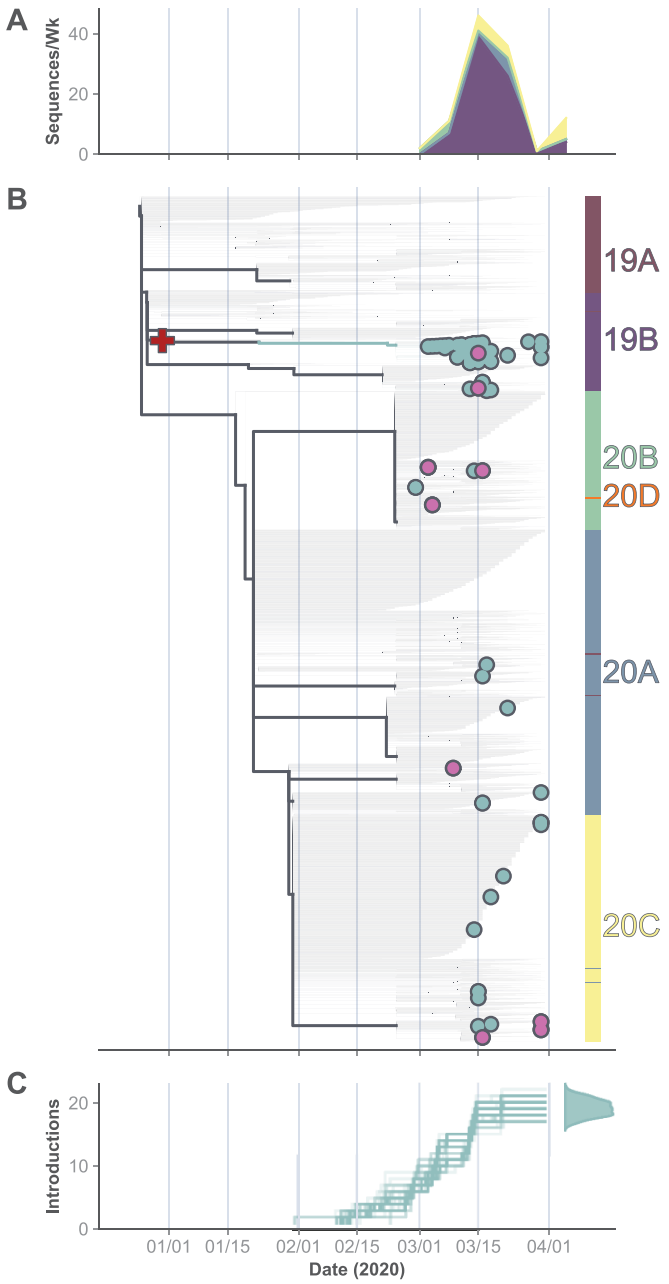

Figure 2. Presence of multiple clades and maximum likelihood phylogenetic analysis indicate multiple introductions of SARS-CoV-2 into Georgia. (A) Number of sequences from Georgia per clade, per week included in the phylogenetic analysis. (B) Time-resolved maximum likelihood tree of 4,611 globally sampled sequences rooted at Wuhan/Hu-1, downsampled based on the cumulative number of cases in a given country as of 31 March 2020 and genetic distance to Georgia sequences (weighted downsampling strategy). Internal nodes are colored based on their estimated location either inside (green) or outside (gray) of Georgia. Georgia tips are colored in green except for those with known travel history, which are shown in pink. The color bar at right shows the clade identity of each sequence in the tree. Branch widths are weighted for visual clarity. Red + indicates the phylogenetic clade used to select sequences for downstream Bayesian phylogenetic analyses. (C) Estimated cumulative number of introductions into Georgia (transition from a non-Georgia node to a Georgia-node/tip) based on the ancestral state reconstruction of internal nodes. Estimation was repeated on 100 bootstrap replicate trees and the timing of introduction events for each replicate is shown as an individual line. The Gaussian kernel density plot at right shows the estimated cumulative number of introduction events as of 31 March 2020.

without state metadata, eighteen sequences from US states with fewer than four sequences in this subclade and seventy-two international sequences sampled after 29 February 2020. The excluded international sequences either did not cluster with the US sequences ($N = 1$, sampled from China) or were evolutionarily descendant from the US sequences and are thus likely exportations from the USA to these international regions (Supplementary Figures S8 and S9). Therefore, 432 sequences were included in our Bayesian phylogenetic analysis including the 67 from Georgia, 346 from other US states, 12 from China (including Hong Kong), 5 from South Korea, and 2 from Vietnam (Supplementary Table S6).

Our analysis revealed that the US sequences in the 19B subclade were phylogenetically distinct from the ancestral sequences, consistent with a single or small number of introductions of this lineage into the USA (Fig. 3, Supplementary Table S7). To evaluate the source of introduction, we inferred the location of the most recent common ancestor (MRCA) of all US sequences in the 19B subclade. The MRCA was assigned to Georgia in 65 per cent of sampled trees (posterior probability of 0.65). The next most likely discrete state of the MRCA node was South Carolina, with posterior probability of 0.13. Thus, Georgia is the most likely site of introduction of the 19B subclade, with the important caveat that undersampling at the beginning of the epidemic makes it difficult to draw firm conclusions. Although we maximized our power to detect multiple introductions of this subclade into the state of Georgia by including nearly all available phylogenetically related domestic sequences, it is possible that the 19B subclade was originally introduced into a state with minimal genomic surveillance. Furthermore, it is possible that over-sampling of sequences within Georgia relative to other regions biased these results. To assess the impact of this possibility, we performed Bayesian phylogenetic (BEAST) analyses in which sequences were downsampled in a temporally and geographically homogeneous manner (Section 4). In each of these downsampled replicates, the MRCA of all US sequences was assigned to Georgia with the highest probability (Supplementary Figure S10A, Supplementary Table S7), consistent with our non-downsampled analysis. The next most probable ancestral state in these downsampled analyses was South Carolina, which indicates that if this clade was not first introduced into Georgia, it was likely introduced elsewhere in the southeastern USA. While the distribution of estimated number of introductions into Georgia in the downsampled alignments was slightly higher than the full alignment (Supplementary Figure S10B), these analyses consistently support a limited number of introductions into Georgia. Much of the genetic diversity of non-Georgia sequences appears nested within the genetic diversity of sequences from Georgia (Fig. 3, Supplementary Figure S8), consistent with one, or a small number of, introduction(s) into Georgia.

Importantly, there was a gap of approximately three weeks between the estimated time to most common ancestor (tMRCA) of the US sequences in this analysis (8 February 2020 [1 February 2020, 14 February 2020]) and the earliest sampled US sequence (1 March 2020), highlighting a relative lack of dense sampling of SARS-CoV-2 genomes throughout the USA during the spring of 2020. Although the earliest US sequence in this analysis was sampled in Mississippi on 1 March 2020 (EPI_ISL_648018), it had one additional single-nucleotide polymorphism (SNP) (G922A) relative to Wuhan/Hu-1 compared to the earliest Georgia sequence (EPI_ISL_420786, sampled 3 March 2020), supporting the

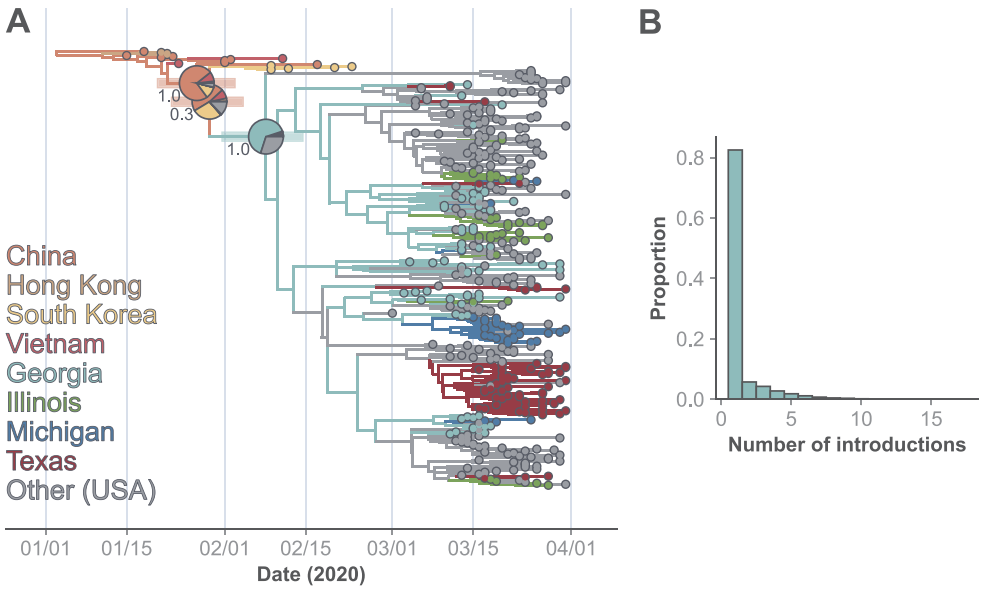

Figure 3. Bayesian phylogenetic analysis of genetically related Georgia 19B sequences and their phylogenetic neighbors reveals undetected circulation in February 2020. (A) Maximum clade credibility tree (median node heights) of select 19B sequences. Tips are colored by their state (USA) or country (intl.) of origin. Less abundant states are colored as 'Other (USA)' for visualization purposes only. Internal nodes are colored by their most probable location based on the set of estimated trees and ancestral state reconstruction. Select nodes annotated with their 95 per cent highest posterior density of estimated date (horizontal bar), location probabilities (pie chart), and posterior support (text). Negative branch lengths are manually set to 0 for visualization purposes. (B) Estimated number of introductions of the 19B subclade shown in (A) into the state of Georgia for each sampled tree in the Bayesian phylogenetic reconstruction.

hypothesis that this 19B subclade was likely first introduced into Georgia. As the first case in the state of Georgia was not reported until 2 March 2020, this analysis indicates that SARS-CoV-2 was likely spreading within the state for approximately three weeks prior to detection in either diagnostic or sequencing data.

While the source of the 19B subclade introduction was ambiguous in our phylogenetic reconstruction (posterior probabilities for China: 0.47, South Korea: 0.28, Vietnam: 0.09), the branching structure of this subclade relative to related sequences from China and South Korea was well-resolved by the data with posterior probability of 1. Overall, these results indicate that this subclade was most likely introduced from Asia in late January or early February and spread undetected throughout the USA for three to four weeks.

2.5 Analysis of sequence metadata identified a small number of travel-associated introductions

To assess the contribution of domestic and international travel to the introduction of SARS-CoV-2 into Georgia, we leveraged the extensive clinical and epidemiological data available for EHC patients in this study. Clinical data were available for forty-six of the forty-seven EHC patients from whom complete SARS-CoV-2 sequences were obtained, as well as an additional 8 patients without complete SARS-CoV-2 sequences (Table 1, Supplementary Table S2). Twenty-five of these 54 patients (46 per cent) were female and 29 (54 per cent) were male, and ages ranged from 21 to 92 years. Thirty (56 per cent) of these patients were African American, a larger proportion than the demographics of Georgia in general (United States Census Bureau 2019), likely owing to both the disproportionate representation of the Atlanta metro in these data and the disproportionate impact of the SARS-CoV-2 pandemic on people of color (Subbaraman 2020). The duration of symptoms prior to sample collection ranged from 1 to 28 days (median 6 days). Clinical severity ranged from mild (outpatient or ED visit only, $N = 19$) to moderate (inpatient without intensive care unit (ICU) admission, $N = 23$) to severe (inpatient with ICU admission, $N = 12$), and four patients died. Although we did not specifically select samples from returning travelers, we found that nine patients (17 per cent) had traveled outside of Georgia within the two weeks prior to diagnosis. Four had traveled internationally, including three of the four patients with the earliest

Table 1. Demographic and clinical data from fifty-four EHC patients. One patient with no available data was excluded.

	N (%)
Age (mean [standard deviation])	53.0 [17.1]
Female sex	25 (46.3)
Race	
African American	30 (55.6)
Asian	4 (7.4)
White	17 (31.5)
Hispanic/Latino	3 (5.6)
Travel in preceding two weeks	9 (16.6)
Diabetes mellitus	13 (24.1)
Hypertension	25 (46.3)
Obesity	25 (46.3)
Lung disease	9 (16.7)
Immunosuppression	14 (25.9)
Days from symptom onset to sample collection (median [aq1–aq3])	5.5 [4,8]
SARS-CoV-2 disease severity[a]	
Mild	19 (35.2)
Moderate	23 (42.6)
Severe	12 (22.2)
In-hospital death	4 (7.4)

[a]SARS-CoV-2 disease severity was classified as severe if the patient was admitted to an ICU, moderate if the patient was hospitalized without ICU admission, and mild if the patient had an outpatient or emergency department visit only.

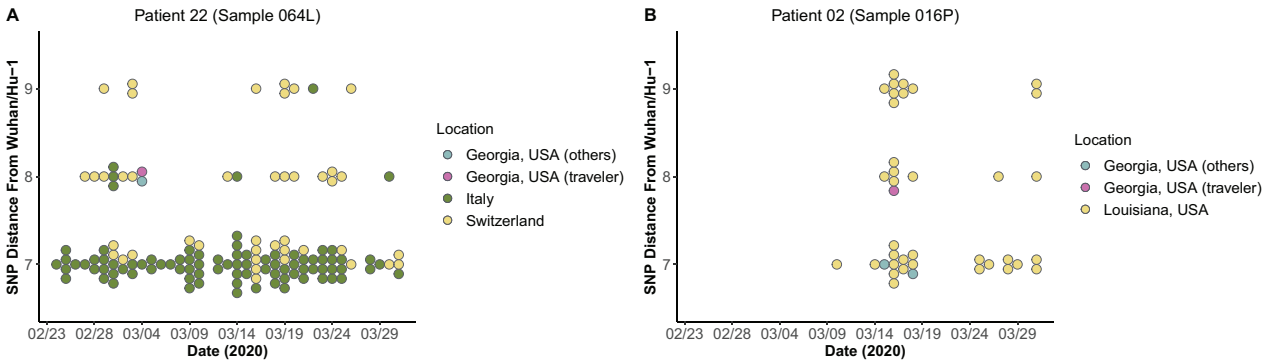

Figure 4. Analysis of SARS-CoV-2 whole genome sequences from EHC patients with recent travel provides examples of travel-associated infections of SARS-CoV-2 coming into Georgia. (A) The sequence from P22 (traveler) was compared to related sequences from Georgia (others) and the regions of travel. Sequences in this analysis were within the same ancestral lineage as the P22 sequence and differed from it by 0 or 1 SNPs compared to Wuhan/Hu-1 (*y*-axis). (B) The sequence from P02 (traveler) was compared to related sequences from Georgia (others) and the region of travel. As in (A), sequences in this analysis were within the same ancestral lineage as the P02 sequence and differed from it by 0 or 1 SNPs compared to Wuhan/Hu-1 (*y*-axis).

dates of testing, consistent with restrictions in place to prioritize SARS-CoV-2 testing from returning travelers in early March 2020.

In one patient (P22), there was strong SARS-CoV-2 genomic evidence that the infection had been acquired in the location of travel (Italy and Switzerland); the SARS-CoV-2 sequence from P22 was identical to 18 of the 1,657 publicly available sequences from Italy and Switzerland sampled within the same time frame. It matched one other sequence from Georgia, from a sample that had matching metadata (date of sample collection, patient age, and patient gender). We therefore presumed that these samples were from the same individual, with independent sequencing performed by our group and the GADPH. Further analysis of SARS-CoV-2 sequences within the same lineage demonstrated that there were many sequences ancestral to the P22 sequence by one SNP from Italy and Switzerland, but none from Georgia (Fig. 4A, Supplementary Table S8), consistent with travel-associated infection. Supporting this, the patient had been traveling in Europe for a month prior to symptom onset, encompassing the entire plausible incubation period for SARS-CoV-2. We were unable to draw definitive conclusions about where infection was acquired for the remaining patients with international travel, not only due to insufficient epidemiological and viral genomic data but also due to the limited diversity of circulating SARS-CoV-2 at the time (Supplementary Results, Supplementary Table S8, Supplementary Figure S11A).

Domestic travel to states with ongoing community transmission could also have introduced SARS-CoV-2 lineages into Georgia. For example, there is considerable genomic evidence that one patient in our study (P02) was infected while traveling to New Orleans. The sequence from P02 was distinct to all samples from Georgia but identical to seven SARS-CoV-2 sequences from Louisiana (Fig. 4B). This finding is consistent with a recently published study on the spread of SARS-CoV-2 into and within Louisiana (Zeller et al. 2021). By contrast, another patient in our study had also recently traveled to Louisiana (P39), yet the most closely related sequences were found in both Georgia ($N = 2$) and Louisiana ($N = 19$). These sequences were not identical to P39 but were three SNPs more ancestral to it. Thus, it is not clear based on viral genomic data whether P39 was infected in Georgia or Louisiana. This uncertainty could be resolved with detailed epidemiological data, e.g. if the patient had traveled to Louisiana outside of the plausible incubation period for SARS-CoV-2. However, travel dates were incompletely recorded in the medical record for this patient (Supplementary Table S8).

Inferring the location of infection for other domestic travelers was also challenging due to the circulation of highly similar viruses in multiple states and ambiguities in travel history. For example, the SARS-CoV-2 sequence from P14, who had traveled to Mississippi, was identical to not only one sequence from Mississippi but also six from Georgia (Supplementary Figure S11B), and the patient was in both locations during the potential incubation period. The SARS-CoV-2 sequence from P05, who had traveled to Colorado, was identical to not only two SARS-CoV-2 sequences from Colorado but also one from Georgia, and the dates of travel were incompletely documented in the medical record (Supplementary Figure S11C). The SARS-CoV-2 sequence from P27, who had traveled to North Carolina, had no identical matches but harbored an additional mutation to sequences from both North Carolina and Georgia (Supplementary Figure S11D), and the patient was in both locations during the potential incubation period. Overall, given higher rates of domestic travel as compared to international travel and the short tMRCA of all circulating SARS-CoV-2 sequences, it is unsurprising that the viral lineages circulating within US states in early 2020 were highly similar. This similarity prevented us from conclusively inferring the location of infection for domestic travelers.

An additional challenge to these analyses is that in all cases, highly similar SARS-CoV-2 sequences were present in widespread locations outside of Georgia and the region of travel (Supplementary Table S8), making it difficult to exclude the possibility that patients were infected through alternative mechanisms such as contact with another traveler or unreported travel themselves.

2.6 The 19B subclade disappeared by the end of April 2020

Given the genetic relationship of many Georgia sequences within clade 19B, we wanted to know to what extent this subclade seeded outbreaks beyond the timeframe of our phylogenetic analyses. We first identified the shared substitutions between these Georgia sequences to generate a subclade-defining mutational profile (Fig. 5A). These SNPs include T490A, C3177T, T18736C, C24034T, T26729C, G28077C, and A29700G as well as the two 19B defining SNPs C8782T and T28144C. Of these nine substitutions, five were non-synonymous: T490A (ORF1ab Asp75Glu), C3177T (ORF1ab Pro971Leu), T18736C (ORF1ab Phe6158Leu), G28077C (ORF8 Val62Leu), and T28144C (ORF8 Leu84Ser).

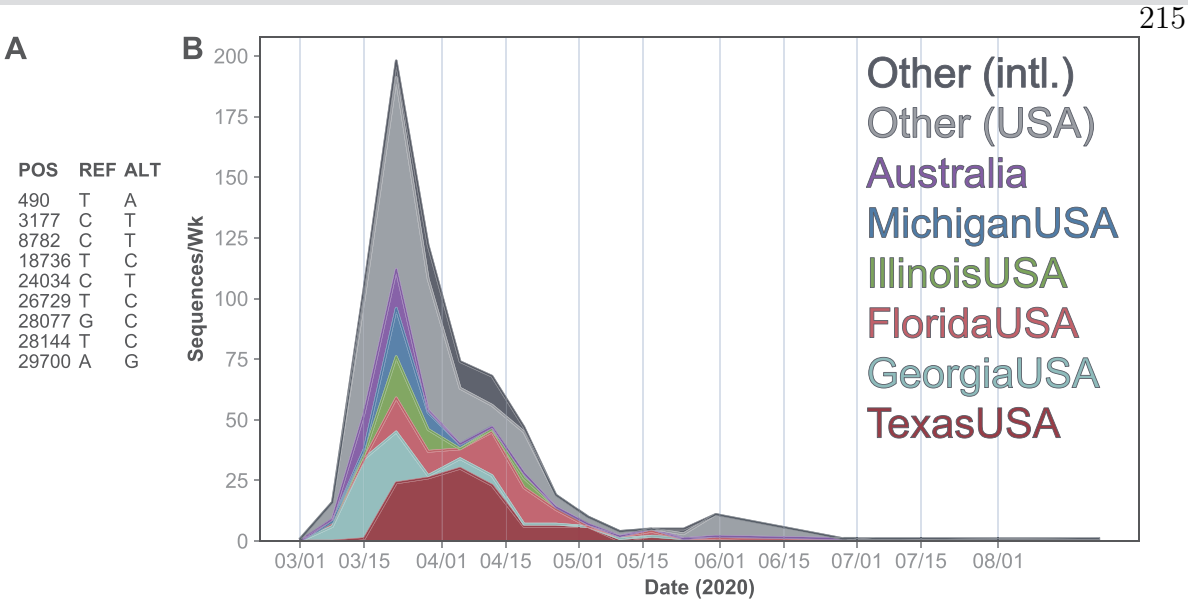

Figure 5. Shared mutations between related Georgia 19B sequences and global sequences harboring this mutational profile indicate its decline in early 2020. (A) Shared mutations (relative to Wuhan/Hu-1) of all the sixty-nine closely related Georgia 19B sequences, which define the 19B subclade. (B) Number of sequences per week with the mutational profile of the 19B subclade shown in (A). Sequences are colored by the region they were sampled from.

The total number of global high-quality sequences per week sharing the above subclade-defining mutational profile peaked in mid-March, within the timeframe of our phylogenetic analyses (Fig. 5B, Supplementary Table S9). The 19B subclade appeared to go extinct by the end of April; consequently, the number of Georgia sequences belonging to this subclade also dropped to zero shortly after its peak. The apparent extinction of the 19B subclade was consistent with the widely reported increase of sequences and clades harboring the D614G substitution in the spike protein (Volz et al. 2020). This subclade was most frequently detected domestically, as opposed to internationally. It was most prominently identified in Texas, where it was first identified on 11 March 2020 and was consistently observed from then until the end of April. Internationally, this 19B subclade was most frequently observed in Australia. Due to limited sequences, particularly from the state of Georgia in May 2020, we did not attempt to estimate the number of reported infections attributable to this subclade over time.

2.7 Samples with D614G substitution did not differ in CT value, subgenomic RNA level, or clinical severity

Due to the rapid decline of the 19B subclade, we wondered whether samples from that lineage displayed clinical or molecular features that could be associated with lower transmissibility. We focused our analysis on spike amino acid position 614. The D614G substitution is a defining substitution between 20X and 19X phylogenetic clades that has been associated with increased transmissibility (Volz et al. 2020), potentially due to higher viral loads (Plante et al. 2021). Sequence data at position 614 were available for 48 EHC patients in this study, 19 (40 per cent) of which carried the 614G amino acid residue and 29 (60 per cent) of which carried the D614 residue. There was no statistically significant difference in the SARS-CoV-2 C_T (cycle threshold) value between nasopharyngeal (NP) samples with the G residue ($n = 18$) and D residue ($n = 28$) (median: 24.0 vs. 24.2, $P = 0.547$) (Supplementary Figure S12), including after adjustment for day of symptom onset and disease severity ($P = 0.84$).

We also assessed whether there were differences in subgenomic RNA (sgRNA), which is a marker for active viral replication (Wölfel et al. 2020). sgRNA was detected in a similar proportion of samples with the D and G residues [30/32 (93.8 per cent) and 15/17 (88.2 per cent), respectively; $P = 0.60$] **(Supplementary Table S1)**, and the level of sgRNA was similar for samples with the D residue (mean C_T 28.6, SD 5.6) and G residue (mean C_T 27.3, SD 6.3; $P = 0.50$). This did not differ when adjusted for the SARS-CoV-2 genomic RNA C_T value in these samples (D residue, mean C_T difference 4.7 cycles, SD 2.5; G residue, mean C_T difference 4.2 cycles, SD 1.7; $P = 0.49$).

Finally, disease severity was similar between patients with the D residue (mild: 42.9 per cent, moderate: 35.7 per cent, severe: 21.4 per cent) and G residue (mild: 27.8 per cent, moderate: 44.4 per cent severe: 27.8 per cent, $P = 0.585$). More broadly, across all EHC patients, disease severity was not associated with age; other comorbidities were not assessed. Disease severity was associated with time since symptom onset; patients with severe disease had experienced a longer duration of symptoms prior to diagnosis (mean of 8.1 days) than those with mild disease (5.1 days, $P = 0.01$) (Supplementary Figure S13A). Disease severity was not associated with the SARS-CoV-2 C_T value, as the mean C_T was 26.6 for patients with severe disease vs. 24.8 for moderate disease vs. 24.3 for mild disease (Supplementary Figure S13B), and there was no significant association after adjustment for symptom duration, age, and the C_T value ($P = 0.42$).

3. Discussion

Despite its high domestic and international connectivity, Georgia was spared a large SARS-CoV-2 epidemic in early 2020. However, little is known about the viral evolutionary dynamics in the state during this time. Here, we detected at least 19 introductions of SARS-CoV-2 into Georgia from phylogenetic analysis of 108 sequences obtained through the end of March 2020. As this estimate includes only those lineages represented in the available sequencing data, the true number of introductions is certainly higher. Furthermore, observing roughly 19 introductions

among only 108 sequences implies that a large proportion of the sequences in this analysis were attributed to a novel introduction compared to local transmission. While phylogenetic studies focused specifically on the spread of SARS-CoV-2 in the southeastern USA in early 2020 are relatively limited, studies from the region (broadly defined) consistently found multiple circulating lineages (Louisiana (Zeller et al. 2021), Maryland (Thielen et al. 2021), and North Carolina (McNamara et al. 2020)), indicative of multiple introductions, and this pattern is mirrored in US states in other regions (California (Deng et al. 2020), Connecticut (Fauver et al. 2020), Illinois (Lorenzo-Redondo et al. 2020), Massachusetts (Lemieux et al. 2021), New York (Gonzalez-Reiche et al. 2020), Washington (Bedford et al. 2020; Worobey et al. 2020), and Wisconsin (Moreno et al. 2020)). Existing studies that leverage genomic and travel data have shown that both international and domestic travel fueled the early domestic spread of SARS-CoV-2 (Fauver et al. 2020).

Notably, nearly 65 per cent of the SARS-CoV-2 sequences sampled from Georgia through March 2020 were highly genetically related and fell within a single 19B subclade. Bayesian phylogenetic reconstruction of these Georgia sequences, as well as globally sampled sequences within the same subclade and ancestral relatives, demonstrates that they were likely the result of a single or small number of introductions into the USA in early February. Based on our analysis, Georgia was the most likely site of introduction of this lineage into the USA, but because international SARS-CoV-2 genomic surveillance was fairly limited in early 2020, it is difficult to know this for certain. Importantly, the time to MRCA of the sequences in this subclade is estimated to have been two to four weeks before the first detected SARS-CoV-2 infection in Georgia, which was reported on 2 March 2020 (Georgia Department of Public Health 2020). Due to stochasticity in transmission dynamics at low infectious population sizes (Pekar et al. 2021), this lineage was likely introduced even earlier. The estimated detection lag of this lineage is therefore one to two weeks longer than was observed in the UK (du Plessis et al. 2021). Thus, SARS-CoV-2 was circulating within Georgia for a substantial period of time before being identified by clinical or genomic surveillance.

Finding a large number of sequences from a single or small number of introductions is consistent with the substantial transmission heterogeneity of SARS-CoV-2 that has been reported both within Georgia (Lau et al. 2020) and elsewhere (Miller et al. 2020; Popa et al. 2020; Lemieux et al. 2021). For example, a recent phylogenetic study of SARS-CoV-2 sequences from Louisiana estimated that a single introduction into Louisiana was responsible for the majority of transmission within the state following superspreading events associated with Mardi Gras (Zeller et al. 2021). Additionally, a study of genomes collected in the Boston area have identified large superspreading events associated with nursing facilities and an international business conference (Lemieux et al. 2021).

Our analysis of SARS-CoV-2 infection in domestic travelers returning to Georgia also underscores the fact that there was widespread unrecognized transmission in early 2020. In fact, due to the presence of identical viruses in multiple states, it was difficult to infer from viral genomic data alone whether returning travelers in this study were infected in Georgia or travel locations such as North Carolina, Mississippi, and Colorado. Taken together, these results emphasize that the early focus of diagnostic testing on returning international travelers, rather than more broad testing of patients with COVID-19 symptoms, led to under-recognition of existing infections in early 2020.

In addition, while our analysis of returning travelers highlights the need for more comprehensive genome sequencing of emerging pathogens, it also emphasizes the limited resolution of genomic epidemiology when the genetic diversity of a pathogen is low. Viral genomic analyses can be enhanced by the collection of finely resolved metadata. Our study benefited from linked clinical and epidemiological data for nearly half of the SARS-CoV-2 samples sequenced, but despite extensive chart review, we encountered limitations, e.g. in reporting specific dates of travel and symptom onset. Thus, there is a need for a dedicated infrastructure for data collection in the setting of outbreak analysis, beyond routinely collected clinical data.

Our study also provides information regarding the dynamics of early SARS-CoV-2 lineages in the USA. The 19B subclade, which caused most of the infections described in this study, appears to have spread from Georgia both domestically and internationally (e.g. to Australia) before dying out in April/May of 2020. The apparent extinction of this D614-containing 19B subclade occurred concurrently with the widely reported sweep of SARS-CoV-2 clades harboring the 614G mutation (Volz et al. 2020). The increased transmission of 614G-containing viruses may be due to their ability to cause infection with higher viral loads (Plante et al. 2021). We did not observe a difference in either viral load or subgenomic RNA in patients with D614 or 614G-containing viruses in this study, which may be due to small sample size.

While the 19B subclade reported here was associated with limited forward transmission, we did not find strong evidence for ongoing transmission from the other observed introductions of SARS-CoV-2 into Georgia. However, we primarily analyzed genomes collected through the end of March 2020, so it is possible that other observed introductions, particularly those that occurred later in the time frame of this analysis, seeded downstream transmission chains that are not described here.

Overall, our findings provide several key take-home messages about the early SARS-CoV-2 pandemic that may be applicable to future outbreaks. First, our study recognizes that, despite intensive effort, diagnostic testing capabilities lagged well behind SARS-CoV-2 transmission early in the pandemic. In addition, the focused effort on diagnosis in returning international travelers meant that substantial local and domestic transmission was occurring, but was missed. In a broader context, our findings highlight that highly transmissible pathogens may potentially spread faster than can be detected by the current surveillance infrastructure around the world. This lesson also applies to emerging variants of SARS-CoV-2 (Centers for Disease Control and Prevention 2021). When new variants with likely enhanced transmission are reported to be circulating widely in other countries, it is highly likely that community transmission is already occurring within the USA, given the mobility of the population. Therefore, success of public health policies and interventions countering these variants depends on early planning and implementation, prior to detection in the USA. Given the inevitable challenges in developing and rolling out diagnostic tests for a novel pathogen, these findings underscore the importance of early, empiric public health interventions to attenuate transmission while diagnostic and sequencing efforts 'catch up'.

Future pandemic responses will benefit from public health measures that presume early unrecognized transmission and act to mitigate it, while also implementing aggressive population-based surveillance, including prioritizing testing of asymptomatic contacts. These activities will be synergistic with the much needed, and now expanding, infrastructure for pathogen genomic

surveillance and enhanced collection of detailed clinical and epidemiological data.

4. Methods

4.1 Collection of clinical data and samples

This study was approved by the Emory University Institutional Review Board. Clinical data including demographics, comorbid conditions, duration of symptoms prior to testing, travel history, and severity of illness were extracted by chart review. Disease severity was classified as mild (ED or outpatient visit only), moderate (inpatient without ICU admission), or severe (inpatient with ICU admission).

Residual clinical samples (nasopharyngeal, oropharyngeal, swab samples, and bronchoalveolar lavage samples) were collected from EHC patients between 3 March 2020 and 31 March 2020, including from inpatient and outpatient sites across 8 hospitals and multiple clinics. Total nucleic acids were extracted and underwent testing in a SARS-CoV-2 triplex real-time reverse-transcriptase polymerase chain reaction (rRT-PCR), as described (Waggoner et al. 2020). Testing for subgenomic RNA was performed using a modified forward primer (5′-CGATCTCTTGTAGATCTGTTCTC-3′) and the reverse primer and probe for the N2 target used in the triplex SARS-CoV-2 rRT-PCR.

4.2 SARS-CoV-2 genome sequencing

Samples underwent DNAse treatment (ArcticZymes), cDNA synthesis with random primers and Superscript III (Invitrogen), Nextera XT tagmentation (Illumina), and Illumina sequencing (Babiker et al. 2020a). A median of 36.4 million reads were obtained per sample, and individual results are listed in Supplementary Table S1. Reference-based SARS-CoV-2 genome assembly was performed using viral-ngs v.2.0.21 (Broad Institute 2020) with reference NC_045512 (Wu et al. 2020). Reads per million (RPM) was calculated by dividing the number of mapped reads by the total number of reads and multiplying by 1 million.

Lower titer viruses were sequenced using a multiplex PCR amplification strategy followed by amplicon sequencing as described (Paden et al. 2020). Briefly, RNA was reverse transcribed using random hexamers. The resulting cDNA was used as a template for four pools of SARS-CoV-2-specific multiplex PCR. PCR amplicons were purified and used to prepare sequencing libraries using the Illumina Nextera FLEX kit and sequenced on an Illumina NovaSeq instrument. Reads were trimmed for quality and primers were removed using BBDuk (Bushnel 2022) and assembled using the BETACORONAVIRUS module of IRMA v.1.0.2 (Shepard et al. 2016).

4.3 Clade assignment

We assigned all sequences in our dataset to a given clade using Nextclade v.0.13.0 (Hadfield et al. 2018; Bedford, Hodcroft, and Neher 2020). Pango lineages were assigned using the Pangolin COVID-19 Lineage Assigner with pangoLEARN v.2021-08-09 (Rambaut et al. 2020).

4.4 Statistical analysis

Comparison of categorical variables was performed by the Chi square test (or Fisher's when expected frequencies < 5). Comparison of continuous variables was performed by the Wilcoxon rank sum test or Kruskal–Wallis test when appropriate. Correlation of C_T values to log RPM was assessed by Poisson regression. Statistical analysis was performed using R v.4.0.2 (Vienna, Austria) (R Core Team 2020) and the RStudio interface v.1.3.1073 (Boston, MA, USA) (RStudio Team 2020). Maps showing the number of cases and number of sequences per Georgia county were generated with https://mapchart.net accessed on 30 August 2021.

4.5 Global sequence data

To place the sequences from Georgia in a global context, we downloaded all sequences sampled through 31 March 2020 and labeled as 'complete', 'high coverage', and 'collection date complete' from the Global Initiative for Sharing All Influenza Data (GISAID) database (Shu and McCauley 2017) as of 27 March 2021. We excluded any sequences from non-human hosts, any sequences related to a cruise ship, and any sequences with known travel history (to avoid biasing the ancestral state reconstruction), as annotated in the NextMeta file. These sequences, as well as the new EHC sequences presented in this analysis (when multiple samples from the same subject were available, we only included the NP swab sample), were aligned to Wuhan/Hu-1 (EPI_ISL_402125) using MAFFT v7.464 (Katoh et al. 2002) and removing any insertions relative to Wuhan/Hu-1 (Wu et al. 2020). To account for the potential sequencing error, we masked the first and last 100 nucleotides of the genome as well as sites 11,083, 15,324, and 21,575, which were identified as 'highly homoplasic' in early SARS-CoV-2 sequencing data (De Maio et al. 2020). Sequences with less than 28,000 A, C, T, and G nucleotides after aligning were removed. The GISAID Acknowledgement Table is provided in Supplementary Table S3.

4.6 Maximum likelihood phylogenetic analysis

For our phylogenetic analyses, we first downsampled the available global sequence data to maintain a representative geographical distribution of sequences (weighted downsampling strategy). We downsampled the available sequences from each country based on the cumulative number of reported SARS-CoV-2 cases by 31 March 2020 (Dong, Du, and Gardner 2020) and a target alignment size of 6,000 sequences. For countries where the number of available sequences was greater than the product of the target alignment size and the relative number of cumulative cases in that country, we sampled sequences with weight $1/(1+D)$ where D is the minimum SNP distance of a given sequence to all available Georgia sequences. Only A, C,T, and G nucleotides were considered when calculating pairwise distances. NumPy v.1.19 (Harris et al. 2020) in Python v.3.9.4 (Python Software Foundation 2020) was used to calculate the pairwise distances. We manually included all Georgia sequences and Wuhan/Hu-1 in the final alignment. The alignment included 4,622 sequences, including 108 from Georgia (Supplementary Table S5). An alternative downsampling procedure, including a maximum of twenty sequences per country per week, was investigated to assess the robustness of our results (Supplementary Methods, Supplementary Figure S6A). Downsampling was conducted in Python using BioPython (Cock et al. 2009) and Pandas v.1.1 (Pandas Development Team 2020).

IQ-TREE v.2.1.3 (Nguyen et al. 2015) was used to generate maximum likelihood phylogenies with 1,000 ultrafast bootstrap replicates (Hoang et al. 2018), collapsing small branches, and using ModelFinder to identify the best fit nucleotide substitution model (Kalyaanamoorthy et al. 2017). A GTR + F + I + G4 model was chosen. TreeTime v.0.8.2 (Sagulenko, Puller, and Neher 2018) was used to remove any sequences falling outside four interquartile ranges of the expected molecular clock rate, rooting at Wuhan/Hu-1.

The date of internal nodes was estimated using TreeTime with a fixed clock rate of 0.001 (Duchene et al. 2020) and a coalescent skyline. TreeTime was run for a maximum of three iterations and polytomies were not resolved. Root-to-tip regression, conducted using SciPy v.1.5.4 (Virtanen et al. 2020), confirmed a significant clock rate ($P < 0.0001$) in the set of included sequences (Supplementary Figure S4).

TreeTime was also used to reconstruct the ancestral states of internal nodes (Georgia/Non-Georgia) with a sampling bias correction of 2.5. We used the reconstructed traits of internal nodes to estimate the number of introductions into Georgia (transition from a non-Georgia node to a Georgia node along a given lineage). To provide a conservative estimate, we attributed multiple Georgia nodes descending from a non-Georgia polytomous internal node to be the result of a single introduction. Furthermore, we only considered the earliest (in time) introduction into Georgia for each lineage giving rise to a Georgia sequence. In other words, we did not account for the reintroduction of a given lineage into Georgia when counting the number of introductions. This procedure was repeated on 100 bootstrap replica trees to account for phylogenetic uncertainty.

4.7 Bayesian phylogenetic analysis

For a more robust reconstruction of the timing and source of introduction for the highly related sequences belonging to clade 19B, we conducted a Bayesian discrete phylogeographic reconstruction. We identified the set of highly related Georgia sequences by calculating the pairwise phylogenetic distance between all Georgia sequences in the time-resolved maximum likelihood phylogeny using BioPython. SciPy was used to identify clusters in this distance matrix with a cutoff of 0.3 years. We identified sixty-nine Georgia sequences in the largest cluster.

As we wished to include the ancestral relatives to these sixty-nine sequences in our Bayesian phylogenetic analysis, we first identified their great-grandparent in the time-resolved maximum likelihood phylogeny. Next, we identified the set of nucleotide substitutions shared between all sequences that descended from that great-grandparent. We allowed for the presence of ambiguous nucleotides when identifying shared SNPs (e.g. an R nucleotide was assumed to match both A and G nucleotides). We identified three nucleotide substitutions shared between these sequences: T26729C, G28077C, and the 19B clade defining SNP T28144C. The other 19B clade defining SNP C8782T was identified in all sequences descending from this node except one, EPI_ISL_454974. Finally, we identified all 'complete', 'high coverage', and 'sampling date complete' sequences sampled through 31 March 2020 in GISAID as of 27 March 2021 that matched this mutational profile (excluding any with ambiguous nucleotides at any sites in the mutational profile) after aligning to Wuhan/Hu-1 as described above. Again, we excluded any sequences from non-human samples, related to cruise ships, or with travel history. IQ-Tree was used to generate a maximum likelihood phylogeny of these sequences with the same parameters as described above and TreeTime was used to remove any samples falling outside four interquartile ranges of the expected molecular clock rate, rooted at the best fit root as identified by least-squares regression. The final alignment included 527 sequences, of which 67 were from Georgia. Root-to-tip regression confirmed a significant clock rate ($P < 0.0001$) in the set of included sequences of sequences (Supplementary Figure S7).

To improve computational efficiency, we removed sequences from any states with fewer than four sequences in the data set or US sequences without a specified state. Furthermore, international sequences sampled after 29 February 2020 were excluded as they were evolutionary descendant from the MRCA of all US sequences and therefore likely represent exportations of this subclade from the USA (Supplementary Figures S8 and S9). Furthermore, we generated five downsampled alignments in which at most five sequences per country/US state per week were randomly sampled, including Georgia. Each downsampled alignment included 226 sequences (Supplementary Table S6).

Bayesian phylogenetic inference was conducted using BEAST2 v2.6.6 (Bouckaert et al. 2019) with Beagle v3.1.2 (Ayres et al. 2012) and discrete trait estimation implemented in BEAST_CLASSIC v.1.50 (Lemey et al. 2009). We assumed an exponential population coalescent using a Laplace distribution for the growth rate prior ($\mu = 0.0$, scale $= 10.0$) and a Lognormal ($\mu = 1.0$, $\sigma = 2.0$) prior on the population size. We used an HKY + Γ4 substitution model with a Lognormal ($\mu = 1.0$, $\sigma = 1.25$) prior on K. We used a relaxed molecular clock (Drummond et al. 2006) with a normal ($\mu = 1E-3$, $\sigma = 1E-4$) prior on the mean clock rate (Duchene et al. 2020), and an exponential ($\mu = 0.33$) prior on the standard deviation of the clock rate. Uniform priors were used for nucleotide frequencies and the proportion of invariant sites. We parameterized the discrete ancestral state reconstruction with a Poisson ($\lambda = (N_{traits}{}^{*}N_{traits} - 1)/8$, offset $= N_{traits} - 1$) distribution for the number of non-zero rates, a Γ ($\alpha = 1.0$, $\beta = 1.0$) prior for the relative rates, and a Γ ($\alpha = 0.001$, $\beta = 1000$) prior on the rate of discrete trait changes. Rates were assumed to be symmetric. Included sequences were assigned to their country (international sequences) or state (US sequences) of origin. BEAST XML files were generated using a custom Python script and XML templates originally generated using Beauti v.2.6.3 and edited by hand. The MCMC chain was run for 285 M steps, saving every 5,000 steps. The first 10 per cent of MCMC steps were discarded as burn in. The ESS value of all parameters was >100 and >200 for parameters relevant to our conclusions as annotated by Tracer (Rambaut et al. 2018). The maximum clade credibility summary tree (with median node heights) was reconstructed using TreeAnnotator v.2.6.3. When tabulating the number of introductions of the 19B subclade into Georgia, we considered only the earliest (in time) introduction along a given lineage. In other words, we did not account for the reintroduction of a given lineage into Georgia when counting the number of introductions.

Downstream analysis of the TreeTime and BEAST output was conducted in Python using BioPython, Pandas, and NumPy. Results were visualized using Baltic v.0.1.6 (Dudas 2020), Matplotlib v.3.3.356 (Hunter 2007), and Seaborn v.0.11.157 (Waskom et al. 2020).

4.8 Georgia travel history

To assess the probability that patients with recent travel history were infected during travel, we compared the sequence from each traveler to sequences circulating in the region they were traveling to, sequences circulating in the state of Georgia, and sequences circulating globally. To ensure that our inferences were not biased by homoplastic artifacts in phylogenetic reconstruction, we generated a mutational profile for each traveler's sequence by identifying the SNPs relative to Wuhan/Hu-1. Insertions and deletions were not considered in this analysis. Next, we identified all sequences that matched either Wuhan/Hu-1 or the traveler's sequence at all positions in the mutational profile, not allowing for Ns or ambiguous nucleotides. We calculated the genetic distance from Wuhan/Hu-1 for the traveler's sequence and

all sequences from a given region, considering only A, C, T, and G characters. Sequences with a smaller genetic distance than the traveler sequence harbored a subset of the mutations in the traveler sequence, while those with a larger genetic distance harbored all of the mutations in the traveler sequence plus additional mutations. This analysis was conducted in Python using NumPy and Pandas. Figures for this analysis were generated in R v.4.0.4 using RStudio v.1.4.1106 with GGplot2 v.3.3 (Wickham et al. 2021).

4.9 Mutational profile of closely related Georgia 19B sequences

First, the shared SNPs (relative to Wuhan/Hu-1) between the sixty-nine closely related Georgia 19B sequences were identified from the sequence alignment described above using BioPython. We allowed for the presence of ambiguous nucleotides when identifying shared SNPs. We refer to sequences harboring this mutational profile as belonging to the 'clade 19B subclade'. The variants in the mutational profile were annotated using snpEff v. 5.0 (Cingolani et al. 2012).

Next, we downloaded all 'complete', 'high coverage', and 'collection date complete' from GISAID sampled and uploaded through 27 March 2020 that shared the L84S amino acid (T28144C nucleotide) substitution, a clade defining mutation of 19B. We removed non-human samples, those related to cruise ships, and samples with travel history and aligned them to Wuhan/Hu-1 with MAFFT with the same parameters described above. We identified all sequences that non-ambiguously matched the Georgia 19B subclade mutational profile (Supplementary Table S9) using NumPy in Python. We summed the number of identified sequences per week for each US state as well as the total number of other countries using Pandas. Results were visualized using Matplotlib.

Data availability

All consensus sequence data used in this analysis are available from the GISAID (https://www.gisaid.org). Accession numbers are available in Supplementary Tables S1, S3, S5, S6, and S9. Sequence data newly generated for this project is available on NCBI under BioProject PRJNA634356, including both consensus sequences and raw reads (cleaned of human reads). Metadata for the Georgia, USA, sequences needed to replicate the analysis is available in Supplementary Tables S1, S2, S4, and S8 as well as at https://zenodo.org/record/6038869. Metadata for non-Georgia sequences is available via GISAID. Code necessary to replicate this analysis is available at https://zenodo.org/record/6038869. Output files from the BEAST analysis can be found at https://figshare.com/articles/dataset/Unrecognized_introductions_of_SARS-CoV-2_into_the_state_of_Georgia_shaped_the_early_epidemic_v_1_0/14935380.

Supplementary data

Supplementary data is available at *Virus Evolution* online.

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6.3 Supplement

Supplement

Supplementary Methods

Maximum likelihood phylogenetic analysis

To estimate the number of introductions into Georgia, USA, sequences sampled from Georgia must be placed in the context of globally sampled sequences. In the main text, available sequences were downsampled by weighting based on the cumulative number of infections in a given country as of 2020-03-31 and the minimum genetic distance of a given sequence to all Georgia sequences. As a sensitivity analysis, we alternatively downsampled the available sequences (*Methods*) in a temporally homogeneous manner but taking a maximum of 20 samples per country per week. The alignment included 5079 sequences including 108 from Georgia (**Supplementary Table 10**). A maximum likelihood phylogenetic tree was inferred and the number of introductions into Georgia estimated as described in *Methods.* Of the 5079 sequences in the alignment, 29 failed the clock filter using the Maximum Likelihood phylogenetic tree.

Supplementary Results

Maximum likelihood phylogenetic analysis

A significant molecular clock rate was confirmed in the set of temporally downsampled sequences using root-to-tip regression ($p < 0.0001$, **Supplementary Figure 14**). Using this tree (**Supplementary Figure 6B**), we estimated slightly fewer introductions into Georgia (14 [13-19]) compared to the analysis using the weighted downsampling procedure presented in the main text. This is likely due to the fact that sequences in this tree were not sampled in proportion to their genetic relatedness to Georgia sequences, which reduces the resolution of phylogenetic clustering near the included Georgia sequences. In other words, clades which are attributed to one introduction in this analysis are attributed to multiple clades in the analysis presented in the main text due to the addition of a closely related non-Georgia sequence.

The estimated timing of introductions into Georgia is, in general, slightly earlier in this analysis compared to that in the main text (**Supplementary Figure 6C)**. The earliest introduction is estimated to have occurred in late-January/early-February as opposed to mid-February. This is because a number of 20B sequences from the state of Georgia descend directly from a polytomous internal node which is dated in early February when using the weighted downsampling scheme but dated early January using the temporal downsampling scheme. These analyses are consistent in that roughly half of the introductions into Georgia are estimated to have occurred throughout the month of March, in line with the increased surveillance during this time period.

SARS-CoV-2 in returning international travelers

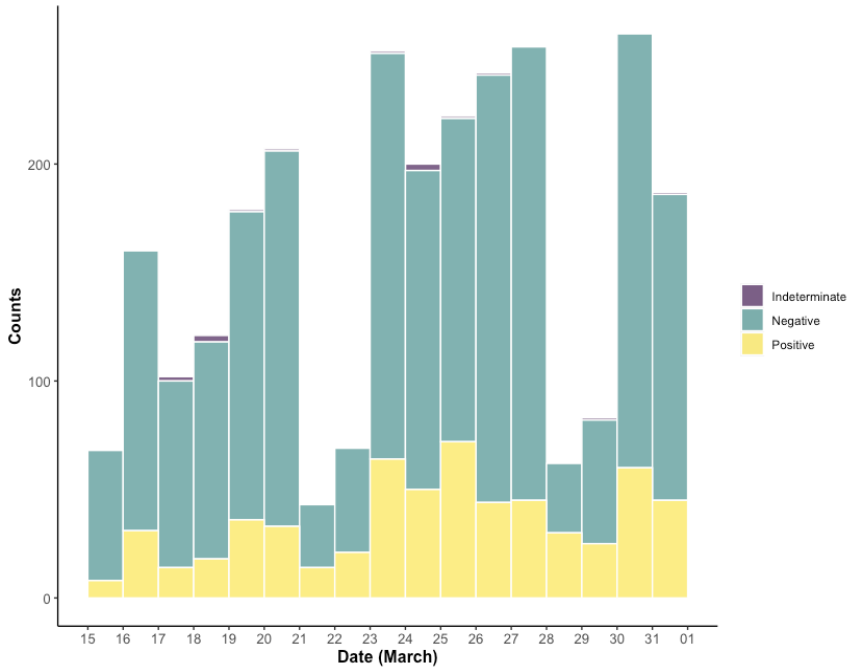
Viral genomic and epidemiologic information was used to evaluate potential SARS-CoV-2 introductions from other returning international travelers. In P33, there was genomic evidence suggesting that SARS-CoV-2 was more likely acquired in the location of travel (Italy and Poland) than Georgia. Specifically, there were 82 sequences from Italy and Poland that were ancestral to the P33 sequence by one SNP (**Supplementary Table 8**). Although there was one sequence from Georgia that was identical to the P33 sequence, based on news reports (Bluestein, G. & Oliviero, H. Officials confirm Georgia's first 2 cases of coronavirus. *Atlanta Journal-Constitution* https://www.ajc.com/blog/politics/kemp-expected-address-coronavirus-late-night-press-conference/VqbHGt7Z0p8U9KTx6bClJM/
) we have reason to believe these cases were epidemiologically linked and both associated with shared travel. Otherwise, there were no other Georgia sequences in the lineage. Supporting travel-associated infection, P33 had traveled to Italy and Poland from 8 days prior to symptom

onset until the day of symptom onset, encompassing the most likely incubation period for SARS-CoV-2.

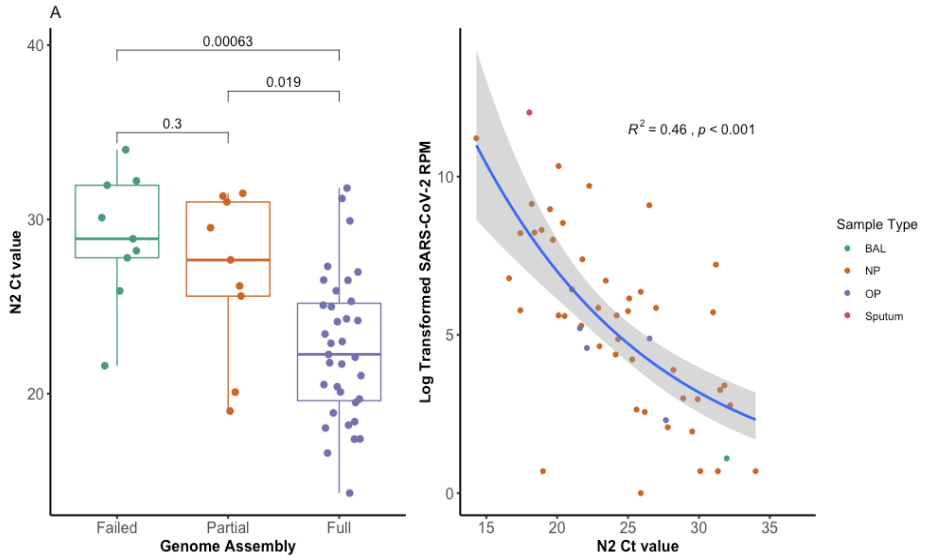
Results were less clear for P8, who had traveled to Nigeria. Among the 15 available sequences from Nigeria during this time period, none were in the same phylogenetic lineage as the sequence from P8. There was one sequence from Georgia in the same lineage, and it was one SNP more ancestral than the P8 sequence, making it plausible that this patient could have had a locally-acquired infection. Compatible with this, P8 returned from Nigeria 8 days prior to symptom onset, allowing time for exposure to and incubation of a locally-acquired infection. However, it is difficult to exclude the possibility that the patient was infected in Nigeria and related sequences were not captured due to undersampling.

Finally, the SARS-CoV-2 sequence from P23, who had traveled to Costa Rica, was equally related to sequences from both Costa Rica and Georgia **(Supplementary Figure 11A**), and the patient's travel spanned part, but not all, of the potential incubation period for infection, making it impossible to know where infection was acquired.

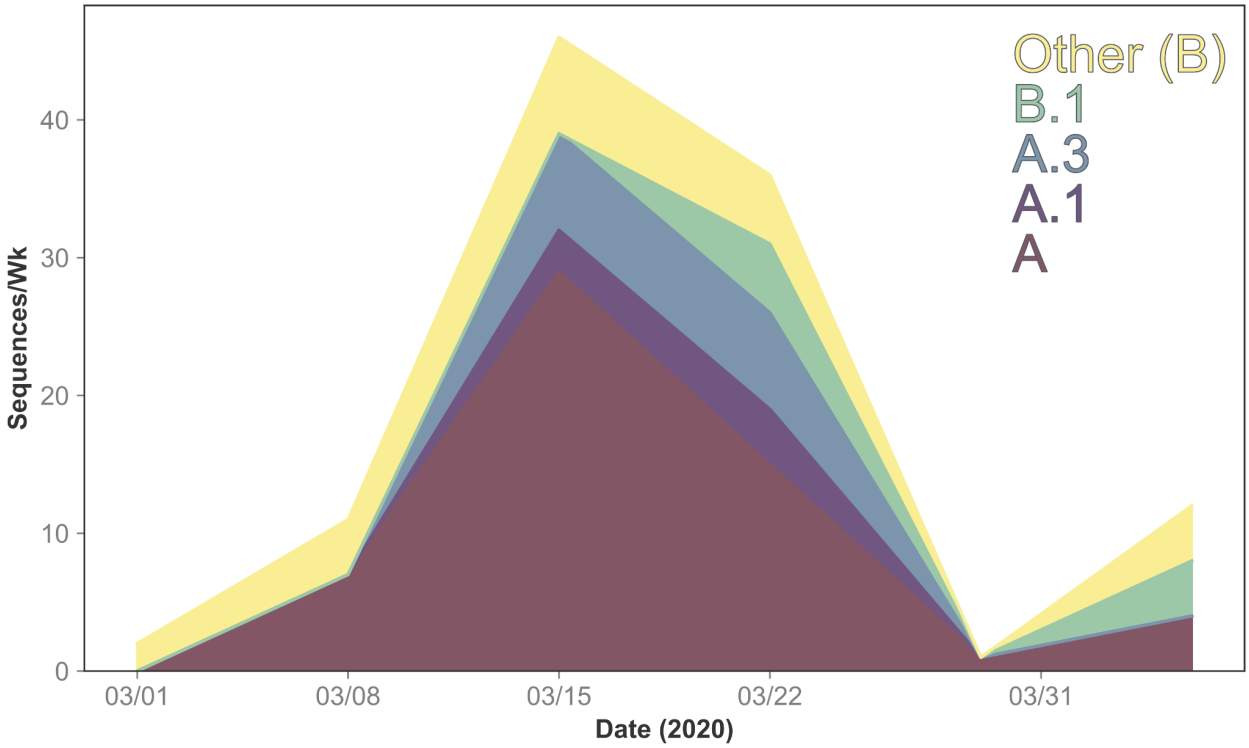
Supplementary Figures



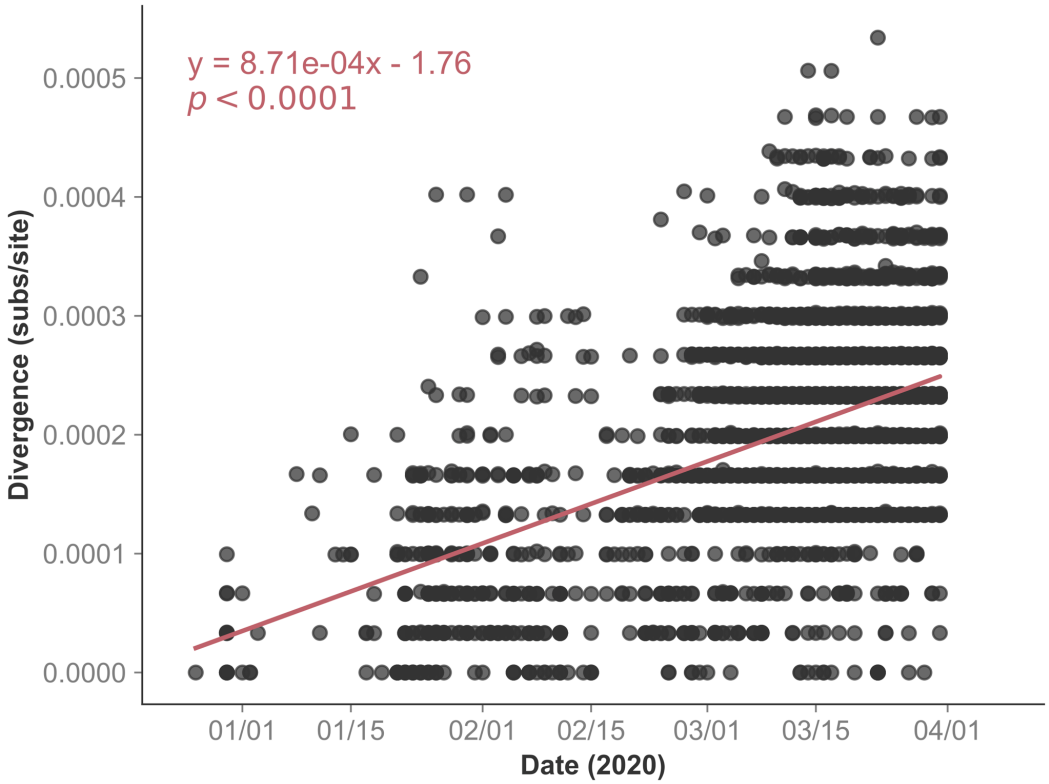
Supplementary Figure 1. SARS-CoV-2 diagnostic rRT-PCR tests performed by the EHC Molecular and Microbiology Laboratories between 2020-03-15 and 2020-03-31. Daily test results are colored by outcome. 610 (22.5%) of the 2,711 tests performed were positive for SARS-CoV-2.



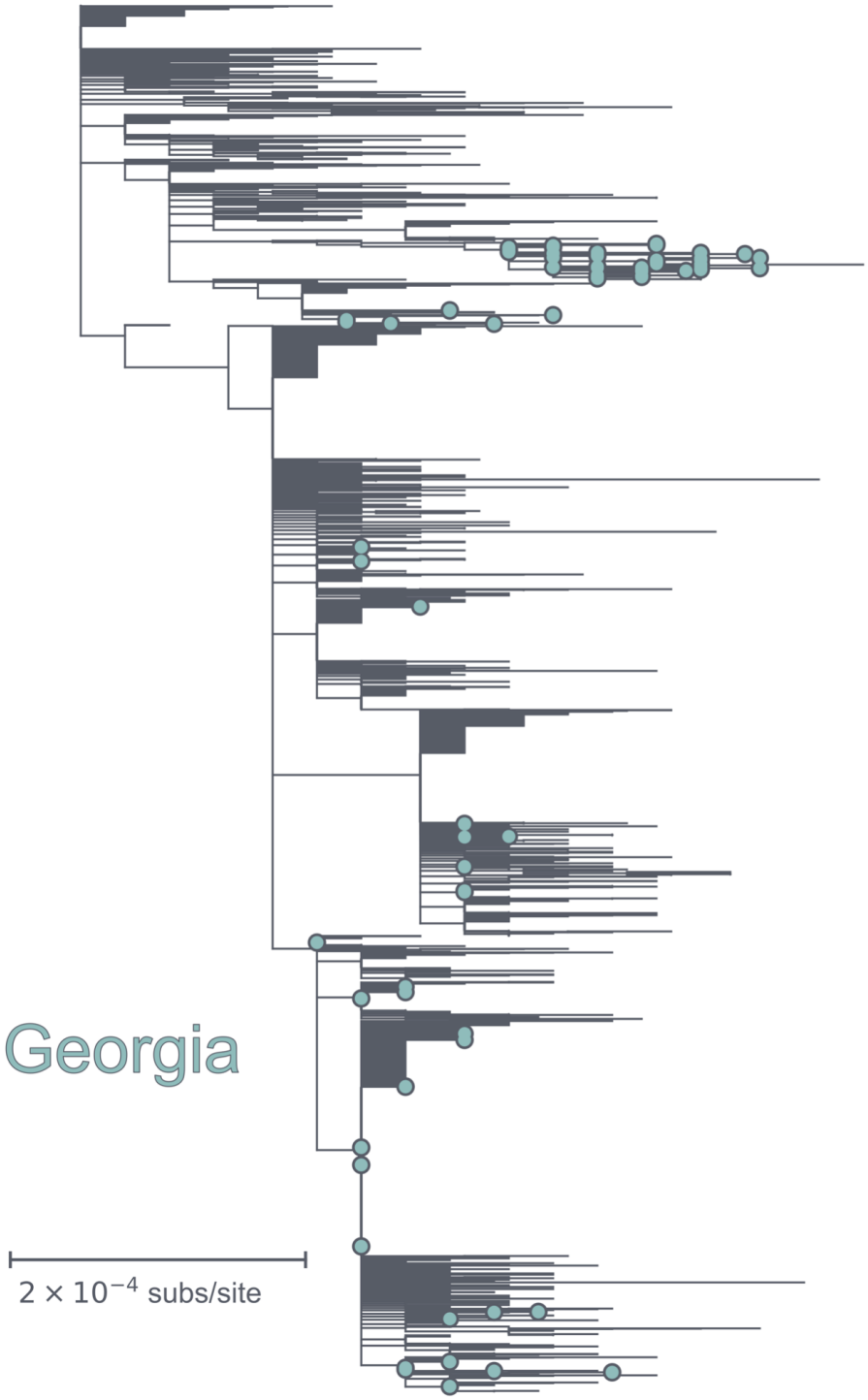
Supplementary Figure 2. Associations between C_T value and SARS-CoV-2 sequencing parameters. (A) SARS-CoV-2 C_T value by SARS-CoV-2 genome coverage for 50 positive nasopharyngeal specimens. (B) Log transformed SARS-CoV-2 reads per million total sequencing reads (RPM) for 52 positive bronchial alveolar lavage (BAL), nasopharyngeal (NP), oropharyngeal (OP), and sputum specimens.



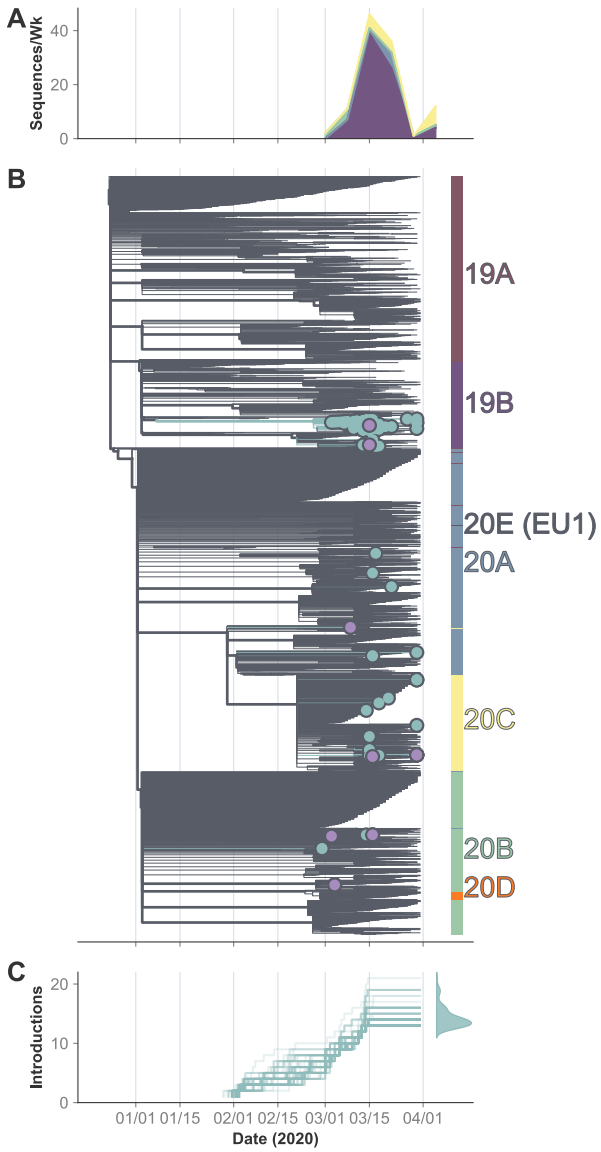
Supplementary Figure 3. Number of sequences from Georgia per lineage, per week included in the phylogenetic analysis. Sequences were grouped based on the last day of their date of sampling. Lineages with a total of less than seven sequences included into the dataset were grouped based on their parent lineage (A/B).



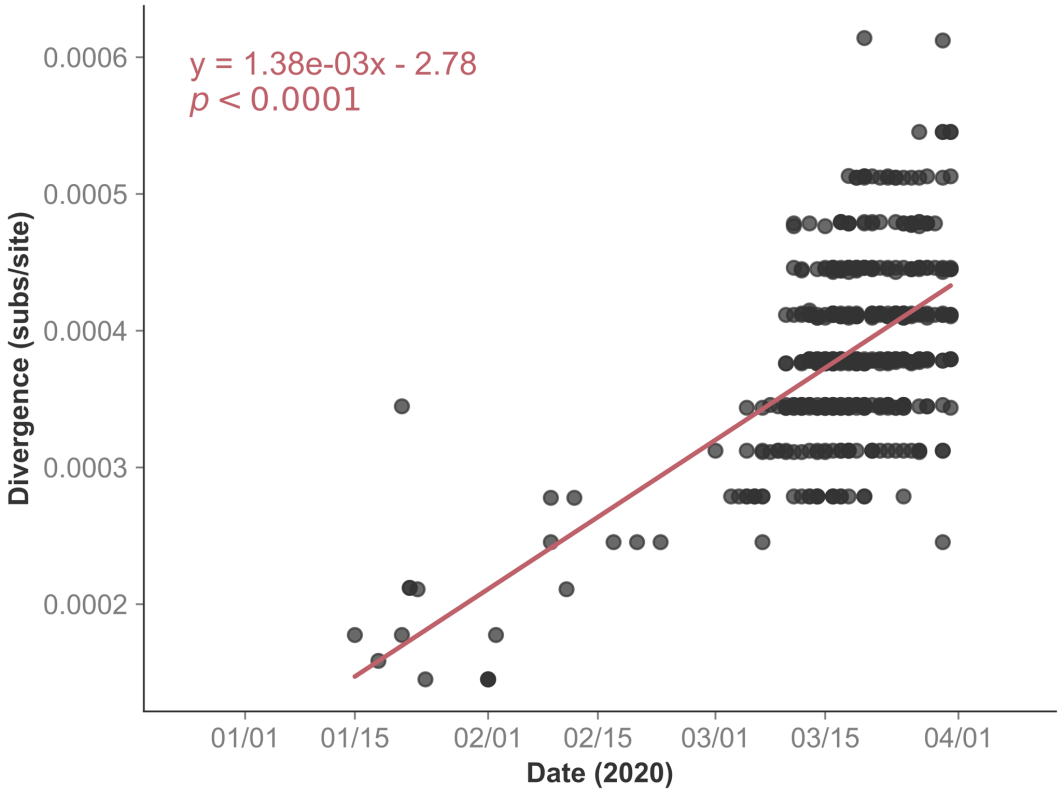
Supplementary Figure 4. Root-to-tip regression of global sequences selected using weighted downsampling. Root-to-tip regression of the 4611 downsampled sequences included in the maximum likelihood phylogenetic analysis that passed the TreeTime clock filter (four interquartile widths). Downsampling was based on per-country case counts and genetic distance to Georgia sequences. A linear regression line was fit and the *p*-value that the slope of that line is 0 is shown.



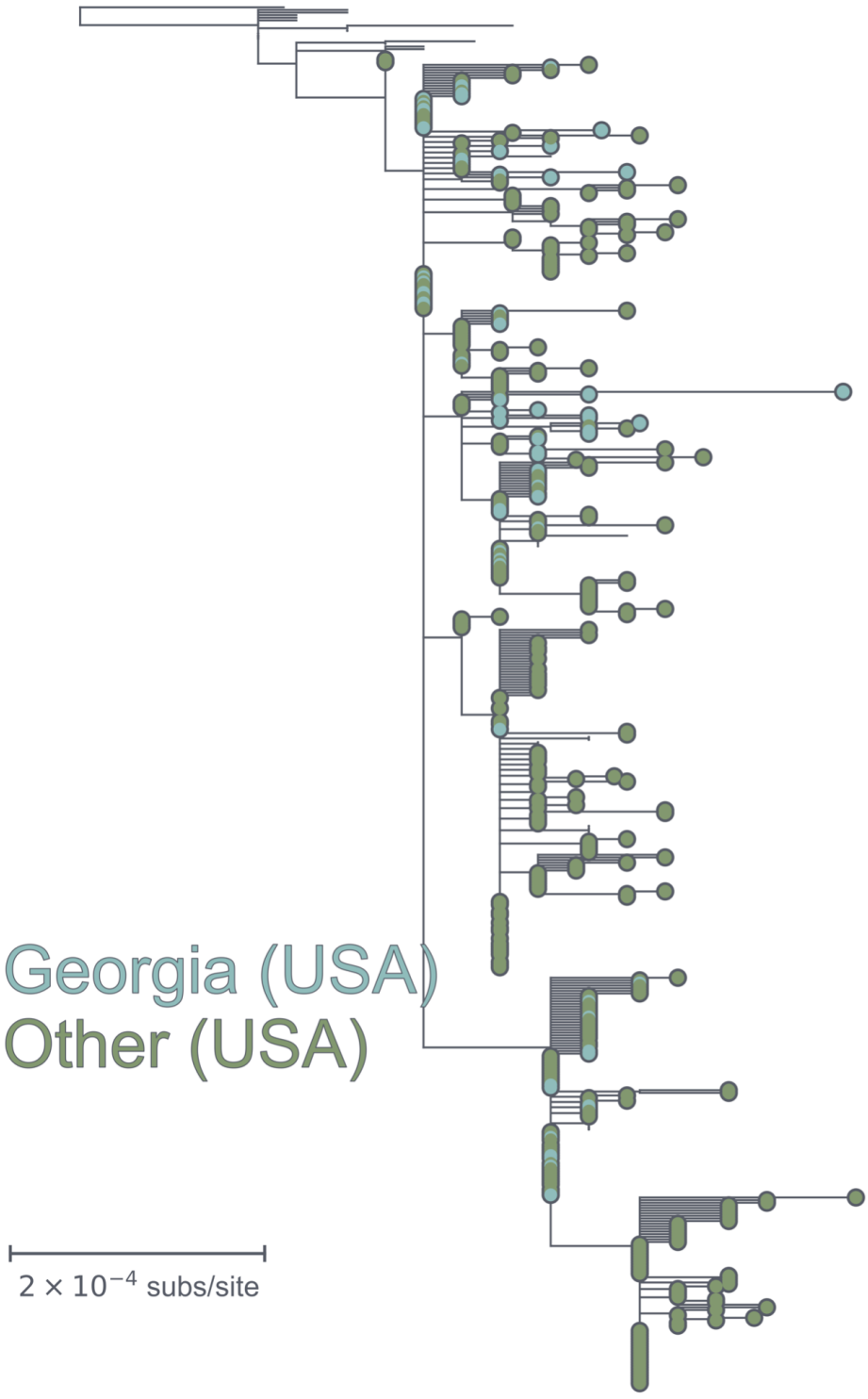
Supplementary Figure 5. Maximum likelihood divergence tree of sequences selected using weighted downsampling. Maximum likelihood phylogeny of the 4611 downsampled sequences which passed the TreeTime clock filter (four interquartile widths) with nucleotide divergence branch lengths. Tips from the state of Georgia are labelled in teal.



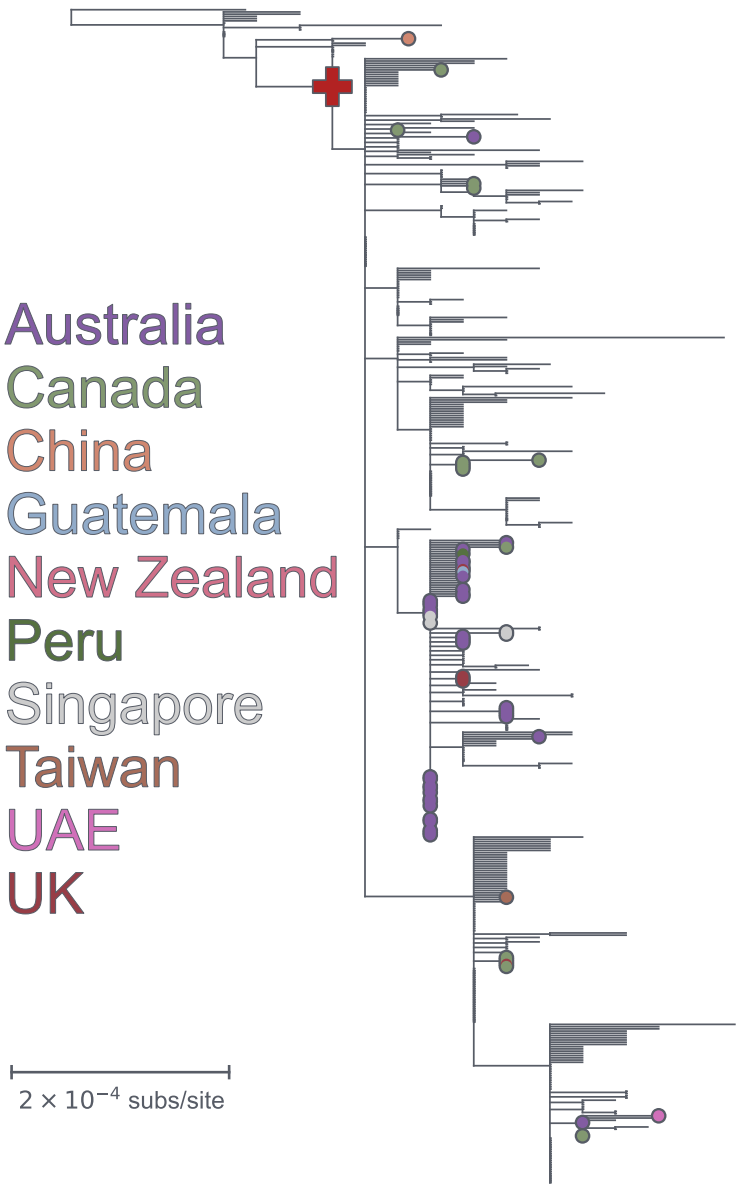
Supplementary Figure 6. Presence of multiple clades and maximum likelihood phylogenetic analysis indicates multiple introductions of SARS-CoV-2 into Georgia (temporally and geographically homogeneous downsampling). A) Number of sequences from Georgia per clade, per week included in the phylogenetic analysis. B) Time-resolved maximum likelihood tree of 5050 global temporally downsampled sequences (based on their date of isolation with a maximum of 20 sequences per country per week) and rooted at Wuhan/Hu-1. Includes sequences which passed the TreeTime clock filter (four interquartile widths). Internal nodes are colored based on their estimated location either inside (green) or outside (grey) of Georgia. Georgia tips are colored in green except for those with known travel history which are shown in pink. Color bar at right shows the clade identity of each sequence in the tree. Branch widths are weighted for visual clarity. B) Estimated cumulative number of introductions into Georgia (transition from a non-Georgia node to a Georgia-node/tip) based on the ancestral state reconstruction of internal nodes. Estimation was repeated on 100 bootstrap replicate trees and the timing of introduction events for each replicate is shown as an individual line. Gaussian kernel density plot at right shows the estimated cumulative number of introduction events as of 2020-03-31.



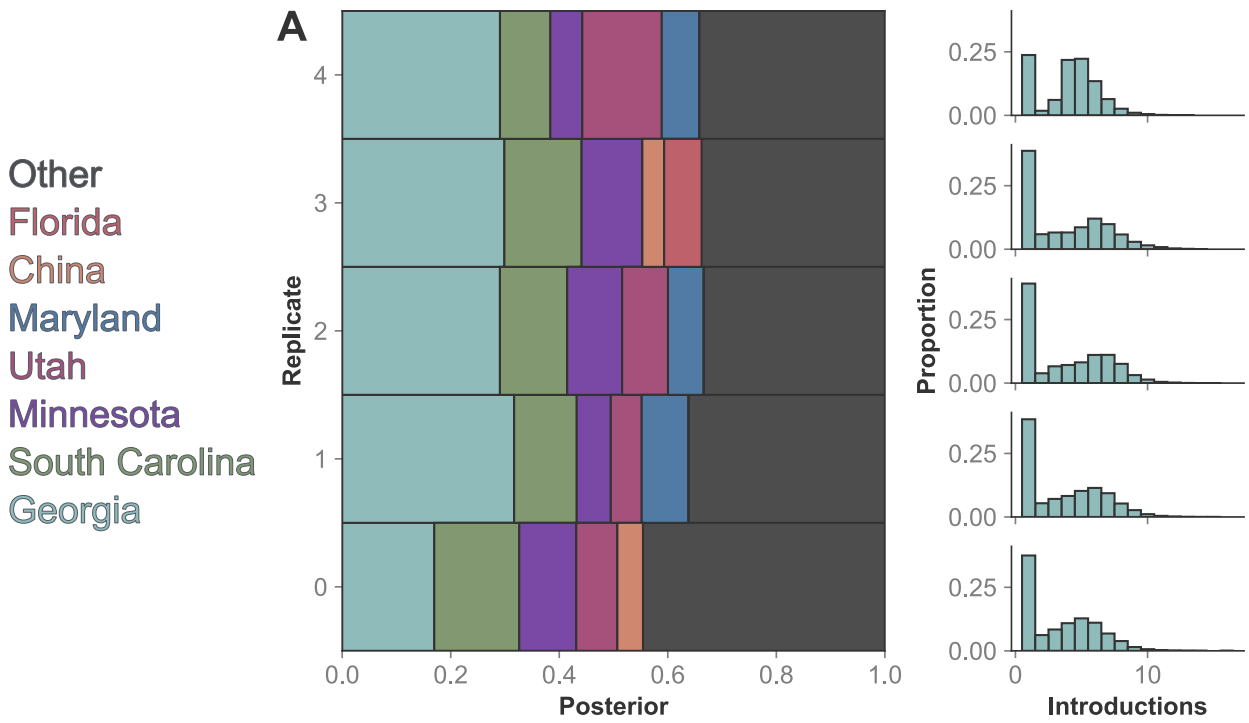
Supplementary Figure 7. Root-to-tip regression of select 19B sequences. Root-to-tip regression of 527 select 19B sequences which are genetically related to the 69 closely-related Georgia 19B sequences which passed the TreeTime clock filter (four interquartile widths). A linear regression line was fit and the *p*-value that the slope of that line is 0 is shown. A subset of these sequences was used in the Bayesian phylogenetic analysis.



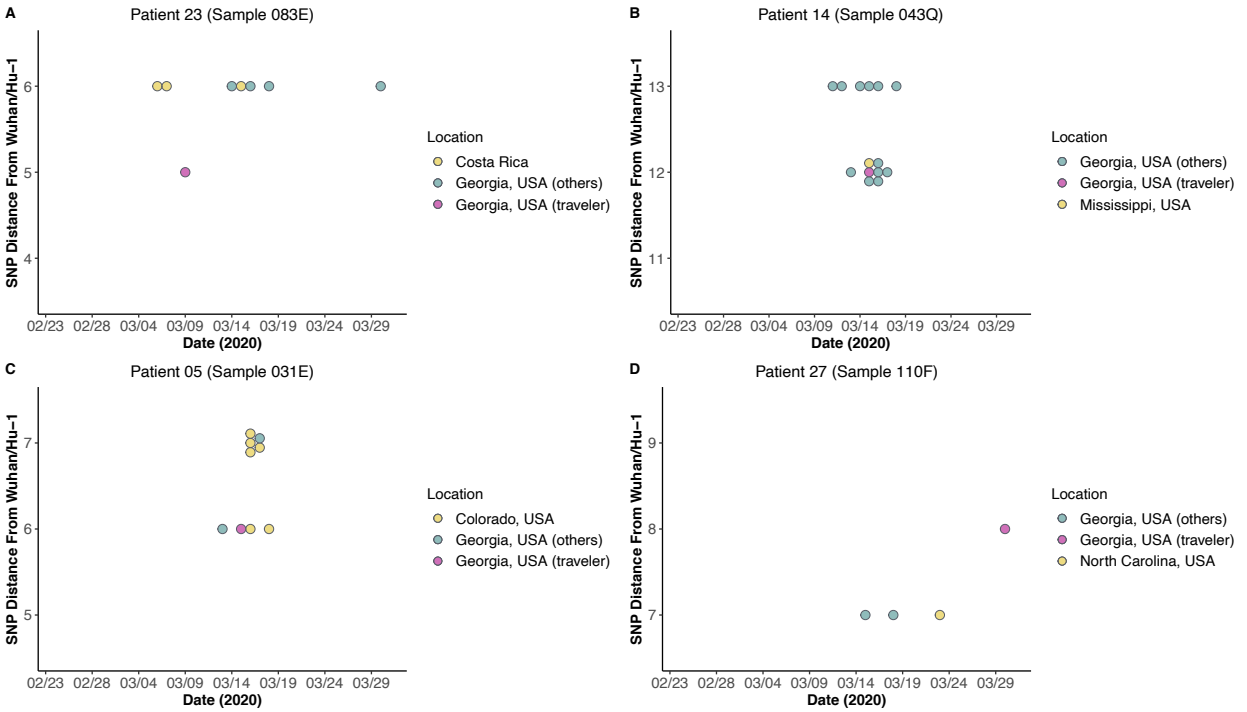
Supplementary Figure 8. Maximum likelihood divergence tree of select 19B sequences with U.S. sequences highlighted. Maximum likelihood phylogeny of 527 select 19B sequences which are genetically related to the 67 closely-related Georgia 19B sequences, which passed the TreeTime clock filter (four interquartile widths). Tips from the state of Georgia are labelled in teal and tips from other U.S. states are labelled in green. A subset of these sequences was used in the Bayesian phylogenetic analysis.



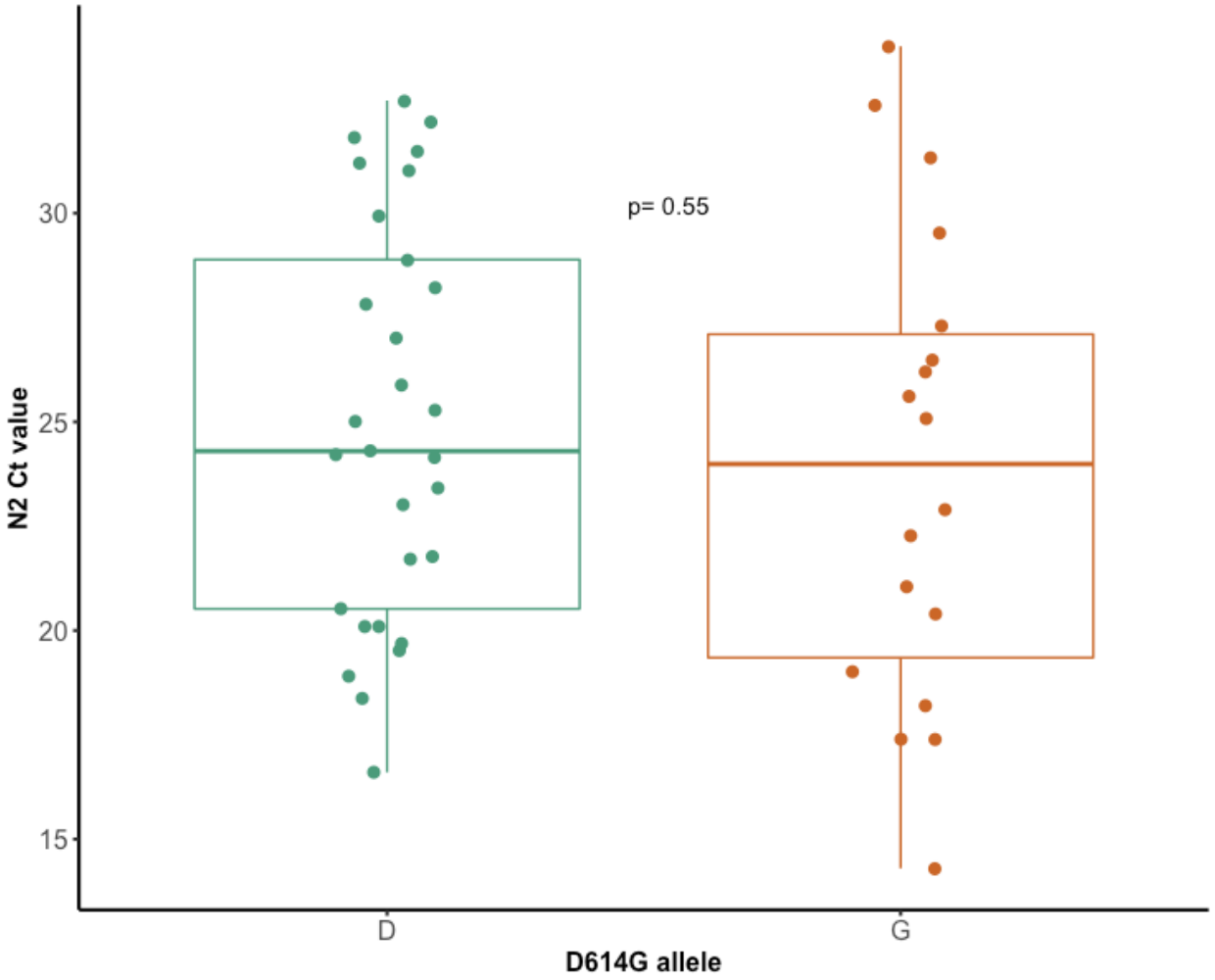
Supplementary Figure 9. Maximum likelihood divergence tree of select 19B sequences with non-U.S. sequences highlighted. Maximum likelihood phylogeny of 527 select 19B sequences which are genetically related to the 67 closely-related Georgia 19B sequences, which passed the TreeTime clock filter (four interquartile widths). Tips from outside of the United States sampled after 2020-02-29 are highlighted. The MRCA of all U.S. sequences in the tree is labelled with a red "+." A subset of these sequences was used in the Bayesian phylogenetic analysis.



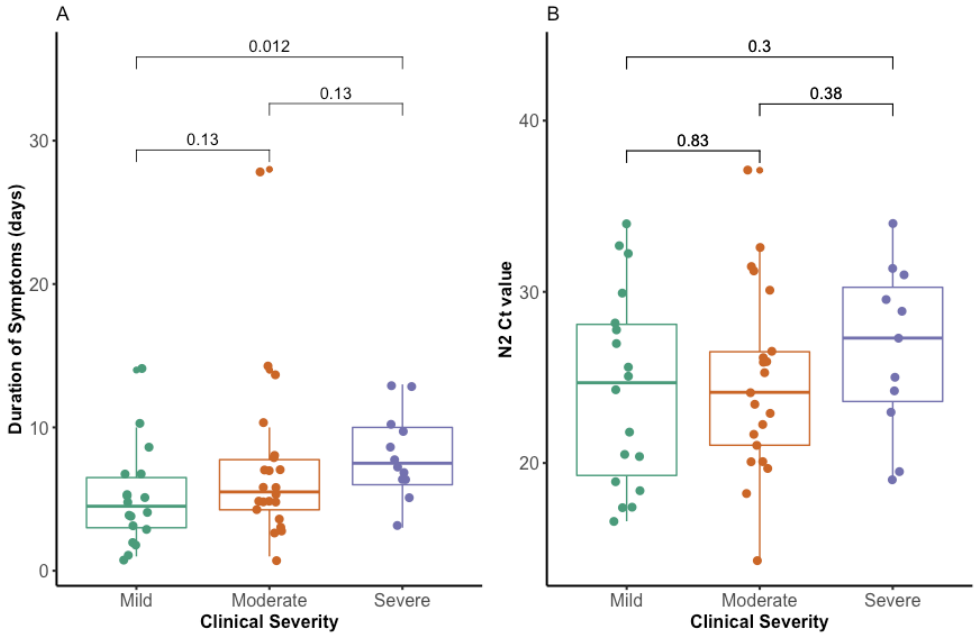
Supplementary Figure 10. Downsampled Bayesian phylogenetic analysis of genetically related Georgia 19B sequences and their phylogenetic neighbors. Sequences in the 19B subclade were randomly downsampled to at most five sequences per country/U.S. state per week, including Georgia. Bayesian discrete trait phylogenographic analysis was conducted on each replicate alignment. A) Discrete trait probabilities of the MRCA of all U.S. sequences in the maximum clade credibility tree for each replicate analysis. B) Estimated number of introductions into Georgia amongst the set of sampled trees for each replicate analysis.



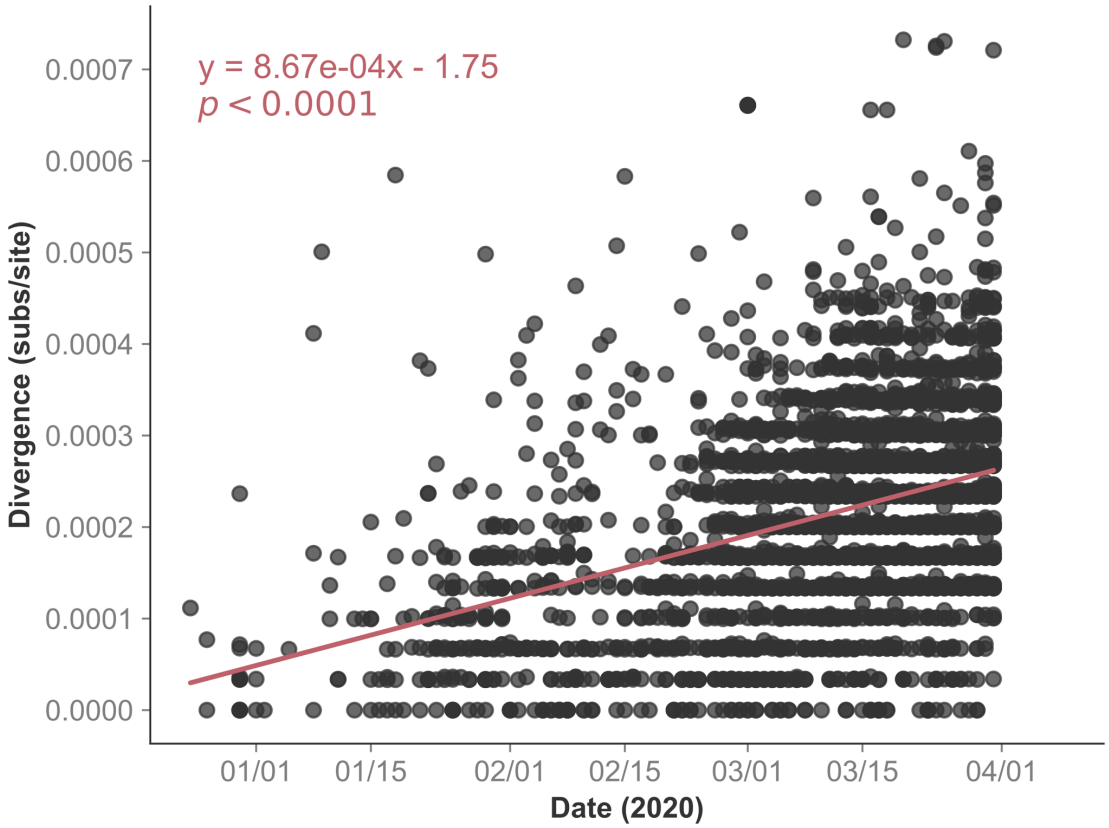
Supplementary Figure 11. Comparison of SARS-CoV-2 genomes from returning travelers. (A) The sequence from P23 was compared to related sequences from Georgia and Costa Rica (B) The sequence from P14 was compared to related sequences from Georgia and Mississippi (C) The sequence from P05 was compared to related sequences from Georgia and Colorado (D) The sequence from P27 was compared to related sequences from Georgia and North Carolina. Each patient sequence was compared to related sequence from Georgia and the region of travel within the same lineage and within 1 SNP (relative to Wuhan/Hu-1, y-axis) of the patient sequence.



Supplementary Figure 12. SARS-CoV-2 rRT-PCR C_T value by spike position 614 residue for 47 Nasopharyngeal (NP) samples. SARS-CoV-2 C_T value, measured using the nucleocapsid N2 target, for 47 positive nasopharyngeal specimens with sequence information available regarding spike amino acid position 614.



Supplementary Figure 13. Associations between molecular results and clinical parameters. (A) Duration of symptoms relative to date of testing across clinical severity for 52 patients with nasopharyngeal (NP) swabs available. (B) C_T value, measured using the nucleocapsid N2 target, across clinical severity for 50 patients with positive NP swabs available.



Supplementary Figure 14. Root-to-tip regression of global sequences selected using temporally and geographically homogeneous downsampling. Root-to-tip regression of 5050 globally sampled sequences downsampled based on their date of isolation (max 20 sequences per country per week) and rooted at Wuhan/Hu-1. Includes sequences which passed the TreeTime clock filter (four interquartile widths).

Table S1. Detailed SARS-CoV-2 sequencing metrics

Patient ID	Sample ID	GISAID Accession	Patient age	Patient gender	Sample Type	Sample date	Research N2 Ct	sgRNA Ct	Total mNGS sequencing reads	SARS-CoV-2 reads per million (RPM) by mNGS	SARS-CoV-2 Coverage by mNGS (%)	Depth by mNGS (Mean X)	Amplicon sequencing coverage	Nextstrain clade	Pangolin lineage	D614G	Included in phylogenetic analysis	19B Subclade
P01	GA-EHC-009I	EPI_ISL_455355	67	F	NP	43903	19.5	22.27	79965924	7867	1	127		19B	A.3	D	Yes	Yes
P02	GA-EHC-016P		40	F	NP	43906	26.2	29.61	98960176	13	0.49	N/A	1	20C	B.1.2	G	Yes	No
P34	GA-EHC-018R		52	F	NP	43901	31.5	41.45	83251868	26	0.52	N/A	0.997550253	19B	A.3	D	Yes	Yes
P41	GA-EHC-019S		63	M	NP	43903	Negative	N	40616205	1	0.06	N/A					No	No
P46	GA-EHC-022V	EPI_ISL_1278099	64	F	NP	43901	17.4	23.37	5358818	1364	0.99	36		19B	A.3	D	Yes	Yes
P03	GA-EHC-023W	EPI_ISL_754776	40	F	NP	43902	31.8	26.82	78160125	30	1	8		19B	A.3	D	Yes	Yes
P04	GA-EHC-030D	EPI_ISL_1503972	22	M	NP	43905	16.6	18.35	41362550	887	1	35		19B	A.3	D	Yes	Yes
P05	GA-EHC-031E	EPI_ISL_754749	63	M	NP	43905	21.8	25.92	416185	1615	0.98	12		19B	A.1	D	Yes	No
P38	GA-EHC-032F		37	F	NP	43906	27.8	31.77	24041304	8	0.21	N/A	0.99647651	19B	A.3	D	Yes	Yes
P06	GA-EHC-033G	EPI_ISL_754751	28	M	NP	43905	19.7	23.58	24797198	2986	1	56		19B	A.3	D	Yes	Yes
P07	GA-EHC-034H	EPI_ISL_754752	21	F	NP	43905	17.4	19.22	108569539	322	1	39		20C	B.1.369	G	Yes	No
P47	GA-EHC-035I		76	F	NP	43906	28.2	35.69	1086358	49	0.05	N/A	0.989563058	19B	A.3	D	Yes	Yes
P08	GA-EHC-036J	EPI_ISL_754753	72	M	NP	43906	22.9	25.27	22341214	348	1	20		20B	B.1.1.29	G	Yes	No
P09	GA-EHC-037K	EPI_ISL_754754	36	M	NP	43904	18.9	21.9	35062760	4087	1	76		19B	A.3	D	Yes	Yes
P10	GA-EHC-038L	EPI_ISL_754755	27	F	NP	43906	24.2	30.3	31598437	274	1	21		19B	A.3	D	Yes	Yes
P43	GA-EHC-039M		53	F	NP	43906	25.9	30.91	27921198	1	0.03	N/A					No	No
P11	GA-EHC-040N	EPI_ISL_754756	71	M	NP	43906	24.3	27.81	24747845	130	1	12		19B	A.3	D	Yes	Yes
P12	GA-EHC-041O	EPI_ISL_754757	71	M	NP	43905	14.3	16.47	25143479	73989	1	180		20C	B.1	G	Yes	No
P13	GA-EHC-042P	EPI_ISL_754758	48	F	NP	43905	18.4	21.53	32914438	3757	1	70		19B	A.3	D	Yes	Yes
P14	GA-EHC-043Q	EPI_ISL_754759	74	M	NP	43905	25.3	28.79	42320931	68	1	10		19B	A.3	D	Yes	Yes
P15	GA-EHC-044R	EPI_ISL_754760	64	M	NP	43905	21.7	24.14	55193628	199	1	19		19B	A.3	D	Yes	Yes
P48	GA-EHC-045S		36	F	NP	43905	Negative	N	not done	not done	not done	not done					No	No
P40	GA-EHC-046T		65	M	NP	43906	30.1	37.72	31970680	2	0.08	N/A					No	No
P55	GA-EHC-047U	EPI_ISL_1278100	25	F	NP	43905	21.9	25.87	2134445	30783	1	312		19B	A.3	D	Yes	Yes
P49	GA-EHC-048V		41	F	NP	43903	32.7	N	not done	not done	not done	not done	0.97047079	19B		D	Yes	No
P16	GA-EHC-049W	EPI_ISL_754761	21	F	NP	43905	17.4	19.62	59818725	3684	1	98		20C	B.1.369	G	Yes	No
P35	GA-EHC-050X		54	M	NP	43906	29.5	36.33	71252821	7	0.47	N/A	0.989543055	20A	B.1	G	Yes	No
P50	GA-EHC-051Y		54	M	NP	43906	31	33.23	1571845	303	0.43	N/A	1	19B	A.3	D	Yes	No
P17	GA-EHC-052Z	EPI_ISL_754762	60	M	NP	43906	24.1	36.4	31394448	80	1	20		19B	A.3	D	Yes	Yes
P18	GA-EHC-053A	EPI_ISL_754763	41	F	NP	43905	20.5	24.15	37807078	269	1	11		19B	A.3	D	Yes	Yes
P19	GA-EHC-054B	EPI_ISL_754764	38	M	NP	43905	23	24.81	82744830	104	1	12		19B	A.3	D	Yes	Yes
P20	GA-EHC-055C	EPI_ISL_754765	42	M	NP	43904	18.2	21.27	42382383	9320	1	130		20C	B.1	G	Yes	No
P21	GA-EHC-060H	EPI_ISL_754777	59	F	OP	43901	26.5	31.3	73241	132	1	17		19B	A.3	D	Yes	Yes
P22	GA-EHC-064L	EPI_ISL_754778	21	F	OP	43894	22.1	27.33	26359072	98	0.99	9		20B	B.1.1	G	Yes	No
P33	GA-EHC-069Q		48	M	NP	43893	25.6		282176415	14	0.79	N/A	1	20B		G	Yes	No
P45	GA-EHC-076X		47	M	BAL	43895	32		670023	3	<1%	N/A					No	No
P36	GA-EHC-080B	EPI_ISL_2790700	58	M	NP	43900	28.9	34.45	834593	20	0.04	N/A	0.989464148	19B	A.3	D	Yes	Yes
P36	GA-EHC-081C		58	M	OP	43900	27.7	30.84	26085121	10	0.4	N/A	0.071073776	19B	B.1	D	No	No
P23	GA-EHC-083E	EPI_ISL_454690	60	F	NP	43899	20.4	26.95	47542787	5098	1	488		20A	B.1	G	Yes	No
P44	GA-EHC-084F		39	F	NP	43901	34		57601938	2	<1%	N/A					No	No
P44	GA-EHC-085G		39	F	OP	43901	21.6		83861856	183	<1%	N/A					No	No
P24	GA-EHC-086H	EPI_ISL_455356	62	M	NP	43900	25	29.09	48905186	314	1	29		19B	A.3	D	Yes	Yes
P24	GA-EHC-087I	EPI_ISL_455360	62	M	Sputum	43900	18	26.95	242735	166985	1	161		19B	A.3	D	No	No
P25	GA-EHC-097S	EPI_ISL_754766	61	M	NP	43902	23.4	27.06	4161690	822	1	19		19B	A.3	D	Yes	Yes
P21	GA-EHC-106B		59	F	NP	43901	20.1	23.68	3991057	274	0.8	N/A		19B		D	No	No
P26	GA-EHC-108D	EPI_ISL_754750	75	M	NP	43920	27	32.53	26745368	348	1	12		19B	A.3	D	Yes	Yes
P51	GA-EHC-109E		51	M	NP	43920	34	N	not done	not done	not done	not done	1	20C	B.1.1	G	Yes	No
P27	GA-EHC-110F	EPI_ISL_754767	61	M	NP	43920	25.1	30.11	26377907	469	1	21		20C	B.1	G	Yes	No
P42	GA-EHC-111G		49	M	NP	43920	32.2	40.32	7331914	16	0.05	N/A	1	19B	B.1.1	D	Yes	Yes
P32	GA-EHC-112H	EPI_ISL_2107431	85	F	NP	43920	21	27.18	46871545	623	1	99		20C	B.1.302	G	Yes	No
P28	GA-EHC-113J	EPI_ISL_754768	75	M	NP	43920	25.9	32.3	11346840	579	1	10		19B	A.3	D	Yes	Yes
P52	GA-EHC-114K		56	F	NP	43920	26.5	31.59	160832	8916	0.85	N/A	0.999832232	20C	B.1	G	Yes	No
P29	GA-EHC-115L	EPI_ISL_455361	62	F	NP	43920	22.3	27.6	1582980	16408	1	312		20C	B.1	G	Yes	No
P30	GA-EHC-117N		45	M	NP	43920	29.9	N	67056013	19	0.92	7	1	19B	A.3	D	Yes	Yes
P53	GA-EHC-118O		47	F	NP	43920	32.6	N	not done	not done	not done	not done	1	20C	B.1	G	Yes	No
P31	GA-EHC-119P	EPI_ISL_754747	92	F	NP	43920	27.3	31.47	52701235	42	0.96	5		20A	B.1	G	Yes	No
P54	GA-EHC-120Q		39	M	NP	43920	37.1	N	not done	not done	not done	not done	0.583196323	19B	A		No	No
P39	GA-EHC-121R		47	F	NP	43920	31.3	39.39	61204786	1	0.1	N/A	0.991674779	20C	B.1	G	Yes	No
P37	GA-EHC-171Q		62	M	NP	43904	19		86820460	2	0.25	N/A	0.850434666	20A	A	G	No	No

Table S2. Detailed clinical data for 54 EHC patients with SARS-CoV-2 infectior

Patient number	Sample ID	Sample Type	Sample date	Research N2 Ct	Age	Gender	Race	Ethnicity	Duration of symptoms (days)	County of residence	Travel within 2 weeks prior to symptom onset	Severity	Death	serology	date of serology	DM	HTN	obesity (BMI>30)	lung disease	Immunosuppression condition	Included in phylogenetic analysis
P01	GA-EHC-009I	NP	43903	19.5	67	F	Caucasian or White	Non-Hispanic or Latino	10	Cherokee	N	ICU	Y	N/A	N/A	Y	Y	Y	N	CKD Stage 3 , ESLD	Yes
P02	GA-EHC-016P	NP	43906	26.2	40	F	Asian	Non-Hispanic or Latino	8	Gwinnett	New Orleans, LA	Inpatient	N	N/A	N/A	N	N	N	N	N	Yes
P03	GA-EHC-023W	NP	43902	31.8	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	unknown	Yes
P04	GA-EHC-030D	NP	43905	16.6	22	M	African American	Non-Hispanic or Latino	1	Forsyth	N	ED	N	N/A	N/A	N	N	N	Asthma	N	Yes
P05	GA-EHC-031E	NP	43905	21.8	63	M	Caucasian or White	Non-Hispanic or Latino	3	Fulton	Colorado	Clinic	N	IGG PoS	44034	N	N	N	N	N	Yes
P06	GA-EHC-033G	NP	43905	19.7	28	M	Hispanic	Hispanic or Latino	5	Fulton	N	Inpatient	N	N/A	N/A	N	N	Y	N	N	Yes
P07	GA-EHC-034H	NP	43905	17.4	21	F	Caucasian or White	Non-Hispanic or Latino	4	Dekalb	N	ED	N	N/A	N/A	N	N	N	Asthma	N	Yes
P08	GA-EHC-036J	NP	43906	22.9	72	M	African American	Non-Hispanic or Latino	5	Fulton	Nigeria	Inpatient	N	N/A	N/A	N	Y	N	N	CKD stage 3	Yes
P09	GA-EHC-037K	NP	43904	18.9	36	M	Caucasian or White	Non-Hispanic or Latino	2	Dekalb	N	ED	N	N/A	N/A	N	N	N	N	N	Yes
P10	GA-EHC-038L	NP	43906	24.2	27	F	Caucasian or White	Non-Hispanic or Latino	13	Cobb	unknown	ICU	N	N/A	N/A	N	N	Y	N	N	Yes
P11	GA-EHC-040N	NP	43906	24.3	71	M	African American	Non-Hispanic or Latino	5	Gwinnett	unknown	ED	N	N/A	N/A	N	N	N	N	N	Yes
P12	GA-EHC-041O	NP	43905	14.3	71	M	African American	Non-Hispanic or Latino	5	Dekalb	N	Inpatient	N	N/A	N/A	N	Y	N	N	ESRD	Yes
P13	GA-EHC-042P	NP	43905	18.4	48	F	African American	Non-Hispanic or Latino	5	Dekalb	N	ED	N	N/A	N/A	Y	N	Y	N	N	Yes
P14	GA-EHC-043Q	NP	43905	25.3	74	M	African American	Non-Hispanic or Latino	6	Fulton	Mississippi	Inpatient	N	N/A	N/A	N	Y	Y	Obstructive Sleep apnea	CKD Stage 3	Yes
P15	GA-EHC-044R	NP	43905	21.7	64	M	African American	Non-Hispanic or Latino	4	Fulton	N	Inpatient	N	N/A	N/A	Y	Y	Y	N	ESRD	Yes
P16	GA-EHC-049W	NP	43905	17.4	21	F	Caucasian or White	Non-Hispanic or Latino	4	Dekalb	N	ED	N	N/A	N/A	N	N	N	N	N	Yes
P17	GA-EHC-052Z	NP	43906	24.1	60	M	African American	Non-Hispanic or Latino	28	Fulton	N	Inpatient	N	N/A	N/A	N	N	N	N	N	Yes
P18	GA-EHC-053A	NP	43905	20.5	41	F	African American	Non-Hispanic or Latino	1	Fulton	N	ED	N	N/A	N/A	N	Y	Y	N	N	Yes
P19	GA-EHC-054B	NP	43905	23	38	M	African American	Non-Hispanic or Latino	8	Henry	N	ICU	N	N/A	N/A	N	Y	Y	N	N	Yes
P20	GA-EHC-055C	NP	43904	18.2	42	M	Hispanic	Hispanic or Latino	7	Fulton	N	Inpatient	N	N/A	N/A	N	N	Y	Chronic bronchitis	N	Yes
P21	GA-EHC-060H	OP	43901	26.5	59	F	African American	Non-Hispanic or Latino	8	Fulton	N	Inpatient	N	N/A	N/A	N	N	N	N	Multiple Sclerosis	Yes
P21	GA-EHC-106B	NP	43901	21.9	59	F	African American	Non-Hispanic or Latino	8	Fulton	N	Inpatient	N	N/A	N/A	N	N	N	N	Multiple Sclerosis	No
P22	GA-EHC-064L	OP	43894	22.1	21	F	Caucasian or White	Non-Hispanic or Latino	3	Gwinnett	Italy, Switzerland	ED	N	N/A	N/A	N	N	N	N	N	Yes
P23	GA-EHC-083E	NP	43899	20.4	60	F	Caucasian or White	Non-Hispanic or Latino	5	Fayette	Costa Rica	ED	N	N/A	N/A	N	Y	Y	Asthma	N	Yes
P24	GA-EHC-086H	NP	43900	25	62	M	African American	Non-Hispanic or Latino	6	Fulton	unknown	ICU	Y	N/A	N/A	Y	Y	N	N	HIV	Yes
P24	GA-EHC-087I	Sputum	43900	18	62	M	African American	Non-Hispanic or Latino	6	Fulton	unknown	ICU	Y	N/A	N/A	Y	Y	N	N	HIV	No
P25	GA-EHC-097S	NP	43902	23.4	61	M	African American	Non-Hispanic or Latino	5	Cobb	N	Inpatient	N	N/A	N/A	Y	Y	Y	Asthma	N	Yes
P26	GA-EHC-108D	NP	43920	27	75	M	African American	Non-Hispanic or Latino	14	Dekalb	unknown	Clinic	N	N/A	N/A	N	N	N	N	Multiple Myeloma	Yes
P27	GA-EHC-110F	NP	43920	25.1	61	M	Caucasian or White	Non-Hispanic or Latino	4	Fulton	North Carolina	Clinic	N	N/A	N/A	N	N	N	N	N	Yes
P28	GA-EHC-113J	NP	43920	25.9	75	M	Caucasian or White	Non-Hispanic or Latino	10	Dekalb	N	Inpatient	N	N/A	N/A	N	Y	N	N	N	Yes
P29	GA-EHC-115L	NP	43920	22.3	62	F	African American	Non-Hispanic or Latino	3	Dekalb	N	Inpatient	N	N/A	N/A	N	N	N	N	N	Yes
P30	GA-EHC-117N	NP	43920	29.9	45	M	African American	Non-Hispanic or Latino	7	Fulton	N	ED	N	N/A	N/A	N	N	N	Asthma	HIV	Yes
P31	GA-EHC-119P	NP	43920	27.3	92	F	African American	Non-Hispanic or Latino	3	Fulton	N	ICU	Y	N/A	N/A	N	Y	N	N	N	No
P32	GA-EHC-112H	NP	43920	21	85	F	African American	Non-Hispanic or Latino	1	Dekalb	N	Inpatient	N	N/A	N/A	N	Y	N	N	N	Yes
P33	GA-EHC-069Q	NP	43893	25.6	48	M	Caucasian or White	Non-Hispanic or Latino	9	Cobb	Italy, Poland	Clinic	N	N/A	N/A	N	Y	N	N	N	No
P34	GA-EHC-018R	NP	43901	31.5	52	F	African American	Non-Hispanic or Latino	14	Dekalb	N	Inpatient	N	N/A	N/A	Y	Y	Y	Asthma	N	Yes
P35	GA-EHC-050X	NP	43906	29.5	54	M	Caucasian or White	Non-Hispanic or Latino	7	Union	N	ICU	N	N/A	N/A	N	N	N	N	N	Yes
P36	GA-EHC-080B	NP	43900	28.9	58	M	African American	Non-Hispanic or Latino	9	Dekalb	unknown	ICU	N	N/A	N/A	N	Y	y	N	N	Yes
P36	GA-EHC-081C	OP	43900	27.7	58	M	African American	Non-Hispanic or Latino	9	Dekalb	unknown	ICU	N	N/A	N/A	N	Y	y	N	N	No
P37	GA-EHC-171Q	NP	43904	19	62	M	African American	Non-Hispanic or Latino	7	Fulton	N	ICU	Y	N/A	N/A	Y	Y	N	N	HIV	No
P38	GA-EHC-032F	NP	43906	27.8	37	F	African American	Non-Hispanic or Latino	5	Gwinnett	N	ED	N	N/A	N/A	N	Y	Y	N	N	Yes
P39	GA-EHC-121R	NP	43920	31.3	47	F	African American	Non-Hispanic or Latino	5	Gwinnett	New Orleans, LA	ICU	N	N/A	N/A	Y	Y	Y	N	N	Yes
P40	GA-EHC-046T	NP	43906	30.1	65	M	Caucasian or White	Non-Hispanic or Latino	5	Cobb	N	Inpatient	N	N/A	N/A	Y	Y	Y	N	CKD Stage 3	No
P41	GA-EHC-019S	NP	43903	Negative	63	M	African American	Non-Hispanic or Latino	6	Fulton	N	Inpatient	N	N/A	N/A	Y	Y	Y	N	N	No
P42	GA-EHC-111G	NP	43920	32.2	49	M	Asian	Non-Hispanic or Latino	7	Gwinnett	N	ED	N	N/A	N/A	N	N	Y	N	N	Yes
P43	GA-EHC-039M	NP	43906	25.9	53	F	Caucasian or White	Non-Hispanic or Latino	14	Gwinnett	N	Inpatient	N	N/A	N/A	N	Y	N	N	Liver Transplant	No
P44	GA-EHC-084F	NP	43901	34	39	F	African American	Non-Hispanic or Latino	3	Fulton	N	ED	N	N/A	N/A	N	N	Y	N	N	No
P44	GA-EHC-085G	OP	43901	21.6	39	F	African American	Non-Hispanic or Latino	3	Fulton	N	ED	N	N/A	N/A	N	N	Y	N	N	No
P45	GA-EHC-076X	BAL	43895	32	47	M	Hispanic	hispanic or Latino	13	Dekalb	N	Inpatient	N	N/A	N/A	N	N	N	N	N	No
P46	GA-EHC-022V	NP	43901	17.4	64	F	African American	Non-Hispanic or Latino	3	Fulton	N	Inpatient	N	N/A	N/A	N	N	Y	N	SLE	Yes
P47	GA-EHC-035I	NP	43906	28.2	76	F	Caucasian or White	Non-Hispanic or Latino	2	Dekalb	N	ED	N	N/A	N/A	N	N	N	N	N	Yes
P48	GA-EHC-045S	NP	43905	Negative	36	F	Caucasian or White	Non-Hispanic or Latino	6	Bartow	unknown	ICU	N	N/A	N/A	N	N	Y	N	N	No
P49	GA-EHC-048V	NP	43903	32.7	41	F	Asian	Non-Hispanic or Latino	10	Dekalb	N	ED	N	N/A	N/A	Y	N	N	N	N	No
P50	GA-EHC-051Y	NP	43906	31	54	M	African American	Non-Hispanic or Latino	13	Fulton	N	ICU	N	N/A	N/A	Y	Y	Y	N	N	No
P51	GA-EHC-109E	NP	43920	34	51	M	Caucasian or White	Non-Hispanic or Latino	10	Fulton	N	ICU	N	N/A	N/A	N	Y	Y	N	N	No
P52	GA-EHC-114K	NP	43920	26.5	56	F	African American	Non-Hispanic or Latino	7	Fulton	N	Inpatient	N	N/A	N/A	N	N	Y	Asthma	N	Yes
P53	GA-EHC-118O	NP	43920	32.6	47	F	Asian	Non-Hispanic or Latino	7	Gwinnett	N	Inpatient	N	N/A	N/A	N	N	N	N	N	No
P54	GA-EHC-120Q	NP	43920	37.1	39	M	African American	Non-Hispanic or Latino	4	Cobb	N	Inpatient	N	N/A	N/A	Y	Y	Y	N	N	No
P55	GA-EHC-047U	NP	43905	20.1	25	F	African American	Non-Hispanic or Latino	3	Dekalb	N	Inpatient	N	N/A	N/A	N	N	N	N	Heart transplant	Yes

Table S3. GISAID acknowledgements table for all sequences used in travel and phylogenetic analyses.

We gratefully acknowledge the following Authors from the Originating laboratories responsible for obtaining the specimens, as well as the Submitting laboratories where the genome data were generated and shared via GISAID, on which this research is based.

All Submitters of data may be contacted directly via www.gisaid.org

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EPI_ISL_451540, EPI_ISL_451588, EPI_ISL_451590, EPI_ISL_451591, EPI_ISL_451592, EPI_ISL_451593, EPI_ISL_451595, EPI_ISL_451596, EPI_ISL_451598, EPI_ISL_451612			
see above	ACT pathology	NSW Health Pathology - Institute of Clinical Pathology and Medical Research; Westmead Hospital; University of Sydney	CIDM-PH et al.
EPI_ISL_471546	AMA DR Jose Soares Hungria	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes
EPI_ISL_467432	AMPATH-DBN	KRISP, KZN Research Innovation and Sequencing Platform	Chimukangara B; Giandhari J; Khan S; Lessells R; Mdlalose K; Pillay S; Tegally H; Wilkinson E; York D; de Oliveira T
EPI_ISL_450800	AR Dept. of Health-Public Health Lab	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Anna Montmayeur; Anna Uehara; Bettina Bankamp; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao; Zachary Weiner
EPI_ISL_418000, EPI_ISL_418001, EPI_ISL_418004	ARS Algarve - Laboratório Laura Ayres	Instituto Nacional de Saude (INSA)	Guiomar et al
EPI_ISL_445326, EPI_ISL_445367	ASISTENCIA PUBLICA DR.ALEJANDRO DEL RIO	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_542098, EPI_ISL_542099, EPI_ISL_542100, EPI_ISL_542101, EPI_ISL_542102, EPI_ISL_542103, EPI_ISL_542104, EPI_ISL_542105, EPI_ISL_542106, EPI_ISL_542107, EPI_ISL_542108, EPI_ISL_542109, EPI_ISL_542110, EPI_ISL_542111, EPI_ISL_542112, EPI_ISL_542113, EPI_ISL_542114, EPI_ISL_542115, EPI_ISL_542116, EPI_ISL_542117, EPI_ISL_542118, EPI_ISL_542119, EPI_ISL_542120, EPI_ISL_542121, EPI_ISL_542122, EPI_ISL_542123, EPI_ISL_542124, EPI_ISL_542125, EPI_ISL_542126, EPI_ISL_542127, EPI_ISL_542128, EPI_ISL_542129, EPI_ISL_542130, EPI_ISL_542131, EPI_ISL_542132, EPI_ISL_542133, EPI_ISL_542134, EPI_ISL_542135, EPI_ISL_542136, EPI_ISL_542137, EPI_ISL_542138, EPI_ISL_542139, EPI_ISL_542140, EPI_ISL_542141, EPI_ISL_542142, EPI_ISL_542143, EPI_ISL_542144, EPI_ISL_542145, EPI_ISL_542146, EPI_ISL_542147, EPI_ISL_542148, EPI_ISL_542149, EPI_ISL_542150, EPI_ISL_542151, EPI_ISL_542152, EPI_ISL_542153, EPI_ISL_542154, EPI_ISL_542155, EPI_ISL_542156, EPI_ISL_542157, EPI_ISL_542158, EPI_ISL_542159, EPI_ISL_542160, EPI_ISL_542161, EPI_ISL_542162, EPI_ISL_542163, EPI_ISL_542164, EPI_ISL_542165, EPI_ISL_542166, EPI_ISL_542167, EPI_ISL_542168, EPI_ISL_542169, EPI_ISL_542170, EPI_ISL_542171, EPI_ISL_542172, EPI_ISL_542173, EPI_ISL_542174, EPI_ISL_542175, EPI_ISL_542176, EPI_ISL_542177, EPI_ISL_542178, EPI_ISL_542179, EPI_ISL_542180, EPI_ISL_542181, EPI_ISL_542182, EPI_ISL_542183, EPI_ISL_542184, EPI_ISL_542185, EPI_ISL_542186, EPI_ISL_542187, EPI_ISL_542188, EPI_ISL_542189, EPI_ISL_542190, EPI_ISL_542191, EPI_ISL_542192, EPI_ISL_542193, EPI_ISL_542194, EPI_ISL_542195, EPI_ISL_542196, EPI_ISL_542197, EPI_ISL_542198, EPI_ISL_542199, EPI_ISL_542200, EPI_ISL_542201, EPI_ISL_542202, EPI_ISL_542203, EPI_ISL_542204, EPI_ISL_542205, EPI_ISL_542206, EPI_ISL_542207, EPI_ISL_542208, EPI_ISL_542209, EPI_ISL_542210, EPI_ISL_542211, EPI_ISL_542212, EPI_ISL_542213, EPI_ISL_542214, EPI_ISL_542215, EPI_ISL_542216, EPI_ISL_542217, EPI_ISL_542218, EPI_ISL_542219, EPI_ISL_542220, EPI_ISL_542221, EPI_ISL_542222, EPI_ISL_542223, EPI_ISL_542224, EPI_ISL_542225, EPI_ISL_542226, EPI_ISL_542228, EPI_ISL_542229, EPI_ISL_542230, EPI_ISL_542231, EPI_ISL_542232, EPI_ISL_542233, EPI_ISL_542234, EPI_ISL_542235, EPI_ISL_542236, EPI_ISL_542237, EPI_ISL_542238, EPI_ISL_542239, EPI_ISL_542240, EPI_ISL_542241, EPI_ISL_542242, EPI_ISL_542243, EPI_ISL_542244, EPI_ISL_542245, EPI_ISL_542246, EPI_ISL_542247, EPI_ISL_542248, EPI_ISL_542249, EPI_ISL_542250, EPI_ISL_542251, EPI_ISL_542252, EPI_ISL_542253, EPI_ISL_542254, EPI_ISL_542255, EPI_ISL_542256, EPI_ISL_542257, EPI_ISL_542258, EPI_ISL_542259, EPI_ISL_542260, EPI_ISL_542261, EPI_ISL_542262, EPI_ISL_542263, EPI_ISL_542264, EPI_ISL_542265, EPI_ISL_542266, EPI_ISL_542267, EPI_ISL_542268, EPI_ISL_542269, EPI_ISL_542270, EPI_ISL_542271, EPI_ISL_542272, EPI_ISL_542273, EPI_ISL_542274, EPI_ISL_542275, EPI_ISL_542276, EPI_ISL_542277, EPI_ISL_542400, EPI_ISL_542401, EPI_ISL_542402, EPI_ISL_542403, EPI_ISL_542404, EPI_ISL_542405, EPI_ISL_542406, EPI_ISL_542407, EPI_ISL_542408, EPI_ISL_542409, EPI_ISL_542410, EPI_ISL_542411, EPI_ISL_542412, EPI_ISL_542413, EPI_ISL_542414, EPI_ISL_542415, EPI_ISL_542416, EPI_ISL_542417, EPI_ISL_542418, EPI_ISL_542419, EPI_ISL_542420, EPI_ISL_542421, EPI_ISL_542422, EPI_ISL_542423, EPI_ISL_542424, EPI_ISL_542425, EPI_ISL_542426, EPI_ISL_542427, EPI_ISL_542428, EPI_ISL_542429, EPI_ISL_542430, EPI_ISL_542431, EPI_ISL_542432, EPI_ISL_542433, EPI_ISL_542434, EPI_ISL_542435, EPI_ISL_542436, EPI_ISL_542437, EPI_ISL_542438, EPI_ISL_542439, EPI_ISL_542440, EPI_ISL_542441, EPI_ISL_542442, EPI_ISL_542443			
see above	ASST GOM Niguarda	Dep. Of Oncology and Hemato-Oncology University of Milan	Antonio Piralla; Carlo Federico Perno; Chiara Vismara; Claudia Alteri; Elisa Matarazzo; Fausto Baldanti; Federica Giardina; Federica Novazzi; Luna Colagrossi; Maria Antonello; Massimo Puoti; Monica Tallarita; Oscar Massimiliano Epis; Roberto Fumagalli; Silvia Renica; Stefano Gaiarsa; Valentino Costabile; Valeria Cento
EPI_ISL_420784	AZ Department of Health Services	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anne Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jasmine Padilla; Jing Zhang; Justin Lee; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_1020171, EPI_ISL_1020172, EPI_ISL_1020173	AZ Klina	AZ Klina	Dr. C. Vael
EPI_ISL_424848, EPI_ISL_424849, EPI_ISL_452118	AZ SPHL, Arizona Department of Health Services	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Montmayeur; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao; Zachary Weiner
EPI_ISL_426485, EPI_ISL_426512, EPI_ISL_426513, EPI_ISL_426514, EPI_ISL_426515, EPI_ISL_426516, EPI_ISL_426517, EPI_ISL_426518, EPI_ISL_426519, EPI_ISL_426527, EPI_ISL_426528, EPI_ISL_426529, EPI_ISL_426530, EPI_ISL_426531, EPI_ISL_426537, EPI_ISL_426538, EPI_ISL_426540, EPI_ISL_426541, EPI_ISL_426542, EPI_ISL_426543, EPI_ISL_426544, EPI_ISL_426545, EPI_ISL_426546, EPI_ISL_426547, EPI_ISL_426548, EPI_ISL_426549, EPI_ISL_426550, EPI_ISL_426551, EPI_ISL_426552, EPI_ISL_426553, EPI_ISL_426554, EPI_ISL_426555, EPI_ISL_426558, EPI_ISL_426559, EPI_ISL_426560, EPI_ISL_426561, EPI_ISL_426562, EPI_ISL_426563, EPI_ISL_427271, EPI_ISL_427272, EPI_ISL_694049			
see above	AZ SPHL, Arizona Department of Health Services	TGen North	Ashlyn Pfeiffer; Chris French; Darrin Lemmer; Dave Engelthaler; Hayley Yaglom; Jolene Bowers; Megan Folkerts; The Arizona COVID Genomics Union (ACGU)
EPI_ISL_420136, EPI_ISL_420139, EPI_ISL_420312	Akershus University Hospital, Department for Microbiology and Infectious Disease Control	Norwegian Institute of Public Health, Department of Virology	Hilde Elshaug; Kamilla Heddeland Instefjord; Karoline Bragstad; Kathrine Stene-Johansen; Olav Hungnes
EPI_ISL_454607, EPI_ISL_454608, EPI_ISL_454609	Alameda County Public Health Lab	Chan-Zuckerberg Biohub	CZB Cliahub Consortium
EPI_ISL_420303, EPI_ISL_420304, EPI_ISL_420305, EPI_ISL_420306, EPI_ISL_424346, EPI_ISL_424347, EPI_ISL_427621, EPI_ISL_427622, EPI_ISL_431013, EPI_ISL_431014, EPI_ISL_431015, EPI_ISL_431016, EPI_ISL_431017, EPI_ISL_431018, EPI_ISL_431019, EPI_ISL_437513, EPI_ISL_437514, EPI_ISL_437515, EPI_ISL_437516, EPI_ISL_437873, EPI_ISL_476898, EPI_ISL_476899			
see above	Alaska State Virology Laboratory	Alaska State Virology Laboratory	Chen; Chen, J.; J; Jack Chen; Ph.D.
EPI_ISL_805020, EPI_ISL_805437, EPI_ISL_805486, EPI_ISL_805512, EPI_ISL_805544, EPI_ISL_805549, EPI_ISL_805581, EPI_ISL_805615, EPI_ISL_805669, EPI_ISL_805679, EPI_ISL_805695, EPI_ISL_805701, EPI_ISL_805714, EPI_ISL_805746, EPI_ISL_805755, EPI_ISL_805763, EPI_ISL_805782, EPI_ISL_805789, EPI_ISL_805801, EPI_ISL_805814, EPI_ISL_805815, EPI_ISL_805836, EPI_ISL_805859, EPI_ISL_805861, EPI_ISL_805869, EPI_ISL_805872, EPI_ISL_805873, EPI_ISL_805897, EPI_ISL_805922, EPI_ISL_805923, EPI_ISL_805937, EPI_ISL_805938, EPI_ISL_805953, EPI_ISL_805955, EPI_ISL_805958, EPI_ISL_805960, EPI_ISL_805964, EPI_ISL_805965, EPI_ISL_805985, EPI_ISL_806007, EPI_ISL_806023, EPI_ISL_806032, EPI_ISL_806034, EPI_ISL_806041, EPI_ISL_806047, EPI_ISL_806056, EPI_ISL_806078, EPI_ISL_806082, EPI_ISL_806112, EPI_ISL_806124, EPI_ISL_806135, EPI_ISL_806157, EPI_ISL_806164, EPI_ISL_806168, EPI_ISL_806178, EPI_ISL_806193, EPI_ISL_806195, EPI_ISL_806196, EPI_ISL_806197, EPI_ISL_806201, EPI_ISL_806207, EPI_ISL_806211, EPI_ISL_806215, EPI_ISL_806216, EPI_ISL_806230, EPI_ISL_806233, EPI_ISL_806245, EPI_ISL_806248, EPI_ISL_806250, EPI_ISL_806263, EPI_ISL_806276, EPI_ISL_806278, EPI_ISL_806279, EPI_ISL_806284, EPI_ISL_806285, EPI_ISL_806288, EPI_ISL_806289, EPI_ISL_806290, EPI_ISL_806292, EPI_ISL_806293, EPI_ISL_806300, EPI_ISL_806302, EPI_ISL_806317, EPI_ISL_806329, EPI_ISL_806330, EPI_ISL_806340, EPI_ISL_806344, EPI_ISL_806367, EPI_ISL_806371, EPI_ISL_806376, EPI_ISL_806383, EPI_ISL_806384, EPI_ISL_806388, EPI_ISL_806389, EPI_ISL_806394, EPI_ISL_806405, EPI_ISL_806406, EPI_ISL_806408, EPI_ISL_806409, EPI_ISL_806412, EPI_ISL_806413, EPI_ISL_806418, EPI_ISL_806417, EPI_ISL_806423, EPI_ISL_806431, EPI_ISL_806437, EPI_ISL_806461, EPI_ISL_806462, EPI_ISL_806463, EPI_ISL_806473, EPI_ISL_806474, EPI_ISL_806486, EPI_ISL_806493, EPI_ISL_806500, EPI_ISL_806513, EPI_ISL_806519			
see above	Alberta Precision Labs (APL)	Alberta Precision Labs (APL)	Berenger B; Bernier F; Chui L; Croxen M; Gordon P; Kellner J; Lam LG; Li V; Ma R; Melin A; Pabbaraju K; Tipples G; Wong A; Zelyas N
EPI_ISL_514647, EPI_ISL_514649, EPI_ISL_514651	Allina Health Laboratory	Minnesota Department of Health, Public Health Laboratory	Jacob Garfin; Matt Plumb; and Xiong Wang
EPI_ISL_515544	Ama Dr Jose Soares Hungria	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes
EPI_ISL_569866, EPI_ISL_569867, EPI_ISL_569869, EPI_ISL_569870, EPI_ISL_569871, EPI_ISL_569872, EPI_ISL_569873, EPI_ISL_569874, EPI_ISL_569875, EPI_ISL_569876, EPI_ISL_569877, EPI_ISL_569880			
see above	Amedeo di savoia	Crosetto lab, Karolinska Institutet, SciLifeLab	Anna Sapino; Luuk Harbers; Maria Grazia Milia; Michele Simonetti; Nicola Crosetto; Ning Zhang; Valeria Ghisetti
EPI_ISL_414648, EPI_ISL_416457	Andersen Lab, The Scripps Research Institute	Andersen Lab, The Scripps Research Institute	Catie Anderson; Emily Spender; Karthik Gangavarapu; Kristian Andersen; Laura Nicholson; Mark Zeller; Raphaelle Klitting; Refugio Robles-Sikisaka; Sarah Topol
EPI_ISL_429991, EPI_ISL_430016	Andersen lab at Scripps Research	Andersen lab at Scripps Research	SEARCH Alliance San Diego
EPI_ISL_582127	Antwerp University Hospital	Institute of Tropical Medicine	Colin Anthony; Philippe Selhorst
EPI_ISL_512653	Area De Salud Desamparados 1 - Clinica Dr. Marcial Fallas [Grifo Alto/Desampara	Inciensa, Instituto Costarricense de Investigación y Enseñanza en Nutrición y Salud	Adriana Godinez & Melany Calderon; Claudio Soto-Garita; Estela Cordero; Francisco Duarte; Hebleen Porras
EPI_ISL_512658	Area De Salud Orotina-San Mateo [Orotina/Alajuela]	Inciensa, Instituto Costarricense de Investigación y Enseñanza	Adriana Godinez & Melany Calderon; Claudio Soto-Garita; Estela Cordero; Francisco Duarte; Hebleen Porras

		en Nutrición y Salud	
EPI_ISL_491446	Area de Salud Alajuela Central	Inciensa, Instituto Costarricense de Investigación y Enseñanza en Nutrición y Salud	Adriana Godinez & Melany Calderon; Claudio Soto-Garita; Estela Cordero; Francisco Duarte; Hebleen Brenes
EPI_ISL_434533, EPI_ISL_434535, EPI_ISL_491449	Area de Salud Alajuela Sur	Inciensa, Instituto Costarricense de Investigación y Enseñanza en Nutrición y Salud	Adriana Godinez & Melany Calderon; Claudio Soto-Garita; Estela Cordero; Francisco Duarte; Hebleen Brenes; Hebleen Porras
EPI_ISL_491437, EPI_ISL_491444	Area de Salud Escazu (Coopesana)	Inciensa, Instituto Costarricense de Investigación y Enseñanza en Nutrición y Salud	Adriana Godinez & Melany Calderon; Claudio Soto-Garita; Estela Cordero; Francisco Duarte; Hebleen Brenes
EPI_ISL_491457	Area de Salud Los Santos	Inciensa, Instituto Costarricense de Investigación y Enseñanza en Nutrición y Salud	Adriana Godinez & Melany Calderon; Claudio Soto-Garita; Estela Cordero; Francisco Duarte; Hebleen Brenes
EPI_ISL_491445	Area de Salud Mata Redonda	Inciensa, Instituto Costarricense de Investigación y Enseñanza en Nutrición y Salud	Adriana Godinez & Melany Calderon; Claudio Soto-Garita; Estela Cordero; Francisco Duarte; Hebleen Brenes
EPI_ISL_434539	Area de Salud Orotina	Inciensa, Instituto Costarricense de Investigación y Enseñanza en Nutrición y Salud	Adriana Godinez & Melany Calderon; Claudio Soto-Garita; Estela Cordero; Francisco Duarte; Hebleen Porras
EPI_ISL_500596, EPI_ISL_500597, EPI_ISL_500598, EPI_ISL_500599, EPI_ISL_500600, EPI_ISL_500601, EPI_ISL_500602, EPI_ISL_500603, EPI_ISL_500604, EPI_ISL_500605, EPI_ISL_500606, EPI_ISL_500607, EPI_ISL_500608, EPI_ISL_500609, EPI_ISL_500610, EPI_ISL_500611, EPI_ISL_500612, EPI_ISL_500613, EPI_ISL_500614, EPI_ISL_500615, EPI_ISL_500616, EPI_ISL_500617, EPI_ISL_500618, EPI_ISL_500619, EPI_ISL_500620, EPI_ISL_500626, EPI_ISL_500627, EPI_ISL_500628, EPI_ISL_500629, EPI_ISL_500630, EPI_ISL_500631, EPI_ISL_500632, EPI_ISL_500633, EPI_ISL_500634, EPI_ISL_500635, EPI_ISL_500636, EPI_ISL_500637, EPI_ISL_500638, EPI_ISL_500639, EPI_ISL_500640, EPI_ISL_500641, EPI_ISL_500642, EPI_ISL_500643, EPI_ISL_500644, EPI_ISL_500645, EPI_ISL_500646, EPI_ISL_500647, EPI_ISL_500648, EPI_ISL_500649, EPI_ISL_500650, EPI_ISL_500651, EPI_ISL_500652, EPI_ISL_500653, EPI_ISL_500654, EPI_ISL_500655, EPI_ISL_500656, EPI_ISL_500657, EPI_ISL_500658, EPI_ISL_500659, EPI_ISL_500660, EPI_ISL_500661, EPI_ISL_500662, EPI_ISL_500663, EPI_ISL_500664, EPI_ISL_500665, EPI_ISL_500666, EPI_ISL_500667, EPI_ISL_500668, EPI_ISL_500669, EPI_ISL_500670, EPI_ISL_500671, EPI_ISL_500672, EPI_ISL_500673, EPI_ISL_500674, EPI_ISL_500675, EPI_ISL_500676, EPI_ISL_500677, EPI_ISL_500678, EPI_ISL_500679, EPI_ISL_500680, EPI_ISL_500681, EPI_ISL_500682, EPI_ISL_500683, EPI_ISL_500684, EPI_ISL_500685, EPI_ISL_500686, EPI_ISL_500687, EPI_ISL_500688, EPI_ISL_500689, EPI_ISL_500690, EPI_ISL_500691, EPI_ISL_500692, EPI_ISL_500693, EPI_ISL_500694, EPI_ISL_500695, EPI_ISL_500696, EPI_ISL_500697, EPI_ISL_500698, EPI_ISL_500699, EPI_ISL_500700, EPI_ISL_500701, EPI_ISL_500705, EPI_ISL_509492, EPI_ISL_509493, EPI_ISL_509494, EPI_ISL_509495, EPI_ISL_509496, EPI_ISL_509497, EPI_ISL_509501, EPI_ISL_509502, EPI_ISL_509503, EPI_ISL_509504, EPI_ISL_509506, EPI_ISL_509507, EPI_ISL_509508, EPI_ISL_509509, EPI_ISL_509510, EPI_ISL_509511, EPI_ISL_509512, EPI_ISL_509513, EPI_ISL_509514, EPI_ISL_509515, EPI_ISL_509516, EPI_ISL_509517, EPI_ISL_509518, EPI_ISL_509520, EPI_ISL_527008, EPI_ISL_527009, EPI_ISL_527010, EPI_ISL_527016, EPI_ISL_527035			
see above	Area of Virology, Serology and Virology Division (SAViD), New South Wales Health Pathology Randwick	Area of Virology, Serology and Virology Division (SAViD), New South Wales Health Pathology Randwick	Rawlinson, W.
EPI_ISL_678293, EPI_ISL_678297, EPI_ISL_678299, EPI_ISL_678307, EPI_ISL_678308, EPI_ISL_678309, EPI_ISL_678333, EPI_ISL_678359, EPI_ISL_678360, EPI_ISL_678361, EPI_ISL_707891, EPI_ISL_707892			
see above	Area of Virology, Serology and Virology Division (SAViD), New South Wales Health Pathology Randwick	Virology Research Laboratory; Area of Virology, Serology and Virology Division (SAViD), New South Wales Health Pathology Randwick	Au, J.; Bull, R.; Deveson, I.; Foster, C.; Rawlinson, W.; Ruiz Silva, M.; Van Hal, S.
EPI_ISL_424668, EPI_ISL_424669, EPI_ISL_424671, EPI_ISL_467372, EPI_ISL_467373	Arizona State University Health Services	Arizona State University	Arvind Varsani; Bereket Estifanos; Brenda G. Hogue; Efrem S. Lim; Emily A. Kaelin; Jason Steel; LaRinda A. Holland; Lily I. Wu; Matthew Scotch; Nicholas J. Mellor; Peter T. Skidmore; Rabia Maqsood; Rolf U. Halden
EPI_ISL_457826	Army Medical Center - Scientific Department	Army Medical and Veterinary Research Center	Anna Anselmo; Antonella Fortunato; Florigio Lista; Francesco Giordani; Giovanni Faggioni; Nino D'Amore; Riccardo De Sanctis; Silvia Fillo; Vanessa Vera Fain
EPI_ISL_457825	Army Medical Research Center - Scientific Department	Army Medical and Veterinary Research Center	Anna Anselmo; Antonella Fortunato; Florigio Lista; Francesco Giordani; Giovanni Faggioni; Nino D'Amore; Riccardo De Sanctis; Silvia Fillo; Vanessa Vera Fain
EPI_ISL_416519	Auckland Hospital	Institute of Environmental Science and Research (ESR)	Erasmus Smit; Gary McAuliffe; Joep de Ligt; Lauren Jelly; Matt Storey; Matthew Blakiston; Sally Roberts; Xiaoyun Ren
EPI_ISL_451486, EPI_ISL_451574, EPI_ISL_451599	Australian Clinical Labs	NSW Health Pathology - Institute of Clinical Pathology and Medical Research; Westmead Hospital; University of Sydney	CIDM-PH et al.
EPI_ISL_475830, EPI_ISL_475831, EPI_ISL_475832, EPI_ISL_475833, EPI_ISL_475834, EPI_ISL_475836, EPI_ISL_475837, EPI_ISL_475838, EPI_ISL_475839, EPI_ISL_475840, EPI_ISL_475841, EPI_ISL_475843, EPI_ISL_475844, EPI_ISL_475845, EPI_ISL_475848, EPI_ISL_475849, EPI_ISL_475850, EPI_ISL_475851, EPI_ISL_475853, EPI_ISL_475854, EPI_ISL_475855, EPI_ISL_475859, EPI_ISL_475860, EPI_ISL_475863, EPI_ISL_475864, EPI_ISL_475866, EPI_ISL_475869, EPI_ISL_475871, EPI_ISL_475872, EPI_ISL_475873, EPI_ISL_475874, EPI_ISL_475875, EPI_ISL_475876, EPI_ISL_475878, EPI_ISL_475879, EPI_ISL_475880, EPI_ISL_475882, EPI_ISL_475883, EPI_ISL_475884, EPI_ISL_475886, EPI_ISL_583577, EPI_ISL_583578, EPI_ISL_583633, EPI_ISL_583640, EPI_ISL_583648, EPI_ISL_583649, EPI_ISL_583658, EPI_ISL_583678, EPI_ISL_583686			
see above	Austrian Agency for Health and Food Safety (AGES)	Bergthaler laboratory, CeMM Research Center for Molecular Medicine of the Austrian Academy of Sciences	Adi Steinrigl; Alexander Lercher; Alexandra Popa; Andreas Bergthaler; Benedikt Agerer; Christian Paar; Christoph Bock; Daniela Schmid; Dorothee von Laer; Elisabeth Puchhammer-Stoeckl; Franz Allerberger; Gernot Walder; Gregor Hörmann; Guenter Weiss; Gunther Vogl; Henrique Colaco; Jakob-Wendelin Genger; Jan Laine; Judith Aberle; Kinga Rigler-Hohenwarter; Lukas Endler; Manfred Nairz; Mark Smyth; Martin Senekowitsch; Michael Schuster; Peter Hufnagl; Peter Obrist; Rainer Gattringer; Sabine Sussitz-Rack; Stephan Aberle; Thomas Penz; Wegene Borena
EPI_ISL_514645	Avera Mckennan Laboratory	Minnesota Department of Health, Public Health Laboratory	Jacob Garfin; Matt Plumb; and Xiong Wang
EPI_ISL_415584, EPI_ISL_415588, EPI_ISL_415589, EPI_ISL_418816, EPI_ISL_418817, EPI_ISL_418818, EPI_ISL_418819, EPI_ISL_418820, EPI_ISL_418821, EPI_ISL_418822, EPI_ISL_418823, EPI_ISL_418824, EPI_ISL_418825, EPI_ISL_418826, EPI_ISL_418829, EPI_ISL_418830, EPI_ISL_418831, EPI_ISL_418832, EPI_ISL_418833, EPI_ISL_418834, EPI_ISL_418835, EPI_ISL_418836, EPI_ISL_418837, EPI_ISL_418838, EPI_ISL_418839, EPI_ISL_418840, EPI_ISL_418841, EPI_ISL_418842, EPI_ISL_418843, EPI_ISL_418844, EPI_ISL_418845, EPI_ISL_418846, EPI_ISL_418847, EPI_ISL_418848, EPI_ISL_418849, EPI_ISL_418850, EPI_ISL_418851, EPI_ISL_418852, EPI_ISL_418853, EPI_ISL_418854, EPI_ISL_418855, EPI_ISL_418856, EPI_ISL_418857, EPI_ISL_418858			
see above	BCCDC Public Health Laboratory	BCCDC Public Health Laboratory	Choi; Gilmour; Harrigan; Hoang; Kamelian; Krajden; Lapointe; Lee; Levett; Li; Loman; Prystajecky; Quick; Sekirov; Snutch; Tyson
EPI_ISL_1259400, EPI_ISL_1260834	BSL-3 Lab, National Institute for Viral Disease Control and Prevention, Chinese Center for Disease Control and Prevention	BSL-3 Lab, National Institute for Viral Disease Control and Prevention, Chinese Center for Disease Control and Prevention	Dayan Wang; George F. Gao; Guizhen Wu; Jing Zhang; Jun Han; Peipei Liu; Shumei Zou; Xiang Zhao; Yuchao Wu; Zhixiao Chen
EPI_ISL_434693, EPI_ISL_434694	Bamrasnaradura hospital	National Institute of Health. Department of medical Sciences, Ministry of Public Health, Thailand	Chittaganpitch; Malinee; Okada; Parnmen; Phuygun; Pilailuk; Siripaporn; Sittiporn; Sunthareeya; Thanadachakul; Thanutsapa; Waicharoen; Warawan; Wongboot
EPI_ISL_842822, EPI_ISL_842823, EPI_ISL_842831	Barts Health NHS Trust	COVID-19 Genomics UK (COG-UK) Consortium	BROAD; Beatrix; CUTINO-MOGUEL; Claire; David; Dola; HARRINGTON; KELE; Maria-Teresa; OWOYEMI; Raghavendran; SHYLINI
EPI_ISL_541760, EPI_ISL_541761, EPI_ISL_541769, EPI_ISL_541770, EPI_ISL_541771, EPI_ISL_541777, EPI_ISL_541782			
see above	Barts Health NHS Trust	Wellcome Sanger Institute for the COVID-19 Genomics UK (COG-UK) consortium	Beatrix Kele; Cordelia Langford; David Harrington and Alex Alderton; David K. Jackson; Dominic Kwiatkowski; Ewan Harrison; Ian Johnston; John Sillitoe on behalf of the Wellcome Sanger Institute COVID-19 Surveillance Team; Mark Hopkins; Roberto Amato; Sonia Goncalves; Teresa Cutino-Moguel
EPI_ISL_1143994, EPI_ISL_1144003	Bayerisches Landesamt für Gesundheit und Lebensmittelsicherheit (LGL)	Robert Koch Institute	
EPI_ISL_444022, EPI_ISL_445078, EPI_ISL_445079, EPI_ISL_445080, EPI_ISL_445081, EPI_ISL_445082, EPI_ISL_445083, EPI_ISL_445084, EPI_ISL_501167			
see above	Baylor College of Medicine	Baylor College of Medicine: HGSC	David Henke; Donna Muzny; Erin Nicholson; George Weissenberger; Ginger Metcalf; Harsha Doddapaneni; Hsu Chao; Hua Shen; Joseph F. Petrosino; Kavya Kottapalli; Kristi L. Hoffman; Matthew C. Ross; Matthew Wong; Pedro Piedra; Qingchang Meng; Richard Sucgang; Sara J.J. Cregeen; Sejal Salvi; Tulin Ayvaz; Vasanthi Avadhanula; Vipin Menon; Yimiti Meiheerguli; Zeineen Momin
EPI_ISL_412386	Beijing Ditan Hospital, Capital Medical University	National Institute for Communicable Disease Control and Prevention, Chinese Center for Disease Control and Prevention	Biao Kan; Chuansheng Li; Fangfang Jin; Haijian Zhou; Haofeng Xiong; Hebing Guo; Huizhu Wang; Jianbo Tan; Jie Gong; Jingjing Hao; Jingyuan Liu; Lili Gao; Lin Pu; Ming Zhang; Pan Xiang; Ruihong Li; Xiaoping Chen; Xin Lu; Xinmin Xu; Yajie Wang; Yanwen Xiong; Yao Sun; Yufeng Liu
EPI_ISL_424355, EPI_ISL_424356, EPI_ISL_424357, EPI_ISL_424358, EPI_ISL_424359, EPI_ISL_424360, EPI_ISL_529213, EPI_ISL_529214, EPI_ISL_529215, EPI_ISL_529216, EPI_ISL_529217			
see above	Beijing Institute of Microbiology and Epidemiology	Beijing Institute of Microbiology and Epidemiology	B. and Cui, Y.; Cui, Y.; Fan; Fan, H.; Guo, Y.; Hang; Hou, J.; Li; Li, B.; Mi, Z.; Mu, J.; Qin, E.; Song; Song, Y.; Teng; Teng, Y.; Wu, Y.; Xu, Z.; Yajun.; Yang, R.; Yong, Y.; Yue; Zhang, X.
EPI_ISL_509711, EPI_ISL_509712,	Belize Ministry of Health	Pathogen Discovery, Respiratory Viruses Branch, Division of	Anna Uehara; Clinton Paden; Haibin Wang; Jing Zhang; Krista Queen; Suxiang Tong; Yan Li; Ying Tao

EPI_ISL_509713		Viral Diseases, Centers for Disease Control and Prevention	
EPI_ISL_631580, EPI_ISL_631804, EPI_ISL_631838, EPI_ISL_632068, EPI_ISL_632069, EPI_ISL_632098, EPI_ISL_632121, EPI_ISL_632136			
see above	Bellevue Hospital Center	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_457824	Bezmialem Vakif University, Dept Microbiology, Medical School, Fatih, Istanbul, Turkey	Bezmialem Vakif University, Medical School & Beykoz Institute of Life Sciences & Biotechnology	Bilge Sumbul; Elif Karaaslan; Filiz Guney; Mehmet Z. Doymaz; Merve Kalkan; Nesibe Cetin
EPI_ISL_429992, EPI_ISL_429993, EPI_ISL_429994, EPI_ISL_429995, EPI_ISL_429996, EPI_ISL_429997, EPI_ISL_429998, EPI_ISL_429999, EPI_ISL_430000, EPI_ISL_430001, EPI_ISL_430002, EPI_ISL_430003, EPI_ISL_430004, EPI_ISL_430006, EPI_ISL_430007, EPI_ISL_430009, EPI_ISL_430011, EPI_ISL_430012, EPI_ISL_430014, EPI_ISL_430015, EPI_ISL_434516			
see above	Biolab Diagnostic Laboratories	Andersen lab at Scripps Research	Ahmad Tibi; Amid Abdelnour with SEARCH Alliance San Diego; Issa Abu-Dayyeh; Lama Hussein; Lina Mohammad; Zein Naber
EPI_ISL_516079, EPI_ISL_516080, EPI_ISL_516081, EPI_ISL_516082, EPI_ISL_516083, EPI_ISL_516084, EPI_ISL_516085, EPI_ISL_516086, EPI_ISL_516087, EPI_ISL_516088			
see above	Biomedical Sciences and Public Health, Polytechnic University of Marche	Biomedical Sciences and Public Health, Polytechnic University of Marche	Alessandrini, F.; Bagnarelli, P.; Caucci, S.; Di Sante, L.; Melchionda, F.; Menzo, S.; Onofri, V.; Tagliabracci, A.; Turchi, C.
EPI_ISL_596453	Booali laboratory, Qom, Iran. Department of Virology, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran.	Genetics Research Center, University of Social Welfare and Rehabilitation Sciences	Ali Jafarpour; Azam Ghaziasadi; Hossein Najmbadi; Khadijeh Jalalvand; Kimia Kahrizi; Marzieh Mohseni; Mohammad Khazeni; Seyed Amir Momeni; Seyed Mohammad Jazayeri; Seyedeh elham Mortazavi; Zohreh Fattahi
EPI_ISL_420799, EPI_ISL_420800, EPI_ISL_420801	Brian D. Allgood Army Community Hospital	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anne Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jasmine Padilla; Jing Zhang; Justin Lee; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_631553, EPI_ISL_631562, EPI_ISL_631565, EPI_ISL_631573, EPI_ISL_631800, EPI_ISL_631803, EPI_ISL_631805, EPI_ISL_631806, EPI_ISL_631807, EPI_ISL_631819, EPI_ISL_631829, EPI_ISL_631864, EPI_ISL_631976, EPI_ISL_631978, EPI_ISL_631981, EPI_ISL_631984, EPI_ISL_632077, EPI_ISL_632078, EPI_ISL_632100, EPI_ISL_632114, EPI_ISL_632123, EPI_ISL_632142, EPI_ISL_632155, EPI_ISL_632156			
see above	Brookdale University Hospital Medical Center	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_631508	Brooklyn Hospital Center	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_414521, EPI_ISL_732541, EPI_ISL_732542, EPI_ISL_732543, EPI_ISL_732544, EPI_ISL_732545, EPI_ISL_732546, EPI_ISL_732547, EPI_ISL_732548, EPI_ISL_732549, EPI_ISL_732550, EPI_ISL_732551, EPI_ISL_732552, EPI_ISL_732564			
see above	Bundeswehr Institute of Microbiology	Bundeswehr Institute of Microbiology	Alexandra Rehn; Enrico Georgi; Malena Bestehorn-Willmann; Markus Antwerpen; Markus H Antwerpen and Roman Wölfel; Mathias C Walter; Mathias Walter; Roman Wölfel; Sabine Zange
EPI_ISL_524476	Bülach Hospital	Institute of Medical Virology, University of Zurich	Alexandra Trkola; Andrea Zbinden; Fiona Steiner; Gabriela Ziltener; Jon Huder; Jürg Böni; Maryam Zaheri; Michael Huber; Patrick Redli; Riccarda Capaul; Stefan Schmutz; Verena Kufner
EPI_ISL_445320	C.C.SALUD FAMILIAR PADRE FELIX DONOSO G.	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445318	C.DE SALUD FAMILIAR PABLO NERUDA	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_539531	C.H.U Nuestra Señora de Candelaria	Instituto de Salud Carlos III	A. Monzón; F. Casas; I; I. Jiménez; Iglesias-Caballero; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; O. Diez; P. Jiménez; S. Julià; S. Pozo; S. Varona
EPI_ISL_576177	CA, CDPH, Viral and Rickettsial Disease Laboratory	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Anna Uehara; Brian Lynch; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Peter Cook; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_605780	CEIRS Data Processing and Coordinating Center, St. Jude Center of Excellence for Influenza Research and Surveillance (CEIRS)	CEIRS Data Processing and Coordinating Center, St. Jude Center of Excellence for Influenza Research and Surveillance (CEIRS)	A.E.; Ali; El-Guindy; El-Sayes, M.; El-Shesheny, R.; El-Taweel, A.; Gomaa, M.; Kamel; Kandeil, A.; Kayali, G.; Kayed; Kutkat, O.; M.A.; M.N.; Mahmoud; Mahrous, N.; Moatasim, Y.; Mostafa, A.; N.M.; Naguib, A.; Roshdy; S.H.; Shehata, M.; Showky, S.; W.H.; Webby, R.
EPI_ISL_1303032	CEIRS Data Processing and Coordinating Center, Center for Research on Influenza Pathogenesis (CRIP)	CEIRS Data Processing and Coordinating Center, Center for Research on Influenza Pathogenesis (CRIP)	Adolfo Garcia-Sastre; Adriana van De Guchte; Ajay Obla; Ana S. Gonzalez-Reiche; Bremy Alburquerque; Edward C. Holmes; Eileen Serrano; Erick Salinas; Hala Alshammary; Harm van Bakel; Jayeeta Dutta; Jorge Levican; Juan Soto; Leonardo I. Almonacid; Matthew M. Hernandez; Melissa Smith; Rafael A. Medina; Robert Sebra; Shwetha Hara Sridhar; Tamara Garcia-Salum; Viviana Simon; Ying-Chih Wang; Zenab Khan
EPI_ISL_445266, EPI_ISL_445267	CENTRO ONCOLOGICO DEL NORTE	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_644273, EPI_ISL_644310, EPI_ISL_644319, EPI_ISL_644321, EPI_ISL_644342, EPI_ISL_644343	CEPHR / Vincent's Hospital	Irish Coronavirus Sequencing Consortium - National Virus Reference Laboratory	Alejandro Abner Garcia Leon; Gabriel Gonzalez; Michael Carr; Patrick Mallon
EPI_ISL_445316	CESFAM BALMACEDA DE RENCA	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_421455, EPI_ISL_421479, EPI_ISL_421480, EPI_ISL_421485, EPI_ISL_421486	CH Barreiro Montijo	Instituto Nacional de Saude (INSA)	Guiomar et al
EPI_ISL_420041, EPI_ISL_420049, EPI_ISL_420050, EPI_ISL_420056, EPI_ISL_420057, EPI_ISL_421500, EPI_ISL_421509, EPI_ISL_421510, EPI_ISL_421511, EPI_ISL_428353, EPI_ISL_428359, EPI_ISL_428360, EPI_ISL_443309, EPI_ISL_443316			
see above	CH Compiègne Laboratoire de Biologie	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Etienne Simon-Lorière; Flora Donati; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Olivia Raulin; Raulin Olivia; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_416493, EPI_ISL_420044, EPI_ISL_420053, EPI_ISL_428350	CH Jean de Navarre Laboratoire de Biologie	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Etienne Simon-Lorière; Flora Donati; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Mélnie Albert; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_428358, EPI_ISL_428366	CH Jeanne de Navarre Laboratoire de Biologie	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Etienne Simon-Lorière; Flora Donati; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_421482, EPI_ISL_421483, EPI_ISL_421484	CH VN Gaia - Espinho	Instituto Nacional de Saude (INSA)	Guiomar et al
EPI_ISL_418006	CHBarreiro Montijo	Instituto Nacional de Saude (INSA)	Guiomar et al
EPI_ISL_418017	CHMT	Instituto Nacional de Saude (INSA)	Guiomar et al
EPI_ISL_418222	CHRU Bretonneau - Serv. Bacterio-Virol.	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Etienne Simon-Lorière; Fabiana Gambaro; Flora Donati; Julien Marlet; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_416502, EPI_ISL_416503, EPI_ISL_416504, EPI_ISL_416505, EPI_ISL_416506, EPI_ISL_416507, EPI_ISL_416508, EPI_ISL_416509, EPI_ISL_416510, EPI_ISL_416511, EPI_ISL_416512, EPI_ISL_416513, EPI_ISL_443289, EPI_ISL_443290			
see above	CHRU Pontchaillou - Laboratoire de Virologie	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Etienne Simon-Lorière; Flora Donati; Gisèle Lagathu; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Mélnie Albert; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_418027, EPI_ISL_421453, EPI_ISL_421464, EPI_ISL_421465	CHTMAD	Instituto Nacional de Saude (INSA)	Guiomar et al
EPI_ISL_418219, EPI_ISL_443266, EPI_ISL_443267, EPI_ISL_443268, EPI_ISL_443269, EPI_ISL_443270, EPI_ISL_443271, EPI_ISL_443272, EPI_ISL_443273, EPI_ISL_443274, EPI_ISL_443275, EPI_ISL_443276, EPI_ISL_443277, EPI_ISL_443278, EPI_ISL_443282, EPI_ISL_443283			
see above	CHU - Hôpital Cavale Blanche - Labo. de Virologie	National Reference Center for Viruses of Respiratory	Angela Brisebarre; Etienne Simon-Lorière; Fabiana Gambaro; Flora Donati; Léa Pilorge; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard;

		Infections, Institut Pasteur, Paris	Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_645169, EPI_ISL_645170, EPI_ISL_645171, EPI_ISL_649954, EPI_ISL_649955, EPI_ISL_649956, EPI_ISL_649957, EPI_ISL_649958, EPI_ISL_649959, EPI_ISL_649960, EPI_ISL_649961, EPI_ISL_649962, EPI_ISL_649963, EPI_ISL_649964, EPI_ISL_649965, EPI_ISL_649966, EPI_ISL_649967, EPI_ISL_649968, EPI_ISL_649969, EPI_ISL_649970			
see above	CHU Bordeaux	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Camille Ciccone; Gregory Destras; Gwendolyne Burfin; Hadrien Règue; Isabelle Garrigue; Laurence Josset; Marie-Edith Lafon; Martine Valette; Pantxika Bellecave; Pascale Trimoulet; Quentin Semanas
EPI_ISL_645188, EPI_ISL_645189, EPI_ISL_645190, EPI_ISL_645191, EPI_ISL_645192, EPI_ISL_645193, EPI_ISL_645194, EPI_ISL_660353, EPI_ISL_660354, EPI_ISL_660355, EPI_ISL_660356, EPI_ISL_660357, EPI_ISL_660358, EPI_ISL_660359, EPI_ISL_660360			
see above	CHU Clermont-Ferrand	CNR Virus des Infections Respiratoires - France SUD	Amélie Brebion; Antonin Bal; Audrey Mirand; Bruno Lina; Christel Regagnon; Christine Archimbaud; Cécile Henquell; Gregory Destras; Gwendolyne Burfin; Hadrien Règue; Hélène Chabrolles; Laurence Josset; Martine Chambon; Martine Valette; Maxime Bisseux; Patricia Combes; Quentin Semanas
EPI_ISL_418002	CHU Coimbra	Instituto Nacional de Saude (INSA)	Guiomar et al
EPI_ISL_418005	CHU Coimbra - Pediátrico	Instituto Nacional de Saude (INSA)	Guiomar et al
EPI_ISL_416751, EPI_ISL_416752	CHU Gabriel Montpied	CNR Virus des Infections Respiratoires - France SUD	Alexandre; Antonin; Bal; Bouscambert-Duchamp; Brengel-Pesce; Bruno.; Cheynet; Destras; Florence; Gaymard; Gregory; Josset; Karen; Laurence; Lina; Martine; Maude; Morfin-Sherpa; Valette; Valérie
EPI_ISL_641556, EPI_ISL_644681, EPI_ISL_644682, EPI_ISL_644683, EPI_ISL_644684, EPI_ISL_644685, EPI_ISL_644686, EPI_ISL_644687, EPI_ISL_644688, EPI_ISL_644689, EPI_ISL_644690, EPI_ISL_644691, EPI_ISL_644692, EPI_ISL_644693, EPI_ISL_660672, EPI_ISL_660673, EPI_ISL_660674, EPI_ISL_660675, EPI_ISL_660676, EPI_ISL_660677, EPI_ISL_660678, EPI_ISL_660679, EPI_ISL_660680, EPI_ISL_660681, EPI_ISL_660682, EPI_ISL_660683, EPI_ISL_660684, EPI_ISL_660685, EPI_ISL_660686, EPI_ISL_660687, EPI_ISL_660688, EPI_ISL_660689, EPI_ISL_660690, EPI_ISL_660691, EPI_ISL_660692			
see above	CHU Montpellier	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Gregory Destras; Gwendolyne Burfin; Hadrien Règue; Laurence Josset; Martine Valette; Michel Segondy; Quentin Semanas; Vincent Foulongne
EPI_ISL_645217, EPI_ISL_649173, EPI_ISL_649174, EPI_ISL_649175, EPI_ISL_649176, EPI_ISL_649177, EPI_ISL_663249, EPI_ISL_663250, EPI_ISL_663251, EPI_ISL_663252, EPI_ISL_663253, EPI_ISL_663254, EPI_ISL_663255, EPI_ISL_663256, EPI_ISL_663257, EPI_ISL_663258, EPI_ISL_663259, EPI_ISL_663260, EPI_ISL_663261, EPI_ISL_663262, EPI_ISL_663263, EPI_ISL_663264, EPI_ISL_663265, EPI_ISL_663266, EPI_ISL_700371			
see above	CHU Nantes	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Celine Bressollette; Gregory Destras; Gwendolyne Burfin; Hadrien Règue; Laurence Josset; Louise Castain; Martine Valette; Quentin Semanas; Virginie Ferré
EPI_ISL_644697, EPI_ISL_644698, EPI_ISL_644699, EPI_ISL_644700, EPI_ISL_644701, EPI_ISL_644702, EPI_ISL_645197, EPI_ISL_645198, EPI_ISL_645199, EPI_ISL_645200, EPI_ISL_660710, EPI_ISL_660711, EPI_ISL_660712, EPI_ISL_660713, EPI_ISL_660714, EPI_ISL_660715, EPI_ISL_660716, EPI_ISL_660717, EPI_ISL_660718			
see above	CHU Nîmes	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Gregory Destras; Gwendolyne Burfin; Hadrien Règue; Jean-Philippe Lavigne; Laurence Josset; Marie-Josée Carles; Martine Valette; Maxence Lotellier; Quentin Semanas; Stephan Robin
EPI_ISL_645216, EPI_ISL_663227, EPI_ISL_663228, EPI_ISL_663229, EPI_ISL_663230, EPI_ISL_663231, EPI_ISL_663232, EPI_ISL_663233, EPI_ISL_663234, EPI_ISL_663235, EPI_ISL_707781, EPI_ISL_707782			
see above	CHU Poitiers	CNR Virus des Infections Respiratoires - France SUD	Agnès Beby-Defaux; Antonin Bal; Bruno Lina; Clément Jousselin; Gregory Destras; Gwendolyne Burfin; Hadrien Règue; Laurence Josset; Magali Garcia; Martine Valette; Nicolas Lévêque; Quentin Semanas
EPI_ISL_671976	CHU Purpan - Laboratoire de Virologie - Institut Fédératif de Biologie	CHU Purpan - Laboratoire de Virologie - Institut Fédératif de Biologie	Boyer P.; Carcenac R.; Dubois M.; Harter A.; Izopet J.; Latour J.; Ranger N.; Tremeaux P.
EPI_ISL_434626, EPI_ISL_434627	CHU Purpan - Laboratoire de Virologie - Institut Fédératif de Biologie	Laboratoire de virologie - École Nationale Vétérinaire de Toulouse	Guillaume Croville; Jacques Izopet; Jean-Luc Guérin
EPI_ISL_535732, EPI_ISL_535801	CHU Sainte-Justine	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_641551, EPI_ISL_641552, EPI_ISL_641553, EPI_ISL_660373	CHU Toulouse	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Gregory Destras; Gwendolyne Burfin; Hadrien Règue; Jean Michel Mansuy; Laurence Josset; Martine Valette; Quentin Semanas
EPI_ISL_644673, EPI_ISL_644674, EPI_ISL_644675, EPI_ISL_645174, EPI_ISL_645175, EPI_ISL_645176, EPI_ISL_645177, EPI_ISL_645178, EPI_ISL_645179, EPI_ISL_645180, EPI_ISL_645181, EPI_ISL_645182, EPI_ISL_645183, EPI_ISL_663206, EPI_ISL_663207, EPI_ISL_663208, EPI_ISL_663209, EPI_ISL_663210, EPI_ISL_663211, EPI_ISL_663212, EPI_ISL_663213, EPI_ISL_663214, EPI_ISL_663215, EPI_ISL_663216, EPI_ISL_663217, EPI_ISL_663218, EPI_ISL_663219, EPI_ISL_663220, EPI_ISL_663221, EPI_ISL_663222, EPI_ISL_663223			
see above	CHU de Limoges	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Gregory Destras; Gwendolyne Burfin; Hadrien Règue; Laurence Josset; Martine Valette; Quentin Semanas; Sylvie Rogez
EPI_ISL_645173	CHU de Nice	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Gregory Destras; Gwendolyne Burfin; Géraldine Gonfrier; Hadrien Règue; Laurence Josset; Martine Valette; Quentin Semanas; Valérie Giordanengo
EPI_ISL_641520, EPI_ISL_693387, EPI_ISL_693388, EPI_ISL_693389, EPI_ISL_693390	CHU de Nice - Hôpital Archet 2	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Gregory Destras; Gwendolyne Burfin; Géraldine Gonfrier; Hadrien Règue; Laurence Josset; Martine Valette; Quentin Semanas; Valérie Giordanengo
EPI_ISL_641522	CHU de Nice - Hôpital Archet 3	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Gregory Destras; Gwendolyne Burfin; Géraldine Gonfrier; Hadrien Règue; Laurence Josset; Martine Valette; Quentin Semanas; Valérie Giordanengo
EPI_ISL_641523	CHU de Nice - Hôpital Archet 4	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Gregory Destras; Gwendolyne Burfin; Géraldine Gonfrier; Hadrien Règue; Laurence Josset; Martine Valette; Quentin Semanas; Valérie Giordanengo
EPI_ISL_641524	CHU de Nice - Hôpital Archet 5	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Gregory Destras; Gwendolyne Burfin; Géraldine Gonfrier; Hadrien Règue; Laurence Josset; Martine Valette; Quentin Semanas; Valérie Giordanengo
EPI_ISL_641525	CHU de Nice - Hôpital Archet 6	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Gregory Destras; Gwendolyne Burfin; Géraldine Gonfrier; Hadrien Règue; Laurence Josset; Martine Valette; Quentin Semanas; Valérie Giordanengo
EPI_ISL_641526	CHU de Nice - Hôpital Archet 7	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Gregory Destras; Gwendolyne Burfin; Géraldine Gonfrier; Hadrien Règue; Laurence Josset; Martine Valette; Quentin Semanas; Valérie Giordanengo
EPI_ISL_641527	CHU de Nice - Hôpital Archet 9	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Gregory Destras; Gwendolyne Burfin; Géraldine Gonfrier; Hadrien Règue; Laurence Josset; Martine Valette; Quentin Semanas; Valérie Giordanengo
EPI_ISL_641538, EPI_ISL_641539, EPI_ISL_641540, EPI_ISL_641542, EPI_ISL_641543, EPI_ISL_641545, EPI_ISL_645184, EPI_ISL_649942, EPI_ISL_649943, EPI_ISL_649944, EPI_ISL_649945, EPI_ISL_649946, EPI_ISL_649953, EPI_ISL_660326, EPI_ISL_660327, EPI_ISL_660328, EPI_ISL_660329, EPI_ISL_660330, EPI_ISL_660331, EPI_ISL_660332, EPI_ISL_660334, EPI_ISL_660335, EPI_ISL_660336, EPI_ISL_660337, EPI_ISL_660338, EPI_ISL_660339, EPI_ISL_660340, EPI_ISL_660341, EPI_ISL_660344, EPI_ISL_660345, EPI_ISL_660346, EPI_ISL_660347, EPI_ISL_660348, EPI_ISL_660349			
see above	CHU de Saint-Étienne Hôpital Nord	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Bruno Pozzetto; Gregory Destras; Gwendolyne Burfin; Hadrien Règue; Issam Bechri; Laurence Josset; Manon Vogrig; Marine Delorme; Martine Valette; Quentin Semanas; Sylvie Gonzalo; Sylvie Pillet; Thomas Bourlet
EPI_ISL_418024	CHUA - Faro	Instituto Nacional de Saude (INSA)	Guiomar et al
EPI_ISL_535736, EPI_ISL_535737, EPI_ISL_535741, EPI_ISL_535772, EPI_ISL_535773, EPI_ISL_535774, EPI_ISL_535775, EPI_ISL_535781, EPI_ISL_535784, EPI_ISL_535785, EPI_ISL_535822, EPI_ISL_535823, EPI_ISL_535824, EPI_ISL_535825, EPI_ISL_535828			
see above	CHUL-LABO MULTI / MICRO	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_417988, EPI_ISL_417990, EPI_ISL_417991, EPI_ISL_417994, EPI_ISL_417995, EPI_ISL_417996, EPI_ISL_418010, EPI_ISL_418011, EPI_ISL_418012, EPI_ISL_418013, EPI_ISL_418014, EPI_ISL_418015, EPI_ISL_418016			
see above	CHULC - H Curry Cabral	Instituto Nacional de Saude (INSA)	Guiomar et al
EPI_ISL_417992, EPI_ISL_417993	CHULC - H D Estefania	Instituto Nacional de Saude (INSA)	Guiomar et al
EPI_ISL_535726, EPI_ISL_535729, EPI_ISL_535735, EPI_ISL_535740, EPI_ISL_535753, EPI_ISL_535783, EPI_ISL_535789, EPI_ISL_535802, EPI_ISL_535806, EPI_ISL_535826, EPI_ISL_535827, EPI_ISL_535830, EPI_ISL_535832			
see above	CHUM - Microbiologie - Hôpital Saint-Luc	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Mark Lathrop and Michel Roger on behalf of the CoVSeQ

			research group; Sandrine Moreira
EPI_ISL_445245, EPI_ISL_445248, EPI_ISL_445250, EPI_ISL_445254, EPI_ISL_445255, EPI_ISL_445258, EPI_ISL_445260			
see above	CLINICA ALEMANA DE SANTIAGO S.A.	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445272, EPI_ISL_445285, EPI_ISL_445287	CLINICA CIUDAD DEL MAR	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445297	CLINICA INTEGRAL S.A.	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445259	CLINICA LAS CONDES S.A.	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445282, EPI_ISL_445283, EPI_ISL_445290, EPI_ISL_445292	CLINICA MAGALLANES S.A.	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445264	CLINICA REDSALUD VITACURA.	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445249	CLINICA SANTA MARIA S.A.	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445262	CLINICA TABANCURA	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445306, EPI_ISL_445312, EPI_ISL_445315, EPI_ISL_445361	CLINICA UC SAN CARLOS DE APOQUINDO	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445334	CLINICA UNIVERSITARIA DE PUERTO MONTT S.A.	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445330	CLINICA VESPUCIO S. A.	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_536310	CLSC et Centre d'Hébergement la Petite-Nation	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_420043, EPI_ISL_420061	CMIP	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Etienne Simon-Lorière; Flora Donati; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_410486, EPI_ISL_416745, EPI_ISL_416746, EPI_ISL_508933, EPI_ISL_508937, EPI_ISL_508939, EPI_ISL_508940, EPI_ISL_508942, EPI_ISL_508945, EPI_ISL_508948, EPI_ISL_508951, EPI_ISL_508953, EPI_ISL_508954, EPI_ISL_508955, EPI_ISL_508956, EPI_ISL_508957, EPI_ISL_508986, EPI_ISL_508987, EPI_ISL_508999, EPI_ISL_509000, EPI_ISL_509001, EPI_ISL_509002, EPI_ISL_525536, EPI_ISL_525537, EPI_ISL_525540, EPI_ISL_525541, EPI_ISL_525542, EPI_ISL_525543, EPI_ISL_578176, EPI_ISL_578177, EPI_ISL_678494, EPI_ISL_678495, EPI_ISL_678496, EPI_ISL_678497, EPI_ISL_678498, EPI_ISL_678499, EPI_ISL_678500, EPI_ISL_678501, EPI_ISL_681261, EPI_ISL_681262, EPI_ISL_681263, EPI_ISL_1359938			
see above	CNR Virus des Infections Respiratoires - France SUD	CNR Virus des Infections Respiratoires - France SUD	Alexandre; Alexandre Gaymard; Antonin; Antonin Bal; Bal; Bouscambert-Duchamp; Brengel-Pesce; Bruno Lina; Bruno.; Carine Moustaud; Cheynet; Destras; Emilie Frobert; Florence; Florence Morfin-Sherpa; Gaymard; Gregory; Gregory Destras; Gregory Queromes; Gwendolyne Burfin; Hadrien Regue; Josset; Karen; Laurence; Laurence Josset; Lina; Martine; Martine Valette; Maude; Maude Bouscambert-Duchamp; Morfin-Sherpa; Quentin Semanas; Raphaelle Lamy; Solenne Brun; Valette; Valérie
EPI_ISL_452127, EPI_ISL_452128, EPI_ISL_452129, EPI_ISL_452130	CO Department of Public Health and Environment	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Montmayeur; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao; Zachary Weiner
EPI_ISL_416994, EPI_ISL_418248, EPI_ISL_418249	COMPLEJO ASISTENCIAL UNIVERSITARIO DE BURGOS	Instituto de Salud Carlos III	A. Monzón; F. Casas; G. Hospital: ------; I. Jiménez; I. Megias-Lobon G.; Iglesias-Caballero; M. Camarero; M. Camarero S. Pozo F. Casas I. Jiménez P. Jiménez M. Zaballos A. Monzón; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; P. Jiménez; S. Juliá; S. Juliá M. Cuesta I. Megias Lobón; S. Pozo; S. Varona
EPI_ISL_412981	CR&WISCO GENERAL HOSPITAL	Hubei Provincial Center for Disease Control and Prevention	Bin Fang; Bo Yang; Bo Yu; Faxian Zhan; Guojun Ye; Jing Li; Junqiang Xu; Kun Cai; Linlin Liu; Xiang Li; Xiao Yu; Xixiang Huo; Yongzhong Jiang.
EPI_ISL_447556, EPI_ISL_447557, EPI_ISL_447558, EPI_ISL_447559, EPI_ISL_447560, EPI_ISL_447561, EPI_ISL_447562, EPI_ISL_447563, EPI_ISL_447847, EPI_ISL_447862			
see above	CSIR-Centre for Cellular and Molecular Biology	CSIR-Centre for Cellular and Molecular Biology	Archana Bharadwaj Siva; Dhiviya Vedagiri; Divya Gupta; Divya Tej Sowpati; Karthik Bharadwaj Tallapaka; Krishnan Harinivas Harshan; Lamuk Zaveri; Namami Gaur; Payel Mukherjee; Priya Singh; Purushotham Vodnala; Rakesh K Mishra; Sakshi Shambhavi; Santosh Kumar Kuncha; Shagufta Khan; Sofia Banu; Tulasi Nagabandi; Vishal Sah
EPI_ISL_450306, EPI_ISL_465687, EPI_ISL_465692, EPI_ISL_535799, EPI_ISL_535800, EPI_ISL_535813, EPI_ISL_535815, EPI_ISL_535876, EPI_ISL_535884, EPI_ISL_535902, EPI_ISL_535910, EPI_ISL_535928, EPI_ISL_535946, EPI_ISL_535984, EPI_ISL_536027, EPI_ISL_536028, EPI_ISL_536040, EPI_ISL_536042, EPI_ISL_536044, EPI_ISL_536110, EPI_ISL_536150, EPI_ISL_536158, EPI_ISL_536160, EPI_ISL_536166, EPI_ISL_536181, EPI_ISL_536213, EPI_ISL_536215, EPI_ISL_536216, EPI_ISL_536237, EPI_ISL_536243, EPI_ISL_536272, EPI_ISL_536278, EPI_ISL_536286, EPI_ISL_536299, EPI_ISL_536301, EPI_ISL_536302, EPI_ISL_536304, EPI_ISL_536344, EPI_ISL_536361, EPI_ISL_536383			
see above	CSSS Haut-Richelieu/Rouville (Hôpital)	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_536109	CSSS de Port-Cartier	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_536206, EPI_ISL_536260	CSSS de la Minganie	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_426416, EPI_ISL_812141	CT-Dr. Katherine A. Kelley State Public Health Lab	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Montmayeur; Anna Uehara; Brian Lynch; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Mary S. Keckler; Peter Cook; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_468314	CTA Centro de Testagem e Aconselhamento	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes
EPI_ISL_445303	CTRO.DE SALUD FAMILIAR DR. RAUL YAZIGI	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_451935, EPI_ISL_452142	CUB Hopital Erasme Laboratoire d'Anatomie Pathologique	CUB Hopital Erasme Laboratoire d'Anatomie Pathologique	Dr. Nicky D'Haene; Isabelle Salmon; Nikcy D'Haene; Prof. Isabelle Salmon
EPI_ISL_535749, EPI_ISL_535761, EPI_ISL_535764, EPI_ISL_535765, EPI_ISL_535811, EPI_ISL_536337, EPI_ISL_536365, EPI_ISL_536366			
see above	CUSM-Site Glen-LAB Microbiologie	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_428367, EPI_ISL_443300, EPI_ISL_443301, EPI_ISL_443302, EPI_ISL_443311, EPI_ISL_443312, EPI_ISL_443313, EPI_ISL_443317			
see above	Cabinet Médical	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Etienne Simon-Lorière; Flora Donati; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_418235	Cabinet médical	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Etienne Simon-Lorière; Flora Donati; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_418812, EPI_ISL_418813, EPI_ISL_429807, EPI_ISL_429817, EPI_ISL_429818, EPI_ISL_429819, EPI_ISL_429820, EPI_ISL_482474, EPI_ISL_482475, EPI_ISL_482478, EPI_ISL_482480, EPI_ISL_482481, EPI_ISL_482482, EPI_ISL_482483, EPI_ISL_482484			
see above	Cadham Provincial Laboratory	National Microbiology Laboratory	; Anna Majer; David Alexander; Elsie Grudeski; Gary Van Domselaar; Grace Seo; Jared Bullard; Jennifer Tanner; Kerry Dust; Kristyn Burak; Matthew Gilmour; Morag Graham; Natalie Knox; Nathalie Bastien; Paul Van Caeseele; Philip Mabon; Rhiannon Huzarewich; Russell Mandes; Russell Mandez; Shari Tyson; Timothy Booth; Yan Li

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see above	Cadham Provincial Laboratory	National Microbiology Laboratory (NML)	Anna Majer; Anneliese Landgraff; CanCOGeN's metadata curation team; Darian Hole; David Alexander; Elsie Grudeski; Gary Van Domselaar; Grace Seo; Jared Bullard; Jennifer Tanner; Kerry Dust; Madison Chapel; Morag Graham; Natalie Knox; Nathalie Bastien; Paul Van Caeseele; Philip Mabon; Public Health Agency of Canada CanCOGeN team; Rhiannon Huzarewich; Russell Mandes; Shari Tyson; Timothy Booth; Yan Li
EPI_ISL_632910, EPI_ISL_632911, EPI_ISL_632912, EPI_ISL_632914, EPI_ISL_632915, EPI_ISL_632916, EPI_ISL_632918, EPI_ISL_632919, EPI_ISL_632920, EPI_ISL_632921, EPI_ISL_632922, EPI_ISL_632923, EPI_ISL_632924, EPI_ISL_632925, EPI_ISL_632926, EPI_ISL_632927, EPI_ISL_632928, EPI_ISL_632929, EPI_ISL_632930, EPI_ISL_632931, EPI_ISL_632932, EPI_ISL_632933			
see above	Cadham Provincial laboratory	Cadham Provincial laboratory	Anna Majer; Anneliese Landgraff; CanCOGeN's metadata curation team; Darian Hole; David Alexander; Elsie Grudeski; Gary Van Domselaar; Grace Seo; Jared Bullard; Jennifer Tanner; Kerry Dust; Madison Chapel; Morag Graham; Natalie Knox; Nathalie Bastien; Paul Van Caeseele; Philip Mabon; Public Health Agency of Canada CanCOGeN team; Rhiannon Huzarewich; Russell Mandes; Shari Tyson; Timothy Booth; Yan Li
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see above	Cadham Provincial laboratory	National Microbiology Laboratory (NML)	Anna Majer; Anneliese Landgraff; CanCOGeN's metadata curation team; Darian Hole; David Alexander; Elsie Grudeski; Gary Van Domselaar; Grace Seo; Jared Bullard; Jennifer Tanner; Kerry Dust; Kirsten Biggar; Madison Chapel; Morag Graham; Natalie Knox; Nathalie Bastien; Paul Van Caeseele; Philip Mabon; Public Health Agency of Canada CanCOGeN team; Rhiannon Huzarewich; Russell Mandes; Shari Tyson; Timothy Booth; Yan Li
EPI_ISL_444794	Cairns Hospital	Public Health Virology Laboratory	Alyssa Pyke; Amanda De Jong; Andrew Van Den Hurk; Bixing Huang; Carmel Taylor; David Warrilow; Doris Genge; Elisabeth Gamez; Glen Hewitson; Ian Maxwell Mackay; Inga Sultana; Jamie McMahon; Jean Barcelon; Judy Northill; Mitchell Finger; Natalie Simpson; Neelima Nair; Peter Burtonclay; Peter Moore; Sarah Wheatley; Sean Moody; Sonja Hall-Mendelin; Timothy Gardam; and Frederick Moore
EPI_ISL_408009	California Department of Health	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Diseases Control and Prevention	Anna Uehara; Brett L. Whitaker; Brian Lynch; Clinton Paden; Janna' R. Murray; Jing Zhang; Krista Queen; Lijuan Wang; Senthil Kumar K. Sakthivel; Shifaq Kamili; Stephen Lindstrom; Susan I. Gerber; Suxiang Tong; Xiaoyan Lu; Yan Li; Ying Tao
EPI_ISL_408008	California Department of Health	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Anna Uehara; Brett L. Whitaker; Brian Lynch; Clinton Paden; Janna' R. Murray; Jing Zhang; Krista Queen; Lijuan Wang; Senthil Kumar K. Sakthivel; Shifaq Kamili; Stephen Lindstrom; Susan I. Gerber; Suxiang Tong; Xiaoyan Lu; Yan Li; Ying Tao
EPI_ISL_515894, EPI_ISL_515896, EPI_ISL_515897, EPI_ISL_515898, EPI_ISL_515899, EPI_ISL_515900, EPI_ISL_515901, EPI_ISL_515902, EPI_ISL_515903, EPI_ISL_515905, EPI_ISL_515906, EPI_ISL_515907, EPI_ISL_515909, EPI_ISL_515910, EPI_ISL_515911, EPI_ISL_515913, EPI_ISL_755036, EPI_ISL_755037			
see above	California Department of Public Health	California Department of Public Health	CDPH IDLB COVIDNet
EPI_ISL_413557, EPI_ISL_413558, EPI_ISL_413559, EPI_ISL_413561, EPI_ISL_413924, EPI_ISL_413925, EPI_ISL_413928			
see above	California Department of Public Health	Chiu Laboratory, University of California, San Francisco	Chao-Yang Pan; Debra A. Wadford; Hugo Guevara; Scot Federman; Wei Gu; Xianding Deng; and Charles Y. Chiu
EPI_ISL_411955	California Department of Public Health	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Diseases Control and Prevention	Anna Uehara; Brett L. Whitaker; Brian Lynch; Clinton R. Paden; Haibin Wang; Janna' R. Murray; Jing Zhang; Krista Queen; Lijuan Wang; Senthil Kumar K. Sakthivel; Shifaq Kamili; Stephen Lindstrom; Susan I. Gerber; Suxiang Tong; Xiaoyan Lu; Yan Li; Ying Tao
EPI_ISL_412862, EPI_ISL_419554, EPI_ISL_594458	California Department of Public Health	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Anna Uehara; Brett L. Whitaker; Brian Lynch; Clinton Paden; Clinton R. Paden; Haibin Wang; Janna' R. Murray; Jasmine Padilla; Jing Zhang; Julu Bhatnagar; Justin Lee; Krista Queen; Lijuan Wang; Senthil Kumar K. Sakthivel; Shifaq Kamili; Stephen Lindstrom; Susan I. Gerber; Suxiang Tong; Xiaoyan Lu; Yan Li; Ying Tao
EPI_ISL_447594	Caloundra Hospital	Public Health Virology Laboratory	Alyssa Pyke; Amanda De Jong; Andrew Van Den Hurk; Bixing Huang; Carmel Taylor; David Warrilow; Doris Genge; Elisabeth Gamez; Glen Hewitson; Ian Maxwell Mackay; Inga Sultana; Jamie McMahon; Jean Barcelon; Judy Northill; Mitchell Finger; Natalie Simpson; Neelima Nair; Peter Burtonclay; Peter Moore; Sarah Wheatley; Sean Moody; Sonja Hall-Mendelin; Timothy Gardam; and Frederick Moore
EPI_ISL_456321, EPI_ISL_456322, EPI_ISL_548129, EPI_ISL_579060, EPI_ISL_579061, EPI_ISL_579063, EPI_ISL_579064, EPI_ISL_579065, EPI_ISL_579066, EPI_ISL_579067, EPI_ISL_579068, EPI_ISL_579069, EPI_ISL_579070, EPI_ISL_579071, EPI_ISL_579072, EPI_ISL_579073, EPI_ISL_579074, EPI_ISL_579075, EPI_ISL_579077, EPI_ISL_579078, EPI_ISL_579079, EPI_ISL_579080, EPI_ISL_579081, EPI_ISL_579082, EPI_ISL_579083, EPI_ISL_579084, EPI_ISL_579085, EPI_ISL_579427, EPI_ISL_579429, EPI_ISL_579430, EPI_ISL_579431, EPI_ISL_579432, EPI_ISL_579433, EPI_ISL_579434, EPI_ISL_579435, EPI_ISL_579436, EPI_ISL_579437, EPI_ISL_579438, EPI_ISL_579439, EPI_ISL_579440, EPI_ISL_579441, EPI_ISL_579442, EPI_ISL_579443, EPI_ISL_579444, EPI_ISL_579445, EPI_ISL_579446, EPI_ISL_579447, EPI_ISL_579448, EPI_ISL_579450, EPI_ISL_579451, EPI_ISL_579452, EPI_ISL_579454, EPI_ISL_579455, EPI_ISL_579456, EPI_ISL_579457, EPI_ISL_579458, EPI_ISL_579459, EPI_ISL_579460, EPI_ISL_579461, EPI_ISL_579462, EPI_ISL_579463, EPI_ISL_579464, EPI_ISL_579465, EPI_ISL_579466, EPI_ISL_579467, EPI_ISL_579468, EPI_ISL_579469, EPI_ISL_579470, EPI_ISL_579471, EPI_ISL_579474, EPI_ISL_579475, EPI_ISL_579478, EPI_ISL_579479, EPI_ISL_579480, EPI_ISL_579481, EPI_ISL_579482, EPI_ISL_579483, EPI_ISL_579484, EPI_ISL_579485, EPI_ISL_579486, EPI_ISL_579487, EPI_ISL_579488, EPI_ISL_579489, EPI_ISL_622794, EPI_ISL_622795, EPI_ISL_622796, EPI_ISL_622797, EPI_ISL_622798, EPI_ISL_622799			
see above	Canterbury Health Laboratories	Institute of Environmental Science and Research (ESR)	Anja Werno; Antje van der Linden; Arlo Upton; Chris Mansell; David Hammer; Dragana Drinkovic; Erasmus Smit; Gary McAuliffe; Hana Sofia Andersson; Hermes Perez; James Ussher; Jill Sherwood; Jing Wang; Joep de Ligt; Josh Freeman; Julia Howard; Juliet Elvy; Lauren Jelly; Mary DeAlmeida; Matt Blakiston; Matt Storey; Matthew Rogers; Max Bloomfield; Michael Addidle; Michelle Balm; Muhammad Faisal; Nikki Freed; Olin Silander; Sally Roberts; Sarah Jefferies; Sharmini Muttaiyah; Susan Morpeth; Susan Taylor; Timothy Blackmore; Vani Sathyendran; Veronica Playle; Virginia Hope; Xiaoyun Ren
EPI_ISL_524478	Cantonal Hospital Winterthur	Institute of Medical Virology, University of Zurich	Alexandra Trkola; Andrea Zbinden; Fiona Steiner; Gabriela Ziltener; Jon Huder; Jürg Böni; Maryam Zaheri; Michael Huber; Patrick Redli; Riccarda Capaul; Stefan Schmutz; Verena Kufner
EPI_ISL_467809, EPI_ISL_475574, EPI_ISL_475578, EPI_ISL_475596, EPI_ISL_475600, EPI_ISL_475607, EPI_ISL_475608, EPI_ISL_475609, EPI_ISL_475610, EPI_ISL_475611, EPI_ISL_475612, EPI_ISL_475613, EPI_ISL_475618, EPI_ISL_475627, EPI_ISL_475628, EPI_ISL_475629, EPI_ISL_475630, EPI_ISL_475631, EPI_ISL_475632, EPI_ISL_475633, EPI_ISL_475634, EPI_ISL_475635, EPI_ISL_475636, EPI_ISL_475637, EPI_ISL_475638, EPI_ISL_475639, EPI_ISL_475640, EPI_ISL_475641, EPI_ISL_475651, EPI_ISL_475653, EPI_ISL_475656, EPI_ISL_475657, EPI_ISL_475673, EPI_ISL_475677, EPI_ISL_475678, EPI_ISL_475679, EPI_ISL_475680, EPI_ISL_475681, EPI_ISL_475682, EPI_ISL_475683, EPI_ISL_475684, EPI_ISL_475685, EPI_ISL_475687, EPI_ISL_475688, EPI_ISL_475689, EPI_ISL_475692, EPI_ISL_475694, EPI_ISL_475695, EPI_ISL_475699, EPI_ISL_475700, EPI_ISL_475703, EPI_ISL_475705, EPI_ISL_475706, EPI_ISL_475708, EPI_ISL_475716			
see above	Cedars-Sinai Medical Center, Department of Pathology & Laboratory Medicine, Molecular Pathology Laboratory	Cedars-Sinai Medical Center, Molecular Pathology Laboratory of Department of Pathology & Laboratory Medicine and Genomic Core	Brian Davis; Eric Vail; Jasmine T Plummer; Jean Lopategui; Jianbo Song; John Paul Govindavari; Jong Taek Kim; Stephanie Chen; Wenjuan Zhang
EPI_ISL_450413	Center for Diagnostics, Institute of Medical Microbiology, Virology and Hygiene	University Medical Center Hamburg-Eppendorf	Huang, J.; Pfefferle; S. and Fischer, N.
EPI_ISL_459856, EPI_ISL_459857, EPI_ISL_459858, EPI_ISL_459859, EPI_ISL_459860, EPI_ISL_459861, EPI_ISL_459862, EPI_ISL_459863, EPI_ISL_468752, EPI_ISL_468760			
see above	Center for Genome Regulation (CRG)	Center for Mathematical Modeling and Center for Genome Regulation. Santiago, Chile	Allende ML; Gaete A; González M.; Maass A; Palma R; Travisany D; Urra C; Varas M
EPI_ISL_479664, EPI_ISL_479665, EPI_ISL_479667, EPI_ISL_479668, EPI_ISL_479671, EPI_ISL_479672, EPI_ISL_481283			
see above	Center for Genomics and System Biology, New York University	Center for Genomics and System Biology, New York University	Banakis, S.; Borenstein; Cornelius, A.; D. and Ghedin, E.; E.S.; Fleming, A.; Ghedin, E.; Gresham; Gresham, D.; Herati, R.; Johnson, K.; Khalfan, M.; Kottkamp, A.; M.J.; Mulligan; Raabe, V.; Roder, A.; Samanovic, M.; Ulrich, R.
EPI_ISL_493137, EPI_ISL_493139	Center for Research and Innovation, Faculty of Medical Technology, Mahidol University	Center for Research and Innovation, Faculty of Medical Technology, Mahidol University	Anek Mungaomklang; Hatairat Lerdsamran; Jarunee Prasertsopon; Kamolthip Atsawawaranunt; Kantima Sangsiriwut; Nattakan Thinpan; Pilaipan Puthavathana; Prabda Praphasiri; Somrak Sirikhetkon; Tipsuda Chanmanee
EPI_ISL_419654, EPI_ISL_419655, EPI_ISL_419658, EPI_ISL_419661, EPI_ISL_419662, EPI_ISL_419664, EPI_ISL_419665, EPI_ISL_419666, EPI_ISL_419667, EPI_ISL_419669, EPI_ISL_419670, EPI_ISL_419671, EPI_ISL_419672, EPI_ISL_419673, EPI_ISL_419674, EPI_ISL_437993, EPI_ISL_437994, EPI_ISL_437995, EPI_ISL_437996, EPI_ISL_437997, EPI_ISL_437998, EPI_ISL_437999, EPI_ISL_438000, EPI_ISL_438003, EPI_ISL_438004, EPI_ISL_438005, EPI_ISL_438006, EPI_ISL_438007, EPI_ISL_438008, EPI_ISL_438010, EPI_ISL_438011, EPI_ISL_438012, EPI_ISL_438013, EPI_ISL_438014, EPI_ISL_438015, EPI_ISL_438016, EPI_ISL_438017, EPI_ISL_438018, EPI_ISL_438019, EPI_ISL_438020, EPI_ISL_438021, EPI_ISL_438022, EPI_ISL_438023, EPI_ISL_438024, EPI_ISL_438025, EPI_ISL_438026, EPI_ISL_438027, EPI_ISL_438029, EPI_ISL_438031, EPI_ISL_438032, EPI_ISL_438033, EPI_ISL_438034, EPI_ISL_438035, EPI_ISL_438036, EPI_ISL_438037, EPI_ISL_438038, EPI_ISL_438039, EPI_ISL_438040, EPI_ISL_438041, EPI_ISL_438042, EPI_ISL_438043, EPI_ISL_438044, EPI_ISL_438045, EPI_ISL_438046, EPI_ISL_438047, EPI_ISL_438048, EPI_ISL_438049, EPI_ISL_438050, EPI_ISL_438051, EPI_ISL_438052, EPI_ISL_438053, EPI_ISL_438054, EPI_ISL_438055, EPI_ISL_438056, EPI_ISL_438057, EPI_ISL_438058, EPI_ISL_438059, EPI_ISL_438060, EPI_ISL_438061, EPI_ISL_438062, EPI_ISL_438063, EPI_ISL_438064, EPI_ISL_438065, EPI_ISL_438066, EPI_ISL_438067, EPI_ISL_438068, EPI_ISL_438069, EPI_ISL_438070, EPI_ISL_438071, EPI_ISL_438072, EPI_ISL_438073, EPI_ISL_438074, EPI_ISL_438075, EPI_ISL_438076, EPI_ISL_438077, EPI_ISL_438078, EPI_ISL_438079, EPI_ISL_438080, EPI_ISL_438081, EPI_ISL_438082, EPI_ISL_438083, EPI_ISL_438084, EPI_ISL_438085, EPI_ISL_438086, EPI_ISL_438087, EPI_ISL_438088, EPI_ISL_438089, EPI_ISL_438090, EPI_ISL_438091, EPI_ISL_438092, EPI_ISL_438093, EPI_ISL_438094, EPI_ISL_438095, EPI_ISL_438096, EPI_ISL_438097, EPI_ISL_438098, EPI_ISL_438099, EPI_ISL_438100, EPI_ISL_438101, EPI_ISL_438102, EPI_ISL_438103, EPI_ISL_438104, EPI_ISL_438105, EPI_ISL_438106, EPI_ISL_438107, EPI_ISL_438108,			

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see above	Center for Virology, Medical University of Vienna	Bergthaler laboratory, CeMM Research Center for Molecular Medicine of the Austrian Academy of Sciences	Adi Steinrigl; Alexander Lercher; Alexandra Popa; Andreas Bergthaler; Benedikt Agerer; Christian Paar; Christoph Bock; Daniela Schmid; Dorothee von Laer; Elisabeth Puchhammer-Stoeckl; Elisabeth Puchhammer-Stöckl; Franz Allerberger; Gernot Walder; Gregor Hörmann; Guenter Weiss; Gunther Vogl; Henrique Colaco; Jakob-Wendelin Genger; Jan Laine; Judith Aberle; Kinga Rigler-Hohenwarter; Lukas Endler; Manfred Nairz; Mark Smyth; Martin Senekowitsch; Michael Schuster; Peter Hufnagl; Peter Obrist; Rainer Gattringer; Sabine Sussitz-Rack; Stephan Aberle; Thomas Penz; Wegene Borena
EPI_ISL_523950	Center of Medical Microbiology, Virology, and Hospital Hygiene, University of Duesseldorf	Center of Medical Microbiology, Virology, and Hospital Hygiene, Heinrich Heine University Düsseldorf	Alexander Dilthey; Andreas Walker; Daniel Strelow; Hendrik Streeck; Jessica Nicolai; Jörg Timm; Klaus Pfeffer; Malte Kohns Vasconcelos; Marek Korencak; Maximilian Damagnez; Tobias Wienemann; Torsten Houwaart
EPI_ISL_413488, EPI_ISL_414497, EPI_ISL_414498, EPI_ISL_414499, EPI_ISL_414505, EPI_ISL_414508, EPI_ISL_414509, EPI_ISL_417457, EPI_ISL_417458, EPI_ISL_417459, EPI_ISL_417460, EPI_ISL_417461, EPI_ISL_417462, EPI_ISL_417463, EPI_ISL_417464, EPI_ISL_417465, EPI_ISL_417466, EPI_ISL_417467, EPI_ISL_417468, EPI_ISL_419541, EPI_ISL_419542, EPI_ISL_419543, EPI_ISL_419544, EPI_ISL_419545, EPI_ISL_419546, EPI_ISL_419547, EPI_ISL_419548, EPI_ISL_419549, EPI_ISL_419550, EPI_ISL_419551, EPI_ISL_419552, EPI_ISL_425121, EPI_ISL_425122, EPI_ISL_425123, EPI_ISL_425124, EPI_ISL_425125, EPI_ISL_425126, EPI_ISL_425127, EPI_ISL_425128, EPI_ISL_425130, EPI_ISL_425131, EPI_ISL_425132, EPI_ISL_425138, EPI_ISL_425139, EPI_ISL_523927, EPI_ISL_523929, EPI_ISL_523931, EPI_ISL_523932, EPI_ISL_523933, EPI_ISL_523934, EPI_ISL_523935, EPI_ISL_523937, EPI_ISL_523938, EPI_ISL_523939, EPI_ISL_523940, EPI_ISL_523941, EPI_ISL_523942, EPI_ISL_523943, EPI_ISL_523944, EPI_ISL_523948, EPI_ISL_523949, EPI_ISL_602513, EPI_ISL_602517			
see above	Center of Medical Microbiology, Virology, and Hospital Hygiene, University of Duesseldorf	Center of Medical Microbiology, Virology, and Hospital Hygiene, University of Duesseldorf	Alexander Dilthey; Andreas Walker; Björn-Erik Jensen; Björn-Erik Jensen; Daniel Strelow; Detlef Kindgen-Milles; Hendrik Streeck; Jessica Nicolai; Jorg Timm; Jörg Timm; Klaus Pfeffer; Lisanna Hülse; Malte Kohns Vasconcelos; Marcel Andree; Marek Korencak; Maximilian Damagnez; Nadine Lübke; Ortwin Adams; Sandra Hauka; Tina Senff; Tobias Wienemann; Torsten Feldt; Torsten Houwaart
EPI_ISL_429852, EPI_ISL_429853, EPI_ISL_429854, EPI_ISL_495459	Centers for Disease Control and Prevention of Lishui	Department of InspectionCenters for Disease Control and Prevention of Lishui	Ji Jiansong; Ji Qiaoying; Wang Xiaoguang; Ye Bifeng; Ye Ling
EPI_ISL_406031, EPI_ISL_420082, EPI_ISL_420083, EPI_ISL_420084, EPI_ISL_420085, EPI_ISL_421641, EPI_ISL_421651, EPI_ISL_428488, EPI_ISL_428489, EPI_ISL_428490, EPI_ISL_428491, EPI_ISL_429882, EPI_ISL_429883, EPI_ISL_429884			
see above	Centers for Disease Control, R.O.C. (Taiwan)	Centers for Disease Control, R.O.C. (Taiwan)	Ji-Rong Yang; Jung-Jung Mu; Ming-Tsan Liu; Ming-Tsan-Liu; Shu-Ying Li; Yu-Chi Lin; Yu-Chi-Lin
EPI_ISL_457750, EPI_ISL_459964	Centogene AG	Centogene AG	Dr. Krishna Kumar Kandaswamy; Prof. Dr. Peter Bauer
EPI_ISL_455583, EPI_ISL_455594	Central Chest Institute of Thailand	National Institute of Health. Department of medical Sciences, Ministry of Public Health, Thailand	Chittaganpitch; Malinee; Okada; Parnmen; Phuygun; Pilailuk; Siripaporn; Sittiporn; Sunthareeya; Thanadachakul; Thanutsapa; Waicharoen; Warawan; Wongboot
EPI_ISL_794603, EPI_ISL_794604	Central Laboratories, Egyptian Ministry of Health and Population	Central Laboratories, Egyptian Ministry of Health and Population	A.E.; Ali; El Guindy; El Sayes; El Taweel, A.; El-Shesheny, R.; Gomaa, M.; Kamel; Kandeil, A.; Kayali, G.; Kayed; Khalifa; Kutkat, O.; M.A.; M.K.; M.N.; Mahmoud; Mahrous, N.; Moatasim, Y.; Mostafa, A.; N.M.; Naguib, A.; Roshdy; S.H.; Saleh, M.; Shawky, S.; Shehata, M.; W.H.
EPI_ISL_978502, EPI_ISL_978503, EPI_ISL_978504, EPI_ISL_978506, EPI_ISL_978507, EPI_ISL_978508, EPI_ISL_978509, EPI_ISL_978510, EPI_ISL_978511, EPI_ISL_978512, EPI_ISL_978513, EPI_ISL_978515, EPI_ISL_978516, EPI_ISL_978517, EPI_ISL_978518, EPI_ISL_978519, EPI_ISL_978520, EPI_ISL_978523, EPI_ISL_978524, EPI_ISL_978527, EPI_ISL_978530, EPI_ISL_978533			
see above	Central Public Health Laboratory - LACEN -Bahia, Salvador, Brazil	Central Public Health Laboratory - LACEN -Bahia, Salvador, Brazil	Arabela Leal; Breno Dominguez; Felicidade Pereira; Jaqueline Gomes; Luciana Oliveira; Luiz Alcantara; Marcela Gómez; Marta Giovanetti; Patrícia Cajado; Stephane Tosta; Vagner Fonseca; Vanessa Nardy
EPI_ISL_429667, EPI_ISL_429669, EPI_ISL_429671, EPI_ISL_429676, EPI_ISL_429681, EPI_ISL_429687, EPI_ISL_429688, EPI_ISL_429695			
see above	Central Public Health Laboratory/Octávio Magalhães Institute (IOM) from the Ezequiel Dias Foundation (FUNED)	Instituto Octávio Magalhães / Fundação Ezequiel Dias (IOM/Funed)	Joilson Xavier; Luiz Carlos Junior Alcantara; Marcos Vinícius Silva; Marluce Aparecida Assunção Oliveira; Marta Giovanetti; Talita Adelino; Vagner Fonseca
EPI_ISL_447251	Central Virology Laboratory	Central Virology Laboratory	Danit Sofer; Efrat Bucris; Ella Mendelson; Michal Mandelboim; Neta Zuckerman; Oran Erster; Orna Mor
EPI_ISL_419211	Central Virology Laboratory	Israel Institute for Biological Research	Adi Beth-Din; Anat Zvi; Boaz Politi; Dana Stein; Einat Vitner; Gadi Segal; Gili Regev-Yochay; Hadas Tamir; Hagit Achdout; Inbar Cohen-Gihon; Lilach Cherry; Michal Mandelboim; Nir Paran; Ofir Israeli; Ohad Shifman; Oran Erster; Orly Laskar; Sharon Melamed; Shay Weiss; Shmuel C. Shapira; Shmuel Yitzhaki; Tomer Israely; Yfat Yahalom Ronen
EPI_ISL_430842	Central chest Institute of Thailand	National Institute of Health. Department of medical Sciences, Ministry of Public Health, Thailand	Chittaganpitch; Malinee; Okada; Parnmen; Phuygun; Pilailuk; Siripaporn; Sittiporn; Sunthareeya; Thanadachakul; Thanutsapa; Waicharoen; Warawan; Wongboot
EPI_ISL_458000	Centre For Biotechnology Research and Development	Centre For Biotechnology Research and Development	C.N. and Michuki; D.K.; G.N.; J.O.; Kimotho, J.; Matoke-Muhia; Muuo; Ochwoto, M.; S.L.; S.N.; Symeker; Waruhiu; Zablon
EPI_ISL_414624, EPI_ISL_416494	Centre Hositalier Universitaire de Rouen Laboratoire de Virologie	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Etienne Simon-Lorière; Flora Donati; Flora Donati Vincent Enouf; Jean-Christophe Plantier; Marion Barbet; Maud Vanpeene; Méline Bizard; Mélnie Albert; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_508958, EPI_ISL_509012	Centre Hospitalier Alpes Leman	CNR Virus des Infections Respiratoires - France SUD	Alexandre Gaymard; Antonin Bal; Bruno Lina; Carine Moustaud; Florence Morfin-Sherpa; Gregory Destras; Gwendolyne Burfin; Laurence Josset; Martine Valette; Maude Bouscambert-Duchamp; Raphaelle Lamy; Solenne Brun
EPI_ISL_414627, EPI_ISL_414628, EPI_ISL_414629, EPI_ISL_414630, EPI_ISL_414634, EPI_ISL_414635, EPI_ISL_414636, EPI_ISL_414637, EPI_ISL_414638, EPI_ISL_415654, EPI_ISL_416495, EPI_ISL_416496, EPI_ISL_416497, EPI_ISL_418218, EPI_ISL_418220, EPI_ISL_418221, EPI_ISL_418223, EPI_ISL_418224, EPI_ISL_418225, EPI_ISL_418227, EPI_ISL_418228, EPI_ISL_418231, EPI_ISL_418236, EPI_ISL_418237, EPI_ISL_418238, EPI_ISL_418239, EPI_ISL_429968			
see above	Centre Hospitalier Compiègne Laboratoire de Biologie	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Etienne Simon-Lorière; Fabiana Gambaro; Flora Donati; Flora Donati Vincent Enouf; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Mélnie Albert; Raulin Olivia; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_418428, EPI_ISL_508947	Centre Hospitalier Lucien Hussel	CNR Virus des Infections Respiratoires - France SUD	Alexandre Gaymard; Antonin Bal; Bruno Lina; Carine Moustaud; Florence Morfin-Sherpa; Gregory Destras; Gwendolyne Burfin; Laurence Josset; Martine Valette; Maude Bouscambert-Duchamp; Raphaelle Lamy; Solenne Brun
EPI_ISL_508998	Centre Hospitalier Pierre Oudot	CNR Virus des Infections Respiratoires - France SUD	Alexandre Gaymard; Antonin Bal; Bruno Lina; Carine Moustaud; Florence Morfin-Sherpa; Gregory Destras; Gwendolyne Burfin; Laurence Josset; Martine Valette; Maude Bouscambert-Duchamp; Raphaelle Lamy; Solenne Brun
EPI_ISL_414633	Centre Hospitalier René Dubois Laboratoire de Microbiologie - Bât A	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Flora Donati Vincent Enouf; Marion Barbet; Maud Vanpeene; Méline Bizard; Mélnie Albert; Pascale Martres; Sylvie Behillil; Sylvie van der Werf
EPI_ISL_414625	Centre Hospitalier Régional Universitaire de Nantes Laboratoire de Virologie	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Flora Donati Vincent Enouf; Marianne Coste-Burel; Marion Barbet; Maud Vanpeene; Méline Bizard; Mélnie Albert; Sylvie Behillil; Sylvie van der Werf
EPI_ISL_535787, EPI_ISL_535788, EPI_ISL_535790, EPI_ISL_535842, EPI_ISL_535844, EPI_ISL_535871, EPI_ISL_535896, EPI_ISL_535907, EPI_ISL_535931, EPI_ISL_535932, EPI_ISL_535933, EPI_ISL_535934, EPI_ISL_535935, EPI_ISL_536002, EPI_ISL_536005, EPI_ISL_536006, EPI_ISL_536009, EPI_ISL_536014, EPI_ISL_536015, EPI_ISL_536016, EPI_ISL_536047, EPI_ISL_536050, EPI_ISL_536052, EPI_ISL_536053, EPI_ISL_536054, EPI_ISL_536059, EPI_ISL_536060, EPI_ISL_536063, EPI_ISL_536073, EPI_ISL_536074, EPI_ISL_536076, EPI_ISL_536079, EPI_ISL_536120, EPI_ISL_536126, EPI_ISL_536129, EPI_ISL_536130, EPI_ISL_536134, EPI_ISL_536138, EPI_ISL_536151, EPI_ISL_536153, EPI_ISL_536154, EPI_ISL_536381, EPI_ISL_560415			
see above	Centre Hospitalier Régional de Lanaudière	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_418418, EPI_ISL_418419, EPI_ISL_420617, EPI_ISL_508879, EPI_ISL_508880, EPI_ISL_508959, EPI_ISL_508960			
see above	Centre Hospitalier Saint Joseph Saint Luc	CNR Virus des Infections Respiratoires - France SUD	Alexandre Gaymard; Antonin Bal; Bruno Lina; Carine Moustaud; Florence Morfin-Sherpa; Gregory Destras; Gwendolyne Burfin; Laurence Josset; Martine Valette; Maude Bouscambert-Duchamp; Raphaelle Lamy; Solenne Brun
EPI_ISL_416757, EPI_ISL_417340, EPI_ISL_418426, EPI_ISL_419183, EPI_ISL_419185, EPI_ISL_419186, EPI_ISL_420620, EPI_ISL_508938, EPI_ISL_508944, EPI_ISL_525539			
see above	Centre Hospitalier de Bourg en Bresse	CNR Virus des Infections Respiratoires - France SUD	Alexandre; Alexandre Gaymard; Antonin; Antonin Bal; Bal; Bouscambert-Duchamp; Brengel-Pesce; Bruno Lina; Bruno.; Carine Moustaud; Cheynet; Destras; Florence; Florence Morfin-Sherpa; Gaymard; Gregory; Gregory Destras; Gwendolyne Burfin; Josset; Karen; Laurence; Laurence Josset; Lina; Martine; Martine Valette; Maude; Maude Bouscambert-Duchamp; Morfin-Sherpa; Raphaelle Lamy; Solenne Brun; Valette; Valérie
EPI_ISL_417338, EPI_ISL_418413, EPI_ISL_419174, EPI_ISL_419175, EPI_ISL_419176, EPI_ISL_419187, EPI_ISL_419188, EPI_ISL_420613, EPI_ISL_420614, EPI_ISL_508875, EPI_ISL_508876, EPI_ISL_508943, EPI_ISL_508946, EPI_ISL_508949, EPI_ISL_508950, EPI_ISL_508952, EPI_ISL_509005			
see above	Centre Hospitalier de Macon	CNR Virus des Infections Respiratoires - France SUD	Alexandre Gaymard; Antonin Bal; Bruno Lina; Carine Moustaud; Florence Morfin-Sherpa; Gregory Destras; Gwendolyne Burfin; Laurence Josset; Martine Valette; Maude Bouscambert-Duchamp; Raphaelle Lamy; Solenne Brun

EPI_ISL_416749, EPI_ISL_418414, EPI_ISL_418417, EPI_ISL_419168, EPI_ISL_508881	Centre Hospitalier de Valence	CNR Virus des Infections Respiratoires - France SUD	Alexandre; Alexandre Gaymard; Antonin; Antonin Bal; Bal; Bouscambert-Duchamp; Brengel-Pesce; Bruno Lina; Bruno.; Carine Moustaud; Cheynet; Destras; Florence; Florence Morfin-Sherpa; Gaymard; Gregory; Gregory Destras; Gwendolyne Burfin; Josset; Karen; Laurence; Laurence Josset; Lina; Martine; Martine Valette; Maude; Maude Bouscambert-Duchamp; Morfin-Sherpa; Raphaelle Lamy; Solenne Brun; Valette; Valérie
EPI_ISL_509006	Centre Hospitalier de Villefranche	CNR Virus des Infections Respiratoires - France SUD	Alexandre Gaymard; Antonin Bal; Bruno Lina; Carine Moustaud; Florence Morfin-Sherpa; Gregory Destras; Gwendolyne Burfin; Laurence Josset; Martine Valette; Maude Bouscambert-Duchamp; Raphaelle Lamy; Solenne Brun
EPI_ISL_418412	Centre Hospitalier des Vals d'Ardeche	CNR Virus des Infections Respiratoires - France SUD	Alexandre Gaymard; Antonin Bal; Bruno Lina; Carine Moustaud; Florence Morfin-Sherpa; Gregory Destras; Gwendolyne Burfin; Laurence Josset; Martine Valette; Maude Bouscambert-Duchamp; Raphaelle Lamy; Solenne Brun
EPI_ISL_539573, EPI_ISL_539574, EPI_ISL_539575, EPI_ISL_539576	Centre de Recherches Medicales de Lambarene (CERMEL)	Department of Emerging Infectious Diseases, Institute of Tropical Medicine, Nagasaki University	Akim A. Adegnika; Bertrand Lell; Haruka Abe; Jiro Yasuda; Rodrigue Bikangui; Yuri Ushijima
EPI_ISL_560413, EPI_ISL_560414	Centre de SSS D'Arthabaska-et-de-l'érable - Hôtel-Dieu	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_535724, EPI_ISL_535742, EPI_ISL_535743	Centre de SSS La Pommeraie	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_535747, EPI_ISL_535748, EPI_ISL_535916, EPI_ISL_535979, EPI_ISL_536007, EPI_ISL_536034, EPI_ISL_536038			
see above	Centre de SSS de Trois-Rivières	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_535727, EPI_ISL_535776, EPI_ISL_535777, EPI_ISL_535778, EPI_ISL_535779, EPI_ISL_535780, EPI_ISL_535803, EPI_ISL_535804, EPI_ISL_535805, EPI_ISL_535816, EPI_ISL_535854			
see above	Centre de SSS de la Haute-Yamaska	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_471456	Centre de Virologie des Maladies Tropicales	Functional Genomic Platform/Service Analyses Biologique/UATRS/ Centre National Pour la Recherche Scientifique Et Technique (CNRST)	Abdelillah LARAQUI; Abdelkader LAATIRIS; Ahmed REGGAD; Elmostafa EL FAHIME; Farida HILALI; Hicham EL ANNAZ; Idriss-Amine LAHLOU; Khalid ENNIBI; Marouane MELLOUL; Mly Abdelaziz ELALAOUI; Mostafa ELOUENNASS; Nadia TOUIL; Rachid ABI; Rida TAGAJDID; Safae ELKOCHRI; Sanaa ALAOUI-Amine; Tahar BAJJOU; Yassine SEKHSOKH; Youssef AKHOUAD; Zohour KASMY
EPI_ISL_535808	Centre de santé Chibougamau	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Sandrine Moreira
EPI_ISL_443310	Centre de santé Filieris	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Etienne Simon-Lorière; Flora Donati; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_465697, EPI_ISL_536353	Centre de santé Inuulitsivik	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_483923, EPI_ISL_483931, EPI_ISL_483937, EPI_ISL_483945, EPI_ISL_483947, EPI_ISL_483948, EPI_ISL_483952, EPI_ISL_483959, EPI_ISL_483961, EPI_ISL_483964, EPI_ISL_483966, EPI_ISL_483967, EPI_ISL_483968, EPI_ISL_483971, EPI_ISL_483973, EPI_ISL_483976, EPI_ISL_483980, EPI_ISL_483982, EPI_ISL_483985, EPI_ISL_483986, EPI_ISL_483987, EPI_ISL_483989, EPI_ISL_483992, EPI_ISL_483995, EPI_ISL_483999, EPI_ISL_484002, EPI_ISL_484005, EPI_ISL_484008, EPI_ISL_484012, EPI_ISL_484019, EPI_ISL_484020, EPI_ISL_484028, EPI_ISL_484034, EPI_ISL_484036, EPI_ISL_484053, EPI_ISL_484056, EPI_ISL_484059, EPI_ISL_484064, EPI_ISL_484070, EPI_ISL_484072, EPI_ISL_484079, EPI_ISL_484082, EPI_ISL_484085, EPI_ISL_484087, EPI_ISL_484091, EPI_ISL_484093, EPI_ISL_484095, EPI_ISL_484096, EPI_ISL_484104, EPI_ISL_484110, EPI_ISL_484115, EPI_ISL_484117, EPI_ISL_484125, EPI_ISL_484126, EPI_ISL_484129, EPI_ISL_484131, EPI_ISL_484134, EPI_ISL_484136, EPI_ISL_484145, EPI_ISL_484150, EPI_ISL_484152, EPI_ISL_484169, EPI_ISL_484170, EPI_ISL_484174, EPI_ISL_484189, EPI_ISL_484191			
see above	Centre for Clinical Infection and Diagnostics Research and Genomics Innovation Unit, Guy's and St. Thomas' NHS Trust	COVID-19 Genomics UK (COG-UK) Consortium	Ali Raza Awan; Chloe Fisher; Jonathan Edgeworth; Luke Snell; Penny Cliff; Rahul Batra
EPI_ISL_560650, EPI_ISL_560651, EPI_ISL_560652, EPI_ISL_560656, EPI_ISL_560658, EPI_ISL_560660, EPI_ISL_560661, EPI_ISL_560668, EPI_ISL_560671, EPI_ISL_560672, EPI_ISL_560673, EPI_ISL_560676, EPI_ISL_560678, EPI_ISL_560679, EPI_ISL_560684, EPI_ISL_560686, EPI_ISL_560695, EPI_ISL_560696, EPI_ISL_560697, EPI_ISL_560698, EPI_ISL_560699, EPI_ISL_560700, EPI_ISL_560701, EPI_ISL_560702, EPI_ISL_560705, EPI_ISL_560712, EPI_ISL_560719, EPI_ISL_560722, EPI_ISL_560723, EPI_ISL_560724, EPI_ISL_560725, EPI_ISL_560726, EPI_ISL_560727, EPI_ISL_560729, EPI_ISL_560730, EPI_ISL_560731, EPI_ISL_560733, EPI_ISL_560734, EPI_ISL_560736, EPI_ISL_560737, EPI_ISL_560739, EPI_ISL_560740, EPI_ISL_561373			
see above	Centre for Clinical Infection and Diagnostics Research and Genomics Innovation Unit, Guy's and St. Thomas' NHS Trust	Centre for Clinical Infection and Diagnostics Research and Genomics Innovation Unit, Guy's and St. Thomas' NHS Trust	Ali Raza Awan; Chloe Fisher; Jonathan Edgeworth; Luke Snell; Rahul Batra
EPI_ISL_428670, EPI_ISL_428671, EPI_ISL_428672, EPI_ISL_428673, EPI_ISL_525478, EPI_ISL_525479	Centre for Dengue Research	Centre for Dengue Research	Ananda Wijewickrama; Chandima Jeewandara; Damayanthi Idampitiya; Damayanthi Tdampitiya; Deshni Jayathilaka; Dinuka Ariyaratne; Dinuka Ariyatane; Diyanath Ranasinghe; Eranga Narangoda; Gathsaurie Neelika Malavige; Laksiri Gomes; Neelika Malaige; Neelika Malavige
EPI_ISL_475279, EPI_ISL_475280, EPI_ISL_475282, EPI_ISL_475283, EPI_ISL_475284, EPI_ISL_475285, EPI_ISL_475286, EPI_ISL_475287, EPI_ISL_475288, EPI_ISL_475289, EPI_ISL_475291, EPI_ISL_475292, EPI_ISL_475293, EPI_ISL_475296, EPI_ISL_475297, EPI_ISL_475298, EPI_ISL_475299, EPI_ISL_475300, EPI_ISL_475321, EPI_ISL_475322, EPI_ISL_475323, EPI_ISL_475325, EPI_ISL_475326, EPI_ISL_475327, EPI_ISL_475328, EPI_ISL_475329, EPI_ISL_475330, EPI_ISL_475341, EPI_ISL_479175, EPI_ISL_479176, EPI_ISL_479177, EPI_ISL_479178, EPI_ISL_479179, EPI_ISL_479180, EPI_ISL_479181, EPI_ISL_479183, EPI_ISL_479184, EPI_ISL_479185, EPI_ISL_479186, EPI_ISL_479187, EPI_ISL_479188, EPI_ISL_479189, EPI_ISL_479190, EPI_ISL_479191, EPI_ISL_479192, EPI_ISL_479193, EPI_ISL_479194, EPI_ISL_484415, EPI_ISL_484416, EPI_ISL_484417, EPI_ISL_499302, EPI_ISL_499303, EPI_ISL_499304, EPI_ISL_499306, EPI_ISL_499307, EPI_ISL_499308, EPI_ISL_507137, EPI_ISL_507139, EPI_ISL_507140, EPI_ISL_507141, EPI_ISL_507142, EPI_ISL_507143, EPI_ISL_507146, EPI_ISL_507147, EPI_ISL_507148, EPI_ISL_507149, EPI_ISL_507152, EPI_ISL_507153, EPI_ISL_507155, EPI_ISL_512409, EPI_ISL_512410, EPI_ISL_512411, EPI_ISL_512412, EPI_ISL_514457, EPI_ISL_514459, EPI_ISL_514460, EPI_ISL_514461, EPI_ISL_514462, EPI_ISL_514463, EPI_ISL_514465, EPI_ISL_514466, EPI_ISL_514485, EPI_ISL_514486, EPI_ISL_514490, EPI_ISL_526434, EPI_ISL_526435, EPI_ISL_526436, EPI_ISL_535024, EPI_ISL_535025, EPI_ISL_613282, EPI_ISL_613283, EPI_ISL_613284, EPI_ISL_613285, EPI_ISL_613286, EPI_ISL_613287			
see above	Centre for Enzyme Innovation, University of Portsmouth / Translational Research Laboratory, Portsmouth Hospitals NHS Trust	COVID-19 Genomics UK (COG-UK) Consortium	Allyson Lloyd; Angela Beckett; Anoop Chauhan; Ethan Butcher; Garry Scarlett; Kelly Bicknell; Robert Impey; Samuel Robson; Sarah Wyllie; Scott Elliott; Sharon Glaysher; Yann Bourgeois
EPI_ISL_654794	Centre for Human Virology & Genomics, Nigerian Institute of Medical Research	Centre for Human Virology & Genomics, Nigerian Institute of Medical Research	Shaibu, J.
EPI_ISL_413596, EPI_ISL_413600	Centre for Infectious Diseases and Microbiology - Public Health	NSW Health Pathology - Institute of Clinical Pathology and Medical Research; Westmead Hospital; University of Sydney	Carter I; Chen SC; Eden J-S; Gall; Gray K; Holmes EC; Kok J and Dwyer DE for the 2019-nCoV Study Group*; Lam C; M; Maddocks S; O'Sullivan MV; Rahman H; Rockett R; Sintchenko V; Timms; V
EPI_ISL_413214, EPI_ISL_413594, EPI_ISL_413595, EPI_ISL_417030	Centre for Infectious Diseases and Microbiology Laboratory Services	NSW Health Pathology - Institute of Clinical Pathology and Medical Research; Westmead Hospital; University of Sydney	; A; Alicia; Carter I; Chen SC; Eden J-S; Gall; Gray K; Holmes EC; Kok J and Dwyer DE for the 2019-nCoV Study Group*; Lam C; M; Maddocks S; O'Sullivan MV; Rahman H; Rockett R; Sintchenko V; Timms; V
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see above	Centre for Infectious Diseases and Microbiology Public Health	NSW Health Pathology - Institute of Clinical Pathology and Medical Research; Westmead Hospital; University of Sydney	Arnott A; Arnott A and Sadsad R for the 2019-nCoV Study Group; Bachmann N; Basile K; Byun R; Carter I; Carter I and Rahman H for the 2019-nCoV Study Group; Chang S; Chen SC; Chen SC and Maddocks S for the 2019-nCoV Study Group; Draper J; Dwyer DE; Dwyer DE and Rockett R for the 2019-nCoV Study Group; Dwyer DE for the 2019-nCoV Study Group; Eden J-S; Eden J-S and Lam C for the 2019-nCoV Study Group; Eden JS; Gall M; Gall M and Arnott A for the 2019-nCoV Study Group; Gray K; Gray K and Timms V for the 2019-nCoV Study Group; Holmes EC; Holmes EC and O'Sullivan MV for the 2019-nCoV Study Group; Kok J; Kok J and Dwyer DE for the 2019-nCoV Study Group; Lam C; Lam C and Gray K for the 2019-nCoV Study Group; Maddocks S; Maddocks S and Kok J for the 2019-nCoV Study Group; O'Sullivan MV; O'Sullivan MV and Sintchenko V for the 2019-nCoV Study Group; Propenko M; Rahman H; Rahman H and Holmes EC for the 2019-nCoV Study Group; Rockett R; Rockett R and Eden J-S for the 2019-nCoV Study Group; Sadsad R; Sadsad R and Carter I for the 2019-nCoV Study Group; Sim E; Sintchenko V; Sintchenko V and Chen SC for the 2019-nCoV Study Group; Sorrell T; Timms; Timms V; Timms V and Gall M for the 2019-nCoV Study Group; V

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see above	Centre hospitalier Anna-Laberge	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_508934, EPI_ISL_508935, EPI_ISL_508936, EPI_ISL_666683, EPI_ISL_666684, EPI_ISL_666685, EPI_ISL_666686, EPI_ISL_693391, EPI_ISL_700377, EPI_ISL_700386, EPI_ISL_700387, EPI_ISL_700388			
see above	Centre hospitalier Métropole Savoie	CNR Virus des Infections Respiratoires - France SUD	Alexandre Gaymard; Antonin Bal; Bruno Lina; Carine Dumollard; Carine Moustaud; Florence Morfin-Sherpa; Gregory Destras; Gwendolyne Burfin; Hadrien Régue; Jérôme Grosjean; Laurence Josset; Martine Valette; Maude Bouscambert-Duchamp; Quentin Semanas; Raphaelle Lamy; Solenne Brun
EPI_ISL_535746, EPI_ISL_535767, EPI_ISL_535768	Centre hospitalier de St-Mary	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Sandrine Moreira
EPI_ISL_535807, EPI_ISL_535959, EPI_ISL_536115, EPI_ISL_536199	Centre hospitalier régional du Grand Portage	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_417997, EPI_ISL_417998, EPI_ISL_417999	Centro Hospital do Porto, E.P.E. - H. Geral de Santo Antonio	Instituto Nacional de Saude (INSA)	Guiomar et al
EPI_ISL_417986, EPI_ISL_417987, EPI_ISL_417989	Centro Hospitalar e Universitario de Sao Joao, Porto	Instituto Nacional de Saude (INSA)	Guiomar et al
EPI_ISL_413648	Centro Hospitalar e Universitário de Sao Joao, Porto	Instituto Nacional de Saude (INSA)	Inês Costa; Joana Isidro; Joana Mendonça; João Paulo Gomes; João Tiago Guimarães; Luís Vieira; Pedro Pechirra; Raquel Guiomar; Vítor Borges
EPI_ISL_515547	Centro Medico da Policia Militar do Estado de Sao Paulo	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes
EPI_ISL_837572, EPI_ISL_837576	Centro Nacional de Enfermedades Tropicales (CENETROP)	Laboratory of Respiratory Viruses and Measles, Oswaldo Cruz Institute, FIOCRUZ	Ana Carolina Mendonca; Anna Carolina Paixao; Cinthia Avila; Fernando Motta; Luciana Appolinario; Marilda Siqueira on behalf of the Fiocruz COVID-19 Genomic Surveillance Network; Paola Resende; Roxana Loayza
EPI_ISL_629023, EPI_ISL_629024, EPI_ISL_629025, EPI_ISL_629026, EPI_ISL_629027, EPI_ISL_629028	Centro de Biotecnología Vegetal, Universidad Andrés Bello, Center for Genome Regulation	Center for Mathematical Modeling and Center for Genome Regulation. Santiago, Chile	Allende ML; Arriagada G; Bastias M; Bustos F; Castro E; González M; M; Maass A; Meneses C.; Montecino; Orellana A; Sanhueza D; Travisany D
EPI_ISL_483065, EPI_ISL_509434	Centro de Desenvolvimento Tecnologico em Saude, Fundacao Oswaldo Cruz	Centro de Desenvolvimento Tecnologico em Saude, Fundacao Oswaldo Cruz	A.D.; Barroso; C.Q.; De Paula; F.B.; Ferreira; Fintelman-Rodrigues, N.; Gregorio; J.S.; M.A.; M.L.; Medeiros; Oliveira; S.P.; Sacramento; Saraiva; Souza; T.M.; Tschoeke, D.
EPI_ISL_468763, EPI_ISL_468764, EPI_ISL_500369, EPI_ISL_500372, EPI_ISL_500375, EPI_ISL_500379, EPI_ISL_500386, EPI_ISL_500391, EPI_ISL_500396, EPI_ISL_500398, EPI_ISL_500399, EPI_ISL_500400, EPI_ISL_500401, EPI_ISL_500402, EPI_ISL_500407, EPI_ISL_500408, EPI_ISL_500409, EPI_ISL_500410, EPI_ISL_500411, EPI_ISL_500412, EPI_ISL_500413, EPI_ISL_500416, EPI_ISL_500417, EPI_ISL_500418, EPI_ISL_500421, EPI_ISL_500423, EPI_ISL_500425, EPI_ISL_500427, EPI_ISL_500428, EPI_ISL_500429, EPI_ISL_500430, EPI_ISL_500431, EPI_ISL_500433, EPI_ISL_500439, EPI_ISL_500445, EPI_ISL_500449, EPI_ISL_500450, EPI_ISL_500451, EPI_ISL_500454, EPI_ISL_500455, EPI_ISL_500456, EPI_ISL_500458, EPI_ISL_537382, EPI_ISL_537387, EPI_ISL_537390, EPI_ISL_537395, EPI_ISL_537397, EPI_ISL_537398, EPI_ISL_537399, EPI_ISL_537403, EPI_ISL_537404, EPI_ISL_537406, EPI_ISL_537410, EPI_ISL_537411, EPI_ISL_537412, EPI_ISL_537414, EPI_ISL_537422, EPI_ISL_537424, EPI_ISL_537426, EPI_ISL_537427, EPI_ISL_537428, EPI_ISL_537429, EPI_ISL_537431, EPI_ISL_537432, EPI_ISL_537434, EPI_ISL_537436, EPI_ISL_537437, EPI_ISL_537438, EPI_ISL_537439, EPI_ISL_537440, EPI_ISL_537445, EPI_ISL_537446, EPI_ISL_537447, EPI_ISL_537449, EPI_ISL_537451, EPI_ISL_537453, EPI_ISL_537460, EPI_ISL_537465, EPI_ISL_537466, EPI_ISL_537811, EPI_ISL_537822, EPI_ISL_537828, EPI_ISL_537829, EPI_ISL_537831, EPI_ISL_537836, EPI_ISL_537837, EPI_ISL_537838, EPI_ISL_537839, EPI_ISL_537840, EPI_ISL_537841, EPI_ISL_537842, EPI_ISL_537844, EPI_ISL_537845, EPI_ISL_537847, EPI_ISL_537849, EPI_ISL_537850, EPI_ISL_537852, EPI_ISL_537853, EPI_ISL_537855, EPI_ISL_537856, EPI_ISL_537857, EPI_ISL_537863, EPI_ISL_537864, EPI_ISL_537865, EPI_ISL_537866, EPI_ISL_537872, EPI_ISL_537873, EPI_ISL_732762, EPI_ISL_732763, EPI_ISL_732764, EPI_ISL_732807, EPI_ISL_732808			
see above	Centro de Investigación Biomédica de La Rioja - Hospital San Pedro Logroño	SeqCOVID-SPAIN consortium/IBV(CSIC)	José Manuel Azcona Gutiérrez; María Pilar Bea Escudero; María de Toro; Miriam Blasco Alberdi and SeqCOVID-SPAIN consortium
EPI_ISL_516629, EPI_ISL_516630, EPI_ISL_516631, EPI_ISL_516632, EPI_ISL_516633, EPI_ISL_516634, EPI_ISL_516635, EPI_ISL_516636, EPI_ISL_516637, EPI_ISL_516638, EPI_ISL_516639, EPI_ISL_516640, EPI_ISL_516641, EPI_ISL_516642, EPI_ISL_516644, EPI_ISL_516645			
see above	Charite Universitatsmedizin Berlin, Institut fur Virologie/Labor Berlin	Charite Universitatsmedizin Berlin, Institut fur Virologie/Labor Berlin	Barbara Muhlemann; Christian Drosten; Julia Schneider; Jörn Beheim-Schwarzbach; Talitha Veith; Terry Jones; Victor M Corman
EPI_ISL_729473, EPI_ISL_729474, EPI_ISL_729475, EPI_ISL_729476, EPI_ISL_729477, EPI_ISL_729478, EPI_ISL_729479, EPI_ISL_729480, EPI_ISL_729481, EPI_ISL_729482, EPI_ISL_729483, EPI_ISL_729484, EPI_ISL_729485, EPI_ISL_729486, EPI_ISL_729487, EPI_ISL_729488, EPI_ISL_729489, EPI_ISL_729490, EPI_ISL_729491, EPI_ISL_729492, EPI_ISL_729493, EPI_ISL_729494, EPI_ISL_729495, EPI_ISL_729496, EPI_ISL_729497, EPI_ISL_729499, EPI_ISL_729514, EPI_ISL_729529, EPI_ISL_729531, EPI_ISL_729533, EPI_ISL_729534, EPI_ISL_729548, EPI_ISL_753799, EPI_ISL_753813, EPI_ISL_753814, EPI_ISL_753822, EPI_ISL_753838, EPI_ISL_753843, EPI_ISL_753844, EPI_ISL_753845, EPI_ISL_753846, EPI_ISL_753850, EPI_ISL_753851, EPI_ISL_753917, EPI_ISL_753918, EPI_ISL_753919, EPI_ISL_753920, EPI_ISL_753921, EPI_ISL_753922, EPI_ISL_753923, EPI_ISL_753924, EPI_ISL_753925, EPI_ISL_753926, EPI_ISL_753927, EPI_ISL_753928, EPI_ISL_753936, EPI_ISL_754024, EPI_ISL_754025, EPI_ISL_754026, EPI_ISL_754027, EPI_ISL_754028, EPI_ISL_754029, EPI_ISL_754030, EPI_ISL_754031, EPI_ISL_754032, EPI_ISL_754033, EPI_ISL_754034, EPI_ISL_754035, EPI_ISL_754037, EPI_ISL_754038, EPI_ISL_754046, EPI_ISL_754047, EPI_ISL_754055, EPI_ISL_754056, EPI_ISL_754057, EPI_ISL_754058, EPI_ISL_806526, EPI_ISL_806528, EPI_ISL_806529			
see above	Charité Universitätsmedizin Berlin, Institut für Virologie/Labor Berlin	Charité Universitätsmedizin Berlin, Institut für Virologie	Barbara Mühlemann; Christian Drosten; Cornelia Schlee; Julia Schneider; Jörn Beheim-Schwarzbach; Talitha Veith; Terry Jones; Tomasz Zemojtel; Victor M Corman
EPI_ISL_406862	Charité Universitätsmedizin Berlin, Institute of Virology; Institut für Mikrobiologie der Bundeswehr, Munich	Charité Universitätsmedizin Berlin, Institute of Virology	Barbara Mühlemann; Christian Drosten; Julia Schneider; Markus Antwerpen; Roman Wölfel; Talitha Veith; Victor M Corman
EPI_ISL_480004, EPI_ISL_480005, EPI_ISL_480006, EPI_ISL_480007, EPI_ISL_480008, EPI_ISL_480009, EPI_ISL_480011, EPI_ISL_480012, EPI_ISL_480013, EPI_ISL_480014, EPI_ISL_684159, EPI_ISL_684160, EPI_ISL_684161			
see above	Chiba Prefectural Institute of Public Health	Pathogen Genomics Center, National Institute of Infectious Diseases	Hajime Kamiya; Kentaro Itokawa; Makoto Kuroda; Masakatsu Taira; Masanori Hashino; Motoi Suzuki; Rina Tanaka; Tsuyoshi Sekizuka
EPI_ISL_430722, EPI_ISL_430724, EPI_ISL_430725, EPI_ISL_430728, EPI_ISL_430729, EPI_ISL_430730, EPI_ISL_430731, EPI_ISL_430733, EPI_ISL_430734, EPI_ISL_430735, EPI_ISL_430736, EPI_ISL_430737, EPI_ISL_430738, EPI_ISL_430740, EPI_ISL_430741, EPI_ISL_430742			
see above	Chinese PLA Institute for Disease Control and Prevention	Chinese PLA Institute for Disease Control and Prevention	Lizhong Li; Peng LiJinhui Li
EPI_ISL_417330	Chiu Laboratory, University of California, San Francisco	Chiu Laboratory, University of California, San Francisco	Scot Federman; Wei Gu; Xianding Deng; and Charles Y. Chiu
EPI_ISL_454646	City of El Paso Department of Public Health Laboratory	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Anna Uehara; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Michael Bowen; Suxiang Tong; Yan Li; Ying Tao; Zachary Weiner
EPI_ISL_414579	Clinica Alemana de Santiago, Chile	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E. Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Gisselle Barra; Jaime Lagos; Javier Tognarelli; Jorge Fernández.; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Soledad Ulloa; Winston Andrade
EPI_ISL_414580	Clinica Santa Maria, Santiago, Chile	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E. Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Gisselle Barra; Jaime Lagos; Javier Tognarelli; Jorge Fernández.; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Soledad Ulloa; Winston Andrade
EPI_ISL_462450, EPI_ISL_462451, EPI_ISL_462452, EPI_ISL_462453, EPI_ISL_462454, EPI_ISL_462455, EPI_ISL_462456, EPI_ISL_462457, EPI_ISL_462458, EPI_ISL_462459, EPI_ISL_462460, EPI_ISL_462462, EPI_ISL_462463, EPI_ISL_462464, EPI_ISL_462465, EPI_ISL_462467, EPI_ISL_462468, EPI_ISL_462469, EPI_ISL_462471, EPI_ISL_462473, EPI_ISL_462474, EPI_ISL_462475, EPI_ISL_462476			
see above	Clinical Center, University of Sarajevo	Charite Universitatsmedizin Berlin, Institute of Virology	Almedina Hadzihasanovic-Moro; Amela Dedeic-Ljubovic; Barbara Muehlemann; Christian Drosten; Irma Salimovic-Besic; Jorn Beheim-Schwarzbach; Julia Schneider; Selma Mutevelic; Suzana Arapcic; Talitha Veith; Terry Jones; Victor M Corman
EPI_ISL_421279, EPI_ISL_421281, EPI_ISL_437455, EPI_ISL_902954, EPI_ISL_902955, EPI_ISL_902956, EPI_ISL_902957, EPI_ISL_902958, EPI_ISL_902959, EPI_ISL_902960, EPI_ISL_902961, EPI_ISL_902962, EPI_ISL_902963, EPI_ISL_902964, EPI_ISL_902965, EPI_ISL_902966, EPI_ISL_902967, EPI_ISL_902968, EPI_ISL_902970, EPI_ISL_902971, EPI_ISL_902972, EPI_ISL_902973, EPI_ISL_902974, EPI_ISL_902975, EPI_ISL_902976, EPI_ISL_902977, EPI_ISL_902978, EPI_ISL_902979, EPI_ISL_902980, EPI_ISL_902981, EPI_ISL_902982, EPI_ISL_902983, EPI_ISL_902984, EPI_ISL_902985, EPI_ISL_902986, EPI_ISL_902987, EPI_ISL_902988, EPI_ISL_902989, EPI_ISL_902990, EPI_ISL_902991, EPI_ISL_902992, EPI_ISL_902993, EPI_ISL_902994, EPI_ISL_902995, EPI_ISL_903218, EPI_ISL_903219, EPI_ISL_903220, EPI_ISL_903221, EPI_ISL_903222, EPI_ISL_903223, EPI_ISL_903224, EPI_ISL_903225, EPI_ISL_903226, EPI_ISL_903227, EPI_ISL_903228, EPI_ISL_911353, EPI_ISL_911354, EPI_ISL_911355, EPI_ISL_911356, EPI_ISL_911357, EPI_ISL_911358, EPI_ISL_911359, EPI_ISL_911360, EPI_ISL_911361, EPI_ISL_911362, EPI_ISL_911363, EPI_ISL_911364, EPI_ISL_911365, EPI_ISL_911366, EPI_ISL_911367, EPI_ISL_911368, EPI_ISL_911369, EPI_ISL_911370, EPI_ISL_911371, EPI_ISL_911402, EPI_ISL_911403, EPI_ISL_911404, EPI_ISL_911405, EPI_ISL_911406, EPI_ISL_911407, EPI_ISL_911408, EPI_ISL_911409, EPI_ISL_911410, EPI_ISL_911411, EPI_ISL_911412, EPI_ISL_911413, EPI_ISL_911414, EPI_ISL_911415, EPI_ISL_911416, EPI_ISL_911417, EPI_ISL_911418, EPI_ISL_911419, EPI_ISL_911420, EPI_ISL_911421, EPI_ISL_911422, EPI_ISL_911423, EPI_ISL_911424, EPI_ISL_911425, EPI_ISL_911426, EPI_ISL_911427, EPI_ISL_911428, EPI_ISL_911429, EPI_ISL_911443, EPI_ISL_911444, EPI_ISL_911445, EPI_ISL_911446, EPI_ISL_911447, EPI_ISL_911448, EPI_ISL_911449, EPI_ISL_911450, EPI_ISL_911451, EPI_ISL_911452, EPI_ISL_911453, EPI_ISL_911454, EPI_ISL_911455, EPI_ISL_911456, EPI_ISL_911457, EPI_ISL_911458, EPI_ISL_911459, EPI_ISL_911460, EPI_ISL_911461, EPI_ISL_911462, EPI_ISL_911463, EPI_ISL_911464, EPI_ISL_911465, EPI_ISL_911466, EPI_ISL_911467, EPI_ISL_911468, EPI_ISL_911469, EPI_ISL_911470, EPI_ISL_911549, EPI_ISL_911550, EPI_ISL_911551, EPI_ISL_911552, EPI_ISL_911553, EPI_ISL_911554, EPI_ISL_911555, EPI_ISL_911556, EPI_ISL_911557, EPI_ISL_911558, EPI_ISL_911559, EPI_ISL_911560, EPI_ISL_911561, EPI_ISL_911562, EPI_ISL_911563, EPI_ISL_911564, EPI_ISL_911565, EPI_ISL_911566, EPI_ISL_911567, EPI_ISL_911568, EPI_ISL_911569, EPI_ISL_911570, EPI_ISL_911571, EPI_ISL_911572, EPI_ISL_911573, EPI_ISL_911574, EPI_ISL_911575, EPI_ISL_911576, EPI_ISL_911577, EPI_ISL_911578, EPI_ISL_911579, EPI_ISL_911604, EPI_ISL_911605, EPI_ISL_911606, EPI_ISL_911607, EPI_ISL_911608, EPI_ISL_911609, EPI_ISL_911610, EPI_ISL_911611, EPI_ISL_911612, EPI_ISL_911613, EPI_ISL_911614, EPI_ISL_911615, EPI_ISL_911616, EPI_ISL_911617, EPI_ISL_911618, EPI_ISL_911619, EPI_ISL_911620, EPI_ISL_911621, EPI_ISL_911622, EPI_ISL_911623, EPI_ISL_911624, EPI_ISL_911625, EPI_ISL_911626, EPI_ISL_911627, EPI_ISL_911628, EPI_ISL_911629, EPI_ISL_911630, EPI_ISL_911631, EPI_ISL_911632, EPI_ISL_911710, EPI_ISL_911711, EPI_ISL_911712, EPI_ISL_911713, EPI_ISL_911714, EPI_ISL_911715, EPI_ISL_911716, EPI_ISL_911717,			

EPI_ISL_911718, EPI_ISL_911719, EPI_ISL_911720, EPI_ISL_911721, EPI_ISL_911722, EPI_ISL_911723, EPI_ISL_911724, EPI_ISL_911725, EPI_ISL_911726, EPI_ISL_911727, EPI_ISL_911728, EPI_ISL_911729, EPI_ISL_911730, EPI_ISL_911731, EPI_ISL_911733, EPI_ISL_911734, EPI_ISL_911735, EPI_ISL_911736, EPI_ISL_911737, EPI_ISL_911738, EPI_ISL_911739, EPI_ISL_911740, EPI_ISL_911741, EPI_ISL_911742, EPI_ISL_911743, EPI_ISL_911744, EPI_ISL_911745, EPI_ISL_911751, EPI_ISL_911752, EPI_ISL_911753, EPI_ISL_911754, EPI_ISL_911924, EPI_ISL_911925, EPI_ISL_911926, EPI_ISL_911927, EPI_ISL_911928			
see above	Clinical Diagnostics Laboratory, Diagnostic & Experimental Pathology, Lilly Research Laboratories	Clinical Diagnostics Laboratory, Diagnostic & Experimental Pathology, Lilly Research Laboratories	Andrew Schade; Angie Fulford; Erin Wray; Jeff Fill; Joe Oakley; John Calley; John McElwee; Leslie ONeill Reising; Leslie O'Neill Reising; Mayuri Vaidya; Pat Finnegan; Phil Ebert; Rachael Redmond; Sam McNeely; Tim Holzer
EPI_ISL_424352	Clinical Laboratory, Fuyang City Center for Disease Control and Prevention	Clinical Laboratory, Fuyang City Center for Disease Control and Prevention	Ge, B.
EPI_ISL_416432	Clinical Microbiology Lab	Infectious Disease Research Department, King Abdullah International Medical Research Center (KAIMRC)	Abdulrahman Alswaji; Liliane Okdah; Majed Alghoribi; Michel Doumith; Sadeem Alhayli; Sameera Al Johani
EPI_ISL_447441, EPI_ISL_447442, EPI_ISL_447443, EPI_ISL_447444, EPI_ISL_447445, EPI_ISL_447446, EPI_ISL_447447, EPI_ISL_447448, EPI_ISL_447449, EPI_ISL_447450			
see above	Clinical Microbiology Laboratory, Sheba Medical Center	Stern Lab	Stern Lab
EPI_ISL_447384, EPI_ISL_447385, EPI_ISL_447386, EPI_ISL_447387, EPI_ISL_447388, EPI_ISL_447389, EPI_ISL_447391, EPI_ISL_447393, EPI_ISL_447394, EPI_ISL_447395, EPI_ISL_447396, EPI_ISL_447397, EPI_ISL_447399, EPI_ISL_447406, EPI_ISL_447417, EPI_ISL_447418			
see above	Clinical Microbiology Laboratory, The Baruch Padeh Medical Center, Poriya	Stern Lab	Stern Lab
EPI_ISL_877585, EPI_ISL_877586, EPI_ISL_877587, EPI_ISL_877588, EPI_ISL_877589, EPI_ISL_877590, EPI_ISL_877591, EPI_ISL_877592, EPI_ISL_877761			
see above	Clinical Molecular Microbiology Laboratory, UNC Hospital	Dirk Dittmer	Angelica Juarez; Blossom Damania.; Brent A. Eason; Cameroon Grant; Carolina Caro-Vegas; Cecilia Thompson; Dirk Dittmer; Evelyn Hoffman; Jason Wong; Justin T. Landis; Linda Pluta; Melissa B. Miller; Patricio Cano; Razia Moorad
EPI_ISL_605803, EPI_ISL_605811, EPI_ISL_605812, EPI_ISL_605816	Clinical Virology Laboratory, Institute of Liver and Biliary Sciences	ILBS - IGIB	Abhishek Padhi; Ekta Gupta; Jaswinder Singh Maras; Reshu Agarwal; Sheetalnath Rooge; Shridhar Sivasubbu; Shvetank Sharma; Vinod Scaria
EPI_ISL_447319, EPI_ISL_447320, EPI_ISL_447321, EPI_ISL_447323, EPI_ISL_447324, EPI_ISL_447327, EPI_ISL_447328, EPI_ISL_447330			
see above	Clinical Virology Laboratory, Soroka Medical Center and the Faculty of Health Sciences, Ben-Gurion University of the Negev	Stern Lab	Stern Lab
EPI_ISL_447406, EPI_ISL_447409, EPI_ISL_447410, EPI_ISL_447411, EPI_ISL_447412, EPI_ISL_447416	Clinical Virology Unit, Hadassah Hebrew University Medical Center	Stern Lab	Stern Lab
EPI_ISL_418230	Clinique AVERAY LA BROUSTE, Med. Polyvalente	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Elsa Ngwem; Etienne Simon-Lorière; Flora Donati; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_949248	Cliniques Saint-Pierre Ottignies	UCLouvain/IREC/MBLG	Benoit Kabamba Mukadi; Jean Ruelle; Lysa Pinsmaye
EPI_ISL_949244, EPI_ISL_949245, EPI_ISL_949246, EPI_ISL_949247, EPI_ISL_949249, EPI_ISL_949250, EPI_ISL_949252, EPI_ISL_1029965, EPI_ISL_1029966, EPI_ISL_1029968, EPI_ISL_1029969, EPI_ISL_1029971, EPI_ISL_1029972, EPI_ISL_1029973			
see above	Cliniques universitaires Saint-Luc	UCLouvain/IREC/MBLG	Benoit Kabamba Mukadi; Jean Ruelle; Lysa Pinsmaye
EPI_ISL_862652, EPI_ISL_862653	Clínica Universidad de Navarra	Instituto de Salud Carlos III	A. Monzón; F. Casas; I. Fernández, M.; I. Jiménez; Iglesias-Caballero; M. Pozo; M. Cuesta; M. González-Esguevillas; M. Zaballos; M.Camarero; P. Jiménez; S. Juliá; S. Molinero Calamita; S. Varona
EPI_ISL_452473, EPI_ISL_452474, EPI_ISL_452476, EPI_ISL_452477, EPI_ISL_452479, EPI_ISL_452480, EPI_ISL_452481, EPI_ISL_452483, EPI_ISL_452484, EPI_ISL_452485, EPI_ISL_452486, EPI_ISL_452487, EPI_ISL_452488, EPI_ISL_452490, EPI_ISL_452491, EPI_ISL_452492, EPI_ISL_452493, EPI_ISL_452495, EPI_ISL_452496, EPI_ISL_452498, EPI_ISL_452500, EPI_ISL_452503, EPI_ISL_452505, EPI_ISL_452506, EPI_ISL_452507, EPI_ISL_452508, EPI_ISL_452509, EPI_ISL_452510, EPI_ISL_452513, EPI_ISL_452514, EPI_ISL_452516, EPI_ISL_452517, EPI_ISL_452518, EPI_ISL_452519, EPI_ISL_452520, EPI_ISL_452521, EPI_ISL_452523, EPI_ISL_452524, EPI_ISL_452526, EPI_ISL_452527, EPI_ISL_452528, EPI_ISL_452531, EPI_ISL_452532, EPI_ISL_452534, EPI_ISL_452535, EPI_ISL_452538, EPI_ISL_452539, EPI_ISL_452540, EPI_ISL_452541			
see above	Clínica Universidad de Navarra. Servicio de Enfermedades Infecciosas y Microbiología clínica	SeqCOVID-SPAIN consortium/IBV(CSIC)	Jose Luis del Pozo and SeqCOVID-SPAIN consortium; Mirian Fernández-Alonso
EPI_ISL_1040819, EPI_ISL_1040820, EPI_ISL_1040821	CoVid WC Cape Town Metro	NHLS/UCT	Arash Iranzadeh; Bruna Galvao; Carolyn Williamson; Deelan Doolabh; Diana Hardie; Innocent Mudau; Kruger Marais; Lynn Tyers; Marvin Hsiao; Stephen Korsman
EPI_ISL_677286, EPI_ISL_677287	Colorado Department of Public Health and Environment	Colorado Department of Puplic Health and Environment	Emily A. Travanty; Laura Bankers; Molly Hetherington-Rauth; Sarah Elizabeth Totten; Shannon Ely; Shannon R. Matzinger
EPI_ISL_455328, EPI_ISL_455329, EPI_ISL_455330, EPI_ISL_455331, EPI_ISL_578194	Complejo Hospitalario Universitario La Coruna	Instituto de Salud Carlos III	A. Monzón; F. Casas; I; I. Jiménez; Iglesias-Caballero; J. López; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; M.A Canizares; P. Jiménez; S. Juliá; S. Pozo; S. Varona
EPI_ISL_455333	Complejo Hospitalario Universitario de Santiago	Instituto de Salud Carlos III	A. Monzón; F. Casas; I; I. Jiménez; Iglesias-Caballero; J. Llovo; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; P. Jiménez; S. Juliá; S. Pozo; S. Varona
EPI_ISL_539569, EPI_ISL_539570, EPI_ISL_539571, EPI_ISL_539572, EPI_ISL_862645, EPI_ISL_862646, EPI_ISL_862647, EPI_ISL_862648, EPI_ISL_862649, EPI_ISL_862650, EPI_ISL_862651			
see above	Complejo Hospitalario de Navarra	Instituto de Salud Carlos III	A. Monzón; F. Casas; I; I. Ezpeleta, C.; I. Jiménez; Iglesias-Caballero; J. López; M. Pozo; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; M.Camarero; P. Jiménez; S. Juliá; S. Molinero Calamita; S. Pozo; S. Varona
EPI_ISL_455334, EPI_ISL_455335, EPI_ISL_578195	Complejo Hospitalario de Orense	Instituto de Salud Carlos III	A. Monzón; F. Casas; I; I. Jiménez; Iglesias-Caballero; M. Camarero; M. Cuesta; M. García; M. González-Esguevillas; M. Molinero Calamita; M. Paz; M. Zaballos; P. Jiménez; S. Juliá; S. Pozo; S. Varona
EPI_ISL_435716	Connecticut State Department of Public Health	Grubaugh Lab - Yale School of Public Health	Adam Moore; Akiko Iwasaki; Albert Ko; Alice Lu; Allison Nelson; Anderson Brito; Anne Wyllie; Arnau Casanovas; Catherine Muenker; Chaney Kalinich; Chantal Vogels; Charlese Dela Cruz; Cole Jensen; Isabel Ott; Joseph Fauver; Maria Tokuyama; Mary Petrone; Nathan Grubaugh; Patrick Wong; Peiwen Lu; Richard Martinello; Saad Omer; Shelli Farhadian; Tara Alpert
EPI_ISL_536288	Conseil Cri de la SSS de la Baie-James	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_455327, EPI_ISL_539526, EPI_ISL_539527, EPI_ISL_539528, EPI_ISL_539529, EPI_ISL_539530, EPI_ISL_691681			
see above	Consejeria de Sanidad y Asuntos Sociales	Instituto de Salud Carlos III	A. Monzón; F. Casas; G. Gutiérrez; I; I. Gutiérrez, G.; I. Jiménez; Iglesias-Caballero; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Pozo; M. Zaballos; P. Jiménez; S. Juliá; S. Molinero Calamita; S. Pozo; S. Varona
EPI_ISL_862641, EPI_ISL_862642, EPI_ISL_862643, EPI_ISL_862644	Consejería de Sanidad y Asuntos Sociales	Instituto de Salud Carlos III	A. Monzón; F. Casas; I. Gutiérrez, G.; I. Jiménez; Iglesias-Caballero; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Pozo; M. Zaballos; P. Jiménez; S. Juliá; S. Molinero Calamita; S. Varona
EPI_ISL_468615, EPI_ISL_468616, EPI_ISL_468617, EPI_ISL_468618, EPI_ISL_468621	Contra Costa Public Health Lab	Chan-Zuckerberg Biohub	CZB Cliahub Consortium
EPI_ISL_454635	County Of San Luis Obispo Public Health Laboratory	Chan-Zuckerberg Biohub	CZB Cliahub Consortium
EPI_ISL_468388, EPI_ISL_468389, EPI_ISL_468390, EPI_ISL_468391, EPI_ISL_468392, EPI_ISL_468393, EPI_ISL_468394, EPI_ISL_468395, EPI_ISL_468396, EPI_ISL_468397, EPI_ISL_468398, EPI_ISL_468399, EPI_ISL_468400, EPI_ISL_468401, EPI_ISL_468402, EPI_ISL_468403, EPI_ISL_468404, EPI_ISL_468405, EPI_ISL_468406, EPI_ISL_468407, EPI_ISL_468409, EPI_ISL_468410, EPI_ISL_468411, EPI_ISL_468413, EPI_ISL_1235029			
see above	County of San Luis Obispo Public Health Laboratory	Chan-Zuckerberg Biohub	CZB Cliahub Consortium
EPI_ISL_437044	County of Santa Clara Public Health	Chan-Zuckerberg Biohub	CZB Cliahub Consortium
EPI_ISL_436641, EPI_ISL_436672, EPI_ISL_436674, EPI_ISL_513773	County of Santa Clara Public Health Department	Chan-Zuckerberg Biohub	CZB Cliahub Consortium

EPI_ISL_476282, EPI_ISL_476297	DB Diagnósticos do Brasil	Instituto de Medicina Tropical da Univesidade de São Paulo	Camila Alves Maia da Silva; Darlan da Silva Candido; Erika Regina Manuli; Ester Sabino; Flavia Cristina da Silva Sales; Giula Magalhaes Ferreira; Jaqueline Goes de Jesus; Julien Theze; Mariana Severo Ramundo; Nuno Faria; Samples: Nelson Gaburo Jr; Sequencing: Ingra Morales Claro; Thais de Moura Coletti
EPI_ISL_594460	DC Department of Forensic Sciences	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Anna Uehara; Clinton Paden; Haibin Wang; Jing Zhang; Julu Bhatnagar; Krista Queen; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_436040, EPI_ISL_436041, EPI_ISL_436042, EPI_ISL_436043	DC Public Health Lab Dept of Forensic Science	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Anna Uehara; Bettina Bankamp; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Suxiang Tong; Yan Li; Ying Tao; Zachary Weiner
EPI_ISL_804845, EPI_ISL_804846, EPI_ISL_804849, EPI_ISL_804850, EPI_ISL_804851, EPI_ISL_804852, EPI_ISL_804853, EPI_ISL_804854, EPI_ISL_804894, EPI_ISL_804896, EPI_ISL_804897, EPI_ISL_804898, EPI_ISL_804899, EPI_ISL_804900, EPI_ISL_804901, EPI_ISL_804902, EPI_ISL_804903, EPI_ISL_804904, EPI_ISL_804905, EPI_ISL_804906, EPI_ISL_804907, EPI_ISL_804908, EPI_ISL_804909, EPI_ISL_804910, EPI_ISL_804911, EPI_ISL_804912, EPI_ISL_804913, EPI_ISL_804914, EPI_ISL_804915, EPI_ISL_804916, EPI_ISL_804917, EPI_ISL_804918, EPI_ISL_804919, EPI_ISL_804920, EPI_ISL_804921, EPI_ISL_804922, EPI_ISL_1168442, EPI_ISL_1168443, EPI_ISL_1168444			
see above	DC Public Health Lab/ Dept. of Forensic Sciences	DC Public Health Lab/ Dept. of Forensic Sciences	Brittany Hamilton; Connie Maza; David Payne; Elizabeth Zelaya; Janis Doss; Jocelyn Hauser; Monica Mann; Sarah Scott; Scott Nguyen
EPI_ISL_424852, EPI_ISL_447840	DC Public Health Lab/ Dept. of Forensic Sciences	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jasmine Padilla; Jing Zhang; Justin Lee; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_416542, EPI_ISL_416543	Dasman Diabetes Institute	Dasman Diabetes Institute	Ebaa AlOzairi; Fahd Al-Mulla; Motasem Melhem; Qais Al-Duwairi; Rasheeba Iqbal; Sara Al-Qabandi; Sumi John
EPI_ISL_416541	Dasman Diabetes Institute and Virology Laboratory Ministry of Health	Dasman Diabetes Institute	Ebaa AlOzairi; Fahd Al-Mulla; Motasem Melhem; Qais Al-Duwairi; Rasheeba Iqbal; Sara Al-Qabandi; Sumi John
EPI_ISL_476022	Defence Research & Development Establishment	Defence Research & Development Establishment	Ambuj Shrivastava; Jyoti S Kumar; Paban Kumar Dash; Shashi Sharma; Sushil Kumar Sharma
EPI_ISL_476023	Defence Research & Development Establishment (DRDE)	Defence Research & Development Establishment (DRDE)	Ambuj Shrivastava; Jyoti S. Kumar; Paban Kumar Dash; Shashi Sharma; Sushil Kumar Sharma
EPI_ISL_560406, EPI_ISL_560647, EPI_ISL_560741, EPI_ISL_561335, EPI_ISL_561345, EPI_ISL_561346, EPI_ISL_561351, EPI_ISL_561352, EPI_ISL_561353, EPI_ISL_561356, EPI_ISL_561358, EPI_ISL_565830, EPI_ISL_565832, EPI_ISL_566084, EPI_ISL_566108, EPI_ISL_574585, EPI_ISL_574586, EPI_ISL_574599, EPI_ISL_576150, EPI_ISL_576151, EPI_ISL_576152, EPI_ISL_576153, EPI_ISL_576154, EPI_ISL_576155, EPI_ISL_576156, EPI_ISL_576157, EPI_ISL_576158, EPI_ISL_576160, EPI_ISL_576161, EPI_ISL_576162, EPI_ISL_576164, EPI_ISL_576165, EPI_ISL_576166, EPI_ISL_576167, EPI_ISL_576169, EPI_ISL_576223, EPI_ISL_576224, EPI_ISL_576225, EPI_ISL_576226, EPI_ISL_576227, EPI_ISL_583246, EPI_ISL_583248, EPI_ISL_583994, EPI_ISL_584013, EPI_ISL_584014, EPI_ISL_593938, EPI_ISL_593940, EPI_ISL_593945, EPI_ISL_593949, EPI_ISL_593950, EPI_ISL_593951, EPI_ISL_593952, EPI_ISL_593953, EPI_ISL_593955, EPI_ISL_593956, EPI_ISL_593957, EPI_ISL_593958, EPI_ISL_593963, EPI_ISL_593965, EPI_ISL_593966, EPI_ISL_593967, EPI_ISL_593969, EPI_ISL_593970			
see above	Delaware Public Health Lab	Delaware Public Health Lab	Gregory Hovan
EPI_ISL_529147, EPI_ISL_529148	Democritus University of Thrace, Department of Medicine	Democritus University of Thrace, Department of Medicine	Bampali, M.; Dovrolis, N.; Froukala, E.; Gatzidou, E.; Karakasiliotis, I.; Kassela, K.; Spanakis, N.; Stavropoulou, A.; Tsakris, A.; Veletza, S.
EPI_ISL_430796, EPI_ISL_430798, EPI_ISL_430802	Departamento de Biología y genética molecular, IACA Laboratorios.	Área de Secuenciación del Laboratorio de Virología del Hospital de Niños Dr. Ricardo Gutierrez on behalf of 'Proyecto Argentino Interinstitucional de genomica de SARS-CoV-2' (PAIS Consortium)	A; AS; E; Goya; LE; Lusso; MI; MS; Masciovecchio MV; Mistchenko; Nabaes Jodar; Natale; S; Streitenberger ER; Suárez; Tittarelli; Valinotto; Viegas, M.
EPI_ISL_444493	Departamento de Laboratorios de Salud Publica (DLSP, Division Epidemiologia, Ministerio de Salud Publica)	Facultad de Ciencias (Sección Genética Evolutiva, Sección Virología).	Arbiza; Calleros, L.; Chiparelli, H.; Coppola, L.; Delfraro, A.; Frabasile, S.; Fuques, E.; Goni, N.; Grecco, S.; J. and Perez, R.; Panzera, Y.; Ramos, N.; Ramos, V.; Techera, C.
EPI_ISL_508627, EPI_ISL_508639, EPI_ISL_508640, EPI_ISL_508641, EPI_ISL_508642, EPI_ISL_508643, EPI_ISL_508646, EPI_ISL_508647, EPI_ISL_508653, EPI_ISL_508661, EPI_ISL_508676, EPI_ISL_949208			
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EPI_ISL_516922, EPI_ISL_516923, EPI_ISL_516924	Department for Molecular Diagnostics, Centre for Medical Microbiology, Institute of Public Health of Montenegro	Charite Universitatsmedizin Berlin, Institut fur Virologie	Barbara Muehlemann; Christian Drosten; Julia Schneider; Jörn Beheim-Schwarzbach; Marija Govedarica and Danijela Vujošević; Talitha Veith; Terry Jones; Victor M Corman
EPI_ISL_420140, EPI_ISL_420142	Department for Virology, Molecular Biology and Genome Research, R. G. Lugar Center for Public Health Research, National Center for Disease Control and Public Health (NCDC) of Georgia.	Department for Virology, Molecular Biology and Genome Research, R. G. Lugar Center for Public Health Research, National Center for Disease Control and Public Health (NCDC) of Georgia.	Adam Kotorashvili; Amiran Gamkrelidze; Amiran Gamkrelidze.; Ana Papkiauri; Ann Machablishvili; Anna Kasradze; Davit Tsaguria; Ekaterine Khmaladze; Ekaterine Zangaladze; Ekaterine Zhghenti; Giorgi Tomashvili; Gvantsa Brachveli; Gvantsa Chanturia; Irma Burjanadze; Ketevan Sidamonidze; Khatuna Zakhashvili; Lela Sabadze; Lela Urushadze; Magda Dgebuadze; Maia Alkhazashvili; Mari Gavashelidze; Mariam Zakalashvili; Marine Murtskhvaladze; Meri Pantsulaia; Nato Kotaria; Nino Berishvili; Paata Imnadze; Roena Sukhiashvili; Tamar Jashiashvili; Tata Imnadze; Tea Tevdoradze
EPI_ISL_515082, EPI_ISL_515084	Department of Biochemistry, Cell and Molecular Biology	WACCBIP, University of Ghana	A.K.; Adu, B.; Amenga-Etego; Ampofo, W.; Amuzu; Anang; Arjarquah, A.; Asante, I.; Awandare; Bediako, Y.; Boatemaa, L.; Bonney, E.; Bonney, K.; C.M.; D.S.; Eshun, M.; G.A.; G.B.; J.K.; J.M.; Kotey, E.; Kumordjie, S.; Kyei; L.N.; Magnussen, V.; Morang'a; Mutungi; Ngoi; Quashie, P.; Tei-Maya, F.
EPI_ISL_429239	Department of Clinical Laboratory, the First People's Hospital of Yunnan Province	Department of Clinical Laboratory, the First People's Hospital of Yunnan Province	Guiqian Zhang; Xin Fan; Ya Xu; Yi Sun; Yu Zhang; Ziqin Dian
EPI_ISL_416997, EPI_ISL_417004, EPI_ISL_417006, EPI_ISL_417008, EPI_ISL_417009, EPI_ISL_417012, EPI_ISL_417013, EPI_ISL_417014, EPI_ISL_417015, EPI_ISL_417016, EPI_ISL_417017, EPI_ISL_417018, EPI_ISL_417019, EPI_ISL_417020, EPI_ISL_417021, EPI_ISL_417022, EPI_ISL_417023, EPI_ISL_417025, EPI_ISL_418624, EPI_ISL_418625, EPI_ISL_418626, EPI_ISL_418627, EPI_ISL_418628, EPI_ISL_418629, EPI_ISL_418630, EPI_ISL_418631, EPI_ISL_418632, EPI_ISL_418633, EPI_ISL_418634, EPI_ISL_418635, EPI_ISL_418636, EPI_ISL_418638, EPI_ISL_418639, EPI_ISL_418640, EPI_ISL_418645, EPI_ISL_418646, EPI_ISL_418648, EPI_ISL_418649, EPI_ISL_418650, EPI_ISL_418651, EPI_ISL_418652, EPI_ISL_418653, EPI_ISL_418654, EPI_ISL_418655, EPI_ISL_418656, EPI_ISL_418657, EPI_ISL_418659, EPI_ISL_418660, EPI_ISL_418661, EPI_ISL_418663, EPI_ISL_418664, EPI_ISL_421182, EPI_ISL_421183, EPI_ISL_421184, EPI_ISL_421185, EPI_ISL_421186, EPI_ISL_421187, EPI_ISL_421188, EPI_ISL_421189, EPI_ISL_421190, EPI_ISL_421191, EPI_ISL_421192, EPI_ISL_421193, EPI_ISL_421194, EPI_ISL_421195, EPI_ISL_421196, EPI_ISL_421198, EPI_ISL_421200, EPI_ISL_421201, EPI_ISL_421202, EPI_ISL_421203, EPI_ISL_421204, EPI_ISL_421205, EPI_ISL_421206, EPI_ISL_421207, EPI_ISL_421210, EPI_ISL_421212, EPI_ISL_421213, EPI_ISL_421214, EPI_ISL_447120, EPI_ISL_447121, EPI_ISL_447122, EPI_ISL_447123, EPI_ISL_447124, EPI_ISL_447127, EPI_ISL_447128, EPI_ISL_447129, EPI_ISL_447130, EPI_ISL_447133, EPI_ISL_447134, EPI_ISL_447135, EPI_ISL_447136, EPI_ISL_447141, EPI_ISL_484702, EPI_ISL_484703			
see above	Department of Clinical Microbiology	GIGA Medical Genomics	Artesi Maria; Axelle Chaslain; Bontems Sébastien; Boreux Raphaël; Bours Vincent.; Cécile Meex; Céline Fombellida-Lopez; Durkin Keith; Hayette Marie-Pierre; Keith Durkin; Maria Artesi; Marie-Pierre Hayette; Meex Cécile; Melin Pierrette; Pierrette Melin; Raphaël Boreux; Sébastien Bontems; Vincent Bours.
EPI_ISL_429262, EPI_ISL_429263, EPI_ISL_429264, EPI_ISL_429265, EPI_ISL_429266, EPI_ISL_429267, EPI_ISL_429268, EPI_ISL_429269, EPI_ISL_429270, EPI_ISL_429271, EPI_ISL_429272, EPI_ISL_429273, EPI_ISL_429274, EPI_ISL_429275, EPI_ISL_429276, EPI_ISL_429277, EPI_ISL_429278, EPI_ISL_429279, EPI_ISL_429280, EPI_ISL_429281, EPI_ISL_429282, EPI_ISL_429283, EPI_ISL_429284, EPI_ISL_429285, EPI_ISL_429287, EPI_ISL_429289, EPI_ISL_429293, EPI_ISL_429295, EPI_ISL_429299, EPI_ISL_429300, EPI_ISL_429301, EPI_ISL_429302, EPI_ISL_429303, EPI_ISL_429304, EPI_ISL_429305, EPI_ISL_429306, EPI_ISL_429307, EPI_ISL_429308, EPI_ISL_429309, EPI_ISL_429310, EPI_ISL_429311, EPI_ISL_429312, EPI_ISL_429315, EPI_ISL_429316, EPI_ISL_429318, EPI_ISL_429321, EPI_ISL_429322, EPI_ISL_429323, EPI_ISL_429324, EPI_ISL_429325, EPI_ISL_429327, EPI_ISL_429328, EPI_ISL_429329, EPI_ISL_429331, EPI_ISL_451988, EPI_ISL_451989, EPI_ISL_451990, EPI_ISL_451991, EPI_ISL_451992, EPI_ISL_451993, EPI_ISL_451994, EPI_ISL_451995, EPI_ISL_451996, EPI_ISL_451997, EPI_ISL_451998, EPI_ISL_451999, EPI_ISL_452000, EPI_ISL_452001, EPI_ISL_452002, EPI_ISL_452003, EPI_ISL_452004, EPI_ISL_452005, EPI_ISL_452007, EPI_ISL_452008, EPI_ISL_452009, EPI_ISL_452010, EPI_ISL_452012, EPI_ISL_452013, EPI_ISL_452014, EPI_ISL_452015, EPI_ISL_452016, EPI_ISL_452017, EPI_ISL_452018, EPI_ISL_452019, EPI_ISL_452020, EPI_ISL_452021, EPI_ISL_452022, EPI_ISL_452023, EPI_ISL_452024, EPI_ISL_452025, EPI_ISL_452026, EPI_ISL_452027, EPI_ISL_452028, EPI_ISL_452029, EPI_ISL_452030, EPI_ISL_452031, EPI_ISL_452032, EPI_ISL_452033, EPI_ISL_452034, EPI_ISL_452044, EPI_ISL_452079, EPI_ISL_452099, EPI_ISL_452100			
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EPI_ISL_417187, EPI_ISL_417188, EPI_ISL_417193, EPI_ISL_417197, EPI_ISL_418815, EPI_ISL_419214, EPI_ISL_419215, EPI_ISL_419216, EPI_ISL_419219, EPI_ISL_419224, EPI_ISL_419225, EPI_ISL_419226, EPI_ISL_419227, EPI_ISL_419228, EPI_ISL_419229, EPI_ISL_419232, EPI_ISL_419245, EPI_ISL_419247, EPI_ISL_419250, EPI_ISL_419252			
see above	Department of Clinical Pathology, Pamela Youde Nethersole Eastern Hospital	Department of Health Technology and Informatics, Faculty of Health and Social Science, The Hong Kong Polytechnic University	Alan Ka-Lun WU; Alex Yat-Man HO; Barry Kin-Chung WONG; David Ho-Keung SHUM; Eugene Yuk-Keung TSO; Gilman Kit-Hang SIU; Hiu-Yin LAO; Kam-Tong YIP; Kam-Tong Yip; Kenneth Siu-Sing LEUNG; Kingsley King-Gee TAM; Kit-Man SIN; Kitty Sau-Chun FUNG; Kwok-Cheung LUNG; Lam-Kwong LEE; Man-Chun CHAN; Ming-Pan CHOI; Miranda Chong-Yee YAU; Raymond Wai-To LIU; Sandy Ka-Yee CHAU; Shea Ping YIP; Tak-Lun QUE; Tak-Lun Que; Timothy Ting-Leung NG; Wai-Shing LEUNG; Wing Cheong YAM; Wing-Kin TO; Yuk-Yung NG
EPI_ISL_419231	Department of Clinical Pathology, Tuen Mun Hospital, 23 Tsing Chung Koon Road, Tuen Mun, N.T.	Department of Health Technology and Informatics, Faculty of Health and Social Science, The Hong Kong Polytechnic University	Alan Ka-Lun WU; Alex Yat-Man HO; Barry Kin-Chung WONG; David Ho-Keung SHUM; Eugene Yuk-Keung TSO; Gilman Kit-Hang SIU; Hiu-Yin LAO; Kam-Tong YIP; Kenneth Siu-Sing LEUNG; Kingsley King-Gee TAM; Kit-Man SIN; Kitty Sau-Chun FUNG; Kwok-Cheung LUNG; Lam-Kwong LEE; Man-Chun CHAN; Ming-Pan CHOI; Miranda Chong-Yee YAU; Raymond Wai-To LIU; Sandy Ka-Yee CHAU; Shea Ping YIP; Tak-Lun QUE; Timothy Ting-Leung NG; Wai-Shing LEUNG; Wing Cheong YAM; Wing-Kin TO; Yuk-Yung NG
EPI_ISL_481251	Department of Emerging Infectious Diseases, Institute of Tropical Medicine, Nagasaki University	Department of Emerging Infectious Diseases, Institute of Tropical Medicine, Nagasaki University	Haruka Abe; Jiro Yasuda; Rokusuke Yoshikawa; Yuichiro Furusato
EPI_ISL_610165, EPI_ISL_610166, EPI_ISL_610167, EPI_ISL_610168, EPI_ISL_610169, EPI_ISL_610170, EPI_ISL_610171, EPI_ISL_610172, EPI_ISL_610173, EPI_ISL_610174, EPI_ISL_610175, EPI_ISL_610177			

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EPI_ISL_1289435, EPI_ISL_1289436, EPI_ISL_1289437, EPI_ISL_1289438, EPI_ISL_1289439, EPI_ISL_1289440, EPI_ISL_1289441, EPI_ISL_1289442, EPI_ISL_1289443, EPI_ISL_1289444, EPI_ISL_1289445			
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EPI_ISL_529151, EPI_ISL_529162	Department of Immunology, The Scripps Research Institute	Andersen lab at Scripps Research	Allison Smither; Antoinette Bell; Arnaud Drouin; Dahlene Fusco; Gilberto Sabino-Santos; I. with SEARCH Alliance San Diego; Kaylynn Genemaras; Lilia Melnik; Mchardy; Patricia Snarski; Quigley, M.; Robert Garry with SEARCH Alliance San Diego; Stefanski, E.
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EPI_ISL_513298, EPI_ISL_513299, EPI_ISL_513300, EPI_ISL_513301, EPI_ISL_513302, EPI_ISL_513303, EPI_ISL_513304, EPI_ISL_513305, EPI_ISL_513306, EPI_ISL_513307			
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EPI_ISL_524474, EPI_ISL_524480, EPI_ISL_524481	Department of Infectious Diseases, Cantonal Hospital Baden	Institute of Medical Virology, University of Zurich	Alexandra Trkola; Andrea Zbinden; Fiona Steiner; Gabriela Zltener; Jon Huder; Jürg Böni; Maryam Zaheri; Michael Huber; Patrick Redli; Riccarda Capaul; Stefan Schmutz; Verena Kufner
EPI_ISL_457699, EPI_ISL_457700, EPI_ISL_457721, EPI_ISL_457724, EPI_ISL_457728, EPI_ISL_457732, EPI_ISL_457736, EPI_ISL_457749			
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EPI_ISL_856905, EPI_ISL_856906	Department of Infectious Diseases, Istituto Superiore di Sanità, Roma, Italy; AO S.M. della Misericordia, S.C. Microbiologia, Perugia, Italy	Virology Laboratory, Scientific Department, Army Medical Center	Alessandra Lo Presti; Angela Di Martino; Anna Anselmo; Antonella Fortunato; Barbara Camilloni; Florigio Lista; Francesco Giordani; Giovanni Faggioni; Nino D'Amore; Paola Stefanelli; Riccardo De Sanctis; Silvia Fillo; Stefano Fiore; Vanessa Vera Fain
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EPI_ISL_856893, EPI_ISL_856894	Department of Infectious Diseases, Istituto Superiore di Sanità, Roma, Italy; ASUITS - Ospedale Maggiore, S.C. UOC Igiene e Sanità Pubblica, Trieste, Italy	Virology Laboratory, Scientific Department, Army Medical Center	Alessandra Lo Presti; Angela Di Martino; Anna Anselmo; Antonella Fortunato; Florigio Lista; Francesco Giordani; Giovanni Faggioni; Nino D'Amore; Paola Stefanelli; Pierlanfranco D'Agaro; Riccardo De Sanctis; Silvia Fillo; Stefano Fiore; Vanessa Vera Fain
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EPI_ISL_856907	Department of Infectious Diseases, Istituto Superiore di Sanità, Roma, Italy; AUSL Valle d'Aosta, Aosta, Italy	Virology Laboratory, Scientific Department, Army Medical Center	Alessandra Lo Presti; Angela Di Martino; Anna Anselmo; Antonella Fortunato; Florigio Lista; Francesco Giordani; Giovanni Faggioni; Massimo Di Benedetto; Nino D'Amore; Paola Stefanelli; Riccardo De Sanctis; Silvia Fillo; Stefano Fiore; Vanessa Vera Fain
EPI_ISL_856880, EPI_ISL_856895, EPI_ISL_856896	Department of Infectious Diseases, Istituto Superiore di Sanità, Roma, Italy; Ospedali Riuniti, Laboratorio Virologia, Ancona, Italy	Virology Laboratory, Scientific Department, Army Medical Center	Alessandra Lo Presti; Angela Di Martino; Anna Anselmo; Antonella Fortunato; Florigio Lista; Francesco Giordani; Giovanni Faggioni; Nino D'Amore; Paola Stefanelli; Patrizia Bagnarelli; Riccardo De Sanctis; Silvia Fillo; Stefano Fiore; Vanessa Vera Fain
EPI_ISL_856881, EPI_ISL_856897	Department of Infectious Diseases, Istituto Superiore di Sanità, Roma, Italy; PO Cardarelli, Laboratorio Analisi Microbiologia e Virologia, Campobasso, Italy	Virology Laboratory, Scientific Department, Army Medical Center	Alessandra Lo Presti; Angela Di Martino; Anna Anselmo; Antonella Fortunato; Florigio Lista; Francesco Giordani; Giovanni Faggioni; Massimiliano Scutellà; Nino D'Amore; Paola Stefanelli; Riccardo De Sanctis; Silvia Fillo; Stefano Fiore; Vanessa Vera Fain
EPI_ISL_856908	Department of Infectious Diseases, Istituto Superiore di Sanità, Roma, Italy; PO Madre Teresa di Calcutta, UOC. Laboratorio Analisi ULSS 6 Euganea, Padova, Italy	Virology Laboratory, Scientific Department, Army Medical Center	Alessandra Lo Presti; Angela Di Martino; Anna Anselmo; Antonella Fortunato; Florigio Lista; Francesco Giordani; Giacomo Mezzapelle; Giovanni Faggioni; Nino D'Amore; Paola Stefanelli; Riccardo De Sanctis; Silvia Fillo; Stefano Fiore; Vanessa Vera Fain
EPI_ISL_856884, EPI_ISL_856903	Department of Infectious Diseases, Istituto Superiore di Sanità, Roma, Italy; PO Santa Chiara, Microbiologia e Virologia, Trento, Italy	Virology Laboratory, Scientific Department, Army Medical Center	Alessandra Lo Presti; Angela Di Martino; Anna Anselmo; Antonella Fortunato; Florigio Lista; Francesco Giordani; Giovanni Faggioni; Nino D'Amore; Paola Stefanelli; Paolo Lanzafame; Riccardo De Sanctis; Silvia Fillo; Stefano Fiore; Vanessa Vera Fain
EPI_ISL_856886	Department of Infectious Diseases, Istituto Superiore di Sanità, Roma, Italy; PO Spirito Santo, UOC Microbiologia e Virologia Clinica, Pescara, Italy	Virology Laboratory, Scientific Department, Army Medical Center	Alessandra Lo Presti; Angela Di Martino; Anna Anselmo; Antonella Fortunato; Florigio Lista; Francesco Giordani; Giovanni Faggioni; Nino D'Amore; Paola Stefanelli; Paolo Fazii; Riccardo De Sanctis; Silvia Fillo; Stefano Fiore; Vanessa Vera Fain
EPI_ISL_856909	Department of Infectious Diseases, Istituto Superiore di	Virology Laboratory, Scientific Department, Army Medical	Alessandra Lo Presti; Angela Di Martino; Anna Anselmo; Antonella Fortunato; Florigio Lista; Francesco Giordani; Giovanni Faggioni; Mario Rassu; Nino

	Sanità, Roma, Italy; ULSS 8 Berica Vicenza, UOC Microbiologia, Vicenza, Italy	Center	D'Amore; Paola Stefanelli; Riccardo De Sanctis; Silvia Fillo; Stefano Fiore; Vanessa Vera Fain
EPI_ISL_855550, EPI_ISL_855553	Department of Infectious Diseases, Istituto Superiore di Sanità, Rome, Italy	Istituto Superiore di Sanità (ISS)	Alessandra Lo Presti; Angela Di Martino; Gabriele Vaccari; Giovanni Ianiro; Ilaria Di Bartolo; Luca De Sabato; Manuela Marra; Marco Crescenzi; Maria Carollo; Paola Stefanelli; Stefano Fiore
EPI_ISL_412974	Department of Infectious Diseases, Istituto Superiore di Sanità, Rome, Italy	Virology Laboratory, Scientific Department, Army Medical Center	Andrea Ciammaruconi; Antonella Fortunato; Antonella Marchi; Concetta Fabiani; Eleonora Benedetti; Filippo Molinari; Florigio Lista; Giancarlo Petralito; Giovanni Faggioni; Paola Stefanelli; Riccardo De Santis; Silvia Fillo; Stefano Fiore
EPI_ISL_855554, EPI_ISL_855555	Department of Infectious Diseases, Istituto Superiore di Sanità, Rome, Italy; ASST G.O.M. Niguarda, Sezione Microbiologia e Virologia, Milano, Italy	Istituto Superiore di Sanità (ISS)	Alessandra Lo Presti; Angela Di Martino; Carlo Federico Perno; Gabriele Vaccari; Giovanni Ianiro; Ilaria Di Bartolo; Luca De Sabato; Manuela Marra; Marco Crescenzi; Maria Carollo; Paola Stefanelli; Stefano Fiore
EPI_ISL_855552	Department of Infectious Diseases, Istituto Superiore di Sanità, Rome, Italy; Ospedali Riuniti, Laboratorio Virologia, Ancona, Italy	Istituto Superiore di Sanità (ISS)	Alessandra Lo Presti; Angela Di Martino; Gabriele Vaccari; Giovanni Ianiro; Ilaria Di Bartolo; Luca De Sabato; Manuela Marra; Marco Crescenzi; Maria Carollo; Paola Stefanelli; Patrizia Bagnarelli; Stefano Fiore
EPI_ISL_479821, EPI_ISL_479822, EPI_ISL_479855, EPI_ISL_479856, EPI_ISL_479857, EPI_ISL_479858, EPI_ISL_479859, EPI_ISL_479860, EPI_ISL_479861, EPI_ISL_479868, EPI_ISL_479986, EPI_ISL_479987, EPI_ISL_479988, EPI_ISL_479989			
see above	Department of Infectious Diseases, Kobe Institute of Health	Pathogen Genomics Center, National Institute of Infectious Diseases	Hajime Kamiya; Kentaro Itokawa; Makoto Kuroda; Masanori Hashino; Motoi Suzuki; Rina Tanaka; Ryohei Nomoto; Tsuyoshi Sekizuka
EPI_ISL_411218, EPI_ISL_411219, EPI_ISL_411220	Department of Infectious and Tropical Diseases, Bichat Claude Bernard Hospital, Paris	Laboratoire Virpath, CIRI U111, UCBL1, INSERM, CNRS, ENS Lyon	Alexandre Gaymard; Aurélien Traversier; Bruno Lina; Catherine Legras-Lachuer; Julien Fouret; Manuel Rosa-Calatrava; Olivier Terrier; Xavier Lescure; Yazdan Yazdanpanah
EPI_ISL_1301441	Department of Infectious and Tropical Diseases, Bichat Claude Bernard Hospital, Paris	NBACC	Aaron Phillips; Adam Bazinet; Amanda Graham; Brian Holland; David Miller; Denise Freeburger; Elyse Abbott; Gregory Williams; Jason Yolitz; Jennifer Biryukov; Jordan Bohannon; Karla Garcia; Katie Beck; M.J. Rosovitz; Melissa Krause; Michael Schuit; Paul Dabisch; Sean Lovett; Shanna Ratnesar-Shumate; Stewart Wood; Victoria Wahl; Wade Weaver
EPI_ISL_410720, EPI_ISL_410984	Department of Infectious and Tropical Diseases, Bichat Claude Bernard Hospital, Paris	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Flora Donati; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf; Xavier Lescure; Xavier Lescure.; Yazdan Yazdanpanah
EPI_ISL_485398, EPI_ISL_985394, EPI_ISL_1007662, EPI_ISL_1007663, EPI_ISL_1007664, EPI_ISL_1007665, EPI_ISL_1007666, EPI_ISL_1007667, EPI_ISL_1007668, EPI_ISL_1007669, EPI_ISL_1007670, EPI_ISL_1007671			
see above	Department of Internal Medicine, College of Medicine, Chosun University	Department of Internal Medicine, College of Medicine, Chosun University	D.-M.; Dong-Min Kim; Kim
EPI_ISL_413019, EPI_ISL_413020	Department of Internal Medicine, Triemli Hospital	Institute of Medical Virology, University of Zurich	Alexandra Trkola; Andrea Zbinden; Fiona Steiner; Gerhard Eich; Jon Huder; Jürg Böni; Maryam Zaheri; Michael Huber; Patrick Redli; Riccarda Capaul; Stefan Schmutz; Verena Kufner
EPI_ISL_477172, EPI_ISL_477174, EPI_ISL_477175, EPI_ISL_477177, EPI_ISL_477178, EPI_ISL_492978, EPI_ISL_492979			
see above	Department of Laboratory Medicine Tan Tock Seng Hospital	Department of Laboratory Medicine Tan Tock Seng Hospital	Barkham TMS; Chen YYC; Li C; Maurer-Stroh S; Nagarajan N; Sessions OM; Tang WY; Zair X
EPI_ISL_516801, EPI_ISL_516802, EPI_ISL_516803, EPI_ISL_516804, EPI_ISL_516805	Department of Laboratory Medicine, Tan Tock Seng Hospital	Department of Laboratory Medicine, Tan Tock Seng Hospital	Barkham TMS; Chen YYC; Li C; Maurer-Stroh S; Nagarajan N; Sessions OM; Tang WY; Zair X
EPI_ISL_447615	Department of Laboratory Medicine, National Taiwan University Hospital	Microbial Genomics Core Lab, National Taiwan University Centers of Genomic and Precision Medicine	Chiao-Ling Li; Pei-Jer Chen; Shan-Chwen Chang; Shiou-Hwei Yeh; Sui-Yuan Chang; Ya-Yun Lai; You-Yu Lin
EPI_ISL_476814, EPI_ISL_476818, EPI_ISL_476819, EPI_ISL_507002, EPI_ISL_507003, EPI_ISL_507004, EPI_ISL_538435, EPI_ISL_538436, EPI_ISL_538437, EPI_ISL_538438, EPI_ISL_538439, EPI_ISL_538440, EPI_ISL_538441, EPI_ISL_538442, EPI_ISL_538443, EPI_ISL_538444, EPI_ISL_538446, EPI_ISL_538447, EPI_ISL_538448, EPI_ISL_538449, EPI_ISL_538450, EPI_ISL_538451, EPI_ISL_538452, EPI_ISL_538453, EPI_ISL_538454, EPI_ISL_538455, EPI_ISL_538456, EPI_ISL_538457, EPI_ISL_538458, EPI_ISL_538459, EPI_ISL_538460, EPI_ISL_538461, EPI_ISL_538462, EPI_ISL_538463, EPI_ISL_538464, EPI_ISL_538465, EPI_ISL_538466, EPI_ISL_648043, EPI_ISL_648044, EPI_ISL_648045, EPI_ISL_648062, EPI_ISL_648063, EPI_ISL_648064, EPI_ISL_648065, EPI_ISL_648066, EPI_ISL_648067, EPI_ISL_648068, EPI_ISL_648069, EPI_ISL_648070, EPI_ISL_648071, EPI_ISL_648072, EPI_ISL_648073, EPI_ISL_648074, EPI_ISL_648075, EPI_ISL_648076, EPI_ISL_648077, EPI_ISL_648078, EPI_ISL_648079, EPI_ISL_648080, EPI_ISL_648081, EPI_ISL_648082, EPI_ISL_648083, EPI_ISL_648084, EPI_ISL_648085			
see above	Department of Laboratory Medicine, Tan Tock Seng Hospital	Department of Laboratory Medicine, Tan Tock Seng Hospital	Barkham TMS; Chen YYC; Li C; Lim JX; Maurer-Stroh S; Nagarajan N; Sessions OM; Tang WY; Zair X
EPI_ISL_477170	Department of Laboratory, Medicine Tan Tock Seng Hospital	Department of Laboratory Medicine Tan Tock Seng Hospital	Barkham TMS; Chen YYC; Li C; Maurer-Stroh S; Nagarajan N; Sessions OM; Tang WY; Zair X
EPI_ISL_477171	Department of Laboratory, Medicine Tan Tock Seng Hospital	Department of Laboratory, Medicine Tan Tock Seng Hospital	Barkham TMS; Chen YYC; Li C; Maurer-Stroh S; Nagarajan N; Sessions OM; Tang WY; Zair X
EPI_ISL_803880, EPI_ISL_803881, EPI_ISL_803882, EPI_ISL_803883, EPI_ISL_803884, EPI_ISL_803885, EPI_ISL_803886, EPI_ISL_803887, EPI_ISL_803888, EPI_ISL_803892, EPI_ISL_803893, EPI_ISL_803895			
see above	Department of Medical Biotechnologies, University of Siena	Laboratory of Infectious Diseases, Department of Biomedical and Clinical Sciences L. Sacco, University of Milan	Alessia Lai; Annalisa Bergna; Carla Della Ventura; Claudia Balotta; Filippo Dragoni; Gianguglielmo Zehender on behalf of SARS-CoV-2 ITALIAN RESEARCH ENTERPRISE-(SCIRE) Collaborative Group; Ilaria Vicenti; Maria Grazia Cusi; Massimo Galli; Maurizio Zazzi
EPI_ISL_454416	Department of Medical Microbiology, Leiden University Medical Center	Department of Medical Microbiology, Leiden University Medical Center	Dalebout; E.J.; J.C.; J.J. and Sidorov, I.; N.S.; Ogando; Snijder; T.J.; Zevenhoven; de Vries
EPI_ISL_417917	Department of Medical Microbiology, University Malaya Medical Centre	Department of Medical Microbiology	Adeeba KAMARULZAMAN; Chee Kuan WONG; Cindy Shuan Ju TEH; I-Ching SAM; Sasheela PONNAMPALAVANAR; Sharifah Faridah SYED OMAR; University Malaya Medical Centre COVID Team; Vijayan MUNUSAMY; Yoke Fun Chan; Yoong Min CHONG
EPI_ISL_417918, EPI_ISL_501176, EPI_ISL_501177, EPI_ISL_501178, EPI_ISL_501179, EPI_ISL_501180, EPI_ISL_501181, EPI_ISL_501182, EPI_ISL_501183, EPI_ISL_501184, EPI_ISL_501185, EPI_ISL_501186, EPI_ISL_501187, EPI_ISL_501188, EPI_ISL_501189, EPI_ISL_501190, EPI_ISL_501193, EPI_ISL_501194, EPI_ISL_501195, EPI_ISL_501196, EPI_ISL_501197, EPI_ISL_501198, EPI_ISL_501199, EPI_ISL_501201, EPI_ISL_501202, EPI_ISL_501203, EPI_ISL_501204, EPI_ISL_501205, EPI_ISL_501206, EPI_ISL_501207, EPI_ISL_501208, EPI_ISL_501209, EPI_ISL_501220, EPI_ISL_501221, EPI_ISL_501223, EPI_ISL_501224, EPI_ISL_501225, EPI_ISL_501226, EPI_ISL_501227, EPI_ISL_501228			
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EPI_ISL_454733	Department of Medical, Biotechnologies University of Siena	Department of Medical, Biotechnologies University of Siena	Anichini, G.; Cusi; G. and Santoro, F.; Gandolfo, C.; M.G.; Pinzauti, D.; Pozzi
EPI_ISL_416314	Department of Microbiology, Faculty of Medicine, The Chinese University of Hong Kong, Hong Kong SAR, China	Department of Microbiology, Faculty of Medicine, Chinese University of Hong Kong, Hong Kong SAR, China	Paul KS Chan; Zigui Chen
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EPI_ISL_413017, EPI_ISL_413018, EPI_ISL_413514, EPI_ISL_413516	Department of Microbiology, Institute for Viral Diseases, College of Medicine, Korea University	Department of Microbiology, Institute for Viral Diseases, College of Medicine, Korea University	Changmin Kang; Cui Chunguang; Dong Min Kim; Gee Eun Lee; Gee eun Lee; Hee Jin Cheong; Heedo Park; Jeonghun Kim; Ji Yun Noh; Jin Gu Yoon; Jin Il Kim; Joon Young Song; Joon-Yong Bae; Jungmin Lee; Juyoung Cho; Kyeong-ryeol Shin; Man-Seong Park; Woo Joo Kim
EPI_ISL_420531, EPI_ISL_420532, EPI_ISL_420533, EPI_ISL_420534, EPI_ISL_420536, EPI_ISL_420537, EPI_ISL_420538, EPI_ISL_420539			
see above	Department of Microbiology, PathWest QEII Medical Centre	Department of Microbiology, PathWest QEII Medical Centre	Avram Levy; Chisha Sikazwe; David Speers and David Smith; Jurissa Lang
EPI_ISL_497769, EPI_ISL_497771, EPI_ISL_497773, EPI_ISL_497775, EPI_ISL_497783, EPI_ISL_497784, EPI_ISL_497786, EPI_ISL_497791, EPI_ISL_497796, EPI_ISL_497797, EPI_ISL_497798, EPI_ISL_497799, EPI_ISL_497806, EPI_ISL_497808, EPI_ISL_497810, EPI_ISL_497811, EPI_ISL_497812, EPI_ISL_497813, EPI_ISL_497819, EPI_ISL_497820, EPI_ISL_497821, EPI_ISL_497824, EPI_ISL_497826, EPI_ISL_497827, EPI_ISL_497831, EPI_ISL_497832, EPI_ISL_497833, EPI_ISL_497840, EPI_ISL_497845, EPI_ISL_497846, EPI_ISL_497847, EPI_ISL_497848, EPI_ISL_497850, EPI_ISL_497856, EPI_ISL_497860, EPI_ISL_497864, EPI_ISL_497870, EPI_ISL_516798			
see above	Department of Microbiology, The University of Hong Kong	Department of Microbiology, The University of Hong Kong	Kelvin K.W. To; Kwok-Yung Yuen
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EPI_ISL_437626	Department of Microbiology,Gandhi Medical College and Hospital	Department of Veterinary Biotechnalogy, College of Veterinary Science, Rajendranagar, PV Narsimha Rao Telengana	Amit A. Upadhyay; Anand Kumar K; Kalyani Putty; Muttineni Radhakrishna; Nagamani K; Pankaj Singh D; Raja Rao M; Rama Amara; Ravikumar P; Steven Bosinger; Sunitha P; Thrilok Chander B

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EPI_ISL_431101	Department of Microbiology,Gandhi Medical College and Hospital	Virus Research Laboratory, Department of Zoology, Osmania University,Hyderabad,India	Amit A. Upadhyay Steven E. Bosinger; Anand Kumar K; Kalyani Putty; Muttineni Radhakrishna; Nagamani K; Pankaj Singh D; Raja Rao M; Rama Amara; Ravikumar P; Sunitha P; Thrilok Chander B
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EPI_ISL_812968	Department of Molecular Medicine, University of Padova	Department of Molecular Medicine, University of Padova	Abate, D.; Barzon, L.; Besutti, V.; De Canale, E.; Del Vecchio, C.; Franchin, E.; Lavezzo, E.; Loregian, A.; M.C.; Manganelli, R.; Manuto, L.; Masi, G.; Onelia, F.; Pacenti, M.; Parisi; Rossi, L.; S. and Crisanti, A.; S.G.; Saluzzo, F.; Sciro, M.; Toppo; Trevisan, M.; Vanuzzo
EPI_ISL_463741, EPI_ISL_463742, EPI_ISL_463743, EPI_ISL_463744	Department of Molecular Virology, Cyprus Institute of Neurology and Genetics	Department of Molecular Virology, Cyprus Institute of Neurology and Genetics	Christina Christodoulou; Christina Tryfonos; Dana Koptides; George Krashias; Jan Richter; Stavros Bashiardes
EPI_ISL_417176, EPI_ISL_417178, EPI_ISL_419217, EPI_ISL_419222	Department of Pathology, Princess Margaret Hospital	Department of Health Technology and Informatics, Faculty of Health and Social Science, The Hong Kong Polytechnic University	Alan Ka-Lun WU; Alex Yat-Man HO; Barry Kin-Chung WONG; David Ho-Keung SHUM; Eugene Yuk-Keung TSO; Gilman Kit-Hang SIU; Hiu-Yin LAO; Kam-Tong YIP; Kam-Tong Yip; Kenneth Siu-Sing LEUNG; Kingsley King-Gee TAM; Kit-Man SIN; Kitty Sau-Chun FUNG; Kwok-Cheung LUNG; Lam-Kwong LEE; Man-Chun CHAN; Ming-Pan CHOI; Miranda Chong-Yee YAU; Raymond Wai-To LIU; Sandy Ka-Yee CHAU; Shea Ping YIP; Tak-Lun QUE; Tak-Lun Que; Timothy Ting-Leung NG; Wai-Shing LEUNG; Wing Cheong YAM; Wing-Kin TO; Yuk-Yung NG
EPI_ISL_594186	Department of Pathology, School of Medicine, Imam Khomeini Hospital, Tehran University of Medical Sciences	Genetics Research Center, University of Social Welfare and Rehabilitation Sciences	Ali Jafarpour; Alireza Abdollahi; Azam Ghaziasadi; Azam Ghaziasadi; Azar Hadadi; Hossein Najmabadi; Khadijeh Jalalvand; Kimia Kahrizi; Marzieh Mohseni; Reza Najafipour; Saber Soltani; Seyed Mohammad Jazayeri; Seyedeh elham Mortazavi; Zohreh Fattahi
EPI_ISL_413459	Department of Pathology, Toshima Hospital	Pathogen Genomics Center, National Institute of Infectious Diseases	Haruka Nishioka; Harutaka Katano; Ippei Miyamoto; Ja-Mun Chong; Jun Yamazaki; Kentaro Itokawa; Makoto Kuroda; Masahiro Sano; Minoru Tobiume; Noriko Nakajima; Tadaki Suzuki; Takuya Adachi; Tsuyoshi Sekizuka; Yuko Sato
EPI_ISL_417181, EPI_ISL_417185, EPI_ISL_419221	Department of Pathology, United Christian Hospital	Department of Health Technology and Informatics, Faculty of Health and Social Science, The Hong Kong Polytechnic University	Alan Ka-Lun WU; Alex Yat-Man HO; Barry Kin-Chung WONG; David Ho-Keung SHUM; Eugene Yuk-Keung TSO; Gilman Kit-Hang SIU; Hiu-Yin LAO; Kam-Tong YIP; Kam-Tong Yip; Kenneth Siu-Sing LEUNG; Kingsley King-Gee TAM; Kit-Man SIN; Kitty Sau-Chun FUNG; Kwok-Cheung LUNG; Lam-Kwong LEE; Man-Chun CHAN; Ming-Pan CHOI; Miranda Chong-Yee YAU; Raymond Wai-To LIU; Sandy Ka-Yee CHAU; Shea Ping YIP; Tak-Lun QUE; Tak-Lun Que; Timothy Ting-Leung NG; Wai-Shing LEUNG; Wing Cheong YAM; Wing-Kin TO; Yuk-Yung NG
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see above	Department of Pathology, University of Cambridge	COVID-19 Genomics UK (COG-UK) Consortium	Aminu S. Jahun; Anna Yakovleva; Charlotte J. Houldcroft; Fahad A Khokhar; Grant Hall; Ian Goodfellow; Laura G Caller; Luke W Meredith; M. Estee Torok; Martin D. Curran; Myra Hosmillo; Sarah L. Caddy; Theresa Feltwell; William L. Hamilton
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			Eberle, U.; Fingerle, V.; Grahl, A.; Haas, W.; Hamouda, O.; Hoch, M.; Hoermansdorfer, S.; Ippisch, S.; Jones; Katz, K.; Konrad, R.; Liebl, B.; M.M.; Marosevic; Muehlemann, B.; Muller, N.; Poertner, K.; Protzer, U.; Reich, A.; Rexroth, U.; Schneider, J.; Sing, A.; T.C.; T.S.; Treis, B.; V.M.; Veith, T.; Walter, M.; Wicklein, B.; Woelfel, R.; Woudenberg, T.; Zapf, A.; Zeitlmann, N.; an der Heiden, M.
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EPI_ISL_408665, EPI_ISL_408666, EPI_ISL_408667, EPI_ISL_408669	Dept. of Virology III, National Institute of Infectious Diseases	Pathogen Genomics Center, National Institute of Infectious Diseases	Kazuya Shirato; Makoto Kuroda; Makoto Takeda; Naganori Nao; Shutoku Matsuyama; Tsuyoshi Sekizuka
EPI_ISL_437197, EPI_ISL_437198, EPI_ISL_437199, EPI_ISL_437200	Diagnostic- and Research Institute of Pathology, Medical University of Graz	Diagnostic- and Research Institute of Pathology, Medical University of Graz	Gregor Gorkiewicz; Karl Kashofer; Martin Zacharias; Peter Regitnig
EPI_ISL_413573	Dienst Gezondheid & Jeugd Zuid-Holland Zuid	Erasmus Medical Center	Anne van der Linden; Annemiek van der Eijk; Aura Timen; Bas Oude Munnink; Claudia Schapendonk; Corien Swaan; Corine GeurtsvanKessel; David Nieuwenhuijse; Irina Chestakova; Jeroen van Kampen; Jolanda Voermans; Madelief Mollers; Manon Haverkate; Marion Koopmans; Mark Pronk; Mart Stein; Pascal Lexmond; Reina Sikkema; Richard Molenkamp; Sandra Kengne Kamga Mobou; on behalf of the Dutch national COVID-19 response team.
EPI_ISL_475562, EPI_ISL_475563	Din Klinik	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Karin Tegmark-Wisell; Maria Lind Karlberg; Mattias Haukland; Mia Brytting; Olov Svartstrom; Oskar Karlsson Lindsjo; Reza Advani; Sandra Broddesson
EPI_ISL_467374	Dinkes Samarinda	Eijkman Institute for Molecular Biology, Ministry of Research and Technology/National Agency for Research and Innovation	Amin Soebandrio; David H Muljono; Edison Johar; Frilasita A Yudhaputri; Hidayat Trimarsanto; Khin Saw Myint; Safarina G Malik
EPI_ISL_591327, EPI_ISL_591328, EPI_ISL_591332, EPI_ISL_591333, EPI_ISL_591334, EPI_ISL_591335	Dipartimento di Biotecnologie Mediche, University of Siena	Dipartimento di Biotecnologie Mediche, University of Siena	Anichini, G.; Cusi; Gandolfo, C.; M.G.; Pinzauti, D.; Pozzi, G.; Santoro, F.
EPI_ISL_524430	Dirk Dittmer	Dirk Dittmer	A.B.; A.G.; Bailey; C.P.; Caro-Vegas; Dittmer, D.; Eason; J.T.; Juarez, A.; L.J.; Landis; M.B.; McNamara; Miller; Moorad, R.; Pluta; R.P.; Seltzer; T.A.; Thompson, C.; Vahrson; W. and Villamor, F.
EPI_ISL_508864, EPI_ISL_508865, EPI_ISL_508866, EPI_ISL_508867, EPI_ISL_508868, EPI_ISL_508869, EPI_ISL_508870, EPI_ISL_509222			
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EPI_ISL_413513, EPI_ISL_413515	Division of Infectious Diseases, Department of Internal Medicine, Korea University College of Medicine	Department of Microbiology, Institute for Viral Diseases, College of Medicine, Korea University	Changmin Kang; Cui Chunguang; Gee Eun Lee; Hee Jin Cheong; Heedo Park; Jeonghun Kim; Ji Yun Noh; Jin Gu Yoon; Jin Il Kim; Joon Young Song; Joon-Yong Bae; Jungmin Lee; Juyoung Cho; Kyeong-ryeol Shin; Man-Seong Park; Woo Joo Kim
EPI_ISL_413024	Division of Infectious Diseases, University Hospital Zurich	Institute of Medical Virology, University of Zurich	Alexandra Trkola; Andrea Zbinden; Fiona Steiner; Gabriela Ziltener; Jon Huder; Jürg Böni; Maryam Zaheri; Michael Huber; Patrick Redli; Riccarda Capaul; Roberto Speck; Stefan Schmutz; Verena Kufner
EPI_ISL_524475, EPI_ISL_524477, EPI_ISL_524483, EPI_ISL_524485, EPI_ISL_939660, EPI_ISL_939661	Division of Infectious Diseases, University Hospital Zürich	Institute of Medical Virology, University of Zurich	Alexandra Trkola; Andrea Zbinden; Annette Audigé; Cyril Shah; Fiona Steiner; Gabriela Ziltener; Guido Bloemberg; Jon Huder; Jürg Böni; Kevin Steiner; Maria Grünberg; Maryam Zaheri; Michael Huber; Patrick Redli; Riccarda Capaul; Stefan Schmutz; Verena Kufner
EPI_ISL_812956, EPI_ISL_812957, EPI_ISL_812958, EPI_ISL_812959, EPI_ISL_812960, EPI_ISL_812961	Division of Pathogen Resource Management, Korea National Institute of Health, Korea Disease Control and Prevention Agency	Division of Pathogen Resource Management, Korea National Institute of Health, Korea Disease Control and Prevention Agency	Choi, Choi, C.; E.-J.; J.-M.; Kim; M.-r.; S.T.; S.Y.; Y.S.; Yun
EPI_ISL_412869, EPI_ISL_412870, EPI_ISL_412871, EPI_ISL_412872, EPI_ISL_412873, EPI_ISL_425117, EPI_ISL_425118, EPI_ISL_426163, EPI_ISL_426164, EPI_ISL_426166, EPI_ISL_426168, EPI_ISL_426169, EPI_ISL_426171, EPI_ISL_426173, EPI_ISL_426180, EPI_ISL_426181, EPI_ISL_426182, EPI_ISL_426183, EPI_ISL_426187, EPI_ISL_427809, EPI_ISL_427810, EPI_ISL_427811, EPI_ISL_427812, EPI_ISL_427813, EPI_ISL_471425, EPI_ISL_471426, EPI_ISL_471438, EPI_ISL_471439, EPI_ISL_471440, EPI_ISL_471441, EPI_ISL_471442, EPI_ISL_471443, EPI_ISL_471444, EPI_ISL_471445, EPI_ISL_471446, EPI_ISL_471447, EPI_ISL_471448, EPI_ISL_471449, EPI_ISL_471450, EPI_ISL_471451, EPI_ISL_471452, EPI_ISL_471453, EPI_ISL_471454, EPI_ISL_471455, EPI_ISL_481370, EPI_ISL_481371, EPI_ISL_481372, EPI_ISL_481373, EPI_ISL_481374, EPI_ISL_481375, EPI_ISL_481376, EPI_ISL_481377, EPI_ISL_481378, EPI_ISL_481379, EPI_ISL_497951, EPI_ISL_497953, EPI_ISL_497954, EPI_ISL_497955, EPI_ISL_497956, EPI_ISL_497957, EPI_ISL_497958, EPI_ISL_497959, EPI_ISL_497960, EPI_ISL_497961, EPI_ISL_497962, EPI_ISL_497963, EPI_ISL_497964, EPI_ISL_497965, EPI_ISL_497966, EPI_ISL_497967, EPI_ISL_497968, EPI_ISL_497969, EPI_ISL_497971, EPI_ISL_497972, EPI_ISL_497973, EPI_ISL_497975, EPI_ISL_497976, EPI_ISL_497977, EPI_ISL_497978, EPI_ISL_497979, EPI_ISL_497980, EPI_ISL_497981, EPI_ISL_497982, EPI_ISL_497983, EPI_ISL_497984, EPI_ISL_497985, EPI_ISL_497986, EPI_ISL_497987, EPI_ISL_497988, EPI_ISL_497989, EPI_ISL_497990, EPI_ISL_497991, EPI_ISL_497992, EPI_ISL_497993, EPI_ISL_497994, EPI_ISL_497995, EPI_ISL_497996, EPI_ISL_497997, EPI_ISL_497998, EPI_ISL_497999, EPI_ISL_498000, EPI_ISL_498001, EPI_ISL_498002, EPI_ISL_498003, EPI_ISL_498004, EPI_ISL_498005, EPI_ISL_498006, EPI_ISL_498007, EPI_ISL_498008, EPI_ISL_498009, EPI_ISL_498010, EPI_ISL_498011, EPI_ISL_498012, EPI_ISL_498013, EPI_ISL_498014, EPI_ISL_498015, EPI_ISL_498016, EPI_ISL_498017, EPI_ISL_498018, EPI_ISL_498019, EPI_ISL_498020, EPI_ISL_498021, EPI_ISL_498022, EPI_ISL_498023, EPI_ISL_498024, EPI_ISL_498025, EPI_ISL_498026, EPI_ISL_498027, EPI_ISL_498028, EPI_ISL_498029, EPI_ISL_498030, EPI_ISL_498031, EPI_ISL_498032, EPI_ISL_498033, EPI_ISL_498034, EPI_ISL_498035, EPI_ISL_498036, EPI_ISL_498037, EPI_ISL_498038, EPI_ISL_498039, EPI_ISL_498040, EPI_ISL_498041, EPI_ISL_498042, EPI_ISL_498043, EPI_ISL_498044, EPI_ISL_498045, EPI_ISL_498046, EPI_ISL_498047, EPI_ISL_498048, EPI_ISL_498049, EPI_ISL_498050, EPI_ISL_498051, EPI_ISL_498052, EPI_ISL_498053, EPI_ISL_506947, EPI_ISL_506948, EPI_ISL_506949, EPI_ISL_506950, EPI_ISL_506951, EPI_ISL_506952, EPI_ISL_506953, EPI_ISL_506954, EPI_ISL_506955, EPI_ISL_506956, EPI_ISL_506957, EPI_ISL_506958, EPI_ISL_506959, EPI_ISL_506960, EPI_ISL_506961, EPI_ISL_506962, EPI_ISL_506963, EPI_ISL_506964, EPI_ISL_506965, EPI_ISL_506966, EPI_ISL_506967, EPI_ISL_506968, EPI_ISL_506969, EPI_ISL_506970, EPI_ISL_506971, EPI_ISL_506972, EPI_ISL_506973, EPI_ISL_506974, EPI_ISL_506975, EPI_ISL_506976, EPI_ISL_506977, EPI_ISL_506978, EPI_ISL_506979, EPI_ISL_506980, EPI_ISL_506981, EPI_ISL_506982, EPI_ISL_506983, EPI_ISL_506984, EPI_ISL_506985, EPI_ISL_506986, EPI_ISL_510547			
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EPI_ISL_451601, EPI_ISL_455051, EPI_ISL_455052, EPI_ISL_455053, EPI_ISL_455065	Douglas Hanly Moir Pathology	NSW Health Pathology - Institute of Clinical Pathology and Medical Research; Westmead Hospital; University of Sydney	CIDM-PH et al.
EPI_ISL_418811, EPI_ISL_429806, EPI_ISL_429811, EPI_ISL_429816, EPI_ISL_479625, EPI_ISL_479626, EPI_ISL_479627, EPI_ISL_479628, EPI_ISL_479629, EPI_ISL_479630, EPI_ISL_479631, EPI_ISL_479632, EPI_ISL_479633, EPI_ISL_479634, EPI_ISL_479635, EPI_ISL_479636, EPI_ISL_479637, EPI_ISL_479638, EPI_ISL_479639, EPI_ISL_479640, EPI_ISL_479641, EPI_ISL_479642, EPI_ISL_479643, EPI_ISL_479644, EPI_ISL_479645, EPI_ISL_479646, EPI_ISL_479647, EPI_ISL_479648, EPI_ISL_479649, EPI_ISL_479650, EPI_ISL_479651, EPI_ISL_481742, EPI_ISL_481743, EPI_ISL_481744, EPI_ISL_481745, EPI_ISL_481747, EPI_ISL_482471, EPI_ISL_482472, EPI_ISL_482473			
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EPI_ISL_583729, EPI_ISL_583730, EPI_ISL_583731, EPI_ISL_583744, EPI_ISL_583745, EPI_ISL_583746, EPI_ISL_583747, EPI_ISL_583748, EPI_ISL_583749, EPI_ISL_583750, EPI_ISL_583751, EPI_ISL_583752, EPI_ISL_583753, EPI_ISL_583754, EPI_ISL_583755, EPI_ISL_583756, EPI_ISL_583757, EPI_ISL_583758, EPI_ISL_583759, EPI_ISL_583760, EPI_ISL_583766, EPI_ISL_583767, EPI_ISL_583768, EPI_ISL_583769, EPI_ISL_583770, EPI_ISL_583771, EPI_ISL_583772, EPI_ISL_583773, EPI_ISL_583774, EPI_ISL_583775, EPI_ISL_583776, EPI_ISL_583777, EPI_ISL_583778, EPI_ISL_583779, EPI_ISL_583780, EPI_ISL_583781, EPI_ISL_583782, EPI_ISL_583783, EPI_ISL_583784, EPI_ISL_583785, EPI_ISL_583786, EPI_ISL_583787, EPI_ISL_583788, EPI_ISL_583789, EPI_ISL_583790, EPI_ISL_583791, EPI_ISL_583792, EPI_ISL_583793, EPI_ISL_583794, EPI_ISL_583795, EPI_ISL_583796, EPI_ISL_583797, EPI_ISL_583798, EPI_ISL_583799, EPI_ISL_583800, EPI_ISL_583801, EPI_ISL_583802, EPI_ISL_583803, EPI_ISL_583804, EPI_ISL_583805, EPI_ISL_583806, EPI_ISL_583807, EPI_ISL_583808, EPI_ISL_583809, EPI_ISL_583810, EPI_ISL_583811, EPI_ISL_583812, EPI_ISL_583813, EPI_ISL_583814, EPI_ISL_583815, EPI_ISL_583849, EPI_ISL_583850, EPI_ISL_583851, EPI_ISL_583852			
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EPI_ISL_495012	Dr. Tony Mazzulli Microbiologist-in-Chief	Dr. Jeff Wrana, Senior Investigator	Bryn Hazlett; Christine Bruce; Dan Trcka; Javier Hernandez; Jeff Wrana; Jess Shen; Jessica Bourke; Kin Chan; Laurence Pelletier; Marie-Ming Aynaud; Seda Barutcu; Sue Poutanen; Tony Mazzulli
EPI_ISL_494970, EPI_ISL_495013	Dr. Tony Mazzulli Microbiologist-in-Chief	Dr. Jeff Wrana, Senior Investigator	Bryn Hazlett; Christine Bruce; Dan Trcka; Javier Hernandez; Jeff Wrana; Jess Shen; Jessica Bourke; Kin Chan; Laurence Pelletier; Marie-Ming Aynaud; Seda Barutcu; Sue Poutanen; Tony Mazzulli
EPI_ISL_417211, EPI_ISL_417212	Dunedin Hospital	University of Otago	B. Lawley; J. Grant; J. Ussher; M.E. Quiñones-Mateu; R. Harfoot
EPI_ISL_414423, EPI_ISL_414424, EPI_ISL_414425, EPI_ISL_414426, EPI_ISL_414428, EPI_ISL_414429, EPI_ISL_414430, EPI_ISL_414432, EPI_ISL_414433, EPI_ISL_414434, EPI_ISL_414435, EPI_ISL_414436, EPI_ISL_414437, EPI_ISL_414438, EPI_ISL_414439, EPI_ISL_414440, EPI_ISL_414441, EPI_ISL_414442, EPI_ISL_414443, EPI_ISL_414444, EPI_ISL_414445, EPI_ISL_414446, EPI_ISL_414448, EPI_ISL_414449, EPI_ISL_414451, EPI_ISL_414452, EPI_ISL_414454, EPI_ISL_414456, EPI_ISL_414457, EPI_ISL_414458, EPI_ISL_414460, EPI_ISL_414461, EPI_ISL_414462, EPI_ISL_414463, EPI_ISL_414464, EPI_ISL_414467, EPI_ISL_414468, EPI_ISL_414469, EPI_ISL_414470, EPI_ISL_414471, EPI_ISL_414529, EPI_ISL_414530, EPI_ISL_414531, EPI_ISL_414532, EPI_ISL_414534, EPI_ISL_414535, EPI_ISL_414536, EPI_ISL_414537, EPI_ISL_414539, EPI_ISL_414541, EPI_ISL_414544, EPI_ISL_414545, EPI_ISL_414548, EPI_ISL_414549, EPI_ISL_414551, EPI_ISL_414552, EPI_ISL_414554, EPI_ISL_414555, EPI_ISL_414556, EPI_ISL_414557, EPI_ISL_414558, EPI_ISL_414559, 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see above	Dutch COVID-19 response team	Erasmus Medical Center	Anne van der Linden; Annemiek van der Eijk; Aura Timen; Bas Oude Munnink; Claudia Schapendonk; Corien Swaan; Corine GeurtsvanKessel; David Nieuwenhuijse; Emmanuelle Munger; Irina Chestakova; Jeroen van Kampen; Jolanda Voermans; Madelief Mollers; Manon Haverkate; Marion Koopmans; Marjan Boter; Mark Pronk; Mart Stein; Pascal Lexmond; Reina Sikkema; Richard Molenkamp; Sandra Kengne Kamga Mobou; Stefan van Nieuwkoop; Theo Bestebroer; on behalf of the Dutch national COVID-19 response team.
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see above	Dutch COVID-19 response team	National Institute for Public Health and the Environment (RIVM)	Adam Meijer; AnneMarie van den Brandt; Bas van der Veer; Chantal Reusken; Dennis Schmitz; Dirk Eggink; Florian Zwagemaker; Harry Vennema; Jeroen Cremer; Matthijs Welkers; Pieter Overduin; Sharon van den Brink; on behalf of the national COVID-19 response team
EPI_ISL_421653, EPI_ISL_421654, EPI_ISL_421655, EPI_ISL_421656, EPI_ISL_426285, EPI_ISL_426286, EPI_ISL_426287, EPI_ISL_426288, EPI_ISL_426289			
see above	E. Gulbja Laboratorija	Latvian Biomedical Research and Study Centre	Dmitrijs Perminovs; Ivars Silamielis; Jnis Kloviš; Kaspars Megnis; Mikus Gavars; Monta Ustinova; Uga Dumpis; Vita Rovte; ikita Zrelovs
EPI_ISL_418226	EHPAD - Résidences les Cèdres	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Etienne Simon-Lorière; Flora Donati; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_593543, EPI_ISL_770823	Eastern Ontario Regional Laboratory Association	McMaster University	Ahmed Draia; Andrew G. McArthur; Emily Panousis; Hooman Derakhshani; Jalees Nasir; Leanne Mortimer; Robert Slinger
EPI_ISL_862849	Ehime Prefectural Central Hospital	Fujita health University, School of Medicine, Department of Microbiology	Masahiro suzuki; Yohei Doi
EPI_ISL_434652	Ektorps Vardcentral	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Eva Espmark; Karin Tegmark-Wisell; Maria Lind Karlberg; Mia Brytting; Olov Svartstrom; Oskar Karlsson Lindsjo; Theresa Enkirch
EPI_ISL_424350, EPI_ISL_424351	Environmental and Global Health	Environmental and Global Health	Alam, M.; C.J.; Elbadry; Gibson; J.A.; J.C.; J.G. Jr. and Lednicky; M.A.; Morris; Stephenson; Subramaniam, K.; T.B.; Waltzek
EPI_ISL_524433, EPI_ISL_524434	Environmental and Global Health, University of Florida - Gainesville	University of Florida	Alam; C.J.; Elbadry; Gibson; J.A.; J.C.; J.G. Jr.; Lednicky; M.A.; M.M.; Morris; Stephenson; Subramaniam, K.; T.B.; Waltzek
EPI_ISL_413582	ErasmusMC	Erasmus Medical Center	Anne van der Linden; Annemiek van der Eijk; Aura Timen; Bas Oude Munnink; Claudia Schapendonk; Corien Swaan; Corine GeurtsvanKessel; David Nieuwenhuijse; Irina Chestakova; Jeroen van Kampen; Jolanda Voermans; Madelief Mollers; Manon Haverkate; Marion Koopmans; Mark Pronk; Mart Stein; Pascal Lexmond; Reina Sikkema; Richard Molenkamp; Sandra Kengne Kamga Mobou; on behalf of the Dutch national COVID-19 response team.
EPI_ISL_514648	Essentia Health-St. Joseph's Medical Center	Minnesota Department of Health, Public Health Laboratory	Jacob Garfin; Matt Plumb; and Xiong Wang
EPI_ISL_514642	Essentia Health-St. Mary's Medical Center	Minnesota Department of Health, Public Health Laboratory	Jacob Garfin; Matt Plumb; and Xiong Wang
EPI_ISL_602282, EPI_ISL_602284, EPI_ISL_602290, EPI_ISL_602292	Evangelisches Klinikum Bethel, Institut für Laboratoriumsmedizin, Mikrobiologie und Hygiene	Bielefeld University	Alexander Sczyrba; Christiane Scherer; David Brandt; Jörn Kalinowski; Levin-Joe Klages; Marina Simunovic; Markus Haak; Svenja Vinke; Tobias Busche
EPI_ISL_424856, EPI_ISL_424857	FL Bur. of Public Health Laboratories-Jacksonville	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao

EPI_ISL_420785	FL Bureau of Health Laboratories Tampa	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anne Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jasmine Padilla; Jing Zhang; Justin Lee; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_452110, EPI_ISL_452111, EPI_ISL_452132	FL Bureau of Public Health Laboratories	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Montmayeur; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao; Zachary Weiner
EPI_ISL_424853, EPI_ISL_424854	FL Bureau of Public Health Laboratories-Miami	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_419559, EPI_ISL_419560, EPI_ISL_424855, EPI_ISL_447841, EPI_ISL_812138, EPI_ISL_812142	FL Bureau of Public Health Laboratories-Tampa	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Montmayeur; Anna Uehara; Brian Lynch; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jasmine Padilla; Jing Zhang; Justin Lee; Krista Queen; Mary S. Keckler; Peter Cook; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_445277	FUNDACION DE SALUD EL TENIENTE	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_417010, EPI_ISL_418252	FUNDACION JIMENEZ DIAZ	Instituto de Salud Carlos III	A. Monzón; F. Casas; I. Fernández Roblas, R.; I. Jiménez; Iglesias-Caballero; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; P. Jiménez; S. Juliá; S. Pozo; S. Varona
EPI_ISL_526937, EPI_ISL_526938, EPI_ISL_526939, EPI_ISL_526940, EPI_ISL_526941, EPI_ISL_526943, EPI_ISL_526946			
see above	Faroese National Reference Laboratory for Fish and Animal Diseases	Faroese National Reference Laboratory for Fish and Animal Diseases	Debes Hammershaimb Christiansen; Maria Marjunardóttir Dahl; Petra Elisabeth Petersen
EPI_ISL_451963, EPI_ISL_451966, EPI_ISL_451969, EPI_ISL_451970	Federal Budget Institution of Science, State Research Center for Applied Microbiology & Biotechnology	Federal Budget Institution of Science, State Research Center for Applied Microbiology & Biotechnology	Abaimova A; Bakhteeva I; Blagodatskikh S; Bogun A; Borzilov A; Chekan L; Chernysh S; Denisenko E; Dentovskaya S; Detushev K; Detusheva E; Dyatlov I; Firstova V; Frolov V; Fursov M; Fursova N; Galkina E; Gapelchenkova T; Goncharova J; Gorbatov A; Hlyntseva A; Ivanov S; Kalmantayev T; Kalmantayeva O; Kanashenko M; Kartsev N; Kartseva A; Khomyakov A; Khramov M; Kisilichkina A; Kolchanova A; Koroleva-Ushakova A; Kosilova I; Krasilnikova E; Kuzin V; Kuzina E; Makarova M; Marin M; Novikova T; Platonov M; Podkopaev Y; Ryabko A; Shakhutdinova R; Shemyakin I; Shishkina L; Silkina M; Sizova A; Skryabin Y; Slukin P; Slukina N; Solomentsev V; Solovieva A; Teymurazov M; Timofeev V; Titareva G; Trunyakova A; Tyurin E; Vagayskaya A; Zeninskaya N; Zhumakaev R
EPI_ISL_480791, EPI_ISL_480796, EPI_ISL_480801, EPI_ISL_480802, EPI_ISL_480804, EPI_ISL_480805, EPI_ISL_480806, EPI_ISL_480812, EPI_ISL_489803, EPI_ISL_495332, EPI_ISL_495333, EPI_ISL_495334, EPI_ISL_495342, EPI_ISL_495344, EPI_ISL_495346, EPI_ISL_495347, EPI_ISL_495349, EPI_ISL_495350, EPI_ISL_495351, EPI_ISL_495355, EPI_ISL_495357, EPI_ISL_495359, EPI_ISL_495360, EPI_ISL_495363, EPI_ISL_495371, EPI_ISL_495388, EPI_ISL_495389, EPI_ISL_495390, EPI_ISL_495393, EPI_ISL_495394, EPI_ISL_495395, EPI_ISL_495396, EPI_ISL_495397, EPI_ISL_495398, EPI_ISL_495399, EPI_ISL_495400, EPI_ISL_495402, EPI_ISL_495403, EPI_ISL_495404, EPI_ISL_508743, EPI_ISL_508744, EPI_ISL_508745, EPI_ISL_508746, EPI_ISL_508748, EPI_ISL_508749, EPI_ISL_508765, EPI_ISL_508766, EPI_ISL_508767, EPI_ISL_508769, EPI_ISL_508771, EPI_ISL_508772, EPI_ISL_508773, EPI_ISL_508774, EPI_ISL_508775, EPI_ISL_508776, EPI_ISL_508777, EPI_ISL_508778, EPI_ISL_508779, EPI_ISL_508780, EPI_ISL_508781, EPI_ISL_508782, EPI_ISL_508784, EPI_ISL_508786, EPI_ISL_508787, EPI_ISL_508788, EPI_ISL_508790, EPI_ISL_508791, EPI_ISL_508792, EPI_ISL_508793, EPI_ISL_508794, EPI_ISL_508795, EPI_ISL_508796, EPI_ISL_508797, EPI_ISL_508798, EPI_ISL_508799, EPI_ISL_508800, EPI_ISL_508801, EPI_ISL_508802, EPI_ISL_508803, EPI_ISL_508804, EPI_ISL_508805, EPI_ISL_508807, EPI_ISL_509716, EPI_ISL_509717, EPI_ISL_509718, EPI_ISL_509719, EPI_ISL_509721, EPI_ISL_509722, EPI_ISL_509723, EPI_ISL_509724, EPI_ISL_509725, EPI_ISL_509726, EPI_ISL_509727, EPI_ISL_509728, EPI_ISL_509729, EPI_ISL_509730, EPI_ISL_509731, EPI_ISL_509732, EPI_ISL_509733, EPI_ISL_509734, EPI_ISL_509735, EPI_ISL_509736, EPI_ISL_509737, EPI_ISL_509738, EPI_ISL_509739, EPI_ISL_509740, EPI_ISL_509741, EPI_ISL_509742, EPI_ISL_509743, EPI_ISL_509745, EPI_ISL_509746, EPI_ISL_509747, EPI_ISL_509748, EPI_ISL_509749, EPI_ISL_509750, EPI_ISL_509751, EPI_ISL_509752, EPI_ISL_509753, EPI_ISL_509754, EPI_ISL_509755, EPI_ISL_509756, EPI_ISL_509757, EPI_ISL_509758, EPI_ISL_509759, EPI_ISL_509760, EPI_ISL_509761, EPI_ISL_509762, EPI_ISL_509763, EPI_ISL_509764, EPI_ISL_509765, EPI_ISL_509766, EPI_ISL_509767, EPI_ISL_509769, EPI_ISL_509771, EPI_ISL_509772, EPI_ISL_509773, EPI_ISL_509774, EPI_ISL_514140, EPI_ISL_514141, EPI_ISL_514142, EPI_ISL_514143, EPI_ISL_514144, EPI_ISL_517871, EPI_ISL_526580, EPI_ISL_526581, EPI_ISL_568681, EPI_ISL_653153, EPI_ISL_653157, EPI_ISL_653181, EPI_ISL_653185, EPI_ISL_653253, EPI_ISL_653254, EPI_ISL_653255, EPI_ISL_653256, EPI_ISL_653257, EPI_ISL_653258, EPI_ISL_653259, EPI_ISL_653261, EPI_ISL_653263, EPI_ISL_653265, EPI_ISL_653266, EPI_ISL_653267, EPI_ISL_653268, EPI_ISL_653269, EPI_ISL_653272, EPI_ISL_653273, EPI_ISL_653274, EPI_ISL_653275, EPI_ISL_653276, EPI_ISL_653277, EPI_ISL_653278			
see above	Florida Bureau of Public Health Laboratories	Florida Bureau of Public Health Laboratories	Jason Blanton; Sarah Schmedes
EPI_ISL_541144, EPI_ISL_541237	Florida Bureau of Public Health Laboratories, Florida Department of Health	Florida Bureau of Public Health Laboratories, Florida Department of Health	Blanton, J.; Schmedes, S.
EPI_ISL_631563, EPI_ISL_631579, EPI_ISL_631586, EPI_ISL_631602, EPI_ISL_631606, EPI_ISL_631766, EPI_ISL_631787, EPI_ISL_631885, EPI_ISL_631891, EPI_ISL_631894, EPI_ISL_631906, EPI_ISL_631961, EPI_ISL_631964, EPI_ISL_631968, EPI_ISL_632003, EPI_ISL_632010, EPI_ISL_632018, EPI_ISL_632019, EPI_ISL_632020, EPI_ISL_632022, EPI_ISL_632024, EPI_ISL_632027, EPI_ISL_632097, EPI_ISL_632103, EPI_ISL_632104, EPI_ISL_632105, EPI_ISL_632119, EPI_ISL_632120, EPI_ISL_632122, EPI_ISL_632124, EPI_ISL_632125, EPI_ISL_632126, EPI_ISL_632127, EPI_ISL_632132, EPI_ISL_632133, EPI_ISL_632134, EPI_ISL_632137, EPI_ISL_632138, EPI_ISL_632139, EPI_ISL_632140, EPI_ISL_632144, EPI_ISL_632174, EPI_ISL_632181, EPI_ISL_632185, EPI_ISL_632190, EPI_ISL_632194, EPI_ISL_632196, EPI_ISL_632211, EPI_ISL_632212, EPI_ISL_632213, EPI_ISL_632222, EPI_ISL_632223, EPI_ISL_632224, EPI_ISL_632225, EPI_ISL_632226, EPI_ISL_632237, EPI_ISL_632947, EPI_ISL_632951, EPI_ISL_632952, EPI_ISL_632954, EPI_ISL_632955, EPI_ISL_632956, EPI_ISL_632960, EPI_ISL_632966, EPI_ISL_632967, EPI_ISL_632968			
see above	Flushing Hospital Medical Center	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_470882	Foerde Hospital, Department of Microbiology	Norwegian Institute of Public Health, Department of Virology	Hilde Elshaug; Kamilla Heddeland Instefjord; Karoline Bragstad; Kathrine Stene-Johansen; Olav Hungnes; Rasmus Riis Kopperud
EPI_ISL_455903, EPI_ISL_476139	Folkhalsomyndigheten	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Karin Tegmark-Wisell; Maria Lind Karlberg; Mattias Haukland; Olov Svartstrom; Oskar Karlsson Lindsjo; Petra Edquist; Reza Advani; Sandra Broddesson; Shamam Muradrasoli
EPI_ISL_434650, EPI_ISL_475536	Follinge Halsocentral	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Karin Tegmark-Wisell; Kerstin Persson Moberg; Maria Lind Karlberg; Mattias Haukland; Mia Brytting; Olov Svartstrom; Oskar Karlsson Lindsjo; Reza Advani; Sandra Broddesson; Theresa Erkkrth
EPI_ISL_413587	Foundation Elisabeth-Tweesteden Ziekenhuis	Erasmus Medical Center	Anne van der Linden; Annemiek van der Eijk; Aura Timen; Bas Oude Munnink; Claudia Schapendonk; Corien Swaan; Corine GeurtsvanKessel; David Nieuwenhuijse; Irina Chestakova; Jeroen van Kampen; Jolanda Voermans; Madelief Mollers; Manon Haverkate; Marion Koopmans; Mark Pronk; Mart Stein; Pascal Lexmond; Reina Sikkema; Richard Molenkamp; Sandra Kengne Kamga Mobou; on behalf of the Dutch national COVID-19 response team.
EPI_ISL_411060, EPI_ISL_411066, EPI_ISL_431118, EPI_ISL_431180, EPI_ISL_431240, EPI_ISL_431782, EPI_ISL_431783, EPI_ISL_431784, EPI_ISL_431785			
see above	Fujian Center for Disease Control and Prevention	Fujian Center for Disease Control and Prevention	Chen Wei; He Wenxiang; Huang Zhimiao; Lin Qi; Weng Yuwei; Zhang Yanhua
EPI_ISL_862839, EPI_ISL_862857	Fujita Health University Bantane Hospital	Fujita health University, School of Medicine, Department of Microbiology	Masahiro suzuki; Yohei Doi
EPI_ISL_862837, EPI_ISL_862838, EPI_ISL_862840, EPI_ISL_862841	Fujita Health University Hospital	Fujita health University, School of Medicine, Department of Microbiology	Masahiro suzuki; Yohei Doi
EPI_ISL_728000	Fujita Health University Okazaki Medical Center	Department of Virology and Parasitology, Fujita Health University School of Medicin	Aki Sakurai; Masahiro suzuki; Satoshi Komoto; Takayuki Murata; Takuma Ishihara; Tomihiko Ide; Yohei Doi
EPI_ISL_718273, EPI_ISL_727998, EPI_ISL_727999, EPI_ISL_728153, EPI_ISL_728154, EPI_ISL_728155, EPI_ISL_728156, EPI_ISL_728159			
see above	Fujita Health University Okazaki Medical Center	Department of Virology and Parasitology, Fujita Health University School of Medicine	Aki Sakurai; Masahiro suzuki; Satoshi Komoto; Takayuki Murata; Takuma Ishihara; Tomihiko Ide; Yohei Doi
EPI_ISL_728206, EPI_ISL_728207, EPI_ISL_728208	Fujita Health University Okazaki Medical Center	Fujita health University, Department of Microbiology	Aki Sakurai; Masahiro suzuki; Satoshi Komoto; Takayuki Murata; Takuma Ishihara; Tomihiko Ide; Yohei Doi
EPI_ISL_479967, EPI_ISL_479968, EPI_ISL_479969, EPI_ISL_479970, EPI_ISL_479971, EPI_ISL_479972, EPI_ISL_479973, EPI_ISL_479974, EPI_ISL_479975, EPI_ISL_479976, EPI_ISL_479977, EPI_ISL_479978, EPI_ISL_480120, EPI_ISL_480121, EPI_ISL_480122, EPI_ISL_480123, EPI_ISL_480124, EPI_ISL_480125, EPI_ISL_480128, EPI_ISL_480129			
see above	Fukui Prefectural Institute of Public Health and Environmental Science	Pathogen Genomics Center, National Institute of Infectious Diseases	Hajime Kamiya; Kentaro Itokawa; Makoto Kuroda; Masanori Hashino; Miho Toho; Motoi Suzuki; Rina Tanaka; Tsuyoshi Sekizuka
EPI_ISL_684421, EPI_ISL_684422, EPI_ISL_684429, EPI_ISL_684434, EPI_ISL_684435, EPI_ISL_684436, EPI_ISL_684437, EPI_ISL_684438, EPI_ISL_684439			
see above	Fukuoka Institute of Health and Environmental Sciences	Pathogen Genomics Center, National Institute of Infectious Diseases	Kentaro Itokawa; Makoto Kuroda; Masanori Hashino; Rina Tanaka; Tsuyoshi Sekizuka
EPI_ISL_419235, EPI_ISL_419236, EPI_ISL_419237	Fundacion Jimenez Diaz	Instituto de Salud Carlos III	Camarero, S.; Casas, I.; Cuesta, I.; Fernández, R.; González-Esguevillas, M.; Iglesias-Caballero, M.; Jiménez, M.; Jiménez, P.; Juliá, M.; Molinero Calamita, M.; Monzón, S.; Pozo, F.; Varona, S.; Zaballos, A.
EPI_ISL_462447, EPI_ISL_462448, EPI_ISL_462449	Fundació Lluita contra la SIDA (FLSida)/Hospital Universitari Germans Trias i Pujol	IrsiCaixa AIDS Research Lab	Bonaventura Clotet; Joaquim Segalés; Jorge Carrillo; Julia Blanco; Lidia Ruiz; Marc Corbacho; Marc Noguera-Julian; Maria Pilar Armengol; Maria Ubals; Mariona Parera; Nuria Izquierdo; Oriol Mitjà; Roger Paredes

EPI_ISL_462478	Fundación Jiménez Díaz	Instituto de Salud Carlos III	A. Monzón; F. Casas; I; I. Jiménez; Iglesias-Caballero; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; P. Jiménez; R. Fernández; S. Juliá; S. Pozo; S. Varona
EPI_ISL_420313	Furst Medical Laboratory	Norwegian Institute of Public Health, Department of Virology	Hilde Elshaug; Kamilla Heddeland Instefjord; Karoline Bragstad; Kathrine Stene-Johansen; Olav Hungnes
EPI_ISL_522549	Félix Guyon Hospital	UMR PIMIT Université de La Réunion	Camille Lebarbenchon; David Wilkinson; Patrick Mavingui
EPI_ISL_420786, EPI_ISL_420787, EPI_ISL_420788	GA Department of Public Health	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anne Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jasmine Padilla; Jing Zhang; Justin Lee; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_419556, EPI_ISL_419557, EPI_ISL_424858, EPI_ISL_424859, EPI_ISL_424861, EPI_ISL_424864, EPI_ISL_426417			
see above	GA Department of Public Health Laboratory	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jasmine Padilla; Jing Zhang; Justin Lee; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_418416, EPI_ISL_508878, EPI_ISL_509003, EPI_ISL_509004	GH Les Portes du Sud	CNR Virus des Infections Respiratoires - France SUD	Alexandre Gaymard; Antonin Bal; Bruno Lina; Carine Moustaud; Florence Morfin-Sherpa; Gregory Destras; Gwendolyne Burfin; Laurence Josset; Martine Valette; Maude Bouscambert-Duchamp; Raphaelle Lamy; Solenne Brun
EPI_ISL_428351, EPI_ISL_428352, EPI_ISL_428363	GH Nord Essonne Service de Biologie clinique	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Etienne Simon-Lorière; Flora Donati; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_583429, EPI_ISL_583434, EPI_ISL_583463, EPI_ISL_583464, EPI_ISL_583467	Garcia-Sastre Laboratory, Department of Microbiology, Icahn School of Medicine at Mount Sinai	van Bakel Laboratory, Genetics and Genomics Sciences, Icahn School of Medicine at Mount Sinai	Adolfo García-Sastre; Adriana van de Guchte; Ajay Obla; Ana S. Gonzalez-Reiche; Genovefa Papanicolaou; Gunjan Shah; Harm van Bakel; Jayeeta Dutta; Judith Aberg; Kent Sepkowitz; Miguel-Angel Perales; Ngolela Esther Babady; Sadaf Aslam; Teresa Aydillo; Tobias Hohl; Zenab Khan; and Mini Kamboj
EPI_ISL_475110, EPI_ISL_475115	Gavle klinisk mikrobiologi	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Karin Tegmark-Wisell; Maria Lind Karlberg; Mattias Haukland; Olov Svartstrom; Oskar Karlsson Lindsjo; Petra Edquist; Reza Advani; Sandra Broddesson; Shamam Muradrasoli
EPI_ISL_420855, EPI_ISL_420876, EPI_ISL_420877, EPI_ISL_430064	Geelong Centre for Emerging Infectious Diseases	Geelong Centre for Emerging Infectious Diseases	Alexandersen S.; Bhatta T.R.; Chamings A.; Chamings, A.; Raj Bhatta T.
EPI_ISL_406798, EPI_ISL_406800, EPI_ISL_406801	General Hospital of Central Theater Command of People's Liberation Army of China	BGI & Institute of Microbiology, Chinese Academy of Sciences & Shandong First Medical University & Shandong Academy of Medical Sciences & General Hospital of Central Theater Command of People's Liberation Army of China	Weifeng Shi and Zhenhong Hu; Weijun Chen; Yuhai Bi
EPI_ISL_1167779, EPI_ISL_1167782, EPI_ISL_1167789, EPI_ISL_1167793, EPI_ISL_1167807, EPI_ISL_1167821, EPI_ISL_1167824, EPI_ISL_1167830			
see above	Genetica Molecular and Subdepartamento de Virologia ISP Chile	Instituto de Salud Publica de Chile	Andres Castillo; Barbara Parra; Gisselle Barra; Jaime Lagos; Javier Tognarelli; Jorge Fernandez; Karen Orostica; Loredana Arata; Patricia Bustos; Rodrigo Fasce
EPI_ISL_452120, EPI_ISL_452125	Georgia Department of Health	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Montmayeur; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao; Zachary Weiner
EPI_ISL_594456	Georgia Public Health Laboratory	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Anna Uehara; Clinton Paden; Haibin Wang; Jing Zhang; Julu Bhatnagar; Krista Queen; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_539524, EPI_ISL_862567, EPI_ISL_862640	Gerencia de Asistencia Sanitaria de Soria	Instituto de Salud Carlos III	A. Monzón; C. Aldea; F. Casas; I; I. Jiménez; Iglesias-Caballero; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; P. Jiménez; S. Juliá; S. Pozo; S. Varona
EPI_ISL_539557	Gerencia del área de salud de Badajoz, Llerena y Zafra	Instituto de Salud Carlos III	A. Monzón; C. Pazos; F. Casas; I; I. Jiménez; Iglesias-Caballero; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; P. Jiménez; S. Juliá; S. Pozo; S. Varona
EPI_ISL_480083, EPI_ISL_480084, EPI_ISL_480085, EPI_ISL_480086, EPI_ISL_480087, EPI_ISL_480088, EPI_ISL_480089			
see above	Gifu Prefectural Institute of Public Health and Environmental Sciences	Pathogen Genomics Center, National Institute of Infectious Diseases	Hajime Kamiya; Kentaro Itokawa; Makoto Kuroda; Masanori Hashino; Motoi Suzuki; Rina Tanaka; Tsuyoshi Sekizuka; Yoshihiko Kameyama
EPI_ISL_452221	Goethe University Hospital Frankfurt	Institute for Medical Virology, Goethe University Hospital Frankfurt	Annemarie Berger; Björn Rotter; Denisa Bojkova; Jindrich Cinatl; Klaus Hoffmeier; Sandra Westhaus; Sandra Ciesek; Sebastian Hoehl; Tuna Toptan; and Marek Widera
EPI_ISL_1225382	Gorgas Memorial Laboratory of Health Studies	Gorgas Memorial Laboratory of Health Studies	Adriana Weeden; Alejandra Valoy; Alexander Martinez; Ambar Moreno; Anyuri Ortiz; Brechla Moreno; Claudia Gonzalez; Daniel Castillo; Danilo Franco; Davis Beltran; Dimelza Arauz; Elimelec Valdespino; Gretel Vasquez; Ilka Guerra; Isela Guerrero; Jessica Gondola; Jim Chang; Juan Miguel Pascale; Layda Abrego; Lisseth Saenz; Mabel Martinez-Montero; Maria Chen-German; Marlene Castillo; Melissa Gaitan; Oris Chavarria; Rita Corrales; Rita Rodriguez; Sandra Lopez-Verges; Yamilka Diaz; Yaneth Pitti; Zumara Chaverra
EPI_ISL_640040, EPI_ISL_640043, EPI_ISL_1040818, EPI_ISL_1040822	Groote Schuur Hospital wc GSH	NHLS/UCT	Arash Iranzadeh; Bruna Galvao; Carolyn Williamson; Deelan Doolabh; Diana Hardie; Innocent Mudau; Kruger Marais; Lynn Tyers; Marvin Hsiao; Stephen Korsman
EPI_ISL_447734, EPI_ISL_447735, EPI_ISL_447736, EPI_ISL_447738, EPI_ISL_447739, EPI_ISL_447740, EPI_ISL_447741, EPI_ISL_447742, EPI_ISL_447743, EPI_ISL_447744, EPI_ISL_447745, EPI_ISL_447746, EPI_ISL_447747, EPI_ISL_447748, EPI_ISL_447750, EPI_ISL_447754			
see above	Grupo de Investigaciones Microbiológicas-UR (GIMUR), Departamento de Biología, Facultad de Ciencias Naturales, Universidad del Rosario, Bogotá, Colombia	Grupo de Investigaciones Microbiológicas-UR (GIMUR), Departamento de Biología, Facultad de Ciencias Naturales, Universidad del Rosario, Bogotá, Colombia Instituto Nacional de Salud, Bogotá, Colombia Icahn School of Medicine at Mount Sinai, New York, USA	Adriana Castillo; Alberto Paniz-Mondolfi; Ana S. Gonzalez-Reiche; Angelica Rico; Anibal A. Teherán; Carolina Florez; Carolina Hernandez; David Martinez; Emilia Mia Sordillo; Esther C. Barros; Harm van Bakel; Jesus E. Jaimes; Juan David Ramirez; Laura Vega; Lisseth Pardo; Marina Muñoz; Martha L. Ospina; Matthew M. Hernandez; Nathalia Ballesteros; Sergio Castañeda; Sergio Gomez; Viviana Simon
EPI_ISL_406531	Guangdong Provincial Center for Diseases Contorl and Prevention; Guangdong Provinical Public Health	Guangdong Provincial Center for Disease Control and Prevention	Baisheng Li; Changwen Ke; Feng Ruan; Guanhao He; Haojie Zhong; Huihong Deng; Jianfeng He; Jianpeng Xiao; Jianxiang Geng; Jianxiong Hu; Jie Wu; Jing Lu; Lifeng Lin; Lijun Liang; Lirong Zou; Min Kang; Qi Zhu; Shujiang Mei; Songjian Xiao; Tao Liu; Tie Song; Weilin Zeng; Wenjun Ma; Xing Li; Xiujuan Tang; Xue Zhuang; Xuguang Chen; Ying Wang; Yingchao Song; Yingtao Zhang; Yuhuang Liao; Zhe Liu
EPI_ISL_406533	Guangdong Provincial Center for Diseases Contorl and Prevention; Guangdong Provinical Public Health	Guangdong Provincial Center for Diseases Control and Prevention	Baisheng Li; Changwen Ke; Feng Ruan; Guanhao He; Haojie Zhong; Huihong Deng; Jianfeng He; Jianpeng Xiao; Jianxiang Geng; Jianxiong Hu; Jie Wu; Jing Lu; Lifeng Lin; Lijun Liang; Lirong Zou; Min Kang; Qi Zhu; Shujiang Mei; Songjian Xiao; Tao Liu; Tie Song; Weilin Zeng; Wenjun Ma; Xing Li; Xiujuan Tang; Xue Zhuang; Xuguang Chen; Ying Wang; Yingchao Song; Yingtao Zhang; Yuhuang Liao; Zhe Liu
EPI_ISL_403932, EPI_ISL_403933, EPI_ISL_403934, EPI_ISL_403935, EPI_ISL_403936, EPI_ISL_403937	Guangdong Provincial Center for Diseases Control and Prevention; Guangdong Provincial Public Health	Department of Microbiology, Guangdong Provincial Center for Diseases Control and Prevention	Baisheng Li; Changwen Ke; Feng Ruan; Guanhao He; Haojie Zhong; Huihong Deng; Jianfeng He; Jianpeng Xiao; Jianxiang Geng; Jianxiong Hu; Jie Wu; Jing Lu; Lifeng Lin; Lijun Liang; Lirong Zou; Min Kang; Qi Zhu; Shujiang Mei; Songjian Xiao; Tao Liu; Tie Song; Weilin Zeng; Wenjun Ma; Xing Li; Xiujuan Tang; Xue Zhuang; Xuguang Chen; Ying Wang; Yingchao Song; Yingtao Zhang; Yuhuang Liao; Zhe Liu
EPI_ISL_406534, EPI_ISL_406535, EPI_ISL_406536	Guangdong Provincial Center for Diseases Control and Prevention; Guangdong Provincial Public Health	Guangdong Provincial Center for Diseases Control and Prevention	Baisheng Li; Changwen Ke; Feng Ruan; Guanhao He; Haojie Zhong; Huihong Deng; Jianfeng He; Jianpeng Xiao; Jianxiang Geng; Jianxiong Hu; Jie Wu; Jing Lu; Lifeng Lin; Lijun Liang; Lirong Zou; Min Kang; Qi Zhu; Shujiang Mei; Songjian Xiao; Tao Liu; Tie Song; Weilin Zeng; Wenjun Ma; Xing Li; Xiujuan Tang; Xue Zhuang; Xuguang Chen; Ying Wang; Yingchao Song; Yingtao Zhang; Yuhuang Liao; Zhe Liu
EPI_ISL_406538	Guangdong Provincial Center for Diseases Control and Prevention;Guangdong Provincial Institute of Public Health	Guangdong Provincial Center for Diseases Control and Prevention	Baisheng Li; Changwen Ke; Feng Ruan; Guanhao He; Haojie Zhong; Huihong Deng; Jianfeng He; Jianpeng Xiao; Jianxiang Geng; Jianxiong Hu; Jie Wu; Jing Lu; Lifeng Lin; Lijun Liang; Lirong Zou; Min Kang; Qi Zhu; Shujiang Mei; Songjian Xiao; Tao Liu; Tie Song; Weilin Zeng; Wenjun Ma; Xing Li; Xiujuan Tang; Xue Zhuang; Xuguang Chen; Ying Wang; Yingchao Song; Yingtao Zhang; Yuhuang Liao; Zhe Liu
EPI_ISL_428441, EPI_ISL_428442, EPI_ISL_428443, EPI_ISL_428444, EPI_ISL_428445, EPI_ISL_428446, EPI_ISL_428447, EPI_ISL_428448, EPI_ISL_428449, EPI_ISL_428452, EPI_ISL_428454, EPI_ISL_428455, EPI_ISL_428456, EPI_ISL_428457, EPI_ISL_428458, EPI_ISL_428460, EPI_ISL_428461, EPI_ISL_428462, EPI_ISL_428463, EPI_ISL_428464, EPI_ISL_428465, EPI_ISL_428466, EPI_ISL_428467, EPI_ISL_428468, EPI_ISL_428469, EPI_ISL_428470, EPI_ISL_428471, EPI_ISL_428472, EPI_ISL_428473, EPI_ISL_428474, EPI_ISL_428475, EPI_ISL_428476, EPI_ISL_428477, EPI_ISL_428478			
see above	Guangdong Provincial Center for Diseases Control and Prevention;Guangdong Provincial Institute of Public Health	School of Public Health, The University of Hong Kong	Bosheng Li; Hanri Zeng; Haogao Gu; Hui-Ling Yen; Jie Wu; Leo L.M. Poon; Lijun Liang; Tie Song; Yao Hu; Yingchao Song; Zhencui Li
EPI_ISL_413851, EPI_ISL_413852, EPI_ISL_413853, EPI_ISL_413854, EPI_ISL_413855, EPI_ISL_413856, EPI_ISL_413857, EPI_ISL_413858, EPI_ISL_413860, EPI_ISL_413861, EPI_ISL_413862, EPI_ISL_413863, EPI_ISL_413864, EPI_ISL_413866, EPI_ISL_413867, EPI_ISL_413875, EPI_ISL_413884			

see above	Guangdong Provincial Institution of Public Health, Guangdong Provinical Center for Disease Control and Prevention	Guangdong Provincial Institution of Public Health	Andrew Rambaut; Bo Peng; Changwen Ke; Chuming Liang; Huanying Zheng; Huifang Lin; Jing Lu; Jingju Peng; Jiufeng Sun; Josh Quick; Juan Su; Kang Min; Kuibiao Li; Lilian Zeng; Liu Zhe; Louis du Plessis; Minfeng Liang; Moritz Kraemer; Nick Loman; Nuno Faria; Oliver Pybus; Pingping Zhou; Qianlin Xiong; Ru bai; Ruilin Sun; Runyu Yuan; Sarah François; Shisong Fang; Song Tie; Tao Liu; Verity Hill; Wei Li; Wenjun Ma; Wenzhe Su; Xi Tang
EPI_ISL_509695, EPI_ISL_509696, EPI_ISL_509697, EPI_ISL_509698, EPI_ISL_509699, EPI_ISL_509700, EPI_ISL_509701, EPI_ISL_509702, EPI_ISL_509703, EPI_ISL_509710			
see above	Guatemala Ministry of Public Health	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Anna Uehara; Clinton Paden; Haibin Wang; Jing Zhang; Krista Queen; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_418186	Gundersen Molecular Diagnostic Laboratory	Kabara Cancer Research Institute	Craig S. Richmond & Paraic A. Kenny
EPI_ISL_418184, EPI_ISL_418187, EPI_ISL_418188, EPI_ISL_419651, EPI_ISL_419652, EPI_ISL_422453, EPI_ISL_422465			
see above	Gundersen Molecular Diagnostics Laboratory	Kabara Cancer Research Institute	Craig S. Richmond; Craig S. Richmond & Paraic A. Kenny; Paraic A. Kenny
EPI_ISL_479850, EPI_ISL_479851, EPI_ISL_479853, EPI_ISL_479854, EPI_ISL_479896, EPI_ISL_479897, EPI_ISL_479898, EPI_ISL_479899, EPI_ISL_479900, EPI_ISL_479901, EPI_ISL_480015, EPI_ISL_480016, EPI_ISL_480017, EPI_ISL_480018, EPI_ISL_480019, EPI_ISL_480020			
see above	Gunma Prefectural Institute of Public Health and Environmental Sciences	Pathogen Genomics Center, National Institute of Infectious Diseases	Hajime Kamiya; Hiroyuki Tsukagoshi; Kentaro Itokawa; Makoto Kuroda; Masanori Hashino; Motoi Suzuki; Rina Tanaka; Tsuyoshi Sekizuka
EPI_ISL_421454, EPI_ISL_421458, EPI_ISL_421481, EPI_ISL_421487, EPI_ISL_421491	H Beatriz Angelo	Instituto Nacional de Saude (INSA)	Guiomar et al
EPI_ISL_418003, EPI_ISL_418007, EPI_ISL_418008, EPI_ISL_418019, EPI_ISL_418020, EPI_ISL_418021, EPI_ISL_418022			
see above	H Braga	Instituto Nacional de Saude (INSA)	Guiomar et al
EPI_ISL_421457	H Dr Nelio Mendonca - Funchal	Instituto Nacional de Saude (INSA)	Guiomar et al
EPI_ISL_418026, EPI_ISL_421449, EPI_ISL_421459, EPI_ISL_421460, EPI_ISL_421461	H Dr. Nelio Mendonca - Funchal	Instituto Nacional de Saude (INSA)	Guiomar et al
EPI_ISL_418023, EPI_ISL_421466, EPI_ISL_421467	H Evora	Instituto Nacional de Saude (INSA)	Guiomar et al
EPI_ISL_418018	H Garcia de Orta	Instituto Nacional de Saude (INSA)	Guiomar et al
EPI_ISL_421446, EPI_ISL_421447, EPI_ISL_421448	H Guimaraes	Instituto Nacional de Saude (INSA)	Guiomar et al
EPI_ISL_418025, EPI_ISL_421462, EPI_ISL_421468, EPI_ISL_421469, EPI_ISL_421470, EPI_ISL_421471, EPI_ISL_421488, EPI_ISL_421490, EPI_ISL_421492, EPI_ISL_421495			
see above	H Santarem	Instituto Nacional de Saude (INSA)	Guiomar et al
EPI_ISL_455587	H.R.H. Maha Chakri Sirindhorn Medical Center	National Institute of Health. Department of medical Sciences, Ministry of Public Health, Thailand	Chittaganpitch; Malinee; Okada; Parnmen; Phuygun; Pilailuk; Siripaporn; Sittiporn; Sunthareeya; Thanadachakul; Thanutsapa; Waicharoen; Warawan; Wongboot
EPI_ISL_426420, EPI_ISL_426421	HI Dept. of Health, State Laboratories Division	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_445323	HOSP.ENFERMEDADES INFECCIOSAS	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445281	HOSPITAL CLINICO DEL SUR	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445275	HOSPITAL CLINICO FUSAT	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445335	HOSPITAL DE CALBUCO	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445251, EPI_ISL_445305	HOSPITAL DE CARABINEROS	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_419238	HOSPITAL DE CRUCES.	Instituto de Salud Carlos III	A. Monzón; F. Casas; I. Aranzamendi, M.; I. Jiménez; Iglesias-Caballero; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; P. Jiménez; S. Juliá; S. Pozo; S. Varona
EPI_ISL_445300	HOSPITAL DE RANCAGUA	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445360, EPI_ISL_445368	HOSPITAL DEL PROFESOR	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445270, EPI_ISL_445340, EPI_ISL_445342, EPI_ISL_445343, EPI_ISL_445344, EPI_ISL_445345, EPI_ISL_445346, EPI_ISL_445347, EPI_ISL_445348, EPI_ISL_447119			
see above	HOSPITAL DR.HERNAN HENRIQUEZ ARAVENA	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445310, EPI_ISL_445329, EPI_ISL_445365, EPI_ISL_445366, EPI_ISL_445371	HOSPITAL DR.SOTERO DEL RIO	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445313, EPI_ISL_445314, EPI_ISL_445364	HOSPITAL EL CARMEN DR.LUIS VALENTIN F.	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445372	HOSPITAL FF.AA. "CIRUJANO C. GUZMAN	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_418247	HOSPITAL GENERAL DE SEGOVIA	Instituto de Salud Carlos III	A. Monzón; F. Casas; I. Hernando-Real S.; I. Jiménez; Iglesias-Caballero; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; P. Jiménez; S. Juliá; S. Pozo; S. Varona
EPI_ISL_445286	HOSPITAL HANGA ROA	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445331, EPI_ISL_445332	HOSPITAL HERMINDA MARTIN CHILLAN	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445289	HOSPITAL NAVAL PUERTO WILLIAMS	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445327	HOSPITAL PADRE HURTADO	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade

EPI_ISL_445268, EPI_ISL_445269, EPI_ISL_445280, EPI_ISL_445284, EPI_ISL_445288, EPI_ISL_445293, EPI_ISL_445294			
see above	HOSPITAL REG.LAUTARO NAVARRO AVARIA	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445307	HOSPITAL SAN JOSE DE MAIPO	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445304	HOSPITAL SAN JUAN DE DIOS	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_417007	HOSPITAL SANTA MARIA NAI	Instituto de Salud Carlos III	A. Monzón; I. García Costa, J.; Iglesias-Caballero; M. Camarero S. Pozo F. Casas I. Jiménez; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; P. Jiménez; S. Juliá; S. Varona
EPI_ISL_418253, EPI_ISL_419240, EPI_ISL_419709	HOSPITAL TXAGORRITXU	Instituto de Salud Carlos III	A. Monzón; C; F. Casas; I. Gomez-Gonzalez C.; I. Gómez; I. Gómez, C.; I. Jiménez; Iglesias-Caballero; M. Camarero; M. Camarero S. Pozo F. Casas I. Jiménez; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; P. Jiménez; S. Juliá; S. Pozo; S. Varona
EPI_ISL_418251	HOSPITAL UNIVERSITARIO LA PAZ	Instituto de Salud Carlos III	A. Monzón; F. Casas; I. Jiménez; I. Romero P.; Iglesias-Caballero; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; P. Jiménez; S. Juliá; S. Pozo; S. Varona
EPI_ISL_418243, EPI_ISL_418244	HOSPITAL UNIVERSITARIO VIRGEN DE LAS NIEVES	Instituto de Salud Carlos III	A. Monzón; F. Casas; I. Jiménez; I. Sanbonmatsu S.; Iglesias-Caballero; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; P. Jiménez; S. Juliá; S. Pozo; S. Varona
EPI_ISL_430847	HS mikrobiologi virus	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Karin Tegmark-Wisell; Maria Lind Karlberg; Olov Svartstrom; Oskar Karlsson Lindsjo; Shaman Muradrasoli; Zhibing Yun
EPI_ISL_418009, EPI_ISL_421463, EPI_ISL_421489, EPI_ISL_421494	HSE Ilha Terceira - Angra do Heroismo	Instituto Nacional de Saude (INSA)	Guiomar et al
EPI_ISL_454436, EPI_ISL_454437, EPI_ISL_454438, EPI_ISL_454439, EPI_ISL_454440, EPI_ISL_454441, EPI_ISL_454442, EPI_ISL_454443, EPI_ISL_454444, EPI_ISL_454445, EPI_ISL_454446, EPI_ISL_455902, EPI_ISL_469073, EPI_ISL_469074, EPI_ISL_475093, EPI_ISL_475094, EPI_ISL_475096, EPI_ISL_475097, EPI_ISL_475098, EPI_ISL_475100, EPI_ISL_475114, EPI_ISL_475116, EPI_ISL_475548, EPI_ISL_475553, EPI_ISL_475556, EPI_ISL_548247			
see above	Halmstad klinisk mikrobiologi	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Karin Tegmark-Wisell; Maria Lind Karlberg; Mattias Haukland; Mia Brytting; Olov Svartstrom; Oskar Karlsson Lindsjo; Petra Edquist; Reza Advani; Sandra Broddesson; Shamam Muradrasoli; Shaman Muradrasoli
EPI_ISL_418510	Hangzhou Center for Disease Control and Prevention	Insepction Center of Hangzhou Center for Disease Control and Prevention	Li jun; Pan jingcao; Wang haoqiu; Yu hua; Yu xinfeng
EPI_ISL_418506	Hangzhou Center for Disease Control and Prevention	Inspection Center of Hanghzou Center for Disease Control and Prevention	Li jun; Pan jingcao; Wang haoqiu; Yu hua; Yu xinfeng
EPI_ISL_418441, EPI_ISL_418442, EPI_ISL_418502, EPI_ISL_418503, EPI_ISL_418504, EPI_ISL_418507, EPI_ISL_418508, EPI_ISL_418509, EPI_ISL_418511, EPI_ISL_418512, EPI_ISL_418513, EPI_ISL_418514, EPI_ISL_418515			
see above	Hangzhou Center for Disease Control and Prevention	Inspection Center of Hangzhou Center for Disease Control and Prevention	Li jun; Pan jingcao; Wang haoqiu; Yu hua; Yu xinfeng
EPI_ISL_421221, EPI_ISL_421222, EPI_ISL_421224, EPI_ISL_421225, EPI_ISL_421226, EPI_ISL_421227, EPI_ISL_421228, EPI_ISL_421229, EPI_ISL_421230, EPI_ISL_421231, EPI_ISL_421232, EPI_ISL_421233, EPI_ISL_421234, EPI_ISL_421235, EPI_ISL_421236, EPI_ISL_482575, EPI_ISL_482576, EPI_ISL_482577, EPI_ISL_482578, EPI_ISL_482579, EPI_ISL_482580, EPI_ISL_482581, EPI_ISL_482582, EPI_ISL_482583, EPI_ISL_482584, EPI_ISL_482585, EPI_ISL_482586			
see above	Hangzhou Center for Diseases Control and Prevention	Hangzhou Center for Diseases Control and Prevention	Haoqiu Wang; Hua Yu; Jun Li; Junfang Chen; Lingfeng Mao; Shuchang Chen; Xin Qian; Xinfen Yu; Xuchu Wang; Zhou Sun
EPI_ISL_883158, EPI_ISL_883159, EPI_ISL_883160, EPI_ISL_883161, EPI_ISL_883162, EPI_ISL_883163	Hannover Medical School, Institute of Virology	Hannover Medical School, Institute of Virology	Jasper Götting; Lars Steinbrück
EPI_ISL_413487	Harborview Medical Center	University of Washington Virology Lab	Alexander Greninger; Arun Nalla; Hong Xie; Keith Jerome; Pavitra Roychoudhury
EPI_ISL_429256	Health Sciences Technology Park, Avicena, 8, 18016 Granada. Spain	Sequencing and Bioinformatics Service FISABIO-Public Health	Almudena Rojas; Joaquín Mendoza; Pablo Mendoza
EPI_ISL_540993, EPI_ISL_540994, EPI_ISL_540995, EPI_ISL_540996, EPI_ISL_540997, EPI_ISL_540998, EPI_ISL_540999, EPI_ISL_541000, EPI_ISL_541001			
see above	Health and Environmental Research Institute of Gwangju Metropolitan city	Health and Environmental Research Institute of Gwangju Metropolitan city	Ji-eun Lee; Min Ji Kim
EPI_ISL_451310, EPI_ISL_451311	Hellenic Pasteur Institute, National Influenza Reference laboratory of Southern Greece & Unit of Bioinformatics and Applied Genomics	Hellenic Pasteur Institute, National Influenza Reference laboratory of Southern Greece & Unit of Bioinformatics and Applied Genomics	Andreas Mentis; Androniki Voulgari-Kokota; Antonios Kalliaropoulos; Aspasia Kontou; Athanasios Kossyvakis; Evangelidou Maria; Horefti Elina; Timokratis Karamitros; Vasiliki Pogka
EPI_ISL_430469	Hellenic Pasteur Institute, Public Health Laboratories	Hellenic Pasteur Institute, Public Health Laboratories, Unit of Bioinformatics and Applied Genomics	Andreas Mentis; Androniki Voulgari-Kokota; Antonios Kalliaropoulos; Aspasia Kontou; Athanasios Kossyvakis; Evangelidou Maria; Horefti Elina; Timokratis Karamitros; Vasiliki Pogka
EPI_ISL_450525, EPI_ISL_450526, EPI_ISL_450527, EPI_ISL_450528, EPI_ISL_450529	Hematology Laboratory, Section of Molecular Diagnostics, University Clinical Centre, Medical University of Gdansk	Department of Virology, Faculty of Medicine, University of Helsinki, Helsinki, Finland	Aneta Szulc; Maciej Grzybek; Marlena Robakowska; Olli Vapalahti; Teemu Smura
EPI_ISL_1303471	Henry Mayo Newhall Hospital	Los Angeles County PHL	P. Hemarajata et al.
EPI_ISL_479903, EPI_ISL_479904, EPI_ISL_479905, EPI_ISL_479906, EPI_ISL_479907, EPI_ISL_479908, EPI_ISL_479909, EPI_ISL_479910, EPI_ISL_479911, EPI_ISL_479912			
see above	Himeji City Institute of Environment and Health	Pathogen Genomics Center, National Institute of Infectious Diseases	Hajime Kamiya; Kentaro Itokawa; Makoto Kuroda; Masanori Hashino; Motoi Suzuki; Rina Tanaka; Tsuyoshi Sekizuka
EPI_ISL_480178, EPI_ISL_480179	Hiroshima City Institute of Public Health	Pathogen Genomics Center, National Institute of Infectious Diseases	Hajime Kamiya; Kentaro Itokawa; Kota Noritsune; Makoto Kuroda; Masanori Hashino; Motoi Suzuki; Rina Tanaka; Tsuyoshi Sekizuka
EPI_ISL_479812, EPI_ISL_479813, EPI_ISL_479814, EPI_ISL_479815, EPI_ISL_479816, EPI_ISL_479817, EPI_ISL_479818, EPI_ISL_479819, EPI_ISL_479820			
see above	Hokkaido Institute of Public Health	Pathogen Genomics Center, National Institute of Infectious Diseases	Hajime Kamiya; Kentaro Itokawa; Makoto Kuroda; Masanori Hashino; Motoi Suzuki; Rika Komagome; Rina Tanaka; Tsuyoshi Sekizuka
EPI_ISL_412028, EPI_ISL_412030	Hong Kong Department of Health	School of Public Health, The University of Hon g Kong	Daniel K.W. Chu; Dominic N.C. Tsang; Leo L.M. Poon; Malik Peiris
EPI_ISL_414517, EPI_ISL_414519, EPI_ISL_414527, EPI_ISL_414528, EPI_ISL_414569, EPI_ISL_414571, EPI_ISL_476801, EPI_ISL_476802, EPI_ISL_476803, EPI_ISL_476804			
see above	Hong Kong Department of Health	School of Public Health, The University of Hong Kong	Daniel K.W. Chu; Dominic N.C. Tsang; Leo L.M. Poon; Malik Peiris
EPI_ISL_412029	Hong Kong Department of Health	The University of Hong Kong	Daniel K.W. Chu; Dominic N.C. Tsang; Leo L.M. Poon; Malik Peiris
EPI_ISL_560581, EPI_ISL_560582, EPI_ISL_560583	Hopital	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Etienne Simon-Lorière; Fabiana Gambaro; Maud Vanpeene; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_418427	Hopital Privé de l'Est Lyonnais	CNR Virus des Infections Respiratoires - France SUD	Alexandre Gaymard; Antonin Bal; Bruno Lina; Carine Moustaud; Florence Morfin-Sherpa; Gregory Destras; Gwendolyne Burfin; Laurence Josset; Martine Valette; Maude Bouscambert-Duchamp; Raphaelle Lamy; Solenne Brun
EPI_ISL_418229	Hopital franco britannique - Laboratoire	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Etienne Simon-Lorière; Flora Donati; Marianne Asso Bonnet; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf

EPI_ISL_416501	Hopital franco britannique - Service des Urgences	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Etienne Simon-Lorière; Flora Donati; Marion Barbet; Maud Vanpeene; Méline Bizard; Mélnie Albert; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_515564	Hosp. Municipal Prof. Dr. Alípio Corrêa Netto	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes
EPI_ISL_560620, EPI_ISL_560621, EPI_ISL_560622, EPI_ISL_560623, EPI_ISL_560624, EPI_ISL_560625, EPI_ISL_560626, EPI_ISL_560627			
see above	Hospital	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Etienne Simon-Lorière; Fabiana Gambaro; Maud Vanpeene; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_434366, EPI_ISL_434368, EPI_ISL_434372, EPI_ISL_434373, EPI_ISL_434375, EPI_ISL_434376, EPI_ISL_450724, EPI_ISL_450725, EPI_ISL_450726, EPI_ISL_450727, EPI_ISL_450728, EPI_ISL_450729, EPI_ISL_450730, EPI_ISL_450731			
see above	Hospital AZ Rivierenland	Institute of Tropical Medicine	; Colin Anthony; Philippe Selhorst
EPI_ISL_471554	Hospital Bosque da Saúde	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes
EPI_ISL_539559, EPI_ISL_539560	Hospital Campo Arañuelo	Instituto de Salud Carlos III	A. Monzón; F. Casas; G. Rodríguez; I; I. Jiménez; Iglesias-Caballero; J. López; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; P. Jiménez; S. Juliá; S. Pozo; S. Varona
EPI_ISL_462479	Hospital Clinic	Instituto de Salud Carlos III	A. Monzón; F. Casas; I; I. Jiménez; Iglesias-Caballero; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; M.A Marcos; P. Jiménez; S. Juliá; S. Pozo; S. Varona
EPI_ISL_491441, EPI_ISL_491442, EPI_ISL_491455	Hospital Clínica Bíblica	Inciensa, Instituto Costarricense de Investigación y Enseñanza en Nutrición y Salud	Adriana Godinez & Melany Calderon; Claudio Soto-Garita; Estela Cordero; Francisco Duarte; Hebleen Brenes
EPI_ISL_539549, EPI_ISL_539550, EPI_ISL_539551, EPI_ISL_539552, EPI_ISL_539553, EPI_ISL_539554, EPI_ISL_539555, EPI_ISL_539556, EPI_ISL_862627, EPI_ISL_862628, EPI_ISL_862629, EPI_ISL_862630, EPI_ISL_862631, EPI_ISL_862632, EPI_ISL_862633, EPI_ISL_862634, EPI_ISL_862635, EPI_ISL_862636			
see above	Hospital Clínic	Instituto de Salud Carlos III	A. Monzón; F. Casas; I; I. Jiménez; I. Marcos; Iglesias-Caballero; M. Pozo; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; M.A Marcos; M.A.; M.Camarero; P. Jiménez; S. Juliá; S. Molinero Calamita; S. Pozo; S. Varona
EPI_ISL_539500, EPI_ISL_539501, EPI_ISL_539502, EPI_ISL_539509, EPI_ISL_539510, EPI_ISL_539511, EPI_ISL_539512, EPI_ISL_578190, EPI_ISL_578191			
see above	Hospital Clínico Universitario Lozano Blesa	Instituto de Salud Carlos III	A. Monzón; F. Casas; I; I. Jiménez; Iglesias-Caballero; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; P. Jiménez; R. Benito; S. Juliá; S. Pozo; S. Varona
EPI_ISL_510268, EPI_ISL_510269, EPI_ISL_510271, EPI_ISL_510272, EPI_ISL_510273, EPI_ISL_510274, EPI_ISL_510275, EPI_ISL_510277, EPI_ISL_510279, EPI_ISL_510280, EPI_ISL_510281, EPI_ISL_510283, EPI_ISL_510284, EPI_ISL_510285, EPI_ISL_510286, EPI_ISL_510288, EPI_ISL_510290, EPI_ISL_510291, EPI_ISL_510292, EPI_ISL_510293, EPI_ISL_510294, EPI_ISL_510296, EPI_ISL_510297, EPI_ISL_510298, EPI_ISL_510300, EPI_ISL_510301, EPI_ISL_510302, EPI_ISL_510303			
see above	Hospital Clínico Universitario de Santiago de Compostela	SeqCOVID-SPAIN consortium/IBV(CSIC)	Amparo Coira Nieto; Antonio Aguilera Guirao; Gema Barbeito Castiñeiras; José Javier Costa Alcalde; Mª Luisa Pérez del Molino Bernal; Rocio Trastoy Pena and SeqCOVID-SPAIN consortium
EPI_ISL_455344, EPI_ISL_455345, EPI_ISL_455346, EPI_ISL_455347, EPI_ISL_455348, EPI_ISL_455349	Hospital Comarcal de Melilla	Instituto de Salud Carlos III	A. Monzón; F. Casas; I; I. Jiménez; I. Pérez; Iglesias-Caballero; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; P. Jiménez; S. Juliá; S. Pozo; S. Varona
EPI_ISL_574592	Hospital Domingos Leonardo Ceravolo Presidente Prudente	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes; Karoline Rodrigues Campos
EPI_ISL_491447	Hospital Fernando Escalante Pradilla	Inciensa, Instituto Costarricense de Investigación y Enseñanza en Nutrición y Salud	Adriana Godinez & Melany Calderon; Claudio Soto-Garita; Estela Cordero; Francisco Duarte; Hebleen Brenes
EPI_ISL_912273	Hospital General Universitario Gregorio Marañón	SeqCOVID-SPAIN consortium / IBV (CSIC)	Darío García de Viedma; Julia Suárez; Laura Pérez-Lago; Marta Herranz; Patricia Muñoz and SeqCOVID-SPAIN consortium; Pedro J Sola-Campoy; Pilar Catalán; Sergio Buenestado-Serrano; Víctor Manuel de la Cueva
EPI_ISL_481043, EPI_ISL_481044, EPI_ISL_481051, EPI_ISL_481052, EPI_ISL_481054, EPI_ISL_481055, EPI_ISL_481056, EPI_ISL_481057, EPI_ISL_481058, EPI_ISL_481059, EPI_ISL_481060, EPI_ISL_481066, EPI_ISL_481075, EPI_ISL_481077, EPI_ISL_481083, EPI_ISL_481086, EPI_ISL_481087, EPI_ISL_481089, EPI_ISL_481094, EPI_ISL_481096, EPI_ISL_481097, EPI_ISL_481103, EPI_ISL_510113, EPI_ISL_510117, EPI_ISL_510122, EPI_ISL_510146, EPI_ISL_510149, EPI_ISL_510165, EPI_ISL_510166, EPI_ISL_510167, EPI_ISL_510168, EPI_ISL_510169, EPI_ISL_510170, EPI_ISL_510171, EPI_ISL_510172, EPI_ISL_510173, EPI_ISL_510174, EPI_ISL_510176, EPI_ISL_510178, EPI_ISL_510180, EPI_ISL_510182, EPI_ISL_510183, EPI_ISL_510185, EPI_ISL_510186, EPI_ISL_510190, EPI_ISL_510191, EPI_ISL_510192, EPI_ISL_510193, EPI_ISL_510194, EPI_ISL_510195, EPI_ISL_510196, EPI_ISL_510199, EPI_ISL_510201, EPI_ISL_510202, EPI_ISL_510203, EPI_ISL_510204, EPI_ISL_510205, EPI_ISL_510207, EPI_ISL_510211, EPI_ISL_510212, EPI_ISL_510213, EPI_ISL_510216, EPI_ISL_510217, EPI_ISL_510218, EPI_ISL_510220, EPI_ISL_510221, EPI_ISL_510222, EPI_ISL_510223, EPI_ISL_510224, EPI_ISL_510225, EPI_ISL_510226, EPI_ISL_510227, EPI_ISL_510228, EPI_ISL_510231, EPI_ISL_510232, EPI_ISL_510233, EPI_ISL_510236, EPI_ISL_510237, EPI_ISL_510238, EPI_ISL_510240, EPI_ISL_541878, EPI_ISL_654082, EPI_ISL_654083, EPI_ISL_654084, EPI_ISL_654187, EPI_ISL_654188			
see above	Hospital General Universitario Gregorio Marañón	SeqCOVID-SPAIN consortium/IBV(CSIC)	Darío García de Viedma; Darío García de Viedma and SeqCOVID-SPAIN consortium; Jon Sicilia; Julia Suárez; Laura Pérez-Lago; Marta Herranz; Patricia Muñoz; Patricia Muñoz and SeqCOVID-SPAIN consortium; Pilar Catalán
EPI_ISL_539523	Hospital General de Segovia	Instituto de Salud Carlos III	A. Monzón; F. Casas; I; I. Jiménez; Iglesias-Caballero; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; P. Jiménez; S. Hernando; S. Juliá; S. Pozo; S. Varona
EPI_ISL_418245, EPI_ISL_418246	Hospital General y Universitario de Guadalajara	Instituto de Salud Carlos III	A. Monzón; F. Casas; I. Gonzalez-Praetorius A.; I. Jiménez; Iglesias-Caballero; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; P. Jiménez; S. Juliá; S. Pozo; S. Varona
EPI_ISL_523971	Hospital Geral Santa Marcelina	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes
EPI_ISL_861636	Hospital Geral de Sao Mateus São Paulo	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes; Karoline Rodrigues Campos
EPI_ISL_515555	Hospital Geral de Vila Nova Cachoeirinha	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes
EPI_ISL_574595	Hospital Geral de Vila Penteado Dr. Jose Pamgella	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes; Karoline Rodrigues Campos
EPI_ISL_871974, EPI_ISL_871975, EPI_ISL_871979	Hospital Infanta Cristina	Instituto de Salud Carlos III	A. Monzón; F. Casas; I. García, P.; I. Jiménez; Iglesias-Caballero; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Pozo; M. Zaballos; P. Jiménez; S. Juliá; S. Molinero Calamita; S. Varona
EPI_ISL_524462	Hospital Metropolitano	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes
EPI_ISL_527739	Hospital Mexico [San Jose/San Jose]	Inciensa, Instituto Costarricense de Investigación y Enseñanza en Nutrición y Salud	Adriana Godinez & Melany Calderon; Claudio Soto-Garita; Estela Cordero; Francisco Duarte; Hebleen Porras
EPI_ISL_515541	Hospital Montemagno	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes
EPI_ISL_468311, EPI_ISL_468312	Hospital Municipal Dr Ignacio Proenca de Gouvea	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes
EPI_ISL_515521	Hospital Municipal Dr Waldemar Tebaldi	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes
EPI_ISL_515548	Hospital Municipal Dr. Jose Soares Hungria	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes
EPI_ISL_527862	Hospital Municipal de Urgência	Instituto Adolfo Lutz, Interdiciplinary Procedures Center,	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes

		Strategic Laboratory	
EPI_ISL_468308, EPI_ISL_515520, EPI_ISL_515526, EPI_ISL_515546, EPI_ISL_515551	Hospital Municipal do Tatuape Carmino Caricchio	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes
EPI_ISL_491451	Hospital México	Inciensa, Instituto Costarricense de Investigación y Enseñanza en Nutrición y Salud	Adriana Godinez & Melany Calderon; Claudio Soto-Garita; Estela Cordero; Francisco Duarte; Hebleen Brenes
EPI_ISL_539496	Hospital Nostra Senyora de Meritxell	Instituto de Salud Carlos III	A. Monzón; F. Casas; F. Fernández; I; I. Jiménez; Iglesias-Caballero; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; P. Jiménez; S. Juliá; S. Pozo; S. Varona
EPI_ISL_539525, EPI_ISL_862637	Hospital Nuestra Señora de Sonsoles	Instituto de Salud Carlos III	A. Monzón; A. San Pedro; F. Casas; I; I. Jiménez; Iglesias-Caballero; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; P. Jiménez; S. Juliá; S. Pozo; S. Varona
EPI_ISL_419386, EPI_ISL_419387	Hospital Prof. Doutor Fernando Fonseca, EPE	Instituto Gulbenkian de Ciência	Cathy Paulino; Joao Sobral; João Costa; Ricardo Leite; Susana Ladeiro
EPI_ISL_523956	Hospital Regional de Assis	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes
EPI_ISL_524463	Hospital Regional de Cotia	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes
EPI_ISL_491456	Hospital San Juan de Dios	Inciensa, Instituto Costarricense de Investigación y Enseñanza en Nutrición y Salud	Adriana Godinez & Melany Calderon; Claudio Soto-Garita; Estela Cordero; Francisco Duarte; Hebleen Brenes
EPI_ISL_419234, EPI_ISL_455336, EPI_ISL_455337, EPI_ISL_455338, EPI_ISL_455339, EPI_ISL_455340, EPI_ISL_455341, EPI_ISL_455342, EPI_ISL_455343, EPI_ISL_578196, EPI_ISL_578197, EPI_ISL_578198, EPI_ISL_578199, EPI_ISL_578200, EPI_ISL_578201			
see above	Hospital San Pedro	Instituto de Salud Carlos III	A. Monzón; Alonso, C.; C. Alonso; Camarero, S.; Casas, I.; Cuesta, I.; F. Casas; González-Esguevillas, M.; I; I. Jiménez; Iglesias-Caballero; Iglesias-Caballero, M.; J.M Azcona; Jiménez, M.; Jiménez, P.; Juliá, M.; M. Blasco; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; Molinero Calamita, M.; Monzón, S.; P. Jiménez; Pozo, F.; S. Juliá; S. Pozo; S. Varona; Varona, S.; Zaballos, A.
EPI_ISL_539558, EPI_ISL_539561, EPI_ISL_539562, EPI_ISL_862654	Hospital San Pedro de Alcántara	Instituto de Salud Carlos III	A. Monzón; E. Cerro; F. Casas; I; I. Jiménez; I. Rodríguez, G.; Iglesias-Caballero; J. López; M. Pozo; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; M.A Cañizares; M.Camarero; P. Jiménez; S. Juliá; S. Molinero Calamita; S. Pozo; S. Varona
EPI_ISL_510312, EPI_ISL_510313, EPI_ISL_510314, EPI_ISL_510315, EPI_ISL_510316, EPI_ISL_510317, EPI_ISL_510318, EPI_ISL_510319, EPI_ISL_510320, EPI_ISL_510321, EPI_ISL_510322, EPI_ISL_510323, EPI_ISL_510324, EPI_ISL_510325, EPI_ISL_510326, EPI_ISL_510327, EPI_ISL_510328, EPI_ISL_510329, EPI_ISL_510330, EPI_ISL_510331			
see above	Hospital San Pedro de Alcántara (Cáceres)	SeqCOVID-SPAIN consortium/IBV(CSIC)	Cristina Muñoz Cuevas; Guadalupe Rodriguez Rodriguez and SeqCOVID-SPAIN consortium
EPI_ISL_491438, EPI_ISL_491440, EPI_ISL_491448	Hospital San Rafael de Alajuela	Inciensa, Instituto Costarricense de Investigación y Enseñanza en Nutrición y Salud	Adriana Godinez & Melany Calderon; Claudio Soto-Garita; Estela Cordero; Francisco Duarte; Hebleen Brenes
EPI_ISL_515527	Hospital Santa Clara	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes
EPI_ISL_468310	Hospital Sao Paulo de Ensino da UNIFESP	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes
EPI_ISL_471545, EPI_ISL_515528, EPI_ISL_515545, EPI_ISL_523969	Hospital Sao Paulo de Ensino da Unifesp	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes
EPI_ISL_524484	Hospital Schwyz	Institute of Medical Virology, University of Zurich	Alexandra Trkola; Andrea Zbinden; Fiona Steiner; Gabriela Ziltener; Jon Huder; Jürg Böni; Maryam Zaheri; Michael Huber; Patrick Redli; Riccarda Capaul; Stefan Schmutz; Verena Kufner
EPI_ISL_414015, EPI_ISL_414016	Hospital São Joaquim Beneficencia Portuguesa	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Audrey Cilli; Carlos Henrique Camargo; Claudia Regina Gonçalves; Claudio Tavares Sacchi; Daniela Bernardes Borges da Silva; Ester Cerdeira Sabino; Fabiana Cristina Pereira dos Santos Terezinha Maria de Paiva; Maria do Carmo Sampaito Tavares Timenetsky; SimoneGuadagnucci Morillo; Terezinha Maria de Paiva
EPI_ISL_455350, EPI_ISL_455351	Hospital Txagorritxu	Instituto de Salud Carlos III	A. Monzón; C. Gómez; F. Casas; I; I. Jiménez; Iglesias-Caballero; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; P. Jiménez; S. Juliá; S. Pozo; S. Varona
EPI_ISL_483059	Hospital Universitari Germans Trias i Pujol	IrsiCaixa AIDS Research Lab	A. Valencia; B. Clotet; C. Avila-Nieto; E. Vidal; G. Cantero; I. Blanco; J. Blanco; J. Carrillo; J. Rodon; J. Segalés; J. Vergara-Alert; M. Noguera-Julián; M. Parera; M. Puig; M.T. Terrón; N. Izquierdo-Useros; S. Cruz; V. Guallar
EPI_ISL_471472, EPI_ISL_510689	Hospital Universitari Germans Trias i Pujol(HUGTiP)/Fundació Lluita contra la SIDA (FLSida)/IRTA-CReSA	IrsiCaixa AIDS Research Lab	Albert Bensaid; Bonaventura Clotet; Joaquim Segalés; Jordi Rodón; Jorge Carrillo; Julia Blanco; Julia Vergara; Lidia Ruiz; Marc Noguera-Julian; Nuria Izquierdo; Pilar Armengol; Roger Paredes
EPI_ISL_418860, EPI_ISL_418861, EPI_ISL_444977, EPI_ISL_444978, EPI_ISL_444979, EPI_ISL_444980, EPI_ISL_444981, EPI_ISL_444982, EPI_ISL_444983, EPI_ISL_444984, EPI_ISL_444985, EPI_ISL_444986, EPI_ISL_444987, EPI_ISL_444988, EPI_ISL_444989, EPI_ISL_444990, EPI_ISL_447532, EPI_ISL_447533, EPI_ISL_450337, EPI_ISL_458130, EPI_ISL_458132, EPI_ISL_819300, EPI_ISL_819301, EPI_ISL_819302, EPI_ISL_819303, EPI_ISL_819304, EPI_ISL_819305, EPI_ISL_819306, EPI_ISL_819307, EPI_ISL_819308, EPI_ISL_819309, EPI_ISL_819310, EPI_ISL_819311, EPI_ISL_819312, EPI_ISL_819313, EPI_ISL_819314, EPI_ISL_819315, EPI_ISL_819316			
see above	Hospital Universitari Vall d'Hebron - Vall d'Hebron Institut de Recerca	Hospital Universitari Vall d'Hebron - Vall d'Hebron Institut de Recerca	Andrés Antón; Ariadna Rando; Carla Castillo; Cristina Andrés; Damir Garcia-Cehic; Dàmir Garcia-Cehic; Josep F Abril; Josep Gregori; Josep Quer; Juliana Esperalba; Maria Carmen Martin; Maria Carmen Martín; Maria Gema Codina; Maria Piñana; Mercedes Guerrero-Murillo; Tomàs Pumarola
EPI_ISL_538012, EPI_ISL_538013, EPI_ISL_538014, EPI_ISL_538015, EPI_ISL_538016, EPI_ISL_538017, EPI_ISL_538018, EPI_ISL_538019, EPI_ISL_538020, EPI_ISL_538021, EPI_ISL_538022, EPI_ISL_538023, EPI_ISL_538024, EPI_ISL_538025, EPI_ISL_538026, EPI_ISL_538027, EPI_ISL_538028, EPI_ISL_538030, EPI_ISL_538033, EPI_ISL_538034, EPI_ISL_538035, EPI_ISL_538036, EPI_ISL_538037, EPI_ISL_538038, EPI_ISL_538039, EPI_ISL_538041, EPI_ISL_538042, EPI_ISL_538043, EPI_ISL_538044, EPI_ISL_538045, EPI_ISL_538046, EPI_ISL_538047, EPI_ISL_538048, EPI_ISL_538049, EPI_ISL_538050, EPI_ISL_538051, EPI_ISL_538052, EPI_ISL_538054			
see above	Hospital Universitari i Politècnic La Fe de València	SeqCOVID-SPAIN consortium/IBV(CSIC)	Ana Gil Brusola; Eva González Barbera; José Luis López Hontangas and SeqCOVID-SPAIN consortium; María Dolores Gómez Ruiz; Salvador Giner Almaraz
EPI_ISL_421171, EPI_ISL_421172, EPI_ISL_421173, EPI_ISL_421174, EPI_ISL_421175, EPI_ISL_421176, EPI_ISL_421177, EPI_ISL_421178, EPI_ISL_421179, EPI_ISL_421180, EPI_ISL_428683, EPI_ISL_428684, EPI_ISL_428686, EPI_ISL_428687, EPI_ISL_428688, EPI_ISL_428689, EPI_ISL_428690, EPI_ISL_428691, EPI_ISL_428692, EPI_ISL_428693, EPI_ISL_428694, EPI_ISL_428695, EPI_ISL_428696, EPI_ISL_428697, EPI_ISL_428698, EPI_ISL_428699, EPI_ISL_428700, EPI_ISL_428701, EPI_ISL_428703, EPI_ISL_428704, EPI_ISL_428705, EPI_ISL_428706, EPI_ISL_428707, EPI_ISL_428708, EPI_ISL_428709, EPI_ISL_428710, EPI_ISL_428711, EPI_ISL_430718, EPI_ISL_529982, EPI_ISL_529983, EPI_ISL_529992			
see above	Hospital Universitario 12 de Octubre	Hospital Universitario 12 de Octubre	Elias Dahdouh; Esther Viedma; Fernando Lázaro; Jesús Mingorance; Juan Carlos Galán; Julio García; Mª Dolores Folgueira; Natalia Stella; Rafael Cantón; Rafael Delgado; Raúl Recio; Sara González
EPI_ISL_417954, EPI_ISL_417961, EPI_ISL_417963, EPI_ISL_417967	Hospital Universitario 12 de Octubre	Hospital Universitario La Paz	Elias Dahdouh; Esther Viedma; Fernando Lázaro; Jesús Mingorance; Juan Carlos Galán; Julio García; Mª Dolores Folgueira; Natalia Stella; Rafael Cantón; Rafael Delgado; Sara González
EPI_ISL_467092, EPI_ISL_467093, EPI_ISL_467094, EPI_ISL_467095, EPI_ISL_467096, EPI_ISL_467097, EPI_ISL_467098, EPI_ISL_467099, EPI_ISL_467100, EPI_ISL_467101, EPI_ISL_467103, EPI_ISL_467104, EPI_ISL_467105, EPI_ISL_467106, EPI_ISL_467107, EPI_ISL_467108, EPI_ISL_467109, EPI_ISL_467110, EPI_ISL_467111, EPI_ISL_467113, EPI_ISL_467114, EPI_ISL_467115, EPI_ISL_467116, EPI_ISL_467117, EPI_ISL_467118, EPI_ISL_467120, EPI_ISL_467121, EPI_ISL_467122, EPI_ISL_467123, EPI_ISL_467124, EPI_ISL_467125, EPI_ISL_467126, EPI_ISL_467127, EPI_ISL_467128, EPI_ISL_467129, EPI_ISL_467130, EPI_ISL_467131, EPI_ISL_467132, EPI_ISL_467134, EPI_ISL_467136, EPI_ISL_467137, EPI_ISL_467138, EPI_ISL_467139, EPI_ISL_467140, EPI_ISL_467141, EPI_ISL_467142, EPI_ISL_467143, EPI_ISL_467144, EPI_ISL_467145, EPI_ISL_467146, EPI_ISL_467147, EPI_ISL_467148, EPI_ISL_467149, EPI_ISL_467150, EPI_ISL_467151, EPI_ISL_467152, EPI_ISL_467153, EPI_ISL_467154, EPI_ISL_467155, EPI_ISL_467156, EPI_ISL_467157, EPI_ISL_467158, EPI_ISL_467159, EPI_ISL_467160, EPI_ISL_467161, EPI_ISL_467162, EPI_ISL_467163, EPI_ISL_467164, EPI_ISL_467165, EPI_ISL_467166, EPI_ISL_467167, EPI_ISL_467168, EPI_ISL_467169, EPI_ISL_467170, EPI_ISL_467171, EPI_ISL_467172, EPI_ISL_467173, EPI_ISL_467174, EPI_ISL_467175, EPI_ISL_467176, EPI_ISL_467177, EPI_ISL_467178, EPI_ISL_467179, EPI_ISL_467180, EPI_ISL_467181, EPI_ISL_467182, EPI_ISL_467183, EPI_ISL_509616, EPI_ISL_509617, EPI_ISL_509618			
see above	Hospital Universitario Araba. Vitoria-Gasteiz	SeqCOVID-SPAIN consortium/IBV(CSIC)	Amaia Aguirre Quiñonero; Andrés Canut Blasco and SeqCOVID-SPAIN consortium; Andrés Canut Blasco. and SeqCOVID-SPAIN consortium; Carmen Gómez González; Marina Fernández Torres; Mª Concepción Lecaroz Agara; Mª Rosario Almela Ferrer; Silvia Hernáez Crespo
EPI_ISL_452692, EPI_ISL_452693, EPI_ISL_452694, EPI_ISL_452695, EPI_ISL_452696, EPI_ISL_452698, EPI_ISL_452699, EPI_ISL_452700, EPI_ISL_452701, EPI_ISL_452703, EPI_ISL_452704, EPI_ISL_452707, EPI_ISL_452708, EPI_ISL_452709, EPI_ISL_452710, EPI_ISL_452711, EPI_ISL_452712, EPI_ISL_452713, EPI_ISL_452714, EPI_ISL_452715, EPI_ISL_452716, EPI_ISL_452717, EPI_ISL_452718, EPI_ISL_452719, EPI_ISL_452720, EPI_ISL_452721, EPI_ISL_452722, EPI_ISL_452723, EPI_ISL_452724, EPI_ISL_452725, EPI_ISL_452726, EPI_ISL_452727, EPI_ISL_452728, EPI_ISL_452729, EPI_ISL_452730, EPI_ISL_452731, EPI_ISL_452732, EPI_ISL_452733, EPI_ISL_452735, EPI_ISL_452736, EPI_ISL_452737, EPI_ISL_452738, EPI_ISL_452739, EPI_ISL_452740, EPI_ISL_452741, EPI_ISL_452742, EPI_ISL_452743, EPI_ISL_452744, EPI_ISL_452745, EPI_ISL_452746, EPI_ISL_452747, EPI_ISL_452748, EPI_ISL_452749, EPI_ISL_452750,			

EPI_ISL_452751, EPI_ISL_452753, EPI_ISL_452754, EPI_ISL_452755, EPI_ISL_452759, EPI_ISL_452761, EPI_ISL_452762, EPI_ISL_452763, EPI_ISL_452765, EPI_ISL_452766, EPI_ISL_452767, EPI_ISL_452768, EPI_ISL_452769, EPI_ISL_452770, EPI_ISL_452771, EPI_ISL_452772, EPI_ISL_452773, EPI_ISL_452774, EPI_ISL_452775, EPI_ISL_452777, EPI_ISL_452780, EPI_ISL_452782, EPI_ISL_452783, EPI_ISL_452784, EPI_ISL_452785, EPI_ISL_452786			
see above	Hospital Universitario Araba. Vitoria-Gasteiz,	SeqCOVID-SPAIN consortium/IBV(CSIC)	Amaia Aguirre Quiñonero; Andrés Canut Blasco and SeqCOVID-SPAIN consortium; Carmen Gómez González; Maria Concepción Lecaroz Agara; Maria Rosario Almela Ferrer; Marina Fernández Torres; Silvia Hernàez Crespo
EPI_ISL_455326	Hospital Universitario Insular de Gran Canaria	Instituto de Salud Carlos III	A. Hernández; A. Monzón; F. Casas; I; I. Jiménez; Iglesias-Caballero; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; P. Jiménez; S. Juliá; S. Pozo; S. Varona
EPI_ISL_428674, EPI_ISL_428675, EPI_ISL_428676, EPI_ISL_428677, EPI_ISL_428678, EPI_ISL_428679, EPI_ISL_428680, EPI_ISL_428681, EPI_ISL_428682, EPI_ISL_430719, EPI_ISL_430720, EPI_ISL_430721, EPI_ISL_435144			
see above	Hospital Universitario La Paz	Hospital Universitario 12 de Octubre	Elias Dahdouh; Esther Viedma; Fernando Lázaro; Jesús Mingorance; Juan Carlos Galán; Julio García; Mª Dolores Folgueira; Natalia Stella; Rafael Cantón; Rafael Delgado; Raúl Recio; Sara González
EPI_ISL_417969, EPI_ISL_417972, EPI_ISL_417975, EPI_ISL_417978, EPI_ISL_530041, EPI_ISL_530042	Hospital Universitario La Paz	Hospital Universitario La Paz	Elias Dahdouh; Esther Viedma; Fernando Lázaro; Jesús Mingorance; Juan Carlos Galán; Julio García; María Rodríguez; Mª Dolores Folgueira; Natalia Stella; Rafael Cantón; Rafael Delgado; Raúl Recio; Sara González
EPI_ISL_831039	Hospital Universitario La Paz (Madrid)	SeqCOVID-SPAIN consortium/IBV(CSIC)	Elias Dahdouh; Fernando Lázaro-Perona; Jesús Mingorance and SeqCOVID-SPAIN consortium; María Rodríguez-Tejedor
EPI_ISL_871976, EPI_ISL_871977	Hospital Universitario Lozano Bielsa	Instituto de Salud Carlos III	A. Monzón; F. Casas; I. Benito, R.; I. Jiménez; Iglesias-Caballero; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Pozo; M. Zaballos; P. Jiménez; S. Juliá; S. Molinero Calamita; S. Varona
EPI_ISL_537809, EPI_ISL_537810	Hospital Universitario Marqués de Valdecilla (Santander), Servicio de Microbiología	SeqCOVID-SPAIN consortium/IBV(CSIC)	Daniel Pablo Marcos; Jesús Rodríguez Lozano; Jose Manuel Méndez Legaza; María Eliecer Cano García; María Siller Ruiz and SeqCOVID-SPAIN consortium; Mónica Gozalo Margüello
EPI_ISL_539503, EPI_ISL_539504, EPI_ISL_539505, EPI_ISL_539506, EPI_ISL_539507, EPI_ISL_539508, EPI_ISL_539513, EPI_ISL_539514, EPI_ISL_539515, EPI_ISL_539516, EPI_ISL_539517, EPI_ISL_539518, EPI_ISL_539519, EPI_ISL_578189, EPI_ISL_578192, EPI_ISL_578193, EPI_ISL_871978, EPI_ISL_871980, EPI_ISL_871981, EPI_ISL_871982, EPI_ISL_871983			
see above	Hospital Universitario Miguel Servet	Instituto de Salud Carlos III	A. Monzón; A. Rezusta; F. Casas; I; I. Jiménez; I. Rezusta, A.; Iglesias-Caballero; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Pozo; M. Zaballos; P. Jiménez; R. Benito; S. Juliá; S. Molinero Calamita; S. Pozo; S. Varona
EPI_ISL_452453, EPI_ISL_452454, EPI_ISL_452457, EPI_ISL_452459, EPI_ISL_452460, EPI_ISL_452461, EPI_ISL_452462, EPI_ISL_452464, EPI_ISL_452465, EPI_ISL_452466, EPI_ISL_452467, EPI_ISL_452468, EPI_ISL_452469, EPI_ISL_452470, EPI_ISL_452471, EPI_ISL_467064, EPI_ISL_467066, EPI_ISL_467068, EPI_ISL_467069, EPI_ISL_467070, EPI_ISL_467071, EPI_ISL_467072, EPI_ISL_467073, EPI_ISL_467074, EPI_ISL_467075, EPI_ISL_467076, EPI_ISL_467077, EPI_ISL_467078, EPI_ISL_467079, EPI_ISL_467080, EPI_ISL_467081, EPI_ISL_467082, EPI_ISL_467083, EPI_ISL_467084, EPI_ISL_467085			
see above	Hospital Universitario Puerta del Mar de Cádiz - INIBICA	SeqCOVID-SPAIN consortium/IBV(CSIC)	Fátima-Galán-Sánchez; Manuel Rodríguez-Iglesias and SeqCOVID-SPAIN consortium; Manuel Rodríguez-Iglesias and SeqCOVID-SPAIN consortium; Salud Rodríguez-Pallares
EPI_ISL_530094, EPI_ISL_530095, EPI_ISL_530096, EPI_ISL_530097, EPI_ISL_530098, EPI_ISL_530099	Hospital Universitario Ramón y Cajal	Hospital Universitario 12 de Octubre	Elias Dahdouh; Esther Viedma; Fernando Lázaro; Jesús Mingorance; Juan Carlos Galán; Julio García; Mª Dolores Folgueira; Natalia Stella; Rafael Cantón; Rafael Delgado; Raúl Recio; Sara González
EPI_ISL_417979, EPI_ISL_417980, EPI_ISL_417981, EPI_ISL_530109, EPI_ISL_530110, EPI_ISL_530112, EPI_ISL_530113			
see above	Hospital Universitario Ramón y Cajal	Hospital Universitario La Paz	Elias Dahdouh; Esther Viedma; Fernando Lázaro; Jesús Mingorance; Juan Carlos Galán; Julio García; Mª Dolores Folgueira; Natalia Stella; Rafael Cantón; Rafael Delgado; Raúl Recio; Sara González
EPI_ISL_871973	Hospital Universitario Severo Ochoa	Instituto de Salud Carlos III	A. Monzón; F. Casas; I. García; I. Jiménez; Iglesias-Caballero; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Pozo; M. Zaballos; M.L.; P. Jiménez; S. Juliá; S. Molinero Calamita; S. Varona
EPI_ISL_419230	Hospital Universitario Virgen de las Nieves	Instituto de Salud Carlos III	Camarero, S.; Casas, I.; Cuesta, I.; González-Esguevillas, M.; Iglesias-Caballero, M.; Jiménez, M.; Jiménez, P.; Juliá, M.; Molinero Calamita, M.; Monzón, S.; Pozo, F.; Sanbonmatsu, S.; Varona, S.; Zaballos, A.
EPI_ISL_467061, EPI_ISL_467062, EPI_ISL_474797, EPI_ISL_474833, EPI_ISL_474834, EPI_ISL_474841, EPI_ISL_474842, EPI_ISL_474843, EPI_ISL_474845, EPI_ISL_474851, EPI_ISL_474852, EPI_ISL_474854, EPI_ISL_474855, EPI_ISL_474856, EPI_ISL_474857, EPI_ISL_474859, EPI_ISL_474860, EPI_ISL_474862, EPI_ISL_474864, EPI_ISL_474867, EPI_ISL_474868, EPI_ISL_474869, EPI_ISL_474870, EPI_ISL_474871, EPI_ISL_474872, EPI_ISL_474873, EPI_ISL_474874, EPI_ISL_474875, EPI_ISL_474876, EPI_ISL_474879, EPI_ISL_474880, EPI_ISL_474881, EPI_ISL_474882, EPI_ISL_474883, EPI_ISL_474886, EPI_ISL_474897, EPI_ISL_474900, EPI_ISL_474908, EPI_ISL_474909, EPI_ISL_474920, EPI_ISL_474922, EPI_ISL_474923, EPI_ISL_474926, EPI_ISL_474927, EPI_ISL_474928, EPI_ISL_474930, EPI_ISL_474934, EPI_ISL_474936, EPI_ISL_474939, EPI_ISL_474943, EPI_ISL_474948, EPI_ISL_510424, EPI_ISL_510444			
see above	Hospital Universitario Virgen de las Nieves de Granada-SAS	SeqCOVID-SPAIN consortium/IBV(CSIC)	Irene Pedrosa Corral; José M. Navarro-Marí and SeqCOVID-SPAIN consortium; Mercedes Pérez Ruiz; Sara Sanbonmatsu Gámez
EPI_ISL_471539	Hospital Universitario da USP Sao Paulo	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes
EPI_ISL_419233, EPI_ISL_455325, EPI_ISL_539532	Hospital Universitario de Canarias	Instituto de Salud Carlos III	A. Monzón; B. Castro; Camarero, S.; Casas, I.; Castro, B.; Cuesta, I.; F. Casas; González-Esguevillas, M.; I; I. Jiménez; Iglesias-Caballero; Iglesias-Caballero, M.; Jiménez, M.; Jiménez, P.; Juliá, M.; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; Molinero Calamita, M.; Monzón, S.; P. Jiménez; Pozo, F., S. Juliá; S. Pozo; S. Varona; Varona, S.; Zaballos, A.
EPI_ISL_539520, EPI_ISL_539521, EPI_ISL_539522, EPI_ISL_862655, EPI_ISL_862656, EPI_ISL_862657, EPI_ISL_862658			
see above	Hospital Universitario de Ceuta	Instituto de Salud Carlos III	A. Monzón; F. Casas; G. Sánchez; I; I. Hijano, S.; I. Jiménez; Iglesias-Caballero; J. López; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Pozo; M. Zaballos; P. Jiménez; S. Juliá; S. Molinero Calamita; S. Pozo; S. Varona
EPI_ISL_467086, EPI_ISL_467087, EPI_ISL_467088, EPI_ISL_467089, EPI_ISL_467090, EPI_ISL_467091, EPI_ISL_474910, EPI_ISL_474911, EPI_ISL_474912, EPI_ISL_474913, EPI_ISL_474914, EPI_ISL_474915, EPI_ISL_474916, EPI_ISL_474917, EPI_ISL_537693, EPI_ISL_537697, EPI_ISL_537700, EPI_ISL_537703, EPI_ISL_537706, EPI_ISL_537708, EPI_ISL_537709, EPI_ISL_537713, EPI_ISL_537715, EPI_ISL_537716, EPI_ISL_537718, EPI_ISL_561370			
see above	Hospital Universitario de Gran Canaria Dr. Negrín	SeqCOVID-SPAIN consortium/IBV(CSIC)	Ana Bordes Benítez and SeqCOVID-SPAIN consortium; Francisco J. Chamizo López; M. Carmen Pérez González
EPI_ISL_455315, EPI_ISL_455316, EPI_ISL_455317, EPI_ISL_455318, EPI_ISL_455319, EPI_ISL_455320, EPI_ISL_455321, EPI_ISL_455322, EPI_ISL_455324, EPI_ISL_539497			
see above	Hospital Virgen de las Nieves	Instituto de Salud Carlos III	A. Monzón; F. Casas; I; I. Jiménez; Iglesias-Caballero; J. Lepe; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; P. Jiménez; S. Juliá; S. Pozo; S. Sanbonmatsu; S. Varona
EPI_ISL_455314	Hospital Virgen del Rocio	Instituto de Salud Carlos III	A. Monzón; F. Casas; I; I. Jiménez; Iglesias-Caballero; J. Lepe; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; P. Jiménez; S. Juliá; S. Pozo; S. Varona
EPI_ISL_476435, EPI_ISL_476439, EPI_ISL_476445, EPI_ISL_476446, EPI_ISL_476469, EPI_ISL_476490	Hospital da Clínicas da Faculdade de Medicina da Universidade de São Paulo	Instituto de Medicina Tropical da Univesidade de São Paulo	Camila Alves Maia da Silva; Carolina S. Lazar; Cecilia Salete Alencar; Darlan da Silva Candido; Erika Regina Manuli; Ester Sabino; Flavia Cristina da Silva Sales; Giula Magalhaes Ferreira; Jaqueline Goes de Jesus; Julien Theze; Mariana Severo Ramundo; Nuno Faria; Samples: Ingra Morales Claro; Sequencing: Ingra Morales Claro; Silvia F. Costa; Thais de Moura Coletti
EPI_ISL_455352, EPI_ISL_455353, EPI_ISL_455354	Hospital de Cruces	Instituto de Salud Carlos III	A. Monzón; F. Casas; I; I. Jiménez; Iglesias-Caballero; M. Aranzamendi; M. Camarero; M. Cuesta; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; P. Jiménez; S. Juliá; S. Pozo; S. Varona
EPI_ISL_414577, EPI_ISL_414578	Hospital de Talca, Chile	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E. Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Gisselle Barra; Jaime Lagos; Javier Tognarelli; Jorge Fernández.; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Soledad Ulloa; Winston Andrade
EPI_ISL_510247, EPI_ISL_510248, EPI_ISL_510249, EPI_ISL_510250, EPI_ISL_510251, EPI_ISL_510252, EPI_ISL_510253, EPI_ISL_510256, EPI_ISL_510257, EPI_ISL_510258, EPI_ISL_510259, EPI_ISL_510260, EPI_ISL_510261, EPI_ISL_510262, EPI_ISL_510263, EPI_ISL_510264, EPI_ISL_510265, EPI_ISL_510266			
see above	Hospital de la Santa Creu i Sant Pau. Servicio de Microbiología	SeqCOVID-SPAIN consortium/IBV(CSIC)	Elisenda Miró and SeqCOVID-SPAIN consortium; Ferran Navarro; Núria Rabella
EPI_ISL_515565, EPI_ISL_523965, EPI_ISL_523982	Hospital do Servidor Público Estadual Francisco Morato de Oliveira	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes
EPI_ISL_861635	Hospital e Maternidade Madre Theodora	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes; Karoline Rodrigues Campos
EPI_ISL_693195	Hospital e Pronto Socorro Portinari	Instituto Adolfo Lutz, Interdiciplinary Procedures Center,	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes; Karoline Rodrigues Campos

		Strategic Laboratory	
EPI_ISL_458024, EPI_ISL_498257	Hospital for Tropical Diseases	COVID-19 Network Investigations (CONI) Alliance	Akanitt Jittmittraphap; Angkana Huang; Anthony R. Jones; Arporn Wangwiwatsin; Bhakbhoom Panthan; Chonticha Klungtong; Ekawat Pasomsub; Elizabeth Batty; Insee Sensorn; Janjira Thaipadungpanit; Khajohn Joonsalak; Kingkan Rakmanee; Krittikorn Kumpornsin; Namfon Kotanan; Nantarat Chantawat; Pornsawan Leaungwutiwong; Stefan Fernandez; Thanat Chookajorn; Theerarat Kochakarn; Treewat Watthanachockchai; Wasun Chantratita; Weena Janwitthayanan; Wudtichai Manasatienkij
EPI_ISL_420147, EPI_ISL_590915	Hospital of Southern Norway - Kristiansand, Department of Medical Microbiology	Norwegian Institute of Public Health, Department of Virology	Hilde Elshaug; Hilde Vollan; Kamilla Heddeland Instefjord; Karoline Bragstad; Kathrine Sterie-Johansen; Olav Hungnes; Rasmus Riis Kopperud
EPI_ISL_434712, EPI_ISL_434713, EPI_ISL_434714, EPI_ISL_434715, EPI_ISL_434716, EPI_ISL_434717, EPI_ISL_434718, EPI_ISL_434720, EPI_ISL_434721, EPI_ISL_434722, EPI_ISL_434724, EPI_ISL_434725, EPI_ISL_434726, EPI_ISL_434727, EPI_ISL_434728, EPI_ISL_434729, EPI_ISL_434730, EPI_ISL_434731, EPI_ISL_434732, EPI_ISL_434735, EPI_ISL_434737, EPI_ISL_434744, EPI_ISL_434745, EPI_ISL_434746, EPI_ISL_434753, EPI_ISL_434755, EPI_ISL_434759, EPI_ISL_434760, EPI_ISL_434764, EPI_ISL_434766, EPI_ISL_434768, EPI_ISL_434772, EPI_ISL_434776, EPI_ISL_434777, EPI_ISL_434780, EPI_ISL_434781, EPI_ISL_434783, EPI_ISL_434784, EPI_ISL_434785, EPI_ISL_434787, EPI_ISL_434788, EPI_ISL_434790, EPI_ISL_434791, EPI_ISL_434792, EPI_ISL_434795, EPI_ISL_434797, EPI_ISL_434798, EPI_ISL_434799, EPI_ISL_434800, EPI_ISL_434801, EPI_ISL_434802, EPI_ISL_434803, EPI_ISL_434805, EPI_ISL_434807, EPI_ISL_434808, EPI_ISL_434810, EPI_ISL_434811, EPI_ISL_434812, EPI_ISL_434813, EPI_ISL_434815, EPI_ISL_434821, EPI_ISL_434822, EPI_ISL_434824, EPI_ISL_434825, EPI_ISL_434827, EPI_ISL_434828, EPI_ISL_434829, EPI_ISL_434831, EPI_ISL_434832, EPI_ISL_434833, EPI_ISL_434834, EPI_ISL_434837, EPI_ISL_434839, EPI_ISL_434840, EPI_ISL_434841, EPI_ISL_434843, EPI_ISL_434844, EPI_ISL_434845, EPI_ISL_434846, EPI_ISL_434847, EPI_ISL_434849, EPI_ISL_434850, EPI_ISL_434851, EPI_ISL_434852, EPI_ISL_434853, EPI_ISL_434854, EPI_ISL_434855, EPI_ISL_434856, EPI_ISL_434857, EPI_ISL_434858, EPI_ISL_434859, EPI_ISL_434860, EPI_ISL_434861, EPI_ISL_434863, EPI_ISL_434864, EPI_ISL_434865, EPI_ISL_434866, EPI_ISL_434867, EPI_ISL_434868, EPI_ISL_434870, EPI_ISL_434871, EPI_ISL_434873, EPI_ISL_434875, EPI_ISL_434876, EPI_ISL_434877, EPI_ISL_434878, EPI_ISL_434879, EPI_ISL_434880, EPI_ISL_434881, EPI_ISL_434882, EPI_ISL_434883, EPI_ISL_434884, EPI_ISL_434885, EPI_ISL_434887, EPI_ISL_434888, EPI_ISL_434889, EPI_ISL_434890, EPI_ISL_434891, EPI_ISL_434892, EPI_ISL_434893, EPI_ISL_434894, EPI_ISL_434895, EPI_ISL_434896, EPI_ISL_434897, EPI_ISL_434898, EPI_ISL_434899, EPI_ISL_434900, EPI_ISL_434901, EPI_ISL_434902, EPI_ISL_434903, EPI_ISL_434904, EPI_ISL_434905, EPI_ISL_434906, EPI_ISL_434907, EPI_ISL_434908, EPI_ISL_434909, EPI_ISL_434910, EPI_ISL_434911, EPI_ISL_434912, EPI_ISL_434913, EPI_ISL_434914, EPI_ISL_434915, EPI_ISL_434916, EPI_ISL_434917, EPI_ISL_434918, EPI_ISL_434919, EPI_ISL_434920, EPI_ISL_434921, EPI_ISL_434922, EPI_ISL_434923, EPI_ISL_434924, EPI_ISL_434925, EPI_ISL_434926, EPI_ISL_434927, EPI_ISL_434928, EPI_ISL_434930, EPI_ISL_434931, EPI_ISL_434933, EPI_ISL_434934, EPI_ISL_434935, EPI_ISL_434936, EPI_ISL_434937, EPI_ISL_434938, EPI_ISL_434939, EPI_ISL_434940, EPI_ISL_434945, EPI_ISL_434946, EPI_ISL_434947, EPI_ISL_434948, EPI_ISL_434949, EPI_ISL_434950, EPI_ISL_434951, EPI_ISL_434952, EPI_ISL_434953, EPI_ISL_434954, EPI_ISL_434955, EPI_ISL_434956, EPI_ISL_434957, EPI_ISL_434958, EPI_ISL_434959, EPI_ISL_434960, EPI_ISL_434961, EPI_ISL_434962, EPI_ISL_434963, EPI_ISL_434964, EPI_ISL_434965, EPI_ISL_434967, EPI_ISL_434969, EPI_ISL_434971, EPI_ISL_434972, EPI_ISL_434973, EPI_ISL_434974, EPI_ISL_434975, EPI_ISL_434977, EPI_ISL_434978, EPI_ISL_434979, EPI_ISL_434980, EPI_ISL_434981, EPI_ISL_434983, EPI_ISL_434984, EPI_ISL_434985, EPI_ISL_434986, EPI_ISL_434988, EPI_ISL_434989, EPI_ISL_434990, EPI_ISL_434991, EPI_ISL_434992, EPI_ISL_434993, EPI_ISL_434994, EPI_ISL_434995, EPI_ISL_434996, EPI_ISL_434997, EPI_ISL_542578, EPI_ISL_542581, EPI_ISL_542585, EPI_ISL_542587, EPI_ISL_542590, EPI_ISL_542610, EPI_ISL_542615, EPI_ISL_542617, EPI_ISL_542795, EPI_ISL_542803, EPI_ISL_542805, EPI_ISL_542821, EPI_ISL_545707, EPI_ISL_545714	
see above	Houston Methodist Hospital	Houston Methodist Hospital	Chia-Wei Chou; Concepcion C. Cantu; Daniel Boutz; David W. Bernard; Ghazaleh Eskandari; Hakon Jonsson; Heather Hendrickson; Hoang A. T. Nguyen; Hung-Che Kuo; Ilya J. Finkelstein; J. Hunter Long; James J. Davis; Jason S. McLellan; Jimmy Gollihar; Jule Goike; Kamyab Javanmardi; Kari Stefansson; Layne Pruitt; Marcus Nguyen; Matthew Ojeda Saavedra; Maulik Shukla; Muthiah Kumaraswami; Paul A. Christensen; Prasanti Yerramilli; Randall J. Olsen; S. Wesley Long; Sishir Subedi; and James M. Musser
EPI_ISL_437512	Human Genetic Research Center, Kawsar Biotech Company	Human Genetic Research Center, Kawsar Biotech Company	Abbasalipour, M.; F. and Haghdoost, Y.; Hosseini; Kehsvar, Y.; Khosravi; M.A.; Sabeghi, S.; Zeinali, S.
EPI_ISL_645013, EPI_ISL_645014, EPI_ISL_645015, EPI_ISL_645016, EPI_ISL_645017, EPI_ISL_645018, EPI_ISL_645019, EPI_ISL_645020, EPI_ISL_645021, EPI_ISL_645022, EPI_ISL_645023, EPI_ISL_645024			
see above	Human Genome Variation Research Group, Malopolska Centre of Biotechnology	Human Genome Variation Research Group, Malopolska Centre of Biotechnology	Botwina, P.; Branicki, W.; Dabrowska, A.; Foremny, J.; Gromowski, T.; Klajmon, A.; Kopera, K.; Kowalski, M.; Labaj; Marszalek, K.; Owczarek, K.; P.P.; Pisarek, A.; Pospiech, E.; Pyrc, K.; Sanak, M.; Swadzba, J.; Szczepanski, A.
EPI_ISL_454636, EPI_ISL_454637, EPI_ISL_454638, EPI_ISL_468438, EPI_ISL_468440, EPI_ISL_468446, EPI_ISL_468447, EPI_ISL_468449, EPI_ISL_468452			
see above	Humboldt County Public Health Laboratory	Chan-Zuckerberg Biohub	CZB Cliahub Consortium
EPI_ISL_529961	Husada Utama Hospital	Institute of Tropical Disease, Universitas Airlangga	Aldise M Nastri; Didi Dewanto; Gatot Soegiarto; Jezzy R Dewantari; Kazufumi Shimizu; Krisnoadi Rahardjo; Laksmi Wulandari; Maria I Lusida; Mitsuhiro Nishimura; Resti Yudhawati; Retno A Setyoningrum; Rima R Prasetya; Soetjipto; Yasuko Mori; Yohko K Shimizu
EPI_ISL_940184, EPI_ISL_940212, EPI_ISL_940213, EPI_ISL_940218, EPI_ISL_940220, EPI_ISL_940236, EPI_ISL_940239, EPI_ISL_940249, EPI_ISL_940250, EPI_ISL_940252, EPI_ISL_940255, EPI_ISL_940272, EPI_ISL_940351, EPI_ISL_940373, EPI_ISL_940374, EPI_ISL_940375, EPI_ISL_940376, EPI_ISL_940377, EPI_ISL_940378, EPI_ISL_940380, EPI_ISL_940384, EPI_ISL_940385, EPI_ISL_940386, EPI_ISL_940388, EPI_ISL_940389, EPI_ISL_940390, EPI_ISL_940392, EPI_ISL_940395, EPI_ISL_940397, EPI_ISL_940399, EPI_ISL_940400, EPI_ISL_940401, EPI_ISL_940405, EPI_ISL_940406, EPI_ISL_940408, EPI_ISL_940410, EPI_ISL_940411, EPI_ISL_940412, EPI_ISL_940413, EPI_ISL_940414, EPI_ISL_940415, EPI_ISL_940416, EPI_ISL_940417, EPI_ISL_940418, EPI_ISL_940420, EPI_ISL_940421, EPI_ISL_940426, EPI_ISL_940429, EPI_ISL_940430, EPI_ISL_940431, EPI_ISL_940432, EPI_ISL_940434, EPI_ISL_940435, EPI_ISL_940436, EPI_ISL_940437, EPI_ISL_940438, EPI_ISL_940439, EPI_ISL_940440, EPI_ISL_940441, EPI_ISL_940442, EPI_ISL_940443, EPI_ISL_940446, EPI_ISL_940448, EPI_ISL_940449, EPI_ISL_940450, EPI_ISL_940455, EPI_ISL_940457, EPI_ISL_940462, EPI_ISL_940463, EPI_ISL_940465, EPI_ISL_940466, EPI_ISL_940467, EPI_ISL_940468, EPI_ISL_940486, EPI_ISL_940489, EPI_ISL_940490, EPI_ISL_940497, EPI_ISL_940507, EPI_ISL_940510, EPI_ISL_940511, EPI_ISL_940513, EPI_ISL_940517, EPI_ISL_940518, EPI_ISL_940525, EPI_ISL_940528, EPI_ISL_940529, EPI_ISL_940531, EPI_ISL_940532, EPI_ISL_940533, EPI_ISL_940534, EPI_ISL_940535, EPI_ISL_940538, EPI_ISL_940542, EPI_ISL_940550, EPI_ISL_940551, EPI_ISL_940552, EPI_ISL_1296382, EPI_ISL_1296384, EPI_ISL_1296392, EPI_ISL_1296406		
see above	Hôpital Bichat Claude Bernard, Laboratoire de Virologie	IAME UMR1137 Inserm, Université de Paris, Hôpital Bichat	Alexandre Storto; Amélie Recoing; Antoine Bridier-Nahmias; Benoit Visseaux; Charlotte Charpentier; Diane Descamps; Gilles Collin; Lena Daniel; Mélanie Bertine; Nadhira Houhou-Fidouh; Quentin Le Hingrat; Siham Hamri
EPI_ISL_450304, EPI_ISL_465681, EPI_ISL_465682, EPI_ISL_465698, EPI_ISL_465699, EPI_ISL_535738, EPI_ISL_535796, EPI_ISL_535819, EPI_ISL_535851, EPI_ISL_535866, EPI_ISL_535869, EPI_ISL_535874, EPI_ISL_535888, EPI_ISL_535920, EPI_ISL_535921, EPI_ISL_535922, EPI_ISL_535923, EPI_ISL_535927, EPI_ISL_535944, EPI_ISL_535949, EPI_ISL_535950, EPI_ISL_535953, EPI_ISL_535957, EPI_ISL_535962, EPI_ISL_535966, EPI_ISL_535972, EPI_ISL_535973, EPI_ISL_535983, EPI_ISL_536017, EPI_ISL_536018, EPI_ISL_536020, EPI_ISL_536024, EPI_ISL_536075, EPI_ISL_536077, EPI_ISL_536078, EPI_ISL_536081, EPI_ISL_536082, EPI_ISL_536087, EPI_ISL_536088, EPI_ISL_536090, EPI_ISL_536094, EPI_ISL_536146, EPI_ISL_536147, EPI_ISL_536148, EPI_ISL_536186, EPI_ISL_536187, EPI_ISL_536223, EPI_ISL_536225, EPI_ISL_536247, EPI_ISL_536268, EPI_ISL_536269, EPI_ISL_536270, EPI_ISL_536279, EPI_ISL_536280, EPI_ISL_536281, EPI_ISL_536282, EPI_ISL_536284, EPI_ISL_536285, EPI_ISL_536290, EPI_ISL_536292, EPI_ISL_536293, EPI_ISL_536294, EPI_ISL_536296, EPI_ISL_536297, EPI_ISL_536298, EPI_ISL_536313, EPI_ISL_536314, EPI_ISL_536328, EPI_ISL_536331, EPI_ISL_536336, EPI_ISL_536338, EPI_ISL_536339, EPI_ISL_536340, EPI_ISL_536342, EPI_ISL_536350, EPI_ISL_536372, EPI_ISL_536373		
see above	Hôpital Charles-LeMoyne	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_535839	Hôpital Cité de la Santé	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Sandrine Moreira
EPI_ISL_535792	Hôpital Fleurimont	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Sandrine Moreira
EPI_ISL_961669, EPI_ISL_961670, EPI_ISL_961671, EPI_ISL_961672	Hôpital Georges L. Dumont	National Microbiology Laboratory (NML)	Anna Majer; Anneliese Landgraff; CanCOGeN's metadata curation team; Darian Hole; Elsie Grudeski; Gary Van Domselaar; Grace Seo; Guillaume Desnoyers; Jennifer Tanner; Kirsten Biggar; Madison Chattel; Morag Graham; Natalie Knox; Nathalie Bastien; Philip Mabon; Public Health Agency of Canada CanCOGeN team; Rhiannon Huzarewich; Richard Garceau; Russell Mandes; Shari Tyson; Timothy Booth; Yan Li
EPI_ISL_535717, EPI_ISL_535797, EPI_ISL_535912, EPI_ISL_535915, EPI_ISL_536013, EPI_ISL_536029, EPI_ISL_536055, EPI_ISL_536180, EPI_ISL_536379			
see above	Hôpital Honoré-Mercier	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_415650	Hôpital Instruction des Armées - BEGIN	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Christine Bigaillon; Flora Donati Vincent Enouf; Marion Barbet; Maud Vanpeene; Méline Bizard; Mélnie Albert; Sylvie Behillil; Sylvie van der Werf
EPI_ISL_535745, EPI_ISL_535994	Hôpital Laurentien	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_536108	Hôpital Le Royer	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_535755, EPI_ISL_535817, EPI_ISL_535831	Hôpital Maisonneuve-Rosemont	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Sandrine Moreira
EPI_ISL_443295, EPI_ISL_443296, EPI_ISL_443298, EPI_ISL_443299	Hôpital Necker - Enfants - Malades Laboratoire de Virologie	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Etienne Simon-Lorière; Flora Donati; Marianne Leruez-Ville; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_535721, EPI_ISL_535795	Hôpital Notre-Dame	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_450315, EPI_ISL_450318, EPI_ISL_465702, EPI_ISL_535718, EPI_ISL_535734, EPI_ISL_535763, EPI_ISL_535786, EPI_ISL_535818, EPI_ISL_535840, EPI_ISL_535879, EPI_ISL_535909, EPI_ISL_535948, EPI_ISL_536021, EPI_ISL_536039, EPI_ISL_536041, EPI_ISL_536092, EPI_ISL_536096, EPI_ISL_536099, EPI_ISL_536103, EPI_ISL_536173, EPI_ISL_536174, EPI_ISL_536176, EPI_ISL_536178, EPI_ISL_536179, EPI_ISL_536195, EPI_ISL_536196, EPI_ISL_536229, EPI_ISL_536234, EPI_ISL_536236, EPI_ISL_536253, EPI_ISL_536277, EPI_ISL_536295, EPI_ISL_536300, EPI_ISL_536303, EPI_ISL_536305, EPI_ISL_536306, EPI_ISL_536307, EPI_ISL_536308, EPI_ISL_536309, EPI_ISL_536322, EPI_ISL_536323, EPI_ISL_536332, EPI_ISL_536335, EPI_ISL_536347, EPI_ISL_536351, EPI_ISL_536352, EPI_ISL_536360, EPI_ISL_536374, EPI_ISL_536375, EPI_ISL_536388, EPI_ISL_536389, EPI_ISL_536391, EPI_ISL_536395, EPI_ISL_536397		
see above	Hôpital Pierre-Boucher	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_535731, EPI_ISL_535752, EPI_ISL_535762, EPI_ISL_535770, EPI_ISL_535771, EPI_ISL_535850, EPI_ISL_535862, EPI_ISL_535881, EPI_ISL_535882, EPI_ISL_535892, EPI_ISL_535893, EPI_ISL_535936, EPI_ISL_535956, EPI_ISL_536061, EPI_ISL_536062, EPI_ISL_536064, EPI_ISL_536065, EPI_ISL_536066, EPI_ISL_536067, EPI_ISL_536068, EPI_ISL_536070, EPI_ISL_536083, EPI_ISL_536084, EPI_ISL_536086, EPI_ISL_536125, EPI_ISL_536128, EPI_ISL_536131, EPI_ISL_536137, EPI_ISL_536139, EPI_ISL_536143, EPI_ISL_536144, EPI_ISL_536152, EPI_ISL_536157			

see above	Hôpital Pierre-Le Gardeur	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_414631, EPI_ISL_414632	Hôpital Robert Debré Laboratoire de Virologie	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Flora Donati Vincent Enouf; Laurent Andreoletti; Marion Barbet; Maud Vanpeene; Méline Bizard; Mélnie Albert; Sylvie Behillil; Sylvie van der Werf
EPI_ISL_535810, EPI_ISL_535899, EPI_ISL_535969, EPI_ISL_536010, EPI_ISL_536011, EPI_ISL_536056, EPI_ISL_536057, EPI_ISL_536252			
see above	Hôpital Sainte-Croix	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_536046	Hôpital d'Alma	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_535829, EPI_ISL_535905, EPI_ISL_535964, EPI_ISL_536107	Hôpital de Chicoutimi	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_465691, EPI_ISL_535858, EPI_ISL_536266	Hôpital de Gatineau	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_465686, EPI_ISL_535794, EPI_ISL_535809, EPI_ISL_535886, EPI_ISL_535887, EPI_ISL_535911, EPI_ISL_535995, EPI_ISL_536051, EPI_ISL_536117, EPI_ISL_536122, EPI_ISL_536124, EPI_ISL_536127, EPI_ISL_536132, EPI_ISL_536168, EPI_ISL_536169, EPI_ISL_536207, EPI_ISL_536208, EPI_ISL_536209, EPI_ISL_536230, EPI_ISL_536238, EPI_ISL_536239, EPI_ISL_536242, EPI_ISL_536244, EPI_ISL_536291, EPI_ISL_536312, EPI_ISL_536363, EPI_ISL_536367, EPI_ISL_536385, EPI_ISL_536386, EPI_ISL_536387, EPI_ISL_536392, EPI_ISL_536393			
see above	Hôpital de Hull	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_535744	Hôpital de Lasalle	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Sandrine Moreira
EPI_ISL_465684, EPI_ISL_535885, EPI_ISL_536111, EPI_ISL_536112, EPI_ISL_536289	Hôpital de Maria	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_535945	Hôpital de Mont-Laurier	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Sandrine Moreira
EPI_ISL_536171	Hôpital de Papineau	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_535985, EPI_ISL_535986, EPI_ISL_535987	Hôpital de Rouyn-Noranda	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_535793, EPI_ISL_535865, EPI_ISL_535926, EPI_ISL_535929, EPI_ISL_535930, EPI_ISL_535941, EPI_ISL_535942, EPI_ISL_535943, EPI_ISL_535947, EPI_ISL_535982, EPI_ISL_536008, EPI_ISL_536049, EPI_ISL_536058, EPI_ISL_536069, EPI_ISL_536071, EPI_ISL_536072			
see above	Hôpital de Saint-Eustache	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_535716, EPI_ISL_535723, EPI_ISL_535728	Hôpital de Verdun	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_535739	Hôpital de l'Enfant-Jésus	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Sandrine Moreira
EPI_ISL_535914, EPI_ISL_535937, EPI_ISL_535971, EPI_ISL_535974, EPI_ISL_535978, EPI_ISL_535996, EPI_ISL_535998, EPI_ISL_535999, EPI_ISL_536001, EPI_ISL_536030, EPI_ISL_536032, EPI_ISL_536033, EPI_ISL_536037, EPI_ISL_536246, EPI_ISL_536248, EPI_ISL_536249, EPI_ISL_536250, EPI_ISL_536251			
see above	Hôpital du Centre-de-la-Mauricie	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_535812	Hôpital du Sacré-Coeur de Montréal	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_450307, EPI_ISL_450311, EPI_ISL_450313, EPI_ISL_465680, EPI_ISL_535913, EPI_ISL_535917, EPI_ISL_535918, EPI_ISL_535919, EPI_ISL_535988, EPI_ISL_536026, EPI_ISL_536095, EPI_ISL_536097, EPI_ISL_536098, EPI_ISL_536102, EPI_ISL_536105, EPI_ISL_536163, EPI_ISL_536198, EPI_ISL_536200, EPI_ISL_536201, EPI_ISL_536202, EPI_ISL_536228, EPI_ISL_536257, EPI_ISL_536259, EPI_ISL_536273, EPI_ISL_536274, EPI_ISL_536319, EPI_ISL_536349, EPI_ISL_536354, EPI_ISL_536355, EPI_ISL_536356, EPI_ISL_536357, EPI_ISL_536358, EPI_ISL_536359, EPI_ISL_536362, EPI_ISL_536390			
see above	Hôpital du Suroît	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_535991, EPI_ISL_536113, EPI_ISL_536114	Hôpital et Centre d'Hébergement de Sept-Iles	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_535720, EPI_ISL_535756, EPI_ISL_535757	Hôpital général Juif	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Sandrine Moreira
EPI_ISL_536205	Hôpital régional de Rimouski	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_535798, EPI_ISL_535838, EPI_ISL_536022	Hôpital régional de Saint-Jérôme	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_536101	Hôpital, CLSC et Centre d'Hébergement de Roberval	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_535750, EPI_ISL_535751, EPI_ISL_535758, EPI_ISL_535759, EPI_ISL_535820, EPI_ISL_535821, EPI_ISL_535833, EPI_ISL_535834, EPI_ISL_535835, EPI_ISL_535836			
see above	Hôtel-Dieu de Lévis	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_535903, EPI_ISL_535904, EPI_ISL_535990, EPI_ISL_536121	Hôtel-Dieu de Sorel	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_424865, EPI_ISL_424895, EPI_ISL_424896, EPI_ISL_424897, EPI_ISL_424898, EPI_ISL_424899, EPI_ISL_424900, EPI_ISL_447842, EPI_ISL_647990, EPI_ISL_647991, EPI_ISL_647992, EPI_ISL_647993, EPI_ISL_647994, EPI_ISL_647995, EPI_ISL_647996, EPI_ISL_647997, EPI_ISL_647998, EPI_ISL_647999, EPI_ISL_648000, EPI_ISL_648001			
see above	IA State Hygienic Laboratory	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Uehara; Brian Lynch; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jasmine Padilla; Jing Zhang; Justin Lee; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_430464, EPI_ISL_430465, EPI_ISL_430466, EPI_ISL_430468, EPI_ISL_455640, EPI_ISL_455641, EPI_ISL_455643			
see above	ICMR-National Institute of Cholera and Enteric Diseases	National Institute of Biomedical Genomics	Ananya Chatterjee; Arindam Maitra; Hasina Banu; Mamta Chawla Sarkar; Saumitra Das; Shanta Dutta; Sreedhar Chinnaswamy
EPI_ISL_424850, EPI_ISL_424851, EPI_ISL_452134	IL Department of Public Health Chicago Laboratory	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Montmayeur; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao; Zachary Weiner
EPI_ISL_424866, EPI_ISL_452131	IN State Department of Health Laboratory Services	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Montmayeur; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao; Zachary Weiner
EPI_ISL_419255, EPI_ISL_493328, EPI_ISL_493329	INMI Lazzaro Spallanzani IRCCS	INMI Lazzaro Spallanzani IRCCS	Antonino Di Caro; Barbara Bartolini; Cesare E. M. Gruber; Cesare E.M. Gruber; Concetta Castilletti; Daniele Lapa; Eleonora Lalle; Emanuela Giombini; Fabrizio Carletti; Francesca Colavita; Francesco Messina; Giuseppe Ippolito.; Maria R. Capobianchi; Martina Rueca
EPI_ISL_417921, EPI_ISL_417922, EPI_ISL_417923, EPI_ISL_419254, EPI_ISL_424342, EPI_ISL_424343, EPI_ISL_424344			
see above	INMI Lazzaro Spallanzani IRCCS	Laboratory of Virology, INMI Lazzaro Spallanzani IRCCS	Antonino Di Caro; Barbara Bartolini; Cesare E. M. Gruber; Cesare Ernesto Maria Gruber; Concetta Castilletti; Daniele Lapa; Eleonora Lalle; Emanuela Giombini; Fabrizio Carletti; Francesca Colavita; Francesco Messina; Francesco Vairo; Giulia Matusali; Giuseppe Ippolito; Giuseppe Ippolito.; Licia Bordi; Maria R. Capobianchi; Maria Rosaria Capobianchi; Martina Rueca
EPI_ISL_826798, EPI_ISL_826800, EPI_ISL_826802, EPI_ISL_826804, EPI_ISL_826805, EPI_ISL_826807, EPI_ISL_826809, EPI_ISL_826811, EPI_ISL_826812, EPI_ISL_826814, EPI_ISL_826816, EPI_ISL_826818			

see above	INSPI-CRN DE INFLUENZA Y OTROS VIRUS RESPIRATORIOS	Instituto de Salud Publica de Chile	Alfredo Bruno; Andres Castillo; Barbara Parra; Domenica de Mora; Gisselle Barra; Jaime Lagos; Javier Tognarelli; Jimmy Garcez; Jorge Fernandez; Loredana Arata; Manuel Gonzalez; Martiza Olmedo; Michelle Paez; Patricia Bustos; Rodrigo Fasce; Solon Narvaez
EPI_ISL_445302	INSTITUTO MEDICO LEGAL	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445261	INTEGRAMEDICA LAB. CLINICO LTDA.	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_492980, EPI_ISL_492984, EPI_ISL_492985, EPI_ISL_492986, EPI_ISL_492987, EPI_ISL_751320, EPI_ISL_751347, EPI_ISL_751348, EPI_ISL_751349, EPI_ISL_751350, EPI_ISL_751351, EPI_ISL_751352, EPI_ISL_751353, EPI_ISL_751354, EPI_ISL_751355, EPI_ISL_751356, EPI_ISL_751357, EPI_ISL_751358, EPI_ISL_751359, EPI_ISL_751360, EPI_ISL_751361, EPI_ISL_751362, EPI_ISL_751363, EPI_ISL_751364, EPI_ISL_751365, EPI_ISL_751366, EPI_ISL_751367, EPI_ISL_751368, EPI_ISL_751369, EPI_ISL_751370, EPI_ISL_751371, EPI_ISL_751372, EPI_ISL_751373, EPI_ISL_751374, EPI_ISL_751375, EPI_ISL_751376, EPI_ISL_751377, EPI_ISL_751378, EPI_ISL_751379, EPI_ISL_751380, EPI_ISL_751381, EPI_ISL_751382, EPI_ISL_751383, EPI_ISL_751384, EPI_ISL_751385, EPI_ISL_751386, EPI_ISL_751387, EPI_ISL_751388, EPI_ISL_751389, EPI_ISL_751390, EPI_ISL_751391, EPI_ISL_751392, EPI_ISL_751393, EPI_ISL_751394, EPI_ISL_751395, EPI_ISL_751396, EPI_ISL_751397, EPI_ISL_751398, EPI_ISL_751399, EPI_ISL_751400, EPI_ISL_751401, EPI_ISL_751402, EPI_ISL_751403, EPI_ISL_751404, EPI_ISL_751405, EPI_ISL_751406, EPI_ISL_751407, EPI_ISL_751408, EPI_ISL_751409, EPI_ISL_751410, EPI_ISL_751411, EPI_ISL_751412, EPI_ISL_751413, EPI_ISL_751414, EPI_ISL_751415, EPI_ISL_751416, EPI_ISL_751417, EPI_ISL_751418, EPI_ISL_751419, EPI_ISL_751420, EPI_ISL_751421, EPI_ISL_751422, EPI_ISL_751423, EPI_ISL_751424, EPI_ISL_751425, EPI_ISL_751426, EPI_ISL_751427			
see above	IRCCS Sacro Cuore Don Calabria Hospital, Department of Infectious, Tropical Diseases & Microbiology	University of Verona, Department of Biotechnology	Antonio Mori; Chiara Degli Esposti; Chiara Piubelli; Cristina Beltrami; Elena Pomari; Emanuela Cosentino; Giulia Lopatriello; Luca Marcolungo; Massimo Delledonne; Michela Deiana
EPI_ISL_480961, EPI_ISL_480989	ISGlobal, Institut de Salut Global de Barcelona	SeqCOVID-SPAIN consortium/IBV(CSIC)	Alberto L Garcia-Basteiro; Alfredo Mayor; Carlota Dobaño; Gemma Moncunill; Pau Cisteró and SeqCOVID-SPAIN consortium
EPI_ISL_572324	IZSM	IZSM	Giovanna Fusco; Lorena Cardillo; Maurizio Viscardi
EPI_ISL_479936, EPI_ISL_479937, EPI_ISL_479938, EPI_ISL_479939, EPI_ISL_479940, EPI_ISL_479941, EPI_ISL_479942, EPI_ISL_479943, EPI_ISL_479985, EPI_ISL_480021, EPI_ISL_480022, EPI_ISL_480023, EPI_ISL_480024, EPI_ISL_480025, EPI_ISL_480026, EPI_ISL_480027, EPI_ISL_480028, EPI_ISL_480180, EPI_ISL_480181			
see above	Ibaraki Prefectural Institute of Public Health	Pathogen Genomics Center, National Institute of Infectious Diseases	Hajime Kamiya; Keiko Goto; Kentaro Itokawa; Makoto Kuroda; Masanori Hashino; Motoi Suzuki; Rina Tanaka; Tsuyoshi Sekizuka
EPI_ISL_683658, EPI_ISL_683659, EPI_ISL_683663, EPI_ISL_683664, EPI_ISL_683669, EPI_ISL_683670, EPI_ISL_683672, EPI_ISL_683673, EPI_ISL_683674, EPI_ISL_779716, EPI_ISL_779717, EPI_ISL_779718, EPI_ISL_779723, EPI_ISL_779724, EPI_ISL_779726, EPI_ISL_779727, EPI_ISL_779728, EPI_ISL_779729, EPI_ISL_779754, EPI_ISL_779755, EPI_ISL_779756, EPI_ISL_779757, EPI_ISL_779758, EPI_ISL_779759, EPI_ISL_779760, EPI_ISL_779761, EPI_ISL_779762, EPI_ISL_779763, EPI_ISL_779764, EPI_ISL_779765, EPI_ISL_779766, EPI_ISL_779767, EPI_ISL_779768, EPI_ISL_779769, EPI_ISL_779770, EPI_ISL_779771, EPI_ISL_779772, EPI_ISL_779773, EPI_ISL_855403			
see above	IdISSC/Hospital Clínico San Carlos de Madrid	SeqCOVID-SPAIN consortium/IBV(CSIC)	Alberto Delgado-Iribarren; Esther Culebras Lopez; Esther Culebras López; Jorge Matias-Guiu; Luis Ortega Medina; Silvia Sánchez Ramón; Ulises Gómez-Pinedo and SeqCOVID-SPAIN consortium; Vicente Estrada Pérez
EPI_ISL_632847, EPI_ISL_632848, EPI_ISL_632849, EPI_ISL_632850, EPI_ISL_632851, EPI_ISL_632852, EPI_ISL_632853, EPI_ISL_632856, EPI_ISL_632857, EPI_ISL_632858, EPI_ISL_632859, EPI_ISL_632861, EPI_ISL_632863, EPI_ISL_632864, EPI_ISL_632865, EPI_ISL_632868, EPI_ISL_632870, EPI_ISL_632871, EPI_ISL_632872, EPI_ISL_632873, EPI_ISL_632876, EPI_ISL_632878, EPI_ISL_632879, EPI_ISL_632880, EPI_ISL_632881, EPI_ISL_632882, EPI_ISL_632883, EPI_ISL_632885, EPI_ISL_632886			
see above	Idaho Bureau of Laboratories	Center for Global Health, University of New Mexico Health Sciences Center	Christopher Ball; Darrell Dinwiddie; Daryl Domman; Kurt Schwalm; Matthew Burns; Robert Voermans
EPI_ISL_1164798, EPI_ISL_1164813	Idaho Bureau of Laboratories	IBL	"R. Beukelman; Aimee Ceniseros; Christopher Ball"; Matthew C. Burns; Robert L. Voermans
EPI_ISL_848466	Illinois Department of Public Health	Gagnon Lab, Southern Illinois University	Keith Gagnon
EPI_ISL_420789, EPI_ISL_420790	Illinois Department of Public Health Chicago Laboratory	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anne Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jasmine Padilla; Jing Zhang; Justin Lee; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_475572	Imperial College London	Imperial College London	Jie Zhou; Wendy Barclay
EPI_ISL_637099, EPI_ISL_637100, EPI_ISL_637101, EPI_ISL_637103, EPI_ISL_637104	Indian Council of Medical Research-National Institute of Virology, Microbial Containment Complex	Indian Council of Medical Research-National Institute of Virology, Microbial Containment Complex	Anita Shete-Aich; Dimpal A. Nyayanit; Gururaj Rao Deshpande; Padinjaremattathil Thankappan Ullas; Pragya D. Yadav; Prasad Sarkale; Priya Abraham; Varsha Potdar
EPI_ISL_413518, EPI_ISL_413519, EPI_ISL_413520, EPI_ISL_413521, EPI_ISL_514752	Infectious Disease Control Center, Center for Disease Control and Prevention of PLA	Infectious Disease Control Center, Center for Disease Control and Prevention of PLA	Li; Li, J.; Li, L.; Li, P.; Li, Z.; P. and Li, P.; Qiu, S.; Song, H.
EPI_ISL_962528, EPI_ISL_962529, EPI_ISL_962530, EPI_ISL_962531, EPI_ISL_962532, EPI_ISL_962533, EPI_ISL_962534, EPI_ISL_962535, EPI_ISL_962536, EPI_ISL_962537, EPI_ISL_962538, EPI_ISL_962539, EPI_ISL_962540, EPI_ISL_962541, EPI_ISL_962542, EPI_ISL_962543, EPI_ISL_962544, EPI_ISL_962545, EPI_ISL_962546, EPI_ISL_962547, EPI_ISL_962548, EPI_ISL_962549, EPI_ISL_962550, EPI_ISL_962551, EPI_ISL_962552, EPI_ISL_962553, EPI_ISL_962554, EPI_ISL_962555, EPI_ISL_962556, EPI_ISL_962557, EPI_ISL_962558, EPI_ISL_962559, EPI_ISL_962560, EPI_ISL_962561, EPI_ISL_962562, EPI_ISL_962563, EPI_ISL_962564, EPI_ISL_962565, EPI_ISL_962566, EPI_ISL_962567, EPI_ISL_962568, EPI_ISL_962569, EPI_ISL_962570, EPI_ISL_962571, EPI_ISL_962572, EPI_ISL_962573, EPI_ISL_962574, EPI_ISL_962575, EPI_ISL_962576, EPI_ISL_962577, EPI_ISL_962578, EPI_ISL_962579, EPI_ISL_962580, EPI_ISL_962581, EPI_ISL_962582, EPI_ISL_962583, EPI_ISL_962584, EPI_ISL_962868, EPI_ISL_962869, EPI_ISL_962870, EPI_ISL_962871, EPI_ISL_962873, EPI_ISL_962874, EPI_ISL_962875			
see above	Infectious Disease Control and Prevention Institute	Infectious Disease Control and Prevention Institute	Bo Pang; Jianxing Wang; Julong Wu; Mingxiao Yao; Ti Liu; Xiaolin Jiang; Yan Li; Yujie He; Yuwei Zhang; Zengqiang Kou
EPI_ISL_596454	Infectious Disease and Tropical Medicine Research Center, Resistant Tuberculosis Institute, Zahedan University of Medical Sciences, Zahedan, Iran.	Genetics Research Center, University of Social Welfare and Rehabilitation Sciences	Ali Jafarpour; Azam Ghaziasadi; Ebrahim Kord; Hossein Najmabadi; Khadijeh Jalalvand; Kimia Kahrizi; Marzieh Mohseni; Seyed Mohammad Hashemi-Shahri; Seyed Mohammad Jazayeri; Seyedeh elham Mortazavi; Zohreh Fattahi
EPI_ISL_856712, EPI_ISL_856716	Infectious Diseases Unit, Department of Internal Medicine, Azienda Ospedaliera-Universitaria di Padova	Laboratory of Infectious Diseases, Department of Biomedical and Clinical Sciences L. Sacco, University of Milan	Alessia Lai; Anna Maria Cattelan; Annalisa Bergna; Carla Della Ventura; Claudia Balotta; Davide Leoni; Gianguglielmo Zehender on behalf of SARS-CoV-2 ITALIAN RESEARCH ENTERPRISE-(SCIRE) Collaborative Group; Lolita Sasset; Massimo Galli
EPI_ISL_541970	Influenza Centre, University of Bergen	Norwegian Institute of Public Health, Department of Virology	Bjørn Blomberg; Fan Zhou; Hilde Elshaug; Hilde Synnøve Vollan; Kamilla Heddeland Instefjord; Karl A Brokstad; Karoline Bragstad; Kathrine Stene-Johansen; Olav Hungnes; Rasmus Riis Kopperud; Rebecca J Cox
EPI_ISL_470900	Influenza etiology and epidemiology laboratory	Pathogenic Microorganisms Variability Laboratory	Alexander Gintsburg; Alexey Shchetinin; Andrey Botikov; Daria Grousova; Denis Logunov; Elena Burtseva; Elena Shidlovskaya; Inna Dolzhikova; Kirill Krasnoslobotsev; Ludmila Kolobukhina; Maria Nikiforova; Nadezhda Kuznetsova; Svetlana Smetanina; Svetlana Trushakova; Vladimir Gushchin
EPI_ISL_418215	Institut Pasteur Dakar	Institut Pasteur de Dakar	Amadou Alpha Sall; Ndongo Dia; Ousmane Faye
EPI_ISL_416498, EPI_ISL_428355, EPI_ISL_428356, EPI_ISL_428357	Institut Médico légal- Hop R. Poincaré	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Etienne Simon-Lorière; Flora Donati; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Mélnie Albert; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_1293351, EPI_ISL_1303031, EPI_ISL_1321604	Institut National d'Hygiène (INH)	Unité Mixte Internationale TransVIHMI (UMI 233 IRD - U1175 INSERM - Université de Montpellier)IRD (Institut de recherche pour le développement)	Abla A. KONOU; Adodo SADJI; Ahidjo AYOUBA; Akoélé SILIADIN; Alassane OURO-MEDELI; Amivi EHLAN; Améyo DORKENOO; Anoumou DAGNRA; Christelle BUTEL; Déléma MABA; Eric DELAPORTE; Issaka Maman; Kokou TEGUENI; Laetitia SERRANO; Martine PEETERS; Messanh DOUFFAN; Mireille PRINCE-DAVID; Mounerou SALOU; Sidonie A.M.KAGNISSODE; Sika DOSSIM; Wembo A. HALATOKO
EPI_ISL_418206, EPI_ISL_418207, EPI_ISL_418208, EPI_ISL_418209, EPI_ISL_418210, EPI_ISL_418211, EPI_ISL_418212, EPI_ISL_418213, EPI_ISL_418216, EPI_ISL_418217, EPI_ISL_420069, EPI_ISL_420070, EPI_ISL_420072, EPI_ISL_420073, EPI_ISL_420074, EPI_ISL_420076, EPI_ISL_420077, EPI_ISL_420078, EPI_ISL_480554, EPI_ISL_480556, EPI_ISL_480783, EPI_ISL_480787			
see above	Institut Pasteur Dakar	Institut Pasteur de Dakar	Amadou Alpha Sall; Amadou Alpha Sall.; Amadou Alpha sall; Mamadou Diop; Mamadou Malado Jallow; Marie Henriette Dior Ndione; Moussa Moise Diagne; Ndongo Dia; Ousmane Faye; Safietou Sanke
EPI_ISL_613419, EPI_ISL_613420, EPI_ISL_613421, EPI_ISL_613422, EPI_ISL_613423, EPI_ISL_613424, EPI_ISL_613425, EPI_ISL_613426, EPI_ISL_613427, EPI_ISL_613428, EPI_ISL_613429, EPI_ISL_613430, EPI_ISL_613431, EPI_ISL_613432, EPI_ISL_613433, EPI_ISL_613434, EPI_ISL_613435, EPI_ISL_613436, EPI_ISL_613437, EPI_ISL_613438, EPI_ISL_613439, EPI_ISL_613440, EPI_ISL_613441, EPI_ISL_613442, EPI_ISL_613443, EPI_ISL_613444, EPI_ISL_613445, EPI_ISL_613446, EPI_ISL_613447, EPI_ISL_613448, EPI_ISL_613449, EPI_ISL_613450, EPI_ISL_613451, EPI_ISL_613452			
see above	Institut Pasteur de la Guadeloupe	Institut Pasteur de la Guadeloupe	Angela Brisebarre; Antoine Talarmin; Camille Capel; Cherina Fleming; Etienne Simon-Lorière; Marion Barbet; Maud Vanpeene; Méline Bizard; Radjin Steingrover; Stéphanie Guyomard; Sylvie Behillil; Sylvie van der Werf; Sébastien Breurec; Vincent Enouf
EPI_ISL_459965, EPI_ISL_459966, EPI_ISL_459967, EPI_ISL_459968, EPI_ISL_459972, EPI_ISL_459973, EPI_ISL_459974, EPI_ISL_459975, EPI_ISL_459976			
see above	Institut Pasteur du Maroc	Institut Pasteur du Maroc	Abdellah Faouzi; Anass Abbad; Anderrahmane Maaroufi; Angela Brisebarre; Camille Capel; Etienne Simon-Lorière; Jalal Nourlil; Latifa Anga; Marion Barbet; Maud Vanpeene; Mjid Elloualid; Méline Bizard; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf

EPI_ISL_416747, EPI_ISL_416748, EPI_ISL_416750, EPI_ISL_416753, EPI_ISL_416754, EPI_ISL_416756, EPI_ISL_416758				
	see above	Institut des Agents Infectieux (IAI) Hospices Civils de Lyon	CNR Virus des Infections Respiratoires - France SUD	Alexandre; Antonin; Bal; Bouscambert-Duchamp; Brengel-Pesce; Bruno.; Cheynet; Destras; Florence; Gaymard; Gregory; Josset; Karen; Laurence; Lina; Martine; Maude; Morfin-Sherpa; Valette; Valérie
EPI_ISL_417333, EPI_ISL_417334, EPI_ISL_417335, EPI_ISL_417336, EPI_ISL_417337, EPI_ISL_417339, EPI_ISL_418420, EPI_ISL_418421, EPI_ISL_418422, EPI_ISL_418423, EPI_ISL_418424, EPI_ISL_418425, EPI_ISL_418429, EPI_ISL_418430, EPI_ISL_418431, EPI_ISL_418432, EPI_ISL_419169, EPI_ISL_419170, EPI_ISL_419171, EPI_ISL_419172, EPI_ISL_419173, EPI_ISL_419177, EPI_ISL_419178, EPI_ISL_419179, EPI_ISL_419180, EPI_ISL_419181, EPI_ISL_419182, EPI_ISL_419184, EPI_ISL_420604, EPI_ISL_420605, EPI_ISL_420606, EPI_ISL_420607, EPI_ISL_420608, EPI_ISL_420609, EPI_ISL_420610, EPI_ISL_420611, EPI_ISL_420615, EPI_ISL_420616, EPI_ISL_420618, EPI_ISL_420619, EPI_ISL_420621, EPI_ISL_420622, EPI_ISL_420623, EPI_ISL_420624, EPI_ISL_420625, EPI_ISL_508871, EPI_ISL_508872, EPI_ISL_508873, EPI_ISL_508874, EPI_ISL_508877, EPI_ISL_508882, EPI_ISL_508883, EPI_ISL_508884, EPI_ISL_508885, EPI_ISL_508886, EPI_ISL_508887, EPI_ISL_508888, EPI_ISL_508889, EPI_ISL_508890, EPI_ISL_508891, EPI_ISL_508892, EPI_ISL_508893, EPI_ISL_508894, EPI_ISL_508895, EPI_ISL_508896, EPI_ISL_508897, EPI_ISL_508898, EPI_ISL_508899, EPI_ISL_508900, EPI_ISL_508901, EPI_ISL_508902, EPI_ISL_508903, EPI_ISL_508904, EPI_ISL_508905, EPI_ISL_508906, EPI_ISL_508907, EPI_ISL_508908, EPI_ISL_508909, EPI_ISL_508910, EPI_ISL_508911, EPI_ISL_509007, EPI_ISL_509008, EPI_ISL_509009, EPI_ISL_509010, EPI_ISL_509011, EPI_ISL_509013, EPI_ISL_509014				
	see above	Institut des Agents Infectieux (IAI), Hospices Civils de Lyon	CNR Virus des Infections Respiratoires - France SUD	Alexandre Gaymard; Antonin Bal; Bruno Lina; Carine Moustaud; Florence Morfin-Sherpa; Gregory Destras; Gwendolyne Burfin; Laurence Josset; Martine Valette; Maude Bouscambert-Duchamp; Raphaelle Lamy; Solenne Brun
EPI_ISL_437913, EPI_ISL_437914, EPI_ISL_437915, EPI_ISL_437916, EPI_ISL_437917, EPI_ISL_437918, EPI_ISL_437919, EPI_ISL_437920, EPI_ISL_437921, EPI_ISL_437922, EPI_ISL_437923, EPI_ISL_437924, EPI_ISL_437925, EPI_ISL_437926, EPI_ISL_437927, EPI_ISL_437928, EPI_ISL_437929, EPI_ISL_437930, EPI_ISL_437931, EPI_ISL_437932, EPI_ISL_437974, EPI_ISL_437975, EPI_ISL_437976, EPI_ISL_437977, EPI_ISL_437978, EPI_ISL_437979, EPI_ISL_437980, EPI_ISL_437981, EPI_ISL_437982, EPI_ISL_437983, EPI_ISL_437984, EPI_ISL_437985, EPI_ISL_437986, EPI_ISL_437987, EPI_ISL_437988, EPI_ISL_437989, EPI_ISL_437990, EPI_ISL_437991, EPI_ISL_437992, EPI_ISL_475769, EPI_ISL_475813, EPI_ISL_475814, EPI_ISL_475815, EPI_ISL_475816, EPI_ISL_475817, EPI_ISL_475818, EPI_ISL_475819, EPI_ISL_475820, EPI_ISL_475821, EPI_ISL_475822, EPI_ISL_475823, EPI_ISL_475829, EPI_ISL_475919, EPI_ISL_475924, EPI_ISL_475926, EPI_ISL_475927, EPI_ISL_475928, EPI_ISL_583601, EPI_ISL_583602, EPI_ISL_583603, EPI_ISL_583605, EPI_ISL_583606, EPI_ISL_583609, EPI_ISL_583610, EPI_ISL_583611, EPI_ISL_583612, EPI_ISL_583613, EPI_ISL_583614, EPI_ISL_583691				
	see above	Institut für Virologie am Department für Hygiene, Mikrobiologie und Public Health	Bergthaler laboratory, CeMM Research Center for Molecular Medicine of the Austrian Academy of Sciences	Adi Steinrigl; Alexander Lercher; Alexandra Popa; Andreas Bergthaler; Benedikt Agerer; Christian Paar; Christoph Bock; Daniela Schmid; Dorothee von Laer; Elisabeth Puchhammer-Stoeckl; Franz Allerberger; Gernot Walder; Gregor Hörmann; Guenter Weiss; Gunther Vogl; Henrique Colaco; Jakob-Wendelin Genger; Jan Laine; Judith Aberle; Kinga Rigler-Hohenwarter; Lukas Endler; Manfred Nairz; Mark Smyth; Martin Senekowitsch; Michael Schuster; Peter Hufnagl; Peter Obrist; Rainer Gattringer; Sabine Sussitz-Rack; Stephan Aberle; Thomas Penz; Wegene Borena
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	see above	Institute for Infectious Diseases, University of Bern	Institute for Infectious Diseases, University of Bern	Alban Ramette; Christian Baumann; Cora Sägesser; Franziska Suter-Riniker; Michel C Koch; Miguel A Terrazos Miani; Peter Keller; Stephen L Leib
	EPI_ISL_455790, EPI_ISL_455791, EPI_ISL_455792, EPI_ISL_455793	Institute for Medical Research, Infectious Disease Research Centre, National Institutes of Health, Ministry of Health Malaysia	Malaysia Genome Institute	Azrin Ahmad; Enizza Kasim; Irni Suhayu Sapian; Jeyanthi Suppiah; Mohd Faizal Abu Bakar; Mohd Noor Mat Isa; Norazah Ahmad; Nurhezreen Md Iqbal; Ravindran Thayan; Shahrul Hisham Zainal Ariffin; Shamsidar Sopie; Siti Noraini Othman; Tahir Aris; Yusuf Muhammad Noor; Zarina Mohd Zawawi
	EPI_ISL_430441, EPI_ISL_430442, EPI_ISL_430444, EPI_ISL_459955, EPI_ISL_489992, EPI_ISL_489994	Institute for Medical Research, Infectious Disease Research Centre, National Institutes of Health, Ministry of Health Malaysia	Institute for Medical Research, Infectious Disease Research Centre, National Institutes of Health, Ministry of Health Malaysia	Abdul-Wahid.M-Z; Ahmad.N; Azizan.M-A; Ellan K; Hisham.H-A; Kalyanasundram J; Kalyanasundram.J; Kamel K; Kamel KA; Mat-Sharani.S; Mohd-Zain R; Mohd-Zain.R; Mohd-Zawawi Z; Mohd-Zawawi.Z; Suppiah J; Suppiah.J; Tan.L-P; Tengku-Rogayah.TAR; Thayan R; Thayan.R
EPI_ISL_583579, EPI_ISL_583580, EPI_ISL_583581, EPI_ISL_583582, EPI_ISL_583583, EPI_ISL_583584, EPI_ISL_583585, EPI_ISL_583586, EPI_ISL_583587, EPI_ISL_583588, EPI_ISL_583591, EPI_ISL_583592, EPI_ISL_583593, EPI_ISL_583594, EPI_ISL_583595, EPI_ISL_583596, EPI_ISL_583597, EPI_ISL_583598				
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	EPI_ISL_454605, EPI_ISL_454606, EPI_ISL_455566, EPI_ISL_455567	Institute for Public Health	Laboratory for advanced genomics	Filip Roki; Igor Jurak; Lovro Trgovec-Greif; Neven Sui; Oliver Vugrek; Tomislav Rukavina
EPI_ISL_602463, EPI_ISL_602464, EPI_ISL_602465, EPI_ISL_602466, EPI_ISL_602467, EPI_ISL_602487, EPI_ISL_602488, EPI_ISL_602489, EPI_ISL_602490, EPI_ISL_602491, EPI_ISL_602492, EPI_ISL_602493, EPI_ISL_602494, EPI_ISL_602495, EPI_ISL_602496, EPI_ISL_602497, EPI_ISL_602498, EPI_ISL_602499, EPI_ISL_602500, EPI_ISL_602501, EPI_ISL_602502, EPI_ISL_602503, EPI_ISL_602504, EPI_ISL_602505, EPI_ISL_602506, EPI_ISL_602507, EPI_ISL_602508, EPI_ISL_602509, EPI_ISL_602518, EPI_ISL_602519, EPI_ISL_602520, EPI_ISL_602522, EPI_ISL_602523, EPI_ISL_602524, EPI_ISL_602527, EPI_ISL_602529, EPI_ISL_602530, EPI_ISL_717977				
	see above	Institute for Virology, University Hospital Essen	Center of Medical Microbiology, Virology, and Hospital Hygiene, University of Duesseldorf	Alexander Dilthey; Andreas Walker; Daniel Strelow; Jessica Nicolai; Jörg Timm; Klaus Pfeffer; Lisanna Hülse; Malte Kohns Vasconcelos; Maximilian Damagnez; Nadine Lübke; Olympia E. Anastasiou; Tobias Wienemann; Torsten Houwaart; Ulf Dittmer
	EPI_ISL_418988	Institute information KU Leuven, Clinical and Epidemiological Virology	Institute information KU Leuven, Clinical and Epidemiological Virology	Bert Vanmechelen; Joan Marti-Carreras; Piet Maes; Tony Wawina
	EPI_ISL_525472	Institute of Clinical Microbiology and Hygiene, University Hospital Regensburg	Institute of Clinical Microbiology and Hygiene, University Hospital Regensburg	Hiergeist, A.
EPI_ISL_539333, EPI_ISL_539334, EPI_ISL_539335, EPI_ISL_539336, EPI_ISL_539337, EPI_ISL_539338, EPI_ISL_539339				
	see above	Institute of Disease Control and Prevention, People's Liberation Army	Institute of Disease Control and Prevention, People's Liberation Army	Li, P.; Qiu, S.
EPI_ISL_723079, EPI_ISL_723084, EPI_ISL_723085, EPI_ISL_723086, EPI_ISL_723087, EPI_ISL_723088, EPI_ISL_723089, EPI_ISL_723090, EPI_ISL_723091, EPI_ISL_723092, EPI_ISL_723093, EPI_ISL_723094, EPI_ISL_723095, EPI_ISL_723096, EPI_ISL_723097, EPI_ISL_723098, EPI_ISL_723099, EPI_ISL_723100, EPI_ISL_723101, EPI_ISL_723102, EPI_ISL_723103, EPI_ISL_723104, EPI_ISL_723105, EPI_ISL_723106				
	see above	Institute of Medical Genetics and Applied Genomics	Institute of Medical Genetics and Applied Genomics	Angel Angelov; Caspar Gross; Daniela Bezdan; Michael Bitzer; Michael Sonnabend; Michaela Pogoda; Nicolas Casadei; Siri Göpel; Stephan Ossowski; Thomas Iftner; Tina Ganzenmüller
EPI_ISL_590823, EPI_ISL_590824, EPI_ISL_590825, EPI_ISL_590826, EPI_ISL_590827, EPI_ISL_590828, EPI_ISL_590829, EPI_ISL_590830				
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EPI_ISL_420294, EPI_ISL_420295, EPI_ISL_420541, EPI_ISL_635201, EPI_ISL_635206, EPI_ISL_635207, EPI_ISL_635208, EPI_ISL_635209, EPI_ISL_635210, EPI_ISL_635211, EPI_ISL_635212, EPI_ISL_635213, EPI_ISL_635214, EPI_ISL_635215, EPI_ISL_635216, EPI_ISL_635217, EPI_ISL_635218, EPI_ISL_635219, EPI_ISL_635221, EPI_ISL_635222, EPI_ISL_635223, EPI_ISL_635224, EPI_ISL_635225, EPI_ISL_635226, EPI_ISL_635227, EPI_ISL_635228, EPI_ISL_635229, EPI_ISL_635230, EPI_ISL_635231, EPI_ISL_635232, EPI_ISL_635233, EPI_ISL_635234, EPI_ISL_635235, EPI_ISL_635236, EPI_ISL_635237, EPI_ISL_635238, EPI_ISL_635239, EPI_ISL_635240, EPI_ISL_635241, EPI_ISL_635242, EPI_ISL_635243, EPI_ISL_635244, EPI_ISL_635245, EPI_ISL_635246, EPI_ISL_635248, EPI_ISL_635250, EPI_ISL_635251, EPI_ISL_635252, EPI_ISL_635253, EPI_ISL_635254, EPI_ISL_635255, EPI_ISL_635256, EPI_ISL_635257, EPI_ISL_635258, EPI_ISL_635259, EPI_ISL_635260, EPI_ISL_635261, EPI_ISL_635262, EPI_ISL_635263, EPI_ISL_635264, EPI_ISL_635265, EPI_ISL_635266, EPI_ISL_635269, EPI_ISL_635270, EPI_ISL_635276, EPI_ISL_635278, EPI_ISL_635282, EPI_ISL_635287, EPI_ISL_635288, EPI_ISL_635290, EPI_ISL_635291, EPI_ISL_635293				
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	EPI_ISL_508338, EPI_ISL_508349, EPI_ISL_508368, EPI_ISL_508376	Institute of Post Graduate Medical Education & Research	National Institute of Biomedical Genomics	Arindam Maitra; Aritra Biswas; Jayeeta Haldar; Monimoy Banerjee; Raja Ray; Saumitra Das
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	EPI_ISL_964878	Institute of Virology Ulm University Medical Center Prof. Dr. Thomas Stamminger	Münch Lab / Ulm University Medical Center Kirchhoff Lab / Ulm University Medical Center Sparrer Lab / Ulm University Medical Center Blum Lab / LMU Munich	Alexander Graf; Carina Conzelmann; Frank Kirchhoff; Helmut Blum; Jan Münch; Janis Müller; Konstantin Sparrer; Rüdiger Gross; Stefan Krebs; Thomas Stamminger
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EPI_ISL_983566, EPI_ISL_983567, EPI_ISL_983568, EPI_ISL_983569, EPI_ISL_983570, EPI_ISL_983571, EPI_ISL_983572, EPI_ISL_983573, EPI_ISL_983574, EPI_ISL_983575, EPI_ISL_983576, EPI_ISL_983577, EPI_ISL_983578, EPI_ISL_983579, EPI_ISL_983580, EPI_ISL_983581, EPI_ISL_983582, EPI_ISL_983583, EPI_ISL_983584, EPI_ISL_983585, EPI_ISL_983586, EPI_ISL_983587			
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EPI_ISL_776751, EPI_ISL_776752, EPI_ISL_776753, EPI_ISL_776754, EPI_ISL_776760, EPI_ISL_776761, EPI_ISL_776762, EPI_ISL_776763, EPI_ISL_792101, EPI_ISL_792102, EPI_ISL_792104, EPI_ISL_792105, EPI_ISL_792106, EPI_ISL_792107, EPI_ISL_833152, EPI_ISL_833153, EPI_ISL_861625, EPI_ISL_861626, EPI_ISL_861627, EPI_ISL_861633			
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EPI_ISL_792103	Instituto Adolfo Lutz - Regional de Santo Andre	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes; Karoline Rodrigues Campos
EPI_ISL_426364	Instituto Nacional de Ciencias Medicas y Nutricion Salvador Zubiran	Instituto Nacional de Ciencias Medicas y Nutricion	Adnan Araiza Rodríguez; Alejandro Sánchez; Alfredo Ponce de León Garduño; Blanca Taboada; Carlos F. Arias; Carolina González Torres; Celia Boukadida; Cesar Raúl González Bonilla; Concepción Grajales Muñiz; Edgar Mendieta Condado; Eduardo Becerril Vargas; Fabiola Garcés Ayala; Fernando Ledesma Barrientos; Francisco Javier Gaytán Cervantes; Francisco Pulido; Gisela Barrera Badillo; Gloria Vázquez; Guillermo M. Ruiz-Palacios; Irma López Martínez; Joel Armando Vázquez Pérez; José Arturo Martínez Orozco; José Ernesto Ramírez González; José Esteban Muñoz Medina; Lucia Hernández Rivas; Luis Alberto García Andrade; Mario Mújica Sánchez; Pavel Isa; Pilar Ramos Cervantes; Ricardo Grande; Santiago Avila Ríos; Victor Hugo Borja Aburto; Violeta Ibarra Gonzalez
EPI_ISL_426361, EPI_ISL_426362, EPI_ISL_426363, EPI_ISL_426365	Instituto Nacional de Ciencias Medicas y Nutricion Salvador Zubiran	Instituto Nacional de Ciencias Medicas y Nutricion Salvador Zubiran	Adnan Araiza Rodríguez; Alejandro Sánchez; Alfredo Ponce de León Garduño; Blanca Taboada; Carlos F. Arias; Carolina González Torres; Celia Boukadida; Cesar Raúl González Bonilla; Concepción Grajales Muñiz; Edgar Mendieta Condado; Eduardo Becerril Vargas; Fabiola Garcés Ayala; Fernando Ledesma Barrientos; Francisco Javier Gaytán Cervantes; Francisco Pulido; Gisela Barrera Badillo; Gloria Vázquez; Guillermo M. Ruiz-Palacios; Irma López Martínez; Joel Armando Vázquez Pérez; José Arturo Martínez Orozco; José Ernesto Ramírez González; José Esteban Muñoz Medina; Lucia Hernández Rivas; Luis Alberto García Andrade; Mario Mújica Sánchez; Pavel Isa; Pilar Ramos Cervantes; Ricardo Grande; Santiago Avila Ríos; Victor Hugo Borja Aburto; Violeta Ibarra Gonzalez
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EPI_ISL_1301717, EPI_ISL_1301718, EPI_ISL_1301731	Instituto Nacional de Enfermedades Respiratorias (INER)	Instituto de Biotecnología de la UNAM	Alejandra Hernández-Terán; Alejandro Sanchez-Flores; Alma Rincón-Rubio; Andrea Santos Coy-Arechavaleta; Authors from IBT; Blanca Taboada; Celia Boukadida; Clara Esperanza Santacruz-Tinoco; Edgar Mendieta-Condado; Eduardo Becerril-Vargas; Fidencio Mejia-Nepomuceno; Francisco Pulido; Gisela Barrera-Badillo; Gloria Vazquez; Hector Esteban Paz-Juárez; IMSS; InDRE and INER (in alphabetical order): Carlos F. Arias; Irma Lopez-Martinez; Jerome Jean Verleyen; Joel Armando Vázquez-Pérez; Jorge Salas-Hernández; José Arturo Martínez-Orozco; José Ernesto Ramírez-González; José Esteban Muñoz-Medina; Larissa Fernandes-Matano; Lucia Hernandez-Rivas; Luis Alberto Ochoa-Carrera; Margarita Matías-Florentino; Mario Mújica-Sánchez; Natividad Cruz-Ortiz; Pavel Isa; Ricardo Grande; Santiago Avila-Rios; Tatiana Nunez-Garcia; Teresita Rojas-Mendoza
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EPI_ISL_456117, EPI_ISL_456119, EPI_ISL_456120, EPI_ISL_456126, EPI_ISL_456127, EPI_ISL_456138, EPI_ISL_456145, EPI_ISL_456146, EPI_ISL_456148, EPI_ISL_456149, EPI_ISL_456150, EPI_ISL_456151, EPI_ISL_456155			
see above	Instituto Nacional de Salud - Unidad de Secuenciación y Análisis Genómico	Instituto Nacional de Salud, Universidad Cooperativa de Colombia, Instituto Alexander von Humboldt, Imperial College-London, London School of Hygiene & Tropical Medicine	Astrid C. Flórez; Carlos Franco-Muñoz; Christian Julian VillabonaArenas; Diana Marcela Walteros-Acero; Diego A. Álvarez-Díaz; Erika Ospitia; Gloria Puerto; Jose A. Usme-Ciro; Juliana Barbosa; Katherine Laiton-Donato; Liz Villabona-Arenas; Luz Dary Rodriguez; Mailyn A.Gonzalez; Marcela Mercado-Reyes.; Martha Lucia Ospina Martinez; Nicolas D. Franco-Sierra; Sergio Gomez-Rangel; Sussy Echeverria; Zulma M. Cucunubá
EPI_ISL_447755, EPI_ISL_447756, EPI_ISL_447757, EPI_ISL_447759, EPI_ISL_447760, EPI_ISL_447761, EPI_ISL_447762, EPI_ISL_447763, EPI_ISL_447765, EPI_ISL_447768			
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see above	Instituto Nacional de Saude (INSA)	Instituto Nacional de Saude (INSA)	Borges et al; Guiomar et al
EPI_ISL_511484, EPI_ISL_511485, EPI_ISL_511486, EPI_ISL_511752, EPI_ISL_511753, EPI_ISL_511754, EPI_ISL_511755, EPI_ISL_511756, EPI_ISL_511757, EPI_ISL_511759, EPI_ISL_511760, EPI_ISL_511761, EPI_ISL_511762, EPI_ISL_511763, EPI_ISL_511764, EPI_ISL_511765, EPI_ISL_511766, EPI_ISL_511767, EPI_ISL_511768, EPI_ISL_511769, EPI_ISL_511770, EPI_ISL_511771			
see above	Instituto Nacional de Saude (INSA)	Instituto Nacional de Saude (INSA) and Instituto Gulbenkian de Ciencia (IGC)	Borges et al
EPI_ISL_511186, EPI_ISL_511187, EPI_ISL_511188, EPI_ISL_511190, EPI_ISL_511191, EPI_ISL_511192, EPI_ISL_511193, EPI_ISL_511194, EPI_ISL_511195, EPI_ISL_511196, EPI_ISL_511197, EPI_ISL_511198, EPI_ISL_511199, EPI_ISL_511200, EPI_ISL_511201, EPI_ISL_511202, EPI_ISL_511203, EPI_ISL_511204, EPI_ISL_511205, EPI_ISL_511206, EPI_ISL_511207, EPI_ISL_511208, EPI_ISL_511209, EPI_ISL_511211, EPI_ISL_511212, EPI_ISL_511213, EPI_ISL_511214, EPI_ISL_511215, EPI_ISL_511216, EPI_ISL_511217, EPI_ISL_511218, EPI_ISL_511219, EPI_ISL_511220, EPI_ISL_511221, EPI_ISL_511222, EPI_ISL_511223, EPI_ISL_511224, EPI_ISL_511225, EPI_ISL_511226, EPI_ISL_511228, EPI_ISL_511229, EPI_ISL_511230, EPI_ISL_511231, EPI_ISL_511232, EPI_ISL_511233, EPI_ISL_511234, EPI_ISL_511235, EPI_ISL_511236, EPI_ISL_511237, EPI_ISL_511238, EPI_ISL_511239, EPI_ISL_511240, EPI_ISL_511241, EPI_ISL_511242, EPI_ISL_511243, EPI_ISL_511244, EPI_ISL_511245, EPI_ISL_511246, EPI_ISL_511247, EPI_ISL_511248, EPI_ISL_511249, EPI_ISL_511250, EPI_ISL_511251, EPI_ISL_511252, EPI_ISL_511253, EPI_ISL_511254, EPI_ISL_511255, EPI_ISL_511256, EPI_ISL_511259, EPI_ISL_511261, EPI_ISL_511264, EPI_ISL_511267, EPI_ISL_511268, EPI_ISL_511269, EPI_ISL_511271, EPI_ISL_511272, EPI_ISL_511274, EPI_ISL_511275, EPI_ISL_511276, EPI_ISL_511277, EPI_ISL_511281, EPI_ISL_511283, EPI_ISL_511284, EPI_ISL_511285, EPI_ISL_511286, EPI_ISL_511287, EPI_ISL_511288, EPI_ISL_511289, EPI_ISL_511290, EPI_ISL_511294, EPI_ISL_511295, EPI_ISL_511296, EPI_ISL_511297, EPI_ISL_511298, EPI_ISL_511299, EPI_ISL_511301, EPI_ISL_511302, EPI_ISL_511307, EPI_ISL_511310, EPI_ISL_511311, EPI_ISL_511312, EPI_ISL_511313, EPI_ISL_511314			
see above	Instituto Nacional de Saude (INSA) and Instituto Gulbenkian de Ciencia (IGC)	Instituto Nacional de Saude (INSA) and Instituto Gulbenkian de Ciencia (IGC)	Borges et al
EPI_ISL_426580	Instituto Sabin	Laboratory of Virology	Bergmann M Ribeiro; Fernando L Melo; Gustavo Barra; Ikaro A Andrade; Pedro G Mesquita; Tatsuya Nagata; Ticiane H Santa-Rita
EPI_ISL_875541, EPI_ISL_875544, EPI_ISL_875545, EPI_ISL_875550, EPI_ISL_888671	Instituto de Biotecnologia - UNESP-Botucatu-SP	Instituto de Biotecnologia - UNESP-Botucatu-SP	Camila Dantas Malossi; Fábio Sossai Possebon; João Pessoa Araújo Jr.; Leila Sabrina Ullmann; Paula Rahal; Paulo Inacio da Costa
EPI_ISL_424673	Instituto de Diagnostico y Referencia Epidemiologicos	Instituto de Diagnostico y Referencia Epidemiologicos	Adnan Araiza Rodríguez; Alejandro Sánchez; Alfredo Ponce de León Garduño; Blanca Taboada; Carlos F. Arias; Carolina González Torres; Celia Boukadida; Cesar Raúl González Bonilla; Concepción Grajales Muñiz; Edgar Mendieta Condado; Eduardo Becerril Vargas; Fabiola Garcés Ayala; Fernando Ledesma Barrientos; Francisco Javier Gaytán Cervantes; Francisco Pulido; Gisela Barrera Badillo; Gloria Vázquez; Guillermo M. Ruiz-Palacios; Irma López Martínez; Joel Armando Vázquez Pérez; José Arturo Martínez Orozco; José Ernesto Ramírez González; José Esteban Muñoz Medina; Lucia Hernández Rivas; Luis Alberto García Andrade; Mario Mújica Sánchez; Pavel Isa; Pilar Ramos Cervantes; Ricardo Grande; Santiago Avila Ríos; Victor Hugo Borja Aburto; Violeta Ibarra Gonzalez
EPI_ISL_455436, EPI_ISL_455437, EPI_ISL_455438, EPI_ISL_455439, EPI_ISL_455455, EPI_ISL_455456, EPI_ISL_493334			
see above	Instituto de Diagnostico y Referencia Epidemiologicos (INDRE)	Instituto de Diagnostico y Referencia Epidemiologicos (INDRE)	; Abril Rodriguez-Maldonado; Araiza-Rodriguez Adnan; Barrera-Badillo Gisela; Claudia Wong-Arambula; Dayanira Arellano-Suarez; Edgar Mendieta-Condado; Ernesto Ramirez-Gonzalez.; Fabiola Garces-Ayala; Garces-Ayala Fabiola; Garces-Ayala Fabiola. Ramirez-Gonzalez Ernesto; Garces-Ayala Fabiola. Taboada Ramirez Blanca. Ramirez-Gonzalez Ernesto; Garces-Ayala Fabiola. Taboada Ramirez Blanca. Ramirez-Gonzalez Ernesto; Garces-Ayala Fabiola. Taboada Ramirez Blanca. Ramirez-Gonzalez Ernesto; Gisela Barrera-Badillo; Hernandez-Rivas Lucia; Irma Lopez-Martinez; Lopez-Martinez Irma; Lucia Hernandez-Rivas; Mendieta-Condado Edgar; Natividad Cruz-Ortiz; Ramirez-Gonzalez Ernesto.; Rodriguez-Maldonado Abril; Taboada Ramirez Blanca; Taboada Ramirez Blanca.; Tatiana Nunez-Garcia; Wong-Arambula Claudia; Wong-Arambula Claudia.
EPI_ISL_510066, EPI_ISL_510067, EPI_ISL_510069, EPI_ISL_510077, EPI_ISL_510463, EPI_ISL_510464	Instituto de Investigaciones Biomédicas de Barcelona (CSIC), Hospital Clínic i Provincial de Barcelona, Instituto de Biomedicina de Valencia (CSIC), Hospital de Sant Pau	SeqCOVID-SPAIN consortium/IBV(CSIC)	Alex Soriano; Andrea Vergara; Anna M. Planas; Israel Fernández Cadenas and SeqCOVID-SPAIN consortium; Jordi Pérez Tur; Miguel J. Martínez; Mª Angeles Marcos
EPI_ISL_956385, EPI_ISL_956386, EPI_ISL_956387, EPI_ISL_956388, EPI_ISL_956389, EPI_ISL_956390, EPI_ISL_956391, EPI_ISL_956392, EPI_ISL_956393, EPI_ISL_956394, EPI_ISL_956395, EPI_ISL_956396, EPI_ISL_956397, EPI_ISL_956398, EPI_ISL_956399, EPI_ISL_956400, EPI_ISL_956401			
see above	Isolation - Virology Unit, Institut Pasteur du Cambodge; Sequencing - US National Institute of Allergy and Infectious Diseases Cambodia, US Naval Medical Research Unit -2, Cambodia National Institute for Public Health	Virology Unit, Institut Pasteur du Cambodge	Chau Darapheak; Chin Savuth; Erik A Karlsson; Jennifer Bohl; Jessica Manning; Jose A Garcia-Rivera; Kraing Sidonn; Ly Sovann; Sophana Chea; Sreyngim Lay; Veasna Duong; Vireak Heang; Yi Sengdoeurn
EPI_ISL_956384	Isolation - Virology Unit, Institut Pasteur du Cambodge; Sequencing - US National Institute of Allergy and Infectious Diseases Cambodia, US Naval Medical Research Unit -2, National Public Health Laboratory, National Institute for Public Health, Cambodia	Virology Unit, Institut Pasteur du Cambodge	Chau Darapheak; Chin Savuth; Erik A Karlsson; Jennifer Bohl; Jessica Manning; Jose A Garcia-Rivera; Kraing Sidonn; Ly Sovann; Sophana Chea; Sreyngim Lay; Veasna Duong; Vireak Heang; Yi Sengdoeurn
EPI_ISL_474960, EPI_ISL_474965, EPI_ISL_474969, EPI_ISL_474973, EPI_ISL_474974, EPI_ISL_474975, EPI_ISL_474979, EPI_ISL_474980, EPI_ISL_474981, EPI_ISL_474986, EPI_ISL_474987, EPI_ISL_474988, EPI_ISL_474992, EPI_ISL_474993, EPI_ISL_474994, EPI_ISL_474999, EPI_ISL_475000, EPI_ISL_475001, EPI_ISL_475002, EPI_ISL_475003, EPI_ISL_475010, EPI_ISL_475013, EPI_ISL_475014, EPI_ISL_475015, EPI_ISL_475018, EPI_ISL_475019, EPI_ISL_475021, EPI_ISL_475022, EPI_ISL_483704, EPI_ISL_483708, EPI_ISL_483709, EPI_ISL_483711, EPI_ISL_483715, EPI_ISL_483717, EPI_ISL_514308, EPI_ISL_514309, EPI_ISL_514310, EPI_ISL_514311, EPI_ISL_514313, EPI_ISL_514314, EPI_ISL_649064, EPI_ISL_649065, EPI_ISL_649066, EPI_ISL_649067, EPI_ISL_649068, EPI_ISL_649069, EPI_ISL_649070, EPI_ISL_649071, EPI_ISL_649072, EPI_ISL_649073, EPI_ISL_649074, EPI_ISL_649075, EPI_ISL_649076, EPI_ISL_649077, EPI_ISL_649078, EPI_ISL_649079, EPI_ISL_649080, EPI_ISL_649081, EPI_ISL_649082, EPI_ISL_649083, EPI_ISL_649084, EPI_ISL_649085, EPI_ISL_649086, EPI_ISL_649087, EPI_ISL_649088, EPI_ISL_649089, EPI_ISL_649090, EPI_ISL_649091, EPI_ISL_649092, EPI_ISL_649093, EPI_ISL_649094, EPI_ISL_649095, EPI_ISL_649096, EPI_ISL_649097, EPI_ISL_649098, EPI_ISL_649099, EPI_ISL_649100, EPI_ISL_649101, EPI_ISL_649102, EPI_ISL_649103, EPI_ISL_649104, EPI_ISL_649105, EPI_ISL_649106, EPI_ISL_649107			
see above	Israel Central Virology laboratory	Israel Central Virology laboratory	Efrat Dahan Bucris; Ella Mendelson; Michal Mandelboim; Neta Zuckerman; Oran Erster
EPI_ISL_477193, EPI_ISL_477203	Istituto Zooprofilattico Sperimentale Puglia e Basilicata;	Beaconlab (Bioinformatics, Evolution and Comparative	Chiara M.; Manzari C.; Parisi A.; Pesole G.

		Genomics lab), Dept of Biosciences, University on Mila	
EPI_ISL_477199, EPI_ISL_477200	Istituto Zooprofilattico Sperimentale Puglia e Basilicata;	Beaconlab (Bioinformatics, Evolution and Comparative Genomics lab), Dept of Biosciences, University on Milan	Chiara M.; Manzari C.; Parisi A.; Pesole G.
EPI_ISL_451961	Istituto Zooprofilattico Sperimentale Puglia e Basilicata; Dipartimento di Bioscienze, Biotecnologie e Biofarmaceutica dell'Università degli Studi di Bari "A.Moro"; Istituto di Biomembrane. Bioenergetica e Biotecnologie Molecolari del Consiglio Nazionale delle Ricerche di Bari	Beaconlab (Bioinformatics Evolution and Comparative Genomics lab), Dept of Biosciences, University of Milan	Chiara M.; Manzari C.; Parisi A.; Pesole G.
EPI_ISL_468914, EPI_ISL_469020, EPI_ISL_469022, EPI_ISL_469023, EPI_ISL_525553, EPI_ISL_525557, EPI_ISL_525570, EPI_ISL_525573			
see above	Istituto Zooprofilattico Sperimentale Puglia e Basilicata; Dipartimento di Bioscienze, Biotecnologie e Biofarmaceutica dell'Università degli Studi di Bari "A.Moro"; Istituto di Biomembrane. Bioenergetica e Biotecnologie Molecolari del Consiglio Nazionale delle Ricerche di Bari	Beaconlab (Bioinformatics, Evolution and Comparative Genomics lab), Dept of Biosciences, University on Milan	Chiara M; Chiara M.; Manzari C.; Parisi A.; Pesole G.
EPI_ISL_493332, EPI_ISL_493333	Istituto Zooprofilattico Sperimentale del Mezzogiorno	INMI Lazzaro Spallanzani IRCCS	Antonino Di Caro; Barbara Bartolini; Cesare E.M. Gruber; Francesco Messina; Giorgia Borriello; Giovanna Fusco; Maria R. Capobianchi; Martina Rueca; Maurizio Viscardi
EPI_ISL_778647, EPI_ISL_778651, EPI_ISL_778686, EPI_ISL_778687, EPI_ISL_778689, EPI_ISL_778690	Istituto Zooprofilattico Sperimentale del Mezzogiorno	TIGEM	Andrea Ballabio; Anna Manfredi; Antonio Grimaldi; Antonio Limone; Biancamaria Pierri; Chiara Colantuono; Davide Cacchiarelli.; Denise Di Concilio; Francesco Panariello; Lucio Di Filippo; Marcello Salvi; Maria Concetta Cuomo; Patrizia Annunziata; Pellegrino Cerino; Valentina Bouche
EPI_ISL_794745	Istituto Zooprofilattico Sperimentale della Puglia e della Basilicata	Istituto Zooprofilattico Sperimentale della Puglia e della Basilicata	Bianco A.; Capozzi L.; Cipolletta D.; Del Sambro L.; Galante D.; Manzulli V; Pace L.; Parisi A.; Rondinone V.
EPI_ISL_631516, EPI_ISL_631524, EPI_ISL_631550, EPI_ISL_631551, EPI_ISL_631554, EPI_ISL_631571, EPI_ISL_631574, EPI_ISL_631578, EPI_ISL_631582, EPI_ISL_631585, EPI_ISL_631590, EPI_ISL_631593, EPI_ISL_631595, EPI_ISL_631597, EPI_ISL_631599, EPI_ISL_631601, EPI_ISL_631604, EPI_ISL_631608, EPI_ISL_631609, EPI_ISL_631610, EPI_ISL_631612, EPI_ISL_631613, EPI_ISL_631615, EPI_ISL_631788, EPI_ISL_631789, EPI_ISL_631809, EPI_ISL_631810, EPI_ISL_631812, EPI_ISL_631813, EPI_ISL_631820, EPI_ISL_631822, EPI_ISL_631833, EPI_ISL_631835, EPI_ISL_631836, EPI_ISL_631866, EPI_ISL_631867, EPI_ISL_631883, EPI_ISL_631887, EPI_ISL_631889, EPI_ISL_631890, EPI_ISL_631895, EPI_ISL_631896, EPI_ISL_631902, EPI_ISL_631904, EPI_ISL_631925, EPI_ISL_631963, EPI_ISL_631966, EPI_ISL_631969, EPI_ISL_631970, EPI_ISL_631973, EPI_ISL_631979, EPI_ISL_631994, EPI_ISL_631997, EPI_ISL_632005, EPI_ISL_632007, EPI_ISL_632008, EPI_ISL_632009, EPI_ISL_632011, EPI_ISL_632012, EPI_ISL_632017, EPI_ISL_632021, EPI_ISL_632023, EPI_ISL_632025, EPI_ISL_632028, EPI_ISL_632029, EPI_ISL_632051, EPI_ISL_632061, EPI_ISL_632065, EPI_ISL_632066, EPI_ISL_632075, EPI_ISL_632093, EPI_ISL_632094, EPI_ISL_632095, EPI_ISL_632096, EPI_ISL_632106, EPI_ISL_632107, EPI_ISL_632108, EPI_ISL_632109, EPI_ISL_632110, EPI_ISL_632128, EPI_ISL_632130, EPI_ISL_632143, EPI_ISL_632145, EPI_ISL_632149, EPI_ISL_632150, EPI_ISL_632151, EPI_ISL_632152, EPI_ISL_632162, EPI_ISL_632166, EPI_ISL_632167, EPI_ISL_632168, EPI_ISL_632169, EPI_ISL_632170, EPI_ISL_632171, EPI_ISL_632172, EPI_ISL_632180, EPI_ISL_632182, EPI_ISL_632184, EPI_ISL_632188, EPI_ISL_632189, EPI_ISL_632191, EPI_ISL_632204, EPI_ISL_632209, EPI_ISL_632210, EPI_ISL_632214, EPI_ISL_632219, EPI_ISL_632221, EPI_ISL_632227, EPI_ISL_632228, EPI_ISL_632229, EPI_ISL_632239, EPI_ISL_632240, EPI_ISL_632241, EPI_ISL_632939, EPI_ISL_632941, EPI_ISL_632944, EPI_ISL_632949, EPI_ISL_632950, EPI_ISL_632953, EPI_ISL_632957, EPI_ISL_632958, EPI_ISL_632961, EPI_ISL_632969, EPI_ISL_632970, EPI_ISL_632971, EPI_ISL_632972, EPI_ISL_632974			
see above	Jamaica Hospital Medical Center	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_450792, EPI_ISL_450793, EPI_ISL_450794, EPI_ISL_450795, EPI_ISL_450796, EPI_ISL_450797, EPI_ISL_450798, EPI_ISL_450799			
see above	Jamaica Ministry of Health and Wellness	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Anna Montmayeur; Anna Uehara; Bettina Bankamp; Clinton R. Paden; Haibin Wang; Jasmine Padilla; Jing Zhang; Justin Lee; Krista Queen; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao; Zachary Weiner
EPI_ISL_631596, EPI_ISL_631600, EPI_ISL_632179, EPI_ISL_632200	James J. Peters VA Medical Center	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_451958	Jamil-ur-Rahman Center for Genome Research, Dr. Panjwani Center for Molecular Medicine and Drug Research, International Center for Chemical and Biological Sciences, University of Karachi	Jamil-ur-Rahman Center for Genome Research, Dr. Panjwani Center for Molecular Medicine and Drug Research, International Center for Chemical and Biological Sciences, University of Karachi	B.A.; I.A; Khan; Khan, S.; M.A.and Khan; Qureshi; Raza; S.A.; Shakeel, M.; Zahid, M.
EPI_ISL_763077, EPI_ISL_763086, EPI_ISL_763087, EPI_ISL_763088, EPI_ISL_763089, EPI_ISL_763090, EPI_ISL_763091			
see above	Jena University Hospital, Institute for Infectious Diseases and Infection Control	Institute of infectious medicine & hospital hygiene, CaSe-Group	Brandt; Christian; Marquet; Matthias W.; Mike; Pletz; Riccardo; Spott
EPI_ISL_421237, EPI_ISL_421238, EPI_ISL_421239, EPI_ISL_421240, EPI_ISL_421241, EPI_ISL_421242, EPI_ISL_421243, EPI_ISL_421244, EPI_ISL_421245, EPI_ISL_421246, EPI_ISL_421247, EPI_ISL_421248, EPI_ISL_421249, EPI_ISL_421250, EPI_ISL_421251, EPI_ISL_421252, EPI_ISL_421253, EPI_ISL_421254, EPI_ISL_421256, EPI_ISL_421257, EPI_ISL_421258, EPI_ISL_421259, EPI_ISL_421260, EPI_ISL_421261, EPI_ISL_421262, EPI_ISL_455460, EPI_ISL_455461, EPI_ISL_455462, EPI_ISL_455463, EPI_ISL_455464, EPI_ISL_455465, EPI_ISL_455466, EPI_ISL_455467			
see above	Jiangxi Province Center for Disease Control and Prevention	Jiangxi Province Center for Disease Control and Prevention	DaJin Xiao; Fang Xiao; Gang Xu; JianXiong Li; Jun Zhou; ShiWen Liu; Tian Gong; XiaoQing Liu; Xin Ran; YanNi Zhang; Ying Xiong; Yong Shi
EPI_ISL_417420	Jiangxi province Center for Disease Control and Prevention	Jiangxi province Center for Disease Control and Prevention	Li jian Xiong
EPI_ISL_412459	Jingzhou Center for Disease Control and Prevention	Hubei Provincial Center for Disease Control and Prevention	Bin Fang; Bo Yang; Bo Yu; Chunlin Mao; Faxian Zhan; Guojun Ye; Jie Hu; Jing Li; Junqiang Xu; Kun Cai; Linlin Liu; Maoyi Chen; Xiang Li; Xiao Yu; Xixiang Huo; Yongzhong Jiang.
EPI_ISL_434586, EPI_ISL_434587, EPI_ISL_434588, EPI_ISL_434638, EPI_ISL_434639, EPI_ISL_434640, EPI_ISL_434682, EPI_ISL_434683, EPI_ISL_434684, EPI_ISL_434685, EPI_ISL_434686, EPI_ISL_434687, EPI_ISL_434688, EPI_ISL_434689, EPI_ISL_434690, EPI_ISL_434691, EPI_ISL_438222, EPI_ISL_438223, EPI_ISL_438224, EPI_ISL_438225, EPI_ISL_438226, EPI_ISL_438228, EPI_ISL_438229, EPI_ISL_438230, EPI_ISL_438231, EPI_ISL_438233, EPI_ISL_438234, EPI_ISL_438235, EPI_ISL_438237, EPI_ISL_438240, EPI_ISL_438241, EPI_ISL_438242, EPI_ISL_438243, EPI_ISL_438244, EPI_ISL_438245, EPI_ISL_438246, EPI_ISL_438247, EPI_ISL_457752, EPI_ISL_457753, EPI_ISL_457754, EPI_ISL_457755, EPI_ISL_457756, EPI_ISL_457757, EPI_ISL_457758, EPI_ISL_457760, EPI_ISL_457761, EPI_ISL_457764, EPI_ISL_457765, EPI_ISL_457766, EPI_ISL_457768, EPI_ISL_457769, EPI_ISL_457780, EPI_ISL_457781, EPI_ISL_457782, EPI_ISL_457783, EPI_ISL_457784, EPI_ISL_457785, EPI_ISL_457787, EPI_ISL_457788, EPI_ISL_457789, EPI_ISL_457790, EPI_ISL_457791, EPI_ISL_457792, EPI_ISL_457795, EPI_ISL_457796, EPI_ISL_457797, EPI_ISL_457798, EPI_ISL_457799, EPI_ISL_457800, EPI_ISL_457801, EPI_ISL_457802, EPI_ISL_457803, EPI_ISL_457804, EPI_ISL_457805, EPI_ISL_457806, EPI_ISL_457807, EPI_ISL_457808, EPI_ISL_457809, EPI_ISL_457810, EPI_ISL_457811, EPI_ISL_457812, EPI_ISL_457813, EPI_ISL_457814, EPI_ISL_457816, EPI_ISL_457817, EPI_ISL_457818, EPI_ISL_457819, EPI_ISL_457820, EPI_ISL_457821, EPI_ISL_457822, EPI_ISL_457823			
see above	Johns Hopkins Hospital Department of Pathology	Johns Hopkins Hospital Department of Pathology	Amanda Ernlund; Craig Howser; Heba H. Mostafa; Heba Mostafa; Kristina Zudock; Mark Hopkins; Melanie Kirsche; Michael C. Schatz; Michael Schatz; N_di_ Trovao; Nidia Trovao; Norah Sadowski; Nidiá Trovao; Oluwaseun Falade-Nwulia; Oluwaseun Nwulia-Falade; Paul Morris; Peter M. Thielen; Shirlee Wohl; Srividya Ramakrishnan; Stuart C. Ray; Thomas Mehoke; Timothy Gilpatrick; Victoria Gniazdowski; Winston Timp; Yunfan Fan; _Amanda Ernlund; _Oluwaseun Falade-Nwulia
EPI_ISL_436684, EPI_ISL_436686, EPI_ISL_455636, EPI_ISL_455639	KRISP, KZN Research Innovation and Sequencing Platform	KRISP, KZN Research Innovation and Sequencing Platform	Chimukangara B; Deforche K; Giandhari J; Lessells R; Pillay S; Tegally H; Wilkinson E; de Oliveira T
EPI_ISL_424867, EPI_ISL_452114	KS Health and Environmental Laboratories	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Montmayeur; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao; Zachary Weiner
EPI_ISL_415153, EPI_ISL_415155, EPI_ISL_415156, EPI_ISL_415157, EPI_ISL_415158, EPI_ISL_415159, EPI_ISL_416467, EPI_ISL_416468, EPI_ISL_416469, EPI_ISL_416470, EPI_ISL_416471, EPI_ISL_416472, EPI_ISL_416475, EPI_ISL_416476, EPI_ISL_417422, EPI_ISL_417424, EPI_ISL_417425, EPI_ISL_417426, EPI_ISL_417427, EPI_ISL_417428, EPI_ISL_417429, EPI_ISL_417430, EPI_ISL_418270, EPI_ISL_418792, EPI_ISL_418793, EPI_ISL_418794, EPI_ISL_418795, EPI_ISL_418796, EPI_ISL_418797, EPI_ISL_418798, EPI_ISL_418800, EPI_ISL_418805, EPI_ISL_418806, EPI_ISL_418863, EPI_ISL_418981, EPI_ISL_418982, EPI_ISL_418983, EPI_ISL_418984, EPI_ISL_418985, EPI_ISL_418986, EPI_ISL_418987, EPI_ISL_418989, EPI_ISL_420314, EPI_ISL_420315, EPI_ISL_420316, EPI_ISL_420317, EPI_ISL_420318, EPI_ISL_420319, EPI_ISL_420320, EPI_ISL_420321, EPI_ISL_420322, EPI_ISL_420323, EPI_ISL_420324, EPI_ISL_420325, EPI_ISL_420326, EPI_ISL_420327, EPI_ISL_420328, EPI_ISL_420329, EPI_ISL_420330, EPI_ISL_420331, EPI_ISL_420332, EPI_ISL_420333, EPI_ISL_420334, EPI_ISL_420335, EPI_ISL_420336, EPI_ISL_420337, EPI_ISL_420338, EPI_ISL_420339, EPI_ISL_420340, EPI_ISL_420341, EPI_ISL_420342, EPI_ISL_420343, EPI_ISL_420344, EPI_ISL_420345, EPI_ISL_420346, EPI_ISL_420347, EPI_ISL_420348, EPI_ISL_420349, EPI_ISL_420350, EPI_ISL_420351, EPI_ISL_420352, EPI_ISL_420353, EPI_ISL_420354, EPI_ISL_420355, EPI_ISL_420356, EPI_ISL_420357, EPI_ISL_420358, EPI_ISL_420359, EPI_ISL_420360, EPI_ISL_420361, EPI_ISL_420362, EPI_ISL_420363, EPI_ISL_420364, EPI_ISL_420365, EPI_ISL_420366, EPI_ISL_420367, EPI_ISL_420368, EPI_ISL_420369, EPI_ISL_420370, EPI_ISL_420371, EPI_ISL_420372, EPI_ISL_420373, EPI_ISL_420374, EPI_ISL_420375, EPI_ISL_420376, EPI_ISL_420377, EPI_ISL_420378, EPI_ISL_420379, EPI_ISL_420380, EPI_ISL_420381, EPI_ISL_420382, EPI_ISL_420383, EPI_ISL_420384, EPI_ISL_420385, EPI_ISL_420386, EPI_ISL_420387, EPI_ISL_420388, EPI_ISL_420389, EPI_ISL_420390, EPI_ISL_420391, EPI_ISL_420392, EPI_ISL_420393, EPI_ISL_420394, EPI_ISL_420395, EPI_ISL_420396, EPI_ISL_420397, EPI_ISL_420398, EPI_ISL_420399, EPI_ISL_420400, EPI_ISL_420401, EPI_ISL_420402, EPI_ISL_420403, EPI_ISL_420404, EPI_ISL_420405, EPI_ISL_420406, EPI_ISL_420407, EPI_ISL_420408, EPI_ISL_420409, EPI_ISL_420410, EPI_ISL_420411, EPI_ISL_420412, EPI_ISL_420413, EPI_ISL_420414, EPI_ISL_420415, EPI_ISL_420416, EPI_ISL_420417, EPI_ISL_420418, EPI_ISL_420419, EPI_ISL_420420, EPI_ISL_420421, EPI_ISL_420422, EPI_ISL_420423, EPI_ISL_420424, EPI_ISL_420425, EPI_ISL_420426, EPI_ISL_420427, EPI_ISL_420428, EPI_ISL_420429, EPI_ISL_420430, EPI_ISL_420431, EPI_ISL_420432, EPI_ISL_420433, EPI_ISL_420434, EPI_ISL_420435, EPI_ISL_420436, EPI_ISL_420437, EPI_ISL_420438, EPI_ISL_420439, EPI_ISL_420440, EPI_ISL_420441, EPI_ISL_420442, EPI_ISL_420443, EPI_ISL_420444, EPI_ISL_420445, EPI_ISL_420446, EPI_ISL_420447, EPI_ISL_420448, EPI_ISL_420449, EPI_ISL_420450, EPI_ISL_420451, EPI_ISL_420452, EPI_ISL_420453, EPI_ISL_420454			
see above	KU Leuven, Clinical and Epidemiological Virology	KU Leuven, Clinical and Epidemiological Virology	Bert Vanmechelen; Joan Marti-Carerras; Joan Marti-Carreras; Marc Van Ranst; Piet Maes; Tony Wawina

EPI_ISL_458156, EPI_ISL_458157, EPI_ISL_458158, EPI_ISL_458159, EPI_ISL_458160, EPI_ISL_458161, EPI_ISL_458162, EPI_ISL_458163, EPI_ISL_458164, EPI_ISL_458165, EPI_ISL_458166, EPI_ISL_458167, EPI_ISL_458168, EPI_ISL_458169, EPI_ISL_458170, EPI_ISL_458171, EPI_ISL_458172, EPI_ISL_458173, EPI_ISL_458174, EPI_ISL_458175, EPI_ISL_458176, EPI_ISL_458177, EPI_ISL_458178, EPI_ISL_458179, EPI_ISL_458180, EPI_ISL_458181, EPI_ISL_458182, EPI_ISL_458183, EPI_ISL_458184, EPI_ISL_458185, EPI_ISL_458186, EPI_ISL_458187, EPI_ISL_458188, EPI_ISL_458189, EPI_ISL_458190, EPI_ISL_458191, EPI_ISL_458192, EPI_ISL_458193, EPI_ISL_458194, EPI_ISL_458195, EPI_ISL_458196, EPI_ISL_458197, EPI_ISL_458198, EPI_ISL_458199, EPI_ISL_458200, EPI_ISL_458201, EPI_ISL_458202, EPI_ISL_458203, EPI_ISL_458204, EPI_ISL_458205, EPI_ISL_458206, EPI_ISL_458207, EPI_ISL_458208, EPI_ISL_458209, EPI_ISL_458210, EPI_ISL_458211, EPI_ISL_458212, EPI_ISL_458213, EPI_ISL_458214, EPI_ISL_458215, EPI_ISL_458216, EPI_ISL_458217, EPI_ISL_458218, EPI_ISL_458219, EPI_ISL_458220, EPI_ISL_458221, EPI_ISL_458222, EPI_ISL_458223, EPI_ISL_458224, EPI_ISL_458225, EPI_ISL_458226, EPI_ISL_458227, EPI_ISL_458228, EPI_ISL_458229, EPI_ISL_458230, EPI_ISL_458231, EPI_ISL_458232, EPI_ISL_458233, EPI_ISL_458234, EPI_ISL_458235, EPI_ISL_462158, EPI_ISL_462159, EPI_ISL_462160, EPI_ISL_462161, EPI_ISL_462162, EPI_ISL_462163, EPI_ISL_462164, EPI_ISL_462165, EPI_ISL_462166, EPI_ISL_462167, EPI_ISL_462168, EPI_ISL_462169, EPI_ISL_462170, EPI_ISL_462171, EPI_ISL_462172, EPI_ISL_462173, EPI_ISL_462174, EPI_ISL_462175, EPI_ISL_462176, EPI_ISL_462177, EPI_ISL_462178, EPI_ISL_462179, EPI_ISL_462180, EPI_ISL_462181, EPI_ISL_462182, EPI_ISL_462183, EPI_ISL_462184, EPI_ISL_462185, EPI_ISL_462186, EPI_ISL_462187, EPI_ISL_462188, EPI_ISL_462189, EPI_ISL_462190, EPI_ISL_462191, EPI_ISL_462192, EPI_ISL_462193, EPI_ISL_462194, EPI_ISL_462195, EPI_ISL_462196, EPI_ISL_462197, EPI_ISL_462198, EPI_ISL_462199, EPI_ISL_462200, EPI_ISL_462201, EPI_ISL_462202, EPI_ISL_462203, EPI_ISL_462204, EPI_ISL_462205, EPI_ISL_462206, EPI_ISL_462207, EPI_ISL_462208, EPI_ISL_462209, EPI_ISL_462210, EPI_ISL_462211, EPI_ISL_462212, EPI_ISL_462213, EPI_ISL_462214, EPI_ISL_462215, EPI_ISL_462216, EPI_ISL_462217, EPI_ISL_462219, EPI_ISL_462221, EPI_ISL_462223, EPI_ISL_462224, EPI_ISL_462231, EPI_ISL_462232, EPI_ISL_462233, EPI_ISL_462234, EPI_ISL_462238, EPI_ISL_462239, EPI_ISL_462240, EPI_ISL_462241, EPI_ISL_462242, EPI_ISL_462243, EPI_ISL_462244, EPI_ISL_462245, EPI_ISL_462246, EPI_ISL_462255, EPI_ISL_462256, EPI_ISL_462263, EPI_ISL_462264, EPI_ISL_462265, EPI_ISL_522349			
see above	KU Leuven, Rega Institute, Clinical and Epidemiological Virology	KU Leuven, Rega Institute, Clinical and Epidemiological Virology	Bert Vanmechelen; Joan Marti-Carerras; Piet Maes; Tony Wawina-Bokalanga
EPI_ISL_475137, EPI_ISL_475138	Kalmar klinisk mikrobiologi	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Karin Tegmark-Wisell; Maria Lind Karlberg; Mattias Haukland; Olov Svartstrom; Oskar Karlsson Lindsjo; Petra Edquist; Reza Advani; Sandra Broddesson; Shamam Muradrasoli
EPI_ISL_690818, EPI_ISL_690819, EPI_ISL_690820, EPI_ISL_690821, EPI_ISL_690822, EPI_ISL_690823, EPI_ISL_690824, EPI_ISL_690825, EPI_ISL_690826			
see above	Kanagawa Prefectural Institute of Public Health	Pathogen Genomics Center, National Institute of Infectious Diseases	Kentaro Itokawa; Makoto Kuroda; Masanori Hashino; Rina Tanaka; Tsuyoshi Sekizuka
EPI_ISL_875675, EPI_ISL_875676, EPI_ISL_875677, EPI_ISL_875678, EPI_ISL_875679, EPI_ISL_875680, EPI_ISL_875681, EPI_ISL_875682, EPI_ISL_875683, EPI_ISL_875684, EPI_ISL_883038, EPI_ISL_883039, EPI_ISL_883045, EPI_ISL_883048, EPI_ISL_883059, EPI_ISL_883060, EPI_ISL_883061			
see above	Kansas Health and Environmental Lab	Kansas Health and Environmental Lab	Ben Olsen; Carissa Robertson; Mike Grose; and Phil Adam
EPI_ISL_454447, EPI_ISL_454448, EPI_ISL_454449, EPI_ISL_454450, EPI_ISL_454451, EPI_ISL_454452, EPI_ISL_454453, EPI_ISL_454454, EPI_ISL_454455, EPI_ISL_454456, EPI_ISL_454457, EPI_ISL_454458, EPI_ISL_454459, EPI_ISL_454460, EPI_ISL_454461, EPI_ISL_454462, EPI_ISL_454463, EPI_ISL_454464, EPI_ISL_454465, EPI_ISL_454466, EPI_ISL_454467, EPI_ISL_454468, EPI_ISL_454469, EPI_ISL_454470, EPI_ISL_454471, EPI_ISL_454472, EPI_ISL_454473, EPI_ISL_454474, EPI_ISL_454475, EPI_ISL_454476, EPI_ISL_454477, EPI_ISL_454478, EPI_ISL_454479, EPI_ISL_454480, EPI_ISL_454481, EPI_ISL_454482, EPI_ISL_454483, EPI_ISL_454484, EPI_ISL_454485, EPI_ISL_454486, EPI_ISL_454487, EPI_ISL_454488, EPI_ISL_454489, EPI_ISL_454490, EPI_ISL_454491, EPI_ISL_454492, EPI_ISL_454493, EPI_ISL_454868, EPI_ISL_454869, EPI_ISL_454870, EPI_ISL_454871, EPI_ISL_454872, EPI_ISL_454873, EPI_ISL_454874, EPI_ISL_454875, EPI_ISL_454876, EPI_ISL_454877, EPI_ISL_454878, EPI_ISL_454879, EPI_ISL_454880, EPI_ISL_454881, EPI_ISL_454882, EPI_ISL_454883, EPI_ISL_454884, EPI_ISL_454885, EPI_ISL_454886, EPI_ISL_454887, EPI_ISL_454888, EPI_ISL_454889, EPI_ISL_454890, EPI_ISL_454891, EPI_ISL_454892, EPI_ISL_454893, EPI_ISL_454894, EPI_ISL_454895, EPI_ISL_454896, EPI_ISL_454897, EPI_ISL_454898, EPI_ISL_454899, EPI_ISL_454900, EPI_ISL_454901, EPI_ISL_454902, EPI_ISL_455846, EPI_ISL_455847, EPI_ISL_455848, EPI_ISL_455849, EPI_ISL_455850, EPI_ISL_455851, EPI_ISL_455852, EPI_ISL_455853, EPI_ISL_455854, EPI_ISL_455855, EPI_ISL_455856, EPI_ISL_455857, EPI_ISL_455858, EPI_ISL_455859, EPI_ISL_455860, EPI_ISL_455861, EPI_ISL_455862, EPI_ISL_455863, EPI_ISL_455864, EPI_ISL_455865, EPI_ISL_455866, EPI_ISL_455867, EPI_ISL_455868, EPI_ISL_455869, EPI_ISL_455870, EPI_ISL_455871, EPI_ISL_455872, EPI_ISL_455873, EPI_ISL_455874, EPI_ISL_455875, EPI_ISL_455876, EPI_ISL_455877, EPI_ISL_455878, EPI_ISL_455879, EPI_ISL_455880, EPI_ISL_455881, EPI_ISL_455882, EPI_ISL_455883, EPI_ISL_455884, EPI_ISL_455885, EPI_ISL_455886, EPI_ISL_455887, EPI_ISL_455888, EPI_ISL_455889, EPI_ISL_455890, EPI_ISL_455891, EPI_ISL_455892, EPI_ISL_455893, EPI_ISL_455894, EPI_ISL_455895, EPI_ISL_455896, EPI_ISL_455897, EPI_ISL_455898, EPI_ISL_455899, EPI_ISL_455900, EPI_ISL_455901, EPI_ISL_469075, EPI_ISL_469077, EPI_ISL_469078, EPI_ISL_469079, EPI_ISL_475086, EPI_ISL_475087, EPI_ISL_475088, EPI_ISL_475089, EPI_ISL_475090, EPI_ISL_475091, EPI_ISL_475095, EPI_ISL_475136, EPI_ISL_475141, EPI_ISL_475142, EPI_ISL_475544, EPI_ISL_475545, EPI_ISL_475546, EPI_ISL_475547, EPI_ISL_475551, EPI_ISL_475552, EPI_ISL_475558, EPI_ISL_475560, EPI_ISL_475561			
see above	Karolinska Universitetslaboratoriet	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Karin Tegmark-Wisell; Maria Lind Karlberg; Mattias Haukland; Olov Svartstrom; Oskar Karlsson Lindsjo; Petra Edquist; Reza Advani; Sandra Broddesson; Shamam Muradrasoli; Shaman Muradrasoli
EPI_ISL_442044	Kawsar Human Genetic Research Center	Kawsar Human Genetic Research Center	Fatemeh Hosseini; Maryam Abbasalipour Bashash; Mohammad Ali Khosravi; Sirous Zeinali; Solmaz Sabeghi; Yeganeh Haghdoost; Yeganeh Keshvar
EPI_ISL_438970, EPI_ISL_438972, EPI_ISL_915385	Keio University School of Medicine	Keio University School of Medicine	Haruhiko Siomi; Hirotsugu Ishizu; Kenjiro Kosaki; Kodai Abe; Yuka Iwasaki
EPI_ISL_512811, EPI_ISL_512812	Kenema Government Hospital, Ministry of Health and Sanitation	Kenema Government Hospital, Ministry of Health and Sanitation	Andersen, K.; Garry, R.; Goba, A.; Grant, D.; Happi, C.; Jalloh, S.; Mehta, S.; Momoh, M.; Olawoye, I.; Oluniyi, P.; Park, D.; Sandi, J.; Siddle, K.; Tomkins-Tinch, C.
EPI_ISL_965815, EPI_ISL_965816, EPI_ISL_965817, EPI_ISL_965818, EPI_ISL_965819, EPI_ISL_965820, EPI_ISL_965821, EPI_ISL_965822, EPI_ISL_965823, EPI_ISL_965824, EPI_ISL_965825, EPI_ISL_965827, EPI_ISL_965828, EPI_ISL_965829, EPI_ISL_965830, EPI_ISL_965831, EPI_ISL_965832, EPI_ISL_965833, EPI_ISL_965834, EPI_ISL_965835, EPI_ISL_966355, EPI_ISL_966356, EPI_ISL_966358, EPI_ISL_966359			
see above	Kentucky State Public Health Lab	Kentucky State Public Health Lab	Joshua Tobias; Karim George; Matthew Johnson; Rachel Zinner; Rhonda Lucas; Stephanie Lunn; Vaneet Arora; William Grooms
EPI_ISL_414510	Key Laboratory of Medical Molecular Virology (MOE/NHC/CAMS), School of Basic Medicine, Shanghai Medical College, Fudan University	Key Laboratory of Medical Molecular Virology (MOE/NHC/CAMS), School of Basic Medicine, Shanghai Medical College, Fudan University	Cai, X.; Chen, H.; Fang, F.; Feng, F.; Fu, C.; Gu, C.; Han, W.; Li, C.; Qu, D.; Song, W.; Sun, Z.; Teng, Z.; Wang, Y.; Xie; Xu, W.; Y. and Yuan, Z.; Ye, R.; Yi, Z.; Zhang, R.; Zhang, X.; Zhou, Y.; Zhu, Y.
EPI_ISL_489996, EPI_ISL_489997, EPI_ISL_489998, EPI_ISL_489999, EPI_ISL_490000, EPI_ISL_490001, EPI_ISL_490002, EPI_ISL_490003, EPI_ISL_490004, EPI_ISL_490005, EPI_ISL_490006, EPI_ISL_490007, EPI_ISL_490008, EPI_ISL_490009, EPI_ISL_490010, EPI_ISL_490011, EPI_ISL_490012			
see above	King Fahad Medical City	King Fahad Medical City	Alghoraibi, M.; Alosaimi, B.; Enani, M.; Naeem, A.
EPI_ISL_516946, EPI_ISL_516948, EPI_ISL_516969, EPI_ISL_516974	King Georges Medical University	CSIR-National Botanical Research Institute	Amita Jain; Babita Singh; Danish Nasar Khan; Hricha Mishra; Kishan Sahu; MLB Bhatt; Mehar H.Asif; Om Prakash; Priti Prasad; SK Barik; Samir V. Sawant; Shantanu Prakash; Sumit Kr. Bag; Suruchi Shukla
EPI_ISL_483542, EPI_ISL_483543, EPI_ISL_483544, EPI_ISL_483545, EPI_ISL_483546, EPI_ISL_483547, EPI_ISL_483548, EPI_ISL_483549, EPI_ISL_483550, EPI_ISL_483551, EPI_ISL_483552, EPI_ISL_483553, EPI_ISL_483554			
see above	Kingdom of Bahrein Ministry of Health	Erasmus Medical Center	Amjad Ghanem Mohamed; Anne van der Linden; Bas Oude Munnink; Claudia Schapendonk; David Nieuwenhuijse; Ebrahim Shehad; Fatema; Hashmeya Al Wasti; Irina Chestakova; Marion Koopmans; Mark Pronk; Pascal Lexmond; Reina Sikkema; Richard Molenkamp; Stefan van Nieuwkoop; Theo Bestebroer; on behalf of the Dutch national COVID-19 response team.
EPI_ISL_459866, EPI_ISL_459867, EPI_ISL_459868, EPI_ISL_459869, EPI_ISL_459871, EPI_ISL_459872, EPI_ISL_459873, EPI_ISL_459874, EPI_ISL_459875, EPI_ISL_459877, EPI_ISL_459879, EPI_ISL_459880, EPI_ISL_459881, EPI_ISL_459882, EPI_ISL_459883, EPI_ISL_459885, EPI_ISL_459886, EPI_ISL_459887, EPI_ISL_459888, EPI_ISL_459889, EPI_ISL_459890, EPI_ISL_459891, EPI_ISL_459892			
see above	Kingston Health Sciences Center	Queen's Genomics Lab at Ongwanada (Q-GLO)	Ayub M; Colautti R; Evans GA; Guan H; Huang D; Hudson ML; Perez-Patrigeon S; Rustom N; Sheth P; Sjaarda CP; Soares CN; Wong H
EPI_ISL_538321, EPI_ISL_538322, EPI_ISL_538323, EPI_ISL_538324, EPI_ISL_538325, EPI_ISL_538326, EPI_ISL_538327, EPI_ISL_538328, EPI_ISL_538329, EPI_ISL_538330, EPI_ISL_538331, EPI_ISL_538332, EPI_ISL_538333, EPI_ISL_538335, EPI_ISL_538336, EPI_ISL_538338, EPI_ISL_538339			
see above	Kingston Health Sciences Centre / Queen's University	Ontario Institute for Cancer Research	Bernard Lam; Calvin Sjaarda; Ilinca Lungu; Jared T. Simpson; Katya Douchant; Lawrence E Heisler; Michael Laszloffy; Paul Krzyzanowski; Prameet M. Sheth; Richard de Borja; Robert Colautti
EPI_ISL_479990	Kitakyushu City Institute of Health and Environmental Sciences	Pathogen Genomics Center, National Institute of Infectious Diseases	Asuka Kikuchi Kentaro Itokawa; Hajime Kamiya; Katsuya Obata; Makoto Kuroda; Masanori Hashino; Motoi Suzuki; Rina Tanaka; Tsuyoshi Sekizuka
EPI_ISL_413021	Klinik Hirslanden Zurich	Institute of Medical Virology, University of Zurich	Alexandra Trkola; Andrea Zbinden; Christian Ruef; Fiona Steiner; Gabriela Ziltener; Jon Huder; Jürg Böni; Maryam Zaheri; Michael Huber; Patrick Redli; Riccarda Capaul; Stefan Schmutz; Verena Kufner
EPI_ISL_524479	Klinik Hirslanden Zürich	Institute of Medical Virology, University of Zurich	Alexandra Trkola; Andrea Zbinden; Fiona Steiner; Gabriela Ziltener; Jon Huder; Jürg Böni; Maryam Zaheri; Michael Huber; Patrick Redli; Riccarda Capaul; Stefan Schmutz; Verena Kufner
EPI_ISL_475910, EPI_ISL_475911, EPI_ISL_475912, EPI_ISL_475913, EPI_ISL_475914	Klinikum Wels-Grieskirchen	Bergthaler laboratory, CeMM Research Center for Molecular Medicine of the Austrian Academy of Sciences	Alexander Lercher; Alexandra Popa; Andreas Bergthaler; Benedikt Agerer; Christoph Bock; Daniela Schmid; Dorothee von Laer; Elisabeth Puchhammer-Stoeckl; Franz Allerberger; Gregor Hörmann; Guenter Weiss; Henrique Colaco; Jakob-Wendelin Genger; Jan Laine; Judith Aberle; Kinga Rigler-Hohenwarter; Lukas Endler; Manfred Nairz; Mark Smyth; Martin Senekowitsch; Michael Schuster; Peter Hufnagl; Rainer Gattringer; Stephan Aberle; Thomas Penz; Wegene Borena
EPI_ISL_475101, EPI_ISL_475102, EPI_ISL_475103, EPI_ISL_475104, EPI_ISL_476140, EPI_ISL_476141, EPI_ISL_476142			
see above	Klinisk Mikrobiologi	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Karin Tegmark-Wisell; Maria Lind Karlberg; Mattias Haukland; Olov Svartstrom; Oskar Karlsson Lindsjo; Petra Edquist; Reza Advani; Sandra Broddesson; Shamam Muradrasoli
EPI_ISL_429136, EPI_ISL_429137, EPI_ISL_429138, EPI_ISL_429139, EPI_ISL_429140, EPI_ISL_429141, EPI_ISL_429142, EPI_ISL_429143, EPI_ISL_429144, EPI_ISL_429145, EPI_ISL_429146, EPI_ISL_429147, EPI_ISL_429148, EPI_ISL_429150, EPI_ISL_429151, EPI_ISL_429152, EPI_ISL_429153, EPI_ISL_429154, EPI_ISL_429155, EPI_ISL_429156, EPI_ISL_429157, EPI_ISL_429158, EPI_ISL_429160, EPI_ISL_430860, EPI_ISL_430861, EPI_ISL_430863			
see above	Klinisk mikrobiologi Orebro	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Karin Tegmark-Wisell; Maria Lind Karlberg; Martin Sundqvist; Olov Svartstrom; Oskar Karlsson Lindsjo; Shaman Muradrasoli

EPI_ISL_475144, EPI_ISL_475145, EPI_ISL_475146, EPI_ISL_475147, EPI_ISL_510618	Klinisk mikrobiologi Vasternorrland	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Karin Tegmark-Wisell; Maria Lind Karlberg; Mattias Haukland; Mia Brytting; Olov Svartstrom; Oskar Karlsson Lindsjo; Petra Edquist; Reza Advani; Sandra Broddesson; Shamam Muradrasoli
EPI_ISL_429115, EPI_ISL_429116, EPI_ISL_429117, EPI_ISL_429118, EPI_ISL_429119, EPI_ISL_429120, EPI_ISL_429121, EPI_ISL_429122, EPI_ISL_429123, EPI_ISL_429124, EPI_ISL_429125, EPI_ISL_430848, EPI_ISL_430849, EPI_ISL_430850, EPI_ISL_430851, EPI_ISL_430852, EPI_ISL_430853, EPI_ISL_430854, EPI_ISL_430855, EPI_ISL_450834			
see above	Klinisk mikrobiologi och vardhygien Halmstad	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Arne Kotz; Karin Tegmark-Wisell; Maria Lind Karlberg; Mia Brytting; Olov Svartstrom; Oskar Karlsson Lindsjo; Shaman Muradrasoli; Theresa Enkirch
EPI_ISL_424703, EPI_ISL_428148, EPI_ISL_428201, EPI_ISL_549024, EPI_ISL_549176	Klinisk mikrobiologi, Region Västerbotten	Unit for Biological Agents, Department for CBRN Defence and Security, Swedish Defence Research Agency	FOI Bioinformatics team; FOI bioinformatics team
EPI_ISL_454903, EPI_ISL_455904, EPI_ISL_455905, EPI_ISL_455906, EPI_ISL_455907	Klinisk mikrobiologi, UAS	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Karin Tegmark-Wisell; Maria Lind Karlberg; Mattias Haukland; Olov Svartstrom; Oskar Karlsson Lindsjo; Petra Edquist; Reza Advani; Shamam Muradrasoli
EPI_ISL_913323, EPI_ISL_934322	Klinisk mikrobiologi, Viruslab	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Carlo Berg; Karin Tegmark-Wisell; Maria Lind Karlberg; Mattias Haukland; Mia Brytting; Noura Walai; Oskar Karlsson Lindsjo; Petra Edquist; Petra Holmstrom; Reza Advani; Sofia Stamouli
EPI_ISL_660384, EPI_ISL_660385, EPI_ISL_660386, EPI_ISL_660387, EPI_ISL_660388, EPI_ISL_660389, EPI_ISL_660390, EPI_ISL_660391, EPI_ISL_660392, EPI_ISL_660393, EPI_ISL_660394, EPI_ISL_660395, EPI_ISL_660396			
see above	Klinsisk mikrobiologi Linkoping	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Karin Tegmark-Wisell; Maria Lind Karlberg; Mattias Haukland; Mia Brytting; Olov Svartstrom; Oskar Karlsson Lindsjo; Petra Edquist; Reza Advani; Sandra Broddesson
EPI_ISL_479823	Kochi Prefectural Institute of Public Health	Pathogen Genomics Center, National Institute of Infectious Diseases	Akihiko Tokaji; Hajime Kamiya; Kentaro Itokawa; Makoto Kuroda; Masanori Hashino; Motoi Suzuki; Rina Tanaka; Tsuyoshi Sekizuka
EPI_ISL_407193	Korea Centers for Disease Control & Prevention (KCDC) Center for Laboratory Control of Infectious Diseases Division of Viral Diseases	Korea Centers for Disease Control & Prevention (KCDC) Center for Laboratory Control of Infectious Diseases Division of Viral Diseases	Heui Man Kim; Hye-Joon Jo; Jeong-Min Kim; Mi-Seon Kim; Myung Guk Han; Namjoo Lee; SangHee Woo; Sehee Park; Yoon-Seok Chung
EPI_ISL_480103, EPI_ISL_480104, EPI_ISL_480105, EPI_ISL_480106, EPI_ISL_480107, EPI_ISL_480108	Koshigaya City Public Health Center	Pathogen Genomics Center, National Institute of Infectious Diseases	Aya Tamura; Hajime Kamiya; Kentaro Itokawa; Kyohei Sakata; Makoto Kuroda; Masanori Hashino; Motoi Suzuki; Rina Tanaka; Takumi Daimon; Tsuyoshi Sekizuka; Yoko Togawa; Yoshiko Hamada; Yuka Furui
EPI_ISL_434651	Krokoms Halsocentral	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Karin Tegmark-Wisell; Maria Lind Karlberg; Martin Ersson; Mia Brytting; Olov Svartstrom; Oskar Karlsson Lindsjo; Theresa Enkirch
EPI_ISL_479991, EPI_ISL_479992, EPI_ISL_479993, EPI_ISL_479994, EPI_ISL_479995, EPI_ISL_479996	Kumamoto City Public Health Research Institute	Pathogen Genomics Center, National Institute of Infectious Diseases	Hajime Kamiya; Kaori Tashiro; Kentaro Itokawa; Makoto Kuroda; Masanori Hashino; Motoi Suzuki; Rina Tanaka; Tsuyoshi Sekizuka
EPI_ISL_479824	Kumamoto PrefecturalInstituteof Public-Health and Environmental Science	Pathogen Genomics Center, National Institute of Infectious Diseases	Hajime Kamiya; Kentaro Itokawa; Makoto Kuroda; Masanori Hashino; Motoi Suzuki; Rina Tanaka; Shunsuke Yahiro; Tsuyoshi Sekizuka
EPI_ISL_515181, EPI_ISL_515182, EPI_ISL_515183	Kumasi Centre for Collaborative Research in Tropical Medicine, Kumasi.	Institute of Virology, Charité - Universitätsmedizin Berlin	Augustina Sylverken; Christian Drosten; Eric Adu; Jesse Addo Asamoah; Julia Schneider; Jörn Beheim-Schwarzbach; Michael Owusu; Philip El-Duah; Richard Phillips.; Richmond Gorman; Richmond Yeboah; Sherihane Aryeetey; Victor Max Corman
EPI_ISL_434644, EPI_ISL_450809	Kungsholmsdoktorn	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Karin Tegmark-Wisell; Linus Hammar; Maria Lind Karlberg; Mia Brytting; Olov Svartstrom; Oskar Karlsson Lindsjo; Theresa Enkirch
EPI_ISL_420039, EPI_ISL_420040	L'Air du Temps	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Etienne Simon-Lorière; Flora Donati; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_424868, EPI_ISL_452106, EPI_ISL_452107	LA Office of Public Health Laboratories	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Montmayeur; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao; Zachary Weiner
EPI_ISL_416499, EPI_ISL_416500, EPI_ISL_418234, EPI_ISL_418240	LABM GH nord Essonne	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Christine Lambert; Etienne Simon-Lorière; Flora Donati; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Mélnie Albert; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_428354, EPI_ISL_428361, EPI_ISL_428365	LABM GH nord Essonne de Longjumeau - BP 125	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Etienne Simon-Lorière; Flora Donati; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_1359983	LABORATOIRE BOUVIER	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Gregory Destras; Gwendolyne Burfin; Hadrien Regue; Laurence Josset; Martine Valette; Quentin Semanas
EPI_ISL_445271	LABORATORIO CLINICA CHILLAN	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445333	LABORATORIO CLINICA UNIVERSITARIA DE CONCEPCION	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445279	LABORATORIO INMUNOLAB SPA	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445273, EPI_ISL_445274, EPI_ISL_445278	LABORATORIO TORRE MEDICA LTDA.	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_1139065, EPI_ISL_1139066, EPI_ISL_1139067, EPI_ISL_1139068, EPI_ISL_1201883	LACEN do Mato Grosso do Sul	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Caio Vinicius Dias Lopes; Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes; Karoline Rodrigues Campos
EPI_ISL_861869, EPI_ISL_861874, EPI_ISL_861879, EPI_ISL_861890, EPI_ISL_861893, EPI_ISL_861900, EPI_ISL_861902, EPI_ISL_861906, EPI_ISL_861907, EPI_ISL_861912, EPI_ISL_861913, EPI_ISL_861915			
see above	LATE - Laboratório de Técnicas Especiais - Hospital Israelita Albert Einstein	LATE - Laboratório de Técnicas Especiais - Hospital Israelita Albert Einstein	Ana Paula Moreira Salles; Deyvid Amgarten; Fernanda de Mello Malta; João Renato Rebello Pinho; Pedro Henrique Sebe Rodrigues; Raquel Riyuzo
EPI_ISL_469049, EPI_ISL_469052, EPI_ISL_469053	LNR National Reference Laboratory, Mohammed VI University of Health Sciences	Medical Biotechnology Laboratory, Rabat Medical and Pharmacy School, Mohammed The Vth University in Rabat	Chakib NEJJARI; Houda BENRAHMA; Idrissa Diawara; Imane SMYEJ; Jalil El Atar; Jalila RAHOUI; Lahcen BELYAMANI and Azeddine IBRAHIMI; Laila SBABOU; Loubna ALLAM; M.W. CHEMAO-ELFIHRI; Meriem LAAMARTI; Mouna OUADGHIRI; Rachid EL JAOUDI; Rachid MENTAG; Rokaia LAAMRTI; Saaid AMZAZI; Souad KARTTI
EPI_ISL_455980, EPI_ISL_455981, EPI_ISL_455982, EPI_ISL_455983, EPI_ISL_455984, EPI_ISL_455985, EPI_ISL_455986, EPI_ISL_455987, EPI_ISL_455988, EPI_ISL_455989, EPI_ISL_455990, EPI_ISL_455991, EPI_ISL_455992, EPI_ISL_455993			
see above	LSUHS Emerging Viral Threat Laboratory	Microbial Genome Sequencing Center	Abida Siddiqa; Adam Greer; Andrew D. Yurochko; Byeong-Jae Lee; Camille F. Abshire; Chan-ki Min; Christopher G. Kevil; Daniel J. Snyder; Edna Ondari; Jason M. Bodily; Jeremy P. Kamil; John A. Vanchiere; Katarzyna Zwolinska; Malgorzata Bienkowska-Haba; Martin J. Sapp; Md Maksudul Alam; Michelle M. Arnold; Monica Gestal-Cartele; Paul M. Weinberger; Rona S. Scott; Vaughn S. Cooper
EPI_ISL_528637, EPI_ISL_528638	LVM/UFRJ	Bioinformatics Laboratory / LNCC	Amilcar Tanuri; Ana Teresa R. Vasconcelos; Bruno B. Bezerra; Diana Marianni; Elena Cobos; Fabio Limonte; Gustavo D. P. Silva; Isadora A. Correa; Luciana B. Arruda; Luciana J. Costa; Lucio A. Caldas; Luiz Almeida; Luiza Higga; M. Romário M. de Souza; Marcelo Bozza; Orlando Ferreira; Sharton V. A. Coelho; Terezinha M. Castineiras; Wanderley de Souza
EPI_ISL_528539	LVM/UFRJ	LNCC	Amilcar Tanuri; Ana Teresa R. Vasconcelos; Bruno B. Bezerra; Diana Marianni; Elena Cobos; Fabio Limonte; Gustavo M. Romário M. de Souza; Isadora A. Correa; Luciana B. Arruda; Luciana J. Costa.; Lucio A. Caldas; Luiz Almeida; Luiza Higga; Marcelo Bozza; Orlando Ferreira; Sharton V. A. Coelho;

			Terezinha M. Castineiras; Wanderley de Souza
EPI_ISL_501614, EPI_ISL_501615, EPI_ISL_501620, EPI_ISL_501624, EPI_ISL_501626, EPI_ISL_501628, EPI_ISL_501629			
see above	Lab Microbiology, Pathology Department, William Harvey Hospital	Wellcome Sanger Institute for the COVID-19 Genomics UK (COG-UK) consortium	Cordelia Langford; David K. Jackson; Dominic Kwiatkowski; Ewan Harrison; Felicity Ryan and Alex Alderton; Hannah Lowe; Ian Johnston; John Sillitoe on behalf of the Wellcome Sanger Institute COVID-19 Surveillance Team (http://www.sanger.ac.uk/covid-team); Roberto Amato; Samuel Moses; Sonia Goncalves
EPI_ISL_419259, EPI_ISL_419264, EPI_ISL_419265, EPI_ISL_419266, EPI_ISL_425048, EPI_ISL_425050, EPI_ISL_425052, EPI_ISL_425053, EPI_ISL_425054, EPI_ISL_425055, EPI_ISL_425056, EPI_ISL_425057, EPI_ISL_425058, EPI_ISL_425059, EPI_ISL_425060, EPI_ISL_425061, EPI_ISL_425062, EPI_ISL_425063, EPI_ISL_425064, EPI_ISL_434347, EPI_ISL_434348, EPI_ISL_434349, EPI_ISL_434351, EPI_ISL_434352, EPI_ISL_434354, EPI_ISL_434355, EPI_ISL_434357, EPI_ISL_434360, EPI_ISL_434361, EPI_ISL_434362, EPI_ISL_451164, EPI_ISL_451166, EPI_ISL_468727, EPI_ISL_468728, EPI_ISL_468729, EPI_ISL_468730, EPI_ISL_468731, EPI_ISL_468732, EPI_ISL_468733, EPI_ISL_468734, EPI_ISL_468735, EPI_ISL_468736, EPI_ISL_468737, EPI_ISL_468738, EPI_ISL_468739, EPI_ISL_468740, EPI_ISL_468741, EPI_ISL_468743, EPI_ISL_468744, EPI_ISL_468745, EPI_ISL_468746, EPI_ISL_475060, EPI_ISL_475061, EPI_ISL_475062, EPI_ISL_475063, EPI_ISL_475064, EPI_ISL_475065, EPI_ISL_475066, EPI_ISL_475067, EPI_ISL_475068, EPI_ISL_475069, EPI_ISL_475070, EPI_ISL_475071, EPI_ISL_475072, EPI_ISL_475073, EPI_ISL_475074, EPI_ISL_475075, EPI_ISL_475076, EPI_ISL_475077, EPI_ISL_475078, EPI_ISL_475079, EPI_ISL_475080			
see above	Lab voor klinische biologie	Onderzoeksgroep Virologie	Basiel Cole; Bruno Verhasselt; Hans Nauwynck; Jozefien De Clercq; Laurens Lambrechts; Linos Vandekerckhove; Marthe Pauwels; Nick Vereecke; Sebastiaan Theuns
EPI_ISL_456172, EPI_ISL_456173, EPI_ISL_456174, EPI_ISL_456175, EPI_ISL_456176, EPI_ISL_456177, EPI_ISL_456178, EPI_ISL_456179, EPI_ISL_456180, EPI_ISL_456197, EPI_ISL_456198, EPI_ISL_456199, EPI_ISL_456200, EPI_ISL_456201, EPI_ISL_456202, EPI_ISL_456203, EPI_ISL_456205, EPI_ISL_456206, EPI_ISL_456210, EPI_ISL_456212, EPI_ISL_456300, EPI_ISL_579119, EPI_ISL_579122, EPI_ISL_579123, EPI_ISL_579156, EPI_ISL_579405			
see above	LabPLUS	Institute of Environmental Science and Research (ESR)	Anja Werno; Antje van der Linden; Arlo Upton; Chris Mansell; David Hammer; Dragana Drinkovic; Erasmus Smit; Gary McAuliffe; Hana Sofia Andersson; Hermes Perez; James Ussher; Jill Sherwood; Jing Wang; Joep de Ligt; Josh Freeman; Julia Howard; Juliet Elvy; Lauren Jelly; Mary DeAlmeida; Matt Blakiston; Matt Storey; Matthew Rogers; Max Bloomfield; Michael Addidle; Michelle Balm; Muhammad Faisal; Nikki Freed; Olin Silander; Sally Roberts; Sarah Jefferies; Sharmini Muttaiyah; Susan Morpeth; Susan Taylor; Timothy Blackmore; Vani Sathyendran; Veronica Playle; Virginia Hope; Xiaoyun Ren
EPI_ISL_420063	Labo BM - Site de Juvisy - Hopital Général	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Etienne Simon-Lorière; Flora Donati; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_416029	Laboiratório Fleury	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Adriana Bugno; Adriano Abbud; Carlos Henrique Camargo; Claudia Regina Gonçalves; Claudio Tavares Sacchi; Daniela Bernardes Borges da Silva; Fabiana Cristina Pereira dos Santos; Maria do Carmo Sampaio Tavares Timenetsky; Simone Guadagnucci Morillo; Terezinha Maria de Paiva
EPI_ISL_421734, EPI_ISL_421735, EPI_ISL_421737, EPI_ISL_421738, EPI_ISL_421740, EPI_ISL_421741, EPI_ISL_421742, EPI_ISL_421743, EPI_ISL_421744, EPI_ISL_421745, EPI_ISL_421746, EPI_ISL_421747, EPI_ISL_421748, EPI_ISL_421750, EPI_ISL_421752, EPI_ISL_421753, EPI_ISL_421754, EPI_ISL_421755, EPI_ISL_421756, EPI_ISL_421757, EPI_ISL_421759, EPI_ISL_421760, EPI_ISL_421761, EPI_ISL_421762, EPI_ISL_429707, EPI_ISL_429710, EPI_ISL_429711, EPI_ISL_429715, EPI_ISL_429716, EPI_ISL_429718, EPI_ISL_429723, EPI_ISL_429724, EPI_ISL_429725, EPI_ISL_429727, EPI_ISL_429728, EPI_ISL_429729, EPI_ISL_429732, EPI_ISL_429733, EPI_ISL_429734, EPI_ISL_429735, EPI_ISL_429736, EPI_ISL_429737, EPI_ISL_429738, EPI_ISL_429740, EPI_ISL_429741, EPI_ISL_429743, EPI_ISL_429746, EPI_ISL_429748, EPI_ISL_429749, EPI_ISL_429750, EPI_ISL_429753, EPI_ISL_429755, EPI_ISL_429756, EPI_ISL_429757, EPI_ISL_429758, EPI_ISL_429759, EPI_ISL_429760, EPI_ISL_429762, EPI_ISL_429766, EPI_ISL_429767, EPI_ISL_429769, EPI_ISL_429770, EPI_ISL_429772, EPI_ISL_429774, EPI_ISL_429775, EPI_ISL_429776, EPI_ISL_429777, EPI_ISL_429778, EPI_ISL_429779, EPI_ISL_429780, EPI_ISL_429781, EPI_ISL_429782, EPI_ISL_429784, EPI_ISL_429786, EPI_ISL_429787, EPI_ISL_429791, EPI_ISL_429793, EPI_ISL_429794			
see above	Laboratoire National de Sante, Microbiology, Virology	Laboratoire National de Sante, Microbiology, Epidemiology and Microbial Genomics	Anke Wienecke-Baldacchino; Ardashel Latsuzbaia; Catherine Ragimbeau; Guillaume Fournier; Jessica Tapp; Joel Mossong; Tamir Abdelrahman; Trung Nguyen Nguyen
EPI_ISL_419562, EPI_ISL_419563, EPI_ISL_419564, EPI_ISL_419566, EPI_ISL_419568, EPI_ISL_419569, EPI_ISL_419570, EPI_ISL_419573, EPI_ISL_419578, EPI_ISL_419579, EPI_ISL_419580, EPI_ISL_419582, EPI_ISL_419583, EPI_ISL_419584, EPI_ISL_419585, EPI_ISL_419586, EPI_ISL_419587, EPI_ISL_419588, EPI_ISL_419589, EPI_ISL_419590, EPI_ISL_419591, EPI_ISL_419592, EPI_ISL_419593, EPI_ISL_419594, EPI_ISL_419595, EPI_ISL_419596, EPI_ISL_419597, EPI_ISL_419598, EPI_ISL_419599, EPI_ISL_419600, EPI_ISL_419601, EPI_ISL_419602, EPI_ISL_419603, EPI_ISL_419604, EPI_ISL_419606, EPI_ISL_419607			
see above	Laboratoire National de Santé, Microbiology, Virology	Laboratoire National de Santé, Microbiology, Epidemiology and Microbial Genomics	Anke Wienecke-Baldacchino; Ardashel Latsuzbaia; Catherine Ragimbeau; Guillaume Fournier; Jessica Tapp; Joel Mossong; Tamir Abdelrahman; Trung Nguyen Nguyen
EPI_ISL_417526, EPI_ISL_417527, EPI_ISL_417528, EPI_ISL_417529, EPI_ISL_417530, EPI_ISL_417531, EPI_ISL_417532, EPI_ISL_417533, EPI_ISL_417534			
see above	Laboratoire Nationale de Santé, Microbiology, Virology	Laboratoire Nationale de Santé, Microbiology, Epidemiology and Microbial Genomics	Anke Wienecke-Baldacchino; Ardashel Latsuzbaia; Catherine Ragimbeau; Guillaume Fournier; Jessica Tapp; Joel Mossong; Tamir Abdelrahman; Trung Nguyen Nguyen
EPI_ISL_414600, EPI_ISL_414623	Laboratoire de Virologie Institut de Virologie - INSERM U 1109 Hôpitaux Universitaires de Strasbourg	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Flora Donati Vincent Enouf; Marion Barbet; Maud Vanpeene; Méline Bizard; Mélnie Albert; Samira Fafi-Kremer; Sylvie Behillil; Sylvie van der Werf
EPI_ISL_666870	Laboratoire de Virologie, CHU de Caen, Normandie, France.	GRAM2.0, Université de Caen Normandie	Astrid VABRET; Estelle LEPERCHOIS; Januel VOUTEAU; Juliette ECHE; Meriadeg LE GOUIL
EPI_ISL_911513	Laboratoire de Virologie, CHU de Caen, Normandie, France.	GRAM2.0, Université de Caen Normandie Laboratoire de Virologie, CHU de Caen	Astrid VABRET; Estelle LEPERCHOIS; Januel VOUTEAU; Juliette ECHE; Meriadeg LE GOUIL
EPI_ISL_413996, EPI_ISL_413999, EPI_ISL_414019, EPI_ISL_414020, EPI_ISL_414021, EPI_ISL_414023	Laboratoire de Virologie, HUG	Swiss National Reference Centre for Influenza	LAUBSCHER Florian et al.
EPI_ISL_463940	Laboratoire de microbiologie, Hopital de Verdun	Smith Laboratory, Centre de Recherche CHU Sainte-Justine	Ivan Pavlov; Marieke Rozendaal; Martin Smith
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see above	Laboratoire de santé publique du Québec	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group (http://covseq.ca/researchgroup); Sandrine Moreira
EPI_ISL_634818, EPI_ISL_700349	Laboratoire de virologie, CHU de Grenoble - CS 10217 - 38043 Grenoble cedex 10	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Gregory Destras; Gwendolyne Burfin; Hadrien Règue; Laurence Josset; Martine Valette; Quentin Semanas; Sylvie Larrat
EPI_ISL_634819, EPI_ISL_700350	Laboratoire de virologie, CHU de Grenoble - CS 10217 - 38043 Grenoble cedex 11	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Gregory Destras; Gwendolyne Burfin; Hadrien Règue; Laurence Josset; Martine Valette; Quentin Semanas; Sylvie Larrat
EPI_ISL_634820	Laboratoire de virologie, CHU de Grenoble - CS 10217 - 38043 Grenoble cedex 12	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Gregory Destras; Gwendolyne Burfin; Hadrien Règue; Laurence Josset; Martine Valette; Quentin Semanas; Sylvie Larrat
EPI_ISL_634821	Laboratoire de virologie, CHU de Grenoble - CS 10217 - 38043 Grenoble cedex 13	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Gregory Destras; Gwendolyne Burfin; Hadrien Règue; Laurence Josset; Martine Valette; Quentin Semanas; Sylvie Larrat
EPI_ISL_634822	Laboratoire de virologie, CHU de Grenoble - CS 10217 - 38043 Grenoble cedex 14	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Gregory Destras; Gwendolyne Burfin; Hadrien Règue; Laurence Josset; Martine Valette; Quentin Semanas; Sylvie Larrat
EPI_ISL_634823	Laboratoire de virologie, CHU de Grenoble - CS 10217 - 38043 Grenoble cedex 15	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Gregory Destras; Gwendolyne Burfin; Hadrien Règue; Laurence Josset; Martine Valette; Quentin Semanas; Sylvie Larrat
EPI_ISL_700359	Laboratoire de virologie, CHU de Grenoble - CS 10217 - 38043 Grenoble cedex 20	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Gregory Destras; Gwendolyne Burfin; Hadrien Règue; Laurence Josset; Martine Valette; Quentin Semanas; Sylvie Larrat
EPI_ISL_700360	Laboratoire de virologie, CHU de Grenoble - CS 10217 - 38043 Grenoble cedex 21	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Gregory Destras; Gwendolyne Burfin; Hadrien Règue; Laurence Josset; Martine Valette; Quentin Semanas; Sylvie Larrat
EPI_ISL_700361	Laboratoire de virologie, CHU de Grenoble - CS 10217 - 38043 Grenoble cedex 22	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Gregory Destras; Gwendolyne Burfin; Hadrien Règue; Laurence Josset; Martine Valette; Quentin Semanas; Sylvie Larrat
EPI_ISL_634833	Laboratoire de virologie, CHU de Grenoble - CS 10217 - 38043 Grenoble cedex 25	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Gregory Destras; Gwendolyne Burfin; Hadrien Règue; Laurence Josset; Martine Valette; Quentin Semanas; Sylvie Larrat
EPI_ISL_634834	Laboratoire de virologie, CHU de Grenoble - CS 10217 - 38043 Grenoble cedex 26	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Gregory Destras; Gwendolyne Burfin; Hadrien Règue; Laurence Josset; Martine Valette; Quentin Semanas; Sylvie Larrat
EPI_ISL_634835	Laboratoire de virologie, CHU de Grenoble - CS 10217 - 38043 Grenoble cedex 27	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Gregory Destras; Gwendolyne Burfin; Hadrien Règue; Laurence Josset; Martine Valette; Quentin Semanas; Sylvie Larrat
EPI_ISL_634817, EPI_ISL_700348	Laboratoire de virologie, CHU de Grenoble - CS 10217 - 38043 Grenoble cedex 9	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Lina; Gregory Destras; Gwendolyne Burfin; Hadrien Règue; Laurence Josset; Martine Valette; Quentin Semanas; Sylvie Larrat
EPI_ISL_476822, EPI_ISL_476824	Laboratoire des Fièvres Hémorragiques Virales du Benin	Charité-Universitätsmedizin Berlin	Anges; Drexler; Jan Felix; Moreira-Soto Andres; Sander Anna-Lena; Yadouleton
EPI_ISL_629081, EPI_ISL_629082, EPI_ISL_629083, EPI_ISL_629084, EPI_ISL_629085, EPI_ISL_629086, EPI_ISL_629088, EPI_ISL_629089, EPI_ISL_629090, EPI_ISL_629091, EPI_ISL_629092, EPI_ISL_629093, EPI_ISL_629094, EPI_ISL_629095, EPI_ISL_666654, EPI_ISL_666656, EPI_ISL_666657, EPI_ISL_666659, EPI_ISL_666660, EPI_ISL_666661, EPI_ISL_666662, EPI_ISL_666664, EPI_ISL_683331, EPI_ISL_683332			
see above	Laboratoire du Centre Hospitalier Annecy Genevois	CNR Virus des Infections Respiratoires - France SUD	Antonin Bal; Bruno Chanzy; Bruno Lina; Gregory Destras; Gwendolyne Burfin; Hadrien Règue; Hélène Petitprez; Laurence Josset; Martine Valette; Quentin Semanas
EPI_ISL_739897, EPI_ISL_740199, EPI_ISL_740242, EPI_ISL_740405, EPI_ISL_740444, EPI_ISL_740510, EPI_ISL_744233, EPI_ISL_744478, EPI_ISL_744723, EPI_ISL_744843, EPI_ISL_745011			
see above	Laboratoire national de santé, Microbiology, Virology	Laboratoire national de santé, Microbiology, Microbial Genomics Platform	Anke Wienecke-Baldacchino; Catherine Ragimbeau; Fatu Djabi; Jessica Tapp; Tamir Abdelrahman
EPI_ISL_429129, EPI_ISL_429130, EPI_ISL_429131, EPI_ISL_429132, EPI_ISL_429133, EPI_ISL_429134, EPI_ISL_430856, EPI_ISL_430857, EPI_ISL_434641, EPI_ISL_434642			
see above	Laboratoriemedicin	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Karin Tegmark-Wisell; Maria Lind Karlberg; Olov Svartstrom; Oskar Karlsson Lindsjo; Shaman Muradrasoli
EPI_ISL_637108	Laboratorio Biologia Molecolare Sars Cov2 - UOC Laboratorio Analisi - Servizio Medicina di Laboratorio, Ospedale "San Francesco" - ATS-ASSL Nuoro	Laboratorio specialistico UOC Ematologia - Ospedale "San Francesco" - ATS-ASSL Nuoro	Asproni Rosanna; Casu Gavino; Fancello Tatiana; Fiamma Maura; Floris Anna Rita; Lo Maglio Iana; Mameli Giuseppe; Monne Maria Itria; Palmas Angelo Domenico; Piras Giovanna; Sanna Filomena; Sulis Vincenzo; Toja Alessandro
EPI_ISL_792478, EPI_ISL_792482, EPI_ISL_792484	Laboratorio Central Mg. Luis Alfredo Pianciola	Hospital Regional Ushuaia - Centro Austral De Investigaciones Científicas - Universidad Nacional De Tierra Del Fuego on behalf of 'Proyecto Argentino Interinstitucional de genomica de SARS-CoV-2' (PAIS Consortium)	C; CF; Ceballos; F; Gallego; Gramundi; ID; M; MC; Mazzeo; Nardi; Pianciola, L.; Pinto; SG; Ziehm
EPI_ISL_1301620, EPI_ISL_1301621, EPI_ISL_1301622	Laboratorio Central de Epidemiología IMSS	Instituto de Biotecnología de la UNAM	Alejandra Hernández-Terán; Alejandro Sanchez-Flores; Alma Rincón-Rubio; Andrea Santos Coy-Arechavaleta; Authors from IBT; Blanca Taboada; Celia Boukadida; Clara Esperanza Santacruz-Tinoco; Edgar Mendieta-Condado; Eduardo Becerril-Vargas; Fidencio Mejía-Nepomuceno; Francisco Pulido; Gisela Barrera-Badillo; Gloria Vazquez; Hector Esteban Paz-Juárez; IMSS; InDRE and INER (in alphabetical order): Carlos F. Arias; Irma Lopez-Martinez; Jerome Jean Verleyen; Joel Armando Vázquez-Pérez; Jorge Salas-Hernández; José Arturo Martínez-Orozco; José Ernesto Ramírez-González; José Esteban Muñoz-Medina; Larissa Fernandes-Matano; Lucia Hernandez-Rivas; Luis Alberto Ochoa-Carrera; Margarita Matías-Florentino; Mario Mújica-Sánchez; Natividad Cruz-Ortiz; Pavel Isa; Ricardo Grande; Santiago Ávila-Ríos; Tatiana Nunez-Garcia; Teresita Rojas-Mendoza
EPI_ISL_1181609, EPI_ISL_1181610, EPI_ISL_1181614, EPI_ISL_1181615, EPI_ISL_1181616, EPI_ISL_1181617, EPI_ISL_1181618, EPI_ISL_1181619			
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EPI_ISL_1181620	Laboratorio Central de Saude Publica do Estado do Rio Grande do Sul (LACEN-RS)	Laboratory of Respiratory Viruses and Measles, Oswaldo Cruz Institute, FIOCRUZ	Alice Sampaio Rocha; Ana Carolina Mendonca; Anna Carolina Paixao; Fernando Motta; Luciana Appolinario; Marilda Siqueira on behalf of the Fiocruz COVID-19 Genomic Surveillance Network; Paola Resende; Renata Serrano Lopes; Tatiana Schaffer Gregianini
EPI_ISL_1181611, EPI_ISL_1181612, EPI_ISL_1181613	Laboratorio Central de Saude Publica do Estado do Rio de Janeiro (LACEN-RJ)	Laboratory of Respiratory Viruses and Measles, Oswaldo Cruz Institute, FIOCRUZ	Alice Sampaio Rocha; Ana Carolina Mendonca; Andrea Cony Cavalcanti; Anna Carolina Paixao; Fernando Motta; Luciana Appolinario; Marilda Siqueira on behalf of the Fiocruz COVID-19 Genomic Surveillance Network; Paola Resende; Renata Serrano Lopes
EPI_ISL_792526, EPI_ISL_792527,	Laboratorio Central, Ministerio de Salud Córdoba	Instituto de Patologia Vegetal (CIAP-INTA) on behalf of	Barbas, G.; Castro, G.; Debat, HJ.; FD; Fernández; MB; Pisano; Re; V

EPI_ISL_792528, EPI_ISL_792531, EPI_ISL_792532, EPI_ISL_792535		'Proyecto Argentino Interinstitucional de genomica de SARS-CoV-2' (PAIS Consortium)	
EPI_ISL_424667	Laboratorio Estatal de Salud Publica del Estado de México	Instituto de Diagnóstico y Referencia Epidemiológicos	Adnan Araiza Rodríguez; Alejandro Sánchez; Alfredo Ponce de León Garduño; Blanca Taboada; Carlos F. Arias.; Carolina González Torres; Celia Boukadida; Cesar Raúl González Bonilla; Concepción Grajales Muñiz; Edgar Mendieta Condado; Eduardo Becerril Vargas; Fabiola Garcés Ayala; Fernando Ledesma Barrientos; Francisco Javier Gaytán Cervantes; Francisco Pulido; Gisela Barrera Badillo; Gloria Vázquez; Guillermo M. Ruiz-Palacios; Irma López Martínez; Joel Armando Vázquez Pérez; José Arturo Martínez Orozco; José Ernesto Ramírez González; José Esteban Muñoz Medina; Lucia Hernández Rivas; Luis Alberto Garcia Andrade; Mario Mújica Sánchez; Pavel Isa; Pilar Ramos Cervantes; Ricardo Grande; Santiago Avila Ríos; Victor Hugo Borja Aburto; Violeta Ibarra Gonzalez
EPI_ISL_424672	Laboratorio Estatal de Salud Publica del Estado de Puebla	Instituto de Diagnostico y Referencia Epidemiologicos	Adnan Araiza Rodríguez; Alejandro Sánchez; Alfredo Ponce de León Garduño; Blanca Taboada; Carlos F. Arias; Carolina González Torres; Celia Boukadida; Cesar Raúl González Bonilla; Concepción Grajales Muñiz; Edgar Mendieta Condado; Eduardo Becerril Vargas; Fabiola Garcés Ayala; Fernando Ledesma Barrientos; Francisco Javier Gaytán Cervantes; Francisco Pulido; Gisela Barrera Badillo; Gloria Vázquez; Guillermo M. Ruiz-Palacios; Irma López Martínez; Joel Armando Vázquez Pérez; José Arturo Martínez Orozco; José Ernesto Ramírez González; José Esteban Muñoz Medina; Lucia Hernández Rivas; Luis Alberto Garcia Andrade; Mario Mújica Sánchez; Pavel Isa; Pilar Ramos Cervantes; Ricardo Grande; Santiago Avila Ríos; Victor Hugo Borja Aburto; Violeta Ibarra Gonzalez
EPI_ISL_424670	Laboratorio Estatal de Salud Publica del Estado de Queretaro	Instituto de Diagnóstico y Referencia Epidemiologicos	Adnan Araiza Rodríguez; Alejandro Sánchez; Alfredo Ponce de León Garduño; Blanca Taboada; Carlos F. Arias; Carolina González Torres; Celia Boukadida; Cesar Raúl González Bonilla; Concepción Grajales Muñiz; Edgar Mendieta Condado; Eduardo Becerril Vargas; Fabiola Garcés Ayala; Fernando Ledesma Barrientos; Francisco Javier Gaytán Cervantes; Francisco Pulido; Gisela Barrera Badillo; Gloria Vázquez; Guillermo M. Ruiz-Palacios; Irma López Martínez; Joel Armando Vázquez Pérez; José Arturo Martínez Orozco; José Ernesto Ramírez González; José Esteban Muñoz Medina; Lucia Hernández Rivas; Luis Alberto Garcia Andrade; Mario Mújica Sánchez; Pavel Isa; Pilar Ramos Cervantes; Ricardo Grande; Santiago Avila Ríos; Victor Hugo Borja Aburto; Violeta Ibarra Gonzalez
EPI_ISL_861628	Laboratorio Municipal de Guarulhos	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes; Karoline Rodrigues Campos
EPI_ISL_457946, EPI_ISL_457948, EPI_ISL_457952, EPI_ISL_457953, EPI_ISL_457956, EPI_ISL_457957, EPI_ISL_457958, EPI_ISL_457959, EPI_ISL_457961, EPI_ISL_457963			
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EPI_ISL_417034, EPI_ISL_811148, EPI_ISL_1068078	Laboratorio de Ecologia de Doencas Transmissiveis na Amazonia, Instituto Leonidas e Maria Deane - Fiocruz Amazonia	Laboratorio de Ecologia de Doencas Transmissiveis na Amazonia, Instituto Leonidas e Maria Deane - Fiocruz Amazonia	André Corado; Debora Duarte; Felipe Naveca on behalf of the Fiocruz COVID-19 Genomic Surveillance Network; Fernanda Nascimento; George Silva; Karina Pessoa; Luciana Gonçalves; Maria Júlia Brandão; Matildé Mejía; Michele Jesus; Sérgio Luz; Valdinete Nascimento; Victor Souza; Ágatha Costa
EPI_ISL_648595	Laboratorio de Infectología Servicio de Infectología Hospital Universitario Dr. José Eleuterio González - Universidad Autónoma de Nuevo León	Laboratorio de Infectología Molecular Departamento de Bioquímica y Medicina Molecular Facultad de Medicina - Universidad Autónoma de Nuevo León	Adrian Camacho-Ortiz; Ana M. Rivas-Estilla; Consuelo Treviño-Garza; Daniel Arellanos-Soto; Eduardo Perez-Alba; Elvira Garza-González; Kame A. Galán-Huerta; Laura Nuzzolo-Shihadeh; Manuel E. de-la-O-Cavazos; María F. Herrera-Saldivar; Natalia Martínez-Acuña; Paola Bocanegra-Ibarias; Roberto Montes-de-Oca; Samantha M. Flores-Treviño; Sonia A. Lozano-Sepúlveda
EPI_ISL_779169, EPI_ISL_779170, EPI_ISL_779171	Laboratorio de Infectología, Servicio de Infectología, Hospital Universitario Dr. José Eleuterio González - Universidad Autónoma de Nuevo León	Laboratorio de Infectología Molecular, Departamento de Bioquímica y Medicina Molecular,Facultad de Medicina - Universidad Autónoma de Nuevo León	Adrian Camacho-Ortiz; Ana M. Rivas-Estilla; Daniel Arellanos-Soto; Eduardo Perez-Alba; Elvira Garza-González; Kame A. Galán-Huerta; Laura Nuzzolo-Shihadeh; Maria F. Herrera-Saldivar; Natalia Martínez-Acuña; Paola Bocanegra-Ibarias; Samantha M. Flores-Treviño; Sonia A. Lozano-Sepúlveda
EPI_ISL_517770	Laboratorio de Referencia Nacional de Virus Respiratorio. Centro Nacional de Salud Publica. Instituto Nacional de Salud Peru	Laboratorio de Referencia Nacional de Biotecnología y Biología Molecular. Centro Nacional de Salud Publica. Instituto Nacional de Salud Peru.	Carlos Padilla Rojas; Henri Bailon Calderon; Johanna Balbuena Torres; Karolyn Vega Chozo; Marco Galarza Perez; Maribel Huaringa Nuñez; Nancy Rojas Serrano.; Omar Caceres Rey; Priscila Lope Pari
EPI_ISL_516626, EPI_ISL_516987, EPI_ISL_517958, EPI_ISL_523810, EPI_ISL_523954, EPI_ISL_523979, EPI_ISL_523994, EPI_ISL_524471, EPI_ISL_525206			
see above	Laboratorio de Referencia Nacional de Virus Respiratorio. Centro Nacional de Salud Publica. Instituto Nacional de Salud Peru.	Laboratorio de Referencia Nacional de Biotecnología y Biología Molecular. Centro Nacional de Salud Publica. Instituto Nacional de Salud Peru.	Carlos Padilla Rojas; Henri Bailon Calderon; Johanna Balbuena Torres; Karolyn Vega Chozo; Marco Galarza Perez; Maribel Huaringa Nuñez; Nancy Rojas Serrano.; Omar Caceres Rey; Priscila Lope Pari
EPI_ISL_489836, EPI_ISL_489837, EPI_ISL_489838, EPI_ISL_489839, EPI_ISL_489987, EPI_ISL_489988, EPI_ISL_489989, EPI_ISL_489990, EPI_ISL_490209, EPI_ISL_490315, EPI_ISL_490316, EPI_ISL_490975, EPI_ISL_490976, EPI_ISL_491427, EPI_ISL_491428, EPI_ISL_491429, EPI_ISL_491430, EPI_ISL_491462, EPI_ISL_491463, EPI_ISL_491464, EPI_ISL_514338			
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EPI_ISL_491172	Laboratorio de Referencia Nacional de Virus Respiratorio. Instituto Nacional de Salud Perú	Laboratorio de Referencia Nacional de Biotecnología y Biología Molecular. Instituto Nacional de Salud Perú.	Carlos Padilla Rojas; Henri Bailon Calderon; Johanna Balbuena Torres; Karolyn Chozo Vega; Marco Galarza Perez; Maribel Huaringa Nuñez; Nancy Rojas Serrano; Omar Caceres Rey; Priscila Lope Pari
EPI_ISL_1111075, EPI_ISL_1111076, EPI_ISL_1111077, EPI_ISL_1111078, EPI_ISL_1111079, EPI_ISL_1111080, EPI_ISL_1111081, EPI_ISL_1111087, EPI_ISL_1111088, EPI_ISL_1111089, EPI_ISL_1111090, EPI_ISL_1111091, EPI_ISL_1111092, EPI_ISL_1111093, EPI_ISL_1111094, EPI_ISL_1111095, EPI_ISL_1111096, EPI_ISL_1111097, EPI_ISL_1111098, EPI_ISL_1111100, EPI_ISL_1111101, EPI_ISL_1111102, EPI_ISL_1111103, EPI_ISL_1111104, EPI_ISL_1111105, EPI_ISL_1111106, EPI_ISL_1111107, EPI_ISL_1111108, EPI_ISL_1111109, EPI_ISL_1111110, EPI_ISL_1111111, EPI_ISL_1111113, EPI_ISL_1111117, EPI_ISL_1111118, EPI_ISL_1111119, EPI_ISL_1111120, EPI_ISL_1111162, EPI_ISL_1111163, EPI_ISL_1111164, EPI_ISL_1111170, EPI_ISL_1111171, EPI_ISL_1111172, EPI_ISL_1111174, EPI_ISL_1111175, EPI_ISL_1111176, EPI_ISL_1111177, EPI_ISL_1111178, EPI_ISL_1111179, EPI_ISL_1111180, EPI_ISL_1111181, EPI_ISL_1111182, EPI_ISL_1111183, EPI_ISL_1111184, EPI_ISL_1111185, EPI_ISL_1111186, EPI_ISL_1111187, EPI_ISL_1111188, EPI_ISL_1111189, EPI_ISL_1111190, EPI_ISL_1111192, EPI_ISL_1111193, EPI_ISL_1111194, EPI_ISL_1111195, EPI_ISL_1111196, EPI_ISL_1111197, EPI_ISL_1111198, EPI_ISL_1111199, EPI_ISL_1111200, EPI_ISL_1111201, EPI_ISL_1111202, EPI_ISL_1111203, EPI_ISL_1111204, EPI_ISL_1111205, EPI_ISL_1111206, EPI_ISL_1111207, EPI_ISL_1111208, EPI_ISL_1111209, EPI_ISL_1111210, EPI_ISL_1111211, EPI_ISL_1111212, EPI_ISL_1111214, EPI_ISL_1111215, EPI_ISL_1111216, EPI_ISL_1111217, EPI_ISL_1111218, EPI_ISL_1111219, EPI_ISL_1111220, EPI_ISL_1111221, EPI_ISL_1111222, EPI_ISL_1111223, EPI_ISL_1111224, EPI_ISL_1111225, EPI_ISL_1111226, EPI_ISL_1111228, EPI_ISL_1111229, EPI_ISL_1111230, EPI_ISL_1111231, EPI_ISL_1111232, EPI_ISL_1111233, EPI_ISL_1111234, EPI_ISL_1111235, EPI_ISL_1111236, EPI_ISL_1111237, EPI_ISL_1111238, EPI_ISL_1111239			
see above	Laboratorio de Referencia Nacional de Virus Respiratorio. Instituto Nacional de Salud Perú	Laboratorio de Referencia Nacional de Enteropatógenos. Instituto Nacional de Salud del Perú	Fiorella Orellana Peralta; Iris Silva Molina; Junior Caro Castro; Ronnie Gavilan Chavez; Veronica Hurtado Vela; Willi Quino Sifuentes
EPI_ISL_487269	Laboratorio de Referencia Nacional de Virus Respiratorio. Instituto Nacional de Salud.	Laboratorio de Referencia Nacional de Biotecnología y Biología Molecular. Instituto Nacional de Salud.	Carlos Padilla Rojas; Henri Bailon Calderon; Johanna Balbuena Torrez; Karolyn Chozo Vega; Marco Galarza Perez; Maribel Huaringa Nuñez; Nancy Rojas Serrano; Omar Caceres Rey; Priscila Lope Pari
EPI_ISL_415787	Laboratorio de Referencia Nacional de Virus Respiratorio. Instituto Nacional de Salud. Peru	Laboratorio de Referencia Nacional de Biotecnología y Biología Molecular.Instituto Nacional de Salud.Peru	Carlos Padilla Rojas; Hemri Bailon Calderon; Johanna Balbuena Torres; Karolyn Vega Chozo; Maribel Huaringa Nuñez; Nancy Rojas Serrano; Omar Caceres Rey; Priscila Lope Pari
EPI_ISL_514264	Laboratorio de Referencia Nacional de Virus Respiratorio. Instituto Nacional de Salud. Perú	Laboratorio de Referencia Nacional de Biotecnología y Biología Molecular.Instituto Nacional de Salud.Perú	Carlos Padilla Rojas; Henri Bailon Calderon; Johanna Balbuena Torrez; Karolyn Vega Chozo; Marco Galarza Perez; Maribel Huaringa Nuñez; Nancy Rojas Serrano; Omar Caceres Rey; Priscila Lope Pari
EPI_ISL_491431	Laboratorio de Referencia Nacional de Virus Respiratorio. Instituto Nacional de Salud. Perú	Laboratorio de Referencia Nacional de Biotecnología y Biología Molecular. Instituto Nacional de Salud.Perú	Carlos Padilla Rojas; Henri Bailon Calderon; Johanna Balbuena Torres; Karolyn Vega Chozo; Marco Galarza Perez; Maribel Huaringa Nuñez; Nancy Rojas Serrano.; Omar Caceres Rey; Priscila Lope Pari
EPI_ISL_529068, EPI_ISL_540924, EPI_ISL_540986, EPI_ISL_540987, EPI_ISL_540988, EPI_ISL_568515, EPI_ISL_568516			
see above	Laboratorio de Referencia Nacional de Virus Respiratorios, Instituto Nacional de Salud Peru	Laboratorio de Genómica Microbiana, Universidad Peruana Cayetano Heredia	Alejandra Dávila-Barclay; Brenda Ayzanoa; Camila Castillo-Vilcahuaman; Guillermo Salvatierra; Janet Huancachoque; Luis González; Maribel Huaringa; Pablo Tsukayama; Pedro E. Romero; Pool Marcos
EPI_ISL_482468	Laboratorio de Referencia Nacional de Virus Respiratorios. Instituto Nacional de Salud Peru	Laboratorio de Referencia Nacional de Biotecnología y Biología Molecular. Instituto Nacional de Salud Peru	Carlos Padilla Rojas; Henri Bailon Calderon; Johanna Balbuena Torres; Karolyn Vega Chozo; Maribel Huaringa Nuñez; Nancy Rojas Serrano; Omar Caceres Rey; Priscila Lope Pari
EPI_ISL_792364	Laboratorio de Virologia - HIEAyC San Juan de Dios	Área de Secuenciación del Laboratorio de Virología del Hospital de Niños Dr. Ricardo Gutierrez on behalf of 'Proyecto Argentino Interinstitucional de genomica de SARS-CoV-2' (PAIS Consortium)	A; Colmeiro; Ercole; Ferioli; Gatelli; Goya; LE; Lusso; M; MI; MS; Nabaes Jodar; Natale; R; S; Valinotto; Viegas, M.
EPI_ISL_623138	Laboratorio de Virologia Molecular / UFRJ	Bioinformatics Laboratory / LNCC	Alexandra L Gerber; Amilcar Tanuri; Ana Paula de C Guimarães; Ana Tereza R de Vasconcelos; Carolina M Voloch; Covid19-UFRJ Workgroup; Cynthia C

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EPI_ISL_430799, EPI_ISL_430800	Laboratorio de Virología del Hospital de Niños Dr. Ricardo Gutierrez	Área de Secuenciación del Laboratorio de Virología del Hospital de Niños Dr. Ricardo Gutierrez on behalf of 'Proyecto Argentino Interinstitucional de genomica de SARS-CoV-2' (PAIS Consortium)	AS; E; Goya; Gravis; LE; Lusso; MI; MS; Mistchenko; Nabaes Jodar; Natale; S; Valinotto; Viegas, M.
EPI_ISL_792451, EPI_ISL_792454, EPI_ISL_792463, EPI_ISL_792471	Laboratorio del Hospital Regional Ushuaia Gdor. Ernesto Campos	Hospital Regional Ushuaia - Centro Austral De Investigaciones Científicas - Universidad Nacional De Tierra Del Fuego on behalf of 'Proyecto Argentino Interinstitucional de genomica de SARS-CoV-2' (PAIS Consortium)	Boutureira, MF.; CA; CB; CF; Castro; Ceballos; Cáceres; De Roccis; F; G; Gallego; Gramundi; ID; Nardi; SB; SG; Yulan
EPI_ISL_413489	Laboratorio di Microbiologia e Virologia, Università Vita-Salute San Raffaele, Milano	Laboratorio di Microbiologia e Virologia, Università Vita-Salute San Raffaele, Milano	C. Di Resta; E. Boeri; E. Criscuolo; G. Lo Raso; I. Negri; M. Castelli; M. Clementi; M. Sampaolo; N. Mancini & N. Clementi; R. Burioni; R. Ferrarese; R.A Diotti; V. Amato; V. Caputo
EPI_ISL_476221	Laboratory Fleury	Instituto de Medicina Tropical da Univesidade de São Paulo	Camila Alves Maia da Silva; Darlan da Silva Candido; Erika Regina Manuli; Ester Sabino; Flavia Cristina da Silva Sales; Giula Magalhaes Ferreira; Jaqueline Goes de Jesus; Julien Theze; Mariana Severo Ramundo; Nuno Faria; Samples: Celso Granato; Sequencing: Ingra Morales Claro; Thais de Moura Coletti
EPI_ISL_415741, EPI_ISL_415742, EPI_ISL_415743, EPI_ISL_417519, EPI_ISL_417520, EPI_ISL_417521, EPI_ISL_417522, EPI_ISL_417523, EPI_ISL_417524, EPI_ISL_417525, EPI_ISL_424969, EPI_ISL_424970, EPI_ISL_424971, EPI_ISL_424972, EPI_ISL_424973, EPI_ISL_424974, EPI_ISL_424975, EPI_ISL_424978, EPI_ISL_444274, EPI_ISL_444276, EPI_ISL_444277, EPI_ISL_444278, EPI_ISL_464092, EPI_ISL_667807, EPI_ISL_667808			
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EPI_ISL_411915	Laboratory Medicine	Department of Laboratory Medicine, Lin-Kou Chang Gung Memorial Hospital, Taoyuan, Taiwan.	Chung-Guei Huang; Kuo-Chien Tsao; Shin-Ru Shih; Shu-Li Yang; Yhu-Chering Huang; Yi-Chun Li; Yu-Nong Gong
EPI_ISL_529208, EPI_ISL_529209, EPI_ISL_529210, EPI_ISL_529211, EPI_ISL_529212	Laboratory Medicine, University of Washington	University of Washington, Laboratory Medicine	Greninger, A.; Jerome, K.; Roychoudhury, P.
EPI_ISL_437689	Laboratory for Urgent Response to Biological Threats	Institut Pasteur CIBU / ERI	A. Kwasiborski; C. Balière; C. Batéjat; J. Vanhomwegen; JC. Manuguerra; V. Caro; V. Hourdel
EPI_ISL_437690	Laboratory for Urgent Response to Biological Threats	Institut Pasteur CIBU /ERI	A. Kwasiborski; C. Balière; C. Batéjat; H. Hourdel; J. Vanhomwegen; JC. Manuguerra; V. Caro
EPI_ISL_435045, EPI_ISL_435046, EPI_ISL_435047	Laboratory of Applied Genetics	RSE "National Center for Biotechnology"	Alexandr Shevtsov; Asylulan Amirgazin; Ilyas Akhmetollayev; Ruslan Kalendar; Viktoriya Lutsay; Yerlan Ramanculov
EPI_ISL_437625	Laboratory of Genomics & Bioinformatics, Institute of Immunology and Experimental Therapy, Polish Academy of Sciences Oddział Mikrobiologii Wojewodzkiej Stacji Sanitarno-Epidemiologicznej.	Laboratory of Genomics & Bioinformatics, Institute of Immunology and Experimental Therapy, Polish Academy of Sciences	Aleksandra Herud; Dariusz Martynowski; Dorota Kujawa; Grazyna Zalewska; Joanna Sikorska; Krzysztof Jakub Pawlik; Oskar Karpinski and Lukasz Laczmanski; Paulina Zebrowska
EPI_ISL_536399	Laboratory of Immunovirology. Universidad de Antioquia	Instituto Nacional de Salud - Unidad de Secuenciación y Genómica	Carlos Franco-Muñoz; Diego Álvarez-Diaz and Marcela Mercado-Reyes; Francisco J. Díaz; Katherine Laiton-Donato; Lizdany Flórez; Wbeimar Aguilar-Jimenez
EPI_ISL_452358, EPI_ISL_452359, EPI_ISL_452361, EPI_ISL_452364	Laboratory of Infectious Diseases Center of Beijing Ditan Hospital	Laboratory of Infectious Diseases Center of Beijing Ditan Hospital	Chengjie Jie; Fengting Yu; Linghang Wang; Liting Yan; Siyuan Yang; Yunxia Tang
EPI_ISL_417445, EPI_ISL_417447, EPI_ISL_779704, EPI_ISL_779709, EPI_ISL_779712, EPI_ISL_779713, EPI_ISL_779714, EPI_ISL_780378, EPI_ISL_780381, EPI_ISL_780413			
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EPI_ISL_418263, EPI_ISL_418264, EPI_ISL_418265	Laboratory of Microbiology, Department of Medicine, National and Kapodistrian University of Athens, Greece	Laboratory of Biology, Department of Medicine, Democritus University of Thrace, Greece	Elisavet Gatzidou; Ioannis Karakasiliotis; Maria Bampali; Nikolaos Dovrolis; Nikolaos Spanakis; Stavroula Veletza
EPI_ISL_427043, EPI_ISL_434455, EPI_ISL_434456, EPI_ISL_434457, EPI_ISL_434458, EPI_ISL_434459, EPI_ISL_434460, EPI_ISL_434461, EPI_ISL_434462, EPI_ISL_434463, EPI_ISL_434464, EPI_ISL_434465, EPI_ISL_434467, EPI_ISL_434468, EPI_ISL_434469, EPI_ISL_434470, EPI_ISL_434471, EPI_ISL_434472, EPI_ISL_434473, EPI_ISL_434474, EPI_ISL_434475, EPI_ISL_434476, EPI_ISL_434477, EPI_ISL_434478, EPI_ISL_434479, EPI_ISL_434480, EPI_ISL_434481, EPI_ISL_434482, EPI_ISL_434483, EPI_ISL_434484, EPI_ISL_434485, EPI_ISL_434486, EPI_ISL_437874, EPI_ISL_437875, EPI_ISL_437876, EPI_ISL_437877, EPI_ISL_437878, EPI_ISL_437879, EPI_ISL_437880, EPI_ISL_437881, EPI_ISL_437882, EPI_ISL_437883, EPI_ISL_437884, EPI_ISL_437885, EPI_ISL_437886, EPI_ISL_437887, EPI_ISL_437888, EPI_ISL_437889, EPI_ISL_437890, EPI_ISL_437891, EPI_ISL_437892, EPI_ISL_437893, EPI_ISL_437894, EPI_ISL_437895, EPI_ISL_437896, EPI_ISL_437897, EPI_ISL_437898, EPI_ISL_437899, EPI_ISL_437900, EPI_ISL_437901, EPI_ISL_437902, EPI_ISL_437903, EPI_ISL_437904, EPI_ISL_437905, EPI_ISL_437906, EPI_ISL_437907, EPI_ISL_437908, EPI_ISL_437909, EPI_ISL_437911			
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EPI_ISL_654016	Laboratory of Microbiology, National Reference Lab, Charles Nicolle Hospital; 2-University of Tunis ElManar, Faculty of Medicine of Tunis, LR99ES09, Tunis, Tunisia	1-Clinical and Experimental Pharmacology Lab, LR16SP02, National Center of Pharmacovigilance, University of Tunis El Manar, Tunis, Tunisia. 2-Neurodegenerative diseases and psychiatric troubles, LR18SP03, Razi Hospital, University of Tunis El Manar, Tunis, Tunisia. 3- Ministry of Health, National Observatory of New and Emerging Diseases, 1006, Tunis, Tunisia	Alia Ben Kahla; Gaies Emna; Ilhem Boutiba-Ben Boubaker; Imen Kacem; Imen Mkada; Jalila Ben Khelil; Maher Kharrat; Mouna Ben Sassi; Mouna Safer; Nissaf Ben Alaya; Riadh Daghfous; Riadh Gouider.; Salma Abid; Sameh Trabelsi; Sana Ferjani; Soumaya Rammeh
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EPI_ISL_613707	Laboratory of Molecular Biology, Blood Center of Ribeirão Preto	Laboratory of Molecular Biology, Blood Center of Ribeirão Preto, Faculty of Medicine of Ribeirão Preto, University of São Paulo	Aparecida Y Yamamoto; Diego Villa Clé; Dimas T Covas; Elaine V Santos; Evandra S Rodrigues; Glauco de Carvalho Pereira; Joilson Xavier; Luiz CJ Alcantara; Marta Giovanetti; Rodrigo T Calado; Simone Kashima; Svetoslav N Slavov; Talita Adelino; Vagner Fonseca
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EPI_ISL_425228, EPI_ISL_425229, EPI_ISL_426051, EPI_ISL_426356, EPI_ISL_426357, EPI_ISL_426358, EPI_ISL_426359, EPI_ISL_426360			
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EPI_ISL_417419, EPI_ISL_417421, EPI_ISL_428854	Laboratory of Molecular Virology International Center for Genetic Engineering and Biotechnology (ICGEB)	ARGO Open Lab Platform for Genome sequencing	D'Agaro P; Dal Monego S; Licastro D; Marcello A; Rajasekharan S; Segat L
EPI_ISL_417418	Laboratory of Molecular Virology International Center fro	ARGO Open Lab Platform for Genome sequencing	D'Agaro P; Dal Monego S; Licastro D; Marcello A; Rajasekharan S; Segat L

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EPI_ISL_479616, EPI_ISL_479617, EPI_ISL_479791	Laboratory of Molecular Virology of the International Centre for Genetic Engineering and Biotechnology (ICGEB)	ARGO Open Lab Platform for Genome Sequencing	Confalonieri M; Confalonieri M Marcello A; Confalonieri P; D; D'Agaro P; Dal Monego S; Licastro; Marcello A; Rajasekharan S; Salton F; Segat L
EPI_ISL_584048, EPI_ISL_584049	Laboratory of Molecular Virology, Department of Biomedical, Surgical and Dental Sciences University of Milano	Laboratory of Molecular Virology, Department of Biomedical, Surgical and Dental Sciences University of Milano	Basilico, N.; Bianchi, M.; C. and Ferrante, P.; D'Alessandro, S.; Delbue, S.; Fattori, M.; Galli; Modenese, A.; Pariani, E.
EPI_ISL_415658, EPI_ISL_415660, EPI_ISL_415661, EPI_ISL_801549, EPI_ISL_801581, EPI_ISL_801582, EPI_ISL_801583, EPI_ISL_801586, EPI_ISL_801587, EPI_ISL_801588, EPI_ISL_801589, EPI_ISL_801590, EPI_ISL_801591, EPI_ISL_801596, EPI_ISL_801599, EPI_ISL_801600, EPI_ISL_801601, EPI_ISL_801602, EPI_ISL_801603, EPI_ISL_801604, EPI_ISL_801605, EPI_ISL_801606, EPI_ISL_801607, EPI_ISL_801608, EPI_ISL_801609, EPI_ISL_801610, EPI_ISL_801611, EPI_ISL_801612, EPI_ISL_801613, EPI_ISL_801614, EPI_ISL_801615, EPI_ISL_801616, EPI_ISL_801617, EPI_ISL_801618, EPI_ISL_801619, EPI_ISL_801620, EPI_ISL_801621, EPI_ISL_801622, EPI_ISL_801623, EPI_ISL_801624, EPI_ISL_801625, EPI_ISL_801626, EPI_ISL_801627, EPI_ISL_801628, EPI_ISL_801629, EPI_ISL_801630, EPI_ISL_801631, EPI_ISL_801632, EPI_ISL_801633, EPI_ISL_801634, EPI_ISL_801635, EPI_ISL_801636, EPI_ISL_801637, EPI_ISL_801638, EPI_ISL_801639, EPI_ISL_801640, EPI_ISL_801641, EPI_ISL_801642, EPI_ISL_801643, EPI_ISL_801644, EPI_ISL_801645, EPI_ISL_801646, EPI_ISL_801647, EPI_ISL_801648, EPI_ISL_801649, EPI_ISL_801650, EPI_ISL_801651, EPI_ISL_801652, EPI_ISL_801653, EPI_ISL_801654, EPI_ISL_801655, EPI_ISL_801656, EPI_ISL_801657, EPI_ISL_801658, EPI_ISL_801659, EPI_ISL_801660, EPI_ISL_801661, EPI_ISL_801662, EPI_ISL_801663, EPI_ISL_801664, EPI_ISL_801665, EPI_ISL_801666, EPI_ISL_801667, EPI_ISL_801668, EPI_ISL_801669, EPI_ISL_801670, EPI_ISL_801671, EPI_ISL_801672, EPI_ISL_801673, EPI_ISL_801674, EPI_ISL_801675, EPI_ISL_801676, EPI_ISL_801677			
see above	Laboratory of Molecular Virology, Pontificia Universidad Católica de Chile	MSHS Pathogen Surveillance Program	Adolfo Garcia-Sastre; Adriana van De Guchte; Ajay Obla; Ana Maria Contreras; Ana S. Gonzalez-Reiche; Ana Silvia Gonzalez-Reiche; Bremy Alburquerque; Carlos Palma; Constanza Maldonado; Edward C. Holmes; Eileen Serrano; Erick Salinas; Hala Alshammary; Harm van Bakel; Jayeeta Dutta; Jorge Levican; Juan Soto; Leonardo I. Almonacid; M. Belen Leyton; Marcela Ferres; Matthew Hernandez; Matthew M. Hernandez; Melissa Smith; Mitchell Sullivan; Pablo Vial; Rafael A. Medina; Rafael A. Medina.; Robert Sebra; Shwetha Hara Sridhar; Shwetha Sridhar Hara; Tamara Garcia; Tamara García-Salum; Viviana Simon; Ying-Chih Wang; Zenab Khan
EPI_ISL_427294, EPI_ISL_427295, EPI_ISL_427296, EPI_ISL_427297, EPI_ISL_427298, EPI_ISL_427299, EPI_ISL_427300, EPI_ISL_427301, EPI_ISL_427302, EPI_ISL_427303, EPI_ISL_427304, EPI_ISL_456071, EPI_ISL_1181608			
see above	Laboratory of Respiratory Viruses and Measles, Oswaldo Cruz Institute, FIOCRUZ	Laboratory of Respiratory Viruses and Measles, Oswaldo Cruz Institute, FIOCRUZ	Alice Sampaio Rocha; Aline Mattos; Ana Carolina Mendonca; Anna Carolina Paixao; Braulia Caetano; Cristiana Garcia; Fernando Motta; Jonathan Lopes; Luciana Appolinario; Maria Ogrzewalska; Marilda Siqueira on behalf of the Fiocruz COVID-19 Genomic Surveillance Network; Milene Miranda; Paola Resende; Priscila Born; Renata Serrano Lopes; Sunando Roy
EPI_ISL_451303, EPI_ISL_451304	Laboratory of Virology, INMI Lazzaro Spallanzani IRCCS	Laboratory of Virology, INMI Lazzaro Spallanzani IRCCS	Antonino Di Caro; Barbara Bartolini; Cesare E.M. Gruber; Francesco Messina; Giuseppe Ippolito; Maria R. Capobianchi; Martina Rueca
EPI_ISL_1341150	Laboratory of Virology, National center of expertise	RSE "National Center of Expertise" and RSE "National center for Biotechnology"	Abdaliyev Askar; Amirgazin Asylulan; Balykbaev Kanat; Kamalova Dinara; Ramankulov Erlan; Sharipova Saule; Shevtsov Alexandr; Tungushbayev Talgat
EPI_ISL_1165139, EPI_ISL_1165140, EPI_ISL_1165141	Laboratory of virology and molecular diagnostics	Laboratory of virology and molecular diagnostics	Boshevska Golubinka; Elizabeta Janchevska; Kuzmanovska Maja
EPI_ISL_1334575, EPI_ISL_1334576, EPI_ISL_1334600, EPI_ISL_1335390, EPI_ISL_1335758, EPI_ISL_1335759, EPI_ISL_1335760			
see above	Laboratory of virology, National center of expertise	RSE "National Center for Biotechnology" and RSE "National Center of Expertise"	Abdaliyev Askar; Amirgazin Asylulan; Balykbaev Kanat; Kamalova Dinara; Ramankulov Yerlan; Sharipova Saule; Shevtsov Alexandr; Tungushbayev Talgat
EPI_ISL_414045, EPI_ISL_456076, EPI_ISL_456077	Laboratório Central de Saúde Pública Noel Nutels (LACEN-RJ)	Laboratory of Respiratory Viruses and Measles, Oswaldo Cruz Institute, FIOCRUZ	Aline Mattos; Alisson Fabri; Braulia Caetano; Cristiana Garcia; Fernando Motta; Joilson Xavier; Jonathan Lopes; Luciana Appolinario; Maria Nóbrega; Maria Ogrzewalska; Marilda Siqueira on behalf of the Fiocruz COVID-19 Genomic Surveillance Network; Marilda SiqueiraFiocruz COVID-19 Genomic Surveillance Network; Milene Miranda; Paola Resende; Sunando Roy
EPI_ISL_415105, EPI_ISL_427293	Laboratório Central de Saúde Pública Professor Gonçalo Moniz (LACEN-BA)	Laboratory of Respiratory Viruses and Measles, Oswaldo Cruz Institute, FIOCRUZ	Aline Mattos; Allison Fabri; Braulia Caetano; Cristiana Garcia; Fernando Motta; Joilson Xavier; Jonathan Lopes; Luciana Appolinario; Maria Nóbrega; Maria Ogrzewalska; Marilda Siqueira Fiocruz COVID-19 Genomic Surveillance Network; Marilda Siqueira on behalf of the Fiocruz COVID-19 Genomic Surveillance Network; Milene Miranda; Paola Resende; Priscila Born; Sunando Roy
EPI_ISL_427292	Laboratório Central de Saúde Pública do Estado de Alagoas (LACEN-AL)	Laboratory of Respiratory Viruses and Measles, Oswaldo Cruz Institute, FIOCRUZ	Aline Mattos; Braulia Caetano; Cristiana Garcia; Fernando Motta; Jonathan Lopes; Luciana Appolinario; Maria Ogrzewalska; Marilda Siqueira on behalf of the Fiocruz COVID-19 Genomic Surveillance Network; Milene Miranda; Paola Resende; Priscila Born; Sunando Roy
EPI_ISL_427305, EPI_ISL_427306	Laboratório Central de Saúde Pública do Estado de Santa Catarina (LACEN-SC)	Laboratory of Respiratory Viruses and Measles, Oswaldo Cruz Institute, FIOCRUZ	Aline Mattos; Braulia Caetano; Cristiana Garcia; Fernando Motta; Jonathan Lopes; Luciana Appolinario; Maria Ogrzewalska; Marilda Siqueira on behalf of the Fiocruz COVID-19 Genomic Surveillance Network; Milene Miranda; Paola Resende; Priscila Born; Sunando Roy
EPI_ISL_541372, EPI_ISL_541373, EPI_ISL_541374, EPI_ISL_541376	Laboratório Central de Saúde Pública do Estado de Sergipe (LACEN-SE)	Laboratory of Respiratory Viruses and Measles, Oswaldo Cruz Institute, FIOCRUZ	Ana Carolina Mendonça; Anna Carolina Paixão; Clioma Santos; Fernando Motta; Jonathan Lopes; Luciana Appolinario; Marilda Siqueira on behalf of the Fiocruz COVID-19 Genomic Surveillance Network; Paola Resende
EPI_ISL_415128	Laboratório Central de Saúde Pública do Estado do Espírito Santo (LACEN-ES)	Laboratory of Respiratory Viruses and Measles, Oswaldo Cruz Institute, FIOCRUZ	Aline Mattos; Allison Fabri; Braulia Caetano; Cristiana Garcia; Fernando Motta; Joilson Xavier; Jonathan Lopes; Luciana Appolinario; Maria Nóbrega; Maria Ogrzewalska; Marilda Siqueira on behalf of the Fiocruz COVID-19 Genomic Surveillance Network; Milene Miranda; Paola Resende; Sunando Roy
EPI_ISL_541340	Laboratório Central de Saúde Pública do Estado do Paraná (LACEN-PR)	Laboratory of Respiratory Viruses and Measles, Oswaldo Cruz Institute, FIOCRUZ	Ana Carolina Mendonça; Anna Carolina Paixão; Fernando Motta; Irina Riediger; Jonathan Lopes; Luciana Appolinario; Maria do Carmo Debur; Marilda Siqueira on behalf of the Fiocruz COVID-19 Genomic Surveillance Network; Paola Resende
EPI_ISL_729804, EPI_ISL_729805, EPI_ISL_729806, EPI_ISL_729807, EPI_ISL_729808, EPI_ISL_729809, EPI_ISL_729810, EPI_ISL_729811, EPI_ISL_729812, EPI_ISL_729813, EPI_ISL_729814, EPI_ISL_729815, EPI_ISL_729819			
see above	Laboratório Central de Saúde Pública do Estado do Rio Grande do Sul (LACEN-RS)	Laboratory of Respiratory Viruses and Measles, Oswaldo Cruz Institute, FIOCRUZ	Ana Carolina Mendonça; Anna Carolina Paixão; Fernando Motta; Luciana Appolinario; Marilda Siqueira on behalf of the Fiocruz COVID-19 Genomic Surveillance Network; Marilda Tereza Mar da Rosa; Paola Resende; Tatiana Schaffer Gregianini
EPI_ISL_636834	Laboratório de Imunofarmacologia - Instituto Oswaldo Cruz	Laboratório de Imunofarmacologia - Instituto Oswaldo Cruz	A.D.; C.Q.; De Paula; F.B.; Ferreira; Fintelman-Rodrigues, N.; M.A. and Sacramento; Saraiva; Souza; T.M.
EPI_ISL_437089, EPI_ISL_437090, EPI_ISL_437091, EPI_ISL_437092, EPI_ISL_437093, EPI_ISL_437094, EPI_ISL_437095, EPI_ISL_437096, EPI_ISL_486422, EPI_ISL_486423, EPI_ISL_486424, EPI_ISL_486425, EPI_ISL_486426, EPI_ISL_486428, EPI_ISL_486430, EPI_ISL_486431, EPI_ISL_486432, EPI_ISL_486433, EPI_ISL_486434, EPI_ISL_486435, EPI_ISL_486436			
see above	Latvijas Infektoloijas centrs	Latvian Biomedical Research and Study Centre	Ivars Silamielis; Jeena Storoženko; Jnis Kloviš; Kaspars Megnis; Monta Ustinova; Oksana Savicka; Tatjana Kolupajeva; Uga Dumpis; Vita Rovte; ikita Zrelovs
EPI_ISL_451489, EPI_ISL_451545, EPI_ISL_451572, EPI_ISL_451602, EPI_ISL_451609, EPI_ISL_451611, EPI_ISL_451631, EPI_ISL_455041, EPI_ISL_455048, EPI_ISL_455063			
see above	Laverty Pathology	NSW Health Pathology - Institute of Clinical Pathology and Medical Research; Westmead Hospital; University of Sydney	CIDM-PH et al.
EPI_ISL_421507, EPI_ISL_421508	Le Château de Seine-Port	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Etienne Simon-Lorière; Flora Donati; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_498551, EPI_ISL_498552, EPI_ISL_498554	Lebanese American University	Lebanese American University	Abdallah, J.; Abi Habib, W.; El Shesheny, R.; Goldstein; J. and Kayali, G.; Mokhbat, J.; R.J.; Webby
EPI_ISL_447588	Lednicky Lab	Lednicky lab	Alam; C.J.; Elbadry; Gibson; J.A.; J.C.; J.G. Jr. and Lednicky; M.A.; M.M.; Morris; Stephenson; Subramaniam, K.; T.B.; Waltzek
EPI_ISL_434636	Lednicky Laboratory, Emerging Pathogens Institute, University of Florida	Lednicky Laboratory at Emerging Pathogens Institute, University of Florida	Alam, M.; C.J.; Elbadry; Gibson; J.A.; J.C.; J.G. Jr. and Lednicky; M.A.; Morris; Stephenson; Subramaniam, K.; T.B.; Waltzek
EPI_ISL_434637	Lednicky Laboratory, Emerging Pathogens Institute, University of Florida.	Lednicky Laboratory, Emerging Pathogens Institute, University of Florida.	C.J.; Elbadry; Gibson; J.A.; J.C.; J.G. Jr. and Lednicky; M.A.; Morris; Stephenson; Subramaniam, K.; T.B.; Waltzek
EPI_ISL_538762, EPI_ISL_538765, EPI_ISL_538766, EPI_ISL_538769, EPI_ISL_538773, EPI_ISL_538779, EPI_ISL_538787, EPI_ISL_538789, EPI_ISL_538799, EPI_ISL_538802, EPI_ISL_538816, EPI_ISL_538819, EPI_ISL_538820, EPI_ISL_538822, EPI_ISL_538823, EPI_ISL_538842, EPI_ISL_538844, EPI_ISL_538847, EPI_ISL_538852, EPI_ISL_538869, EPI_ISL_538881, EPI_ISL_538900, EPI_ISL_538901, EPI_ISL_538906, EPI_ISL_538912, EPI_ISL_538913, EPI_ISL_538915, EPI_ISL_538925, EPI_ISL_538928, EPI_ISL_538932, EPI_ISL_538933, EPI_ISL_538934, EPI_ISL_538935, EPI_ISL_538938, EPI_ISL_538939, EPI_ISL_538940, EPI_ISL_538941, EPI_ISL_538944, EPI_ISL_538947, EPI_ISL_538948, EPI_ISL_538950, EPI_ISL_538951, EPI_ISL_538954, EPI_ISL_538955, EPI_ISL_538956, EPI_ISL_538957, EPI_ISL_538961, EPI_ISL_538962, EPI_ISL_538963, EPI_ISL_538965, EPI_ISL_538966, EPI_ISL_538968, EPI_ISL_538971, EPI_ISL_538972, EPI_ISL_538974, EPI_ISL_538975, EPI_ISL_538978, EPI_ISL_538991, EPI_ISL_538993, EPI_ISL_538995, EPI_ISL_538996, EPI_ISL_538998, EPI_ISL_539001, EPI_ISL_539002, EPI_ISL_539003, EPI_ISL_539004, EPI_ISL_539008, EPI_ISL_539013, EPI_ISL_539014, EPI_ISL_539015, EPI_ISL_539023, EPI_ISL_539028, EPI_ISL_539031, EPI_ISL_539032, EPI_ISL_539033, EPI_ISL_539034, EPI_ISL_539038, EPI_ISL_539041, EPI_ISL_539051, EPI_ISL_539053, EPI_ISL_539054, EPI_ISL_539055, EPI_ISL_539058, EPI_ISL_539064, EPI_ISL_539077, EPI_ISL_539078, EPI_ISL_539080, EPI_ISL_539081, EPI_ISL_539083, EPI_ISL_539085, EPI_ISL_539086, EPI_ISL_539087, EPI_ISL_539089, EPI_ISL_539097, EPI_ISL_539099, EPI_ISL_539100, EPI_ISL_539109, EPI_ISL_539114, EPI_ISL_539118, EPI_ISL_539119, EPI_ISL_539121, EPI_ISL_539127, EPI_ISL_539129, EPI_ISL_539130, EPI_ISL_539131, EPI_ISL_539132, EPI_ISL_539134, EPI_ISL_539144, EPI_ISL_539147, EPI_ISL_539148, EPI_ISL_539153, EPI_ISL_539156, EPI_ISL_539158, EPI_ISL_539159, EPI_ISL_539160, EPI_ISL_539162, EPI_ISL_539163, EPI_ISL_539166, EPI_ISL_539169, EPI_ISL_539170, EPI_ISL_539172, EPI_ISL_539173, EPI_ISL_539174, EPI_ISL_539176, EPI_ISL_539178, EPI_ISL_539186, EPI_ISL_539187, EPI_ISL_539194, EPI_ISL_539195, EPI_ISL_539196, EPI_ISL_539200, EPI_ISL_539206, EPI_ISL_539208, EPI_ISL_539211, EPI_ISL_539215, EPI_ISL_539217			

see above	Leeds Teaching Hospitals NHS Trust and Public Health England, National Infection Service (Leeds laboratory)	Wellcome Sanger Institute for the COVID-19 Genomics UK (COG-UK) consortium	Antony Hale and Alex Alderton; Cordelia Langford; David K. Jackson; Dominic Kwiatkowski; Ewan Harrison; Holli Carden; Ian Johnston; John Sillitoe on behalf of the Wellcome Sanger Institute COVID-19 Surveillance Team; Katherine L. Harper; Louissa Macfarlane-Smith; Roberto Amato; Sonia Goncalves
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see above	Liverpool Clinical Laboratories	COVID-19 Genomics UK (COG-UK) Consortium	A Alrezaihi; Alessandro Gerada; Alistair Darby; Angela Cowell; Anita Lucaci; Anu Chawla; Cassie Olateju; Catherine Hartley; Charlotte Nelson; Ecaterina Vamos; Elaine O'Toole; Eleanor G Bentley; Ghada T Shawli; Isabel Garcia-Dorival; James Johnson; James P Stewart; Jenifer Manson; Joanne Watts; Jones Benjamin; Jordan J Clark; Julian Hiscox; L Luu; Lucille Rainbow; M Almsaud; Margaret Hughes; Mark Whitehead; Matthew Gemmell; Miren Iturriza-Gomara; Muhannad Alruwaili; N.P Randle; Neil Swainston; PKF Gilmore; Parul Sharma; Rebekah Penrice-Randal; Richard Eccles; Richard Gregory; Sam Haldenby; Steve Paterson; Stuart D Armstrong; Trevor Ian Robinson; Ximeng Han
EPI_ISL_632050	Long Island Jewish Medical Center	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_436044	Louisiana Office of Public Health Laboratories	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Anna Uehara; Bettina Bankamp; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Suxiang Tong; Yan Li; Ying Tao; Zachary Weiner
EPI_ISL_683678, EPI_ISL_683679, EPI_ISL_683680, EPI_ISL_683681, EPI_ISL_683682, EPI_ISL_683683, EPI_ISL_683684, EPI_ISL_683685, EPI_ISL_683686, EPI_ISL_683687, EPI_ISL_683688, EPI_ISL_708504			
see above	M Health Fairview	Minnesota Department of Health, Public Health Laboratory	Alexandra Lorentz; Jacob Garfin; Matt Plumb; and Xiong Wang
EPI_ISL_443255, EPI_ISL_445077	M Health Fairview	University of Minnesota Genomics Center	Andrew Nelson; Benjamin Auch; Daryl M. Gohl; Jerry Daniel; John Garbe; Patrick Grady; Ray Watson; Sophia Yohe; and Kenneth B. Beckman
EPI_ISL_514637, EPI_ISL_514643, EPI_ISL_514650, EPI_ISL_514652, EPI_ISL_514657	M Health Fairview St. Joseph's Hospital	Minnesota Department of Health, Public Health Laboratory	Jacob Garfin; Matt Plumb; and Xiong Wang
EPI_ISL_424843, EPI_ISL_424844, EPI_ISL_424845, EPI_ISL_424846, EPI_ISL_424847, EPI_ISL_424908, EPI_ISL_424909, EPI_ISL_424910, EPI_ISL_424911, EPI_ISL_424912, EPI_ISL_424913, EPI_ISL_424914, EPI_ISL_424915, EPI_ISL_424916, EPI_ISL_424917, EPI_ISL_424918, EPI_ISL_424919, EPI_ISL_424920			
see above	MA State Public Health Laboratory	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_1257920, EPI_ISL_1257938, EPI_ISL_1257983, EPI_ISL_1257985, EPI_ISL_1257986, EPI_ISL_1257987, EPI_ISL_1257988, EPI_ISL_1257989, EPI_ISL_1257990, EPI_ISL_1257991, EPI_ISL_1257992			
see above	MB-Cadham Provincial laboratory	National Microbiology Laboratory (NML)	Anna Majer; Anneliese Landgraff; CanCOGeN's metadata curation team; Darian Hole; David Alexander; Elsie Grudeski; Gary Van Domselaar; Grace Seo; Jared Bullard; Jennifer Tanner; Kerry Dust; Kirsten Biggar; Madison Chapel; Morag Graham; Natalie Knox; Nathalie Bastien; Paul Van Caeseele; Philip Mabon; Public Health Agency of Canada CanCOGeN team; Rhiannon Huzarewich; Russell Mandes; Shari Tyson; Timothy Booth; Yan Li
EPI_ISL_424869, EPI_ISL_426425, EPI_ISL_447843	MD DOH Laboratories Administration	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jasmine Padilla; Jing Zhang; Justin Lee; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_445311, EPI_ISL_445328	MEGASALUD S.A.	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445263, EPI_ISL_445358	MEGASALUD SPA.	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_568910, EPI_ISL_568911, EPI_ISL_568912, EPI_ISL_568914, EPI_ISL_568915, EPI_ISL_568916, EPI_ISL_568917, EPI_ISL_568918, EPI_ISL_568919, EPI_ISL_568920, EPI_ISL_568921, EPI_ISL_568922, EPI_ISL_568956, EPI_ISL_568986, EPI_ISL_569243, EPI_ISL_569244, EPI_ISL_569246, EPI_ISL_569247, EPI_ISL_569248, EPI_ISL_569249, EPI_ISL_569250, EPI_ISL_569251, EPI_ISL_569252, EPI_ISL_569253, EPI_ISL_569254, EPI_ISL_569255, EPI_ISL_569256, EPI_ISL_569257, EPI_ISL_569258, EPI_ISL_569259, EPI_ISL_569261, EPI_ISL_569262, EPI_ISL_569263, EPI_ISL_569264, EPI_ISL_569265, EPI_ISL_569266, EPI_ISL_569267, EPI_ISL_569268, EPI_ISL_569269, EPI_ISL_569270, EPI_ISL_569271, EPI_ISL_569272, EPI_ISL_569273, EPI_ISL_569274, EPI_ISL_569275, EPI_ISL_569276, EPI_ISL_569277, EPI_ISL_569278, EPI_ISL_569279, EPI_ISL_569280, EPI_ISL_569281, EPI_ISL_569282, EPI_ISL_569284, EPI_ISL_569285, EPI_ISL_569288, EPI_ISL_569290, EPI_ISL_569291, EPI_ISL_569292, EPI_ISL_569293, EPI_ISL_569294, EPI_ISL_569295, EPI_ISL_569296, EPI_ISL_569297, EPI_ISL_569298, EPI_ISL_569299, EPI_ISL_569300, EPI_ISL_569301, EPI_ISL_569302, EPI_ISL_569303, EPI_ISL_569304, EPI_ISL_569305, EPI_ISL_569307, EPI_ISL_569308, EPI_ISL_569309, EPI_ISL_569310, EPI_ISL_569311, EPI_ISL_569312, EPI_ISL_569313, EPI_ISL_569314, EPI_ISL_569315, EPI_ISL_569316, EPI_ISL_569317, EPI_ISL_569318, EPI_ISL_569321, EPI_ISL_569323, EPI_ISL_569324, EPI_ISL_569325, EPI_ISL_569326, EPI_ISL_569327, EPI_ISL_569328, EPI_ISL_569329, EPI_ISL_569330, EPI_ISL_569331, EPI_ISL_569332, EPI_ISL_569333, EPI_ISL_569334, EPI_ISL_569335, EPI_ISL_569336, EPI_ISL_569337, EPI_ISL_569338, EPI_ISL_569339, EPI_ISL_569340, EPI_ISL_569341, EPI_ISL_569343, EPI_ISL_569344, EPI_ISL_569345, EPI_ISL_569346, EPI_ISL_569347, EPI_ISL_569348, EPI_ISL_569350, EPI_ISL_569351, EPI_ISL_569352, EPI_ISL_569353, EPI_ISL_569354, EPI_ISL_569355, EPI_ISL_569356, EPI_ISL_569357, EPI_ISL_569358, EPI_ISL_569359, EPI_ISL_569360, EPI_ISL_569361, EPI_ISL_569362, EPI_ISL_569363, EPI_ISL_569364, EPI_ISL_569365, EPI_ISL_569366, EPI_ISL_569367, EPI_ISL_569368, EPI_ISL_569369, EPI_ISL_569370, EPI_ISL_569371, EPI_ISL_569372, EPI_ISL_569373, EPI_ISL_569374, EPI_ISL_569375, EPI_ISL_569377, EPI_ISL_569378, EPI_ISL_569379, EPI_ISL_569380, EPI_ISL_569381, EPI_ISL_569382, EPI_ISL_569383, EPI_ISL_569384, EPI_ISL_569386, EPI_ISL_569387, EPI_ISL_569388, EPI_ISL_569389, EPI_ISL_569390, EPI_ISL_569391, EPI_ISL_569392, EPI_ISL_569393, EPI_ISL_569394, EPI_ISL_569395, EPI_ISL_569397, EPI_ISL_569398, EPI_ISL_569399, EPI_ISL_569400, EPI_ISL_569401, EPI_ISL_569402, EPI_ISL_569403, EPI_ISL_569404, EPI_ISL_569405, EPI_ISL_569406, EPI_ISL_569407, EPI_ISL_569408, EPI_ISL_569410, EPI_ISL_569411, EPI_ISL_569412, EPI_ISL_569413, EPI_ISL_569414, EPI_ISL_569415, EPI_ISL_569416, EPI_ISL_569417, EPI_ISL_569418, EPI_ISL_569419, EPI_ISL_569420, EPI_ISL_569421, EPI_ISL_569422, EPI_ISL_569423, EPI_ISL_569424, EPI_ISL_569425, EPI_ISL_569426, EPI_ISL_569427, EPI_ISL_569428, EPI_ISL_569429, EPI_ISL_569431, EPI_ISL_569432, EPI_ISL_569433, EPI_ISL_569434, EPI_ISL_569435, EPI_ISL_569436, EPI_ISL_569437, EPI_ISL_569438, EPI_ISL_569440, EPI_ISL_569441, EPI_ISL_569443, EPI_ISL_569444, EPI_ISL_569445, EPI_ISL_569446, EPI_ISL_569447, EPI_ISL_569448, EPI_ISL_569450, EPI_ISL_569465, EPI_ISL_569466, EPI_ISL_569467, EPI_ISL_569468, EPI_ISL_569469, EPI_ISL_569470, EPI_ISL_569471, EPI_ISL_569472, EPI_ISL_569473, EPI_ISL_569474, EPI_ISL_569475, EPI_ISL_569476, EPI_ISL_569477, EPI_ISL_569478, EPI_ISL_569479, EPI_ISL_569481, EPI_ISL_569483, EPI_ISL_569484, EPI_ISL_569485, EPI_ISL_569489, EPI_ISL_569490, EPI_ISL_569538, EPI_ISL_569601, EPI_ISL_644403, EPI_ISL_644404, EPI_ISL_644405, EPI_ISL_644406, EPI_ISL_644407, EPI_ISL_644408, EPI_ISL_644409, EPI_ISL_644410, EPI_ISL_896179		
see above	MEPHI, Aix Marseille University	MEPHI, Aix Marseille University	Anthony LEVASSEUR

EPI_ISL_413571	MHC Brabant Zuidoost	Erasmus Medical Center	Anne van der Linden; Annemiek van der Eijk; Aura Timen; Bas Oude Munnink; Claudia Schapendonk; Corien Swaan; Corine GeurtsvanKessel; David Nieuwenhuijse; Irina Chestakova; Jeroen van Kampen; Jolanda Voermans; Madelief Mollers; Manon Haverkate; Marion Koopmans; Mark Pronk; Mart Stein; Pascal Lexmond; Reina Sikkema; Richard Molenkamp; Sandra Kengne Kamga Mobou; on behalf of the Dutch national COVID-19 response team.
EPI_ISL_413568	MHC Drente	Erasmus Medical Center	Anne van der Linden; Annemiek van der Eijk; Aura Timen; Bas Oude Munnink; Claudia Schapendonk; Corien Swaan; Corine GeurtsvanKessel; David Nieuwenhuijse; Irina Chestakova; Jeroen van Kampen; Jolanda Voermans; Madelief Mollers; Manon Haverkate; Marion Koopmans; Mark Pronk; Mart Stein; Pascal Lexmond; Reina Sikkema; Richard Molenkamp; Sandra Kengne Kamga Mobou; on behalf of the Dutch national COVID-19 response team.
EPI_ISL_413591	MHC Flevoland	Erasmus Medical Center	Anne van der Linden; Annemiek van der Eijk; Aura Timen; Bas Oude Munnink; Claudia Schapendonk; Corien Swaan; Corine GeurtsvanKessel; David Nieuwenhuijse; Irina Chestakova; Jeroen van Kampen; Jolanda Voermans; Madelief Mollers; Manon Haverkate; Marion Koopmans; Mark Pronk; Mart Stein; Pascal Lexmond; Reina Sikkema; Richard Molenkamp; Sandra Kengne Kamga Mobou; on behalf of the Dutch national COVID-19 response team.
EPI_ISL_413566, EPI_ISL_413577	MHC Gooi & Vechtstreek	Erasmus Medical Center	Anne van der Linden; Annemiek van der Eijk; Aura Timen; Bas Oude Munnink; Claudia Schapendonk; Corien Swaan; Corine GeurtsvanKessel; David Nieuwenhuijse; Irina Chestakova; Jeroen van Kampen; Jolanda Voermans; Madelief Mollers; Manon Haverkate; Marion Koopmans; Mark Pronk; Mart Stein; Pascal Lexmond; Reina Sikkema; Richard Molenkamp; Sandra Kengne Kamga Mobou; on behalf of the Dutch national COVID-19 response team.
EPI_ISL_413579	MHC Haaglanden	Erasmus Medical Center	Anne van der Linden; Annemiek van der Eijk; Aura Timen; Bas Oude Munnink; Claudia Schapendonk; Corien Swaan; Corine GeurtsvanKessel; David Nieuwenhuijse; Irina Chestakova; Jeroen van Kampen; Jolanda Voermans; Madelief Mollers; Manon Haverkate; Marion Koopmans; Mark Pronk; Mart Stein; Pascal Lexmond; Reina Sikkema; Richard Molenkamp; Sandra Kengne Kamga Mobou; on behalf of the Dutch national COVID-19 response team.
EPI_ISL_413580	MHC Hart voor Brabant	Erasmus Medical Center	Anne van der Linden; Annemiek van der Eijk; Aura Timen; Bas Oude Munnink; Claudia Schapendonk; Corien Swaan; Corine GeurtsvanKessel; David Nieuwenhuijse; Irina Chestakova; Jeroen van Kampen; Jolanda Voermans; Madelief Mollers; Manon Haverkate; Marion Koopmans; Mark Pronk; Mart Stein; Pascal Lexmond; Reina Sikkema; Richard Molenkamp; Sandra Kengne Kamga Mobou; on behalf of the Dutch national COVID-19 response team.
EPI_ISL_413572	MHC Kennemerland	Erasmus Medical Center	Anne van der Linden; Annemiek van der Eijk; Aura Timen; Bas Oude Munnink; Claudia Schapendonk; Corien Swaan; Corine GeurtsvanKessel; David Nieuwenhuijse; Irina Chestakova; Jeroen van Kampen; Jolanda Voermans; Madelief Mollers; Manon Haverkate; Marion Koopmans; Mark Pronk; Mart Stein; Pascal Lexmond; Reina Sikkema; Richard Molenkamp; Sandra Kengne Kamga Mobou; on behalf of the Dutch national COVID-19 response team.
EPI_ISL_413583	MHC Rotterdam-Rijnmond	Erasmus Medical Center	Anne van der Linden; Annemiek van der Eijk; Aura Timen; Bas Oude Munnink; Claudia Schapendonk; Corien Swaan; Corine GeurtsvanKessel; David Nieuwenhuijse; Irina Chestakova; Jeroen van Kampen; Jolanda Voermans; Madelief Mollers; Manon Haverkate; Marion Koopmans; Mark Pronk; Mart Stein; Pascal Lexmond; Reina Sikkema; Richard Molenkamp; Sandra Kengne Kamga Mobou; on behalf of the Dutch national COVID-19 response team.
EPI_ISL_413588, EPI_ISL_413589, EPI_ISL_413590	MHC Utrecht	Erasmus Medical Center	Anne van der Linden; Annemiek van der Eijk; Aura Timen; Bas Oude Munnink; Claudia Schapendonk; Corien Swaan; Corine GeurtsvanKessel; David Nieuwenhuijse; Irina Chestakova; Jeroen van Kampen; Jolanda Voermans; Madelief Mollers; Manon Haverkate; Marion Koopmans; Mark Pronk; Mart Stein; Pascal Lexmond; Reina Sikkema; Richard Molenkamp; Sandra Kengne Kamga Mobou; on behalf of the Dutch national COVID-19 response team.
EPI_ISL_413564, EPI_ISL_413574	MHC West-Brabant	Erasmus Medical Center	Anne van der Linden; Annemiek van der Eijk; Aura Timen; Bas Oude Munnink; Claudia Schapendonk; Corien Swaan; Corine GeurtsvanKessel; David Nieuwenhuijse; Irina Chestakova; Jeroen van Kampen; Jolanda Voermans; Madelief Mollers; Manon Haverkate; Marion Koopmans; Mark Pronk; Mart Stein; Pascal Lexmond; Reina Sikkema; Richard Molenkamp; Sandra Kengne Kamga Mobou; on behalf of the Dutch national COVID-19 response team.
EPI_ISL_452108, EPI_ISL_452113, EPI_ISL_452133	MN Department of Health	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Montmayeur; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao; Zachary Weiner
EPI_ISL_426426, EPI_ISL_426427, EPI_ISL_812198	MN PHL Division, Minnesota Department of Health	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Montmayeur; Anna Uehara; Brian Lynch; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Mary S. Keckler; Peter Cook; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_424870	MO State Public Health Laboratory	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_428856	MRCG at LSHTM Genomics Lab	MRCG at LSHTM Genomics lab	Sesay et al
EPI_ISL_471158	MRCG at LSHTM Genomics lab	MRCG at LSHTM Genomics lab	Sesay et al
EPI_ISL_428855	MRCG at LSHTM Genomics lab	MRCG at LSHTM Genomics lab	Sesay et al
EPI_ISL_648018, EPI_ISL_648019, EPI_ISL_648020, EPI_ISL_648021, EPI_ISL_648022, EPI_ISL_648023, EPI_ISL_648024, EPI_ISL_648025, EPI_ISL_648026, EPI_ISL_648027, EPI_ISL_648028, EPI_ISL_648029, EPI_ISL_648030, EPI_ISL_648042			
see above	MS Public Health Laboratory	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Anna Montmayeur; Anna Uehara; Brian Lynch; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_415151, EPI_ISL_421348, EPI_ISL_421349, EPI_ISL_421350, EPI_ISL_421351, EPI_ISL_421352, EPI_ISL_421353, EPI_ISL_421354, EPI_ISL_421355, EPI_ISL_421357, EPI_ISL_421358, EPI_ISL_421359, EPI_ISL_421360, EPI_ISL_421363, EPI_ISL_421364, EPI_ISL_421365, EPI_ISL_421366, EPI_ISL_421367, EPI_ISL_421369, EPI_ISL_421370, EPI_ISL_421371, EPI_ISL_421375, EPI_ISL_421376, EPI_ISL_421378, EPI_ISL_421379, EPI_ISL_421383, EPI_ISL_421384, EPI_ISL_421385, EPI_ISL_421386, EPI_ISL_421387, EPI_ISL_421388, EPI_ISL_421389, EPI_ISL_421390, EPI_ISL_421391, EPI_ISL_421394, EPI_ISL_421395, EPI_ISL_421396, EPI_ISL_421397, EPI_ISL_421398, EPI_ISL_421399, EPI_ISL_421400, EPI_ISL_421401, EPI_ISL_421402, EPI_ISL_421403, EPI_ISL_421404, EPI_ISL_421405, EPI_ISL_421406, EPI_ISL_421407, EPI_ISL_421408, EPI_ISL_421409, EPI_ISL_421410, EPI_ISL_421411, EPI_ISL_421412, EPI_ISL_421413, EPI_ISL_421414, EPI_ISL_421415, EPI_ISL_421416, EPI_ISL_421417, EPI_ISL_421419, EPI_ISL_421420, EPI_ISL_421421, EPI_ISL_421422, 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EPI_ISL_450009, EPI_ISL_450010, EPI_ISL_450011, EPI_ISL_450012, EPI_ISL_450013, EPI_ISL_450014, EPI_ISL_450015, EPI_ISL_450016, EPI_ISL_450017, EPI_ISL_450018, EPI_ISL_450019, EPI_ISL_450020, EPI_ISL_450021, EPI_ISL_450022, EPI_ISL_450023, EPI_ISL_450024, EPI_ISL_450025, EPI_ISL_450026, EPI_ISL_450027, EPI_ISL_450028, EPI_ISL_450029, EPI_ISL_450030, EPI_ISL_450031, EPI_ISL_450032, EPI_ISL_450033, EPI_ISL_450034, EPI_ISL_450035, EPI_ISL_450036, EPI_ISL_450037, EPI_ISL_450038, EPI_ISL_450039, EPI_ISL_450040, EPI_ISL_450041, EPI_ISL_450042, EPI_ISL_450043, EPI_ISL_450044, EPI_ISL_450045, EPI_ISL_450046, EPI_ISL_450047, EPI_ISL_450048, EPI_ISL_450049, EPI_ISL_450050, EPI_ISL_450051, EPI_ISL_450052, EPI_ISL_450053, EPI_ISL_450054, EPI_ISL_450055, EPI_ISL_450056, EPI_ISL_450058, EPI_ISL_450059, EPI_ISL_450060, EPI_ISL_450061, EPI_ISL_450062, EPI_ISL_450063, EPI_ISL_450064, EPI_ISL_450065, EPI_ISL_450066, EPI_ISL_450067, EPI_ISL_450068, EPI_ISL_450069, EPI_ISL_450070, EPI_ISL_450072, EPI_ISL_450074, EPI_ISL_450075, EPI_ISL_450076, EPI_ISL_450077, EPI_ISL_450078, EPI_ISL_450079, EPI_ISL_450080, EPI_ISL_450081, EPI_ISL_450082, EPI_ISL_450086, EPI_ISL_450087, EPI_ISL_450089, EPI_ISL_450090, EPI_ISL_450091, EPI_ISL_450092, EPI_ISL_450093, EPI_ISL_450094, EPI_ISL_450095, EPI_ISL_450096, EPI_ISL_450097, EPI_ISL_450098, EPI_ISL_450099, EPI_ISL_450100, EPI_ISL_450101, EPI_ISL_450102, EPI_ISL_450103, EPI_ISL_450104, EPI_ISL_450105, EPI_ISL_450106, EPI_ISL_450107, EPI_ISL_450108, EPI_ISL_450109, EPI_ISL_450110, EPI_ISL_450111, EPI_ISL_450112, EPI_ISL_450113, EPI_ISL_450114, EPI_ISL_450115, EPI_ISL_450116, EPI_ISL_450117, EPI_ISL_450118, EPI_ISL_450120, EPI_ISL_450121, EPI_ISL_450123, EPI_ISL_450124, EPI_ISL_450125, EPI_ISL_450126, EPI_ISL_450127, EPI_ISL_450128, EPI_ISL_450129, EPI_ISL_450130, EPI_ISL_450132, EPI_ISL_450133, EPI_ISL_450134, EPI_ISL_450135, EPI_ISL_450136, EPI_ISL_450137, EPI_ISL_450138, EPI_ISL_450139, EPI_ISL_450140, EPI_ISL_450141, EPI_ISL_450142, 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see above	MSHS Clinical Microbiology Laboratories	MSHS Pathogen Surveillance Program	Adolfo Garcia-Sarstre; Adolfo Garcia-Sastre; Adolfo Garcia-Sastre; Adriana van de Guchte; Ajay Obla; Alberto Paniz-Mondolfi; Alberto Paniz-mondolfi; Ana S. Gonzalez-Reiche; Ana Silvia Gonzalez-Reiche; Andrew Kasarskis; Angela Amoako; Ashley S. Salimbangon; Betsaida Salom Melo; Bremy Albuquerque; Bremy Alburquerque; Brianne Ciferri; Charles Gleason; Deena R. Altman; Denise Jurczyszak; Elena Hirsch; Emilia Mia Sordillo; Emilia Sordillo; Emily Ferreri; Florian Krammer; Gintaras Deikus; Giulio Kleiner; Gopi Patel; Hala Alshammary; Harm van Bakel; Irina Oussenko; Jayeeta Dutta; Jose Polanco; Juan Soto; Judith Aberg; Katherine Beach; Kathryn Twyman; Kayla Russo; Komal Srivastava; Levy Sominsky; Lisa Miorin; Mahmoud Awawda; Marta Luksza; Matthew Hernandez; Matthew M. Hernandez; Melissa Gitman; Melissa Smith; Michael D. Nowak; Mitchell J. Sullivan; Mitchell Sullivan; Nancy Francoeur; Rachel Chernet; Randy Albrecht; Robert Sebra; Sarah Schaefer; Shelcie Fabre; Shwetha Hara Sridhar; Shwetha Sridhar Hara; Viviana Simon; Wen-chun Liu; Ying-Chih Wang; Zenab Khan
EPI_ISL_1301440	MSHS Clinical Microbiology Laboratories	NBACC	Aaron Phillips; Adam Bazinet; Amanda Graham; Brian Holland; David Miller; Denise Freeburger; Elyse Abbott; Gregory Williams; Jason Yolitz; Jennifer Biryukov; Jordan Bohannon; Karla Garcia; Katie Beck; M.J. Rosovitz; Melissa Krause; Michael Schuit; Paul Dabisch; Sean Lovett; Shanna Ratnesar-Shumate; Stewart Wood; Victoria Wahl; Wade Weaver
EPI_ISL_445309, EPI_ISL_445355	MUTUAL DE SEGURIDAD C.CH.C.	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_631300, EPI_ISL_631301, EPI_ISL_631302, EPI_ISL_632311	MVZ DIAMEDIS Diagnostische Medizin Sennestadt GmbH	Bielefeld University	Alexander Sczyrba; Christiane Scherer; David Brandt; Jörn Kalinowski; Levin-Joe Klages; Marina Simunovic; Markus Haak; Svenja Vinke; Tobias Busche

EPI_ISL_1181176, EPI_ISL_1181177, EPI_ISL_1181178, EPI_ISL_1181179, EPI_ISL_1181180	MVZ Dr. Eberhard & Partner Dortmund	Bielefeld University	Alexander Sczyrba; David Brandt; Jörn Kalinowski; Levin-Joe Klages; Marina Simunovic; Markus Haak; Svenja Vinke; Tobias Busche
EPI_ISL_614294, EPI_ISL_631528, EPI_ISL_631538, EPI_ISL_631546, EPI_ISL_631796, EPI_ISL_631863, EPI_ISL_631881, EPI_ISL_631915, EPI_ISL_631993			
see above	Maimonides Medical Center	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_513414, EPI_ISL_513415, EPI_ISL_513416, EPI_ISL_513418, EPI_ISL_513419, EPI_ISL_513420, EPI_ISL_513421, EPI_ISL_513422, EPI_ISL_513423, EPI_ISL_513424, EPI_ISL_513425, EPI_ISL_513426, EPI_ISL_513427, EPI_ISL_513428, EPI_ISL_513429, EPI_ISL_513430, EPI_ISL_513431, EPI_ISL_513432, EPI_ISL_513433, EPI_ISL_513434, EPI_ISL_513435, EPI_ISL_513436, EPI_ISL_513437, EPI_ISL_513438, EPI_ISL_513439, EPI_ISL_513440, EPI_ISL_513441, EPI_ISL_513442, EPI_ISL_513443, EPI_ISL_513444, EPI_ISL_513447, EPI_ISL_513448, EPI_ISL_513449, EPI_ISL_513450, EPI_ISL_513451, EPI_ISL_513452, EPI_ISL_513453, EPI_ISL_513454, EPI_ISL_513455, EPI_ISL_513456, EPI_ISL_513457, EPI_ISL_513458, EPI_ISL_513459, EPI_ISL_513460, EPI_ISL_513461, EPI_ISL_513462, EPI_ISL_513463, EPI_ISL_513464, EPI_ISL_513465, EPI_ISL_513466, EPI_ISL_513467, EPI_ISL_513468, EPI_ISL_513469, EPI_ISL_513470, EPI_ISL_513471, EPI_ISL_513472, EPI_ISL_513473, EPI_ISL_513474, EPI_ISL_513475, EPI_ISL_513476, EPI_ISL_513477, EPI_ISL_513478, EPI_ISL_513479, EPI_ISL_513480, EPI_ISL_513481, EPI_ISL_513482, EPI_ISL_513483, EPI_ISL_513484, EPI_ISL_513485, EPI_ISL_513486, EPI_ISL_513488, EPI_ISL_513489, EPI_ISL_513490, EPI_ISL_513491, EPI_ISL_513492, EPI_ISL_513493, EPI_ISL_513494, EPI_ISL_513495, EPI_ISL_513496, EPI_ISL_513497, EPI_ISL_513498, EPI_ISL_513499, EPI_ISL_513500, EPI_ISL_513501, EPI_ISL_513502, EPI_ISL_513503, EPI_ISL_513504, EPI_ISL_513505, EPI_ISL_513506, EPI_ISL_513507, EPI_ISL_513508, EPI_ISL_513509, EPI_ISL_513510			
see above	Maine HETL	Tewhey Lab, The Jackson Laboratory	Barter, M.; Dewey, H.; H. and Tewhey, R.; Lynch, R.; Matluk, N.; Munger
EPI_ISL_428348	Maison de Santé du Val d'Ormois	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Etienne Simon-Lorière; Flora Donati; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_481265	Maryland Department of Health	Maryland Department of Health	Keller, E.
EPI_ISL_454431, EPI_ISL_454435	Maryland Department of Health Laboratories Administration	Maryland Department of Health Laboratories Administration	MDH Laboratories Administration
EPI_ISL_538265, EPI_ISL_538266, EPI_ISL_538267, EPI_ISL_538268	Maryland Public Health Laboratory	Maryland Public Health Laboratory	Maryland Department of Health Laboratories Administration
EPI_ISL_460097, EPI_ISL_460101, EPI_ISL_460102, EPI_ISL_460103, EPI_ISL_460104, EPI_ISL_460105, EPI_ISL_460107, EPI_ISL_460108, EPI_ISL_460109, EPI_ISL_460110, EPI_ISL_460111, EPI_ISL_460114, EPI_ISL_460115, EPI_ISL_460116, EPI_ISL_460117, EPI_ISL_460118, EPI_ISL_460119, EPI_ISL_460122, EPI_ISL_460124, EPI_ISL_460125, EPI_ISL_460126, EPI_ISL_460128, EPI_ISL_460129, EPI_ISL_460134, EPI_ISL_460137, EPI_ISL_460138, EPI_ISL_460140, EPI_ISL_460142, EPI_ISL_460143, EPI_ISL_460145, EPI_ISL_460146, EPI_ISL_460149, EPI_ISL_460150, EPI_ISL_460154, EPI_ISL_460156, EPI_ISL_460158, EPI_ISL_460161, EPI_ISL_460163, EPI_ISL_460166, EPI_ISL_460170, EPI_ISL_460174, EPI_ISL_460175, EPI_ISL_460178, EPI_ISL_460179, EPI_ISL_460180, EPI_ISL_460182, EPI_ISL_460183, EPI_ISL_460184, EPI_ISL_460185, EPI_ISL_460186, EPI_ISL_460202, EPI_ISL_460203, EPI_ISL_460204, EPI_ISL_460205, EPI_ISL_460206, EPI_ISL_460207, EPI_ISL_460209, EPI_ISL_460212, EPI_ISL_460214, EPI_ISL_460216, EPI_ISL_460221, EPI_ISL_460224, EPI_ISL_460229, EPI_ISL_460231, EPI_ISL_460232, EPI_ISL_460235, EPI_ISL_460238, EPI_ISL_460239, EPI_ISL_460240, EPI_ISL_460241, EPI_ISL_460242, EPI_ISL_460245, EPI_ISL_460250, EPI_ISL_460252, EPI_ISL_460253, EPI_ISL_460258, EPI_ISL_460261, EPI_ISL_460263, EPI_ISL_460264, EPI_ISL_460266, EPI_ISL_460267, EPI_ISL_460269, EPI_ISL_460270, EPI_ISL_460271, EPI_ISL_460273, EPI_ISL_460275, EPI_ISL_460276, EPI_ISL_460279, EPI_ISL_460280, EPI_ISL_460281, EPI_ISL_460283, EPI_ISL_460285, EPI_ISL_460286, EPI_ISL_460288, EPI_ISL_460289, EPI_ISL_460290, EPI_ISL_460291, EPI_ISL_460292, EPI_ISL_460295, EPI_ISL_460297, EPI_ISL_460300, EPI_ISL_460301, EPI_ISL_460302, EPI_ISL_460304, EPI_ISL_460306, EPI_ISL_460310, EPI_ISL_460311, EPI_ISL_460312, EPI_ISL_460313, EPI_ISL_460314, EPI_ISL_460316, EPI_ISL_460317, EPI_ISL_460319, EPI_ISL_460321, EPI_ISL_460322, EPI_ISL_460324, EPI_ISL_460326, EPI_ISL_460329, EPI_ISL_460331, EPI_ISL_460333, EPI_ISL_460334, EPI_ISL_460335, EPI_ISL_460337, EPI_ISL_460338, EPI_ISL_460339, EPI_ISL_460340, EPI_ISL_460343, EPI_ISL_460344, EPI_ISL_460347, EPI_ISL_460348, EPI_ISL_460349, EPI_ISL_460353, EPI_ISL_460354, EPI_ISL_460359, EPI_ISL_460362, EPI_ISL_460364, EPI_ISL_460366, EPI_ISL_460368, EPI_ISL_460369, EPI_ISL_460371, EPI_ISL_460372, EPI_ISL_460376, EPI_ISL_460380, EPI_ISL_460381, EPI_ISL_460382, EPI_ISL_460384, EPI_ISL_460388, EPI_ISL_460391, EPI_ISL_460394, EPI_ISL_460396, EPI_ISL_460397, EPI_ISL_460398, EPI_ISL_460399, EPI_ISL_460400, EPI_ISL_460406, EPI_ISL_460409, EPI_ISL_460410, EPI_ISL_460413, EPI_ISL_460415, EPI_ISL_460417, EPI_ISL_460421, EPI_ISL_460425, EPI_ISL_460426, EPI_ISL_460427, EPI_ISL_460428, EPI_ISL_460434, EPI_ISL_460436, EPI_ISL_460437, EPI_ISL_460440, EPI_ISL_460442, EPI_ISL_460444, EPI_ISL_460445, EPI_ISL_460446, EPI_ISL_460447, EPI_ISL_460448, EPI_ISL_460451, EPI_ISL_460453, EPI_ISL_460456, EPI_ISL_460457, EPI_ISL_460458, EPI_ISL_460459, EPI_ISL_460460, EPI_ISL_460462, EPI_ISL_460465, EPI_ISL_460466, EPI_ISL_460467, EPI_ISL_460468, EPI_ISL_460469, EPI_ISL_460470, EPI_ISL_460471, EPI_ISL_460472			
see above	Massachusetts General Hospital	Infectious Disease Program, Broad Institute of Harvard and MIT	A.E.; Adams, G.; Anahtar, M.; B.L.; B.W.; Bauer, M.; Birren; Branda, J.; Carter, A.; Cerrato, F.; Chaluvadi, S.; Chapman; Cusick, C.; D.J.; DeRuff, K.; Flowers, K.; Gallagher, G.; Gladden-Young, A.; Gnirke, A.; Harris, J.; J.E.; KJ.; LaRocque, R.; Lagerborg, K.; Lemieux; Lin; Loreth, C.; MacInnis; Neumann, A.; Normandin, E.; P.C.; Park; Pierce, V.; Reilly, S.; Rosenberg, E.; Rudy, M.; Ryan, E.; S.B.; Sabeti; Shaw, B.; Siddle; Slater, D.; Smole, S.; Tomkins-Tinch, C.; Turbett, S.
EPI_ISL_791514, EPI_ISL_791515, EPI_ISL_791518, EPI_ISL_791519, EPI_ISL_791520, EPI_ISL_791521	Massachusetts State Public Health Laboratory	Infectious Disease Program, Broad Institute of Harvard and MIT	A.E.; Adams, G.; Anahtar, M.; B.L.; B.W.; Bauer, M.; Birren; Branda, J.; Carter, A.; Cerrato, F.; Chaluvadi, S.; Chapman; Cusick, C.; D.J.; DeRuff, K.; E. and Sabeti; Flowers, K.; Gallagher, G.; Gladden-Young, A.; Gnirke, A.; Harris, J.; J.E.; K.J.; LaRocque, R.; Lagerborg, K.; Lemieux; Lin; Loreth, C.; MacInnis; Neumann, A.; Normandin, E.; P.C.; Park; Pierce, V.; Reilly, S.; Rosenberg; Rudy, M.; Ryan, E.; S.B.; Shaw, B.; Siddle; Slater, D.; Smole, S.; Tomkins-Tinch, C.; Turbett, S.
EPI_ISL_692947	Massachusetts State Public Health Laboratory	Massachusetts State Public Health Laboratory	Andrew Lang; Glen Gallagher; Sandra Smole; Timelia Fink
EPI_ISL_418799, EPI_ISL_418801, EPI_ISL_420878, EPI_ISL_420879	Mater Pathology	Public Health Virology Laboratory	Alyssa Pyke; Amanda De Jong; Andrew Van Den Hurk; Bixing Huang; Carmel Taylor; David Warrilow; Doris Genge; Elisabeth Gamez; Glen Hewitson; Ian Maxwell Mackay; Inga Sultana; Jamie McMahon; Jean Barcelon; Judy Northill; Mitchell Finger; Natalie Simpson; Neelima Nair; Peter Burtonclay; Peter Moore; Sarah Wheatley; Sean Moody; Sonja Hall-Mendelin; Timothy Gardam; and Frederick Moore
EPI_ISL_420898, EPI_ISL_420899, EPI_ISL_420900, EPI_ISL_420901, EPI_ISL_420902, EPI_ISL_420903, EPI_ISL_420905, EPI_ISL_420906, EPI_ISL_420907, EPI_ISL_420912			
see above	Max von Pettenkofer Institute, Virology, National Reference Center for Retroviruses, LMU Munich	Laboratory for Functional Genome Analysis, Dept. Genomics, Gene Center of the LMU Munich	Alexander Graf; Ashok Varadharajan; Helmut Blum; Max Muenchhoff; Oliver Keppler; Stefan Krebs
EPI_ISL_437204, EPI_ISL_437205, EPI_ISL_437206, EPI_ISL_437210, EPI_ISL_437211, EPI_ISL_437212, EPI_ISL_437218, EPI_ISL_437223, EPI_ISL_437224, EPI_ISL_437228, EPI_ISL_437229, EPI_ISL_437230, EPI_ISL_437231, EPI_ISL_437232, EPI_ISL_437233, EPI_ISL_437234, EPI_ISL_437235, EPI_ISL_437236, EPI_ISL_437237, EPI_ISL_437238, EPI_ISL_437244, EPI_ISL_437245, EPI_ISL_437246, EPI_ISL_437247, EPI_ISL_437248, EPI_ISL_437249, EPI_ISL_437250, EPI_ISL_437251, EPI_ISL_437252, EPI_ISL_437253, EPI_ISL_437254, EPI_ISL_437255, EPI_ISL_437256, EPI_ISL_437257, EPI_ISL_437258, EPI_ISL_437259, EPI_ISL_437260, EPI_ISL_437261, EPI_ISL_437262, EPI_ISL_437263, EPI_ISL_437264, EPI_ISL_437265, EPI_ISL_437266, EPI_ISL_437267, EPI_ISL_437268, EPI_ISL_437269, EPI_ISL_437270, EPI_ISL_437271, EPI_ISL_437272, EPI_ISL_437273, EPI_ISL_437274, EPI_ISL_437275, EPI_ISL_437276, EPI_ISL_437277, EPI_ISL_437359, EPI_ISL_451937, EPI_ISL_451940, EPI_ISL_451941, EPI_ISL_451944, EPI_ISL_452103			
see above	Max von Pettenkofer Institute, Virology, National Reference Center for Retroviruses, LMU München	Laboratory for Functional Genome Analysis, Dept. Genomics, Gene Center of the LMU Munich	Alexander Graf; Helmut Blum; Max Muenchhoff; Oliver Keppler; Stefan Krebs
EPI_ISL_477291, EPI_ISL_477292, EPI_ISL_495597, EPI_ISL_514638, EPI_ISL_514639, EPI_ISL_514640, EPI_ISL_514644, EPI_ISL_514653, EPI_ISL_514654, EPI_ISL_514655, EPI_ISL_514656, EPI_ISL_518856, EPI_ISL_518857, EPI_ISL_518858, EPI_ISL_518859, EPI_ISL_518860, EPI_ISL_518861, EPI_ISL_518862, EPI_ISL_518863, EPI_ISL_518864, EPI_ISL_518865, EPI_ISL_518866, EPI_ISL_518867, EPI_ISL_518868, EPI_ISL_518869, EPI_ISL_518870, EPI_ISL_518871, EPI_ISL_518872, EPI_ISL_518873, EPI_ISL_518874, EPI_ISL_518875, EPI_ISL_518876, EPI_ISL_518877, EPI_ISL_518878, EPI_ISL_518879, EPI_ISL_518880, EPI_ISL_518881, EPI_ISL_518882, EPI_ISL_518883, EPI_ISL_518884, EPI_ISL_518885, EPI_ISL_518886, EPI_ISL_518887, EPI_ISL_518888, EPI_ISL_518889, EPI_ISL_518890, EPI_ISL_518891, EPI_ISL_518892, EPI_ISL_518893, EPI_ISL_518894, EPI_ISL_518895, EPI_ISL_518896, EPI_ISL_518897, EPI_ISL_518898, EPI_ISL_518899, EPI_ISL_521153			
see above	Mayo Clinic & Mayo Clinic Laboratories	Minnesota Department of Health, Public Health Laboratory	Jacob Garfin; Kelly Pung; Matt Plumb; and Xiong Wang
EPI_ISL_490978, EPI_ISL_490988, EPI_ISL_490997, EPI_ISL_490998, EPI_ISL_490999, EPI_ISL_491000, EPI_ISL_491004			
see above	Mayo Clinic Laboratories	UW Virology Lab	Alexander Greninger; Amin Addetia; Hong Xie; Keith R Jerome; Lasata Shrestha; Meei-Li Huang; Pavitra Roychoudhury; Truong Nguyen; Victoria M Rachleff
EPI_ISL_500503, EPI_ISL_500504, EPI_ISL_500505, EPI_ISL_500506, EPI_ISL_500507, EPI_ISL_500508, EPI_ISL_500509, EPI_ISL_500510, EPI_ISL_500511, EPI_ISL_500512, EPI_ISL_500513, EPI_ISL_500514, EPI_ISL_500515, EPI_ISL_500516, EPI_ISL_500519, EPI_ISL_500520, EPI_ISL_500521, EPI_ISL_500525, EPI_ISL_500526, EPI_ISL_500527, EPI_ISL_500528, EPI_ISL_500529, EPI_ISL_500530, EPI_ISL_500531, EPI_ISL_500533, EPI_ISL_500534, EPI_ISL_500535, EPI_ISL_500536, EPI_ISL_500537, EPI_ISL_500538, EPI_ISL_501073, EPI_ISL_501074, EPI_ISL_501075, EPI_ISL_501076, EPI_ISL_501077, EPI_ISL_501078, EPI_ISL_501079, EPI_ISL_501080, EPI_ISL_501081, EPI_ISL_501082, EPI_ISL_501165			
see above	Mayo Clinic Laboratories	University of Washington Virology Lab	Alexander Greninger; Amin Addetia; Hong Xie; Keith R Jerome; Lasata Shrestha; Meei-Li Huang; Pavitra Roychoudhury; Truong Nguyen; Victoria M Rachleff
EPI_ISL_482745, EPI_ISL_482746	Medical Microbiology, Leiden University Medical Center	Medical Microbiology, Leiden University Medical Center	Dalebout; E.J.; J.C.; J.C. and Sidorov, I.; J.J. and Sidorov, I.; N.S.; Ogando; Snijder; T.J.; Zevenhoven; de Vries
EPI_ISL_435281	Medistra Hospital Jakarta	Eijkman Institute for Molecular Biology, Ministry of Research and Technology/National Agency for Research and Innovation	Amin Soebandrio; David H Muljono; Edison Johar; Frilasita A Yudhaputri; Hidayat Trimarsanto; Khin Saw Myint; Safarina G Malik
EPI_ISL_581478, EPI_ISL_581479, EPI_ISL_581480, EPI_ISL_581481, EPI_ISL_581482, EPI_ISL_581483	Medizinische Klinik Innere Medizin I, Universitätsklinikum Tübingen	NGS Competence Center Tübingen, Institut für Medizinische Mikrobiologie und Hygiene, Universitätsklinikum Tübingen	Angel Angelov
EPI_ISL_451553, EPI_ISL_451567	Medlab Pathology	NSW Health Pathology - Institute of Clinical Pathology and Medical Research; Westmead Hospital; University of Sydney	CIDM-PH et al.
EPI_ISL_583428, EPI_ISL_583431, EPI_ISL_583461, EPI_ISL_583462, EPI_ISL_583466, EPI_ISL_583469, EPI_ISL_583472, EPI_ISL_583479			
see above	Memorial Sloan Kettering Cancer Center	van Bakel Laboratory, Genetics and Genomics Sciences,	Adolfo García-Sastre; Adriana van de Guchte; Ajay Obla; Ana S. Gonzalez-Reiche; Genovefa Papanicolaou; Gunjan Shah; Harm van Bakel; Jayeeta

		Icahn School of Medicine at Mount Sinai	Dutta; Judith Aberg; Kent Sepkowitz; Miguel-Angel Perales; Ngolela Esther Babady; Sadaf Aslam; Teresa Aydillo; Tobias Hohl; Zenab Khan; and Mini Kamboj
EPI_ISL_631832	Metro Urgicare	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_436800, EPI_ISL_436801, EPI_ISL_436802, EPI_ISL_436803, EPI_ISL_436804, EPI_ISL_436807, EPI_ISL_436808, EPI_ISL_436812, EPI_ISL_436814, EPI_ISL_436815, EPI_ISL_436818, EPI_ISL_436819, EPI_ISL_436820, EPI_ISL_436821, EPI_ISL_436822, EPI_ISL_436823, EPI_ISL_436824, EPI_ISL_436825, EPI_ISL_436827, EPI_ISL_436829, EPI_ISL_436830, EPI_ISL_436831, EPI_ISL_436833, EPI_ISL_436834, EPI_ISL_436836, EPI_ISL_436838, EPI_ISL_436841, EPI_ISL_436842, EPI_ISL_436843, EPI_ISL_436846, EPI_ISL_436847, EPI_ISL_436848, EPI_ISL_436850, EPI_ISL_436852, EPI_ISL_436853, EPI_ISL_436854, EPI_ISL_436855, EPI_ISL_436856, EPI_ISL_436857, EPI_ISL_436859, EPI_ISL_436861, EPI_ISL_436863, EPI_ISL_436864, EPI_ISL_436865, EPI_ISL_436867, EPI_ISL_436868, EPI_ISL_436869, EPI_ISL_436870, EPI_ISL_436874, EPI_ISL_436875, EPI_ISL_436876, EPI_ISL_436877, EPI_ISL_436878, EPI_ISL_436879, EPI_ISL_436880, EPI_ISL_436884, EPI_ISL_436885, EPI_ISL_436886, EPI_ISL_436887, EPI_ISL_436889, EPI_ISL_437099, EPI_ISL_437100, 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see above	Michigan Department of Health and Human Services, Bureau of Laboratories	Michigan Department of Health and Human Services, Bureau of Laboratories	Blankenship HM; Riner D; Soehnlen MK
EPI_ISL_1068682	Micrbiological Laboratory	Micrbiological Laboratory,Lu`an Center for Disease Control and Prevention	Chang Hongwei; Chen Beilei; Chen Zhichao; Gao Dawei; Li Zhaoyang; Yang Wei; Zhang Feng; Zhang Limei; Zhang Qin; Zhu Rui
EPI_ISL_1069173	Micrbiological Laboratory,Lu`an Center for Disease Control and Prevention	Micrbiological Laboratory,Lu`an Center for Disease Control and Prevention	Chang Hongwei; Chen Beilei; Chen Zhichao; Gao Dawei; Li Zhaoyang; Yang Wei; Zhang Feng; Zhang Limei; Zhang Qin; Zhu Rui
EPI_ISL_1069192	Micrbiological Laboratory,Lu`an Center for Disease Control and Prevention	No.409,Gaocheng Middle Road,Lu`an City,Anhui Provice	Chang Hongwei; Chen Beilei; Chen Zhichao; Gao Dawei; Li Zhaoyang; Yang Wei; Zhang Feng; Zhang Limei; Zhang Qin; Zhu Rui
EPI_ISL_1069193	Micrbiology Laboratory,Lu`an Center for Disease Control and Prevention	Micrbiology Laboratory,Lu`an Center for Disease Control and Prevention	Chang Hongwei; Chen Beilei; Chen Zhichao; Gao Dawei; Li Zhaoyang; Yang Wei; Zhang Feng; Zhang Limei; Zhang Qin; Zhu Rui
EPI_ISL_454353	Microbial Genome Sequencing Center; Microbial Genomic Epidemiology Laboratory	Microbial Genomic Epidemiology Laboratory, University of Pittsburgh	Chinelo Ezeonwuku; Dan Snyder; Jane W. Marsh; Kady D. Waggle; Lee H. Harrison; Marissa P. Griffith; Mustapha M. Mustapha; Stephanie L. Mitchell; Vatsala R. Srinivasa; Vaughn S. Cooper
EPI_ISL_480560, EPI_ISL_480561, EPI_ISL_480772, EPI_ISL_521887, EPI_ISL_563979, EPI_ISL_1055352	Microbiological Diagnostic Unit - Public Health Laboratory (MDU-PHL)	MDU-PHL	M.L.; N.L.; Sait; Sait, M.; Schultz M.; Schultz M. B.; Seemann T.; Seemann, T.; Sherry; Sherry, N.
EPI_ISL_419714, EPI_ISL_419715, EPI_ISL_419716, EPI_ISL_419717, EPI_ISL_419718, EPI_ISL_419719, EPI_ISL_419720, EPI_ISL_419721, EPI_ISL_419722, EPI_ISL_419723, EPI_ISL_419725, EPI_ISL_419726, EPI_ISL_419727, EPI_ISL_419728, EPI_ISL_419729, EPI_ISL_419730, EPI_ISL_419731, EPI_ISL_419732, EPI_ISL_419823, EPI_ISL_419824, EPI_ISL_419825, EPI_ISL_419827, EPI_ISL_419828, EPI_ISL_419829, EPI_ISL_419830, EPI_ISL_419980, EPI_ISL_419999, EPI_ISL_420000, EPI_ISL_420001, EPI_ISL_420002, EPI_ISL_420003, EPI_ISL_420006, EPI_ISL_420007, EPI_ISL_420008, EPI_ISL_420009, EPI_ISL_420010, EPI_ISL_420011, EPI_ISL_420012, EPI_ISL_420013, EPI_ISL_420014, EPI_ISL_420016, EPI_ISL_420017, EPI_ISL_426906, EPI_ISL_426907, EPI_ISL_426910, EPI_ISL_426914, EPI_ISL_426917, EPI_ISL_426918, EPI_ISL_426919, EPI_ISL_426920, EPI_ISL_426921, EPI_ISL_427022, EPI_ISL_427054, EPI_ISL_427055, EPI_ISL_427056, EPI_ISL_427057, EPI_ISL_427058, EPI_ISL_427060, EPI_ISL_427061, EPI_ISL_427062, EPI_ISL_427063, EPI_ISL_427065, EPI_ISL_427066, EPI_ISL_427068, EPI_ISL_427069, EPI_ISL_427070, EPI_ISL_430471, EPI_ISL_430472, EPI_ISL_430639, EPI_ISL_430640, EPI_ISL_430643, EPI_ISL_430645, EPI_ISL_430646, EPI_ISL_430647, EPI_ISL_430649, EPI_ISL_430651, EPI_ISL_430653, EPI_ISL_430654, EPI_ISL_430655, EPI_ISL_430658, EPI_ISL_430659, EPI_ISL_430661, EPI_ISL_430663, EPI_ISL_430687			
see above	Microbiological Diagnostic Unit Public Health Laboratory	Microbiological Diagnostic Unit Public Health Laboratory	Sait, M.; Schultz M.; Seemann T.; Sherry, N.
EPI_ISL_1068593	Microbiological Laboratory	Microbiological Laboratory,Lu`an Center for Disease Control and Prevention	Chang Hongwei; Chen Beilei; Chen Zhichao; Gao Dawei; Li Zhaoyang; Yang Wei; Zhang Feng; Zhang Limei; Zhang Qin; Zhu Rui
EPI_ISL_447281, EPI_ISL_447282, EPI_ISL_447283, EPI_ISL_447284, EPI_ISL_447285, EPI_ISL_447286, EPI_ISL_447287, EPI_ISL_447288, EPI_ISL_447289, EPI_ISL_447290, EPI_ISL_447291, EPI_ISL_447292, EPI_ISL_447293, EPI_ISL_447294, EPI_ISL_447295, EPI_ISL_447296, EPI_ISL_447297, EPI_ISL_447299, EPI_ISL_447300, EPI_ISL_447301, EPI_ISL_447302, EPI_ISL_447303, EPI_ISL_447305, EPI_ISL_447306, EPI_ISL_447307, EPI_ISL_447308, EPI_ISL_447309, EPI_ISL_447310			
see above	Microbiology Division, Barzilai University Medical Center	Stern Lab	Stern Lab
EPI_ISL_539879	Microbiology Division, South Carolina Department of Health and Environmental Control	Microbiology Division, South Carolina Department of Health and Environmental Control	Flores, H.
EPI_ISL_1069198, EPI_ISL_1069199, EPI_ISL_1069200, EPI_ISL_1069201, EPI_ISL_1069203, EPI_ISL_1069205, EPI_ISL_1069206, EPI_ISL_1069207, EPI_ISL_1069208, EPI_ISL_1069210, EPI_ISL_1069211, EPI_ISL_1069213, EPI_ISL_1069215, EPI_ISL_1069216, EPI_ISL_1069219, EPI_ISL_1081193, EPI_ISL_1081194, EPI_ISL_1081195, EPI_ISL_1081196, EPI_ISL_1081197, EPI_ISL_1081198, EPI_ISL_1081199, EPI_ISL_1081260, EPI_ISL_1081291, EPI_ISL_1081310, EPI_ISL_1081311, EPI_ISL_1081324, EPI_ISL_1081325, EPI_ISL_1081326, EPI_ISL_1081331, EPI_ISL_1081340			
see above	Microbiology Laboratory,Lu`an Center for Disease Control and Prevention	Microbiology Laboratory,Lu`an Center for Disease Control and Prevention	Chang Hongwei; Chen Beilei; Chen Zhichao; Gao Dawei; Li Zhaoyang; Lu`an Center for Disease Control and Prevention; Microbiology Laboratory; Yang Wei; Zhang Feng; Zhang Limei; Zhang Qin; Zhu Rui
EPI_ISL_418267, EPI_ISL_418269	Microbiology and Immunology department, Pasteur institute in Ho Chi Minh city	Microbiology and Immunology department, Pasteur institute in Ho Chi Minh city	A.H.; C.Q.; Cao; D.T.; Dao; H.Q.; H.T.; H.T.T.; Hoang; Huynh; K.C.; L.T.; L.T. and Nguyen; L.T.K.; Le; Luong; M.H.; N.P.H.; N.T.; Nguyen; Pham; Phan; Phung; Q.C.; Q.D.; S.N.; T.M.; T.N.A.; T.T.; T.T.N.; T.V.; T.V. and Phan; Tran; Tran, T.; Vo; Vu
EPI_ISL_1064033, EPI_ISL_1064034, EPI_ISL_1064035, EPI_ISL_1064036, EPI_ISL_1064037, EPI_ISL_1064038, EPI_ISL_1064039, EPI_ISL_1064040, EPI_ISL_1064041, EPI_ISL_1064042, EPI_ISL_1064044, EPI_ISL_1064045, EPI_ISL_1064046, EPI_ISL_1064047, EPI_ISL_1064048, EPI_ISL_1064049, EPI_ISL_1064050, EPI_ISL_1064051, EPI_ISL_1064052, EPI_ISL_1064053, EPI_ISL_1064054, EPI_ISL_1064055, EPI_ISL_1064056, EPI_ISL_1064057, EPI_ISL_1064058, EPI_ISL_1064059, EPI_ISL_1064060, EPI_ISL_1064061, EPI_ISL_1064062, EPI_ISL_1064063, EPI_ISL_1064064, EPI_ISL_1064065, EPI_ISL_1064066, EPI_ISL_1064067, EPI_ISL_1064068, EPI_ISL_1064069, EPI_ISL_1064070, EPI_ISL_1064071, EPI_ISL_1064072, EPI_ISL_1064073, EPI_ISL_1064074, EPI_ISL_1064075, EPI_ISL_1064076, EPI_ISL_1064078, EPI_ISL_1064079, EPI_ISL_1064080, EPI_ISL_1064081, EPI_ISL_1064082, EPI_ISL_1064083, EPI_ISL_1064084, EPI_ISL_1064085, EPI_ISL_1064086, EPI_ISL_1064087, EPI_ISL_1064088, EPI_ISL_1064089, EPI_ISL_1064090, EPI_ISL_1064091, EPI_ISL_1064092, EPI_ISL_1064093, EPI_ISL_1064094, EPI_ISL_1064095, EPI_ISL_1064096, EPI_ISL_1064097, EPI_ISL_1064098, EPI_ISL_1064099, EPI_ISL_1064100, EPI_ISL_1064101, EPI_ISL_1064102, EPI_ISL_1064103, EPI_ISL_1064104, EPI_ISL_1064105, EPI_ISL_1064106, EPI_ISL_1064107, EPI_ISL_1064108, EPI_ISL_1064109, EPI_ISL_1064110, EPI_ISL_1064111, EPI_ISL_1064112, EPI_ISL_1064113, EPI_ISL_1064114, EPI_ISL_1064115, EPI_ISL_1064116			
see above	Microbiology and Virology Unit, Azienda Ospedale Padova, Padova, Italy	Department of Molecular Medicine, Computational Medicine Group, University of Padova, Padova, Italy	Andrea Crisanti; Andrea Spitaleri; Claudia Del Vecchio; Daniela Maria Cirillo; Dejan Lazarevic; Elisa Franchin; Enrico Lavezzo; Fabio Simeoni; Federico Bianca; Francesca Saluzzo; Francesco Onelia; Giovanni Lorenzin; Giovanni Tonon; Laura Manuto; Marco Grazioli; Stefano Toppo
EPI_ISL_738147, EPI_ISL_738194, EPI_ISL_738243	Microbiology and Virology Unit, Florence Careggi University Hospital	Microbiology and Virology Unit, Florence Careggi University Hospital	Alberto Antonelli; Gian Maria Rossolini; Marco Coppi; Simona Pollini; Vincenzo Di Pilato
EPI_ISL_1181730, EPI_ISL_1181743, EPI_ISL_1181744, EPI_ISL_1181745, EPI_ISL_1181761, EPI_ISL_1181764, EPI_ISL_1181765, EPI_ISL_1181766, EPI_ISL_1181768, EPI_ISL_1181769, EPI_ISL_1181771, EPI_ISL_1181773, EPI_ISL_1181777, EPI_ISL_1181779, EPI_ISL_1181780, EPI_ISL_1181781, EPI_ISL_1181784, EPI_ISL_1181789, EPI_ISL_1181790, EPI_ISL_1181801, EPI_ISL_1181802, EPI_ISL_1181806, EPI_ISL_1181808, EPI_ISL_1181818			
see above	Microbiology and Virology Unit,Azienda Ospedale Padova,Padova,Italy	Department of Molecular Medicine,Computational Medicine Group,Universeity of Padova,Padova,Italy	Andrea Crisanti; Claudia Del Vecchio; Elisa Franchin; Enrico Lavezzo; Federico Bianca; Francesco Onelia; Laura Manuto; Marco Grazioli; Stefano Toppo
EPI_ISL_447260, EPI_ISL_447263, EPI_ISL_447267, EPI_ISL_447268, EPI_ISL_447269, EPI_ISL_447271, EPI_ISL_447272, EPI_ISL_447273, EPI_ISL_447274, EPI_ISL_447275, EPI_ISL_447277, EPI_ISL_447279, EPI_ISL_447280			
see above	Microbiology laboratory, Assuta Ashdod University-Affiliated	Stern Lab	Stern Lab

	Hospital		
EPI_ISL_613461, EPI_ISL_613462	Microbiology, Koc University	Microbiology, Koc University	Can, F.; Dogan, O.; Kuskucu; M.A.; Nurtop, E.; Ozer, B.
EPI_ISL_434571	Microbiology, The University of Hong Kong	Microbiology, The University of Hong Kong	Chan; J.F.W. and Yuen; K.-Y.
EPI_ISL_475717, EPI_ISL_475718, EPI_ISL_475719, EPI_ISL_475720, EPI_ISL_475721	Microbiology, University Hospital Donostia	Microbiology, University Hospital Donostia	Cilla, G.; J.M.; Marimon; Montes, M.; Pineiro, L.
EPI_ISL_486646, EPI_ISL_486650, EPI_ISL_486651, EPI_ISL_486653, EPI_ISL_486657, EPI_ISL_486659, EPI_ISL_486660, EPI_ISL_486662, EPI_ISL_486663, EPI_ISL_486664, EPI_ISL_486665			
see above	Microbiology, Virology and Biemergency Laboratory-ASST FBF Sacco	Microbiology, Virology and Biemergency Laboratory-ASST FBF Sacco	Comandatore F; Mancon A; Micheli V; Rimoldi SG; Romeri F
EPI_ISL_456213, EPI_ISL_456214, EPI_ISL_456255, EPI_ISL_456256, EPI_ISL_456257, EPI_ISL_456258, EPI_ISL_548127, EPI_ISL_579129, EPI_ISL_579130, EPI_ISL_579131, EPI_ISL_579132, EPI_ISL_579301, EPI_ISL_579302, EPI_ISL_579303, EPI_ISL_579304, EPI_ISL_579305, EPI_ISL_579306, EPI_ISL_579307, EPI_ISL_579308, EPI_ISL_579309, EPI_ISL_579310, EPI_ISL_579313, EPI_ISL_579314			
see above	Middlemore Hospital	Institute of Environmental Science and Research (ESR)	Anja Werno; Antje van der Linden; Arlo Upton; Chris Mansell; David Hammer; Dragana Drinkovic; Erasmus Smit; Gary McAuliffe; Hana Sofia Andersson; Hermes Perez; James Ussher; Jill Sherwood; Jing Wang; Joep de Ligt; Josh Freeman; Julia Howard; Juliet Elvy; Lauren Jelly; Mary DeAlmeida; Matt Blakiston; Matt Storey; Matthew Rogers; Max Bloomfield; Michael Addidle; Michelle Balm; Muhammad Faisal; Nikki Freed; Olin Silander; Sally Roberts; Sarah Jefferies; Sharmini Muttaiyah; Susan Morpeth; Susan Taylor; Timothy Blackmore; Vani Sathyendran; Veronica Playle; Virginia Hope; Xiaoyun Ren
EPI_ISL_678275, EPI_ISL_678278, EPI_ISL_678279, EPI_ISL_678287	Mikrobiologie, RARI	Mikrobiologie, RARI	A.V.; Badanin; D.V.; E.A.; Fedorov; Guseva; Krasnov; Kutyrev; N.A.; N.P.; Naryshkina; Portenko; S.A.; Sharapova; Shcherbakova; Sosedova; V.V.; Y.M.
EPI_ISL_718150, EPI_ISL_718152, EPI_ISL_718163	Ministry of Health Hospitals	Institute of Health and Community Medicine	Chan Chia Jui; Chua Hock Hin; David Perera; Ooi Mong How; Tonnii Sia Loong Loong; Wong Jyn Shan; Wong Kiing Aik
EPI_ISL_428713, EPI_ISL_428715, EPI_ISL_428717, EPI_ISL_428719, EPI_ISL_428720, EPI_ISL_428721, EPI_ISL_428722, EPI_ISL_429861, EPI_ISL_429863, EPI_ISL_429864, EPI_ISL_429865, EPI_ISL_429867, EPI_ISL_429868, EPI_ISL_429872, EPI_ISL_429873, EPI_ISL_437304, EPI_ISL_437305, EPI_ISL_437306, EPI_ISL_437307, EPI_ISL_437308, EPI_ISL_437309, EPI_ISL_437310, EPI_ISL_437311, EPI_ISL_437312, EPI_ISL_437313, EPI_ISL_437314, EPI_ISL_437315, EPI_ISL_437316, EPI_ISL_437318, EPI_ISL_437320, EPI_ISL_437321, EPI_ISL_437322, EPI_ISL_437330, EPI_ISL_437333, EPI_ISL_437334, EPI_ISL_437335			
see above	Ministry of Health Turkey	Ministry of Health Turkey	Aye Baak Alta; Fatma Bayrakdar; Gülay Korukluolu; Selçuk Klç; Süleyman Yalçn; Tülin Demir; Yasemin Cogun
EPI_ISL_427408, EPI_ISL_427416, EPI_ISL_427417, EPI_ISL_427418	Ministry of Public Health (MoPH)	Biomedical Research Center (BRC)	Abdullatif Al-Khal; Ajaeb D. M. H. Al-Nabet; Asmaa A. Al-Thani.; Einas A. E. Al-Kuwari; Fatiha M. Benslimane; Hadi M. Yassine; Hamad E. Al-Romaihi; Heba A. Al-Khatib; Mohammed Al-Thani; Muna A. S. Al-Maslamani; Nourah B. M. Younes; Peter V. Coyle; Salih Al-Marri; Sonia Boughattas
EPI_ISL_414589, EPI_ISL_417191, EPI_ISL_417192, EPI_ISL_417194, EPI_ISL_417196, EPI_ISL_417469, EPI_ISL_417470, EPI_ISL_417471, EPI_ISL_417472, EPI_ISL_417473, EPI_ISL_417474, EPI_ISL_417475, EPI_ISL_417476, EPI_ISL_417477, EPI_ISL_417478, EPI_ISL_417479, EPI_ISL_417480, EPI_ISL_417492, EPI_ISL_417493, EPI_ISL_417494, EPI_ISL_417495, EPI_ISL_417496, EPI_ISL_417497, EPI_ISL_417498, EPI_ISL_417499, EPI_ISL_417500, EPI_ISL_417501, EPI_ISL_417502, EPI_ISL_417503, EPI_ISL_419388, EPI_ISL_419390, EPI_ISL_419391, EPI_ISL_419392, EPI_ISL_419393, EPI_ISL_419394, EPI_ISL_419395, EPI_ISL_419396, EPI_ISL_419397, EPI_ISL_421683, EPI_ISL_421684, EPI_ISL_421685, EPI_ISL_421686, EPI_ISL_421687, EPI_ISL_421688, EPI_ISL_421689, EPI_ISL_421690, EPI_ISL_421691, EPI_ISL_421692, EPI_ISL_427273, EPI_ISL_427274, EPI_ISL_427275, EPI_ISL_427276, EPI_ISL_427277, EPI_ISL_427278, EPI_ISL_427279, EPI_ISL_427280, EPI_ISL_427281, EPI_ISL_427282, EPI_ISL_427283, EPI_ISL_427284, EPI_ISL_427285, EPI_ISL_427286, EPI_ISL_427287, EPI_ISL_437361, EPI_ISL_437362, EPI_ISL_437363, EPI_ISL_450748, EPI_ISL_450749, EPI_ISL_450750, EPI_ISL_450751, EPI_ISL_450752, EPI_ISL_450753, EPI_ISL_450754, EPI_ISL_450755, EPI_ISL_450756, EPI_ISL_450757, EPI_ISL_450758, EPI_ISL_450759, EPI_ISL_450760, EPI_ISL_450761, EPI_ISL_450762, EPI_ISL_450763, EPI_ISL_450764, EPI_ISL_450765, EPI_ISL_450766, EPI_ISL_450767, EPI_ISL_450768, EPI_ISL_450769, EPI_ISL_450770, EPI_ISL_450771, EPI_ISL_450772, EPI_ISL_450773, EPI_ISL_450774, EPI_ISL_450775, EPI_ISL_450776, EPI_ISL_450777, EPI_ISL_450778, EPI_ISL_450779, EPI_ISL_450780, EPI_ISL_460045, EPI_ISL_460046, EPI_ISL_460047, EPI_ISL_460048, EPI_ISL_460049, EPI_ISL_460050, EPI_ISL_460051, EPI_ISL_460052, EPI_ISL_460053, EPI_ISL_460054, EPI_ISL_460055, EPI_ISL_460056, EPI_ISL_460057, EPI_ISL_460058, EPI_ISL_460059, EPI_ISL_460060, EPI_ISL_460061, EPI_ISL_460062, EPI_ISL_460063, EPI_ISL_460064, EPI_ISL_460065, EPI_ISL_460066, EPI_ISL_460067, EPI_ISL_460068, EPI_ISL_460069, EPI_ISL_460070, EPI_ISL_460071, EPI_ISL_460072, EPI_ISL_460073, EPI_ISL_460075, EPI_ISL_460076, EPI_ISL_460077, EPI_ISL_460078, EPI_ISL_482988, EPI_ISL_482989, EPI_ISL_482990, EPI_ISL_482991, EPI_ISL_482992, EPI_ISL_482993, EPI_ISL_482994, EPI_ISL_482995, EPI_ISL_482996, EPI_ISL_482997, EPI_ISL_482998, EPI_ISL_482999, EPI_ISL_483000, EPI_ISL_483001, EPI_ISL_483002, EPI_ISL_483003, EPI_ISL_483004, EPI_ISL_483005, EPI_ISL_483006, EPI_ISL_483007, EPI_ISL_483008, EPI_ISL_483009, EPI_ISL_483010, EPI_ISL_483011, EPI_ISL_483012, EPI_ISL_483013, EPI_ISL_483014, EPI_ISL_483015, EPI_ISL_483016, EPI_ISL_483017, EPI_ISL_495610, EPI_ISL_495611, EPI_ISL_495612, EPI_ISL_495613, EPI_ISL_495614, EPI_ISL_495615, EPI_ISL_495616, EPI_ISL_495617, EPI_ISL_495618, EPI_ISL_495619, EPI_ISL_495620, EPI_ISL_495621, EPI_ISL_495622, EPI_ISL_495623, EPI_ISL_495624, EPI_ISL_495625, EPI_ISL_495626, EPI_ISL_495627, EPI_ISL_495628, EPI_ISL_496919, EPI_ISL_496920, EPI_ISL_496921, EPI_ISL_496922, EPI_ISL_496923, EPI_ISL_496924, EPI_ISL_496925, EPI_ISL_496926, EPI_ISL_496927, EPI_ISL_496928, EPI_ISL_496929, EPI_ISL_496930, EPI_ISL_507973, EPI_ISL_507974, EPI_ISL_507975, EPI_ISL_507976, EPI_ISL_507977, EPI_ISL_507978, EPI_ISL_507979, EPI_ISL_507980, EPI_ISL_507981, EPI_ISL_507982, EPI_ISL_507983, EPI_ISL_514658, EPI_ISL_514659, EPI_ISL_514660, EPI_ISL_514661, EPI_ISL_514662, EPI_ISL_514663, EPI_ISL_514664, EPI_ISL_514665, EPI_ISL_514666, EPI_ISL_514667, EPI_ISL_514668, EPI_ISL_514669, EPI_ISL_514670, EPI_ISL_514671, EPI_ISL_514672, EPI_ISL_515269, EPI_ISL_530222, EPI_ISL_530223, EPI_ISL_530224			
see above	Minnesota Department of Health, Public Health Laboratory	Minnesota Department of Health, Public Health Laboratory	Jacob Garfin; Jacob Garfin and Xiong Wang; Jake Garfin and Xiong Wang; Matt Plumb; Xiong Wang; and Xiong Wang
EPI_ISL_1362552, EPI_ISL_1362553, EPI_ISL_1362554, EPI_ISL_1362555, EPI_ISL_1362556, EPI_ISL_1362558, EPI_ISL_1362559, EPI_ISL_1362560, EPI_ISL_1362561, EPI_ISL_1362562, EPI_ISL_1362563, EPI_ISL_1362564, EPI_ISL_1362566, EPI_ISL_1362567, EPI_ISL_1362568, EPI_ISL_1362569, EPI_ISL_1362570, EPI_ISL_1362571, EPI_ISL_1362572, EPI_ISL_1362573, EPI_ISL_1362574, EPI_ISL_1362575, EPI_ISL_1362579, EPI_ISL_1362580, EPI_ISL_1362581, EPI_ISL_1362583, EPI_ISL_1362584, EPI_ISL_1362585, EPI_ISL_1362588, EPI_ISL_1362591, EPI_ISL_1362592, EPI_ISL_1362593, EPI_ISL_1362594			
see above	Missouri State Public Health Laboratory	Missouri State Public Health Laboratory	Ashley New; Joshua Barry; Matthew Sinn
EPI_ISL_458079	Mitra Keluarga Hospital Kenjeran	Institute of Tropical Disease, Universitas Airlangga	Aldise M Nastri; Anastasia W Jefuna; Gatot Soegiarto; Jezzy R Dewantari; Kazufumi Shimizu; Krisnoadi Rahardjo; Laksmi Wulandari; Maria I Lusida; Mitsuhiro Nishimura; Resti Yudhawati; Retno A Setyoningrum; Rima R Prasetya; Soetjipto; Yasuko Mori; Yohko K Shimizu
EPI_ISL_435119	Mohammed Bin Rashid University of Medicine and Health Sciences	Al Jalila Children's Hospital	Abdulmajeed Alkhaja; Abiola Catherine Senok; Ahmad Abou Tayoun; Alawi Alsheikh-Ali; Divinlal Harilal; Hamda Khansaheb; Hanan Al Suwaidi; Mohammed Uddin; Norbert Nowotny; Qutayba Hamid; Rabih Halwani; Rifat Hamoudi; Rupa Murthy Varghese; Sathishkumar Ramaswamy; Tom Loney; Zulfa Omar Deesi
EPI_ISL_435120, EPI_ISL_435121, EPI_ISL_435122, EPI_ISL_435123, EPI_ISL_435124, EPI_ISL_435125, EPI_ISL_435126, EPI_ISL_435127, EPI_ISL_435128, EPI_ISL_435129, EPI_ISL_435130, EPI_ISL_435131, EPI_ISL_435132, EPI_ISL_435133, EPI_ISL_435134, EPI_ISL_435135, EPI_ISL_435136, EPI_ISL_435137, EPI_ISL_435138, EPI_ISL_435139, EPI_ISL_435140, EPI_ISL_435141, EPI_ISL_435142, EPI_ISL_435143, EPI_ISL_463740, EPI_ISL_469276, EPI_ISL_469278, EPI_ISL_469279, EPI_ISL_469280, EPI_ISL_469281, EPI_ISL_520719, EPI_ISL_520720, EPI_ISL_520721, EPI_ISL_520722, EPI_ISL_520723, EPI_ISL_520724, EPI_ISL_520725, EPI_ISL_520726, EPI_ISL_520727, EPI_ISL_520728, EPI_ISL_520743			
see above	Mohammed Bin Rashid University of Medicine and Health Sciences	Al Jalila Genomics Center	Abdulmajeed Alkhaja; Abiola Catherine Senok; Ahmad Abou Tayoun; Alawi Alsheikh-Ali; Divinlal Harilal; Hamda Khansaheb; Hanan Al Suwaidi; Mohammed Uddin; Norbert Nowotny; Qutayba Hamid; Rabih Halwani; Rifat Hamoudi; Rupa Murthy Varghese; Sathishkumar Ramaswamy; Tom Loney; Zulfa Omar Deesi
EPI_ISL_421573	Molecular Diagnostic Services	KRISP, KZN Research Innovation and Sequencing Platform	Chimukangara B; Deforche K; Giandhari J; Lessells R; Ngcapu S; Pillay S; Samsunder N; Tegally H; Wilkinson E; de Oliveira T
EPI_ISL_467431, EPI_ISL_467444, EPI_ISL_467446	Molecular Diagnostics Services (MDS)	KRISP, KZN Research Innovation and Sequencing Platform	Chimukangara B; Giandhari J; Khan S; Lessells R; Mdlalose K; Pillay S; Tegally H; Wilkinson E; York D; de Oliveira T
EPI_ISL_444455, EPI_ISL_444519	Molecular Infectious Disease	Molecular Infectious Disease	Anderson; B.P.; Gerasimova, A.; Kagan; R.M. and Owen, R.; Rosenthal; S.H.
EPI_ISL_681673	Molecular Medicine Laboratory, University of Magallanes	Centro Asistencial Docente y de Investigacion, Universidad de Magallanes	Diego Alvarez; Hermy Alvarez; Jacqueline Aldridge; Jorge González; Marcelo Navarrete; Marco Montes de Oca; Roberto Uribe-Paredes
EPI_ISL_884532, EPI_ISL_884533, EPI_ISL_884534, EPI_ISL_884535, EPI_ISL_884536, EPI_ISL_884538, EPI_ISL_884539, EPI_ISL_884541, EPI_ISL_884542, EPI_ISL_884543, EPI_ISL_884546, EPI_ISL_884547, EPI_ISL_884548, EPI_ISL_884549, EPI_ISL_884552, EPI_ISL_884554, EPI_ISL_884555, EPI_ISL_884556, EPI_ISL_884568, EPI_ISL_884570, EPI_ISL_884571, EPI_ISL_884573, EPI_ISL_884576			
see above	Molecular Microbiology & Immunology, University of Missouri	Molecular Microbiology & Immunology, University of Missouri	C.Y.; G.M.; Hang, J.; Li, T.; Lidl; Tang; Wan; X.-F.
EPI_ISL_943808	Molecular Pathology, Pathology and Laboratory Medicine Institute, Cleveland Clinic, Ohio, USA	Molecular Pathology, Pathology and Laboratory Medicine Institute, Cleveland Clinic, Ohio, USA	Brian P. Rubin; Daniel H. Farkas; Frank P. Esper; Gary Procop; Jennifer Ko; Jing Li; Thamali M. Adhikari; Timothy A. Chan; Yu-Wei Cheng; Zheng Jin Tu
EPI_ISL_451306, EPI_ISL_451307, EPI_ISL_451308, EPI_ISL_451309, EPI_ISL_460079, EPI_ISL_460080, EPI_ISL_460081, EPI_ISL_460082, EPI_ISL_460083, EPI_ISL_460084, EPI_ISL_460085, EPI_ISL_460086, EPI_ISL_460087, EPI_ISL_460088, EPI_ISL_460089, EPI_ISL_460090, EPI_ISL_460091, EPI_ISL_460092, EPI_ISL_460093, EPI_ISL_460094, EPI_ISL_460095			
see above	Molecular Virology Unit, Fondazione IRCCS Policlinico San Matteo , Pavia	Laboratory of Virology, INMI Lazzaro Spallanzani IRCCS	Antonino Di Caro; Antonio Piralla; Barbara Bartolini; Cesare E.M. Gruber; Fausto Baldanti; Maria R. Capobianchi; Martina Rueca
EPI_ISL_895728, EPI_ISL_895731, EPI_ISL_895732, EPI_ISL_895733, EPI_ISL_895734, EPI_ISL_895735, EPI_ISL_895736, EPI_ISL_895738, EPI_ISL_895741, EPI_ISL_895742, EPI_ISL_895743, EPI_ISL_895744, EPI_ISL_895747, EPI_ISL_895750, EPI_ISL_895751, EPI_ISL_895752, EPI_ISL_895757, EPI_ISL_895759, EPI_ISL_895761, EPI_ISL_895762, EPI_ISL_895763, EPI_ISL_895766, EPI_ISL_895770, EPI_ISL_895771, EPI_ISL_895774, EPI_ISL_895775, EPI_ISL_895776, EPI_ISL_895778, EPI_ISL_895779, EPI_ISL_895780, EPI_ISL_895781, EPI_ISL_895782, EPI_ISL_895783, EPI_ISL_895784, EPI_ISL_895785, EPI_ISL_895786, EPI_ISL_895790, EPI_ISL_895791, EPI_ISL_895794, EPI_ISL_895795, EPI_ISL_895798, EPI_ISL_895799, EPI_ISL_895800, EPI_ISL_895805, EPI_ISL_895806, EPI_ISL_895807, EPI_ISL_895810, EPI_ISL_895811, EPI_ISL_895815, EPI_ISL_895817, EPI_ISL_895821, EPI_ISL_895823, EPI_ISL_895824, EPI_ISL_895825, EPI_ISL_895826, EPI_ISL_895828, EPI_ISL_895829, EPI_ISL_895830, EPI_ISL_895832, EPI_ISL_895833, EPI_ISL_895835, EPI_ISL_895837, EPI_ISL_895838, EPI_ISL_895839, EPI_ISL_895840, EPI_ISL_895842, EPI_ISL_895843, EPI_ISL_895847			
see above	Molecular biology division, Institute of Clinical Biochemistry	Molecular biology division, Institute of Clinical Biochemistry	Helena Kovalková; Ivana Baranová; Jitka Novotná; Kateina Hrochová; Kateina Pehliková; Petr Brož; Tereza Baková; Vladimír Palika. Cooperation project

	and Diagnostics, Charles University, Faculty of Medicine in Hradec Králové and University Hospital Hradec Králové	and Diagnostics, Charles University, Faculty of Medicine in Hradec Králové and University Hospital Hradec Králové	with BioVendor-R&D and bioinformatics company BIOXSYS s r.o.
EPI_ISL_460096, EPI_ISL_460604, EPI_ISL_460605, EPI_ISL_462149, EPI_ISL_462150, EPI_ISL_467774, EPI_ISL_467775, EPI_ISL_470539, EPI_ISL_479620, EPI_ISL_479621, EPI_ISL_479622, EPI_ISL_479624, EPI_ISL_486815, EPI_ISL_486816, EPI_ISL_486817, EPI_ISL_486818, EPI_ISL_486819, EPI_ISL_486820, EPI_ISL_486821, EPI_ISL_486822, EPI_ISL_486823, EPI_ISL_486824, EPI_ISL_486825, EPI_ISL_486826, EPI_ISL_534347, EPI_ISL_534348, EPI_ISL_534349, EPI_ISL_610237, EPI_ISL_610238			
see above	Molecular diagnostic laboratory of Federal Budget Institution of Science "Central Research Institute of Epidemiology" of The Federal Service on Customers' Rights Protection and Human Well-being Surveillance	Group of Genomics and Postgenomic Technologies of Central Research Institute of Epidemiology	Akimkin VG; Bukharina AY; Bulanenko VP; Kaptelova VV; Korneenko EV; Samoilov AE; Shipulina OY; Sizova TV; Speranskaya AS; Tivanova EV; Valdokhina AV
EPI_ISL_826641, EPI_ISL_826642, EPI_ISL_826643, EPI_ISL_826644, EPI_ISL_826645, EPI_ISL_826646	Montefiore Medical Center	Albert Einstein College of Medicine, Dept. of Microbiology & Immunology, Chandran lab	Amy S. Fox; Ariel S. Wirchnianski; Aviv Bergman; Catalina Florez; D. Yitzchak Goldstein; David L. Goldman; Denise Haslwanter; Ethan Laudermilch; Hnin Khine; J. Maximilian Fels; Jason Barnhill; Johanna P. Daily; Karin A. Skalina; Kartik Chandran; Libusha Kelly; Lucia R. Wolgast; M. Eugenia Dieterle; Robert H. Bortz III; Rohit K. Jangra; Ryan Forster; Saad Khan; Suriksha Sirichand; Wendy Szymczak; William B. Mitchell
EPI_ISL_631513, EPI_ISL_631560, EPI_ISL_631561, EPI_ISL_631982, EPI_ISL_632111	Montefiore Medical Center	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_426883, EPI_ISL_426884, EPI_ISL_426885, EPI_ISL_426886, EPI_ISL_426887, EPI_ISL_426888, EPI_ISL_426890, EPI_ISL_426891, EPI_ISL_426892, EPI_ISL_426893, EPI_ISL_426894, EPI_ISL_426895, EPI_ISL_426896, EPI_ISL_426897, EPI_ISL_889307, EPI_ISL_889308			
see above	Motol University Hospital	Institute of Applied Biotechnologies a.s.	Adam Novotný; Jan Geryk; Kateina Kvapilová; Martin Kašný; Milan Macek; Ondej Brzo; Pavel Devinek; Petr Brož; Petr Klempt; Petr Kvapil
EPI_ISL_631512, EPI_ISL_631525, EPI_ISL_631532, EPI_ISL_631534, EPI_ISL_631537, EPI_ISL_631549, EPI_ISL_631764, EPI_ISL_631785, EPI_ISL_631786, EPI_ISL_631830, EPI_ISL_631914, EPI_ISL_631983			
see above	Mount Sinai Hospital	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_632101, EPI_ISL_632102	Mount Sinai Queens	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_631880	Mount Sinai West	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_424871, EPI_ISL_424872, EPI_ISL_424873, EPI_ISL_426428, EPI_ISL_452124, EPI_ISL_452126	NC State Laboratory of Public Health	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Montmayeur; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao; Zachary Weiner
EPI_ISL_424874, EPI_ISL_424875	NE Public Health Laboratory	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_420791, EPI_ISL_420792	NH Department of Health and Human Services Public Health Labs	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anne Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jasmine Padilla; Jing Zhang; Justin Lee; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_424876, EPI_ISL_424877	NH Dept. of Health and Human Services Public Health Labs	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_411950, EPI_ISL_411952, EPI_ISL_411953	NHC Key laboratory of Enteric Pathogenic Microbiology, Institute of Pathogenic Microbiology	Jiangsu Provincial Center for Disease Control & Prevention	Baoli Zhu; Bin Wu; Fengcai Zhu; Kangchen Zhao; Lunbiao Cui; Ming Wu; Tao Wu; Xiaojuan Zhu; Yin Chen; Yiyue Ge
EPI_ISL_467441, EPI_ISL_467442, EPI_ISL_467443	NHLS-IALCH	KRISP, KZN Research Innovation and Sequencing Platform	Chimukangara B; Giandhari J; Khan S; Lessells R; Mdlalose K; Pillay S; Tegally H; Wilkinson E; York D; de Oliveira T
EPI_ISL_632242, EPI_ISL_632247, EPI_ISL_632248, EPI_ISL_632249	NHSGGC West of Scotland Specialist Virology Centre	MRC-University of Glasgow Centre for Virus Research	Alasdair MacLean; Alex Alderton; Ana da Silva Filipe; Antonia Ho; Cordelia Langford; Daniel Mair; David K. Jackson; David L Robertson; Dominic Kwiatkowski; Emma Thomson; Ewan Harrison; Ian Johnston; James Shepherd; Jenna Nichols; John Sillitoe on behalf of the Wellcome Sanger Institute COVID-19 Surveillance Team (http://www.sanger.ac.uk/covid-team); Joseph Hughes; Kathy Li; Kathy Smollett; Kyriaki Nomikou; Lily Tong; Natasha Jesudason; Natasha Johnson; Rajiv Shah; Richard Orton; Roberto Amato; Rory Gunson; Sonia Goncalves; Sreenu Vattipally; Stephen Carmichael
EPI_ISL_459506, EPI_ISL_459508, EPI_ISL_459509, EPI_ISL_459510, EPI_ISL_459513, EPI_ISL_459514, EPI_ISL_459517, EPI_ISL_459518, EPI_ISL_459519, EPI_ISL_459520, EPI_ISL_459521, EPI_ISL_459522, EPI_ISL_459524, EPI_ISL_459525, EPI_ISL_459526, EPI_ISL_459527, EPI_ISL_459528, EPI_ISL_459529, EPI_ISL_459530, EPI_ISL_459532, EPI_ISL_459533, EPI_ISL_459534, EPI_ISL_459535, EPI_ISL_459536, EPI_ISL_459538, EPI_ISL_459539, EPI_ISL_459542, EPI_ISL_459544, EPI_ISL_459546, EPI_ISL_459547, EPI_ISL_459548, EPI_ISL_459550, EPI_ISL_459552, EPI_ISL_459555, EPI_ISL_459556, EPI_ISL_459557, EPI_ISL_459558, EPI_ISL_459559, EPI_ISL_459560, EPI_ISL_459561, EPI_ISL_459562, EPI_ISL_459563, EPI_ISL_459565, EPI_ISL_459566, EPI_ISL_459568, EPI_ISL_459569, EPI_ISL_459572, EPI_ISL_459574, EPI_ISL_459575, EPI_ISL_459577, EPI_ISL_459578, EPI_ISL_459580, EPI_ISL_459581, EPI_ISL_459583, EPI_ISL_459584, EPI_ISL_459586, EPI_ISL_459587, EPI_ISL_459589, EPI_ISL_459590, EPI_ISL_459591, EPI_ISL_459593, EPI_ISL_459594, 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see above	NHSGGC West of Scotland Specialist Virology Centre / MRC-University of Glasgow Centre for Virus Research	Wellcome Sanger Institute for the COVID-19 Genomics UK (COG-UK) consortium	Alasdair MacLean; Alice Broos; Ana da Silva Filipe; Antonia Ho; Cordelia Langford; Daniel Mair; David K. Jackson; David L Robertson; Dominic Kwiatkowski; Elihu Aranday-Cortes; Emma Thomson and Alex Alderton; Ewan Harrison; Ian Johnston; James Shepherd; Jenna Nichols; John Sillitoe on behalf of the Wellcome Sanger Institute COVID-19 Surveillance Team (http://www.sanger.ac.uk/covid-team); Joseph Hughes; Kathy Li; Kathy Smollett; Kirstyn Brunker; Kyriaki Nomikou; Lily Tong; Marc Niebel; Natasha Jesudason; Natasha Johnson; Patawee Asamaphan; Rajiv Shah; Richard Orton; Roberto Amato; Rory Gunson; Sarah McDonald; Sonia Goncalves; Sreenu Vattipally; Stephen Carmichael; Yasmin Parr
EPI_ISL_418241, EPI_ISL_418242, EPI_ISL_420037	NIC Viral Respiratory Unit - Institut Pasteur of Algeria	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Etienne Simon-Lorière; Fawzi Derrar; Flora Donati; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_452202, EPI_ISL_452203, EPI_ISL_452204, EPI_ISL_452205, EPI_ISL_452206, EPI_ISL_452213, EPI_ISL_454525, EPI_ISL_454526, EPI_ISL_454527, EPI_ISL_454528, EPI_ISL_454529, EPI_ISL_454530, EPI_ISL_454531, EPI_ISL_454532, EPI_ISL_454533, EPI_ISL_454534, EPI_ISL_454536, EPI_ISL_454537, EPI_ISL_454542, EPI_ISL_454543, EPI_ISL_454565			
see above	NIV Influenza	NIV Influenza	Potdar V
EPI_ISL_450323, EPI_ISL_450324, EPI_ISL_450325	NIV Pune	CSIR-Centre for Cellular and Molecular Biology	A. Awhale; A. Gondhalikar; A. Jagtap; Archana Bharadwaj Siva; B. Minhas S. Bharadwaj; Deepak Kumar; Devi Prasad Vijayashankara; Dhiviya Vedagiri; Disha Nanda; Divya Das; Divya Gupta; Dr ML Choudhary; Dr Priya Abraham; Dr V A Potdar; G. Aditya Kumar; Gangumala Srinivas Reddy; H Kaushal Y. Gurav; H. Kengle; Jotin Goggoi; K. Patel; Karthik Bharadwaj Tallapaka; Koushick Sivakumar; Krishnan Harinivas Harshan; Lamuk Zaveri; M. Kakade; Manish; Manish Bhattacharjee; N Srivastava; Namami Gaur; P Shinde; P. Malsane; Payel Mukherjee; Pooja Ramesh Gupta; Priya Singh; Purushotham Vodnala; R. Gunjikar; Rajan Kumar Jha; Rakesh K Mishra; Ravi Prasad Mukku; Renu Sudhakar; S. Bhorekar; S. Digraskar; S. Hundekar; S. Jadhav; S. Salve; S. Tomar; Sakshi Shambhavi; Santosh Kumar Kuncha; Shagufta Khan; Shraddha Vijay Lahoti; Sofia Banu; Someish Gorde; Sujoy Deb; Swati Bayyana; Tulasi Nagabandi; U. Saha; V Malik; V. Awtade; V. Vipat; Vishal Sah; Yogesh Balakartik; Zeba Rizvi
EPI_ISL_424878, EPI_ISL_424901, EPI_ISL_452116, EPI_ISL_452117	NJ Public Health and Environmental Laboratories	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Montmayeur; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao; Zachary Weiner

EPI_ISL_960309, EPI_ISL_960310, EPI_ISL_960311, EPI_ISL_965184	NLZOH, Laboratory for Virology	NLZOH, Laboratory for Virology	Cesare Camma (IZSAM); Erik Alm (ECDC); Katarina Prosenc (Laboratory for Virology)
EPI_ISL_452109	NM Department of Health	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Montmayeur; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao; Zachary Weiner
EPI_ISL_812199, EPI_ISL_812200	NM Dept. Health, Scientific Laboratory Division	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Anna Montmayeur; Anna Uehara; Brian Lynch; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Peter Cook; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_416742, EPI_ISL_416743	NRL for Influenza, Centrum Epidemiology and Microbiology of National Institute of Public Health, Czech Republic	Charite Universitaetsmedizin Berlin, Institute of Virology	Alexander Nagy; Barbara Muehlemann; Christian Drosten; Dusan Trnka; Helena Jirincova; Jaromira Vecerova; Jorn Beheim-Schwarzbach; Julia Schneider; Ludmila Novakova; Talitha Veith; Terry Jones; Victor M Corman
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EPI_ISL_426429	NV State Public Health Laboratory	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_424879	NV-Southern Nevada Public Health Laboratory	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_631541, EPI_ISL_631572, EPI_ISL_631862, EPI_ISL_632039, EPI_ISL_632062, EPI_ISL_632074	NYC Department Of Health And Mental Hygiene	New York City Public Health Laboratory	Jade Wang; et al.
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see above	NYC Department of Health and Mental Hygiene	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Montmayeur; Anna Uehara; Anne Uehara; Bettina Bankamp; Brian Lynch; Christopher A. Elkins; Christy Harrison; Clinton R. Paden; Haibin Wang; Jasmine Padilla; Jennifer Rakeman; Jing Zhang; Justin Lee; Krista Queen; Mary S. Keckler; Peter Cook; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao; Zachary Weiner
EPI_ISL_631974	NYC HH Coney Island Hospital	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_631564	NYC HH Elmhurst Hospital Medical Center	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_631556	NYC HH Jacobi Medical Center	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_631520, EPI_ISL_631557, EPI_ISL_631577, EPI_ISL_631584, EPI_ISL_631587, EPI_ISL_631603, EPI_ISL_631607, EPI_ISL_631752, EPI_ISL_631753, EPI_ISL_631754, EPI_ISL_631827, EPI_ISL_632026, EPI_ISL_632072, EPI_ISL_632116, EPI_ISL_632131, EPI_ISL_632146, EPI_ISL_632147, EPI_ISL_632177, EPI_ISL_632186, EPI_ISL_632187, EPI_ISL_632192, EPI_ISL_632193, EPI_ISL_632235			
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EPI_ISL_632060	NYC HH Queens Hospital Center	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_594457	NYS Department of Health	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Anna Uehara; Clinton Paden; Haibin Wang; Jing Zhang; Julu Bhatnagar; Krista Queen; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_416830, EPI_ISL_416831, EPI_ISL_416832, EPI_ISL_418192, EPI_ISL_418193, EPI_ISL_418196, EPI_ISL_418197, EPI_ISL_418198, EPI_ISL_418199, EPI_ISL_418200, EPI_ISL_418203, EPI_ISL_418204, EPI_ISL_418972, EPI_ISL_418973, EPI_ISL_418974, EPI_ISL_418975, EPI_ISL_418976, EPI_ISL_418977, EPI_ISL_418978, EPI_ISL_418979, EPI_ISL_418980			
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EPI_ISL_419696, EPI_ISL_419697, EPI_ISL_419698, EPI_ISL_419699, EPI_ISL_419700, EPI_ISL_419702, EPI_ISL_419703, EPI_ISL_419704, EPI_ISL_419705, EPI_ISL_420296, EPI_ISL_420297, EPI_ISL_420298, EPI_ISL_420299, EPI_ISL_420300, EPI_ISL_420301, EPI_ISL_420302, EPI_ISL_420307, EPI_ISL_420308, EPI_ISL_420309, EPI_ISL_420570, EPI_ISL_420571, EPI_ISL_420572, EPI_ISL_420573, EPI_ISL_420575, EPI_ISL_420576, EPI_ISL_420577, EPI_ISL_420578, EPI_ISL_420579, EPI_ISL_420580, EPI_ISL_420581, EPI_ISL_420582, EPI_ISL_420585, EPI_ISL_420586, EPI_ISL_420587, EPI_ISL_420588, EPI_ISL_420589, EPI_ISL_420590, EPI_ISL_420591, EPI_ISL_421577, EPI_ISL_421578, EPI_ISL_421579, EPI_ISL_421580, EPI_ISL_421581, EPI_ISL_421582, EPI_ISL_421583, EPI_ISL_421584, EPI_ISL_421585, EPI_ISL_421586, EPI_ISL_421587, EPI_ISL_421588, EPI_ISL_421589, EPI_ISL_421590, EPI_ISL_421591, EPI_ISL_421592, EPI_ISL_421706, EPI_ISL_421707, EPI_ISL_421709, EPI_ISL_421710, EPI_ISL_421711, EPI_ISL_421712, EPI_ISL_421714, EPI_ISL_421715, EPI_ISL_421717, EPI_ISL_421718, EPI_ISL_421719, EPI_ISL_421720, EPI_ISL_421721, EPI_ISL_421722, EPI_ISL_421723, EPI_ISL_421724, EPI_ISL_421725, EPI_ISL_421726, EPI_ISL_421727, EPI_ISL_421728, EPI_ISL_421729, EPI_ISL_421730, EPI_ISL_421731, EPI_ISL_421732, EPI_ISL_421733, EPI_ISL_424929, EPI_ISL_427515, EPI_ISL_427516, EPI_ISL_427518, EPI_ISL_427519, EPI_ISL_427520, EPI_ISL_427521, EPI_ISL_427629, EPI_ISL_428757, EPI_ISL_430326, EPI_ISL_430327, EPI_ISL_430328, EPI_ISL_430329, EPI_ISL_430330, EPI_ISL_430331, EPI_ISL_430333, EPI_ISL_430334, EPI_ISL_430335, EPI_ISL_430336, EPI_ISL_430337, EPI_ISL_430338, EPI_ISL_430339, EPI_ISL_430340, EPI_ISL_430341, EPI_ISL_430342, EPI_ISL_430343, EPI_ISL_430344, EPI_ISL_430345, EPI_ISL_430346, EPI_ISL_430347, EPI_ISL_430348, EPI_ISL_430349, EPI_ISL_430351, EPI_ISL_435475, EPI_ISL_435476, EPI_ISL_435477, EPI_ISL_435478, EPI_ISL_435479, EPI_ISL_435480, EPI_ISL_435481, EPI_ISL_435482, EPI_ISL_435483, EPI_ISL_435484, EPI_ISL_435485, EPI_ISL_435486, EPI_ISL_435489, EPI_ISL_444616, EPI_ISL_444617, EPI_ISL_444618, EPI_ISL_444619, EPI_ISL_444620, EPI_ISL_444621, EPI_ISL_444622, EPI_ISL_444623, EPI_ISL_444624, EPI_ISL_444625, EPI_ISL_444626, EPI_ISL_444627, EPI_ISL_444628, EPI_ISL_444629, EPI_ISL_444630, EPI_ISL_444631, EPI_ISL_444632, EPI_ISL_444633, EPI_ISL_444634, EPI_ISL_444635, EPI_ISL_444636, EPI_ISL_444637, EPI_ISL_444638, EPI_ISL_444639, EPI_ISL_444640, EPI_ISL_444641, EPI_ISL_444642, EPI_ISL_444643, EPI_ISL_444644, EPI_ISL_444645, EPI_ISL_444646, EPI_ISL_444647, EPI_ISL_444648, EPI_ISL_444650, EPI_ISL_444651, EPI_ISL_444652, EPI_ISL_444653, EPI_ISL_444654, EPI_ISL_444655, EPI_ISL_444656, EPI_ISL_444657, EPI_ISL_444658, EPI_ISL_444659, EPI_ISL_444660, EPI_ISL_444661, EPI_ISL_444662, EPI_ISL_444663, EPI_ISL_444664, EPI_ISL_444665, EPI_ISL_444666, EPI_ISL_444667, EPI_ISL_444668, EPI_ISL_444669, EPI_ISL_444670, EPI_ISL_444671, EPI_ISL_444673, EPI_ISL_444675, EPI_ISL_444677, EPI_ISL_444678, EPI_ISL_444679, EPI_ISL_444680, EPI_ISL_444681, EPI_ISL_444682, EPI_ISL_444683, EPI_ISL_444684, EPI_ISL_444685, EPI_ISL_444686, EPI_ISL_444687, EPI_ISL_444688, EPI_ISL_444690, EPI_ISL_444691, EPI_ISL_444692, EPI_ISL_444693, EPI_ISL_444694, EPI_ISL_444695, EPI_ISL_444696, EPI_ISL_444697, EPI_ISL_444698, EPI_ISL_444699, EPI_ISL_444700, EPI_ISL_444701, EPI_ISL_444702, EPI_ISL_444703, EPI_ISL_444704, EPI_ISL_444705, EPI_ISL_444706, EPI_ISL_444765, EPI_ISL_444773, EPI_ISL_444774, EPI_ISL_444775, EPI_ISL_444776, EPI_ISL_444777, EPI_ISL_444780, EPI_ISL_444781, EPI_ISL_444782, EPI_ISL_444784, EPI_ISL_444786, EPI_ISL_444788, EPI_ISL_444789, EPI_ISL_444790, EPI_ISL_444791, EPI_ISL_450393, EPI_ISL_450394, EPI_ISL_450396, EPI_ISL_450397, EPI_ISL_450398, EPI_ISL_450399, EPI_ISL_451401, EPI_ISL_451402, EPI_ISL_451404, EPI_ISL_451405, EPI_ISL_451406, EPI_ISL_451407, EPI_ISL_451408, EPI_ISL_451409, EPI_ISL_451410, EPI_ISL_451411, EPI_ISL_451412, EPI_ISL_451413, EPI_ISL_451414, EPI_ISL_451415, EPI_ISL_451416, EPI_ISL_451417, EPI_ISL_451418, EPI_ISL_451419, EPI_ISL_451420, EPI_ISL_451421, EPI_ISL_451422, EPI_ISL_451423, EPI_ISL_451424, EPI_ISL_451426, EPI_ISL_451427, EPI_ISL_451428, EPI_ISL_451429, EPI_ISL_451430, EPI_ISL_451431, EPI_ISL_451432, EPI_ISL_451434, EPI_ISL_451435, EPI_ISL_451436, EPI_ISL_451437, EPI_ISL_451438, EPI_ISL_451439, EPI_ISL_451440,			

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EPI_ISL_631515, EPI_ISL_631523, EPI_ISL_631526, EPI_ISL_631527, EPI_ISL_631531, EPI_ISL_631558, EPI_ISL_631559, EPI_ISL_632043, EPI_ISL_632044, EPI_ISL_632067, EPI_ISL_632076, EPI_ISL_632079			
see above	NYU Langone Health	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_479997, EPI_ISL_479998, EPI_ISL_479999, EPI_ISL_480000, EPI_ISL_480001	Nagano Environmental Conservation Research Institute	Pathogen Genomics Center, National Institute of Infectious Diseases	Hajime Kamiya; Kentaro Itokawa; Makoto Kuroda; Masanori Hashino; Motoi Suzuki; Naoko Shimodaira; Rina Tanaka; Tsuyoshi Sekizuka
EPI_ISL_480003	Nagasaki Prefectural Institute for Environmental Research and Public Health	Pathogen Genomics Center, National Institute of Infectious Diseases	Fumiaki Matsumoto; Hajime Kamiya; Kentaro Itokawa; Makoto Kuroda; Masanori Hashino; Motoi Suzuki; Rina Tanaka; Tsuyoshi Sekizuka
EPI_ISL_480042, EPI_ISL_480043, EPI_ISL_480044, EPI_ISL_480045, EPI_ISL_480046, EPI_ISL_480047, EPI_ISL_480048, EPI_ISL_480049, EPI_ISL_480050, EPI_ISL_480051, EPI_ISL_480052, EPI_ISL_480053, EPI_ISL_480054, EPI_ISL_480055, EPI_ISL_480056, EPI_ISL_480057, EPI_ISL_480058, EPI_ISL_480059, EPI_ISL_480060, EPI_ISL_480061, EPI_ISL_480062, EPI_ISL_480063, EPI_ISL_480064			
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EPI_ISL_862859	Nara Medical University Hospital	Fujita health University, School of Medicine, Department of Microbiology	Masahiro suzuki; Yohei Doi
EPI_ISL_452229, EPI_ISL_452230	Narhalsan Backa vardcentral	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Karin Tegmark-Wisell; Maria Lind Karlberg; Mats Olsson; Mia Brytting; Olov Svartstrom; Oskar Karlsson Lindsjo; Theresa Enkirch
EPI_ISL_445224	Narhalsan Olskroken VC	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Karin Tegmark-Wisell; Mahin Ghoroghi; Maria Lind Karlberg; Mia Brytting; Olov Svartstrom; Oskar Karlsson Lindsjo; Theresa Enkirch
EPI_ISL_454572	National Center of Expertise	National Center for Expertise, Kazakhstan National Center for Biotechnology, Kazakhstan	; Abdaliyev Askar; Akhmetollayev Ilyas; Amirgazin Asylulan; Aushakhmetova Zabira; Kalendar Ruslan; Lutsay Viktoriya; Rakhmetova Akbota; Ramankulov Yerlan; Shevtsov Alexandr
EPI_ISL_454571	National Center of Expertise	National Center for Expertise, National Center for Biotechnology, Kazakhstan	; Abdaliyev Askar; Akhmetollayev Ilyas; Amirgazin Asylulan; Aushakhmetova Zabira; Kalendar Ruslan; Lutsay Viktoriya; Rakhmetova Akbota; Ramankulov Yerlan; Shevtsov Alexandr
EPI_ISL_436413, EPI_ISL_436414, EPI_ISL_436415, EPI_ISL_436417, EPI_ISL_436418, EPI_ISL_436419, EPI_ISL_436420, EPI_ISL_436421, EPI_ISL_436422			
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EPI_ISL_435060, EPI_ISL_435061, EPI_ISL_435062, EPI_ISL_435063, EPI_ISL_435064, EPI_ISL_435065, EPI_ISL_435066, EPI_ISL_435067, EPI_ISL_435068, EPI_ISL_435069, EPI_ISL_435070, EPI_ISL_435071, EPI_ISL_435072, EPI_ISL_435074, EPI_ISL_435078, EPI_ISL_435080, EPI_ISL_435081, EPI_ISL_435082, EPI_ISL_435083, EPI_ISL_435084, EPI_ISL_435085, EPI_ISL_435086, EPI_ISL_435087, EPI_ISL_435088, EPI_ISL_435090, EPI_ISL_435091, EPI_ISL_435092, EPI_ISL_435093, EPI_ISL_435094, EPI_ISL_435095, EPI_ISL_435096, EPI_ISL_435097, EPI_ISL_435099, EPI_ISL_435100, EPI_ISL_435101, EPI_ISL_435102, EPI_ISL_435103, EPI_ISL_435104, EPI_ISL_435105, EPI_ISL_435106, EPI_ISL_435108, EPI_ISL_435109, EPI_ISL_435110, EPI_ISL_435111, EPI_ISL_435112			
see above	National Centre for Disease control (NCDC), CSIR-Institute of Genomics and Integrative Biology (CSIR-IGIB)	NCDC/CSIR-IGIB	Aarti Tewari; Anurag Agrawal; Bharathram Uppili; Bibhash Nandi; Debasis Dash; Dhirendra Kumar; Hema Gogia; Hemlata Lall; Himanshu Vashisht; Mahesh Dhar; Manju Bala; Meena Datta; Mitali Mukerji; Mohammed Faruq; Nidhi Saini; Nishu Tyagi; Partha Rakshit; Pooja Sharma; Poonam Gupta; Pramod Kumar; Prateek Singh; Preeti Madan; Priyanka Singh; Rajesh Pandey; Sandhya Kabra; Saruchi Wadhwa; Satyabrata Bag; Simrita Singh; Sujeet Singh; Uma Sharma; Varun Jaiswal; Vivekanand A
EPI_ISL_407988, EPI_ISL_414378, EPI_ISL_414379, EPI_ISL_414380, EPI_ISL_420099, EPI_ISL_420100, EPI_ISL_420101, EPI_ISL_420102, EPI_ISL_420103, EPI_ISL_420104, EPI_ISL_420105, EPI_ISL_420106, EPI_ISL_420107, EPI_ISL_420108, EPI_ISL_420109, EPI_ISL_420110, EPI_ISL_420111			
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EPI_ISL_560386	National Health Laboratory	Botswana Institute for Technology Research and innovation	Dineo Emang Tshiamo. Gape Nyepetsi; Kefentse Arnold Tumedi; Madisa Mine; Maitshwarelo Ignatius Matsheka; Thongbotho Mphoyakgosi
EPI_ISL_464113, EPI_ISL_464114	National Health Laboratory Service (NHLS), Tygerberg	Division of Medical Virology, Stellenbosch University and National Health Laboratory Service (NHLS)	Bronwyn Kleinhans; Eduan Wilkindon; Gert van Zyl; Houriiyah Tegally; Kayla Delaney; Susan Engelbrecht; Tulio de Oliveira; Wolfgang Preiser
EPI_ISL_1366805	National Health Laboratory Service, South Africa	KRISP, KZN Research Innovation and Sequencing Platform	Emmanuel SJ; Giandhari J; Khan S; Laguda-Akingba O; Lessells R; Mdlalose K; Pillay S; Tegally H; Wilkinson E; York D; de Oliveira T
EPI_ISL_456600	National Health Laboratory, Timor-Leste	Microbiological Diagnostic Unit Public Health Laboratory, The Peter Doherty Institute for Infection and Immunity	Antonia da Costa, E.; Baird, R.; Barreto, I.; Caly, L.; Canisia, D.; Dakh, F.; Dolores de Jesus da Costa, M.; Douglas, N.; Francis, J.; Freeman, K.; Jayanti Pereira Tilman, A.; Marr, I.; Sait, M.; Salles de Sousa, A.; Schultz, M.; Seemann, T.; Sherry, N.; Soares da Silva, E.; Wapling, J.; Ximenes, J.
EPI_ISL_435303, EPI_ISL_435305, EPI_ISL_435308, EPI_ISL_435310, EPI_ISL_435311, EPI_ISL_435312, EPI_ISL_435313, EPI_ISL_435314, EPI_ISL_435315, EPI_ISL_435316, EPI_ISL_435317, EPI_ISL_455694, EPI_ISL_455695, EPI_ISL_455696, EPI_ISL_455697, EPI_ISL_455698, EPI_ISL_455699, EPI_ISL_455700, EPI_ISL_455701, EPI_ISL_455702, EPI_ISL_455703, EPI_ISL_455704, EPI_ISL_455705, EPI_ISL_455706, EPI_ISL_455714, EPI_ISL_511891, EPI_ISL_511892, EPI_ISL_511893, EPI_ISL_511894, EPI_ISL_511895, EPI_ISL_511896, EPI_ISL_511897			
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EPI_ISL_416031, EPI_ISL_416032, EPI_ISL_416035	National Influenza Center - Instituto Adolfo Lutz	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Adriana Bugno; Adriano Abbud; Carlos Henrique Camargo; Claudia Regina Gonçalves; Claudio Tavares Sacchi; Daniela Bernardes Borges da Silva; Erica Valessa Ramos Gomes; Fabiana Cristina Pereira dos Santos; Maria do Carmo Sampaio Tavares Timenetsky; Simone Guadagnucci Morillo; Terezinha Maria de Paiva
EPI_ISL_420551, EPI_ISL_420555, EPI_ISL_424364, EPI_ISL_424365, EPI_ISL_426179	National Influenza Center, Indian Council of Medical Research - National Institute of Virology	Indian Council of Medical Research-National Institute of Virology, Microbial Containment Complex	Amita Jain; Anita M. Shete; Anita Shete-Aich; Atanu Basu; Bharati Malhotra; Bharti Malhotra; Deepika Chaudhary; Dimpal A. Nyayanit; Gajanan Sapkal; Gururaj Deshpande; Hitesh Dighe; Lalit Dar; M Choudhary; Manohar. L. Chaudhary; Padinjaremattathil Thankappan Ullas; Pragya D. Yadav; Pragya D. Yadav. Savita Patil; Pranita Gawande; Prasad Sarkale; Priya Abraham; Sarah Cherian; Savita Patil; Sreelekshmy Mohandas; Triparna Majumdar; Varsha Potdar
EPI_ISL_416427, EPI_ISL_416428, EPI_ISL_416429, EPI_ISL_416430, EPI_ISL_416431	National Influenza Center, National Institute of Hygiene and Epidemiology (NIHE)	National Influenza Center, National Institute of Hygiene and Epidemiology (NIHE)	Dang Duc Anh; Futoshi Hasebe; Hoang Vu Mai Phuong; Kouichi Morita; Le Quynh Mai; Le Thi Thanh; Meng Ling Moi; Nguyen Le Khanh Hang; Nguyen Phuong Anh; Nguyen Vu Son; Pham Hong Quynh Anh; Pham Thi Hien; Taichiro Takemura; Takeshi Nabeshima; Tran Thu Huong; Ung Thi Hong Trang; Vuong Duc Cuong
EPI_ISL_660542	National Influenza Center, National Institute of Hygiene and Epidemiology (NIHE)	National Institute of Hygiene and Epidemiology (NIHE)	Dang Duc Anh; Futoshi Hasebe; Hoang Vu Mai Phuong; Kouichi Morita; Le Quynh Mai; Le Thi Thanh; Meng Ling Moi; Nguyen Le Khanh Hang; Nguyen Phuong Anh; Nguyen Vu Son; Pham Hong Quynh Anh; Pham Thi Hien; Taichiro Takemura; Takeshi Nabeshima; Tran Thu Huong; Ung Thi Hong Trang; Vuong Duc Cuong
EPI_ISL_862077, EPI_ISL_862078, EPI_ISL_1014677	National Influenza Center, Virology Department	National Influenza Center	A Nejati; F Ajaminejad and T Mokhtari Azad; J Yavarian; K Sadeghi; N Ghavvami; NZ Shafiei Jandaghi; V Salimi

EPI_ISL_596386	National Institute for Allergy and Infectious Diseases Integrated Research Facility - Frederick (NIAID IRF-Frederick), National Institutes of Health (NIH)	National Institute for Allergy and Infectious Diseases Integrated Research Facility - Frederick (NIAID IRF-Frederick), National Institutes of Health (NIH)	B. and Palacios, G.; Beitzel; J.R.; Kocher, G.; Kugelman
EPI_ISL_402125	National Institute for Communicable Disease Control and Prevention (ICDC) Chinese Center for Disease Control and Prevention (China CDC)	National Institute for Communicable Disease Control and Prevention (ICDC) Chinese Center for Disease Control and Prevention (China CDC)	Chen; Dai; F.-H.; Hu, Y.; J.-H.; J.-J.; J.-L. and Zhu; Liu, Y.; Pei; Q.-M.; She; Song; T.-Y.; Tao; Tian; Wang; Wang, W.; Wu, F.; Xu, L.; Y.-L.; Y.-M.; Y.-Y.; Y.-Z.; Yu, B.; Z.-G.; Z.-W.; Zhang; Zhao, S.; Zheng
EPI_ISL_417186, EPI_ISL_430297	National Institute for Communicable Diseases of the National Health Laboratory Service	National Institute for Communicable Diseases of the National Health Laboratory Service	A; Allam M; Bhiman JN; Ismail A; Khumalo Z; Kwenda S; Mohale T; Subramoney K; van Heusden P; von Gottberg
EPI_ISL_408480, EPI_ISL_408481, EPI_ISL_408482, EPI_ISL_408484, EPI_ISL_408485, EPI_ISL_408486, EPI_ISL_408488			
see above	National Institute for Viral Disease Control and Prevention, China CDC	National Institute for Viral Disease Control & Prevention, CCDC	Baoying Huang; Fei Ye; George F. Gao; Guizhen Wu; Hengqin Wang; Huiping Yang; Jianan Xu; Jianxiong Li; Kangchen Zhao; Li Zhao; Peihua Niu; Quanyi Wang; Roujian Lu; Sheng Ye; Shenjiao Wang; Ti Liu; Wenbo Xu; Wenjie Tan; Wenjie TanXiaoqing FuXiang ZhaoWenling Wang Peihua NiuRoujian Lu; Wenling Wang; Xiang Zhao; Yang Pan; Yanhong SunBaoying HuangLi ZhaoFei YeWenbo XuGeorge F. GaoGuizhen Wu; Yong Shi; Zhaoguo Wang
EPI_ISL_402119, EPI_ISL_402120, EPI_ISL_402121	National Institute for Viral Disease Control and Prevention, China CDC	National Institute for Viral Disease Control and Prevention, China CDC	Faxian ZhanWeifeng ShiBaoying HuangJun LiuLi ZhaoYao MengFei YeNa Zhu; Ji Wang; Weimin Zhou; Weimin ZhouPeihua NiuPeipei LiuFaxian ZhanWeifeng ShiBaoying HuangJun LiuLi ZhaoYao MengXiaozhou HeFei YeNa ZhuYang LiJing ChenWenbo XuGeorge F. GaoGuizhen Wu; Wenjie TanXiang ZhaoWenling WangXuejun MaYongzhong JiangRoujian Lu; Wenjie TanXiang ZhaoWenling WangXuejun MaYongzhong JiangRoujian LuJi WangWeimin ZhouPeihua NiuPeipei LiuFaxian ZhanWeifeng ShiBaoying HuangJun LiuLi ZhaoYao MengXiaozhou HeFei YeNa ZhuYang LiJing ChenWenbo XuGeorge F. GaoGuizhen Wu; Wenjie TanXuejun MaXiang ZhaoWenling WangYongzhong JiangRoujian LuJi WangPeihua Niu; Xiaozhou HePeipei Liu; Yang LiJing ChenWenbo XuGeorge F. GaoGuizhen Wu
EPI_ISL_434534	National Institute for Viral Disease Control and Prevention, China CDC	National Institute for Viral Disease Control and Prevention, China CDC, Yunnan Provincial CDC	Baoying Huang; Fei Ye; Guizhen Wu; Huijuan Wang; Li Zhao; Peihua Niu; Roujian Lu; Wenjie Tan; Wenling Wang
EPI_ISL_910014, EPI_ISL_984277	National Institute of Health Research and Development	National Institute of Health Research and Development	Agustiningsih; Arie Ardiansyah Nugraha; Asri Febriyani; Aulia Rizki; Fauzul Muna; Hana Apsari Pawestri; Hartanti Dian Ikawati; Herna; Holy Arif Wibowo; Irene Lorinda Indalao; Juwita Kurniawati; Kartika Dewi Puspa; Kindi Adam; Krisna Nur Andriana Pangesti; Muhammad Nurhadi; Mursinah; Natalie Laurencia Kipuw; Nelly Puspandari; Ni Ketut Susilarini; Nike Susanti; Nur Ika Hariastuti; Reni Herman; Ririn Ramadhany; Subangkit; Tati Febriyanti; Triyani Soekarso; Uli Alfi Nikmah; Uly Alfi Nikmah; Vivi Setiawaty; Yuni Rukminiati
EPI_ISL_450197, EPI_ISL_455584, EPI_ISL_455589, EPI_ISL_455590, EPI_ISL_455591, EPI_ISL_455592, EPI_ISL_455593, EPI_ISL_455624			
see above	National Institute of Health. Department of medical Sciences, Ministry of Public Health, Thailand	National Institute of Health. Department of medical Sciences, Ministry of Public Health, Thailand	Chittaganpitch; Malinee; Okada; Parnmen; Phuygun; Pilailuk; Siripaporn; Sittiporn; Sunthareeya; Thanadachakul; Thanutsapa; Waicharoen; Warawan; Wongboot
EPI_ISL_479756, EPI_ISL_479757, EPI_ISL_479758	National Institute of Hygiene and Epidemiology (NIHE)	National Key Laboratory of Gene Technology, Institute of Biotechnology (IBT)	Chu Hoang Ha; Dang Duc Anh; Futoshi Hasebe; Ho Thi Thuong; Hoang Ha; Hoang Vu Mai Phuong; Le Quynh Mai; Le Thi Thanh; Le Tung Lam; Nguyen Hong Trang; Nguyen Le Khanh Hang; Nguyen Phuong Anh; Nguyen Vu Son; Pham Thi Hien; Taichiro Takemura; Tran Huyen Linh; Tran Thu Huong; Truong Nam Hai; Ung Thi Hong Trang; Vuong Duc Cuong
EPI_ISL_539776, EPI_ISL_539781	National Institute of Public Health (Czech Republic)	State Veterinary Institute Prague	A; D; H; Jirincova; L; Nagy; Novakova; Trnka; Vecerova, J.
EPI_ISL_434555, EPI_ISL_434558	National Institutes of Health, University of the Philippines Manila	Philippine Genome Center	Alessandra C. Sanchez; Benedict A. Maralit; Bernard Demot; Carlo M. Lapid; Christina Tan; El King D. Morado; Eva Maria Cutiongco-de la Paz; Francis A. Tablizo; Haifa L.Gaza; Jan Michael C. Yap; Jarvin E. Nipales; Jo-Hannah S. Llames; John Mark Velasco; Joshua Gregor A. Dizon; Joy Ann Petronio-Santos; Julius Aaron Mejia; Kris P. Punayan; Kristianne Arielle D. Gabriel; Maribell Dollete; Marissa M. Alejandria; Raul V. Destura; Shana F. Genavia; Shelona Rose D. Fabilloren; Shiela Mae M. Araiza; Sonia Salamat; and Cynthia P. Saloma
EPI_ISL_483637	National Laboratory of Virology, Szentágothai Research Centre	National Laboratory of Virology, Szentágothai Research Centre	Balázs Somogyi; Endre Gábor Tóth; Ferenc Jakab; Gábor Kemenesi
EPI_ISL_647978	National Microbiology Reference Laboratory	Quadram Institute Bioscience	Agnes Juru; Alexander Goredema; Ana-Victoria Gutierrez; Andrew J. Page; Andrew Tarupiwa; Barbra Murwira; Beuty Makamure; Charles Nyagupe; David Baker; Gaetan Thilliez; Gemma Kay; Gibson Mhlanga; Hlanai Gumbo; Isaac Phiri; Justin O'Grady; Leonardo de Oliveira Martins; Muchaneta Mugabe; Portia Manangazira; Robert Kingsley; Sekesai Zinyowera; Tapfumanei Mashe; Tatenda Takawira; Thanh Le Viet
EPI_ISL_1039831, EPI_ISL_1039959, EPI_ISL_1039998, EPI_ISL_1095626, EPI_ISL_1095627, EPI_ISL_1172022, EPI_ISL_1172023, EPI_ISL_1172024, EPI_ISL_1172025			
see above	National Public Health Center, COVID Laboratory	National Public Health Center, National Biosafety Laboratory	Bernadett Pályi; Dániel Déri; Judit Henczkó; Norbert Solymosi; Nóra Magyar; Zoltán Kis
EPI_ISL_457833, EPI_ISL_457843	National Public Health Laboratory	KEMRI-Wellcome Trust Research Programme/KEMRI-CGMR-C Kilifi	Githinji G. et al 2020
EPI_ISL_416829, EPI_ISL_416866, EPI_ISL_416885, EPI_ISL_416886, EPI_ISL_416907	National Public Health Laboratory	Malaysia Genome Institute	Azrin Ahmad; Enizza Kasim; Hani Mat Hussin; Irni Suhayu Sapian; Mohd Faizal Abu Bakar; Mohd Noor Mat Isa; Noorliza Mohamad Noordin; Nor Azfa Johari; Norazimah Tajudin; Nurhezreen Md Iqbal; Rehan Shuhada Abu Bakar; Selvanesan Sengol; Shahrul Hisham Zainal Ariffin; Shamsidar Sopie; Siti Noraini Othman; W Afiza W Mohd Arifin; Yu Kie Chem; Yusuf Muhammad Noor
EPI_ISL_410719	National Public Health Laboratory	National Public Health Laboratory	Cui L; Lin RTP; Mak TM; Octavia S
EPI_ISL_410716	National Public Health Laboratory, National Centre for Infectious Diseases	National Centre for Infectious Diseases, National Centre for Infectious Diseases	Cui L; Lin RTP; Mak TM; Octavia S
EPI_ISL_410713, EPI_ISL_410714, EPI_ISL_410715, EPI_ISL_418992, EPI_ISL_418993, EPI_ISL_418994, EPI_ISL_418995, EPI_ISL_418996, EPI_ISL_418997, EPI_ISL_418998, EPI_ISL_418999, EPI_ISL_419000, EPI_ISL_419001, EPI_ISL_422428, EPI_ISL_422429, EPI_ISL_422430, EPI_ISL_422431, EPI_ISL_422432, EPI_ISL_422433, EPI_ISL_422434, EPI_ISL_422435, EPI_ISL_428822, EPI_ISL_428823, EPI_ISL_428824, EPI_ISL_428825, EPI_ISL_428826, EPI_ISL_428827, EPI_ISL_428828, EPI_ISL_428829, EPI_ISL_428830, EPI_ISL_428831, EPI_ISL_435678, EPI_ISL_435697, EPI_ISL_435698, EPI_ISL_435699, EPI_ISL_435700, EPI_ISL_443188, EPI_ISL_443189, EPI_ISL_443193, EPI_ISL_443195, EPI_ISL_443197, EPI_ISL_443198, EPI_ISL_443199, EPI_ISL_443200, EPI_ISL_443201, EPI_ISL_443202, EPI_ISL_443203, EPI_ISL_443204, EPI_ISL_443205, EPI_ISL_443206, EPI_ISL_443207, EPI_ISL_443208, EPI_ISL_443209, EPI_ISL_443210, EPI_ISL_443211, EPI_ISL_443214, EPI_ISL_443215, EPI_ISL_443216, EPI_ISL_443217, EPI_ISL_443218, EPI_ISL_443219, EPI_ISL_443220, EPI_ISL_443221, EPI_ISL_443222, EPI_ISL_443223, EPI_ISL_443224, EPI_ISL_443225, EPI_ISL_443226, EPI_ISL_443227, EPI_ISL_443228, EPI_ISL_443229, EPI_ISL_443230, EPI_ISL_443231, EPI_ISL_443232, EPI_ISL_443233, EPI_ISL_443234, EPI_ISL_443235, EPI_ISL_443236, EPI_ISL_443237, EPI_ISL_443238, EPI_ISL_443239, EPI_ISL_443240, EPI_ISL_443241, EPI_ISL_443242, EPI_ISL_443243, EPI_ISL_443248, EPI_ISL_443249, EPI_ISL_462277, EPI_ISL_462278, EPI_ISL_462279, EPI_ISL_462280, EPI_ISL_462281, EPI_ISL_462282, EPI_ISL_462283, EPI_ISL_462284, EPI_ISL_462285, EPI_ISL_462286, EPI_ISL_462287, EPI_ISL_462290, EPI_ISL_462291, EPI_ISL_462292, EPI_ISL_462293, EPI_ISL_462295, EPI_ISL_462296, EPI_ISL_462297, EPI_ISL_462298, EPI_ISL_462299, EPI_ISL_462300, EPI_ISL_462301, EPI_ISL_462305, EPI_ISL_462306, EPI_ISL_462328, EPI_ISL_462338, EPI_ISL_462341, EPI_ISL_462342, EPI_ISL_462345, EPI_ISL_462346, EPI_ISL_462349, EPI_ISL_462350, EPI_ISL_462351, EPI_ISL_462358, EPI_ISL_462359, EPI_ISL_462369, EPI_ISL_462370, EPI_ISL_462371, EPI_ISL_462373, EPI_ISL_462376, EPI_ISL_462385, EPI_ISL_462386, EPI_ISL_462387, EPI_ISL_462389, EPI_ISL_462390, EPI_ISL_462391, EPI_ISL_462392, EPI_ISL_462396, EPI_ISL_462401, EPI_ISL_462404, EPI_ISL_462405, EPI_ISL_462409, EPI_ISL_462410, EPI_ISL_462415, EPI_ISL_462416, EPI_ISL_462420, EPI_ISL_462422, EPI_ISL_462429, EPI_ISL_462431, EPI_ISL_462432, EPI_ISL_462433, EPI_ISL_469100, EPI_ISL_469103, EPI_ISL_469104, EPI_ISL_469106, EPI_ISL_469121, EPI_ISL_469124, EPI_ISL_469127, EPI_ISL_469132, EPI_ISL_469143, EPI_ISL_475948, EPI_ISL_475949, EPI_ISL_475950, EPI_ISL_475954, EPI_ISL_475955, EPI_ISL_475957, EPI_ISL_475958, EPI_ISL_475959, EPI_ISL_475960, EPI_ISL_475962, EPI_ISL_475963, EPI_ISL_475966, EPI_ISL_475968, EPI_ISL_475969, EPI_ISL_475970, EPI_ISL_475981, EPI_ISL_475983, EPI_ISL_475985, EPI_ISL_475986, EPI_ISL_475997, EPI_ISL_483610, EPI_ISL_483613, EPI_ISL_483617, EPI_ISL_483621, EPI_ISL_490058, EPI_ISL_493390, EPI_ISL_493414, EPI_ISL_493415, EPI_ISL_493417, EPI_ISL_493419, EPI_ISL_493421, EPI_ISL_493425, EPI_ISL_536435, EPI_ISL_536436, EPI_ISL_536437, EPI_ISL_536439, EPI_ISL_536440, EPI_ISL_536441, EPI_ISL_536447, EPI_ISL_548977, EPI_ISL_548978, EPI_ISL_548979, EPI_ISL_548980, EPI_ISL_548981, EPI_ISL_548982, EPI_ISL_548983, EPI_ISL_548984, EPI_ISL_548985, EPI_ISL_548986, EPI_ISL_548987, EPI_ISL_548988, EPI_ISL_548989, EPI_ISL_548990, EPI_ISL_548991, EPI_ISL_548992, EPI_ISL_548993, EPI_ISL_548994, EPI_ISL_548995, EPI_ISL_548996, EPI_ISL_548997, EPI_ISL_548998, EPI_ISL_548999, EPI_ISL_549000, EPI_ISL_549001, EPI_ISL_549002, EPI_ISL_549003, EPI_ISL_549004, EPI_ISL_549005, EPI_ISL_574493, EPI_ISL_574495, EPI_ISL_574496, EPI_ISL_574497, EPI_ISL_574498, EPI_ISL_574499, EPI_ISL_574500, EPI_ISL_574501, EPI_ISL_574502, EPI_ISL_574504, EPI_ISL_574505, EPI_ISL_574506, EPI_ISL_574507, EPI_ISL_574508, EPI_ISL_574509, EPI_ISL_574510, EPI_ISL_574511, EPI_ISL_574512, EPI_ISL_574513, EPI_ISL_574514, EPI_ISL_574515, EPI_ISL_574516, EPI_ISL_574517, EPI_ISL_574518, EPI_ISL_574520, EPI_ISL_574521, EPI_ISL_574522, EPI_ISL_574523, EPI_ISL_574524, EPI_ISL_574525, EPI_ISL_574526, EPI_ISL_574527, EPI_ISL_574528, EPI_ISL_574529, EPI_ISL_574530, EPI_ISL_574531, EPI_ISL_574532, EPI_ISL_574533, EPI_ISL_574534, EPI_ISL_574535, EPI_ISL_574536, EPI_ISL_574537, EPI_ISL_574538, EPI_ISL_574539, EPI_ISL_574540, EPI_ISL_1315626			
see above	National Public Health Laboratory, National Centre for Infectious Diseases	National Public Health Laboratory, National Centre for Infectious Diseases	Chavatte JM; Chavatte Jean-Marc; Cui L; Cui Lin; Lin Cui; Lin RTP; Lin Raymond Tzer Pin; Mak TM; Mak Tze Minn; Octavia S; Octavia Sophie; Raymond Tzer Pin Lin; Sophie Octavia; Tze Minn Mak; Zhenyang Zhou; Zhou Z
EPI_ISL_480297, EPI_ISL_480303, EPI_ISL_480307, EPI_ISL_480310	National Reference Laboratory "Influenza and acute respiratory diseases"	NRL-HIV	Ivailo Alexiev; Ivan Ivanov; Iva Philipova
EPI_ISL_507008	National Veterinary Institute	National Veterinary Institute	Siamak Zohari
EPI_ISL_435674, EPI_ISL_435675, EPI_ISL_435676, EPI_ISL_435677, EPI_ISL_443187	National Virology Reference Laboratory	National Public Health Laboratory, National Centre for Infectious Diseases	Chavatte Jean-Marc; Cui Lin; Lin Raymond Tzer Pin; Mak Tze Minn; Octavia Sophie; Taib Surita; Zaini Zainun

EPI_ISL_605058, EPI_ISL_605059, EPI_ISL_605060, EPI_ISL_605061, EPI_ISL_605062, EPI_ISL_605063, EPI_ISL_605064, EPI_ISL_605065, EPI_ISL_605066, EPI_ISL_605067, EPI_ISL_605068, EPI_ISL_605069, EPI_ISL_605070, EPI_ISL_605071, EPI_ISL_605072, EPI_ISL_605073, EPI_ISL_605074, EPI_ISL_605077, EPI_ISL_605080, EPI_ISL_981203			
see above	National Virus Reference Laboratory	Irish Coronavirus Sequencing Consortium - Helixworks	Conor Crosbie; Nimesh Pinnamaneni; Sachin Chalapati
EPI_ISL_848153, EPI_ISL_848154, EPI_ISL_848155, EPI_ISL_848156, EPI_ISL_848157, EPI_ISL_848158, EPI_ISL_848159, EPI_ISL_848160, EPI_ISL_848161, EPI_ISL_848162, EPI_ISL_848163, EPI_ISL_848164, EPI_ISL_848165, EPI_ISL_848166			
see above	National Virus Reference Laboratory	Irish Coronavirus Sequencing Consortium - National University of Ireland Galway	Grainne Mc Andrew; Kate Reddington; Simone Coughlan
EPI_ISL_671373, EPI_ISL_671374, EPI_ISL_671375, EPI_ISL_671376, EPI_ISL_671377, EPI_ISL_671378, EPI_ISL_681908, EPI_ISL_681910, EPI_ISL_681912, EPI_ISL_681913, EPI_ISL_681919, EPI_ISL_681920, EPI_ISL_681921, EPI_ISL_681922, EPI_ISL_681923, EPI_ISL_681925, EPI_ISL_681928, EPI_ISL_682057, EPI_ISL_767760, EPI_ISL_767761, EPI_ISL_767762, EPI_ISL_767768, EPI_ISL_767769, EPI_ISL_767798, EPI_ISL_767826, EPI_ISL_767836, EPI_ISL_767837			
see above	National Virus Reference Laboratory	Irish Coronavirus Sequencing Consortium - Teagasc Moorepark	Calum Walsh; Fiona Crispie; Genuity Ireland; John Kenny; Matthew McCabe; Paul Cotter
EPI_ISL_493149, EPI_ISL_493150, EPI_ISL_493151, EPI_ISL_493152, EPI_ISL_493153, EPI_ISL_493154, EPI_ISL_493155, EPI_ISL_493156, EPI_ISL_493157, EPI_ISL_493158, EPI_ISL_493159, EPI_ISL_493161, EPI_ISL_493163, EPI_ISL_493164, EPI_ISL_493165, EPI_ISL_493166, EPI_ISL_493167, EPI_ISL_493168, EPI_ISL_493169, EPI_ISL_493170, EPI_ISL_493171, EPI_ISL_493172, EPI_ISL_493173, EPI_ISL_493174, EPI_ISL_493175, EPI_ISL_493176, EPI_ISL_493177, EPI_ISL_493178, EPI_ISL_493179, EPI_ISL_493180, EPI_ISL_493181, EPI_ISL_493182, EPI_ISL_493183, EPI_ISL_493184, EPI_ISL_493185, EPI_ISL_493186, EPI_ISL_493188, EPI_ISL_493189			
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EPI_ISL_444994, EPI_ISL_444995, EPI_ISL_444996, EPI_ISL_444997, EPI_ISL_444998, EPI_ISL_444999, EPI_ISL_445000			
see above	Naval Health Research Center	Naval Medical Research Center Biological Defense Research Directorate	Adrian Paskey; Chris Myers; Dessiree Pena-Gomez; Ewell Hollis; Kimberly Bishop-Lilly; Kyle Long; Logan Voegtly; Melinda Balansay-Ames; Nathaniel Christy; Regina Cer; Roger Pan
EPI_ISL_491910, EPI_ISL_491911, EPI_ISL_491912, EPI_ISL_491913, EPI_ISL_491914, EPI_ISL_491915, EPI_ISL_491916, EPI_ISL_491917, EPI_ISL_491918, EPI_ISL_491919, EPI_ISL_491920			
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EPI_ISL_515293, EPI_ISL_515294, EPI_ISL_515295, EPI_ISL_515296, EPI_ISL_515297, EPI_ISL_515299, EPI_ISL_515300, EPI_ISL_515301, EPI_ISL_515302, EPI_ISL_515303, EPI_ISL_515304, EPI_ISL_515305, EPI_ISL_515306, EPI_ISL_515307, EPI_ISL_515308, EPI_ISL_515309, EPI_ISL_515311, EPI_ISL_515312, EPI_ISL_515313, EPI_ISL_515314, EPI_ISL_515315, EPI_ISL_515316, EPI_ISL_515317, EPI_ISL_515318, EPI_ISL_515319, EPI_ISL_515320, EPI_ISL_515321, EPI_ISL_515322, EPI_ISL_515324, EPI_ISL_515325, EPI_ISL_515327, EPI_ISL_515328, EPI_ISL_515329, EPI_ISL_515330, EPI_ISL_515331, EPI_ISL_515332, EPI_ISL_515333, EPI_ISL_515334, EPI_ISL_515336, EPI_ISL_515337, EPI_ISL_515338, EPI_ISL_515339, EPI_ISL_515340, EPI_ISL_515341, EPI_ISL_515342, EPI_ISL_515344, EPI_ISL_1136974			
see above	Nevada State Public Health Laboratory	Nevada State Public Health Laboratory	Andrew Gorzalski; Chris Laverdure; Cyprian Rossetto; David Jackson; Heather Kerwin; Joel R. Sevinsky; Mark Pandori; Natalie Crawford; Paul Hartley; Richard Tillett; Stephanie Van Hooser; Subhash C. Verma; and Mark Pandori
EPI_ISL_467529, EPI_ISL_467536, EPI_ISL_467590, EPI_ISL_467591, EPI_ISL_467594, EPI_ISL_467596, EPI_ISL_467598, EPI_ISL_467599, EPI_ISL_467600, EPI_ISL_467604, EPI_ISL_467608, EPI_ISL_467610, EPI_ISL_467611, EPI_ISL_467612, EPI_ISL_467624			
see above	New Mexico Department of Health Scientific Laboratory Division	Center for Global Health, University of New Mexico Health Sciences Center	Darrell Dinwiddie; Daryl Domman; Joseph Hicks; Kurt Schwalm; Michael Edwards; Twila Kunde
EPI_ISL_631514, EPI_ISL_632055, EPI_ISL_632056	New York Community Hospital	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_631509, EPI_ISL_631533, EPI_ISL_631536, EPI_ISL_631539, EPI_ISL_631540, EPI_ISL_631542, EPI_ISL_632038, EPI_ISL_632041, EPI_ISL_632042, EPI_ISL_632045, EPI_ISL_632047			
see above	New York Presbyterian Lower Manhattan	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_631530, EPI_ISL_631547, EPI_ISL_631568, EPI_ISL_631569, EPI_ISL_631861, EPI_ISL_632040, EPI_ISL_632049, EPI_ISL_632052, EPI_ISL_632053, EPI_ISL_632063, EPI_ISL_632064, EPI_ISL_632070, EPI_ISL_632071			
see above	New York Presbyterian Queens	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_631517, EPI_ISL_631518, EPI_ISL_631519, EPI_ISL_631544, EPI_ISL_631545, EPI_ISL_631548, EPI_ISL_631566, EPI_ISL_631567, EPI_ISL_632046, EPI_ISL_632048, EPI_ISL_632054			
see above	New York Presbyterian-Brooklyn Methodist Hospital	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_631510, EPI_ISL_631511, EPI_ISL_631860	New York Presbyterian/ Weill Cornell Medical Center	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_631502, EPI_ISL_632057	New York-Presbyterian-Columbia University Medical Center	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_427526, EPI_ISL_427527, EPI_ISL_427528, EPI_ISL_427529, EPI_ISL_427530, EPI_ISL_427531, EPI_ISL_427532, EPI_ISL_427533, EPI_ISL_427534, EPI_ISL_427535, EPI_ISL_427536, EPI_ISL_427537, EPI_ISL_427538, EPI_ISL_427539, EPI_ISL_427540, EPI_ISL_427541, EPI_ISL_427542, EPI_ISL_427543, EPI_ISL_427544, EPI_ISL_427545, EPI_ISL_427546, EPI_ISL_427547, EPI_ISL_427548, EPI_ISL_427549, EPI_ISL_427550, EPI_ISL_427551, EPI_ISL_427552, EPI_ISL_427553, EPI_ISL_427554, EPI_ISL_427555, EPI_ISL_427556, EPI_ISL_427557, EPI_ISL_427558, EPI_ISL_427559, EPI_ISL_427560, EPI_ISL_427561, EPI_ISL_427562, EPI_ISL_427563, EPI_ISL_427564, EPI_ISL_427565, EPI_ISL_427566, EPI_ISL_427567, EPI_ISL_427568, EPI_ISL_427569, EPI_ISL_427570, EPI_ISL_427571, EPI_ISL_427572, EPI_ISL_427573, EPI_ISL_427574, EPI_ISL_427575, EPI_ISL_427576, EPI_ISL_427577, EPI_ISL_427578, EPI_ISL_427579, EPI_ISL_427580, EPI_ISL_427581, EPI_ISL_427582, EPI_ISL_427583, EPI_ISL_427584, EPI_ISL_427585, EPI_ISL_427586, EPI_ISL_427587, EPI_ISL_427588, EPI_ISL_427589, EPI_ISL_427590, EPI_ISL_427591, EPI_ISL_427592, EPI_ISL_427593, EPI_ISL_427594, EPI_ISL_427595, EPI_ISL_427596, EPI_ISL_427597, EPI_ISL_427598, EPI_ISL_427599, EPI_ISL_427600, EPI_ISL_427601, EPI_ISL_427602, EPI_ISL_427603, EPI_ISL_427604, EPI_ISL_427605, EPI_ISL_427606, EPI_ISL_427607, EPI_ISL_427608, EPI_ISL_427609, EPI_ISL_427610, EPI_ISL_427611, EPI_ISL_427612, EPI_ISL_427613, EPI_ISL_427614, EPI_ISL_427615, EPI_ISL_427616, EPI_ISL_427617, EPI_ISL_427618			
see above	NewYork-Presbyterian & Mason Lab	Mason Lab	Alon Shaiber; Arryn Craney; Benjamin Young; Cem Meydan; Chandrima Bhattacharya; Christopher E. Mason; Christopher Mozsary; Craig D. Westover; Daniel J. Butler; David Danko; Dmitry Meleshko; Dong Xu; Ebrahim Afshinnekoo; Fritz J. Sedlazeck; Hanna Rennert; Iman Hajirasouliha; Jenny Xiang; Joel Rosiene; John Sipley; Jonathan Foox; Justyna Gawrys; Krista Ryon; Lars F. Westblade; Lin Cong; Marcin Imielinski; Maria Sierra; Massimo Loda; Matthew MacKay; Melissa Cushing; Mirella Salvatore; Nikolay A. Ivanov; Phyllis Ruggiero; Priya Velu; Shawn Levy
EPI_ISL_455422, EPI_ISL_455426	Nigeria Centre for Disease Control	African Centre of Excellence for Genomics of Infectious Diseases (ACEGID), Redeemer's University, Ede, Osun State, Nigeria	Ajogbasile F.V.; Folarin O.A.; Happi C.T.; Ihekweazu C.; Kayode A.; Oguzie J.; Olawoye I.; Olumade T.; Oluniyi P.E.; Uwanibe J.
EPI_ISL_455412, EPI_ISL_455413, EPI_ISL_455419, EPI_ISL_455423, EPI_ISL_455424, EPI_ISL_455429, EPI_ISL_527873, EPI_ISL_527874, EPI_ISL_527876, EPI_ISL_527878, EPI_ISL_527880, EPI_ISL_527881			
see above	Nigeria Centre for Disease Control (NCDC)	African Centre of Excellence for Genomics of Infectious Diseases (ACEGID), Redeemer's University, Ede, Osun State, Nigeria	Ajogbasile F.V.; Folarin O.A.; Happi C.T.; Ihekweazu C.; Kayode A.; Oguzie J.; Olawoye I.; Olumade T.; Oluniyi P.E. et al; Uwanibe J.
EPI_ISL_479913, EPI_ISL_479914, EPI_ISL_479915, EPI_ISL_479916, EPI_ISL_479917, EPI_ISL_479918, EPI_ISL_479919, EPI_ISL_479920, EPI_ISL_479921, EPI_ISL_479922, EPI_ISL_479923, EPI_ISL_479924			
see above	Niigata City Public Health Research Institute	Pathogen Genomics Center, National Institute of Infectious Diseases	Hajime Kamiya; Kentaro Itokawa; Makoto Kuroda; Masanori Hashino; Motoi Suzuki; Rina Tanaka; Tsuyoshi Sekizuka; Yurie Takahashi
EPI_ISL_479869, EPI_ISL_479902, EPI_ISL_685297, EPI_ISL_685298	Niigata Prefectural Institute of Public Health and Environmental Sciences	Pathogen Genomics Center, National Institute of Infectious Diseases	Hajime Kamiya; Kentaro Itokawa; Makoto Kuroda; Masanori Hashino; Motoi Suzuki; Reiko Arai; Rina Tanaka; Tsuyoshi Sekizuka
EPI_ISL_420151	Nordland Hospital - Bodo, Laboratory Department, Molecular Biology Unit	Norwegian Institute of Public Health, Department of Virology	Hilde Elshaug; Kamilla Heddeland Instefjord; Karoline Bragstad; Kathrine Stene-Johansen; Olav Hungnes
EPI_ISL_812239, EPI_ISL_812240, EPI_ISL_812241, EPI_ISL_812242, EPI_ISL_812243, EPI_ISL_812244, EPI_ISL_848183, EPI_ISL_848184, EPI_ISL_848185, EPI_ISL_848186, EPI_ISL_848187, EPI_ISL_848638, EPI_ISL_848639			
see above	North Dakota Department of Health, Public Health Laboratory	North Dakota Department of Health, Public Health Laboratory	Lisa Wingerter
EPI_ISL_516831, EPI_ISL_516833, EPI_ISL_516835, EPI_ISL_516836, EPI_ISL_516841, EPI_ISL_516842, EPI_ISL_516848, EPI_ISL_516852, EPI_ISL_516857, EPI_ISL_516863, EPI_ISL_516864, EPI_ISL_516865, EPI_ISL_516868, EPI_ISL_516870, EPI_ISL_524622, EPI_ISL_524638, EPI_ISL_524645, EPI_ISL_524648, EPI_ISL_524651, EPI_ISL_524652, EPI_ISL_524653, EPI_ISL_524654, EPI_ISL_524656, EPI_ISL_524658, EPI_ISL_524659, EPI_ISL_524663, EPI_ISL_524665, EPI_ISL_524668, EPI_ISL_524669, EPI_ISL_524670, EPI_ISL_524671, EPI_ISL_524673, EPI_ISL_524674, EPI_ISL_524676, EPI_ISL_524683, EPI_ISL_524696, EPI_ISL_524702, EPI_ISL_524706, EPI_ISL_524707			

see above	North West London Pathology, Imperial College Healthcare NHS Trust	Wellcome Sanger Institute for the COVID-19 Genomics UK (COG-UK) consortium	Aileen Rowan; Alison Holmes; Anjna Badhan; Carolina Herrera and Alex Alderton; Cordelia Langford; David K. Jackson; David Muir; Dominic Kwiatkowski; Ewan Harrison; Frankie Bolt; Graham Taylor; Ian Johnston; James Price; John Sillitoe on behalf of the Wellcome Sanger Institute COVID-19 Surveillance Team (http://www.sanger.ac.uk/covid-team); Ling Li; Paul Randell; Roberto Amato; Sonia Goncalves
EPI_ISL_453489, EPI_ISL_453492, EPI_ISL_453499, EPI_ISL_472228, EPI_ISL_478536, EPI_ISL_478537, EPI_ISL_478539, EPI_ISL_478541, EPI_ISL_478543, EPI_ISL_478544, EPI_ISL_478546, EPI_ISL_478547, EPI_ISL_478548, EPI_ISL_478549, EPI_ISL_478550, EPI_ISL_478551, EPI_ISL_478553, EPI_ISL_478555, EPI_ISL_478556, EPI_ISL_478558, EPI_ISL_478559, EPI_ISL_478561, EPI_ISL_478564, EPI_ISL_478565, EPI_ISL_478566, EPI_ISL_478567, EPI_ISL_478568, EPI_ISL_478569, EPI_ISL_478571, EPI_ISL_478573, EPI_ISL_478575, EPI_ISL_478576, EPI_ISL_478577, EPI_ISL_478578, EPI_ISL_478579, EPI_ISL_478580, EPI_ISL_478581, EPI_ISL_478582, EPI_ISL_478583, EPI_ISL_478584, EPI_ISL_478585, EPI_ISL_478586, EPI_ISL_478587, EPI_ISL_478588, EPI_ISL_478591, EPI_ISL_478592, EPI_ISL_478593, EPI_ISL_478594, EPI_ISL_478596, EPI_ISL_478608, EPI_ISL_478614, EPI_ISL_478616, EPI_ISL_478619, EPI_ISL_478621, EPI_ISL_478622, EPI_ISL_478624, EPI_ISL_478626, EPI_ISL_478627, EPI_ISL_478628, EPI_ISL_478630, EPI_ISL_478632, EPI_ISL_490449, EPI_ISL_490451, EPI_ISL_490452, EPI_ISL_490453, EPI_ISL_490461, EPI_ISL_490467, EPI_ISL_507126, EPI_ISL_507127, EPI_ISL_507129			
see above	Northumbria University / South Tees Hospitals NHS Foundation Trust / North Cumbria Integrated Care NHS Foundation Trust / North Tees and Hartlepool NHS Foundation Trust / Newcastle Hospitals NHS Foundation Trust	COVID-19 Genomics UK (COG-UK) Consortium	Andrew Nelson; Brendan Payne; Clive Graham; Darren L Smith; Debra Padgett; Edward Barton; Emma Swindells; Garren Scott; Gary Black; Gary Eltringham; Giles S Holt; Greg R Young; Jane Greenaway; Jennifer Collins; John Allan; Joshua Loh; Lynn Dover; Matthew Bashton; Mohammad A Tariq; Paul Baker; Sarah Essex; Steve Liggett; Wen C Yew; Yusri Taha
EPI_ISL_631505	Northwell Health-GoHealth Urgent Care 10025	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_444521, EPI_ISL_444522, EPI_ISL_444523, EPI_ISL_444524, EPI_ISL_444525, EPI_ISL_444527, EPI_ISL_444528, EPI_ISL_444530, EPI_ISL_444531, EPI_ISL_444532, EPI_ISL_444533, EPI_ISL_444534, EPI_ISL_444535, EPI_ISL_444537, EPI_ISL_444538, EPI_ISL_444540, EPI_ISL_444544, EPI_ISL_444545, EPI_ISL_444546, EPI_ISL_444547, EPI_ISL_444549, EPI_ISL_444550, EPI_ISL_444552, EPI_ISL_444553, EPI_ISL_444555, EPI_ISL_444556, EPI_ISL_444558, EPI_ISL_444560, EPI_ISL_444561, EPI_ISL_444562, EPI_ISL_444564, EPI_ISL_444566, EPI_ISL_444567, EPI_ISL_444568, EPI_ISL_444569, EPI_ISL_444570, EPI_ISL_444571, EPI_ISL_444572, EPI_ISL_444573, EPI_ISL_444574, EPI_ISL_444575, EPI_ISL_444576, EPI_ISL_444577, EPI_ISL_444578, EPI_ISL_444579, EPI_ISL_444580, EPI_ISL_444581, EPI_ISL_444583, EPI_ISL_444585, EPI_ISL_444586, EPI_ISL_444587, EPI_ISL_444588, EPI_ISL_444589, EPI_ISL_444590, EPI_ISL_444591, EPI_ISL_444592, EPI_ISL_444593, EPI_ISL_444594, EPI_ISL_444595, EPI_ISL_444596, EPI_ISL_444597, EPI_ISL_444598, EPI_ISL_444599, EPI_ISL_444600, EPI_ISL_444601, EPI_ISL_444603, EPI_ISL_444604, EPI_ISL_444605, EPI_ISL_444606, EPI_ISL_444607, EPI_ISL_444608, EPI_ISL_444609, EPI_ISL_626359, EPI_ISL_626360, EPI_ISL_626364, EPI_ISL_626365, EPI_ISL_626366, EPI_ISL_626368, EPI_ISL_626370, EPI_ISL_626371, EPI_ISL_626372, EPI_ISL_626373, EPI_ISL_626374, EPI_ISL_626375, EPI_ISL_626376, EPI_ISL_626377, EPI_ISL_626378, EPI_ISL_626379, EPI_ISL_626381, EPI_ISL_626382, EPI_ISL_626383, EPI_ISL_626384, EPI_ISL_626464, EPI_ISL_626465, EPI_ISL_626466, EPI_ISL_626467, EPI_ISL_626468, EPI_ISL_936497			
see above	Northwestern Memorial Hospital	Ozer Lab	Alan R. Hauser; Chad J. Achenbach; Chao Qi; Egon A. Ozer; Hannah H. Nam; Judd F. Hultquist; Lacy M. Simons; Lawrence J. Jennings; Michael G. Ison; Ramon Lorenzo-Redondo; Scott C. Roberts
EPI_ISL_631570, EPI_ISL_631591, EPI_ISL_631594, EPI_ISL_631598, EPI_ISL_631605, EPI_ISL_631758, EPI_ISL_631759, EPI_ISL_631760, EPI_ISL_631761, EPI_ISL_631797, EPI_ISL_631898, EPI_ISL_632006, EPI_ISL_632073, EPI_ISL_632175, EPI_ISL_632176, EPI_ISL_632178, EPI_ISL_632202, EPI_ISL_632238, EPI_ISL_632945, EPI_ISL_632946			
see above	OCME Office Of Chief Medical Examiner	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_424880, EPI_ISL_426430, EPI_ISL_426431	OH Department of Health Laboratory	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_509069, EPI_ISL_509070, EPI_ISL_509071	OHSU Lab Services Molecular Microbiology Lab	Oregon SARS-CoV-2 Genome Sequencing Center	Alec J. Hirsch; Andrew C. Adey; Benjamin N. Bimber; Brendan L. O'Connell; Brian J. O'Roak; Daniel N. Streblow; Guang Fan; Ruth V. Nichols; Sally B. Grindstaff; William B. Messer
EPI_ISL_419558	OR State PHL-Virology/Immunology Section	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Anna Uehara; Clinton R. Paden; Haibin Wang; Jasmine Padilla; Jing Zhang; Justin Lee; Krista Queen; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_498171, EPI_ISL_498172, EPI_ISL_498173, EPI_ISL_498174, EPI_ISL_498175, EPI_ISL_498176, EPI_ISL_498177, EPI_ISL_498178, EPI_ISL_498179, EPI_ISL_498180, EPI_ISL_498181, EPI_ISL_498182, EPI_ISL_498183, EPI_ISL_498184, EPI_ISL_498185, EPI_ISL_498186, EPI_ISL_498187, EPI_ISL_498188, EPI_ISL_498189, EPI_ISL_498190, EPI_ISL_498191, EPI_ISL_498192			
see above	OUCRU	OUCRU	Dinh Nguyen Huy Man; Guy Thwaites; Lam Anh Nguyet; Lam Minh Yen; Le Manh Hung; Le Nguyen Truc Nhu; Nghiem My Ngoc; Ngo Ngoc Quang Minh; Nguyen Tan Binh; Nguyen Thanh Dung; Nguyen Thanh Phong; Nguyen Thanh Truong; Nguyen Thi Han Ny; Nguyen Thi Thu Hong; Nguyen Tri Dung; Nguyen Van Vinh Chau; Tang Chi Thuong; Tran Chanh Xuan; Tran Nguyen Hoang Tu; Tran Tan Thanh; Tran Tinh Hien; Vo Thanh Lam; and Le Van Tan; for OUCRU COVID-19 research group*
EPI_ISL_450738, EPI_ISL_450739, EPI_ISL_450740, EPI_ISL_450741, EPI_ISL_450742, EPI_ISL_450743, EPI_ISL_450744, EPI_ISL_450745			
see above	OUCRU/HTD	OUCRU/HTD	Dinh Nguyen Huy Man; Guy Thwaites; Lam Anh Nguyet; Lam Minh Yen; Le Manh Hung; Le Nguyen Truc Nhu; Nghiem My Ngoc; Ngo Ngoc Quang Minh; Nguyen Tan Binh; Nguyen Thanh Dung; Nguyen Thanh Phong; Nguyen Thanh Truong; Nguyen Thi Han Ny; Nguyen Thi Thu Hong; Nguyen Tri Dung; Nguyen Van Vinh Chau; Tang Chi Thuong; Tran Chanh Xuan; Tran Nguyen Hoang Tu; Tran Tan Thanh; Tran Tinh Hien; Vo Thanh Lam; and Le Van Tan; for OUCRU COVID-19 research group*
EPI_ISL_860710, EPI_ISL_860711, EPI_ISL_860718, EPI_ISL_860729, EPI_ISL_876427, EPI_ISL_876518, EPI_ISL_882647, EPI_ISL_882650, EPI_ISL_935027, EPI_ISL_935031, EPI_ISL_935036, EPI_ISL_935520, EPI_ISL_935521, EPI_ISL_935525, EPI_ISL_940145, EPI_ISL_940158, EPI_ISL_940553, EPI_ISL_940563, EPI_ISL_940745, EPI_ISL_940748, EPI_ISL_940754, EPI_ISL_940759, EPI_ISL_940846, EPI_ISL_940860, EPI_ISL_941272, EPI_ISL_941274, EPI_ISL_941298, EPI_ISL_941299, EPI_ISL_959378, EPI_ISL_959379, EPI_ISL_959381, EPI_ISL_959383, EPI_ISL_959385, EPI_ISL_959415, EPI_ISL_959417, EPI_ISL_959472, EPI_ISL_959473, EPI_ISL_959474, EPI_ISL_1165135			
see above	Ohio Department of Health Laboratory	Ohio Department of Health Laboratory	Allison Black; Brent Lee; Caitlin McDonnell; Eric Brandt; Erica Leasure; Glen McGillivary; Heather Blankenship; Holmes; Jade Mowery; Jennifer; Kelsey Florek; Keoni Omura; Kirtana Ramadugu; Quanta Brown; Stephanie Mccracken; Tyler Payne; and Tammy Bannerman
EPI_ISL_479979, EPI_ISL_479980, EPI_ISL_479981, EPI_ISL_479982, EPI_ISL_479983, EPI_ISL_479984, EPI_ISL_480109, EPI_ISL_480110, EPI_ISL_480111, EPI_ISL_480112, EPI_ISL_480113, EPI_ISL_480114, EPI_ISL_480115, EPI_ISL_480116, EPI_ISL_480117, EPI_ISL_480118, EPI_ISL_480119			
see above	Oita Prefectural Institute of Public Health and Environmental Science	Pathogen Genomics Center, National Institute of Infectious Diseases	Hajime Kamiya; Kentaro Itokawa; Makoto Kuroda; Mari Sasaki; Masanori Hashino; Motoi Suzuki; Rina Tanaka; Tsuyoshi Sekizuka
EPI_ISL_889373, EPI_ISL_889374, EPI_ISL_889375, EPI_ISL_889376, EPI_ISL_889377, EPI_ISL_889378, EPI_ISL_889379, EPI_ISL_889380			
see above	Olomouc University Hospital	Institute of Applied Biotechnologies a.s.	Kateina Kvapilová; Marián Hajdúch; Martin Kašný; Ondej Brzo; Petr Klempt; Petr Kvapil
EPI_ISL_457703, EPI_ISL_457707	Oman-NIC	Department of Microbiology and Immunology- SQUH	Abdulla Balkhair; Ahlam Al-Amri; Aisha Al-Amri; Aisha Al-Busaidi; Amina Al Jardani; Fahad Zadjali; Fatma BaAlawi; Hamida AL Barwani; Hanan Al-kindi; Intisar Al-Shukri; Khulood Al-Mammary; Mohammed Al-Tobi; Samiha Al Kharusi; Samira Al-Maruqi; Zeyana AL-Dahmani
EPI_ISL_457701, EPI_ISL_457704, EPI_ISL_457706, EPI_ISL_457937, EPI_ISL_457938, EPI_ISL_457939, EPI_ISL_457974, EPI_ISL_457975, EPI_ISL_457976, EPI_ISL_457977, EPI_ISL_457978, EPI_ISL_457979, EPI_ISL_457980, EPI_ISL_457985, EPI_ISL_457986, EPI_ISL_457987, EPI_ISL_457988, EPI_ISL_457989, EPI_ISL_457990, EPI_ISL_457991, EPI_ISL_457992, EPI_ISL_457993, EPI_ISL_457994, EPI_ISL_457995, EPI_ISL_457996, EPI_ISL_457997, EPI_ISL_457998			
see above	Oman-NIC	Oman-NIC	Abdulla Balkhair; Ahlam Al-Amri; Aisha Al-Amri; Aisha Al-Busaidi; Amina Al Jardani; Fahad Zadjali; Fatma BaAlawi; Hamida AL Barwani; Hanan Al-kindi; Intisar Al-Shukri; Khulood Al-Mammary; Mohammed Al-Tobi; Samiha Al Kharusi; Samira Al-Maruqi; Zeyana AL-Dahmani
EPI_ISL_491116, EPI_ISL_491134, EPI_ISL_491154, EPI_ISL_525425	Oman-National Influenza Center	Biotechnology & OMICs Laboratory	Abdul Latif Khan; Adil Al-Wahaibi; Adil Khan; Ahlam Al-Amri; Ahmed Al-Harrasi; Ahmed Al-Rawahi; Aisha Al-Amri; Aisha Al-Busaidi; Amina Al-Jardani; Hanan Al-Kindi; Intisar Al-Shukri; Sajjad Asaf; Samiha Al-Kharusi; Samira Al-Mahruqi; Seif Al-Abri; Seif Al-Abri.
EPI_ISL_518822, EPI_ISL_518823	Oman-National Influenza Center	Biotechnology & OMICs Laboratory, Natural & Medical Sciences Research Center, University of Nizwa	Abdul Latif Khan; Adil Al-Wahaibi; Adil Khan; Ahmed Al-Harrasi; Ahmed Al-Rawahi; Amina Al-Jardani; Hanan Al-Kindi; Intisar Al-Shukri; Sajjad Asaf; Samiha Al-Kharusi; Samira Al-Mahruqi; Seif Al-Abri
EPI_ISL_455840, EPI_ISL_455841, EPI_ISL_475128, EPI_ISL_475129, EPI_ISL_475130, EPI_ISL_475131, EPI_ISL_475132, EPI_ISL_475133, EPI_ISL_475134, EPI_ISL_475135, EPI_ISL_475139, EPI_ISL_510817, EPI_ISL_560972			
see above	Orebro klinisk mikrobiologi	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Karin Tegmark-Wisell; Maria Lind Karlberg; Mattias Haukland; Mia Brytting; Olov Svartstrom; Oskar Karlsson Lindsjo; Petra Edquist; Reza Advani; Sandra Broddesson; Shamam Muradrasoli
EPI_ISL_420794	Oregon State Public Health- Virology section	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anne Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jasmine Padilla; Jing Zhang; Justin Lee; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_455100	Orsa VC	The Public Health Agency of Sweden	Anna Risberg; Anna-Karin Lundqvist; Anna-Malin Linde; Karin Tegmark-Wisell; Maria Lind Karlberg; Mia Brytting; Olov Svartstrom; Oskar Karlsson Lindsjo; Theresa Enkirch
EPI_ISL_417488, EPI_ISL_420135, EPI_ISL_590914, EPI_ISL_590916, EPI_ISL_590918	Oslo University Hospital, Department of Medical Microbiology	Norwegian Institute of Public Health, Department of Virology	Hilde Elshaug; Hilde Vollan; Kamilla Heddeland Instefjord; Karoline Bragstad; Kathrine Stene-Johansen; Olav Hungnes; Rasmus Riis Kopperud
EPI_ISL_447902	Osmania University	Osmania University	Amit; An and Kumar, K.; Bosinger; Kalyani, P.; Nagamani, K.; Pankaj Singh, D.; Radhakrishna, M.; Raja Rao, M.; Ravikumar, P.; S.E. and Rama, A.; Sunitha, P.; Thrilok Chander, B.; U.A.

EPI_ISL_528922, EPI_ISL_528924, EPI_ISL_528926, EPI_ISL_528927, EPI_ISL_528928, EPI_ISL_529026	Ospedale "Giuseppe Mazzini"-Teramo	Istituto Zooprofilattico Sperimentale dell'Abruzzo e Molise "G.Caporale"	Ancora M; Cammà C; Curini V; Di Domenico M; Di Pasquale A; Lorusso A; Mangone I; Marcacci M; Puglia I; Rinaldi A; Savini G.
EPI_ISL_420564	Ospedale Civile Castel Di Sangro	Istituto Zooprofilattico Sperimentale dell'Abruzzo e Molise "G.Caporale"	Ancora M; Cammà C; Curini V; Di Domenico M; Di Pasquale A; Lorusso A; Mangone I; Marcacci M; Puglia I; Rinaldi A; Savini G
EPI_ISL_418260, EPI_ISL_420563, EPI_ISL_429228, EPI_ISL_429231, EPI_ISL_429232, EPI_ISL_429235	Ospedale Civile Giuseppe Mazzini	Istituto Zooprofilattico Sperimentale dell'Abruzzo e Molise "G. Caporale"	Ancora M; Camma C; Cammà C; Curini V; Di Domenico M; Di Pasquale A; Lorusso A; Mangone I; Marcacci M; Puglia I; Rinaldi A; Savini G; Savini G.
EPI_ISL_420565, EPI_ISL_420568, EPI_ISL_420569, EPI_ISL_420583, EPI_ISL_435145, EPI_ISL_436723	Ospedale Civile Giuseppe Mazzini	Istituto Zooprofilattico Sperimentale dell'Abruzzo e Molise "G.Caporale"	Ancora M; Cammà C; Curini V; Di Domenico M; Di Pasquale A; Lorusso A; Mangone I; Marcacci M; Puglia I; Rinaldi A; Savini G
EPI_ISL_418257	Ospedale Civile Giuseppe Mazzini, Teramo	Istituto Zooprofilattico Sperimentale dell'Abruzzo e Molise "G.Caporale"	Ancora M; Cammà C; Curini V; Di Domenico M; Di Pasquale A; Lorusso A; Mangone I; Marcacci M; Puglia I; Rinaldi A; Savini G.
EPI_ISL_429236	Ospedale Civile S. Liberatore di Atri	Istituto Zooprofilattico Sperimentale dell'Abruzzo e Molise "G. Caporale"	Ancora M; Camma C; Curini V; Di Domenico M; Di Pasquale A; Lorusso A; Mangone I; Marcacci M; Puglia I; Rinaldi A; Savini G
EPI_ISL_436719, EPI_ISL_436720, EPI_ISL_436721, EPI_ISL_436722, EPI_ISL_436724	Ospedale Civile S. Liberatore di Atri	Istituto Zooprofilattico Sperimentale dell'Abruzzo e Molise "G.Caporale"	Ancora M; Cammà C; Curini V; Di Domenico M; Di Pasquale A; Lorusso A; Mangone I; Marcacci M; Puglia I; Rinaldi A; Savini G
EPI_ISL_528919, EPI_ISL_528929	Ospedale Civile S. Liberatore-Atri	Istituto Zooprofilattico Sperimentale dell'Abruzzo e Molise "G.Caporale"	Ancora M; Cammà C; Curini V; Di Domenico M; Di Pasquale A; Lorusso A; Mangone I; Marcacci M; Puglia I; Rinaldi A; Savini G.
EPI_ISL_420566, EPI_ISL_420567, EPI_ISL_436718	Ospedale Regionale San Salvatore	Istituto Zooprofilattico Sperimentale dell'Abruzzo e Molise "G.Caporale"	Ancora M; Cammà C; Curini V; Di Domenico M; Di Pasquale A; Lorusso A; Mangone I; Marcacci M; Puglia I; Rinaldi A; Savini G
EPI_ISL_528925	Ospedale Regionale San Salvatore-L'Aquila	Istituto Zooprofilattico Sperimentale dell'Abruzzo e Molise "G.Caporale"	Ancora M; Cammà C; Curini V; Di Domenico M; Di Pasquale A; Lorusso A; Mangone I; Marcacci M; Puglia I; Rinaldi A; Savini G.
EPI_ISL_418256	Ospedale "San Liberatore" di Atri	Istituto Zooprofilattico Sperimentale dell'Abruzzo e Molise "G. Caporale"	Ancora M; Cammà C; Curini V; Di Domenico M; Di Pasquale A; Lorusso A; Mangone I; Marcacci M; Puglia I; Rinaldi A; Savini G.
EPI_ISL_448814, EPI_ISL_448816, EPI_ISL_448817, EPI_ISL_448818, EPI_ISL_448820, EPI_ISL_448821, EPI_ISL_448822, EPI_ISL_448824, EPI_ISL_448825, EPI_ISL_534790, EPI_ISL_534797, EPI_ISL_534813, EPI_ISL_534815, EPI_ISL_534816, EPI_ISL_534817, EPI_ISL_534820, EPI_ISL_534821, EPI_ISL_534822, EPI_ISL_534827, EPI_ISL_534830, EPI_ISL_534835, EPI_ISL_534839, EPI_ISL_534840, EPI_ISL_534844, EPI_ISL_534846, EPI_ISL_534849, EPI_ISL_534850, EPI_ISL_534851, EPI_ISL_534853, EPI_ISL_534854, EPI_ISL_534855, EPI_ISL_534857, EPI_ISL_534859, EPI_ISL_534860, EPI_ISL_534862, EPI_ISL_534865, EPI_ISL_534867, EPI_ISL_534868, EPI_ISL_534870, EPI_ISL_534871, EPI_ISL_534872, EPI_ISL_534878, EPI_ISL_534879, EPI_ISL_534882, EPI_ISL_534886, EPI_ISL_534887, EPI_ISL_534889, EPI_ISL_534890, EPI_ISL_534891, EPI_ISL_534893, EPI_ISL_534897, EPI_ISL_534898, EPI_ISL_534899, EPI_ISL_534900, EPI_ISL_534902, EPI_ISL_534903, EPI_ISL_534905, EPI_ISL_534906, EPI_ISL_534907, EPI_ISL_534910, EPI_ISL_534911, EPI_ISL_534915, EPI_ISL_534925, EPI_ISL_534929, EPI_ISL_534931, EPI_ISL_534933, EPI_ISL_534934, EPI_ISL_534935, EPI_ISL_534938, EPI_ISL_534939, EPI_ISL_534944, EPI_ISL_534945, EPI_ISL_534947, EPI_ISL_534948, EPI_ISL_534953, EPI_ISL_534954, EPI_ISL_534971, EPI_ISL_534975, EPI_ISL_534976, EPI_ISL_534980, EPI_ISL_534981, EPI_ISL_534982, EPI_ISL_534983, EPI_ISL_534985, EPI_ISL_534986, EPI_ISL_535006, EPI_ISL_535007, EPI_ISL_535020, EPI_ISL_535021			
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EPI_ISL_424881, EPI_ISL_424882, EPI_ISL_424883, EPI_ISL_424884, EPI_ISL_424885, EPI_ISL_424886, EPI_ISL_426432, EPI_ISL_426433, EPI_ISL_426434, EPI_ISL_447844, EPI_ISL_450802, EPI_ISL_450803, EPI_ISL_576170, EPI_ISL_576171			
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EPI_ISL_1040031, EPI_ISL_1040033, EPI_ISL_1040034, EPI_ISL_1040036, EPI_ISL_1040037, EPI_ISL_1040040, EPI_ISL_1040041, EPI_ISL_1040042, EPI_ISL_1040043, EPI_ISL_1040045, EPI_ISL_1040046, EPI_ISL_1040047, EPI_ISL_1040048			
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EPI_ISL_1063403, EPI_ISL_1063528	PGIMER, Chandigarh	ICMR-NATIONAL INSTITUTE OF VIROLOGY, MICROBIAL CONTAINMENT COMPLEX	Pragya D. Yadav; Rupinder Bakshi
EPI_ISL_439957, EPI_ISL_439959, EPI_ISL_439964, EPI_ISL_439965, EPI_ISL_439966, EPI_ISL_439967, EPI_ISL_439969, EPI_ISL_439971, EPI_ISL_439972, EPI_ISL_439973, EPI_ISL_439974, EPI_ISL_439978, EPI_ISL_439979, EPI_ISL_439981, EPI_ISL_439982, EPI_ISL_439983, EPI_ISL_439984, EPI_ISL_439985, EPI_ISL_439986, EPI_ISL_439988, EPI_ISL_439992, EPI_ISL_439998, EPI_ISL_440001, EPI_ISL_440002, EPI_ISL_440005, EPI_ISL_440006, EPI_ISL_440008, EPI_ISL_440013, EPI_ISL_440018, EPI_ISL_440020, EPI_ISL_440021, EPI_ISL_440022, EPI_ISL_440023, EPI_ISL_440027, EPI_ISL_440029, EPI_ISL_440032, EPI_ISL_440033, EPI_ISL_440037, EPI_ISL_440038, EPI_ISL_440039, EPI_ISL_440042, EPI_ISL_440050, EPI_ISL_440052, EPI_ISL_440054, EPI_ISL_440056, EPI_ISL_440063, EPI_ISL_440065, EPI_ISL_440068, EPI_ISL_440070, EPI_ISL_440071, EPI_ISL_440081, EPI_ISL_440087, EPI_ISL_440091, EPI_ISL_440092, EPI_ISL_440093, EPI_ISL_440094, EPI_ISL_440095, EPI_ISL_440098, EPI_ISL_440100, EPI_ISL_440101, EPI_ISL_440102, EPI_ISL_440103, 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EPI_ISL_445356	PONTIFICIA U. CATOLICA SERV. LABORATORIO	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_447845	PR - Biological and Chemical Emergencies Lab Office of Public Health Preparedness and Response	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jasmine Padilla; Jing Zhang; Justin Lee; Krista Queen; Mary S. Keckler; Suxiang Tong; Yan Li; Ying Tao

EPI_ISL_596502, EPI_ISL_596503, EPI_ISL_596504, EPI_ISL_596506, EPI_ISL_596508, EPI_ISL_596509, EPI_ISL_596510, EPI_ISL_596511, EPI_ISL_596512, EPI_ISL_596513, EPI_ISL_596515, EPI_ISL_596516, EPI_ISL_596517, EPI_ISL_596518			
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EPI_ISL_968080	Pandemic Response Lab - NYC	Pandemic Response Lab, R&D	Cybill del Castillo; Haiping Hao; Henry Lee; Jon Laurent; Melissa Hopkins; Michael Hammerling; Pradeep Bugga; William Ward
EPI_ISL_455605	Panyananthaphikkhu Chonprathan Medical Center	National Institute of Health. Department of medical Sciences, Ministry of Public Health, Thailand	Chittaganpitch; Malinee; Okada; Parnmen; Phuygun; Pilailuk; Siripaporn; Sittiporn; Sunthareeya; Thanadachakul; Thanutsapa; Waicharoen; Warawan; Wongboot
EPI_ISL_434701	Panyanunthaphikkhu Chonprathan Medical Center (PCMC)	National Institute of Health. Department of medical Sciences, Ministry of Public Health, Thailand	Chittaganpitch; Malinee; Okada; Parnmen; Phuygun; Pilailuk; Siripaporn; Sittiporn; Sunthareeya; Thanadachakul; Thanutsapa; Waicharoen; Warawan; Wongboot
EPI_ISL_421502, EPI_ISL_421503	Parc des Dames	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Etienne Simon-Lorière; Flora Donati; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_448222	Pasteur Insitute Ho Chi Minh City	National Key Laboratory of Gene Technology, Institute of Biotechnology, Vietnam Academy of Science and Technology	Cao Minh Thang; Chu Hoang Ha; Ho Thi Thuong; Hoang Ha; Huynh Thi Kim Loan; Le Tung Lam; Luong Chan Quang; Luu Thuy Tien; Nguyen Hong Trang; Nguyen Thi Ngoc Thao; Nguyen Trung Hieu; Nguyen Vu Thuong; Pham Duy Quang; Phan Trong Lan; Tran Huyen Linh; Truong Nam Hai
EPI_ISL_654866, EPI_ISL_654867, EPI_ISL_654868, EPI_ISL_654869, EPI_ISL_654870, EPI_ISL_654872, EPI_ISL_654873, EPI_ISL_654874, EPI_ISL_654875, EPI_ISL_654876, EPI_ISL_654877, EPI_ISL_654878, EPI_ISL_654879, EPI_ISL_654882, EPI_ISL_654884, EPI_ISL_654885, EPI_ISL_654886, EPI_ISL_654887, EPI_ISL_654888, EPI_ISL_654889, EPI_ISL_654890, EPI_ISL_654891			
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EPI_ISL_442523	Pasteur Institute of Iran	Kawsar Human Genetic Research Company	Elmira Khateri; Maraym Firoozi; Maryam Abbasalipour Bashash; Mohammad Ali Khosravi; Razieh Zeinali and Fahimeh Hoseini; Sanaz Mostafavi Jabbari; Sirous Zeinali; Sormeh Pourtavakoli
EPI_ISL_456163, EPI_ISL_456171, EPI_ISL_456194, EPI_ISL_456195, EPI_ISL_456215, EPI_ISL_456221, EPI_ISL_456222, EPI_ISL_456223, EPI_ISL_456224			
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EPI_ISL_420456, EPI_ISL_470830, EPI_ISL_470840, EPI_ISL_470841, EPI_ISL_470845, EPI_ISL_470846, EPI_ISL_470847, EPI_ISL_470848, EPI_ISL_470849, EPI_ISL_470851, EPI_ISL_470853, EPI_ISL_470856, EPI_ISL_470858, EPI_ISL_470863, EPI_ISL_470864, EPI_ISL_470865, EPI_ISL_470867, EPI_ISL_470868, EPI_ISL_470869, EPI_ISL_470872, EPI_ISL_470873			
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EPI_ISL_512738, EPI_ISL_512739, EPI_ISL_512741, EPI_ISL_512742, EPI_ISL_512743, EPI_ISL_512744, EPI_ISL_512749, EPI_ISL_512750, EPI_ISL_512755, EPI_ISL_512756, EPI_ISL_512759, EPI_ISL_512760, EPI_ISL_512761, EPI_ISL_512762, EPI_ISL_512763, EPI_ISL_512764, EPI_ISL_596677, EPI_ISL_596679, EPI_ISL_596682, EPI_ISL_596685, EPI_ISL_596686, EPI_ISL_596687, EPI_ISL_596688, EPI_ISL_596689, EPI_ISL_596693, EPI_ISL_596695, EPI_ISL_596697, EPI_ISL_596700, EPI_ISL_596701, EPI_ISL_596705, EPI_ISL_596706, EPI_ISL_596709, EPI_ISL_596710, EPI_ISL_596711, EPI_ISL_596820, EPI_ISL_596822, EPI_ISL_596823, EPI_ISL_596824, EPI_ISL_596827, EPI_ISL_596829, EPI_ISL_596830, EPI_ISL_596831, EPI_ISL_596834, EPI_ISL_596835, EPI_ISL_596836, EPI_ISL_596839, EPI_ISL_596845, EPI_ISL_596846, EPI_ISL_596847, EPI_ISL_596848, EPI_ISL_596850, EPI_ISL_596853, EPI_ISL_596854, EPI_ISL_596855, EPI_ISL_596856, EPI_ISL_596858, EPI_ISL_596859, EPI_ISL_596860, EPI_ISL_672631, EPI_ISL_672633, EPI_ISL_672634, EPI_ISL_672635, EPI_ISL_708738, EPI_ISL_708739, EPI_ISL_794693, EPI_ISL_794695, EPI_ISL_794696, EPI_ISL_794699, EPI_ISL_794701, EPI_ISL_794702, EPI_ISL_794703, EPI_ISL_794704, EPI_ISL_794705, EPI_ISL_794706, EPI_ISL_794707, EPI_ISL_794708, EPI_ISL_794709			
see above	PathWest Laboratory Medicine WA	PathWest Laboratory Medicine WA Microbial Surveillance Unit	PathWest Laboratory Medicine WA Microbial Surveillance Unit
EPI_ISL_684110, EPI_ISL_684111, EPI_ISL_684113, EPI_ISL_684114, EPI_ISL_684115, EPI_ISL_684116, EPI_ISL_684118, EPI_ISL_684119, EPI_ISL_684120, EPI_ISL_684121, EPI_ISL_684122, EPI_ISL_684123, EPI_ISL_684124, EPI_ISL_684125, EPI_ISL_684126, EPI_ISL_684128, EPI_ISL_684129, EPI_ISL_684130, EPI_ISL_684132, EPI_ISL_684133, EPI_ISL_684139, EPI_ISL_684142, EPI_ISL_684143, EPI_ISL_684145, EPI_ISL_684146, EPI_ISL_684150, EPI_ISL_684156, EPI_ISL_684157, EPI_ISL_684158, EPI_ISL_684162, EPI_ISL_684163, EPI_ISL_684164, EPI_ISL_684168, EPI_ISL_684170, EPI_ISL_684171, EPI_ISL_684172, EPI_ISL_684173, EPI_ISL_684219, EPI_ISL_684361, EPI_ISL_684370, EPI_ISL_684371, EPI_ISL_684372, EPI_ISL_684373, EPI_ISL_684374, EPI_ISL_684375, EPI_ISL_684376, EPI_ISL_684377, EPI_ISL_684378, EPI_ISL_684379, EPI_ISL_684381, EPI_ISL_684382, EPI_ISL_684383, EPI_ISL_684384, EPI_ISL_684486, EPI_ISL_684487, EPI_ISL_684488, EPI_ISL_684492, EPI_ISL_684493, EPI_ISL_684500, EPI_ISL_684693, EPI_ISL_684694, EPI_ISL_684716, EPI_ISL_684717, EPI_ISL_684736, EPI_ISL_684762, EPI_ISL_684763, EPI_ISL_685133, EPI_ISL_685134, EPI_ISL_685135, EPI_ISL_685203, EPI_ISL_685238, EPI_ISL_685240, EPI_ISL_685241, EPI_ISL_685242, EPI_ISL_685243, EPI_ISL_685524, EPI_ISL_685525, EPI_ISL_685526, EPI_ISL_685527, EPI_ISL_685585, EPI_ISL_685586, EPI_ISL_685617, EPI_ISL_685618, EPI_ISL_685619, EPI_ISL_685620, EPI_ISL_685621, EPI_ISL_685622, EPI_ISL_685647, EPI_ISL_685648, EPI_ISL_685695, EPI_ISL_685696, EPI_ISL_685697, EPI_ISL_685700, EPI_ISL_685780, EPI_ISL_685781, EPI_ISL_685782, EPI_ISL_685784, EPI_ISL_685785, EPI_ISL_685905, EPI_ISL_685988, EPI_ISL_685989, EPI_ISL_685990, EPI_ISL_685991, EPI_ISL_686021, EPI_ISL_686022, EPI_ISL_686023, EPI_ISL_686038, EPI_ISL_686039, EPI_ISL_686040, EPI_ISL_686041, EPI_ISL_686042, EPI_ISL_686043, EPI_ISL_686845, EPI_ISL_686846, EPI_ISL_686847, EPI_ISL_686848, EPI_ISL_688757, EPI_ISL_688758, EPI_ISL_688759, EPI_ISL_688760, EPI_ISL_688761, EPI_ISL_690708, EPI_ISL_690709, EPI_ISL_690710, EPI_ISL_690745, EPI_ISL_690746, EPI_ISL_690747, EPI_ISL_690748, EPI_ISL_690749, EPI_ISL_690750, EPI_ISL_690751, EPI_ISL_690845, EPI_ISL_690846, EPI_ISL_690847, EPI_ISL_690848, EPI_ISL_690849, EPI_ISL_690850, EPI_ISL_690851, EPI_ISL_690852, EPI_ISL_690853, EPI_ISL_690854, EPI_ISL_690855, EPI_ISL_690856, EPI_ISL_690857, EPI_ISL_690858, EPI_ISL_690859, EPI_ISL_690860, EPI_ISL_690861, EPI_ISL_690862, EPI_ISL_690863, EPI_ISL_690864, EPI_ISL_690865, EPI_ISL_690866, EPI_ISL_690867, EPI_ISL_690868, EPI_ISL_690869, EPI_ISL_690870, EPI_ISL_690871, EPI_ISL_690872, EPI_ISL_690873, EPI_ISL_690987, EPI_ISL_690988, EPI_ISL_690989, EPI_ISL_690990, EPI_ISL_691015, EPI_ISL_691016, EPI_ISL_691017, EPI_ISL_691018, EPI_ISL_691019, EPI_ISL_691020, EPI_ISL_691021, EPI_ISL_691022, EPI_ISL_691023, EPI_ISL_691024, EPI_ISL_691025, EPI_ISL_691026, EPI_ISL_691027, EPI_ISL_691028, EPI_ISL_691029, EPI_ISL_691030, EPI_ISL_691031, EPI_ISL_691032, EPI_ISL_691242, EPI_ISL_691289, EPI_ISL_691290, EPI_ISL_691291, EPI_ISL_691292, EPI_ISL_691293, EPI_ISL_691294, EPI_ISL_691295, EPI_ISL_691296, EPI_ISL_691297, EPI_ISL_691298, EPI_ISL_691299, EPI_ISL_691379, EPI_ISL_691380, EPI_ISL_691381, EPI_ISL_691382, EPI_ISL_691383, EPI_ISL_691395, EPI_ISL_897528, EPI_ISL_898565, EPI_ISL_898566, EPI_ISL_898567, EPI_ISL_898568, EPI_ISL_901221, EPI_ISL_901222, EPI_ISL_901223, EPI_ISL_901224, EPI_ISL_901225, EPI_ISL_901226, EPI_ISL_901322, EPI_ISL_901323, EPI_ISL_901324, EPI_ISL_901325, EPI_ISL_901326, EPI_ISL_901327			
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EPI_ISL_437459, EPI_ISL_437460, EPI_ISL_437461, EPI_ISL_437462, EPI_ISL_437463, EPI_ISL_437464, EPI_ISL_437465, EPI_ISL_437466, EPI_ISL_437468, EPI_ISL_437469, EPI_ISL_437470, EPI_ISL_437471, EPI_ISL_437472, EPI_ISL_437473, EPI_ISL_437474, EPI_ISL_437481, EPI_ISL_437482, EPI_ISL_437483, EPI_ISL_437484, EPI_ISL_437485, EPI_ISL_437486, EPI_ISL_437487, EPI_ISL_437488, EPI_ISL_437489, EPI_ISL_437490, EPI_ISL_437491, EPI_ISL_437492, EPI_ISL_437493, EPI_ISL_437494, EPI_ISL_437495, EPI_ISL_437496, EPI_ISL_437497, EPI_ISL_437691, EPI_ISL_437692, EPI_ISL_437693, EPI_ISL_437694, EPI_ISL_437695, EPI_ISL_437733, EPI_ISL_437734, EPI_ISL_437735, EPI_ISL_437736, EPI_ISL_437737, EPI_ISL_437738, EPI_ISL_437739, EPI_ISL_437740, EPI_ISL_437741, EPI_ISL_437742, EPI_ISL_437743, EPI_ISL_437744, EPI_ISL_437745, EPI_ISL_437746, EPI_ISL_437747, EPI_ISL_437748, EPI_ISL_437749, EPI_ISL_437750, EPI_ISL_437751, EPI_ISL_437752, EPI_ISL_437753, EPI_ISL_437754, EPI_ISL_437755, EPI_ISL_437756, EPI_ISL_437757, EPI_ISL_437758, EPI_ISL_437759, EPI_ISL_437760, EPI_ISL_437761, EPI_ISL_437762, EPI_ISL_677940, EPI_ISL_678037, EPI_ISL_678076, EPI_ISL_678078, EPI_ISL_678079, EPI_ISL_678080, EPI_ISL_678081, EPI_ISL_678082, EPI_ISL_678096, EPI_ISL_678141, EPI_ISL_678144, EPI_ISL_751237			
see above	Pathogen Genomics Lab King Abdullah University of Science and Technology(KAUST)	Pathogen Genomics Lab King Abdullah University of Science and Technology(KAUST)	Abdulaziz Alahmadi; Afrah Alsomali; Amanda Ooi; Amit Kumar Subudhi; Amit Subudhi; Anwar Hashem; Arnab Pain; Asim Khogeer; Fadwa Alofi; Fathia Ben Rached; Fathia Ben-Rached; Fathia Rached; Jumana Taha; Kahled Algithami; Khaled Algithami; Luke Esau; Naif Almontashiri; Olga Douvropoulou; Raeece Naeem; Rahul P Salunke; Rahul Salunke; Raushan Nugmanova; Sara Mfarrej; Sharif Hala
EPI_ISL_583619, EPI_ISL_583620, EPI_ISL_583621, EPI_ISL_583622, EPI_ISL_583623, EPI_ISL_583624, EPI_ISL_583625, EPI_ISL_583626, EPI_ISL_583627, EPI_ISL_583629			
see above	Pathologie-Labor Dr. Obrist- Dr. Brunhuber	Bergthaler laboratory, CeMM Research Center for Molecular Medicine of the Austrian Academy of Sciences	Adi Steinrigl; Alexander Lercher; Alexandra Popa; Andreas Bergthaler; Benedikt Agerer; Christian Paar; Christoph Bock; Daniela Schmid; Dorothee von Laer; Elisabeth Puchhammer-Stoeckl; Franz Allerberger; Gernot Walder; Gregor Hörmann; Guenter Weiss; Gunther Vogl; Henrique Colaco; Jakob-Wendelin Genger; Jan Laine; Judith Aberle; Kinga Rigler-Hohenwarter; Lukas Endler; Manfred Nairz; Mark Smyth; Martin Senekowitsch; Michael Schuster; Peter Hufnagl; Peter Obrist; Rainer Gattringer; Sabine Sussitz-Rack; Stephan Aberle; Thomas Penz; Wegene Borena
EPI_ISL_421636	Pathology North	Public Health Virology Laboratory	Alyssa Pyke; Amanda De Jong; Andrew Van Den Hurk; Bixing Huang; Carmel Taylor; David Warrilow; Doris Genge; Elisabeth Gamez; Glen Hewitson; Ian Maxwell Mackay; Inga Sultana; Jamie McMahon; Jean Barcelon; Judy Northill; Mitchell Finger; Natalie Simpson; Neelima Nair; Peter Burtonclay; Peter Moore; Sarah Wheatley; Sean Moody; Sonja Hall-Mendelin; Timothy Gardam; and Frederick Moore
EPI_ISL_451487, EPI_ISL_451488, EPI_ISL_451552, EPI_ISL_451604	Pathology North - NSW Health Pathology	NSW Health Pathology - Institute of Clinical Pathology and Medical Research; Westmead Hospital; University of Sydney	CIDM-PH et al.
EPI_ISL_478673, EPI_ISL_478674	Pathology North - Royal North Shore Hospital - NSW Health Pathology	NSW Health Pathology - Institute of Clinical Pathology and Medical Research; Westmead Hospital; University of Sydney	CIDM-PH et al.
EPI_ISL_407896, EPI_ISL_410717, EPI_ISL_410718, EPI_ISL_414414, EPI_ISL_417031, EPI_ISL_418802, EPI_ISL_418803, EPI_ISL_418804, EPI_ISL_418807, EPI_ISL_418808, EPI_ISL_444611, EPI_ISL_444793			
see above	Pathology Queensland	Public Health Virology Laboratory	Alyssa Pyke; Amanda De Jong; Andrew Van Den Hurk; Ben Huang; Bixing Huang; Carmel Taylor; David Warrilow; Doris Genge; Elisabeth Gamez; Glen Hewitson; Ian Maxwell Mackay; Inga Sultana; Jamie McMahon; Jean Barcelon; Judy Northill; Mitchell Finger; Natalie Simpson; Neelima Nair; Peter

			Burtonclay; Peter Moore; Sarah Wheatley; Sean Moody; Sonja Hall-Mendelin; Timothy Gardam; and Frederick Moore; and Frederick Moore.
EPI_ISL_447595	Pathology Queensland, Sunshine Coast University Hospital	Public Health Virology Laboratory	Alyssa Pyke; Amanda De Jong; Andrew Van Den Hurk; Bixing Huang; Carmel Taylor; David Warrilow; Doris Genge; Elisabeth Gamez; Glen Hewitson; Ian Maxwell Mackay; Inga Sultana; Jamie McMahon; Jean Barcelon; Judy Northill; Mitchell Finger; Natalie Simpson; Neelima Nair; Peter Burtonclay; Peter Moore; Sarah Wheatley; Sean Moody; Sonja Hall-Mendelin; Timothy Gardam; and Frederick Moore
EPI_ISL_451530, EPI_ISL_451531, EPI_ISL_451533, EPI_ISL_451536, EPI_ISL_451542, EPI_ISL_451543, EPI_ISL_451544, EPI_ISL_451563, EPI_ISL_451578, EPI_ISL_451608, EPI_ISL_455094			
see above	Pathology Sydney South West - NSW Health Pathology	NSW Health Pathology - Institute of Clinical Pathology and Medical Research; Westmead Hospital; University of Sydney	CIDM-PH et al.
EPI_ISL_451490, EPI_ISL_451491, EPI_ISL_451492, EPI_ISL_451493, EPI_ISL_451494, EPI_ISL_451495, EPI_ISL_451496, EPI_ISL_451497, EPI_ISL_451498, EPI_ISL_451499, EPI_ISL_451500, EPI_ISL_451501, EPI_ISL_451502, EPI_ISL_451503, EPI_ISL_451504, EPI_ISL_451505, EPI_ISL_451506, EPI_ISL_451507, EPI_ISL_451508, EPI_ISL_451509, EPI_ISL_451510, EPI_ISL_451511, EPI_ISL_451512, EPI_ISL_451513, EPI_ISL_451514, EPI_ISL_451515, EPI_ISL_451516, EPI_ISL_451522, EPI_ISL_451523, EPI_ISL_451524, EPI_ISL_451525, EPI_ISL_451526, EPI_ISL_451527, EPI_ISL_451528, EPI_ISL_451529, EPI_ISL_451538, EPI_ISL_451556, EPI_ISL_451557, EPI_ISL_451569, EPI_ISL_451575, EPI_ISL_451576, EPI_ISL_451577, EPI_ISL_451579, EPI_ISL_451580, EPI_ISL_451584, EPI_ISL_451586, EPI_ISL_451607, EPI_ISL_455044, EPI_ISL_455045, EPI_ISL_455046, EPI_ISL_455064, EPI_ISL_455067, EPI_ISL_498748, EPI_ISL_498749, EPI_ISL_498750, EPI_ISL_593660, EPI_ISL_593661, EPI_ISL_593662, EPI_ISL_593664, EPI_ISL_593665			
see above	Pathology West - NSW Health Pathology	NSW Health Pathology - Institute of Clinical Pathology and Medical Research; Westmead Hospital; University of Sydney	CIDM-PH et al.
EPI_ISL_455585, EPI_ISL_455608	Phramongkutklao Hospital	National Institute of Health. Department of medical Sciences, Ministry of Public Health, Thailand	Chittaganpitch; Malinee; Okada; Pamnen; Phuygun; Pilailuk; Siripaporn; Sittiporn; Sunthareeya; Thanadachakul; Thanutsapa; Waicharoen; Warawan; Wongboot
EPI_ISL_1263331, EPI_ISL_1263332, EPI_ISL_1263333	Platform BIS UZA/UAntwerpen	UAntwerp, Laboratory of Medical Microbiology	Basil Britto Xavier; Christine Lammens; Herman Goossens; Jasmine Coppens; Marie Le Mercier; Veerle Matheeussen
EPI_ISL_536263	Point de Service de Témiscaming-et-Kipawa	Laboratoire de santé publique du Québec	Guillaume Bourque; Ioannis Ragoussis; Jesse Shapiro; Mark Lathrop and Michel Roger on behalf of the CoVSeQ research group; Sandrine Moreira
EPI_ISL_539850	Pok Oi Hospital	Hong Kong Department of Health	Alan K.L. Tsang; Dominic N.C. Tsang; Edman T.K. Lam; Peter C.W. Yip; Rickjason C.W. Chan
EPI_ISL_434699, EPI_ISL_434703, EPI_ISL_434705, EPI_ISL_434706, EPI_ISL_455606, EPI_ISL_455607	Praram 9 Hospital	National Institute of Health. Department of medical Sciences, Ministry of Public Health, Thailand	Chittaganpitch; Malinee; Okada; Pamnen; Phuygun; Pilailuk; Siripaporn; Sittiporn; Sunthareeya; Thanadachakul; Thanutsapa; Waicharoen; Warawan; Wongboot
EPI_ISL_759959	Premier Hospital Surabaya	Institute of Tropical Disease, Universitas Airlangga	Aldise M Nastri; Gatot Soegiarto; Hartono Tanto; Jezzy R Dewantari; Kazufumi Shimizu; Krisnoadi Rahardjo; Laksmi Wulandari; Maria I Lusida; Resti Yudhawati; Rima R Prasetya; Soetjipto; Yasuko Mori
EPI_ISL_418255	Presidio Ospedaliero "S. Spirito" - PESCARA	Istituto Zooprofilattico Sperimentale dell'Abruzzo e Molise "G. Caporale"	Cammà C; Di Pasquale A; Lorusso A; Mangone I; Marcacci M; Monaco F; Puglia I; Rinaldi A; Savini G
EPI_ISL_528920, EPI_ISL_528921	Presidio Ospedaliero "Santo Spirito"-Pescara	Istitituto Zooprofilattico Sperimentale dell'Abruzzo e Molise "G.Caporale"	Ancora M; Cammà C; Curini V; Di Domenico M; Di Pasquale A; Lorusso A; Mangone I; Marcacci M; Puglia I; Rinaldi A; Savini G.
EPI_ISL_429226, EPI_ISL_429227	Presidio Ospedaliero Santo Spirito	Istituto Zooprofilattico Sperimentale dell'Abruzzo e Molise "G. Caporale"	Ancora M; Camma C; Curini V; Di Domenico M; Di Pasquale A; Lorusso A; Mangone I; Marcacci M; Puglia I; Rinaldi A; Savini G
EPI_ISL_418258, EPI_ISL_418259	Presidio ospedaliero "Santo Spirito"	Istituto Zooprofilattico Sperimentale dell'Abruzzo e Molise "G. Caporale"	Ancora M; Cammà C; Curini V; Di Domenico M; Di Pasquale A; Lorusso A; Mangone I; Marcacci M; Puglia I; Rinaldi A; Savini G.
EPI_ISL_436097	Prince Charles Hospital	Public Health Virology Laboratory, Forensics and Scientific Services, Queensland Health	Alyssa Pyke; Amanda De Jong; Andrew Van Den Hurk; Bixing Huang; Carmel Taylor; David Warrilow; Doris Genge; Elisabeth Gamez; Glen Hewitson; Ian Maxwell Mackay; Inga Sultana and Frederick Moore; Jamie McMahon; Jean Barcelon; Judy Northill; Lisa Leckie; Mitchell Finger; Natalie Simpson; Neelima Nair; Peter Burtonclay; Peter Moore; Sarah Wheatley; Sean Moody; Sonja Hall-Mendelin
EPI_ISL_417064	Prince of Wales Hospital	Hong Kong Department of Health	Alan K.L. Tsang; Dominic N.C. Tsang; Edman T.K. Lam; Peter C.W. Yip; Rickjason C.W. Chan
EPI_ISL_574479, EPI_ISL_574481, EPI_ISL_574482, EPI_ISL_574483, EPI_ISL_574484, EPI_ISL_574487, EPI_ISL_574488, EPI_ISL_574489, EPI_ISL_574490			
see above	Programme in Emerging Infectious Diseases, Duke-NUS Medical School	National Public Health Laboratory, National Centre for Infectious Diseases	Adrian Eng Zheng Kang; Danielle E Anderson; Lin Cui; Raymond Tzer Pin Lin; Sophie Octavia; Tze Minn Mak; Zhenyang Zhou
EPI_ISL_527858	Pronto Atendimento Sancta Maggiore Jardim Paulista	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes
EPI_ISL_515529	Pronto Socorro Municipal Julio Tupy	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes
EPI_ISL_515554	Pronto Socorro Municipal de Perus	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes
EPI_ISL_887327, EPI_ISL_887330, EPI_ISL_887331, EPI_ISL_887332, EPI_ISL_887336, EPI_ISL_887339, EPI_ISL_887341, EPI_ISL_887344, EPI_ISL_887346, EPI_ISL_887347, EPI_ISL_887349, EPI_ISL_887350, EPI_ISL_887352, EPI_ISL_887353, EPI_ISL_887354, EPI_ISL_887357, EPI_ISL_887359, EPI_ISL_887361, EPI_ISL_887362, EPI_ISL_887364, EPI_ISL_887370, EPI_ISL_887371, EPI_ISL_887373, EPI_ISL_887374, EPI_ISL_887378, EPI_ISL_887379, EPI_ISL_887380, EPI_ISL_887381, EPI_ISL_887382, EPI_ISL_887383, EPI_ISL_887384, EPI_ISL_887386, EPI_ISL_887388, EPI_ISL_887393, EPI_ISL_887394, EPI_ISL_887395, EPI_ISL_887397, EPI_ISL_887401, EPI_ISL_887406, EPI_ISL_887408, EPI_ISL_887410, EPI_ISL_887413, EPI_ISL_887418			
see above	Protzer Lab	Protzer Lab, Gagneur Lab, Robert Koch Institut	Aleksandar Radonic; Alexander Karollus; Andrea Theumer; Dieter Hoffmann; Eva Schulte; Julien Gagneur; Max von Kleist; Oliver Drechsel; Stephan Fuchs; Ulrike Protzer
EPI_ISL_482298, EPI_ISL_482299, EPI_ISL_482300, EPI_ISL_482306, EPI_ISL_482307, EPI_ISL_482308, EPI_ISL_482309, EPI_ISL_482310, EPI_ISL_482311, EPI_ISL_482312, EPI_ISL_482313, EPI_ISL_482314, EPI_ISL_482315, EPI_ISL_482316, EPI_ISL_482317, EPI_ISL_482318, EPI_ISL_482319, EPI_ISL_482320, EPI_ISL_482321, EPI_ISL_482322, EPI_ISL_482323, EPI_ISL_482324, EPI_ISL_482325, EPI_ISL_482326, EPI_ISL_482327, EPI_ISL_482328, EPI_ISL_482329, EPI_ISL_482330, EPI_ISL_482331, EPI_ISL_482332, EPI_ISL_482333, EPI_ISL_482449, EPI_ISL_482451, EPI_ISL_482452, EPI_ISL_482455, EPI_ISL_482456, EPI_ISL_482457, EPI_ISL_482458, EPI_ISL_482459, EPI_ISL_482460, EPI_ISL_482462, EPI_ISL_482463, EPI_ISL_482464, EPI_ISL_482465, EPI_ISL_482466, EPI_ISL_482467, EPI_ISL_486830, EPI_ISL_486831			
see above	Providence St. Joseph Health Molecular Genomics Laboratory	Providence St. Joseph Health Molecular Genomics Laboratory	Alexa K Dowdell; Brian D Piening; Carlo B Bifulco; Fred L Robinson; Mary Campbell
EPI_ISL_632058, EPI_ISL_632059	Proximedical Urgent Care	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_429815, EPI_ISL_469224, EPI_ISL_469225, EPI_ISL_469226, EPI_ISL_469227, EPI_ISL_469228, EPI_ISL_469229, EPI_ISL_469230, EPI_ISL_469231, EPI_ISL_469232, EPI_ISL_469233, EPI_ISL_469234, EPI_ISL_469235, EPI_ISL_469236, EPI_ISL_469237, EPI_ISL_469238, EPI_ISL_469239, EPI_ISL_469240, EPI_ISL_482479			
see above	Public Health Laboratory	National Microbiology Laboratory	Adel Malek; Anna Majer; Elsie Grudeski; Gary Van Domselaar; George Zahariadis; Grace Seo; Jennifer Tanner; Kristyn Burak; Laura Gilbert; Matthew Gilmour; Morag Graham; Natalie Knox; Nathalie Bastien; Philip Mabon; Rhiannon Huzarewich; Robert Needle; Russell Mandes; Shari Tyson; Timothy Booth; Yan Li; Yang Yu
EPI_ISL_425177	Public Health Ontario	Public Health Agency of Canada - National Microbiology Laboratory	Amrit S. Boese; Anders Leung; Darwyn Kobasa; Jonathan Audet; Joshua Quick; Morag Graham; Natalie Knox; Nikesh Tailor; Shari Tyson
EPI_ISL_593597, EPI_ISL_593598, EPI_ISL_593599, EPI_ISL_593600, EPI_ISL_593601, EPI_ISL_593602, EPI_ISL_593603, EPI_ISL_593604, EPI_ISL_593605, EPI_ISL_593606, EPI_ISL_593607, EPI_ISL_593608, EPI_ISL_593609, EPI_ISL_593610, EPI_ISL_593611, EPI_ISL_593612, EPI_ISL_593618, EPI_ISL_593619, EPI_ISL_593620, EPI_ISL_593621, EPI_ISL_593622, EPI_ISL_593623, EPI_ISL_593624, EPI_ISL_593625, EPI_ISL_593626, EPI_ISL_593627, EPI_ISL_593628, EPI_ISL_593629, EPI_ISL_593630, EPI_ISL_593631, EPI_ISL_593632, EPI_ISL_639741, EPI_ISL_639742, EPI_ISL_639743, EPI_ISL_639744, EPI_ISL_639745, EPI_ISL_639746, EPI_ISL_639747, EPI_ISL_639748, EPI_ISL_639749, EPI_ISL_639751, EPI_ISL_639752, EPI_ISL_639753, EPI_ISL_639754, EPI_ISL_639755, EPI_ISL_639756, EPI_ISL_639757, EPI_ISL_639760, EPI_ISL_639761, EPI_ISL_639762, EPI_ISL_639763, EPI_ISL_639764, EPI_ISL_639765, EPI_ISL_639766, EPI_ISL_639767, EPI_ISL_639768, EPI_ISL_639769, EPI_ISL_639770, EPI_ISL_639771, EPI_ISL_639772, EPI_ISL_639773, EPI_ISL_639774, EPI_ISL_639775, EPI_ISL_639776, EPI_ISL_639777, EPI_ISL_639778, EPI_ISL_639779, EPI_ISL_639780, EPI_ISL_639781, EPI_ISL_639782, EPI_ISL_639783, EPI_ISL_639784, EPI_ISL_639785, EPI_ISL_639786, EPI_ISL_639787, EPI_ISL_639788, EPI_ISL_639789, EPI_ISL_639790, EPI_ISL_639791, EPI_ISL_639792, EPI_ISL_639793, EPI_ISL_639794, EPI_ISL_639795, EPI_ISL_639796, EPI_ISL_639797, EPI_ISL_639798, EPI_ISL_639799, EPI_ISL_639800, EPI_ISL_639801, EPI_ISL_639802, EPI_ISL_639803, EPI_ISL_639804, EPI_ISL_639805, EPI_ISL_639806, EPI_ISL_639807, EPI_ISL_639808, EPI_ISL_639809, EPI_ISL_639810, EPI_ISL_639811, EPI_ISL_639812, EPI_ISL_639813, EPI_ISL_639814, EPI_ISL_639815, EPI_ISL_639816, EPI_ISL_639817, EPI_ISL_639820, EPI_ISL_641309, EPI_ISL_693250, EPI_ISL_693251, EPI_ISL_693252, EPI_ISL_693253, EPI_ISL_693254, EPI_ISL_693255, EPI_ISL_693256, EPI_ISL_693257, EPI_ISL_693258, EPI_ISL_693259, EPI_ISL_693260, EPI_ISL_693261, EPI_ISL_693262, EPI_ISL_693263, EPI_ISL_693264, EPI_ISL_693265, EPI_ISL_693266, EPI_ISL_693267, EPI_ISL_693268, EPI_ISL_693270, EPI_ISL_693271, EPI_ISL_693272, EPI_ISL_693273, EPI_ISL_693274, EPI_ISL_693275, EPI_ISL_693276, EPI_ISL_693277, EPI_ISL_693278, EPI_ISL_693279, EPI_ISL_693280, EPI_ISL_693281, EPI_ISL_693286, EPI_ISL_693287, EPI_ISL_693288, EPI_ISL_693289, EPI_ISL_693290, EPI_ISL_693291, EPI_ISL_693292, EPI_ISL_693293, EPI_ISL_693294, EPI_ISL_693295, EPI_ISL_693296, EPI_ISL_849664, EPI_ISL_849665, EPI_ISL_849666, EPI_ISL_849667, EPI_ISL_849668, EPI_ISL_849669, EPI_ISL_849670, EPI_ISL_849671, EPI_ISL_849672, EPI_ISL_849673, EPI_ISL_849674, EPI_ISL_849675, EPI_ISL_849676, EPI_ISL_849677, EPI_ISL_849678, EPI_ISL_849679, EPI_ISL_849681, EPI_ISL_849687, EPI_ISL_849688, EPI_ISL_849701, EPI_ISL_849702, EPI_ISL_849703, EPI_ISL_849704, EPI_ISL_849713, EPI_ISL_849719, EPI_ISL_849725			

see above	Public Health Virology Laboratory, Forensic and Scientific Services (PHV-FSS)	Public Health Virology Laboratory, Forensic and Scientific Services (PHV-FSS)	Son Nguyen et al
EPI_ISL_512785, EPI_ISL_512787, EPI_ISL_512789, EPI_ISL_512790, EPI_ISL_512795, EPI_ISL_512797, EPI_ISL_512798, EPI_ISL_512799, EPI_ISL_512801, EPI_ISL_512802, EPI_ISL_512803, EPI_ISL_512805, EPI_ISL_512806, EPI_ISL_512807, EPI_ISL_512808, EPI_ISL_513310			
see above	Public Health, United States Air Force School of Aerospace Medicine	Public Health, United States Air Force School of Aerospace Medicine	A.C.; A.K.; A.W.; B.C.; C.R.; Chapleau; Connors; E.A.; Fries; J.R.; Javorina; Lambert; Macias; Meyer; Purves; R.R.; R.R. and Starr; S.M.; Starr
EPI_ISL_513312	Public Health, United States Air Force School of Aerospace Medicine	Public Health, United States Air Force School of Aerospace Medicine	A.C.; A.K.; A.W.; B.C.; C.R.; Chapleau; Connors; E.A.; Fries; J.R.; Javorina; Lambert; Macias; Meyer; Purves; R.R. and Starr; S.M.
EPI_ISL_434541, EPI_ISL_434543, EPI_ISL_434545, EPI_ISL_434546, EPI_ISL_434547, EPI_ISL_434548, EPI_ISL_434549, EPI_ISL_434551			
see above	Puerto Rico Department of Health	Centers for Disease Control and Prevention, Dengue Branch	Betzabel Flores; Chaney Kalinich; Fabiola Cruz; Gilberto A. Santiago; Glenda Gonzalez; Jessica I. Falcon; Jorge L. Munoz-Jordan; Joseph Fauver; Keyla Charriez; Nathan Grubaugh
EPI_ISL_437189	Pusat Pertamina Hospital	Eijkman Institute for Molecular Biology, Ministry of Research and Technology/National Agency for Research and Innovation	Amin Soebandrio; David H Muljono; Edison Johar; Frilasita A Yudhaputri; Hidayat Trimarsanto; Khin Saw Myint; Safarina G Malik
EPI_ISL_579515, EPI_ISL_579516, EPI_ISL_579517, EPI_ISL_579537, EPI_ISL_579538, EPI_ISL_579539, EPI_ISL_579540, EPI_ISL_579541, EPI_ISL_579542, EPI_ISL_579543, EPI_ISL_579544, EPI_ISL_579545, EPI_ISL_579546, EPI_ISL_579547, EPI_ISL_579548, EPI_ISL_579549, EPI_ISL_579550, EPI_ISL_579551, EPI_ISL_579552, EPI_ISL_579553, EPI_ISL_579554, EPI_ISL_579555, EPI_ISL_579556, EPI_ISL_579557, EPI_ISL_579558, EPI_ISL_579559, EPI_ISL_579560, EPI_ISL_579561, EPI_ISL_579562, EPI_ISL_579563, EPI_ISL_579564, EPI_ISL_579565, EPI_ISL_579566, EPI_ISL_579567, EPI_ISL_579568, EPI_ISL_579569, EPI_ISL_579570, EPI_ISL_579571, EPI_ISL_579572, EPI_ISL_579573, EPI_ISL_579574, EPI_ISL_579575, EPI_ISL_579576, EPI_ISL_579577, EPI_ISL_579579, EPI_ISL_579580, EPI_ISL_579581, EPI_ISL_579582, EPI_ISL_579583, EPI_ISL_579585, EPI_ISL_579586, EPI_ISL_579587, EPI_ISL_579588, EPI_ISL_579589, EPI_ISL_579590, EPI_ISL_579591, EPI_ISL_579592, EPI_ISL_579593, EPI_ISL_579597, EPI_ISL_579598, EPI_ISL_914978, EPI_ISL_914979, EPI_ISL_914980, EPI_ISL_914982, EPI_ISL_914984, EPI_ISL_914994			
see above	QEII Health Sciences Centre	National Microbiology Laboratory (NML)	Anna Majer; Anneliese Landgraff; CanCOGeN's metadata curation team; Dan Gaston; Darian Hole; Elsie Grudeski; Gary Van Domselaar; Grace Seo; Janice Pettipas; Jason LeBlanc; Jennifer Tanner; Madison Chapel; Morag Graham; Natalie Knox; Nathalie Bastien; Philip Mabon; Public Health Agency of Canada CanCOGeN team; Public Health Agency of Canada's CanCOGeN team; Rhiannon Huzarewich; Russell Mandes; Shari Tyson; Timothy Booth; Todd Hatchette; Yan Li
EPI_ISL_444612	QML Pathology	Public Health Virology Laboratory	Alyssa Pyke; Amanda De Jong; Andrew Van Den Hurk; Bixing Huang; Carmel Taylor; David Warrilow; Doris Genge; Elisabeth Gamez; Glen Hewitson; Ian Maxwell Mackay; Inga Sultana; Jamie McMahon; Jean Barcelon, Judy Northill; Mitchell Finger; Natalie Simpson; Neelima Nair; Peter Burtonclay; Peter Moore; Sarah Wheatley; Sean Moody; Sonja Hall-Mendelin; Timothy Gardam; and Frederick Moore
EPI_ISL_490498, EPI_ISL_490502, EPI_ISL_490504, EPI_ISL_490505, EPI_ISL_490506, EPI_ISL_490507, EPI_ISL_490509, EPI_ISL_490511, EPI_ISL_490514, EPI_ISL_490515, EPI_ISL_490524, EPI_ISL_490526, EPI_ISL_490530, EPI_ISL_490537, EPI_ISL_490538, EPI_ISL_490543, EPI_ISL_490551			
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EPI_ISL_418814, EPI_ISL_429812, EPI_ISL_429813, EPI_ISL_429814, EPI_ISL_482469, EPI_ISL_482470, EPI_ISL_482476, EPI_ISL_482477			
see above	Queen Elizabeth II Health Science Centre	National Microbiology Laboratory	Anna Majer; Elsie Grudeski; Gary Van Domselaar; Grace Seo; Jason LeBlanc; Jennifer Tanner; Kristyn Burak; Matthew Gilmour; Morag Graham; Natalie Knox; Nathalie Bastien; Philip Mabon; Rhiannon Huzarewich; Russell Mandes; Shari Tyson; Timothy Booth; Todd Hatchette; Yan Li
EPI_ISL_539820	Queen Mary Hospital	Hong Kong Department of Health	Alan K.L. Tsang; Dominic N.C. Tsang; Edman T.K. Lam; Peter C.W. Yip; Rickjason C.W. Chan
EPI_ISL_425462, EPI_ISL_425464, EPI_ISL_425465, EPI_ISL_425466, EPI_ISL_425468, EPI_ISL_425469, EPI_ISL_425470, EPI_ISL_425471, EPI_ISL_425472, EPI_ISL_425473, EPI_ISL_425474, EPI_ISL_425475, EPI_ISL_425476, EPI_ISL_425477, EPI_ISL_425479, EPI_ISL_425480, EPI_ISL_425481, EPI_ISL_425482, EPI_ISL_425483, EPI_ISL_425484, EPI_ISL_425485, EPI_ISL_425486, EPI_ISL_425487, EPI_ISL_425488, EPI_ISL_425489, EPI_ISL_425490, EPI_ISL_425491, EPI_ISL_425492, EPI_ISL_425493, EPI_ISL_425494, EPI_ISL_425495, EPI_ISL_425496, EPI_ISL_425497, EPI_ISL_425498, EPI_ISL_425501, EPI_ISL_425502, EPI_ISL_425504, EPI_ISL_425505, EPI_ISL_425506, EPI_ISL_425507, EPI_ISL_425508, EPI_ISL_425509, EPI_ISL_425510, EPI_ISL_425511, EPI_ISL_425512, EPI_ISL_425513, EPI_ISL_425514, EPI_ISL_425515, EPI_ISL_425517, EPI_ISL_425518, EPI_ISL_425519, EPI_ISL_425522, EPI_ISL_425523, EPI_ISL_425525, EPI_ISL_425526, EPI_ISL_425532, EPI_ISL_425533, EPI_ISL_425535, EPI_ISL_425536, EPI_ISL_425537, EPI_ISL_425544, EPI_ISL_425547, EPI_ISL_425548, EPI_ISL_425549, EPI_ISL_425550, EPI_ISL_425551, EPI_ISL_425554, EPI_ISL_425561, EPI_ISL_425562, EPI_ISL_425563, EPI_ISL_425565, EPI_ISL_425566, EPI_ISL_425567, EPI_ISL_425568, EPI_ISL_425570, EPI_ISL_425571, EPI_ISL_425573, EPI_ISL_425574, EPI_ISL_425575, EPI_ISL_425576, EPI_ISL_425579, EPI_ISL_425581, EPI_ISL_425582, EPI_ISL_425583, EPI_ISL_425584, EPI_ISL_425586, EPI_ISL_425587, EPI_ISL_425590, EPI_ISL_425593, EPI_ISL_425600, EPI_ISL_425601, EPI_ISL_425603, EPI_ISL_425609, EPI_ISL_425611, EPI_ISL_425614, EPI_ISL_425615, EPI_ISL_425616, EPI_ISL_425618, EPI_ISL_425620, EPI_ISL_425621, EPI_ISL_425622, EPI_ISL_425623, EPI_ISL_425627, EPI_ISL_425628, EPI_ISL_425630, EPI_ISL_425631, EPI_ISL_425632, EPI_ISL_425633, EPI_ISL_425635, EPI_ISL_425637, EPI_ISL_425638, EPI_ISL_425639, EPI_ISL_425640, EPI_ISL_425641, EPI_ISL_425642, EPI_ISL_425643, EPI_ISL_425644, EPI_ISL_425645, EPI_ISL_432900, EPI_ISL_432916, EPI_ISL_432921, EPI_ISL_432925, EPI_ISL_432930, EPI_ISL_432935, EPI_ISL_432938, EPI_ISL_432942, EPI_ISL_432944, EPI_ISL_432951, EPI_ISL_432954, EPI_ISL_432955, EPI_ISL_432956, EPI_ISL_432961, EPI_ISL_432963, EPI_ISL_432965, EPI_ISL_432967, EPI_ISL_432970, EPI_ISL_484339			
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EPI_ISL_530226, EPI_ISL_530241, EPI_ISL_530242, EPI_ISL_530243, EPI_ISL_530244, EPI_ISL_530260, EPI_ISL_530261, EPI_ISL_530262, EPI_ISL_530263, EPI_ISL_530264, EPI_ISL_530265, EPI_ISL_530266, EPI_ISL_530267, EPI_ISL_530268, EPI_ISL_530269, EPI_ISL_530270, EPI_ISL_530271, EPI_ISL_530272, EPI_ISL_530273, EPI_ISL_530274			
see above	Queensland Health Forensic and Scientific Services, Public Health Virology	Public Health Virology Laboratory, Forensic and Scientific Services, Queensland Health	Son Nguyen et al
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see above	Quest Diagnostics	Quest Diagnostics	Anderson; Anderson, B.; B.P.; D.F.; Gerasimova, A.; Grover, D.; Hua, M.; K.E.; Kagan; Lacbawan, F.; Liu Y.; Livingston; Owen, R.; R.M.; R.M. and Owen, R.; Rosenthal; S.H.; Shalhout
EPI_ISL_415641, EPI_ISL_415642, EPI_ISL_415643, EPI_ISL_415644, EPI_ISL_416477, EPI_ISL_416478, EPI_ISL_416479, EPI_ISL_416480, EPI_ISL_416481, EPI_ISL_416482			
see above	R. G. Lugar Center for Public Health Research, National Center for Disease Control and Public Health (NCDC) of Georgia.	R. G. Lugar Center for Public Health Research, National Center for Disease Control and Public Health (NCDC) of Georgia.	Adam Kotorashvili; Amiran Gamkrelidze.; Ana Papkiauri; Ann Machablishvili; Anna Kasradze; Davit Tsaguria; Ekaterine Khmaladze; Ekaterine Zangaladze; Ekaterine Zhghenti; Giorgi Tomashvili; Gvantsa Brachveli; Gvantsa Chanturia; Irma Burjanadze; Ketevan Sidamonidze; Khatuna Zakhashvili; Lela Sabadze; Lela Urushadze; Magda Dgebuadze; Maia Alkhazashvili; Mari Gavashelidze; Mariam Zakalashvili; Marine Murtskhvaladze; Meri Pantsulaia; Nato Kotaria; Nino Berishvili; Paata Imnadze; Roena Sukhiashvili; Tamar Jashiashvili; Tata Imnadze; Tea Tevdoradze
EPI_ISL_455771	REGIONAL VRDL,ICMR-RMRC BBSR	Immunogenomics lab, Institute of Life Sciences, Bhubaneswar	Ajay Parida; Arup Ghosh; Atimukta Jha; COVID-19 team of ILS & RMRC; DBT's PAN-INDIA 1000 SARS-CoV2 RNA genome sequencing consortium; Debdutta Bhattacharya; Ghulam Hussain Syed; Jaya Singh Khastri; Jyotirmayee Turuk; Manasi Priyadarshini; Orissa COVID-19 study group; Punit Prasad; Rajeeb Swain; Rupesh Dash; Sanghamitra Pati; Shanti Senapati; Shuchi Smita; Soma Chattopadhyay; Sunil Raghav; Swati Madhulika; Tushar K. Beuria; Viplov K. Biswas
EPI_ISL_419553, EPI_ISL_424887, EPI_ISL_426435, EPI_ISL_812202, EPI_ISL_812203	RI State Health Laboratories	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Montmayeur; Anna Uehara; Brian Lynch; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jasmine Padilla; Jing Zhang; Justin Lee; Krista Queen; Mary S. Keckler; Peter Cook; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_420795	RI State Health Laboratory	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anne Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jasmine Padilla; Jing Zhang; Justin Lee; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_413575	RIVM	Erasmus Medical Center	Anne van der Linden; Annemiek van der Eijk; Aura Timen; Bas Oude Munnink; Claudia Schapendonk; Corien Swaan; Corine GeurtsvanKessel; David Nieuwenhuijse; Irina Chestakova; Jeroen van Kampen; Jolanda Voermans; Madelief Mollers; Manon Haverkate; Marion Koopmans; Mark Pronk; Mart Stein; Pascal Lexmond; Reina Sikkema; Richard Molenkamp; Sandra Kengne Kamga Mobou; on behalf of the Dutch national COVID-19 response team.
EPI_ISL_568693, EPI_ISL_574603	RS Freeport Tembagapura	Eijkman Institute for Molecular Biology, Ministry of Research and Technology/National Agency for Research and Innovation	Amin Soebandrio; David H Muljono; Edison Johar; Frilasita A Yudhaputri; Herawati Sudoyo; Hidayat Trimarsanto; Iskandar A Adnan; Khin Saw Myint; Safarina G Malik; Willy Agustine
EPI_ISL_435282, EPI_ISL_435283, EPI_ISL_437190, EPI_ISL_437191, EPI_ISL_888982	RS Pondok Indah Hospital - Pondok Indah	Eijkman Institute for Molecular Biology, Ministry of Research and Technology/National Agency for Research and Innovation	Amin Soebandrio; David H Muljono; Edison Johar; Frilasita A Yudhaputri; Hidayat Trimarsanto; Iskandar Adnan; Khin Saw Myint; Lydia V. Panggalo; Safarina G Malik; Sukma Oktavianthi; Willy Agustine
EPI_ISL_889008	RS Sentra Medika Cibinong	Eijkman Institute for Molecular Biology, Ministry of Research and Technology/National Agency for Research and Innovation	Amin Soebandrio; Edison Johar; Frilasita A Yudhaputri; Hidayat Trimarsanto; Iskandar Adnan; Khin Saw Myint; Lydia V. Panggalo; Safarina G Malik; Sukma Oktavianthi; Willy Agustine
EPI_ISL_458081, EPI_ISL_529964	RSUD Bangil Pasuruan	Institute of Tropical Disease, Universitas Airlangga	Aldise M Nastri; Arma Roosalina; Gatot Soegiarto; Jezzy R Dewantari; Kazufumi Shimizu; Krisnoadi Rahardjo; Laksmi Wulandari; Maria I Lusida; Mitsuhiro Nishimura; Resti Yudhawati; Retno A Setyoningrum; Rima R Prasetya; Soetjipto; Yasuko Mori; Yohko K Shimizu
EPI_ISL_568686	RSUD Prof. DR. Margono Soekarjo	Eijkman Institute for Molecular Biology, Ministry of Research and Technology/National Agency for Research and Innovation	Amin Soebandrio; David H Muljono; Edison Johar; Frilasita A Yudhaputri; Herawati Sudoyo; Hidayat Trimarsanto; Iskandar A Adnan; Khin Saw Myint; Safarina G Malik; Willy Agustine
EPI_ISL_766033	RSUD Prof. DR. W. Z. Johannes Kupang	Eijkman Institute for Molecular Biology, Ministry of Research and Technology/National Agency for Research and Innovation	Amin Soebandrio; David H Muljono; Edison Johar; Frilasita A Yudhaputri; Hidayat Trimarsanto; Khin Saw Myint; Safarina G Malik
EPI_ISL_766032	RSUP Dr. Sardjito	Eijkman Institute for Molecular Biology, Ministry of Research and Technology/National Agency for Research and Innovation	Amin Soebandrio; David H Muljono; Edison Johar; Frilasita A Yudhaputri; Hidayat Trimarsanto; Khin Saw Myint; Safarina G Malik
EPI_ISL_467375, EPI_ISL_568694, EPI_ISL_574604	RSUP Prof. Dr. R. Kandou Manado	Eijkman Institute for Molecular Biology, Ministry of Research and Technology/National Agency for Research and Innovation	Amin Soebandrio; David H Muljono; Edison Johar; Frilasita A Yudhaputri; Herawati Sudoyo; Hidayat Trimarsanto; Iskandar A Adnan; Khin Saw Myint; Safarina G Malik; Willy Agustine
EPI_ISL_574605	RSUP dr. Sardjito	Eijkman Institute for Molecular Biology, Ministry of Research and Technology/National Agency for Research and Innovation	Amin Soebandrio; David H Muljono; Edison Johar; Frilasita A Yudhaputri; Herawati Sudoyo; Hidayat Trimarsanto; Iskandar A Adnan; Khin Saw Myint; Safarina G Malik; Willy Agustine
EPI_ISL_429990	Rady's Childrens Hospital	Andersen lab at Scripps Research	Denise Malicki; Michelle Vanderpool; SEARCH Alliance San Diego with Christina Clarke; Teresa Mueller
EPI_ISL_450509	Rafik Hariri University Hospital	Rafik Hariri University Hospital	Rita Feghali
EPI_ISL_423039, EPI_ISL_423040, EPI_ISL_423041, EPI_ISL_423042, EPI_ISL_423043, EPI_ISL_429164, EPI_ISL_429165, EPI_ISL_429166, EPI_ISL_429167, EPI_ISL_429169, EPI_ISL_429170, EPI_ISL_429171, EPI_ISL_429172, EPI_ISL_429173, EPI_ISL_429174, EPI_ISL_429175, EPI_ISL_429177, EPI_ISL_429178, EPI_ISL_429179, EPI_ISL_429181, EPI_ISL_429182, EPI_ISL_429183, EPI_ISL_429184, EPI_ISL_446996, EPI_ISL_447011, EPI_ISL_447015, EPI_ISL_447017, EPI_ISL_450723, EPI_ISL_455909, EPI_ISL_455910, EPI_ISL_455911, EPI_ISL_455912, EPI_ISL_455913, EPI_ISL_455915, EPI_ISL_455917, EPI_ISL_455922, EPI_ISL_455925, EPI_ISL_455926, EPI_ISL_455927, EPI_ISL_455928, EPI_ISL_455931, EPI_ISL_455932, EPI_ISL_455934, EPI_ISL_455935, EPI_ISL_455936, EPI_ISL_455938, EPI_ISL_455939, EPI_ISL_455940, EPI_ISL_455941, EPI_ISL_455942, EPI_ISL_455943, EPI_ISL_455947, EPI_ISL_498264, EPI_ISL_498265, EPI_ISL_512849, EPI_ISL_512851, EPI_ISL_512852, EPI_ISL_512856, EPI_ISL_512857, EPI_ISL_512858, EPI_ISL_512859, EPI_ISL_512860, EPI_ISL_512861, EPI_ISL_512862, EPI_ISL_512863, EPI_ISL_512864, EPI_ISL_512866, EPI_ISL_512869, EPI_ISL_568580, EPI_ISL_568581, EPI_ISL_568582, EPI_ISL_568583, EPI_ISL_568584, EPI_ISL_568585, EPI_ISL_568586, EPI_ISL_693334, EPI_ISL_693335, EPI_ISL_693336, EPI_ISL_693337, EPI_ISL_693339, EPI_ISL_693340, EPI_ISL_693341, EPI_ISL_693342, EPI_ISL_693343, EPI_ISL_693344, EPI_ISL_693346, EPI_ISL_693347, EPI_ISL_693348, EPI_ISL_693349, EPI_ISL_693350, EPI_ISL_693351, EPI_ISL_693352, EPI_ISL_693353, EPI_ISL_693354, EPI_ISL_693355, EPI_ISL_693356, EPI_ISL_693357, EPI_ISL_693358, EPI_ISL_693359, EPI_ISL_693361, EPI_ISL_693362, EPI_ISL_693363, EPI_ISL_693364, EPI_ISL_693366, EPI_ISL_693367, EPI_ISL_693368, EPI_ISL_693370, EPI_ISL_693371, EPI_ISL_693372, EPI_ISL_693373, EPI_ISL_693374, EPI_ISL_693375, EPI_ISL_693376, EPI_ISL_693377, EPI_ISL_693378, EPI_ISL_693379, EPI_ISL_693380, EPI_ISL_693381, EPI_ISL_693382, EPI_ISL_693383, EPI_ISL_693384, EPI_ISL_693385			
see above	Ramathibodi Hospital	COVID-19 Network Investigations (CONI) Alliance	Angkana Huang; Anthony R. Jones; Arporn Wangwiwatsin; Bhakbhoom Panthan; Chonticha Klungtong; Ekawat Pasomsub; Elizabeth Batty; Insee Sensorn; Janjira Thaipadungpanit; Khajohn Joonsalak; Kingkan Rakmanee; Krittikorn Kumpornsin; Namfon Kotanan; Poramate Jiaranai; Stefan Fernandez; Thanat Chookajorn; Theerarat Kochakarn; Treewat Watthanachockchai; Wasun Chantratita; Wudtichai Manasatienkij
EPI_ISL_455604	Ramkhamhaeng Hospital	National Institute of Health. Department of medical Sciences, Ministry of Public Health, Thailand	Chittaganpitch; Malinee; Okada; Parnmen; Phuygun; Pilailuk; Siripaporn; Sittiporn; Sunthareeya; Thanadachakul; Thanutsapa; Waicharoen; Warawan; Wongboot
EPI_ISL_699464, EPI_ISL_708723,	Regional Medical Sciences Center 11/1 phuket	National Institute of Health, Department of Medical Sciences,	Malinee Chittaganpitch; Pilailuk Okada; Siripaporn Phuygun; Sittiporn Parnmen; Sunthareeya Waicharoen; Thanutsapa Thanadachakul; Warawan

EPI_ISL_708735	Ministry of Public Health, Thailand		Wongboot

EPI_ISL_441355, EPI_ISL_441356, EPI_ISL_441357, EPI_ISL_441358, EPI_ISL_441359, EPI_ISL_441360, EPI_ISL_441361, EPI_ISL_441363, EPI_ISL_441364, EPI_ISL_441365, EPI_ISL_441366, EPI_ISL_441367, EPI_ISL_441368, EPI_ISL_441369, EPI_ISL_441370, EPI_ISL_441371, EPI_ISL_441372, EPI_ISL_441373, EPI_ISL_441375, EPI_ISL_441376, EPI_ISL_441378, EPI_ISL_441379, EPI_ISL_441380, EPI_ISL_441381, EPI_ISL_441382, EPI_ISL_441397, EPI_ISL_441398, EPI_ISL_441399, EPI_ISL_441401, EPI_ISL_441402, EPI_ISL_441403, EPI_ISL_441404, EPI_ISL_441405, EPI_ISL_441406, EPI_ISL_441407, EPI_ISL_441408, EPI_ISL_441409, EPI_ISL_441410, EPI_ISL_441411, EPI_ISL_441412, EPI_ISL_441414, EPI_ISL_441415, EPI_ISL_441416, EPI_ISL_441417, EPI_ISL_441418, EPI_ISL_441419, EPI_ISL_441420, EPI_ISL_441421, EPI_ISL_441422, EPI_ISL_441423, EPI_ISL_441424, EPI_ISL_441425, EPI_ISL_441426, EPI_ISL_441427, EPI_ISL_441428, EPI_ISL_441429, EPI_ISL_441430, EPI_ISL_441431, EPI_ISL_441432, EPI_ISL_441433, EPI_ISL_441434, EPI_ISL_441435, EPI_ISL_441436, EPI_ISL_448918, EPI_ISL_448925, EPI_ISL_448928, EPI_ISL_448936, EPI_ISL_448939, EPI_ISL_448940, EPI_ISL_448942, EPI_ISL_448943, EPI_ISL_448945, EPI_ISL_448947, EPI_ISL_448950, EPI_ISL_448951, EPI_ISL_448955, EPI_ISL_448956, EPI_ISL_448958, EPI_ISL_448959, EPI_ISL_448961, EPI_ISL_448962, EPI_ISL_448965, EPI_ISL_448966, EPI_ISL_448967, EPI_ISL_448968, EPI_ISL_448970, EPI_ISL_448971, EPI_ISL_448972, EPI_ISL_448973, EPI_ISL_448974, EPI_ISL_448976, EPI_ISL_448977, EPI_ISL_453465, EPI_ISL_453466, EPI_ISL_453467, EPI_ISL_453468, EPI_ISL_453469, EPI_ISL_453470, EPI_ISL_453471, EPI_ISL_453472, EPI_ISL_453473, EPI_ISL_453474, EPI_ISL_453475, EPI_ISL_453476, EPI_ISL_453477, EPI_ISL_453478, EPI_ISL_453479, EPI_ISL_453480, EPI_ISL_453481, EPI_ISL_453482, EPI_ISL_453483, EPI_ISL_453484, EPI_ISL_453485, EPI_ISL_585092, EPI_ISL_585093, EPI_ISL_585094, EPI_ISL_585095, EPI_ISL_585096, EPI_ISL_585097, EPI_ISL_585099, EPI_ISL_585100, EPI_ISL_585101, EPI_ISL_585102, EPI_ISL_585103, EPI_ISL_585104, EPI_ISL_585105, EPI_ISL_585106, EPI_ISL_585107, EPI_ISL_585108, EPI_ISL_585109, EPI_ISL_585110, EPI_ISL_585111, EPI_ISL_585114, EPI_ISL_585115, EPI_ISL_585116, EPI_ISL_585117, EPI_ISL_585118, EPI_ISL_585119, EPI_ISL_585120, EPI_ISL_585121, EPI_ISL_585122, EPI_ISL_585123, EPI_ISL_585125, EPI_ISL_585126, EPI_ISL_585127, EPI_ISL_585129, EPI_ISL_585130, EPI_ISL_585131, EPI_ISL_585132, EPI_ISL_585135, EPI_ISL_585136, EPI_ISL_585137, EPI_ISL_585138, EPI_ISL_585139, EPI_ISL_585140, EPI_ISL_585141, EPI_ISL_585142, EPI_ISL_585143, EPI_ISL_585145, EPI_ISL_585146, EPI_ISL_585147, EPI_ISL_585148, EPI_ISL_585149, EPI_ISL_585150, EPI_ISL_585151, EPI_ISL_585152, EPI_ISL_585153, EPI_ISL_585154, EPI_ISL_585155, EPI_ISL_585156, EPI_ISL_585157, EPI_ISL_585158, EPI_ISL_585159, EPI_ISL_585160, EPI_ISL_585161, EPI_ISL_585162, EPI_ISL_585163, EPI_ISL_585164, EPI_ISL_585165, EPI_ISL_585166, EPI_ISL_585167, EPI_ISL_585168, EPI_ISL_585169, EPI_ISL_585170, EPI_ISL_585171, EPI_ISL_585172, EPI_ISL_585173, EPI_ISL_585174, EPI_ISL_585181, EPI_ISL_585183, EPI_ISL_585184, EPI_ISL_585246, EPI_ISL_585250, EPI_ISL_585252, EPI_ISL_585254, EPI_ISL_585256, EPI_ISL_680285

see above	Regional Virus Laboratory, Belfast Health and Social Care Trust	COVID-19 Genomics UK (COG-UK) Consortium	Alison Watt; Ciara Cox; Conall McCaughey; David Simpson; Derek Fairley; James McKenna; Mairead Connor; Susan Feeney; Tanya Curran; Zoltan Molnar	

EPI_ISL_441659, EPI_ISL_441662, EPI_ISL_441663, EPI_ISL_441670, EPI_ISL_441675, EPI_ISL_441676, EPI_ISL_441690, EPI_ISL_441691, EPI_ISL_441696, EPI_ISL_441697, EPI_ISL_441714, EPI_ISL_441717, EPI_ISL_441730, EPI_ISL_441733, EPI_ISL_441737, EPI_ISL_441765, EPI_ISL_441766, EPI_ISL_441770, EPI_ISL_441771, EPI_ISL_441775, EPI_ISL_441781

see above	Regional Virus Laboratory, Belfast Health and Social Care Trust	Wellcome Sanger Institute for the COVID-19 Genomics UK (COG-UK) consortium	Alex Alderton; Alison Watt; Ciara Cox; Conall McCaughey; Cordelia Langford; David K. Jackson; David Simpson; Derek Fairley; Dominic Kwiatkowski; Ewan Harrison; Ian Johnston; James McKenna; John Sillitoe on behalf of the Wellcome Sanger Institute COVID-19 Surveillance Team (http://www.sanger.ac.uk/covid-team); Mairead Connor; Roberto Amato; Sonia Goncalves; Susan Feeney; Tanya Curran; Zoltan Molnar

EPI_ISL_451934	Research Unit, University Hospital for Infectious Diseases "Dr. Fran Mihaljevi"	Cicin Sain lab, Helmholtz Centre for Infection Research	Ivan-Christian Kurolt; Kathrin Eschke; Zeeshan Chaudhry; Željka Maak Šafranko

EPI_ISL_454417, EPI_ISL_454418	Research and Experiment Center, Meizhou People Hospital	Research and Experiment Center, Meizhou People Hospital	Guo, X.; L. and Yu, Z.; Zeng
EPI_ISL_661271	Research platform for Transfusion-transmitted Disease, Institute of Blood Transfusion, Chinese Academy of Medical Sciences	Research platform for Transfusion-transmitted Disease, Institute of Blood Transfusion, Chinese Academy of Medical Sciences	He; M. and Fan, Z.

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see above	Respiratory Virus Unit, Microbiology Services Colindale, Public Health England	Respiratory Virus Unit, Microbiology Services Colindale, Public Health England	Angie Lackenby; Joanna Ellis; Jonathan Hubb; Kirstin Edwards; Leena Bhaw; Maria Zambon; Monica Galiano; Omolola Akinbami; PHE Covid Sequencing Team; Richard Myers; Shahjahan Miah; Steven Platt; Tiina Talts; Tina Talts
EPI_ISL_639740, EPI_ISL_641311, EPI_ISL_682298	Respiratory virus Laboratory, Chinese Academy of Medical Science	Respiratory virus Laboratory, Chinese Academy of Medical Science	Chen; Li, J.; Y. and Liu, L.; Zhen, H.
EPI_ISL_631555, EPI_ISL_631576, EPI_ISL_631583, EPI_ISL_631755, EPI_ISL_631757, EPI_ISL_631792, EPI_ISL_631801, EPI_ISL_631815, EPI_ISL_631816, EPI_ISL_631817, EPI_ISL_631818, EPI_ISL_631828, EPI_ISL_631837, EPI_ISL_631873, EPI_ISL_631875, EPI_ISL_631892, EPI_ISL_631897, EPI_ISL_631903, EPI_ISL_631905, EPI_ISL_631962, EPI_ISL_631965, EPI_ISL_631967, EPI_ISL_631972, EPI_ISL_631975, EPI_ISL_631998, EPI_ISL_631999, EPI_ISL_632000, EPI_ISL_632001, EPI_ISL_632002, EPI_ISL_632013, EPI_ISL_632014, EPI_ISL_632015, EPI_ISL_632016, EPI_ISL_632030, EPI_ISL_632031, EPI_ISL_632112, EPI_ISL_632113, EPI_ISL_632115, EPI_ISL_632117, EPI_ISL_632118, EPI_ISL_632154, EPI_ISL_632163, EPI_ISL_632164, EPI_ISL_632165, EPI_ISL_632173, EPI_ISL_632199, EPI_ISL_632201, EPI_ISL_632203, EPI_ISL_632205, EPI_ISL_632206, EPI_ISL_632207, EPI_ISL_632208, EPI_ISL_632215, EPI_ISL_632216, EPI_ISL_632217, EPI_ISL_632218, EPI_ISL_632230, EPI_ISL_632231, EPI_ISL_632232, EPI_ISL_632233, EPI_ISL_632234, EPI_ISL_632940, EPI_ISL_632942, EPI_ISL_632948, EPI_ISL_632959, EPI_ISL_632962, EPI_ISL_632965			
see above	Richmond University Medical Center	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_434517, EPI_ISL_434518, EPI_ISL_434519, EPI_ISL_434526, EPI_ISL_434527, EPI_ISL_434530, EPI_ISL_435445, EPI_ISL_435446, EPI_ISL_435447, EPI_ISL_435448, EPI_ISL_435449, EPI_ISL_435450, EPI_ISL_435451, EPI_ISL_435452, EPI_ISL_435453, EPI_ISL_435464, EPI_ISL_435465, EPI_ISL_435466, EPI_ISL_435467, EPI_ISL_437546, EPI_ISL_437547, EPI_ISL_445119, EPI_ISL_445121, EPI_ISL_445122, EPI_ISL_445126, EPI_ISL_445130, EPI_ISL_445134, EPI_ISL_445136, EPI_ISL_445138, EPI_ISL_445141, EPI_ISL_445144, EPI_ISL_450231, EPI_ISL_878539, EPI_ISL_878541			
see above	Robert Garry lab	Andersen lab at Scripps Research	Allison Smither; Antoinette Bell; Arnaud Drouin; Dahlene Fusco; Gilberto Sabino-Santos; Kaylynn Genemaras; Lilia Melnik; Patricia Snarski; Robert Garry with SEARCH Alliance San Diego
EPI_ISL_481253, EPI_ISL_481256, EPI_ISL_481262	Robert Koch Institute, National Reference center for Influenza, Berlin, Germany	Robert Koch Institute, Bioinformatics MF1, Berlin, Germany	Andrea Thuermer; Marianne Wedde; Max v. Kleist; Oliver Drechsel; Ralf Duerrwald; Rene Kmiecinski; Stephan Fuchs; Thorsten Wolff
EPI_ISL_631522, EPI_ISL_631543	Robert Kutnick	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_417032	Rockhampton Base Hospital	Public Health Virology Laboratory	Alyssa Pyke; Amanda De Jong; Andrew Van Den Hurk; Bixing Huang; Carmel Taylor; David Warrilow; Doris Genge; Elisabeth Gamez; Glen Hewitson; Ian Maxwell Mackay; Inga Sultana; Jamie McMahon; Jean Barcelon; Judy Northill; Mitchell Finger; Natalie Simpson; Neelima Nair; Peter Burtonclay; Peter Moore; Sarah Wheatley; Sean Moody; Sonja Hall-Mendelin; Timothy Gardam; and Frederick Moore
EPI_ISL_436098	Royal Brisbane and Women's Hospital	Public Health Virology Laboratory, Forensic and Scientific Services, Queensland Health	Alyssa Pyke; Amanda De Jong; Andrew Van Den Hurk; Bixing Huang; Carmel Taylor; David Warrilow; Doris Genge; Elisabeth Gamez; Glen Hewitson; Ian Maxwell Mackay; Inga Sultana and Frederick Moore; Jamie McMahon; Jean Barcelon; Judy Northill; Lisa Lecke; Mitchell Finger; Natalie Simpson; Neelima Nair; Peter Burtonclay; Peter Moore; Sarah Wheatley; Sean Moody; Sonja Hall-Mendelin
EPI_ISL_492850, EPI_ISL_492852, EPI_ISL_492864, EPI_ISL_492874, EPI_ISL_492879, EPI_ISL_492882, EPI_ISL_492888, EPI_ISL_492890, EPI_ISL_492894, EPI_ISL_492902, EPI_ISL_492908			
see above	Royal Free Hospital / Health Services Laboratories	Wellcome Sanger Institute for the COVID-19 Genomics UK (COG-UK) consortium	Cate Goodlad; Cordelia Langford; David K. Jackson; Dianne Irish; Dominic Kwiatkowski; Ewan Harrison; Ian Johnston; Jenny Cross; John Sillitoe on behalf of the Wellcome Sanger Institute COVID-19 Surveillance Team (http://www.sanger.ac.uk/covid-team); Judith Heaney and Alex Alderton; Roberto Amato; Sonia Goncalves; Tabitha Mahungu; Tanzina Haque
EPI_ISL_522568, EPI_ISL_522574, EPI_ISL_522650, EPI_ISL_522652, EPI_ISL_522653, EPI_ISL_522654, EPI_ISL_522655, EPI_ISL_522656, EPI_ISL_522690, EPI_ISL_522731, EPI_ISL_522737			
see above	Royal Hobart Hospital Microbiology Department	MDU-PHL	Cooley L.; M.B.; Sait M.; Schultz; Seemann T.; Sherry N.; van Haeften R.
EPI_ISL_421275, EPI_ISL_470896	Russian State Collection of Viruses	Pathogenic Microorganisms Variability Laboratory	Alexander Gintsburg; Alexey Shchetinin; Andrey Botikov; Daria Grousova; Denis Logunov; Ekaterina Aksenova; Elena Shidlovskaya; Inna Dolzhikova; Maria Nikiforova; Marina Kunda; Nadezhda Kuznetsova; Natalia Ryzhova; Olga Voronina; Vladimir Gushchin
EPI_ISL_420051	Résidence Eleusis	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Etienne Simon-Lorière; Flora Donati; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_420046, EPI_ISL_420047	Résidence Villa Caroline	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Etienne Simon-Lorière; Flora Donati; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_420052	Résidence les Marines	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Etienne Simon-Lorière; Flora Donati; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_450193, EPI_ISL_450194, EPI_ISL_451077, EPI_ISL_451078, EPI_ISL_451079, EPI_ISL_451080, EPI_ISL_451081, EPI_ISL_451082, EPI_ISL_451083, EPI_ISL_451084, EPI_ISL_451087, EPI_ISL_451088, EPI_ISL_451089, EPI_ISL_451090, EPI_ISL_451091, EPI_ISL_451093, EPI_ISL_451094, EPI_ISL_451095, EPI_ISL_451096, EPI_ISL_451097, EPI_ISL_451098, EPI_ISL_451099, EPI_ISL_451100, EPI_ISL_451101, EPI_ISL_451102, EPI_ISL_451103, EPI_ISL_451104, EPI_ISL_451105, EPI_ISL_451106, EPI_ISL_451107, EPI_ISL_451108, EPI_ISL_451109, EPI_ISL_451110, EPI_ISL_451111, EPI_ISL_451112, EPI_ISL_451113, EPI_ISL_451114, EPI_ISL_451115, EPI_ISL_451116, EPI_ISL_451117, EPI_ISL_451118, EPI_ISL_451121, EPI_ISL_451122, EPI_ISL_451131, EPI_ISL_451132, EPI_ISL_451133, EPI_ISL_451134, EPI_ISL_451135, EPI_ISL_451136, EPI_ISL_451137, EPI_ISL_451138, EPI_ISL_451139, EPI_ISL_451140, EPI_ISL_451141, EPI_ISL_451147, EPI_ISL_451148, EPI_ISL_467991, EPI_ISL_467999, EPI_ISL_468000, EPI_ISL_468001, EPI_ISL_468002, EPI_ISL_468004, EPI_ISL_468005, EPI_ISL_468006, EPI_ISL_468008, EPI_ISL_468013, EPI_ISL_468014, EPI_ISL_468015, EPI_ISL_468016, EPI_ISL_468018, EPI_ISL_468020, EPI_ISL_468021, EPI_ISL_468022, EPI_ISL_468023, EPI_ISL_468026, EPI_ISL_468028, EPI_ISL_468029, EPI_ISL_468030, EPI_ISL_468031, EPI_ISL_468032, EPI_ISL_468033, EPI_ISL_468034, EPI_ISL_468035, EPI_ISL_468036, EPI_ISL_468037, EPI_ISL_468038, EPI_ISL_468039, EPI_ISL_468041, EPI_ISL_468042, EPI_ISL_468043, EPI_ISL_483066, EPI_ISL_483068, EPI_ISL_483071, EPI_ISL_483078, EPI_ISL_483080, EPI_ISL_483082, EPI_ISL_483086, EPI_ISL_483088, EPI_ISL_483089, EPI_ISL_483090, EPI_ISL_483091, EPI_ISL_483092, EPI_ISL_483093, EPI_ISL_483094, EPI_ISL_483098, EPI_ISL_483099, EPI_ISL_483101, EPI_ISL_483105, EPI_ISL_483108, EPI_ISL_483109, EPI_ISL_483111, EPI_ISL_483113, EPI_ISL_483116, EPI_ISL_483117, EPI_ISL_483119, EPI_ISL_483120, EPI_ISL_483121, EPI_ISL_483122, EPI_ISL_483124, EPI_ISL_483125, EPI_ISL_483126, EPI_ISL_483127, EPI_ISL_483129, EPI_ISL_483132, EPI_ISL_483137, EPI_ISL_492109, EPI_ISL_492110, EPI_ISL_492111, EPI_ISL_492116, EPI_ISL_492117, EPI_ISL_492122, EPI_ISL_492123, EPI_ISL_492124, EPI_ISL_492125, EPI_ISL_492126, EPI_ISL_492127, EPI_ISL_492128, EPI_ISL_492129, EPI_ISL_492130, EPI_ISL_492131, EPI_ISL_492133, EPI_ISL_492134, EPI_ISL_492135, EPI_ISL_492136, EPI_ISL_492137, EPI_ISL_492138, EPI_ISL_492140, EPI_ISL_492141, EPI_ISL_492142, EPI_ISL_492143, EPI_ISL_492144, EPI_ISL_492145, EPI_ISL_492146, EPI_ISL_492147, EPI_ISL_492148, EPI_ISL_492149, EPI_ISL_492150, EPI_ISL_492151, EPI_ISL_492153, EPI_ISL_492154, EPI_ISL_492155, EPI_ISL_492156, EPI_ISL_492157, EPI_ISL_492158, EPI_ISL_492159, EPI_ISL_492160, EPI_ISL_492161, EPI_ISL_492162, EPI_ISL_492163, EPI_ISL_492164, EPI_ISL_492165, EPI_ISL_492166, EPI_ISL_508122, EPI_ISL_508123, EPI_ISL_508124, EPI_ISL_508125, EPI_ISL_508126, EPI_ISL_508127, EPI_ISL_508129, EPI_ISL_508130, EPI_ISL_508131, EPI_ISL_508133, EPI_ISL_508135, EPI_ISL_508136, EPI_ISL_508137, EPI_ISL_508138, EPI_ISL_508139, EPI_ISL_508140, EPI_ISL_508141, EPI_ISL_508142, EPI_ISL_508143, EPI_ISL_1229177			
see above	SA Pathology	SA Pathology	Chuan Kok Lim; Geoff Higgins; Ivan Bastian; Julien Soubrier; Karin Kassahn; Lex Leong; Mark Turra; Song Gao
EPI_ISL_455595, EPI_ISL_455596, EPI_ISL_455602, EPI_ISL_455603	SA Pathology	VPRL	Beard, MR.; C.K.; Coldbeck-Shackley, R.; Kirby, E.; L.E.X.; Leong; Lim; Llamas, B.; Merrett, J.; Shue, B.; Van Der Hoek, K.
EPI_ISL_491097, EPI_ISL_491098, EPI_ISL_491099, EPI_ISL_491101, EPI_ISL_491102, EPI_ISL_491103, EPI_ISL_491104			
see above	SC Department of Health and Environmental Control	SC Department of Health and Environmental Control	Flores, H.

EPI_ISL_424841, EPI_ISL_424842, EPI_ISL_424888, EPI_ISL_424902, EPI_ISL_424903, EPI_ISL_424904, EPI_ISL_424905			
see above	SC Dept of Health and Env. Control-Bureau of Laboratories	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_631581, EPI_ISL_631588, EPI_ISL_631793, EPI_ISL_631794, EPI_ISL_631802, EPI_ISL_631977, EPI_ISL_632080, EPI_ISL_632091, EPI_ISL_632092, EPI_ISL_632135, EPI_ISL_632148, EPI_ISL_632153, EPI_ISL_632158, EPI_ISL_632160, EPI_ISL_632161			
see above	SUNY Downstate Medical Center	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_479797, EPI_ISL_479798, EPI_ISL_479802, EPI_ISL_479803, EPI_ISL_479804, EPI_ISL_479870, EPI_ISL_479871			
see above	Sagamihara City Public Health Research Institute	Pathogen Genomics Center, National Institute of Infectious Diseases	Hajime Kamiya; Hiroshi Nakamura; Kentaro Itokawa; Makoto Kuroda; Masanori Hashino; Motoi Suzuki; Rina Tanaka; Tsuyoshi Sekizuka
EPI_ISL_416525	Saitama Medical University	Saitama Medical University	Kazuo Imai
EPI_ISL_416524	Saitama Medical University Hospital	Saitama Medical University	Kazuo Imai
EPI_ISL_479805, EPI_ISL_479806, EPI_ISL_479807, EPI_ISL_479808, EPI_ISL_479928, EPI_ISL_479929, EPI_ISL_479930, EPI_ISL_479931, EPI_ISL_479932, EPI_ISL_479933, EPI_ISL_479934, EPI_ISL_479935, EPI_ISL_684149, EPI_ISL_684881, EPI_ISL_684882, EPI_ISL_684883, EPI_ISL_684884, EPI_ISL_684885, EPI_ISL_684886, EPI_ISL_684887, EPI_ISL_684888, EPI_ISL_684889, EPI_ISL_684890, EPI_ISL_684891, EPI_ISL_684892, EPI_ISL_684893, EPI_ISL_684894, EPI_ISL_684895, EPI_ISL_684896, EPI_ISL_684897, EPI_ISL_684898, EPI_ISL_684899, EPI_ISL_684900, EPI_ISL_684901, EPI_ISL_684902, EPI_ISL_684903, EPI_ISL_684904, EPI_ISL_684905, EPI_ISL_684906, EPI_ISL_684907, EPI_ISL_684908, EPI_ISL_684909, EPI_ISL_685132			
see above	Saitama Prefectural Institute of Public Health	Pathogen Genomics Center, National Institute of Infectious Diseases	Hajime Kamiya; Hayato Ehara; Kentaro Itokawa; Makoto Kuroda; Masanori Hashino; Motoi Suzuki; Rina Tanaka; Tsuyoshi Sekizuka
EPI_ISL_479925, EPI_ISL_479926, EPI_ISL_479927, EPI_ISL_480065, EPI_ISL_480066, EPI_ISL_480067	Sakai City Institute of Public Health	Pathogen Genomics Center, National Institute of Infectious Diseases	Hajime Kamiya; Kentaro Itokawa; Makoto Kuroda; Masanori Hashino; Motoi Suzuki; Rina Tanaka; Tatsuya Miyoshi; Tsuyoshi Sekizuka
EPI_ISL_467950, EPI_ISL_467951, EPI_ISL_467952, EPI_ISL_467953, EPI_ISL_467954, EPI_ISL_467955, EPI_ISL_467956, EPI_ISL_467957, EPI_ISL_467958, EPI_ISL_467959, EPI_ISL_467960, EPI_ISL_467961, EPI_ISL_467962, EPI_ISL_467964, EPI_ISL_467965, EPI_ISL_467966, EPI_ISL_467968, EPI_ISL_467969, EPI_ISL_467970, EPI_ISL_467971, EPI_ISL_467973, EPI_ISL_467974, EPI_ISL_467975, EPI_ISL_467978, EPI_ISL_467979, EPI_ISL_467982, EPI_ISL_467983, EPI_ISL_494571, EPI_ISL_494572, EPI_ISL_494573, EPI_ISL_494575, EPI_ISL_494592, EPI_ISL_494624, EPI_ISL_494714, EPI_ISL_494716, EPI_ISL_494718, EPI_ISL_494721, EPI_ISL_494723, EPI_ISL_494727, EPI_ISL_494728, EPI_ISL_494729, EPI_ISL_494732, EPI_ISL_494733, EPI_ISL_494734, EPI_ISL_494735, EPI_ISL_494740, EPI_ISL_494743, EPI_ISL_494744			
see above	San Diego County Public Health Laboratory	Andersen lab at Scripps Research	Brett Austin; Jovan Shephard; SEARCH Alliance San Diego with Tracy Basler
EPI_ISL_513876	San Francisco Public Health Laboratory	Chan-Zuckerberg Biohub	CZB Cliahub Consortium
EPI_ISL_468506, EPI_ISL_468507, EPI_ISL_468508, EPI_ISL_468509, EPI_ISL_468510, EPI_ISL_468511, EPI_ISL_468512, EPI_ISL_468513, EPI_ISL_468515, EPI_ISL_468517, EPI_ISL_468518, EPI_ISL_468519, EPI_ISL_468520, EPI_ISL_468521, EPI_ISL_468522, EPI_ISL_468523, EPI_ISL_468524, EPI_ISL_468525, EPI_ISL_468526, EPI_ISL_468527, EPI_ISL_468528, EPI_ISL_486287			
see above	San Joaquin County Public Health Lab	Chan-Zuckerberg Biohub	CZB Cliahub Consortium
EPI_ISL_542278, EPI_ISL_542279, EPI_ISL_542280, EPI_ISL_542281, EPI_ISL_542282, EPI_ISL_542283, EPI_ISL_542284, EPI_ISL_542285, EPI_ISL_542286, EPI_ISL_542287, EPI_ISL_542288, EPI_ISL_542289, EPI_ISL_542290, EPI_ISL_542291, EPI_ISL_542292, EPI_ISL_542293, EPI_ISL_542294, EPI_ISL_542295, EPI_ISL_542296, EPI_ISL_542297, EPI_ISL_542298, EPI_ISL_542299, EPI_ISL_542300, EPI_ISL_542301, EPI_ISL_542302, EPI_ISL_542303, EPI_ISL_542304, EPI_ISL_542305, EPI_ISL_542306, EPI_ISL_542307, EPI_ISL_542308, EPI_ISL_542309, EPI_ISL_542310, EPI_ISL_542311, EPI_ISL_542312, EPI_ISL_542313, EPI_ISL_542314, EPI_ISL_542315, EPI_ISL_542316, EPI_ISL_542317, EPI_ISL_542318, EPI_ISL_542319, EPI_ISL_542320, EPI_ISL_542321, EPI_ISL_542322, EPI_ISL_542323, EPI_ISL_542324, EPI_ISL_542325, EPI_ISL_542326, EPI_ISL_542327, EPI_ISL_542328, EPI_ISL_542329, EPI_ISL_542330, EPI_ISL_542331, EPI_ISL_542332, EPI_ISL_542333, EPI_ISL_542334, EPI_ISL_542335, EPI_ISL_542336, EPI_ISL_542337, EPI_ISL_542338, EPI_ISL_542339, EPI_ISL_542340, EPI_ISL_542341, EPI_ISL_542342, EPI_ISL_542343, EPI_ISL_542344, EPI_ISL_542345, EPI_ISL_542346, EPI_ISL_542347, EPI_ISL_542348, EPI_ISL_542349, EPI_ISL_542350, EPI_ISL_542351, EPI_ISL_542352, EPI_ISL_542353, EPI_ISL_542354, EPI_ISL_542355, EPI_ISL_542356, EPI_ISL_542357, EPI_ISL_542358, EPI_ISL_542359, EPI_ISL_542360, EPI_ISL_542361, EPI_ISL_542362, EPI_ISL_542363, EPI_ISL_542364, EPI_ISL_542365, EPI_ISL_542366, EPI_ISL_542367, EPI_ISL_542368, EPI_ISL_542369, EPI_ISL_542370, EPI_ISL_542371, EPI_ISL_542372, EPI_ISL_542373, EPI_ISL_542374, EPI_ISL_542375, EPI_ISL_542376, EPI_ISL_542377, EPI_ISL_542378, EPI_ISL_542379, EPI_ISL_542380, EPI_ISL_542381, EPI_ISL_542382, EPI_ISL_542383, EPI_ISL_542384, EPI_ISL_542385, EPI_ISL_542386, EPI_ISL_542387, EPI_ISL_542388, EPI_ISL_542390, EPI_ISL_542391, EPI_ISL_542392, EPI_ISL_542393, EPI_ISL_542394, EPI_ISL_542395, EPI_ISL_542396, EPI_ISL_542397, EPI_ISL_542398, EPI_ISL_542399			
see above	San Matteo Hospital Pavia	Dep. Of Oncology and Hemato-Oncology University of Milan	Antonio Piralla; Carlo Federico Perno; Chiara Vismara; Claudia Alteri; Elisa Matarazzo; Fausto Baldanti; Federica Giardina; Federica Novazzi; Luna Colagrossi; Maria Antonello; Massimo Puoti; Monica Tallarita; Oscar Massimiliano Epis; Roberto Fumagalli; Silvia Renica; Stefano Gaiarsa; Valentino Costabile; Valeria Cento
EPI_ISL_524464	Santa Casa de Santa Isabel	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes
EPI_ISL_417317, EPI_ISL_417318, EPI_ISL_429879, EPI_ISL_435580, EPI_ISL_435583, EPI_ISL_435587, EPI_ISL_435594, EPI_ISL_435596, EPI_ISL_435601, EPI_ISL_435608, EPI_ISL_435609, EPI_ISL_435612, EPI_ISL_435615, EPI_ISL_435621, EPI_ISL_435627, EPI_ISL_435631, EPI_ISL_435634, EPI_ISL_435636, EPI_ISL_435637, EPI_ISL_435639, EPI_ISL_435641, EPI_ISL_435643, EPI_ISL_435645, EPI_ISL_435649, EPI_ISL_435650, EPI_ISL_435654, EPI_ISL_435657, EPI_ISL_435662, EPI_ISL_435663, EPI_ISL_435670, EPI_ISL_435671, EPI_ISL_671765, EPI_ISL_671768			
see above	Santa Clara County Public Health Department	Chiu Laboratory, University of California, San Francisco	Brandon Bonin; Debra A. Wadford; Elsa Villarino; Scot Federman; Wei Gu; Xianding Deng; and Charles Y. Chiu
EPI_ISL_479799, EPI_ISL_479800, EPI_ISL_479826, EPI_ISL_479827, EPI_ISL_479828, EPI_ISL_479829, EPI_ISL_479830, EPI_ISL_479831, EPI_ISL_479832, EPI_ISL_479833, EPI_ISL_479834, EPI_ISL_479835, EPI_ISL_479836, EPI_ISL_479837, EPI_ISL_479838, EPI_ISL_479839, EPI_ISL_479840, EPI_ISL_479841, EPI_ISL_479842, EPI_ISL_479843, EPI_ISL_479844, EPI_ISL_479845, EPI_ISL_479846, EPI_ISL_479847, EPI_ISL_479848, EPI_ISL_479849, EPI_ISL_479872, EPI_ISL_479873, EPI_ISL_479874, EPI_ISL_479875, EPI_ISL_479876, EPI_ISL_479877, EPI_ISL_479878, EPI_ISL_479879, EPI_ISL_479880, EPI_ISL_479881, EPI_ISL_479882, EPI_ISL_479883, EPI_ISL_479884, EPI_ISL_479885			
see above	Sapporo City Institute of Public Health	Pathogen Genomics Center, National Institute of Infectious Diseases	Asami Ohnishi; Hajime Kamiya; Kentaro Itokawa; Makoto Kuroda; Masanori Hashino; Motoi Suzuki; Rina Tanaka; Tsuyoshi Sekizuka
EPI_ISL_434654, EPI_ISL_445222, EPI_ISL_445226, EPI_ISL_450808, EPI_ISL_452231, EPI_ISL_452232	Saroledens Familjelakare	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Karin Tegmark-Wisell; Katarina Jarbur; Maria Lind Karlberg; Mia Brytting; Olov Svartstrom; Oskar Karlsson Lindsjo; Theresa Enkirch
EPI_ISL_759859	School of Public Health, The University of Hong Kong	School of Public Health, The University of Hong Kong	Barrs; Brackman; C.J.; Chu; D.K.W.; E.M.W.; K.W.S.; Law; P.Y.L.; Peiris, M.; Perera; R.A.P.M. and Sit; T.H.C.; Tam; To; V.R.; V.Y.T.; Yu
EPI_ISL_510529	School of Veterinary Medicine, Disease Control	School of Veterinary Medicine, Disease Control	A.L.; A.N.; Bates, M.; C. and Zumla, A.; Chambaro, H.; Chanda, D.; Changula, K.; Chilufya; Chipimo; Chitanga, S.; Fwoloshi, S.; K.S.; Kapata; Kapata, N.; Kapaya, F.; Kapin'a, M.; Kayeyi, N.; Liwewe; M.M.; Malama, K.; Masahiro, K.; Monze, M.; Morales; Mubemba, B.; Mukonka, V.; Mulenga, L.; Muleya, W.; Mupeta, F.; Musonda, K.; Nalubamba; Ngosa, W.; P.C.; P.J.; Saasa, N.; Sawa, H.; Shibemba; Simulundu, E.; Sinyange, N.; Takada, A.; Tembo, J.; Zulu, P.
EPI_ISL_661189, EPI_ISL_676576	Scientific Veterinary Institute Novi Sad	Veterinary Specialized Institute "Kraljevo", Serbia	Afonso, C.; Banovic Djeri, B.; Jankovic, M.; Jovanovic, T.; Knezevic, A.; Petrovic, T.; Sekler, M.; Tesovic, B.; Vidanovic, D.; Volkening, J.
EPI_ISL_437552, EPI_ISL_437553, EPI_ISL_437554, EPI_ISL_437555, EPI_ISL_437556, EPI_ISL_437559, EPI_ISL_437560, EPI_ISL_437561, EPI_ISL_437562, EPI_ISL_437563, EPI_ISL_437564, EPI_ISL_437566, EPI_ISL_437582, EPI_ISL_437583, EPI_ISL_437584, EPI_ISL_437585, EPI_ISL_437586, EPI_ISL_437587, EPI_ISL_437588, EPI_ISL_437589, EPI_ISL_437590, EPI_ISL_437591, EPI_ISL_437592, EPI_ISL_437594, EPI_ISL_437595, EPI_ISL_437596, EPI_ISL_437598, EPI_ISL_437599, EPI_ISL_437600, EPI_ISL_445164, EPI_ISL_445166, EPI_ISL_445167, EPI_ISL_450191, EPI_ISL_458283, EPI_ISL_467967, EPI_ISL_494596, EPI_ISL_494597, EPI_ISL_494598, EPI_ISL_494601, EPI_ISL_494603, EPI_ISL_494604, EPI_ISL_494605, EPI_ISL_494607, EPI_ISL_494608, EPI_ISL_494609, EPI_ISL_494610, EPI_ISL_494611, EPI_ISL_494612, EPI_ISL_494613, EPI_ISL_494615, EPI_ISL_494617, EPI_ISL_494618, EPI_ISL_494619			
see above	Scripps Medical Laboratory	Andersen lab at Scripps Research	Brett Austin; Ellen Stefanski; Ian Mchardy; Jovan Shephard; SEARCH Alliance San Diego with Michael Quigley; SEARCH Alliance San Diego with Tracy Basler
EPI_ISL_413560, EPI_ISL_416460, EPI_ISL_416461, EPI_ISL_416462, EPI_ISL_416465, EPI_ISL_416466, EPI_ISL_417163, EPI_ISL_417164, EPI_ISL_417165, EPI_ISL_430113, EPI_ISL_430114, EPI_ISL_430115, EPI_ISL_430116, EPI_ISL_430117, EPI_ISL_430118, EPI_ISL_430119, EPI_ISL_430121, EPI_ISL_430122, EPI_ISL_430123, EPI_ISL_430124, EPI_ISL_430125, EPI_ISL_430126, EPI_ISL_430127, EPI_ISL_430128, EPI_ISL_430129, EPI_ISL_430131, EPI_ISL_430132, EPI_ISL_430133, EPI_ISL_430134, EPI_ISL_430135, EPI_ISL_430136, EPI_ISL_430137, EPI_ISL_430140, EPI_ISL_430141, EPI_ISL_430142, EPI_ISL_430143, EPI_ISL_430146, EPI_ISL_430148, EPI_ISL_430149, EPI_ISL_430150, EPI_ISL_430151, EPI_ISL_430152, EPI_ISL_430153, EPI_ISL_430154, EPI_ISL_430155, EPI_ISL_430156, EPI_ISL_438152, EPI_ISL_438154, EPI_ISL_438155, EPI_ISL_495657, EPI_ISL_495658, EPI_ISL_495661, EPI_ISL_495663, EPI_ISL_575033			
see above	Seattle Flu Study	Seattle Flu Study	Amanda Adler; Barry R. Lutz; Benjamin Pelle; Brian Hiatt; Caitlin R. Wolf; Chris D. Frazar; Chu et al; Chu etl al; Deborah A. Nickerson; Elisabeth Brandstetter; Geoff Melly; Helen Y. Chu; Janet A. Englund; Jay Shendure; Jeff Duchin; Jover Lee; Kairsten Fay; Karen Cowgill; Kirsten Lacombe; Lea M. Starita; Mark J. Rieder; Matthew Richardson; Matthew Thompson; Melissa Truong; Michael Boeckh; Michael Famulare; Misja Ilcisin; Peter D. Han; Philip Dykema; Romesh Gautom; Scott Lindquist; Stephanie Schrag; Thomas R. Sibley; Trevor Bedford
EPI_ISL_413456	Seattle Flu Study, University of Washington Medical Center	Seattle Flu Study, University of Washington Medical Center	Chu et al
EPI_ISL_412026	Second Hospital of Anhui Medical University	Second Hospital of Anhui Medical University	Changtai Wang; Mengji Lu; Mengyuan Xua; Tengfei He; Xin Huang; Zhenhua Zhang; Zhongping Liua; Zixiang Chen
EPI_ISL_469253	Second Military Medical University, Department of Microbiology	Second Military Medical University, Department of Microbiology	Jiang, L.; Peng, H.; Qi; Tang, H.; Z. and Zhao, P.

EPI_ISL_417924	Secretaría de Salud Medellín	Instituto Nacional de Salud, Universidad Cooperativa de Colombia, Instituto Alexander von Humboldt, Imperial College-London, London School of Hygiene & Tropical Medicine	Astrid C. Flórez; Carlos Franco-Muñoz; Christian Julian VillabonaArenas; Diana Marcela Walteros-Acero; Diego A. Álvarez-Diaz; Erika Ospitia; Gloria Puerto; Jose A. Usme-Ciro; Juliana Barbosa; Katherine Laiton-Donato; Liz Villabona-Arenas; Luz Dary Rodriguez; Mailyn A. Gonzalez; Marcela Mercado-Reyes; Martha Lucia Ospina Martinez; Nicolás D. Franco-Sierra; Sergio Gomez Rangel; Sussy Echeverria-Londoño; Zulma M. Cucunubá
EPI_ISL_420038, EPI_ISL_420045, EPI_ISL_420055, EPI_ISL_421514	Sentinelles network	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Etienne Simon-Lorière; Flora Donati; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_420048, EPI_ISL_420058, EPI_ISL_420059, EPI_ISL_420060, EPI_ISL_420064, EPI_ISL_421501, EPI_ISL_421504, EPI_ISL_421505, EPI_ISL_421506, EPI_ISL_421512, EPI_ISL_428347, EPI_ISL_428349			
see above	Service de Biologie Médicale - BP 125	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Christine Lambert; Etienne Simon-Lorière; Flora Donati; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_420042, EPI_ISL_421513	Service de Biologie clinique	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Christine Lambert; Etienne Simon-Lorière; Flora Donati; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_469283, EPI_ISL_469284	Service de Virologie Hôpital Saint-Louis	Laboratory Cell Biology of Viral Infection-INSERM unit 944	Ali Amara; Constance Delaugerre; Laurent Meertens; Lucie Bonnet-Madin; Maud SALMONA; Séverine Mercier-Delarue
EPI_ISL_469282	Service de Virologie Hôpital Saint-Louis	Laboratory of Cell Biology of viral infection, Unit INSERM-U944	Ali Amara; Constance Delaugerre; Laurent Meertens; Lucie Bonnet-Madin
EPI_ISL_418232, EPI_ISL_418233	Service des Urgences	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Boubkeur; Etienne Simon-Lorière; Flora Donati; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_414598	Servicio Microbiologia, Hospital Clínico Universitario, Valencia	Sequencing and Bioinformatics Service and Molecular Epidemiology Research Group. FISABIO-Public Health.	David Navarro; Fernando Gonzalez-Candelas; Giuseppe D'Auria; Griselda De Marco; Maria Alma Bracho; Neris Garcia-Gonzalez
EPI_ISL_414495	Servicio Microbiología. Hospital Clínico Universitario. Valencia.	Sequencing and Bioinformatics Service. Molecular Epidemiology Laboratory. FISABIO-Public Health	David Navarro; Fernando Gonzalez-Candelas; Giuseppe D'Auria; Griselda De Marco; Maria Alma Bracho; Neris Garcia-Gonzalez
EPI_ISL_420598, EPI_ISL_420599, EPI_ISL_420600	Servicio Virosis Respiratorias-Departamento Virología-INEI	Instituto Nacional Enfermedades Infecciosas C.G.Malbran	Avaro M.; Baumeister E.; Benedetti E.; Campos J.; Cisterna D.; Dattero ME; Lorenzo F.; Molina V.; Perandones C.; Poklepovich T.; Pontoriero A.; Russo M.; Tuduri E.
EPI_ISL_416485	Servicio de Microbiología. Consorcio Hospital General Universitario de Valencia	Sequencing and Bioinformatics Service and Molecular Epidemiology Research Group. FISABIO-Public Health	Concepcion Gimeno; Fernando Gonzalez-Candelas; Giuseppe D'Auria; Griselda De Marco; Maria Alma Bracho; Maria Dolores Ocete; Neris Garcia-Gonzalez
EPI_ISL_420125, EPI_ISL_420126, EPI_ISL_420127, EPI_ISL_420128, EPI_ISL_420129, EPI_ISL_420130, EPI_ISL_420131, EPI_ISL_420132, EPI_ISL_421515, EPI_ISL_421519, EPI_ISL_425199, EPI_ISL_425201, EPI_ISL_425203, EPI_ISL_425205, EPI_ISL_425210, EPI_ISL_436282, EPI_ISL_436283, EPI_ISL_436284, EPI_ISL_436285, EPI_ISL_436287, EPI_ISL_436288, EPI_ISL_436290, EPI_ISL_436291, EPI_ISL_436292, EPI_ISL_436295, EPI_ISL_436297, EPI_ISL_436301, EPI_ISL_436303, EPI_ISL_436304, EPI_ISL_436307, EPI_ISL_436310, EPI_ISL_436311, EPI_ISL_436314, EPI_ISL_436316, EPI_ISL_436317, EPI_ISL_436318, EPI_ISL_436325, EPI_ISL_436326, EPI_ISL_436327, EPI_ISL_436328, EPI_ISL_436330, EPI_ISL_436335, EPI_ISL_436336, EPI_ISL_436337, EPI_ISL_436341, EPI_ISL_436342, EPI_ISL_436345, EPI_ISL_436346, EPI_ISL_436353, EPI_ISL_436355, EPI_ISL_436356, EPI_ISL_436364, EPI_ISL_436366, EPI_ISL_436367, EPI_ISL_436368, EPI_ISL_436369, EPI_ISL_436371, EPI_ISL_436397, EPI_ISL_436411, EPI_ISL_447471, EPI_ISL_447472, EPI_ISL_447473, EPI_ISL_447474, EPI_ISL_447477, EPI_ISL_447478, EPI_ISL_447481, EPI_ISL_447482, EPI_ISL_447483, EPI_ISL_447485, EPI_ISL_447493, EPI_ISL_447497, EPI_ISL_447498, EPI_ISL_447500, EPI_ISL_447501, EPI_ISL_447502, EPI_ISL_447503, EPI_ISL_447505, EPI_ISL_447506, EPI_ISL_447510, EPI_ISL_447511, EPI_ISL_447512, EPI_ISL_447513, EPI_ISL_447514, EPI_ISL_447515, EPI_ISL_447529, EPI_ISL_447530, EPI_ISL_447531			
see above	Servicio de Microbiología. Hospital Clínico Universitario de Valencia	Sequencing and Bioinformatics Service and Molecular Epidemiology Research Group. FISABIO-Public Health	Beatriz Beamud; Concepcion Gimeno; David Navarro; Eliseo Albert; Fernando Gonzalez-Candelas; Giuseppe 'Auria; Giuseppe D'Auria; Griselda De Marco; Inma Galán Vendrell; Ivan Ansari; Lidia Ruiz Roldan; Llúcia Martínez-Priego; Loreto Ferrús Abad; Maria Alma Bracho; Maria Dolores Ocete; Mariana Reyes-Prieto; Marta Pla Diaz; Neris Garcia-Gonzalez; Paula Ruiz-Hueso; Sandra Carbo; Vicente Soriano Chirona
EPI_ISL_455727, EPI_ISL_455730, EPI_ISL_455733, EPI_ISL_455741, EPI_ISL_455742, EPI_ISL_455743	Servicio de Microbiología. Hospital Clínico Universitario de Valencia	Sequencing and Bioinformatics Service and Molecular Epidemiology Research Group. FISABIO-Public Health, and SeqCOVID-Spain Consortium	David Navarro; Eliseo Albert; Fernando Gonzalez-Candelas; Giuseppe 'Auria; Griselda De Marco; Inma Galán Vendrell; Ivan Ansari; Lidia Ruiz Roldan; Llúcia Martínez-Priego; Loreto Ferrús Abad; Maria Alma Bracho; Mariana Reyes-Prieto; Neris Garcia-Gonzalez; Paula Ruiz-Hueso; Sandra Carbo; Vicente Soriano Chirona
EPI_ISL_436235, EPI_ISL_436236, EPI_ISL_436237, EPI_ISL_436238, EPI_ISL_436239, EPI_ISL_436240, EPI_ISL_436241, EPI_ISL_436242, EPI_ISL_436244, EPI_ISL_436245, EPI_ISL_436246, EPI_ISL_436247, EPI_ISL_436248, EPI_ISL_436249, EPI_ISL_436250, EPI_ISL_436251, EPI_ISL_436252, EPI_ISL_436254, EPI_ISL_436255, EPI_ISL_436258, EPI_ISL_436261, EPI_ISL_436262, EPI_ISL_436263, EPI_ISL_436264, EPI_ISL_436265, EPI_ISL_436266, EPI_ISL_436267, EPI_ISL_436268, EPI_ISL_436269, EPI_ISL_436373, EPI_ISL_436374, EPI_ISL_436376, EPI_ISL_436377, EPI_ISL_436378, EPI_ISL_436379, EPI_ISL_436380			
see above	Servicio de Microbiologia. Hospital Universitario Doctor Peset	Sequencing and Bioinformatics Service and Molecular Epidemiology Research Group. FISABIO-Public Health	Beatriz Beamud; Fernando Gonzalez-Candelas; Giuseppe D'Auria; Griselda De Marco; Inma Galán Vendrell; Ivan Ansari; Jose Miguel Nogueira Coito; Juan Alberola Enguídanos; Juan Jose Camarena Miñana; Lidia Ruiz Roldan; Llúcia Martínez-Priego; Loreto Ferrús Abad; Maria Alma Bracho; Mariana Reyes-Prieto; Marta Pla Diaz; Neris Garcia-Gonzalez; Paula Ruiz-Hueso; Rosa González Pellicer; Sandra Carbo; Vicente Soriano Chirona
EPI_ISL_455735, EPI_ISL_455736	Servicio de Microbiologia. Hospital_Arnau_de_Vilanova	Sequencing and Bioinformatics Service and Molecular Epidemiology Research Group. FISABIO-Public Health, and SeqCOVID-Spain Consortium	Fernando Gonzalez-Candelas; Giuseppe 'Auria; Griselda De Marco; Inma Galán Vendrell; Ivan Ansari; Lidia Ruiz Roldan; Llúcia Martínez-Priego; Loreto Ferrús Abad; Maria Alma Bracho; Mariana Reyes-Prieto; Neris Garcia-Gonzalez; Paula Ruiz-Hueso; Sandra Carbo; Vicente Soriano Chirona; Victoria Dominguez
EPI_ISL_452544, EPI_ISL_452546, EPI_ISL_452547, EPI_ISL_452549, EPI_ISL_452551, EPI_ISL_452552, EPI_ISL_452553, EPI_ISL_452554, EPI_ISL_452555, EPI_ISL_452556, EPI_ISL_452557, EPI_ISL_452558, EPI_ISL_452559, EPI_ISL_452560, EPI_ISL_452561, EPI_ISL_452562, EPI_ISL_452564, EPI_ISL_452566, EPI_ISL_452567, EPI_ISL_452570, EPI_ISL_452571, EPI_ISL_452572, EPI_ISL_452573, EPI_ISL_452574, EPI_ISL_452575, EPI_ISL_452576, EPI_ISL_452577, EPI_ISL_452578, EPI_ISL_452579, EPI_ISL_452580, EPI_ISL_452581, EPI_ISL_452582, EPI_ISL_452583, EPI_ISL_452584, EPI_ISL_452586, EPI_ISL_452588, EPI_ISL_452590, EPI_ISL_452592, EPI_ISL_452593, EPI_ISL_452594, EPI_ISL_452595, EPI_ISL_452596, EPI_ISL_452597, EPI_ISL_452598, EPI_ISL_452600, EPI_ISL_452601, EPI_ISL_452603, EPI_ISL_452604, EPI_ISL_452605, EPI_ISL_452606, EPI_ISL_452609			
see above	Servicio de Microbiología y Parasitología clínica. UCEIMP. Hospital Universitario Virgen del Rocío/IBIS/CSIC/US.	SeqCOVID-SPAIN consortium/IBV(CSIC)	Guillermo Martí-n Gutiérrez; Javier Aznar Martí-n and SeqCOVID-SPAIN consortium; Lidia Gálvez Benitez; Verónica González Galán; Ángel Rodrí-guez Villodres
EPI_ISL_468765, EPI_ISL_468766, EPI_ISL_468768, EPI_ISL_468769, EPI_ISL_468770, EPI_ISL_468771, EPI_ISL_468772, EPI_ISL_468773, EPI_ISL_468774, EPI_ISL_468775, EPI_ISL_468776, EPI_ISL_468778, EPI_ISL_468779, EPI_ISL_468780, EPI_ISL_468781, EPI_ISL_468782, EPI_ISL_468783, EPI_ISL_468784, EPI_ISL_468785, EPI_ISL_468786, EPI_ISL_468788, EPI_ISL_468790, EPI_ISL_468791, EPI_ISL_468792, EPI_ISL_468793, EPI_ISL_468794, EPI_ISL_468795, EPI_ISL_468797, EPI_ISL_468798, EPI_ISL_468799, EPI_ISL_468800, EPI_ISL_468801, EPI_ISL_468802, EPI_ISL_468803, EPI_ISL_468804, EPI_ISL_468805, EPI_ISL_468806, EPI_ISL_468807, EPI_ISL_468808, EPI_ISL_468809, EPI_ISL_468810, EPI_ISL_468811, EPI_ISL_468812, EPI_ISL_468813, EPI_ISL_468814, EPI_ISL_468815, EPI_ISL_468816, EPI_ISL_468817, EPI_ISL_468818, EPI_ISL_468819, EPI_ISL_468820, EPI_ISL_468822, EPI_ISL_468823, EPI_ISL_468824, EPI_ISL_468825, EPI_ISL_468826, EPI_ISL_468828, EPI_ISL_468829, EPI_ISL_468830, EPI_ISL_468831, EPI_ISL_468832, EPI_ISL_468833, EPI_ISL_468834, EPI_ISL_468835, EPI_ISL_468836, EPI_ISL_468838, EPI_ISL_468840, EPI_ISL_468841, EPI_ISL_468842, EPI_ISL_468843, EPI_ISL_468845, EPI_ISL_468846, EPI_ISL_468847, EPI_ISL_468849, EPI_ISL_468850, EPI_ISL_468851, EPI_ISL_468852, EPI_ISL_468853, EPI_ISL_468854, EPI_ISL_468855, EPI_ISL_468856, EPI_ISL_468858, EPI_ISL_468859			
see above	Servicio de Microbiología, Hospital Miguel Servet, Zaragoza	SeqCOVID-SPAIN consortium/IBV(CSIC)	Alexander Tristancho Baró; Ana Milagro; Antonio Rezusta López; Nieves Martínez Cameo and SeqCOVID-SPAIN consortium; Yolanda Gracia Grataloup
EPI_ISL_654631, EPI_ISL_654632, EPI_ISL_654635, EPI_ISL_654636, EPI_ISL_654637, EPI_ISL_654638, EPI_ISL_654639, EPI_ISL_654640, EPI_ISL_654641, EPI_ISL_654642, EPI_ISL_654643, EPI_ISL_654644, EPI_ISL_654645, EPI_ISL_654646, EPI_ISL_654647, EPI_ISL_654648, EPI_ISL_654649, EPI_ISL_654650, EPI_ISL_654651, EPI_ISL_654652, EPI_ISL_654653, EPI_ISL_654654, EPI_ISL_654655, EPI_ISL_654656, EPI_ISL_654657, EPI_ISL_654658, EPI_ISL_654659, EPI_ISL_654660, EPI_ISL_654661, EPI_ISL_654662, EPI_ISL_654663, EPI_ISL_654664, EPI_ISL_654665, EPI_ISL_654666, EPI_ISL_654672, EPI_ISL_654673, EPI_ISL_654675, EPI_ISL_654682, EPI_ISL_654683, EPI_ISL_722241			
see above	Servicio de Microbiología, Hospital Universitario Central de Asturias	SeqCOVID-SPAIN consortium/IBV(CSIC)	Cristián Castelló Abietar; Jose A. Boga; Marta Elena Álvarez-Argüelles; Santiago Melón and SeqCOVID-SPAIN consortium; Susana Rojo-Alba
EPI_ISL_467055, EPI_ISL_467056, EPI_ISL_467058, EPI_ISL_468953, EPI_ISL_468954, EPI_ISL_468959, EPI_ISL_468960, EPI_ISL_468961, EPI_ISL_468962, EPI_ISL_468968, EPI_ISL_468972, EPI_ISL_468974, EPI_ISL_468975, EPI_ISL_468976, EPI_ISL_468977, EPI_ISL_468979, EPI_ISL_468982, EPI_ISL_468983, EPI_ISL_468987, EPI_ISL_468988, EPI_ISL_468989, EPI_ISL_468990, EPI_ISL_468991, EPI_ISL_468992, EPI_ISL_468993, EPI_ISL_468998, EPI_ISL_468999, EPI_ISL_469000, EPI_ISL_469001, EPI_ISL_469003, EPI_ISL_469004, EPI_ISL_469008, EPI_ISL_469009, EPI_ISL_469010, EPI_ISL_469012, EPI_ISL_469013, EPI_ISL_469014, EPI_ISL_541949, EPI_ISL_541950, EPI_ISL_541951, EPI_ISL_541958, EPI_ISL_541963, EPI_ISL_541965			
see above	Servicio de Microbiología, Hospital Universitario Son Espases	SeqCOVID-SPAIN consortium/IBV(CSIC)	Antonio Oliver and SeqCOVID-SPAIN consortium; Carla López-Causapé; Jordi Reina; Jordi Reina y Antonio Oliver and SeqCOVID-SPAIN consortium
EPI_ISL_416484, EPI_ISL_416486, EPI_ISL_416487, EPI_ISL_419675, EPI_ISL_419676, EPI_ISL_419677, EPI_ISL_419678, EPI_ISL_419679, EPI_ISL_419680, EPI_ISL_419681, EPI_ISL_419682, EPI_ISL_419683, EPI_ISL_420112, EPI_ISL_420113, EPI_ISL_420114, EPI_ISL_420115, EPI_ISL_420116, EPI_ISL_420117, EPI_ISL_420118, EPI_ISL_420119, EPI_ISL_420120, EPI_ISL_420121, EPI_ISL_420122, EPI_ISL_420123, EPI_ISL_420124, EPI_ISL_425178, EPI_ISL_425179, EPI_ISL_425180, EPI_ISL_425181, EPI_ISL_425182, EPI_ISL_425183, EPI_ISL_425184, EPI_ISL_425185, EPI_ISL_425186, EPI_ISL_425187, EPI_ISL_425188, EPI_ISL_425189, EPI_ISL_425193, EPI_ISL_425196, EPI_ISL_425197, EPI_ISL_425212, EPI_ISL_425213, EPI_ISL_425214, EPI_ISL_425216, EPI_ISL_425217, EPI_ISL_425218, EPI_ISL_425219, EPI_ISL_425220, EPI_ISL_425221, EPI_ISL_436197, EPI_ISL_436200, EPI_ISL_436201, EPI_ISL_436202, EPI_ISL_436203, EPI_ISL_436205, EPI_ISL_436206, EPI_ISL_436207, EPI_ISL_436209, EPI_ISL_436210, EPI_ISL_436211, EPI_ISL_436212, EPI_ISL_436213, EPI_ISL_436214, EPI_ISL_436217, EPI_ISL_436219, EPI_ISL_436220, EPI_ISL_436223, EPI_ISL_436224, EPI_ISL_436225, EPI_ISL_436227, EPI_ISL_436229, EPI_ISL_436230, EPI_ISL_436231, EPI_ISL_436233, EPI_ISL_436234, EPI_ISL_436271, EPI_ISL_436272, EPI_ISL_436361, EPI_ISL_436382, EPI_ISL_436383, EPI_ISL_436384, EPI_ISL_436386, EPI_ISL_436387, EPI_ISL_436388, EPI_ISL_436389, EPI_ISL_436390, EPI_ISL_436391			
see above	Servicio de Microbiología. Consorcio Hospital General Universitario de Valencia	Sequencing and Bioinformatics Service and Molecular Epidemiology Research Group. FISABIO-Public Health	; Beatriz Beamud; Concepcion Gimeno; David Navarro; Fernando Gonzalez-Candelas; Giuseppe D'Auria; Griselda De Marco; Inma Galán Vendrell; Ivan Ansari; Lidia Ruiz Roldan; Llúcia Martínez-Priego; Llúcia Martínez-PriegoGriselda De Marco; Loreto Ferrús Abad; Maria Alma Bracho; Maria Dolores Ocete; Mariana Reyes-Prieto; Marta Pla Diaz; Neris Garcia-Gonzalez; Paula Ruiz-Hueso; Sandra Carbo; Vicente Soriano Chirona
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EPI_ISL_452448, EPI_ISL_452449, EPI_ISL_452452, EPI_ISL_509619, EPI_ISL_509620, EPI_ISL_509621, EPI_ISL_509622, EPI_ISL_509623, EPI_ISL_509624, EPI_ISL_509625, EPI_ISL_509626, EPI_ISL_509627, EPI_ISL_509628, EPI_ISL_509629, EPI_ISL_509630, EPI_ISL_509631, EPI_ISL_509632			
see above	Servicio de Microbiología. HRU de Málaga. Servicio Andaluz de Salud	SeqCOVID-SPAIN consortium/IBV(CSIC)	Begoña Palop Borrás and SeqCOVID-SPAIN consortium; Inmaculada de Toro Peinado; Inmaculada de Toro Peinado. MªConcepción Mediavilla Gradolph. Begoña Palop Borrás and SeqCOVID-SPAIN consortium; Maria Concepción Mediavilla Gradolph
EPI_ISL_539284, EPI_ISL_539285, EPI_ISL_539286, EPI_ISL_539287, EPI_ISL_654469, EPI_ISL_654470, EPI_ISL_654477, EPI_ISL_654478, EPI_ISL_796070, EPI_ISL_796093, EPI_ISL_796094, EPI_ISL_796095, EPI_ISL_796096, EPI_ISL_796097, EPI_ISL_796098, EPI_ISL_796099, EPI_ISL_796101, EPI_ISL_796102, EPI_ISL_796103, EPI_ISL_796104, EPI_ISL_796105, EPI_ISL_796106, EPI_ISL_796107, EPI_ISL_796108, EPI_ISL_796109, EPI_ISL_796135, EPI_ISL_796136, EPI_ISL_796137, EPI_ISL_796138, EPI_ISL_796139, EPI_ISL_796140, EPI_ISL_796141, EPI_ISL_796142, EPI_ISL_796143, EPI_ISL_796144, EPI_ISL_796145, EPI_ISL_796146, EPI_ISL_796147, EPI_ISL_796148, EPI_ISL_796149, EPI_ISL_796150, EPI_ISL_796151, EPI_ISL_796152, EPI_ISL_796153			
see above	Servicio de Microbiología. Hospital General Universitario de Castellón	SeqCOVID-SPAIN consortium/IBV(CSIC)	María Dolores Tirado Balaguer and SeqCOVID-SPAIN consortium; María Dolores Tirado and SeqCOVID-SPAIN consortium; Rosario Moreno; Rosario Moreno Muñoz
EPI_ISL_1014733	Servicio de Microbiología. Hospital Ramón y Cajal. (CIBERESP)	SeqCOVID-SPAIN consortium/IBV(CSIC)	Jose Mª González-Alba; Juan C Galán and SeqCOVID-SPAIN consortium; L. Olavarrieta; Val Fernández
EPI_ISL_480952, EPI_ISL_480953, EPI_ISL_480954, EPI_ISL_480955, EPI_ISL_480956, EPI_ISL_480957, EPI_ISL_480958, EPI_ISL_480959, EPI_ISL_480960, EPI_ISL_480962, EPI_ISL_480963, EPI_ISL_480965, EPI_ISL_480966, EPI_ISL_480967, EPI_ISL_480968, EPI_ISL_480969, EPI_ISL_480970, EPI_ISL_480971, EPI_ISL_480972, EPI_ISL_480973, EPI_ISL_480976, EPI_ISL_480977, EPI_ISL_480978, EPI_ISL_480980, EPI_ISL_480982, EPI_ISL_480983, EPI_ISL_480984, EPI_ISL_480985, EPI_ISL_480986, EPI_ISL_480987, EPI_ISL_480988, EPI_ISL_480991, EPI_ISL_480994, EPI_ISL_480996, EPI_ISL_480997, EPI_ISL_480998, EPI_ISL_480999, EPI_ISL_481000, EPI_ISL_481002, EPI_ISL_481004, EPI_ISL_481005, EPI_ISL_481007, EPI_ISL_481008, EPI_ISL_481009, EPI_ISL_481010, EPI_ISL_481011, EPI_ISL_481013, EPI_ISL_481014, EPI_ISL_481015, EPI_ISL_481018, EPI_ISL_481019, EPI_ISL_481020, EPI_ISL_481022, EPI_ISL_481023, EPI_ISL_481027, EPI_ISL_481028, EPI_ISL_481030, EPI_ISL_481032, EPI_ISL_481033, EPI_ISL_481036, EPI_ISL_481037, EPI_ISL_481038, EPI_ISL_481039, EPI_ISL_481040			
see above	Servicio de Microbiología. Hospital Universitario Donostia. OSI Donostialdea. Área de Enfermedades Infecciosas, Grupo de Infección Respiratoria y Resistencia Antimicrobiana. Instituto de Investigación Sanitaria Biodonostia	SeqCOVID-SPAIN consortium/IBV(CSIC)	Gustavo Cilla; Jose Maria Marimón and SeqCOVID-SPAIN consortium; Luis Piñeiro; Milagrosa Montes
EPI_ISL_452618, EPI_ISL_452620, EPI_ISL_452621, EPI_ISL_452622, EPI_ISL_452623, EPI_ISL_452624, EPI_ISL_452625, EPI_ISL_452626, EPI_ISL_452627, EPI_ISL_452630, EPI_ISL_452631, EPI_ISL_452632, EPI_ISL_452633, EPI_ISL_452634, EPI_ISL_452635, EPI_ISL_452636, EPI_ISL_452637, EPI_ISL_452638, EPI_ISL_452639, EPI_ISL_452640, EPI_ISL_452641, EPI_ISL_452642, EPI_ISL_452643, EPI_ISL_452644, EPI_ISL_452645, EPI_ISL_452646, EPI_ISL_452647, EPI_ISL_452648, EPI_ISL_452649, EPI_ISL_452650, EPI_ISL_452651, EPI_ISL_452652, EPI_ISL_452653, EPI_ISL_452657, EPI_ISL_452658, EPI_ISL_452659, EPI_ISL_452661, EPI_ISL_452662, EPI_ISL_452663, EPI_ISL_452664, EPI_ISL_452665, EPI_ISL_452666, EPI_ISL_452669, EPI_ISL_452670, EPI_ISL_452671, EPI_ISL_452672, EPI_ISL_452675, EPI_ISL_452677, EPI_ISL_452678, EPI_ISL_452679, EPI_ISL_452680, EPI_ISL_452681, EPI_ISL_452682, EPI_ISL_452683, EPI_ISL_452684, EPI_ISL_452686, EPI_ISL_452688, EPI_ISL_452689, EPI_ISL_452691			
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EPI_ISL_414936, EPI_ISL_414937, EPI_ISL_414938, EPI_ISL_414939, EPI_ISL_414940, EPI_ISL_414941	Shandong Provincial Center for Disease Control and Prevention	Beijing Institute of Microbiology and Epidemiology	Bo Pang; Can-Fang Lin; Cun-Bao Li; Dian-Ming Kang; Feng Gao; Guo-Lin Wang; Jie Lei; Li-Jun Duan; Lin Yao; Mai-Juan Ma; Ming-Xiao Yao; Sheng-Xiang Ji; Wen-Kui Sun; Xiang-Na Zhao; Xiao Wei; Xiao-Li Zhang; Xiao-Lin Jiang; Yang Hang; Zeng-Qiang Kou
EPI_ISL_416316, EPI_ISL_416317, EPI_ISL_416318, EPI_ISL_416319, EPI_ISL_416320, EPI_ISL_416321, EPI_ISL_416322, EPI_ISL_416323, EPI_ISL_416324, EPI_ISL_416325, EPI_ISL_416326, EPI_ISL_416329, EPI_ISL_416330, EPI_ISL_416331, EPI_ISL_416332, EPI_ISL_416333, EPI_ISL_416334, EPI_ISL_416335, EPI_ISL_416336, EPI_ISL_416337, EPI_ISL_416338, EPI_ISL_416339, EPI_ISL_416340, EPI_ISL_416341, EPI_ISL_416342, EPI_ISL_416348, EPI_ISL_416349, EPI_ISL_416350, EPI_ISL_416352, EPI_ISL_416353, EPI_ISL_416354, EPI_ISL_416355, EPI_ISL_416358, EPI_ISL_416359, EPI_ISL_416361, EPI_ISL_416362, EPI_ISL_416363, EPI_ISL_416364, EPI_ISL_416365, EPI_ISL_416366, EPI_ISL_416367, EPI_ISL_416368, EPI_ISL_416369, EPI_ISL_416370, EPI_ISL_416372, EPI_ISL_416373, EPI_ISL_416376, EPI_ISL_416377, EPI_ISL_416378, EPI_ISL_416379, EPI_ISL_416380, EPI_ISL_416381, EPI_ISL_416382, EPI_ISL_416384, EPI_ISL_416387, EPI_ISL_416389, EPI_ISL_416390, EPI_ISL_416393, EPI_ISL_416394, EPI_ISL_416396, EPI_ISL_416397, EPI_ISL_416398, EPI_ISL_416399, EPI_ISL_416400, EPI_ISL_416401, EPI_ISL_416402, EPI_ISL_416403, EPI_ISL_416404, EPI_ISL_416405, EPI_ISL_416406, EPI_ISL_416407, EPI_ISL_416409			
see above	Shanghai Public Health Clinical Center, Shanghai Medical College, Fudan University	National Research Center for Translational Medicine (Shanghai), Ruijin Hospital affiliated to Shanghai Jiao Tong University School of Medicine & Shanghai Public Health Clinical Center	Gang Lu; Hongzhou Lu; Saijuan Chen; Shengyue Wang; Xiaonan Zhang; Yun Ling; Yun Tan
EPI_ISL_463889, EPI_ISL_463894, EPI_ISL_463895, EPI_ISL_463896, EPI_ISL_463897, EPI_ISL_463901	Shaoxing Center for Disease Control and Prevention	Department of Pathology and Laboratory Medicine, University of California Los Angeles	Evann E. Hilt; Fan Li; Huan Wu; JiLing Wang; Jialiang Tang; Jinkun Chen; QinChao Zhang; Shangxin Yang; Yifang Wang; Zhuojing Jiang; Ziqin Li
EPI_ISL_582125, EPI_ISL_582126	Sheikh Khalifa Medical City	Molecular Surveillance lab Sheikh Khalifa Medical City	Amirtharaj Francis; Hala Imambaccus; Hiba Saud; Sahar Almarzooqi; Sajeed Abdul; Stefan Weber
EPI_ISL_582608, EPI_ISL_582613, EPI_ISL_582620, EPI_ISL_582624, EPI_ISL_582625	Sheikh Khalifa Medical City	Molecular/Surveillance lab Sheikh Khalifa Medical City	Amirtharaj Francis; Hala Imambaccus; Hiba Saud; Sahar Almarzooqi; Sajeed Abdul; Stefan Weber
EPI_ISL_406593	Shenzhen Key Laboratory of Pathogen and Immunity, National Clinical Research Center for Infectious Disease, Shenzhen Third People's Hospital	Shenzhen Key Laboratory of Pathogen and Immunity, National Clinical Research Center for Infectious Disease, Shenzhen Third People's Hospital	Chenguang Shen; Haixia Zheng; Li Xing; Yang Yang; Yingxia Liu; Zhixiang Xu
EPI_ISL_406592	Shenzhen Third People's Hospital	Shenzhen Key Laboratory of Pathogen and Immunity, National Clinical Research Center for Infectious Disease,Shenzhen Third People's Hospital	Chenguang Shen; Haixia Zheng; Li Xing; Yang Yang; Yingxia Liu; Zhixiang Xu
EPI_ISL_480074, EPI_ISL_480075, EPI_ISL_480076, EPI_ISL_480077, EPI_ISL_480078, EPI_ISL_480079, EPI_ISL_480080, EPI_ISL_480081			
see above	Shizuoka City Institute of Environmental Sciences and Public Health	Pathogen Genomics Center, National Institute of Infectious Diseases	Hajime Kamiya; Kenji Yagi; Kentaro Itokawa; Makoto Kuroda; Masanori Hashino; Motoi Suzuki; Rina Tanaka; Sou Okamura; Takaharu Maehata; Tsuyoshi Sekizuka; Yuji Kanazawa
EPI_ISL_437187	Siloam Hospitals	Institute of Tropical Disease, Universitas Airlangga	Aldise M Nastri; Gatot Soegiarto; Jezzy R Dewantari; Kazufumi Shimizu; Krisnoadi Rahardjo; Laksmi Wulandari; Maria I Lusida; Maria M Padmidewi; Mitsuhiro Nishimura; Resti Y Meliana; Retno A Setyoningrum; Rima R Prasetya; Soetjipto; Yasuko Mori; Yohko K Shimizu
EPI_ISL_482672, EPI_ISL_482677, EPI_ISL_482680	Singapore General Hospital	Department of Microbiology	Chenhao Li; Karrie Ko; Kern Rei Chng; Kian Sing Chan; Kun Lee Lim; Lynette Oon; Niranjan Nagarajan; Nurdyana Abdul Rahman
EPI_ISL_407987	Singapore General Hospital	Programme in Emerging Infectious Diseases, Duke-NUS Medical School	Danielle E Anderson; Gavin JD Smith; Jayanthi Jayakumar; Jenny GH Low; Kian Sing Chan; Linfa Wang; Lynette LE Oon; Martin Linster; Yan Zhuang; Yvonne CF Su
EPI_ISL_410536, EPI_ISL_410537	Singapore General Hospital, Molecular Laboratory, Division of Pathology	Programme in Emerging Infectious Diseases, Duke-NUS Medical School	Danielle E Anderson; Gavin JD Smith; Jayanthi Jayakumar; Jenny GH Low; Kian Sing Chan; Lynette LE Oon; Martin Linster; Shirin Kalimuddin; Yan Zhuang; Yvonne CF Su
EPI_ISL_455586	Siriraj hospital	National Institute of Health. Department of medical Sciences, Ministry of Public Health, Thailand	Chittaganpitch; Malinee; Okada; Parnmen; Phuygun; Pilailuk; Siripaporn; Sittiporn; Suntharеeya; Thanadachakul; Thanutsapa; Waicharoen; Warawan; Wongboot
EPI_ISL_454494, EPI_ISL_454495, EPI_ISL_454496, EPI_ISL_455842, EPI_ISL_455843, EPI_ISL_455844, EPI_ISL_455845, EPI_ISL_475085, EPI_ISL_475092, EPI_ISL_475099, EPI_ISL_475105, EPI_ISL_475106, EPI_ISL_475107, EPI_ISL_475108, EPI_ISL_475109, EPI_ISL_475111, EPI_ISL_475112, EPI_ISL_475113, EPI_ISL_475549, EPI_ISL_475550, EPI_ISL_475554, EPI_ISL_475555, EPI_ISL_476143, EPI_ISL_476144, EPI_ISL_548245, EPI_ISL_548246, EPI_ISL_710584			
see above	Skovde/Unilabs	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Department of Microbiology; Karin Tegmark-Wisell; Maria Lind Karlberg; Mattias Haukland; Mia Brytting; Olov Svartstrom; Oskar Karlsson Lindsjo; Petra Edquist; Reza Advani; Sandra Broddesson; Shamam Muradrasoli; Shaman Muradrasoli; The Public Health Agency of Sweden
EPI_ISL_1145037	Sonic - MVZ Medizinisches Labor Bremen GmbH	Robert Koch Institute	
EPI_ISL_1113261, EPI_ISL_1113276, EPI_ISL_1113446, EPI_ISL_1113457	Sonora Quest Laboratories	TGen North	"Jolene Bowers; Ashlyn Pfeiffer; Chris French; Darrin Lemmer; Dave Engelthaler; Hayley Yaglom; Megan Folkerts; The Arizona COVID Genomics Union (ACGU)"
EPI_ISL_696208, EPI_ISL_696223, EPI_ISL_696226, EPI_ISL_696249, EPI_ISL_696416, EPI_ISL_696420, EPI_ISL_696430, EPI_ISL_696432, EPI_ISL_696433			
see above	Sonora Quest Laboratories, Laboratory Sciences of Arizona	TGen North	Ashlyn Pfeiffer; Chris French; Darrin Lemmer; Dave Engelthaler; Hayley Yaglom; Jolene Bowers; Megan Folkerts; The Arizona COVID Genomics Union

			(ACGU)
EPI_ISL_408431	Sorbonne Université, Inserm et Assistance Publique-Hôpitaux de Paris (Pitié Salpétrière)	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Anne-Geneviève Marcelin; David Boutolleau; Elise Klément; Eric Caumes.; Flora Donati; Marion Barbet; Maud Vanpeene; Mélanie Albert; Méline Bizard; Sonia Burrel; Sylvie Behillil; Sylvie van der Werf; Valérie Pourcher; Vincent Calvez; Vincent Enouf
EPI_ISL_529171, EPI_ISL_529173, EPI_ISL_529174, EPI_ISL_529175	South Carolina Department of Health and Environmental Control	South Carolina Department of Health and Environmental Control	Haley V. Flores
EPI_ISL_451517, EPI_ISL_451518, EPI_ISL_451519, EPI_ISL_451521, EPI_ISL_451632, EPI_ISL_451633, EPI_ISL_451634, EPI_ISL_451635, EPI_ISL_451636, EPI_ISL_455036, EPI_ISL_455075, EPI_ISL_455076, EPI_ISL_455077, EPI_ISL_455078, EPI_ISL_455079, EPI_ISL_455080, EPI_ISL_455081, EPI_ISL_455082, EPI_ISL_455087, EPI_ISL_455088, EPI_ISL_455089, EPI_ISL_455096, EPI_ISL_455098			
see above	South Eastern Area Laboratory Services	NSW Health Pathology - Institute of Clinical Pathology and Medical Research; Westmead Hospital; University of Sydney	CIDM-PH et al.
EPI_ISL_478683, EPI_ISL_478684, EPI_ISL_478685, EPI_ISL_478686, EPI_ISL_478687, EPI_ISL_478688, EPI_ISL_478689, EPI_ISL_478690, EPI_ISL_478691, EPI_ISL_478692, EPI_ISL_478693, EPI_ISL_478694, EPI_ISL_478695, EPI_ISL_478696, EPI_ISL_478697, EPI_ISL_478698, EPI_ISL_478699, EPI_ISL_478700, EPI_ISL_478702, EPI_ISL_478703, EPI_ISL_478704, EPI_ISL_478708, EPI_ISL_490017, EPI_ISL_490018, EPI_ISL_490032, EPI_ISL_490034, EPI_ISL_490035, EPI_ISL_498751, EPI_ISL_513317, EPI_ISL_526697, EPI_ISL_593683			
see above	South Eastern Area Laboratory Services (SEALS)	NSW Health Pathology - Institute of Clinical Pathology and Medical Research; Westmead Hospital; University of Sydney	CIDM-PH et al.
EPI_ISL_456159, EPI_ISL_456167, EPI_ISL_456181, EPI_ISL_456217, EPI_ISL_456218, EPI_ISL_456219, EPI_ISL_456220, EPI_ISL_456225, EPI_ISL_456229, EPI_ISL_456230, EPI_ISL_456233, EPI_ISL_456234, EPI_ISL_456236, EPI_ISL_456237, EPI_ISL_456238, EPI_ISL_456242, EPI_ISL_456243, EPI_ISL_456244, EPI_ISL_456245, EPI_ISL_456246, EPI_ISL_456247, EPI_ISL_456248, EPI_ISL_456249, EPI_ISL_456250, EPI_ISL_456251, EPI_ISL_456252, EPI_ISL_456253, EPI_ISL_456254, EPI_ISL_456261, EPI_ISL_456262, EPI_ISL_456263, EPI_ISL_456264, EPI_ISL_456265, EPI_ISL_456266, EPI_ISL_456267, EPI_ISL_456268, EPI_ISL_456270, EPI_ISL_456271, EPI_ISL_456272, EPI_ISL_456273, EPI_ISL_456276, EPI_ISL_456278, EPI_ISL_456279, EPI_ISL_456280, EPI_ISL_456281, EPI_ISL_456282, EPI_ISL_456283, EPI_ISL_456284, EPI_ISL_456287, EPI_ISL_456288, EPI_ISL_456289, EPI_ISL_456290, EPI_ISL_456292, EPI_ISL_456308, EPI_ISL_536789, EPI_ISL_579125, EPI_ISL_579126, EPI_ISL_579127, EPI_ISL_579128, EPI_ISL_579133, EPI_ISL_579134, EPI_ISL_579135, EPI_ISL_579136, EPI_ISL_579138, EPI_ISL_579139, EPI_ISL_579140, EPI_ISL_579141, EPI_ISL_579142, EPI_ISL_579143, EPI_ISL_579144, EPI_ISL_579145, EPI_ISL_579146, EPI_ISL_579147, EPI_ISL_579148, EPI_ISL_579149, EPI_ISL_579150, EPI_ISL_579151, EPI_ISL_579152, EPI_ISL_579153, EPI_ISL_579154, EPI_ISL_579155, EPI_ISL_579163			
see above	Southern Community Labs Dunedin	Institute of Environmental Science and Research (ESR)	Anja Werno; Antje van der Linden; Arlo Upton; Chris Mansell; David Hammer; Dragana Drinkovic; Erasmus Smit; Gary McAuliffe; Hana Sofia Andersson; Hermes Perez; James Ussher; Jill Sherwood; Jing Wang; Joep de Ligt; Josh Freeman; Julia Howard; Juliet Elvy; Lauren Jelly; Mary DeAlmeida; Matt Blakiston; Matt Storey; Matthew Rogers; Max Bloomfield; Michael Addidle; Michelle Balm; Muhammad Faisal; Nikki Freed; Olin Silander; Sally Roberts; Sarah Jefferies; Sharmini Muttaiyah; Susan Morpeth; Susan Taylor; Timothy Blackmore; Vani Sathyendran; Veronica Playle; Virginia Hope; Xiaoyun Ren
EPI_ISL_469241, EPI_ISL_469242, EPI_ISL_469243, EPI_ISL_469244, EPI_ISL_469245, EPI_ISL_469246, EPI_ISL_469247, EPI_ISL_469248, EPI_ISL_469249, EPI_ISL_469250, EPI_ISL_469251, EPI_ISL_469252			
see above	Special Infectious Agents Unit	Special Infectious Agents Unit	A.M.; Al-Sobahy; Azhar; E.I.; El-Kafrawy; Farraj; Hassan; N.A.; S.A.; T.L.; Tolah; Uthman
EPI_ISL_631888, EPI_ISL_631917, EPI_ISL_631952, EPI_ISL_631971, EPI_ISL_631980	St Barnabas Hospital	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_631529	St. Johns Episcopal Hospital	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_514641, EPI_ISL_514646	St. Luke's Hospital	Minnesota Department of Health, Public Health Laboratory	Jacob Garfin; Matt Plumb; and Xiong Wang
EPI_ISL_450346, EPI_ISL_450347, EPI_ISL_450348, EPI_ISL_450349, EPI_ISL_450350, EPI_ISL_450351, EPI_ISL_450352			
see above	St.Olavs hospital/NTNU	Institute of Genomics Core Facility, University of Tartu	Aleksandr Ianevski; Denis Kainov; Janne-Fossum Malmring; Svein Arne Nordbø; Tuuli Reisberg
EPI_ISL_596646, EPI_ISL_596648, EPI_ISL_596653, EPI_ISL_596665, EPI_ISL_596668, EPI_ISL_596675	St.Vincent's University Hospital	St.Vincent's University Hospital	Aisling Purcell; Gabriel Gonzalez; Guerrino Macori; Kirsten Schaffer; Lynda Fenelon; Mary Lucey; Niamh Mullane; Suzie Coughlan; Séamus Fanning; Una Sutton-Fitzpatrick
EPI_ISL_450445, EPI_ISL_450446, EPI_ISL_450447, EPI_ISL_450448, EPI_ISL_450449, EPI_ISL_450450, EPI_ISL_450451, EPI_ISL_450452, EPI_ISL_450453, EPI_ISL_450454, EPI_ISL_450455, EPI_ISL_450456, EPI_ISL_450457, EPI_ISL_450458, EPI_ISL_450459, EPI_ISL_450460, EPI_ISL_450461, EPI_ISL_450462, EPI_ISL_450463, EPI_ISL_450464, EPI_ISL_450465, EPI_ISL_450466, EPI_ISL_450467, EPI_ISL_450468, EPI_ISL_450469, EPI_ISL_450470, EPI_ISL_450471, EPI_ISL_450472, EPI_ISL_450473, EPI_ISL_450474, EPI_ISL_450475, EPI_ISL_450476, EPI_ISL_450477, EPI_ISL_450478, EPI_ISL_450479, EPI_ISL_450480, EPI_ISL_450481, EPI_ISL_476768, EPI_ISL_476772, EPI_ISL_476773, EPI_ISL_476774, EPI_ISL_476775, EPI_ISL_476778, EPI_ISL_476780, EPI_ISL_476781, EPI_ISL_476782, EPI_ISL_476783, EPI_ISL_476784, EPI_ISL_476785, EPI_ISL_476786, EPI_ISL_476787, EPI_ISL_476788			
see above	Stanford clinical virology lab	Chan-Zuckerberg Biohub	Benjamin Pinsky; Carlos Bustamante; Euan Ashley; Hannah N. DeJong; Jason Andrews; John Gorzynski; Katharine Walter; Manuel Rivas; Matthew T. Wheeler; Victoria N. Parikh; with CZB Cliahub Consortium
EPI_ISL_418990, EPI_ISL_418991	State Key Laboratory for Diagnosis and Treatment of Infectious Diseases, National Clinical Research Center for Infectious Diseases, First Affiliated Hospital, Zhejiang University School of Medicine, Hangzhou, China 310003	State Key Laboratory for Diagnosis and Treatment of Infectious Diseases, National Clinical Research Center for Infectious Diseases, First Affiliated Hospital, Zhejiang University School of Medicine, Hangzhou, China 310003	Changzhong Jin; Chao Jiang; Fumin Liu; Haibo Wu; Hangping Yao; Lanjuan Li; Linfang Cheng; Min Zheng; Nanping Wu; Xiangyun Lu; Zhigang Wu
EPI_ISL_417443	State Key Laboratory for Emerging Infectious Diseases Department of Microbiology Li Ka Shing Faculty of Medicine The University of Hong Kong	State Key Laboratory for Emerging Infectious Diseases Department of Microbiology Li Ka Shing Faculty of Medicine The University of Hong Kong	Bobo Wing-Yee Mok; Honglin Chen; Kwok-Yung Yuen; Pui Wang; Shaofeng Deng; Siu-Ying Lau; Wenjun Song
EPI_ISL_444273	State Key Laboratory of Respiratory Disease, National Clinical Research Center for Respiratory Disease, Guangzhou Institute of Respiratory Health, the First Affiliated Hospital of Guangzhou Medical University	State Key Laboratory of Respiratory Disease, National Clinical Research Center for Respiratory Disease, Guangzhou Institute of Respiratory Health, the First Affiliated Hospital of Guangzhou Medical University	Huang; J. and Zhao, J.; Shi, Y.; Sun, J.; Zheng, K.
EPI_ISL_414663, EPI_ISL_414686, EPI_ISL_414689, EPI_ISL_414690, EPI_ISL_414691, EPI_ISL_414692	State Key Laboratory of Respiratory Disease, National Clinical Research Center for Respiratory Disease, Guangzhou Institute of Respiratory Health, the First Affiliated Hospital of Guangzhou Medical University	The First Affiliated Hospital of Guangzhou Medical University & BGI-Shenzhen	Zhao et al
EPI_ISL_414687	State Key Laboratory of Respiratory Disease, National Clinical Research Center for Respiratory Disease, Guangzhou Institute of Respiratory Health, the First Affiliated Hospital of Guangzhou Medical University	the First Affiliated Hospital of Guangzhou Medical University & BGI-Shenzhen	Zhao et al
EPI_ISL_406716, EPI_ISL_406717	State Key Laboratory of Virology, Wuhan University	State Key Laboratory of Virology, Wuhan University	Chen, L.; Chen, Y.; K. and Liu, Y.; Lan; Li, Y.; Liu, F.; Liu, W.; Mei, Y.; Shi, M.; Sun, Z.; Wu, K.; Wu, W.; Xu, K.; Ye, G.; Zhang, Q.; Zhang, W.
EPI_ISL_752608, EPI_ISL_752609, EPI_ISL_752612, EPI_ISL_752614, EPI_ISL_752615, EPI_ISL_752616, EPI_ISL_752617, EPI_ISL_752618, EPI_ISL_752619, EPI_ISL_752626, EPI_ISL_752627, EPI_ISL_752628, EPI_ISL_752660, EPI_ISL_752700, EPI_ISL_752710, EPI_ISL_752711, EPI_ISL_752845			
see above	State Laboratories Division, Hawaii State Department of Health	State Laboratories Division, Hawaii State Department of Health	Drew Kuwazaki; Edward Desmond; Pamela O'Brien; Razvan Sultana; Sabrina Diemert
EPI_ISL_428860, EPI_ISL_428861, EPI_ISL_428862, EPI_ISL_428863, EPI_ISL_428864, EPI_ISL_428865, EPI_ISL_428866, EPI_ISL_428867, EPI_ISL_428868, EPI_ISL_428869, EPI_ISL_428870, EPI_ISL_428871, EPI_ISL_428872, EPI_ISL_428873, EPI_ISL_428874, EPI_ISL_428875, EPI_ISL_428876, EPI_ISL_428877, EPI_ISL_428879, EPI_ISL_428880, EPI_ISL_428881, EPI_ISL_428882, EPI_ISL_428883, EPI_ISL_428884, EPI_ISL_428885, EPI_ISL_428886, EPI_ISL_428887, EPI_ISL_428888, EPI_ISL_428889, EPI_ISL_428890, EPI_ISL_428891, EPI_ISL_428892, EPI_ISL_428893, EPI_ISL_428894, EPI_ISL_428895, EPI_ISL_428896, EPI_ISL_428897, EPI_ISL_428898, EPI_ISL_428899, EPI_ISL_428900, EPI_ISL_428901, EPI_ISL_428902, EPI_ISL_428903, EPI_ISL_428904, EPI_ISL_428905, EPI_ISL_428906, EPI_ISL_428908, EPI_ISL_428909, EPI_ISL_428910, EPI_ISL_428912, EPI_ISL_428913, EPI_ISL_428914, EPI_ISL_428915, EPI_ISL_428916, EPI_ISL_428917, EPI_ISL_428918, EPI_ISL_428919, EPI_ISL_428920, EPI_ISL_428921, EPI_ISL_428922, EPI_ISL_428923, EPI_ISL_428924			
see above	State Research Center of Virology and Biotechnology VECTOR, Department of Collection of Microorganisms	State Research Center of Virology and Biotechnology VECTOR, Department of Collection of Microorganisms	Alexander N. Shvalov; Anastasiya A. Nazarenko; Anastasiya M. Smirnova; Elena V. Gavrilova; Oleg V. Pyankov; Rinat A. Maksyutov; Sergey A. Bodnev; Tatyana V. Tregubchak
EPI_ISL_417033	Sullivan Nicolaides Pathology	Public Health Virology Laboratory	Alyssa Pyke; Amanda De Jong; Andrew Van Den Hurk; Bixing Huang; Carmel Taylor; David Warrilow; Doris Genge; Elisabeth Gamez; Glen Hewitson; Ian Maxwell Mackay; Inga Sultana; Jamie McMahon; Jean Barcelon; Judy Northill; Mitchell Finger; Natalie Simpson; Neelima Nair; Peter Burtonclay; Peter Moore; Sarah Wheatley; Sean Moody; Sonja Hall-Mendelin; Timothy Gardam; and Frederick Moore
EPI_ISL_445225, EPI_ISL_475564	Surbrunns VC	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Erik Embring; Karin Tegmark-Wisell; Maria Lind Karlberg; Mattias Haukland; Mia Brytting; Olov Svartstrom; Oskar Karlsson Lindsjo; Reza Advani; Sandra Broddesson; Theresa Enkirch

EPI_ISL_434645, EPI_ISL_434649	Svardsjo VC	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Karin Tegmark-Wisell; Maria Lind Karlberg; Mia Brytting; Olov Svartstrom; Oskar Karlsson Lindsjo; Theresa Enkirch; Tommy Janers
EPI_ISL_478675, EPI_ISL_478676, EPI_ISL_478677, EPI_ISL_478678, EPI_ISL_478679, EPI_ISL_478680, EPI_ISL_478681, EPI_ISL_478682, EPI_ISL_478706, EPI_ISL_490037, EPI_ISL_593755, EPI_ISL_593756, EPI_ISL_593757, EPI_ISL_593758, EPI_ISL_593759			
see above	Sydney South West Pathology Service (SSWPS) - Liverpool Hospital - NSW Health Pathology	NSW Health Pathology - Institute of Clinical Pathology and Medical Research; Westmead Hospital; University of Sydney	CIDM-PH et al.
EPI_ISL_426500, EPI_ISL_426501, EPI_ISL_426502, EPI_ISL_426503, EPI_ISL_426504, EPI_ISL_426505, EPI_ISL_426506, EPI_ISL_426507, EPI_ISL_426509, EPI_ISL_426510, EPI_ISL_426511, EPI_ISL_426520, EPI_ISL_426521, EPI_ISL_426522, EPI_ISL_426523, EPI_ISL_426524, EPI_ISL_426525, EPI_ISL_426526, EPI_ISL_426532, EPI_ISL_426533, EPI_ISL_426534, EPI_ISL_426535, EPI_ISL_426536, EPI_ISL_694047, EPI_ISL_694048, EPI_ISL_694050, EPI_ISL_694052			
see above	TGen North	TGen North	Ashlyn Pfeiffer; Chris French; Darrin Lemmer; Dave Engelthaler; Hayley Yaglom; Jolene Bowers; Megan Folkerts; The Arizona COVID Genomics Union (ACGU)
EPI_ISL_540432, EPI_ISL_540433, EPI_ISL_540434, EPI_ISL_576172, EPI_ISL_576175, EPI_ISL_576176	TN Division of Laboratory Services	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Anna Montmayeur; Anna Uehara; Brian Lynch; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Peter Cook; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_426629, EPI_ISL_426630, EPI_ISL_426632, EPI_ISL_427392, EPI_ISL_427393, EPI_ISL_427394, EPI_ISL_427395, EPI_ISL_427398, EPI_ISL_428229, EPI_ISL_428230, EPI_ISL_428231, EPI_ISL_436101, EPI_ISL_436102, EPI_ISL_436104, EPI_ISL_436106, EPI_ISL_436107, EPI_ISL_447252, EPI_ISL_447253, EPI_ISL_447255, EPI_ISL_447257, EPI_ISL_447592, EPI_ISL_457726, EPI_ISL_457730, EPI_ISL_457733, EPI_ISL_458029			
see above	TSGH-CP molecular lab	TSGH-CP molecular lab	Cherng-Lih Perng; Chien-Wen Chen; Chih-Kai Chang; Feng-Yee Chang; Hsing-Yi Chung; Hung-Sheng Shang; Jung-Chung Lin; Kuo-Ming Yeh; Kuo-Sheng Hung; Ming-Jr JIAN; Ming-Jr Jian; Sheng-Kang Chiu; Shih-Hung Tsai; Tien-Yao Chang
EPI_ISL_411926, EPI_ISL_411927	Taiwan Centers for Disease Control	Taiwan Centers for Disease Control	Ji-Rong Yang; Jung-Jung Mu; Ming-Tsan-Liu; Yu-Chi-Lin
EPI_ISL_412968, EPI_ISL_420889, EPI_ISL_420890, EPI_ISL_445183	Takayuki Hishiki Kanagawa Prefectural Institute of Public Health	Takayuki Hishiki Kanagawa Prefectural Institute of Public Health	An, T.; Hayashizaki; Hishiki, T.; Kawai, J.; Kogo, Y.; Matsuki, Y.; Sakuragi, J.; Suzuki, R.; Tanaka, Y.; Usui, K.; Y. and Takasaki, T.
EPI_ISL_1379444, EPI_ISL_1379445, EPI_ISL_1379446, EPI_ISL_1379447, EPI_ISL_1379448, EPI_ISL_1379449, EPI_ISL_1379450, EPI_ISL_1379451, EPI_ISL_1379452, EPI_ISL_1379453, EPI_ISL_1379454, EPI_ISL_1379455, EPI_ISL_1379456, EPI_ISL_1379457, EPI_ISL_1379458, EPI_ISL_1379459, EPI_ISL_1379460, EPI_ISL_1379461, EPI_ISL_1379462, EPI_ISL_1379463, EPI_ISL_1379464, EPI_ISL_1379465, EPI_ISL_1379466, EPI_ISL_1379467, EPI_ISL_1379468, EPI_ISL_1379469, EPI_ISL_1379470, EPI_ISL_1379471, EPI_ISL_1379472, EPI_ISL_1379473, EPI_ISL_1379474, EPI_ISL_1379475, EPI_ISL_1379476, EPI_ISL_1379478, EPI_ISL_1379479, EPI_ISL_1379480, EPI_ISL_1379481, EPI_ISL_1379482, EPI_ISL_1379483, EPI_ISL_1379484, EPI_ISL_1379485, EPI_ISL_1379486, EPI_ISL_1379487, EPI_ISL_1379488, EPI_ISL_1379489, EPI_ISL_1379490, EPI_ISL_1379491, EPI_ISL_1379492, EPI_ISL_1379493, EPI_ISL_1379494, EPI_ISL_1379495, EPI_ISL_1379496, EPI_ISL_1379497, EPI_ISL_1379498, EPI_ISL_1379499, EPI_ISL_1379500, EPI_ISL_1379501, EPI_ISL_1379502, EPI_ISL_1379503, EPI_ISL_1379504, EPI_ISL_1379505, EPI_ISL_1379506			
see above	Tampa General Hospital Esoteric Lab	Tampa General Hospital Esoteric Research & Development Lab	Amorce Lima; Deanna Becker; Dominic Uy; Grant Vestal; Suzane Silbert; Vicki Healer
EPI_ISL_529149, EPI_ISL_529150	Technology Centre, Guangzhou Customs	Technology Centre, Guangzhou Customs	Dai, J.; Huang, J.; Huang, S.; Li, X.; Shi, Y.; Sun, F.; Sun, J.; Wang, Y.; Zhang, Z.; Zheng, K.; Zhu, .; Zhuang, Z.
EPI_ISL_412966	Technology Centre, Guangzhou Customs	Technology Centre, Guangzhou Customs	Huang; J. and Zhao, J.; Shi, Y.; Sun, J.; Zheng, K.
EPI_ISL_420796, EPI_ISL_420797, EPI_ISL_420798, EPI_ISL_452105, EPI_ISL_452112, EPI_ISL_452115	Texas DSHS Lab Services	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Montmayeur; Anna Uehara; Anne Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jasmine Padilla; Jing Zhang; Justin Lee; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao; Zachary Weiner
EPI_ISL_525763, EPI_ISL_631660, EPI_ISL_631661, EPI_ISL_631669, EPI_ISL_631683, EPI_ISL_644168, EPI_ISL_644176			
see above	Texas Department of State Health Services	Texas Department of State Health Services	Anita Pokharel; Bonnie Oh; Chun Wang; Chung Wang; Grace Kubin; Jenny Zhang; Maliha Rahman; Mayela Pedrueza; Myong Koag; Rachel Lee; Rashmi Tuladhar
EPI_ISL_918160, EPI_ISL_918161, EPI_ISL_918162, EPI_ISL_918163, EPI_ISL_937531, EPI_ISL_937534, EPI_ISL_937539, EPI_ISL_937540, EPI_ISL_937541, EPI_ISL_937542, EPI_ISL_937543, EPI_ISL_937544, EPI_ISL_976893, EPI_ISL_976894, EPI_ISL_976895, EPI_ISL_976896, EPI_ISL_976897, EPI_ISL_976898, EPI_ISL_976899, EPI_ISL_976901, EPI_ISL_976902, EPI_ISL_976903, EPI_ISL_976904, EPI_ISL_976905, EPI_ISL_1296442, EPI_ISL_1296443, EPI_ISL_1296444, EPI_ISL_1296446, EPI_ISL_1296447, EPI_ISL_1296448, EPI_ISL_1296449, EPI_ISL_1296451, EPI_ISL_1296453, EPI_ISL_1296455, EPI_ISL_1296457, EPI_ISL_1296458, EPI_ISL_1296459, EPI_ISL_1296460, EPI_ISL_1296461, EPI_ISL_1296462			
see above	Thai Red Cross Emerging Infectious Diseases Health Science Centre, Chulalongkorn Hospital, Faculty of Medicine, Chulalongkorn University	Thai Red Cross Emerging Infectious Diseases Center and Faculty of Medicine, Chulalongkorn University	Apaporn Rodpan; Gompol Suwanpimolkul; Leilani Paitoonpong; Opass Putcharoen; Pattama Torvorapanit; Sininat Petcharat; Sopon Iamsirithaworn; Supaporn Wacharapluesadee; Thiravat Hemachudha; Watsamon Jantarabenjakul; Weenassarin Ampoot; Yutthana Joyjinda
EPI_ISL_672153, EPI_ISL_672154, EPI_ISL_672155, EPI_ISL_672156, EPI_ISL_672157, EPI_ISL_672158, EPI_ISL_672159, EPI_ISL_672160, EPI_ISL_672161, EPI_ISL_672162, EPI_ISL_672172, EPI_ISL_857039			
see above	The Ashley Laboratory, Stanford University	Chan-Zuckerberg Biohub	CZB Cliahub Consortium
EPI_ISL_412978	The Central Hospital Of Wuhan	Hubei Provincial Center for Disease Control and Prevention	Bin Fang; Bo Yang; Bo Yu; Faxian Zhan; Guojun Ye; Jing Li; Junqiang Xu; Kun Cai; Linlin Liu; Xiang Li; Xiao Yu; Xixiang Huo; Yongzhong Jiang.
EPI_ISL_450442	The Department of Infectious Disease Prevention and Control, Henan Provincial Center for Disease Control and Prevention	The Department of Infectious Disease Prevention and Control, Henan Provincial Center for Disease Control and Prevention	Hu, X.; Huang; Li, D.; Li, X.; Lu, S.; Wu, B.; X. and Guo, W.
EPI_ISL_429074, EPI_ISL_429075, EPI_ISL_429076, EPI_ISL_429077, EPI_ISL_429078, EPI_ISL_429079, EPI_ISL_429080, EPI_ISL_429081, EPI_ISL_429082, EPI_ISL_429083, EPI_ISL_429084, EPI_ISL_429085, EPI_ISL_429086, EPI_ISL_429088, EPI_ISL_429089, EPI_ISL_429090, EPI_ISL_429091, EPI_ISL_429092, EPI_ISL_429093, EPI_ISL_429094, EPI_ISL_429095, EPI_ISL_429096, EPI_ISL_429097, EPI_ISL_429098, EPI_ISL_429100, EPI_ISL_429101, EPI_ISL_429102, EPI_ISL_429103, EPI_ISL_429104, EPI_ISL_429105			
see above	The First Affiliated Hospital of Guangzhou Medical University	BGI-shenzhen & The First Affiliated Hospital of Guangzhou Medical University	; Daxi Wang; Lu Zhang; Wanying Sun; Yanqun Wang; Zhaoyong Zhang et al.
EPI_ISL_457687, EPI_ISL_457688, EPI_ISL_457689, EPI_ISL_457690, EPI_ISL_457691, EPI_ISL_457692, EPI_ISL_457693, EPI_ISL_457694, EPI_ISL_457695, EPI_ISL_457696, EPI_ISL_457697, EPI_ISL_457698			
see above	The First Affiliated Hospital of Guangzhou Medical University, Guangzhou, China	BGI-shenzhen & The First Affiliated Hospital of Guangzhou Medical University	Daxi Wang; Lu Zhang; Wanying Sun; Yanqun Wang; Zhaoyong Zhang et al.
EPI_ISL_491092, EPI_ISL_530348, EPI_ISL_530349, EPI_ISL_539494	The National Institute of Public Health	State Veterinary Institute Prague	A; D; H; J; Jirincova; L; Nagy; Novakova; Trnka; Vecerova
EPI_ISL_471540, EPI_ISL_471544, EPI_ISL_471547, EPI_ISL_471550, EPI_ISL_471553, EPI_ISL_471555, EPI_ISL_476067			
see above	The National Institute of Public Health	State Veterinary Institute Prague and The National Institute of Public Health	A; D; H; J; Jirincova; L; Nagy; Novakova; Trnka; Vecerova
EPI_ISL_489708, EPI_ISL_489709, EPI_ISL_490112, EPI_ISL_491093, EPI_ISL_491094, EPI_ISL_491095, EPI_ISL_491117, EPI_ISL_513314, EPI_ISL_513511, EPI_ISL_513512			
see above	The National Institute of Public Health	The National Institute of Public Health and State Veterinary Institute Prague	A; D; H; J; Jirincova; L; Nagy; Novakova; Trnka; Vecerova
EPI_ISL_422636	The National Institute of Public Health Center for Epidemiology and Microbiology	State Veterinary Institute Prague	Alexander Nagy; Dusan Trnka; Helena Jirincova; Jaromira Vecerova; Klara Labska; Ludmila Novakova; Olga Storkanova
EPI_ISL_437519	The National Institute of Public Health Center for Epidemiology and Microbiology	The National Institute of Public Health Center for Epidemiology and Microbiology	Alexander Nagy; Dusan Trnka; Helena Jirincova; Jaromira Vecerova; Ludmila Novakova
EPI_ISL_426379	The National Laboratory of Health, Environment and Food, Maribor, Slovenia	The National Laboratory of Health, Environment and Food, Maribor, Slovenia	Blazun Vosner H.; Duh D.; Hedzet S.; Janezic S.; Mahnic A.; Rupnik M.; Zavrsnik J.
EPI_ISL_417551, EPI_ISL_417553, EPI_ISL_417555, EPI_ISL_417556, EPI_ISL_417557, EPI_ISL_417558, EPI_ISL_417560, EPI_ISL_417564, EPI_ISL_417566, EPI_ISL_417568, EPI_ISL_417569, EPI_ISL_417571, EPI_ISL_417572, EPI_ISL_417573, EPI_ISL_417575, EPI_ISL_417577, EPI_ISL_417580, EPI_ISL_417583, EPI_ISL_417586, EPI_ISL_417588, EPI_ISL_417592, EPI_ISL_417596, EPI_ISL_417597, EPI_ISL_417598, EPI_ISL_417599, EPI_ISL_417600, EPI_ISL_417601, EPI_ISL_417602, EPI_ISL_417603, EPI_ISL_417604, EPI_ISL_417605, EPI_ISL_417606, EPI_ISL_417607, EPI_ISL_417608, EPI_ISL_417611, EPI_ISL_417612, EPI_ISL_417613, EPI_ISL_417614, EPI_ISL_417619, EPI_ISL_417620, EPI_ISL_417621, EPI_ISL_417623, EPI_ISL_417624, EPI_ISL_417625, EPI_ISL_417626, EPI_ISL_417627, EPI_ISL_417628, EPI_ISL_417629, EPI_ISL_417630, EPI_ISL_417631, EPI_ISL_417632, EPI_ISL_417633, EPI_ISL_417634, EPI_ISL_417635, EPI_ISL_417636, EPI_ISL_417638, EPI_ISL_417639, EPI_ISL_417640, EPI_ISL_417644, EPI_ISL_417645, EPI_ISL_417646, EPI_ISL_417649, EPI_ISL_417650, EPI_ISL_417651, EPI_ISL_417652, EPI_ISL_417653, EPI_ISL_417678, EPI_ISL_417679, EPI_ISL_417680, EPI_ISL_417684, EPI_ISL_417687, EPI_ISL_417689, EPI_ISL_417692, EPI_ISL_417696, EPI_ISL_417699, EPI_ISL_417703, EPI_ISL_417705, EPI_ISL_417709, EPI_ISL_417712, EPI_ISL_417713, EPI_ISL_417714, EPI_ISL_417716, EPI_ISL_417725, EPI_ISL_417726, EPI_ISL_417731, EPI_ISL_417733, EPI_ISL_417735, EPI_ISL_417737, EPI_ISL_417738, EPI_ISL_417739,			

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see above	The National University Hospital of Iceland	deCODE genetics	Agnar Helgason; Alma Moller; Arna B Agustsdottir; Arnaldur Gylfason; Asgeir Sigurdsson; Aslaug Jonasdottir; Berglind Eiriksdottir; Bjarni Thorbjornsson; Brynjar O Jensson; Daniel F Gudbjartsson; Droplaug N Magnusdottir; Elisabet E Gardarsdottir; Emil A Thorarensen; Gardar Sveinbjornsson; Gisli Masson; Gudmundur Georgsson; Gudmundur L Norddahl; Gudrun Sigmundsdottir; Hakon Jonsson; Hilma Holm; Ingileif Jonsdottir; Jona Saemundsdottir; Kamilla S Josefsdottir; Kari Stefansson; Karl G Kristinsson; Kjartan R Gudmundsson; Kristin E Sveinsdottir; Louise le Roux; Maney Sveinsdottir; Olafia S Gretarsdottir; Olafur T Magnusson; Pall Melsted; Patrick Sulem; Run Fridriksdottir; Thora R Gunnarsdottir; Thordur Kristjansson; Thorolfur Gudnason; Unnur Thorsteinsdottir
EPI_ISL_427288, EPI_ISL_427290	The Ohio State University	The Ohio State University-James Molecular Lab at Polaris	Dan Jones; Erica Vincent; Huolin Tu; Jason Garee; Joan-Miquel Balada-Llasat; Matthew Hunt; Preeti Panchioli; Preeti Pancholi; Rongqin Ren; Weiqiang Zhao
EPI_ISL_429161, EPI_ISL_429162, EPI_ISL_429163, EPI_ISL_430862, EPI_ISL_430864	The Public Health Agency of Sweden	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Karin Tegmark-Wisell; Maria Lind Karlberg; Olov Svartstrom; Oskar Karlsson Lindsjo; Shaman Muradrasoli
EPI_ISL_889309, EPI_ISL_889310, EPI_ISL_889311, EPI_ISL_889312, EPI_ISL_889313, EPI_ISL_889314, EPI_ISL_889315, EPI_ISL_889316, EPI_ISL_889317, EPI_ISL_889318, EPI_ISL_889319, EPI_ISL_889320, EPI_ISL_889321, EPI_ISL_889322, EPI_ISL_889323, EPI_ISL_889324, EPI_ISL_889325, EPI_ISL_889326			
see above	The University Hospital Brno	Institute of Applied Biotechnologies a.s.	Kateina Kvapilová; Martin Kašný; Martina Lengerová; Ondej Brzo; Petr Klempt; Petr Kvapil
EPI_ISL_405839, EPI_ISL_406030	The University of Hong Kong - Shenzhen Hospital	Li Ka Shing Faculty of Medicine, The University of Hong Kong	C.C.-Y.; C.K.-M. and Yuen; Cai; Chan; Chen, H.; Cheng; Chu, H.; H.W.; Hui; Ip; J.D.; J.F.-W.; J.P.; K.H.; K.K.-W.; K.Y.; Kok; Liu, J.; Lo; Poon; R.W.-S.; S.K.-F.; To; Tsai; V.C.-C.; V.K.-M.; W.M.; Xing, F.; Yang, J.; Yip; Yuan, S.
EPI_ISL_412983	Tianmen Center for Disease Control and Prevention	Hubei Provincial Center for Disease Control and Prevention	Bin Fang; Bo Yang; Bo Yu; Faxian Zhan; Guojun Ye; Jing Li; Junqiang Xu; Kun Cai; Linlin Liu; Xiang Li; Xiao Yu; Xierong Li; Xixiang Huo; Yangyang Tao; YiFa Zhu; Yongzhong Jiang.
EPI_ISL_480030, EPI_ISL_480031, EPI_ISL_480032, EPI_ISL_480033, EPI_ISL_480034, EPI_ISL_480035, EPI_ISL_480036, EPI_ISL_480037, EPI_ISL_480038, EPI_ISL_480039, EPI_ISL_480040, EPI_ISL_480041, EPI_ISL_480073			
see above	Tochigi Prefectural Institute of Public Health and Environmental Science	Pathogen Genomics Center, National Institute of Infectious Diseases	Ako Nakajima; Hajime Kamiya; Kentaro Itokawa; Makoto Kuroda; Masanori Hashino; Motoi Suzuki; Rina Tanaka; Tsuyoshi Sekizuka
EPI_ISL_479886, EPI_ISL_479887, EPI_ISL_479888, EPI_ISL_479889, EPI_ISL_479890, EPI_ISL_479891, EPI_ISL_479892, EPI_ISL_479893, EPI_ISL_479894, EPI_ISL_479895, EPI_ISL_479959, EPI_ISL_479960, EPI_ISL_479961, EPI_ISL_479962, EPI_ISL_479963, EPI_ISL_479964, EPI_ISL_479965, EPI_ISL_684136, EPI_ISL_684154, EPI_ISL_684155, EPI_ISL_684506, EPI_ISL_684507, EPI_ISL_684508, EPI_ISL_684509, EPI_ISL_684510, EPI_ISL_684511, EPI_ISL_684512, EPI_ISL_684513, EPI_ISL_684514, EPI_ISL_684517, EPI_ISL_684519, EPI_ISL_684520, EPI_ISL_684521, EPI_ISL_684522, EPI_ISL_684556, EPI_ISL_684615, EPI_ISL_684616, EPI_ISL_684617, EPI_ISL_684619, EPI_ISL_684620, EPI_ISL_684622, EPI_ISL_684623, EPI_ISL_684624, EPI_ISL_684625, EPI_ISL_684626, EPI_ISL_684627, EPI_ISL_684628, EPI_ISL_684629, EPI_ISL_684630, EPI_ISL_684631, EPI_ISL_685220, EPI_ISL_685606			
see above	Tokyo Metropolitan Institute of Public Health	Pathogen Genomics Center, National Institute of Infectious Diseases	Hajime Kamiya; Kenji Sadamasu; Kentaro Itokawa; Makoto Kuroda; Mami Nagashima; Masanori Hashino; Motoi Suzuki; Rina Tanaka; Takashi Chiba; Tsuyoshi Sekizuka
EPI_ISL_463970, EPI_ISL_463971, EPI_ISL_463975, EPI_ISL_463976, EPI_ISL_463977, EPI_ISL_463979, EPI_ISL_463980, EPI_ISL_463981, EPI_ISL_463982, EPI_ISL_463984, EPI_ISL_463988, EPI_ISL_463989, EPI_ISL_463991, EPI_ISL_463993, EPI_ISL_463994, EPI_ISL_586268, EPI_ISL_586293, EPI_ISL_586295, EPI_ISL_586297, EPI_ISL_586299, EPI_ISL_586300, EPI_ISL_586301, EPI_ISL_586336, EPI_ISL_586364, EPI_ISL_586376, EPI_ISL_586378, EPI_ISL_586380, EPI_ISL_586387, EPI_ISL_586390, EPI_ISL_586391, EPI_ISL_586393, EPI_ISL_586396, EPI_ISL_586398, EPI_ISL_586405, EPI_ISL_586411, EPI_ISL_586505, EPI_ISL_591122, EPI_ISL_591137, EPI_ISL_591182, EPI_ISL_755796, EPI_ISL_755816, EPI_ISL_755821, EPI_ISL_755822, EPI_ISL_755823, EPI_ISL_755827, EPI_ISL_755828, EPI_ISL_755831, EPI_ISL_755832, EPI_ISL_755839, EPI_ISL_755840, EPI_ISL_755841, EPI_ISL_755842, EPI_ISL_755843, EPI_ISL_755863, EPI_ISL_755867, EPI_ISL_755868, EPI_ISL_755871, EPI_ISL_755873, EPI_ISL_755874, EPI_ISL_755876, EPI_ISL_755880, EPI_ISL_792091, EPI_ISL_933603, EPI_ISL_933604, EPI_ISL_933605, EPI_ISL_933606, EPI_ISL_933607, EPI_ISL_933608, EPI_ISL_933609, EPI_ISL_933610, EPI_ISL_933611, EPI_ISL_933612, EPI_ISL_933613, EPI_ISL_933614, EPI_ISL_933615, EPI_ISL_933616, EPI_ISL_933617, EPI_ISL_933618			
see above	Toronto Invasive Bacterial Diseases Network	McMaster University	Ahmed Draia; Allison McGeer; Andrew G. McArthur; Angel Li; Emily Panousis; Hooman Derakhshani; Jalees Nasir; Kuganya Nirmalarajah; Michael Surette; Patryk Aftanas; Samira Mubareka
EPI_ISL_480198, EPI_ISL_480199, EPI_ISL_480200, EPI_ISL_480201	Toyama Institute of Health	Pathogen Genomics Center, National Institute of Infectious Diseases	Hajime Kamiya; Kazunori Oishi; Kentaro Itokawa; Makoto Kuroda; Masae Itamochi; Masanori Hashino; Motoi Suzuki; Rina Tanaka; Tsuyoshi Sekizuka
EPI_ISL_455588	Trang Hospital	National Institute of Health. Department of medical Sciences, Ministry of Public Health, Thailand	Chittaganpitch; Malinee; Okada; Parnmen; Phuygun; Pilailuk; Siripaporn; Sittiporn; Sunthareeya; Thanadachakul; Thanutsapa; Waicharoen; Warawan; Wongboot
EPI_ISL_434653, EPI_ISL_434656	Trollbackens VC	The Public Health Agency of Sweden	Amelie Holmqvist; Anna Risberg; Anna-Malin Linde; Karin Tegmark-Wisell; Maria Lind Karlberg; Mia Brytting; Olov Svartstrom; Oskar Karlsson Lindsjo; Theresa Enkirch
EPI_ISL_444610	U.S. Naval Medical Research Center Biological Defense Research Directorate	U.S. Naval Medical Research Center Biological Defense Research Directorate	A.C.; Balansy-Ames; C.A.; Cer; Christy; E.M.; Hollis; K.A.; L.J.; Long; M.S.; Myers; N.C. and Bishop-Lilly; Pan; Paskey; Pena-Gomez, D.; R.W.; R.Z.; Voegtly
EPI_ISL_523963	UBS Vila Silvia	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes
EPI_ISL_445094, EPI_ISL_445096, EPI_ISL_445097, EPI_ISL_445098, EPI_ISL_445101, EPI_ISL_445102, EPI_ISL_445105, EPI_ISL_445107, EPI_ISL_445108, EPI_ISL_445109, EPI_ISL_445110, EPI_ISL_445111, EPI_ISL_445113, EPI_ISL_445114, EPI_ISL_445115, EPI_ISL_445116, EPI_ISL_445117, EPI_ISL_483167, EPI_ISL_483171, EPI_ISL_483172, EPI_ISL_483179, EPI_ISL_483189, EPI_ISL_483190, EPI_ISL_483194, EPI_ISL_483201, EPI_ISL_483300, EPI_ISL_483301, EPI_ISL_483302, EPI_ISL_483303, EPI_ISL_483304, EPI_ISL_483305, EPI_ISL_483307, EPI_ISL_483308, EPI_ISL_483309, EPI_ISL_483310, EPI_ISL_483311, EPI_ISL_483312, EPI_ISL_483313, EPI_ISL_483315, EPI_ISL_483316, EPI_ISL_483317, EPI_ISL_483318, EPI_ISL_483319, EPI_ISL_483320, EPI_ISL_483321, EPI_ISL_483322, EPI_ISL_483323, EPI_ISL_483368, EPI_ISL_483370, EPI_ISL_483371, EPI_ISL_483372, EPI_ISL_483373, EPI_ISL_483374, EPI_ISL_483375, EPI_ISL_483376, EPI_ISL_483377, EPI_ISL_483378, EPI_ISL_483383, EPI_ISL_483386, EPI_ISL_483388, EPI_ISL_483392, EPI_ISL_483425, EPI_ISL_483426, EPI_ISL_483427, EPI_ISL_483428, EPI_ISL_483429, EPI_ISL_483430, EPI_ISL_483431, EPI_ISL_483432, EPI_ISL_483434, EPI_ISL_483435, EPI_ISL_483436, EPI_ISL_483439, EPI_ISL_483441, EPI_ISL_483445, EPI_ISL_483446, EPI_ISL_483447			
see above	UC San Diego Center for Advanced Laboratory Medicine	Andersen lab at Scripps Research	Ji H Shin; SEARCH Alliance San Diego with David Pride
EPI_ISL_414487, EPI_ISL_414586, EPI_ISL_414587, EPI_ISL_418516, EPI_ISL_418548, EPI_ISL_418580, EPI_ISL_418581, EPI_ISL_418582, EPI_ISL_418583, EPI_ISL_418584			
see above	UCD National Virus Reference Laboratory	UCD National Virus Reference Laboratory	Alison Murphy; Brendan Loftus; Cillian F De Gascun; Gabriel Gonzalez; Jeff Connell; Jonathan Dean; Ken Wolfe; Kevin Byrne; Michael Carr; Suzie Coughlan
EPI_ISL_537492, EPI_ISL_537493, EPI_ISL_537494, EPI_ISL_537495, EPI_ISL_537496, EPI_ISL_537497, EPI_ISL_537507, EPI_ISL_537512, EPI_ISL_537558, EPI_ISL_537568, EPI_ISL_537569, EPI_ISL_537571, EPI_ISL_537573, EPI_ISL_537577, EPI_ISL_537578, EPI_ISL_537582, EPI_ISL_537583, EPI_ISL_537584, EPI_ISL_537586, EPI_ISL_537587, EPI_ISL_537590, EPI_ISL_537591, EPI_ISL_537595, EPI_ISL_537596, EPI_ISL_537597, EPI_ISL_537598, EPI_ISL_537599, EPI_ISL_537602, EPI_ISL_537603, EPI_ISL_537604, EPI_ISL_537606, EPI_ISL_537607			
see above	UCLA Pathology Clinical Microbiology Lab	Kruglyak Lab	Guo et al.
EPI_ISL_417931, EPI_ISL_417932, EPI_ISL_417933, EPI_ISL_417935, EPI_ISL_417937, EPI_ISL_417938, EPI_ISL_417939, EPI_ISL_428990, EPI_ISL_428991, EPI_ISL_428994, EPI_ISL_428996, EPI_ISL_428997, EPI_ISL_428998, EPI_ISL_428999, EPI_ISL_429000, EPI_ISL_429001, EPI_ISL_429002, EPI_ISL_429004, EPI_ISL_429005, EPI_ISL_429006, EPI_ISL_429007, EPI_ISL_429008, EPI_ISL_429010, EPI_ISL_429012, EPI_ISL_429013, EPI_ISL_429016, EPI_ISL_429017, EPI_ISL_429019, EPI_ISL_429020, EPI_ISL_429021, EPI_ISL_429022, EPI_ISL_429023, EPI_ISL_429024, EPI_ISL_429025, EPI_ISL_429026, EPI_ISL_429029, EPI_ISL_429030, EPI_ISL_429032, EPI_ISL_429033, EPI_ISL_429034, EPI_ISL_429035, EPI_ISL_429036, EPI_ISL_429037, EPI_ISL_429038, EPI_ISL_429039, EPI_ISL_429040, EPI_ISL_429041, EPI_ISL_429042, EPI_ISL_429045, EPI_ISL_429048, EPI_ISL_429049, EPI_ISL_429050, EPI_ISL_429052, EPI_ISL_429055, EPI_ISL_429056, EPI_ISL_429057, EPI_ISL_429058, EPI_ISL_430791, EPI_ISL_430792, EPI_ISL_445169, EPI_ISL_445171, EPI_ISL_445172, EPI_ISL_445173, EPI_ISL_445177, EPI_ISL_445179, EPI_ISL_445180			
see above	UCSF Clinical Microbiology Laboratory	Chan-Zuckerberg Biohub	Amy Kistler; Angela Detweiler; Angela Pisco; CZB Cliahub Consortium; Chaz Langelier; Chunyu Zhao; David Dynerman; G. Renuka Kumar; Gloria Castaneda; Jack Kamm; Josh Batson; Lucy Li; Lusajo Mwakibete; Maira Phelps; Michelle Tan; Norma Neff; Olga Botvinnik; Samantha Hao; Shaun Arevalo; Steve Miller

EPI_ISL_450232, EPI_ISL_450233, EPI_ISL_450235, EPI_ISL_450236, EPI_ISL_450237, EPI_ISL_450238, EPI_ISL_450239, EPI_ISL_450240			
see above	UCSF Clinical Microbiology Laboratory	Chiu Laboratory, University of California, San Francisco	Scot Federman; Wei Gu; Xianding Deng; and Charles Y. Chiu
EPI_ISL_883156, EPI_ISL_883179, EPI_ISL_883180, EPI_ISL_883181, EPI_ISL_883182, EPI_ISL_883183, EPI_ISL_883184, EPI_ISL_883185, EPI_ISL_883186, EPI_ISL_883187, EPI_ISL_883188, EPI_ISL_883189			
see above	UK Tübingen, Medical Microbiology	Hannover Medical School, Institute of Virology	Jasper Götting; Lars Steinbrück
EPI_ISL_1260885, EPI_ISL_1260887, EPI_ISL_1260889, EPI_ISL_1260890, EPI_ISL_1260891, EPI_ISL_1260892, EPI_ISL_1260893			
see above	ULSS 2 Treviso	Istituto Zooprofilattico Sperimentale delle Venezie	Adelaide Milani; Alessia Schivo; Alice Fusaro; Ambra Pastori; Annalisa Salviato; Antonia Ricci; Calogero Terregino; Edoardo Giussani; Erika Giorgia Quaranta; Isabella Monne; Luca Tassoni
EPI_ISL_636467, EPI_ISL_636468, EPI_ISL_636469, EPI_ISL_636470, EPI_ISL_636474, EPI_ISL_636475	ULSS6 Distretto Padova Terme Colli	Istituto Zooprofilattico Sperimentale delle Venezie	Adelaide Milani; Alessia Schivo; Alice Fusaro; Ambra Pastori; Annalisa Salviato; Antonia Ricci; Bianca Zecchin; Calogero Terregino; Erika Giorgia Quaranta; Isabella Monne
EPI_ISL_636464, EPI_ISL_636471, EPI_ISL_636472	ULSS6 Piove di Sacco	Istituto Zooprofilattico Sperimentale delle Venezie	Adelaide Milani; Alessia Schivo; Alice Fusaro; Ambra Pastori; Annalisa Salviato; Antonia Ricci; Bianca Zecchin; Calogero Terregino; Erika Giorgia Quaranta; Isabella Monne
EPI_ISL_422437, EPI_ISL_422438, EPI_ISL_452181, EPI_ISL_452182, EPI_ISL_452183, EPI_ISL_452184, EPI_ISL_452185, EPI_ISL_452186, EPI_ISL_452187, EPI_ISL_452188			
see above	ULSS9 Distretto di Bussolengo	Istituto Zooprofilattico Sperimentale delle Venezie	Adelaide Milani; Alessia Schivo; Alice Fusaro; Ambra Pastori; Annalisa Salviato; Antonia Ricci; Bianca Zecchin; Calogero Terregino; Erika Giorgia Quaranta; Isabella Monne
EPI_ISL_445317, EPI_ISL_445322	UNIV.DE CHILE HOSP.CLINICO	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
EPI_ISL_445247	UNIVERSIDAD DE LOS ANDES	Instituto de Salud Publica de Chile	Alejandra Acevedo; Andrés E Castillo; Bárbara Parra; Carolina Tambley; Gabriel Leal; Jaime Lagos; Jorge Fernandez; Loredana Arata; Patricia Bustos; Paz Tapia; Rodrigo Fasce; Winston Andrade
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see above	UOC Microbiologia e Virologia, Azienda Ospedaliera Universitaria Senese, Siena, Italy	Dipartimento di Biotecnologie Mediche	Claudia Gandolfo; David Pinzauti; Francesco Santoro; Gabriele Anichini; Gianni Pozzi; Maria Grazia Cusi
EPI_ISL_515522	UPA 24HS de Itatiba	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes
EPI_ISL_515550	UPA Vila Santa Catarina	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes
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see above	UPMC Clinical Laboratory	Microbial Genome Sequencing Center, Microbial Genomic Epidemiological Laboratory	Chinelo Ezeonwuku; Dan Snyder; Jane W. Marsh; Kady D Waggle; Lee H. Harrison; Marissa P Griffith; Mustapha M Mustapha; Stephanie L Mitchell; Vatsala R Srinivasa; Vaughn S. Cooper
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see above	UPMC Clinical Microbiology Laboratory	Microbial Genome Sequencing Center, Microbial Genomic Epidemiological Laboratory	Chinelo Ezeonwuku; Dan Snyder; Jane W. Marsh; Kady D. Waggle; Lee H. Harrison; Marissa P. Griffith; Mustapha M. Mustapha; Stephanie L. Mitchell; Vatsala R. Srinivasa; Vaughn S. Cooper
EPI_ISL_454354	UPMC Clinical Microbiology Laboratory	Microbial Genome Sequencing Center; Microbial Genomic Epidemiology Laboratory, University of Pittsburgh	Chinelo Ezeonwuku; Dan Snyder; Jane W. Marsh; Kady D. Waggle; Lee H. Harrison; Marissa P. Griffith; Mustapha M. Mustapha; Stephanie L. Mitchell; Vatsala R. Srinivasa; Vaughn S. Cooper
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see above	UPMC Clinical Microbiology Laboratory	Microbial Genomic Epidemiology Laboratory, University of Pittsburgh	Chinelo Ezeonwuku; Dan Snyder; Jane W. Marsh; Kady D. Waggle; Lee H. Harrison; Marissa P. Griffith; Mustapha M. Mustapha; Stephanie L. Mitchell; Vatsala R. Srinivasa; Vaughn S. Cooper
EPI_ISL_436045	US VI Department of Health	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Anna Uehara; Bettina Bankamp; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Suxiang Tong; Yan Li; Ying Tao; Zachary Weiner
EPI_ISL_424889, EPI_ISL_424890	UT-Unified State Labs: Public Health Utah DOH	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
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see above	UW Virology Lab	UW Virology Lab	Alexander Greninger; Amin Addetia; Hong Xie; Keith Jerome; Keith R Jerome; Lasata Shrestha; Meei-Li Huang; Michelle Lin; Pavitra Roychoudhury; Truong Nguyen; Victoria M Rachleff
EPI_ISL_734503, EPI_ISL_734504, EPI_ISL_734505, EPI_ISL_734506, EPI_ISL_734507, EPI_ISL_734508, EPI_ISL_734509, EPI_ISL_734510, EPI_ISL_734511, EPI_ISL_734512, EPI_ISL_734513, EPI_ISL_734514, EPI_ISL_734515, EPI_ISL_734516, EPI_ISL_734517, EPI_ISL_734518, EPI_ISL_734519, EPI_ISL_734520, EPI_ISL_734521, EPI_ISL_734522, EPI_ISL_734523, EPI_ISL_734524, EPI_ISL_734525, EPI_ISL_734526, EPI_ISL_734527, EPI_ISL_738196, EPI_ISL_738198, EPI_ISL_738199, EPI_ISL_738200, EPI_ISL_738201, EPI_ISL_738202, EPI_ISL_738203, EPI_ISL_738204, EPI_ISL_738205, EPI_ISL_738206, EPI_ISL_738207			
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EPI_ISL_737954, EPI_ISL_737955, EPI_ISL_737956, EPI_ISL_737957, EPI_ISL_737958, EPI_ISL_737959	Uganda Central Public Health Lab and Uganda Virus Research Institute	MRC/UVRI & LSHTM Uganda Research Unit	Dan Lule Bugembe; Matthew Cotten; My V.T. Phan; Pontiano Kaleebu et al.
EPI_ISL_451183, EPI_ISL_451184, EPI_ISL_451186, EPI_ISL_451189, EPI_ISL_451190, EPI_ISL_451192, EPI_ISL_451193, EPI_ISL_451194, EPI_ISL_451195, EPI_ISL_451196			
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EPI_ISL_434646	Ulltuna Vardcentral	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Heidi Lindback; Karin Tegmark-Wisell; Maria Lind Karlberg; Mia Brytting; Olov Svartstrom; Oskar Karlsson Lindsjo; Theresa Enkirch
EPI_ISL_475143	Umea klinisk mikrobiologi	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Karin Tegmark-Wisell; Maria Lind Karlberg; Mattias Haukland; Olov Svartstrom; Oskar Karlsson Lindsjo; Petra Edquist; Reza Advani; Sandra Broddesson; Shamam Muradrasoli
EPI_ISL_792303, EPI_ISL_792304	Unidad de Virologia, Centro de Educación Médica en Investigaciones Clínicas CEMIC	Área de Secuenciación del Laboratorio de Virología del Hospital de Niños Dr. Ricardo Gutierrez on behalf of 'Proyecto Argentino Interinstitucional de genomica de SARS-CoV-2' (PAIS Consortium)	AS; Echavarría; Goya; LE; Lusso; M; MI; MS; Mistchenko; Nabaes Jodar; Natale; S; Valinotto; Viegas, M.
EPI_ISL_590917, EPI_ISL_1013465	Unilabs Laboratory Medicine	Norwegian Institute of Public Health, Department of Virology	Engebretsen Serina Beate Atiya R Ali; Garcia Llorente Ignacio; Hilde Elshaug; Hilde Vollan; Kamilla Heddeland Instefjord; Karoline Bragstad; Kathrine Stene-Johansen; Marie Paulsen Madsen; Olav Hungnes; Rasmus Riis Kopperud
EPI_ISL_429126, EPI_ISL_429127, EPI_ISL_450835	Unilabs Skovde	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Helena Enroth; Karin Tegmark-Wisell; Maria Lind Karlberg; Mia Brytting; Olov Svartstrom; Oskar Karlsson Lindsjo; Shaman Muradrasoli; Theresa Enkirch; Tobias Kollberg
EPI_ISL_412979, EPI_ISL_412980	Union Hospital of Tongji Medical College, Huazhong University of Science and Technology	Hubei Provincial Center for Disease Control and Prevention	Bin Fang; Bo Yang; Bo Yu; Faxian Zhan; Guojun Ye; Jing Li; Junqiang Xu; Kun Cai; Linlin Liu; Xiang Li; Xiao Yu; Xixiang Huo; Yongzhong Jiang.
EPI_ISL_411951	Unit for Laboratory Development and Technology Transfer, Public Health Agency of Sweden	Unit for Laboratory Development and Technology Transfer, Public Health Agency of Sweden	Appelberg, S.; Bengner, M.; Brave, A.; Lind Karlberg, M.; Lindsjo, O.; Monteil, V.; Muradrasoli; Palmerus, M.; S. and Tegmark-Wisell, K.
EPI_ISL_882883	Unit of Infectious Diseases, Azienda Socio Sanitaria Territoriale di Cremona	Laboratory of Infectious Diseases, Department of Biomedical and Clinical Sciences L. Sacco, University of Milan	Alessia Lai; Alice Ferraresi; Annalisa Bergna; Antonio Coluccello; Carla Della Ventura; Chiara Fornabaio; Claudia Balotta; Fabio Sagradi; Gianguglielmo Zehender on behalf of SARS-CoV-2 ITALIAN RESEARCH ENTERPRISE-(SCIRE) Collaborative Group; Massimo Galli; Matteo Giorgi Pierfranceschi; Sophie Testa
EPI_ISL_812311, EPI_ISL_812312, EPI_ISL_812313, EPI_ISL_812315, EPI_ISL_812316, EPI_ISL_812318, EPI_ISL_812320, EPI_ISL_812322, EPI_ISL_812323, EPI_ISL_812330, EPI_ISL_812333, EPI_ISL_812343, EPI_ISL_812344, EPI_ISL_812345			
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EPI_ISL_644710, EPI_ISL_644711, EPI_ISL_644712, EPI_ISL_660733, EPI_ISL_660734, EPI_ISL_660736	Unité des Virus Émergents	CNR Virus des Infections Respiratoires - France SUD	Antoine Nougairède; Antonin Bal; Bruno Lina; Gregory Destras; Gwendolyne Burfin; Hadrien Règue; Laetitia Ninove; Laurence Josset; Léa Luciani; Martine Valette; Quentin Semanas
EPI_ISL_523811	Universidad Iberoamericana, Instituto de Medicina Tropical & Salud Global	International Centre for Genetic Engineering and Biotechnology (ICGEB) and ARGO Open Lab Platform	Alejandro Vallejo Degaudenzi; Danilo Licastro; Eileen Riego; Leandro Tapia; Robert Paulino-Ramirez; Simeone Dal Monego; Sreejith Rajasekharan and Alessandro Marcello.; Victor Virgilio Calderon
EPI_ISL_537288, EPI_ISL_537289	Universidad de León	SeqCOVID-SPAIN consortium/IBV(CSIC)	Ana Carvajal; Antonio J. Molina and SeqCOVID-SPAIN consortium; Héctor Argüello; Juan M. Fregeneda; Tania Fernández-Villa; Vicente Martín
EPI_ISL_437933, EPI_ISL_437934, EPI_ISL_437935, EPI_ISL_437936, EPI_ISL_437937, EPI_ISL_437940, EPI_ISL_437941, EPI_ISL_437942, EPI_ISL_437943, EPI_ISL_437944, EPI_ISL_437945, EPI_ISL_437946, EPI_ISL_437947, EPI_ISL_437948, EPI_ISL_437949, EPI_ISL_437950, EPI_ISL_437951, EPI_ISL_437952, EPI_ISL_437953, EPI_ISL_437954, EPI_ISL_437955, EPI_ISL_437956, EPI_ISL_437957, EPI_ISL_437958, EPI_ISL_437959, EPI_ISL_437960, EPI_ISL_437961, EPI_ISL_437962, EPI_ISL_437963, EPI_ISL_437964, EPI_ISL_437965, EPI_ISL_437966, EPI_ISL_437967, EPI_ISL_437968, EPI_ISL_437969, EPI_ISL_437970, EPI_ISL_437971, EPI_ISL_437972, EPI_ISL_437973, EPI_ISL_583557			

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EPI_ISL_529962, EPI_ISL_759961	Universitas Airlangga Hospital	Institute of Tropical Disease, Universitas Airlangga	Aldise M Nastri; Gatot Soegiarto; Jezzy R Dewantari; Kazufumi Shimizu; Krisnoadi Rahardjo; Laksmi Wulandari; Maria I Lusida; Mitsuhiro Nishimura; Nasronudin; Resti Yudhawati; Retno A Setyoningrum; Rima R Prasetya; Soetjipto; Yasuko Mori; Yohko K Shimizu
EPI_ISL_812966, EPI_ISL_812967	University Clinical Research Center, University of Sciences	University Clinical Research Center, University of Sciences	A.A.; Bane, S.; Dao, S.; Diakite, M.; Diarra, B.; Doumbia, S.; Guindo, I.; Ikhane; Kone, A.
EPI_ISL_507043, EPI_ISL_507048, EPI_ISL_507049, EPI_ISL_507050, EPI_ISL_507052, EPI_ISL_507053, EPI_ISL_507054, EPI_ISL_507055, EPI_ISL_507056, EPI_ISL_507057, EPI_ISL_507058, EPI_ISL_507059, EPI_ISL_507060, EPI_ISL_507062, EPI_ISL_507063, EPI_ISL_507064, EPI_ISL_507065, EPI_ISL_507066, EPI_ISL_507067, EPI_ISL_507068, EPI_ISL_507069, EPI_ISL_507070, EPI_ISL_507071, EPI_ISL_507072, EPI_ISL_507073, EPI_ISL_507074, EPI_ISL_507075, EPI_ISL_507076, EPI_ISL_507077, EPI_ISL_507078, EPI_ISL_507079, EPI_ISL_507080, EPI_ISL_507084, EPI_ISL_507086, EPI_ISL_507087, EPI_ISL_507089, EPI_ISL_507090, EPI_ISL_507091, EPI_ISL_507092, EPI_ISL_507093, EPI_ISL_664742, EPI_ISL_664744, EPI_ISL_665143, EPI_ISL_665144, EPI_ISL_665162, EPI_ISL_665163, EPI_ISL_665164, EPI_ISL_665165, EPI_ISL_665166, EPI_ISL_665167, EPI_ISL_665168, EPI_ISL_665169, EPI_ISL_665170, EPI_ISL_665171, EPI_ISL_665172, EPI_ISL_665173, EPI_ISL_665174, EPI_ISL_665175, EPI_ISL_665176, EPI_ISL_665177, EPI_ISL_665178, EPI_ISL_665179, EPI_ISL_665180, EPI_ISL_665181, EPI_ISL_665188, EPI_ISL_665189, EPI_ISL_665206, EPI_ISL_665207			
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EPI_ISL_440951, EPI_ISL_440952, EPI_ISL_440953, EPI_ISL_440954, EPI_ISL_440956, EPI_ISL_440957, EPI_ISL_440958, EPI_ISL_440971, EPI_ISL_440972, EPI_ISL_440973, EPI_ISL_440975, EPI_ISL_440976, EPI_ISL_440980, EPI_ISL_440981, EPI_ISL_440983, EPI_ISL_440984, EPI_ISL_440985, EPI_ISL_440986, EPI_ISL_440987, EPI_ISL_440988, EPI_ISL_440989, EPI_ISL_440990, EPI_ISL_478411, EPI_ISL_478412, EPI_ISL_478413, EPI_ISL_478414, EPI_ISL_478415, EPI_ISL_478417, EPI_ISL_478418, EPI_ISL_478419, EPI_ISL_478420, EPI_ISL_478421, EPI_ISL_478422			
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EPI_ISL_418277, EPI_ISL_418279, EPI_ISL_418280, EPI_ISL_418282, EPI_ISL_418433, EPI_ISL_418434, EPI_ISL_418438, EPI_ISL_527926, EPI_ISL_527928, EPI_ISL_527929, EPI_ISL_527930, EPI_ISL_527931, EPI_ISL_527932, EPI_ISL_527933, EPI_ISL_527934, EPI_ISL_527941, EPI_ISL_527947, EPI_ISL_527955, EPI_ISL_527956, EPI_ISL_527957, EPI_ISL_527958, EPI_ISL_527963, EPI_ISL_527964, EPI_ISL_527967, EPI_ISL_527968, EPI_ISL_527970, EPI_ISL_527972, EPI_ISL_527973, EPI_ISL_527983, EPI_ISL_527984, EPI_ISL_527986, EPI_ISL_527987, EPI_ISL_527990, EPI_ISL_527991, EPI_ISL_527996, EPI_ISL_528001, EPI_ISL_528002, EPI_ISL_528003, EPI_ISL_528004, EPI_ISL_528006, EPI_ISL_528007, EPI_ISL_528008, EPI_ISL_528011, EPI_ISL_528012, EPI_ISL_528013, EPI_ISL_528015, EPI_ISL_528016, EPI_ISL_528017, EPI_ISL_528021, EPI_ISL_528022, EPI_ISL_528023, EPI_ISL_528025, EPI_ISL_528028, EPI_ISL_528030, EPI_ISL_528032, EPI_ISL_528033, EPI_ISL_528034, EPI_ISL_528039, EPI_ISL_528040, EPI_ISL_528041, EPI_ISL_528042, EPI_ISL_528043, 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EPI_ISL_681721, EPI_ISL_681731, EPI_ISL_681764	University Hospital Limerick	Irish Coronavirus Sequencing Consortium - Teagasc Moorepark	Calum Walsh; Fiona Crispie; John Kenny; Paul Cotter
EPI_ISL_524482, EPI_ISL_524782	University Hospital Zürich	Institute of Medical Virology, University of Zurich	Alexandra Trkola; Andrea Zbinden; Fiona Steiner; Gabriela Ziltener; Jon Huder; Jürg Böni; Maryam Zaheri; Michael Huber; Patrick Redli; Riccarda Capaul; Stefan Schmutz; Verena Kufner
EPI_ISL_454578, EPI_ISL_454581, EPI_ISL_454583, EPI_ISL_454588, EPI_ISL_454592	University Hospital for Infectious Diseases "Dr. Fran Mihaljevi", Research Unit	University of Zagreb, Centre for research and knowledge transfer in biotechnology	Anamarija Slovic; Ivan-Christian Kurolt; Jelena Ivancic Jelecki
EPI_ISL_420152, EPI_ISL_420153	University Hospital of Northern Norway, Department for Microbiology and Infectious Disease Control	Norwegian Institute of Public Health, Department of Virology	Hilde Elshaug; Kamilla Heddeland Instefjord; Karoline Bragstad; Kathrine Stene-Johansen; Olav Hungnes
EPI_ISL_984663	University Hospitals Translational Laboratory (UHTL), University Hospitals	University Hospitals Translational Laboratory (UHTL), University Hospitals	Alouani, D.; Sadri, N.; Song, X.
EPI_ISL_415454, EPI_ISL_415455, EPI_ISL_415456, EPI_ISL_415457, EPI_ISL_415458, EPI_ISL_415459, EPI_ISL_415698, EPI_ISL_415699, EPI_ISL_415700, EPI_ISL_415701, EPI_ISL_415702, EPI_ISL_415703, EPI_ISL_415704, EPI_ISL_415705, EPI_ISL_415706, EPI_ISL_415707, EPI_ISL_415708, EPI_ISL_429196, EPI_ISL_429197, EPI_ISL_429199, EPI_ISL_429200, EPI_ISL_429201, EPI_ISL_429203, EPI_ISL_429208, EPI_ISL_429209, EPI_ISL_429210, EPI_ISL_429211, EPI_ISL_429212, EPI_ISL_429213, EPI_ISL_429214, EPI_ISL_429215			
see above	University Hospitals of Geneva Laboratory of Virology	University Hospitals of Geneva Laboratory of Virology	Laubscher F.
EPI_ISL_738085	University Hospitals of Geneva, Laboratory of Virology	University Hospitals of Geneva, Laboratory of Virology	Cordey Samuel and Laubscher Florian
EPI_ISL_775905, EPI_ISL_775906, EPI_ISL_775910, EPI_ISL_775911, EPI_ISL_775912, EPI_ISL_775913, EPI_ISL_775914, EPI_ISL_775915, EPI_ISL_775916, EPI_ISL_775917, EPI_ISL_775918, EPI_ISL_775919, EPI_ISL_775920, EPI_ISL_775927, EPI_ISL_775928, EPI_ISL_775929, EPI_ISL_775930, EPI_ISL_775931, EPI_ISL_775932, EPI_ISL_775933, EPI_ISL_775934, EPI_ISL_775935, EPI_ISL_775936, EPI_ISL_775937, EPI_ISL_775938, EPI_ISL_775940, EPI_ISL_775941, EPI_ISL_775942, EPI_ISL_775943, EPI_ISL_775944, EPI_ISL_775945, EPI_ISL_775946, EPI_ISL_775947, EPI_ISL_775948, EPI_ISL_775949, EPI_ISL_775950, EPI_ISL_775951, EPI_ISL_775952, EPI_ISL_775953, EPI_ISL_775954, EPI_ISL_775955, EPI_ISL_775956, EPI_ISL_775957, EPI_ISL_775958, EPI_ISL_775959, EPI_ISL_775960, EPI_ISL_775961, EPI_ISL_775962, EPI_ISL_775963, EPI_ISL_775964, EPI_ISL_775965, EPI_ISL_775966, EPI_ISL_775967, EPI_ISL_775968, EPI_ISL_775969, EPI_ISL_775970, EPI_ISL_775971, EPI_ISL_775972, EPI_ISL_775973, EPI_ISL_775974, EPI_ISL_775975, EPI_ISL_775976, 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see above	University Medical Center Hamburg Eppendorf	Heinrich Pette Institute, Leibniz Institute for Experimental Virology	Adam Grundhoff; Alexis Robitaille; Johannes Knobloch; Martin Aepfelbacher; Nicole Fischer; Thomas Günther
EPI_ISL_767043, EPI_ISL_940753	University of Bari Biomedical Sciences and Human Oncology	University of Bari Biomedical Sciences and Human Oncology	Accogli M.; Anna Sallustio; Chironna M.; Daniela Loconsole; Loconsole D.; Maria Chironna; Marisa Accogli; Sallustio A.
EPI_ISL_444299, EPI_ISL_444300, EPI_ISL_529218, EPI_ISL_529219, EPI_ISL_529220, EPI_ISL_529221, EPI_ISL_529222, EPI_ISL_529223, EPI_ISL_529597, EPI_ISL_529598, EPI_ISL_529599, EPI_ISL_529600, EPI_ISL_529601, EPI_ISL_529602, EPI_ISL_529603, EPI_ISL_529604, EPI_ISL_529605, EPI_ISL_529606, EPI_ISL_529607, EPI_ISL_529608, EPI_ISL_529609, EPI_ISL_529610, EPI_ISL_529611, EPI_ISL_529612, EPI_ISL_529613, EPI_ISL_529614, EPI_ISL_529615, EPI_ISL_529616, EPI_ISL_529617			
see above	University of Birmingham	COVID-19 Genomics UK (COG-UK) Consortium	Alex Richter; Andrew Bosworth; Andrew Bosworth. Queen Elizabeth Hospital: Anna Casey; Andrew D Beggs // PHE Heartlands Lab: Husam Osman; Andrew D Beggs PHE Heartlands Lab: Husam Osman; Charlotte Poxon; Institute of Microbiology; Joanne Stockton; Josh Quick; Kasun Wanigasooriya; Loman Lab: Claire McMurray; Mike Kidd; Nicholas Loman // UHB Lab: Celina M Whalley; Nicholas Loman. University of Birmingham Testing Laboratory: Celina M Whalley; Oliver Pickles; Radoslaw Poplawski; Samuel Nicholls; University of Birmingham: Claire McMurray; Will Rowe
EPI_ISL_447887, EPI_ISL_447888	University of California, Davis	Chan-Zuckerberg Biohub	CZB Cliahub Consortium
EPI_ISL_476069	University of Debrecen, Department of Medical Microbiology	National Laboratory of Virology, Szentágothai Research Centre	Balázs Somogyi; Brigitta Zana; Endre Gábor Tóth; Eszter Csoma; Ferenc Jakab; Gábor Kemenesi
EPI_ISL_457052, EPI_ISL_457089, EPI_ISL_457099, EPI_ISL_457101, EPI_ISL_457124, EPI_ISL_457126, EPI_ISL_457127, EPI_ISL_457128, EPI_ISL_457132, EPI_ISL_457139, EPI_ISL_457140, EPI_ISL_457144, EPI_ISL_457146, EPI_ISL_457147, EPI_ISL_457150, EPI_ISL_457151, EPI_ISL_457154, EPI_ISL_457156, EPI_ISL_457157, EPI_ISL_457162, EPI_ISL_457163, EPI_ISL_457167, EPI_ISL_457168, EPI_ISL_457170, EPI_ISL_457171, EPI_ISL_457176, EPI_ISL_457177, EPI_ISL_457182, EPI_ISL_457185, EPI_ISL_471959, EPI_ISL_471963, EPI_ISL_471964, EPI_ISL_471966, EPI_ISL_471967, EPI_ISL_471971, EPI_ISL_471972, EPI_ISL_471973, EPI_ISL_471975, EPI_ISL_471976			
see above	University of Exeter	COVID-19 Genomics UK (COG-UK) Consortium	Aaron Jeffries; Audrey Farbos; Ben Temperton; Jane Masoli; Joanna Warwick-Dugdale; Michelle Michelsen; Robyn Manley; Stephen Michell
EPI_ISL_447589	University of Florida, Lednicky Lab	University of Florida, Lednicky Lab	Alam; C.J.; Elbadry; Gibson; J.A.; J.C.; J.G. Jr. and Lednicky; M.A.; M.M.; Morris; Stephenson; Subramaniam, K.; T.B.; Waltzek
EPI_ISL_484709, EPI_ISL_484710, EPI_ISL_484711, EPI_ISL_484712, EPI_ISL_484713, EPI_ISL_484714, EPI_ISL_484715, EPI_ISL_484718, EPI_ISL_484719, EPI_ISL_484720, EPI_ISL_484721, EPI_ISL_484723, EPI_ISL_484724, EPI_ISL_484726, EPI_ISL_484731, EPI_ISL_484732, EPI_ISL_484733, EPI_ISL_484745, EPI_ISL_484753, EPI_ISL_484754, EPI_ISL_484758, EPI_ISL_484759, EPI_ISL_484760, EPI_ISL_484761, EPI_ISL_484762, EPI_ISL_484763, EPI_ISL_484768, EPI_ISL_484770, EPI_ISL_484776, EPI_ISL_484779, EPI_ISL_484785, EPI_ISL_484794, EPI_ISL_495594, EPI_ISL_495595, EPI_ISL_495596, EPI_ISL_578090, EPI_ISL_578093, EPI_ISL_578094, EPI_ISL_578095, EPI_ISL_578096, EPI_ISL_578097, EPI_ISL_578098, EPI_ISL_578099, EPI_ISL_578100, EPI_ISL_578101, EPI_ISL_578102, EPI_ISL_578103, EPI_ISL_578104, EPI_ISL_578105, EPI_ISL_578106, EPI_ISL_578107, EPI_ISL_578108, EPI_ISL_578109, EPI_ISL_578110, EPI_ISL_578111, EPI_ISL_578112, EPI_ISL_578113, EPI_ISL_578114, EPI_ISL_578115, EPI_ISL_578116, EPI_ISL_578117, EPI_ISL_578118, EPI_ISL_578119, EPI_ISL_578120, EPI_ISL_578121, EPI_ISL_578122, EPI_ISL_578123, EPI_ISL_578124, EPI_ISL_578125, EPI_ISL_578126, EPI_ISL_578127, EPI_ISL_578128, EPI_ISL_578129, EPI_ISL_578130, EPI_ISL_578131, EPI_ISL_578174, EPI_ISL_590747, EPI_ISL_590748			
see above	University of Michigan Clinical Microbiology Laboratory	Lauring Lab, University of Michigan, Department of Microbiology and Immunology	Valesano; Valesano et al.
EPI_ISL_476078, EPI_ISL_477615, EPI_ISL_477616, EPI_ISL_477617, EPI_ISL_477618, EPI_ISL_477619, EPI_ISL_477620, EPI_ISL_477621, EPI_ISL_477622, EPI_ISL_477623, EPI_ISL_477624, EPI_ISL_477625			
see above	University of Szeged, Institute of Clinical Microbiology	National Laboratory of Virology, Szentágothai Research Centre	Balázs Somogyi; Brigitta Zana; Endre Gábor Tóth; Ferenc Jakab; Gábor Kemenesi; Terhes Gabriella
EPI_ISL_485001, EPI_ISL_485002, EPI_ISL_485392	University of Ulsan College of Medicine and Asan Medical Center	University of Ulsan College of Medicine and Asan Medical Center	Heungsup Sung; Jaewoong Lee; Jina Lee; Jiwon Jung; Jongsik Chun; Kihyun Lee; Kuenyoul Park; Kyu-Hwa Hur; Mauricio Chalita; Mi-Na Kim; Seok-Hwan Yoon; Sung-Han Kim; and Hae Kyung Lee
EPI_ISL_524437, EPI_ISL_524438, EPI_ISL_524439, EPI_ISL_524440, EPI_ISL_524441, EPI_ISL_524442, EPI_ISL_524443			
see above	University of Washington Virology Lab	Laboratory Medicine, University of Washington	Greninger, A.; Jerome, K.; Roychoudhury, P.
EPI_ISL_500500, EPI_ISL_500501, EPI_ISL_513632, EPI_ISL_513637, EPI_ISL_515270, EPI_ISL_515271, EPI_ISL_515272, EPI_ISL_515273, EPI_ISL_515274, EPI_ISL_515276, EPI_ISL_515277, EPI_ISL_515278, EPI_ISL_515279, EPI_ISL_515280, EPI_ISL_515281, EPI_ISL_515282, EPI_ISL_515283, EPI_ISL_515284, EPI_ISL_515285			
see above	University of Washington Virology Lab	University of Washington Virology Lab	Alexander Greninger; Amin Addetia; Hong Xie; Keith R Jerome; Lasata Shrestha; Meei-Li Huang; Pavitra Roychoudhury; Truong Nguyen; Victoria M Rachleff
EPI_ISL_529155, EPI_ISL_529156, EPI_ISL_529157, EPI_ISL_529159, EPI_ISL_529160, EPI_ISL_529161, EPI_ISL_529170, EPI_ISL_529200			
see above	University of Washington, Laboratory Medicine	University of Washington, Laboratory Medicine	Greninger, A.; Jerome, K.; Roychoudhury, P.
EPI_ISL_418809	University of Wisconsin - Madison: Influenza Research Institute	University of Wisconsin Madison, AIDS Vaccine Research Laboratories	Gage Moreno; Katarina Braun; Peter Halfmann; et al.
EPI_ISL_416489, EPI_ISL_416491, EPI_ISL_416492, EPI_ISL_416523, EPI_ISL_417200, EPI_ISL_417201, EPI_ISL_417202, EPI_ISL_417203, EPI_ISL_417204, EPI_ISL_417504, EPI_ISL_417505, EPI_ISL_417506, EPI_ISL_417507, EPI_ISL_417508, EPI_ISL_417509, EPI_ISL_417510, EPI_ISL_417512, EPI_ISL_417513, EPI_ISL_417514, EPI_ISL_417515, EPI_ISL_417516, EPI_ISL_417517, EPI_ISL_421283, EPI_ISL_421284, EPI_ISL_421285, EPI_ISL_421286, EPI_ISL_421287, EPI_ISL_421288, EPI_ISL_421289, EPI_ISL_421290, EPI_ISL_421291, EPI_ISL_421292, EPI_ISL_421293, EPI_ISL_421294, EPI_ISL_421295, EPI_ISL_421296, EPI_ISL_421297, EPI_ISL_421298, EPI_ISL_421299, EPI_ISL_421300, EPI_ISL_421301, EPI_ISL_421302, EPI_ISL_421303, EPI_ISL_421304, EPI_ISL_421305, EPI_ISL_421306, EPI_ISL_421307, EPI_ISL_421308, EPI_ISL_421309, EPI_ISL_421310, EPI_ISL_421311, EPI_ISL_421312, EPI_ISL_421313, EPI_ISL_421314, EPI_ISL_421315, EPI_ISL_421316, EPI_ISL_421317, EPI_ISL_421318, EPI_ISL_421319, EPI_ISL_421320, EPI_ISL_421321, EPI_ISL_421322, EPI_ISL_421323, EPI_ISL_421324, EPI_ISL_421325, EPI_ISL_421326, EPI_ISL_421327, EPI_ISL_421328, EPI_ISL_421329, EPI_ISL_421330, EPI_ISL_421331, EPI_ISL_421332, EPI_ISL_421333, EPI_ISL_421334, EPI_ISL_421335, EPI_ISL_421336, EPI_ISL_421338, EPI_ISL_421339, EPI_ISL_421340, EPI_ISL_421341, EPI_ISL_421342, EPI_ISL_421343, EPI_ISL_425146, EPI_ISL_425149, EPI_ISL_425151, EPI_ISL_425152, EPI_ISL_425154, EPI_ISL_425155, EPI_ISL_425158, EPI_ISL_425159, EPI_ISL_425162, EPI_ISL_425163, EPI_ISL_425164, EPI_ISL_425165, EPI_ISL_425166, EPI_ISL_425167, EPI_ISL_425168, EPI_ISL_425169, EPI_ISL_425170, EPI_ISL_425171, EPI_ISL_425172, EPI_ISL_425173, EPI_ISL_425174, EPI_ISL_425175, EPI_ISL_428252, EPI_ISL_428253, EPI_ISL_428254, EPI_ISL_428255, EPI_ISL_428256, EPI_ISL_428257, EPI_ISL_428258, EPI_ISL_428259, EPI_ISL_428260, EPI_ISL_428261, EPI_ISL_428262, EPI_ISL_428263, EPI_ISL_428264, EPI_ISL_428265, EPI_ISL_428266, EPI_ISL_428267, EPI_ISL_428268, EPI_ISL_428269, EPI_ISL_428270, EPI_ISL_428271, EPI_ISL_428272, EPI_ISL_428273, EPI_ISL_428274, EPI_ISL_428275, EPI_ISL_428276, EPI_ISL_428277, EPI_ISL_428278, EPI_ISL_428279, EPI_ISL_428280, EPI_ISL_428281, EPI_ISL_428282, EPI_ISL_428283, EPI_ISL_428284, EPI_ISL_428285, EPI_ISL_428286, EPI_ISL_428287, EPI_ISL_428288, EPI_ISL_428289, EPI_ISL_428290, EPI_ISL_428291, EPI_ISL_428292, EPI_ISL_428293, EPI_ISL_428294, EPI_ISL_428295, EPI_ISL_428296, EPI_ISL_428297, EPI_ISL_428298, EPI_ISL_428299, EPI_ISL_428300, EPI_ISL_428301, EPI_ISL_428302, EPI_ISL_428303, EPI_ISL_428304, EPI_ISL_428305, EPI_ISL_428306, EPI_ISL_428307, EPI_ISL_428308, EPI_ISL_428309, EPI_ISL_428310, EPI_ISL_428311, EPI_ISL_428312, EPI_ISL_428313, EPI_ISL_428314, EPI_ISL_428315, EPI_ISL_428316, EPI_ISL_428317, EPI_ISL_428318, EPI_ISL_428319, EPI_ISL_428320, EPI_ISL_428321, EPI_ISL_428322, EPI_ISL_428323, EPI_ISL_428324, EPI_ISL_428325, EPI_ISL_428326, EPI_ISL_428327, EPI_ISL_428328, EPI_ISL_428329, EPI_ISL_428330, EPI_ISL_428331, EPI_ISL_428332, EPI_ISL_428333, EPI_ISL_428334, EPI_ISL_428335, EPI_ISL_428336, EPI_ISL_428337, EPI_ISL_428338, EPI_ISL_428339, EPI_ISL_428340, EPI_ISL_428341, EPI_ISL_428342, EPI_ISL_428343, EPI_ISL_428344, EPI_ISL_428345, EPI_ISL_428724, EPI_ISL_428725, EPI_ISL_428726, EPI_ISL_428727, EPI_ISL_434607, EPI_ISL_436564, EPI_ISL_436566, EPI_ISL_436567, EPI_ISL_436568, EPI_ISL_436627, EPI_ISL_436628, EPI_ISL_436629, EPI_ISL_436630, EPI_ISL_436631, EPI_ISL_436632, EPI_ISL_450700, EPI_ISL_480378, EPI_ISL_480379, EPI_ISL_480380, EPI_ISL_480381, EPI_ISL_480382, EPI_ISL_480383, EPI_ISL_480384, EPI_ISL_480385, EPI_ISL_480386, EPI_ISL_480387, EPI_ISL_480388, EPI_ISL_480389, EPI_ISL_480390, EPI_ISL_480391, EPI_ISL_480392			
see above	University of Wisconsin-Madison AIDS Vaccine Research Laboratories	University of Wisconsin-Madison AIDS Vaccine Research Laboratories	Gage Moreno; Katarina Braun; et al. AIDS Vaccine Research Laboratories
EPI_ISL_977294, EPI_ISL_977356, EPI_ISL_977358, EPI_ISL_977364, EPI_ISL_977366, EPI_ISL_977367, EPI_ISL_977376, EPI_ISL_977411, EPI_ISL_977422, EPI_ISL_977459, EPI_ISL_977467, EPI_ISL_977470			
see above	University of Zambia, School of Veterinary Medicine	UNZAVET and PATH	Daniel Bridges; Mulenga Mwenda-Chimfwembe; Ngonda Saasa
EPI_ISL_856695	University of Zambia, School of Veterinary Medicine, Disease Control	University of Zambia, School of Veterinary Medicine, Disease Control	A.L.; A.N.; Bates, M.; C. and Zumla, A.; Chambaro, H.; Chanda, D.; Changula, K.; Chilufya; Chipimo; Chitanga, S.; Fwoloshi, S.; K.S.; Kapata; Kapata, N.; Kapaya, F.; Kapin'a, M.; Kayeyi, N.; Liwewe; M.M.; Malama, K.; Masahiro, K.; Monze, M.; Morales; Mubemba, B.; Mukonka, V.; Mulenga, L.; Muleya, W.; Mupeta, F.; Musonda, K.; Nalubamba; Ngosa, W.; P.C.; P.J.; Saasa, N.; Sawa, H.; Shibemba; Simulundu, E.; Sinyange, N.; Takada, A.; Tembo, J.; Zulu, P.
EPI_ISL_434643, EPI_ISL_434655	Uppsala Narakut Aleris	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Annika Nilsson; Karin Tegmark-Wisell; Maria Lind Karlberg; Mia Brytting; Olov Svartstrom; Oskar Karlsson Lindsjo; Theresa Enkirch
EPI_ISL_469076, EPI_ISL_648131, EPI_ISL_654953, EPI_ISL_710579,	Uppsala klinisk mikrobiologi	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Department of Microbiology; Karin Tegmark-Wisell; Maria Lind Karlberg; Mattias Haukland; Mia Brytting; Olov Svartstrom; Oskar Karlsson Lindsjo; Petra Edquist; Reza Advani; Sandra Broddesson; Shamam Muradrasoli; The Public Health Agency of Sweden

EPI_ISL_831975			
EPI_ISL_415543, EPI_ISL_415544, EPI_ISL_417026, EPI_ISL_417027, EPI_ISL_417028, EPI_ISL_417958, EPI_ISL_417960, EPI_ISL_417964, EPI_ISL_417966, EPI_ISL_417970, EPI_ISL_417971, EPI_ISL_417973, EPI_ISL_417974, EPI_ISL_417976, EPI_ISL_417977, EPI_ISL_418962, EPI_ISL_418963, EPI_ISL_418964, EPI_ISL_418965, EPI_ISL_418967, EPI_ISL_420803, EPI_ISL_420809, EPI_ISL_420810, EPI_ISL_420812, EPI_ISL_420814, EPI_ISL_420820, EPI_ISL_420821, EPI_ISL_420822, EPI_ISL_420824, EPI_ISL_420825, EPI_ISL_421560, EPI_ISL_421561, EPI_ISL_421562, EPI_ISL_421563, EPI_ISL_430019, EPI_ISL_430021, EPI_ISL_430022, EPI_ISL_430024, EPI_ISL_430025, EPI_ISL_430026, EPI_ISL_430028, EPI_ISL_430031, EPI_ISL_430032, EPI_ISL_430033, EPI_ISL_430035, EPI_ISL_430037, EPI_ISL_430038, EPI_ISL_430039, EPI_ISL_430041, EPI_ISL_430042, EPI_ISL_430043, EPI_ISL_430044, EPI_ISL_430045, EPI_ISL_430050, EPI_ISL_435350, EPI_ISL_435353, EPI_ISL_435356, EPI_ISL_449801, EPI_ISL_449802, EPI_ISL_449804, EPI_ISL_449805, EPI_ISL_449806, EPI_ISL_449809, EPI_ISL_449810, EPI_ISL_450538, EPI_ISL_450539, EPI_ISL_450541, EPI_ISL_450542, EPI_ISL_450543, EPI_ISL_575035, EPI_ISL_575036, EPI_ISL_575040, EPI_ISL_575045, EPI_ISL_575106, EPI_ISL_672550, EPI_ISL_672551, EPI_ISL_672552, EPI_ISL_672556, EPI_ISL_672557			
see above	Utah Public Health Laboratory	Utah Public Health Laboratory	Erin Young; Kelly Oakeson
EPI_ISL_603050, EPI_ISL_603051, EPI_ISL_603052	Utah Public Health Laboratory, Utah Public Health Laboratory Infectious Disease submission group	Utah Public Health Laboratory, Utah Public Health Laboratory Infectious Disease submission group	E.L.; Oakeson, K.; Young
EPI_ISL_631831, EPI_ISL_632099	VA NY Harbor Healthcare System	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_424891, EPI_ISL_424892, EPI_ISL_424893, EPI_ISL_424894, EPI_ISL_424907	VA-Division of Consolidated Laboratory Services	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_452119, EPI_ISL_452121, EPI_ISL_452122, EPI_ISL_452123, EPI_ISL_464167	VI-US Virgin Islands Department of Health	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Montmayeur; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jasmine Padilla; Jing Zhang; Justin Lee; Krista Queen; Mary S. Keckler; Rachel Marine; Suxiang Tong; Yan Li; Ying Tao; Zachary Weiner
EPI_ISL_447846	VT Dept. of Health Laboratory	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Alison S. Laufer Halpin; Anna Uehara; Christopher A. Elkins; Clinton R. Paden; Haibin Wang; Jasmine Padilla; Jing Zhang; Justin Lee; Krista Queen; Mary S. Keckler; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_424366	Vaccine Research, Development and Application Center, Ercives University	Gen Era Diagnostics Inc.	Alper Iseri; Aykut Ozdarendeli; Can Holyavkin; Gunsu Aydin; Hazel Yetiskin; Muhammet Ali Uygut; Shaikh Terkis Islam Pavel; Zehra B Dursun; Ihami Celik
EPI_ISL_413486	Valley Medical Center	University of Washington Virology Lab	Alexander Greninger; Arun Nalla; Hong Xie; Keith Jerome; Pavitra Roychoudhury
EPI_ISL_468495, EPI_ISL_468496, EPI_ISL_468497, EPI_ISL_548346, EPI_ISL_548348, EPI_ISL_548349, EPI_ISL_548353, EPI_ISL_548354, EPI_ISL_548355, EPI_ISL_548356, EPI_ISL_548358, EPI_ISL_548362, EPI_ISL_548367, EPI_ISL_548368			
see above	Ventura County Public Health Lab	Chan-Zuckerberg Biohub	CZB Cliahub Consortium
EPI_ISL_420137	Vestfold Hospital, Tonsberg Department of Microbiology	Norwegian Institute of Public Health, Department of Virology	Hilde Elshaug; Kamilla Heddeland Instefjord; Karoline Bragstad; Kathrine Stene-Johansen; Olav Hungnes
EPI_ISL_434647, EPI_ISL_434648, EPI_ISL_445223, EPI_ISL_450807, EPI_ISL_452233	Victoria Vard och Halsa	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Karin Tegmark-Wisell; Maria Lind Karlberg; Mia Brytting; Olov Svartstrom; Oskar Karlsson Lindsjo; Sarah Henriksson; Theresa Enkirch
EPI_ISL_426637, EPI_ISL_426638, EPI_ISL_426639, EPI_ISL_426640, EPI_ISL_426641, EPI_ISL_426642, EPI_ISL_426643, EPI_ISL_426644, EPI_ISL_426645, EPI_ISL_426646, EPI_ISL_426647, EPI_ISL_426648, EPI_ISL_426649, EPI_ISL_426650, EPI_ISL_426651, EPI_ISL_426652, EPI_ISL_426653, EPI_ISL_426654, EPI_ISL_426655, EPI_ISL_426656, EPI_ISL_426657, EPI_ISL_426658, EPI_ISL_426659, EPI_ISL_426661, EPI_ISL_426662, EPI_ISL_426663, EPI_ISL_426664, EPI_ISL_426665, EPI_ISL_426666, EPI_ISL_426667, EPI_ISL_426669, EPI_ISL_426670, EPI_ISL_426671, EPI_ISL_426672, EPI_ISL_426673, EPI_ISL_426674, EPI_ISL_426675, EPI_ISL_426676, EPI_ISL_426677, EPI_ISL_426679, EPI_ISL_426680, EPI_ISL_426682, EPI_ISL_426683, EPI_ISL_426684, EPI_ISL_426685, EPI_ISL_426686, EPI_ISL_426687, EPI_ISL_426688, EPI_ISL_426689, EPI_ISL_426690, EPI_ISL_426691, EPI_ISL_426692, EPI_ISL_426693, EPI_ISL_426694, EPI_ISL_426696, EPI_ISL_426697, EPI_ISL_426698, EPI_ISL_426699, EPI_ISL_426700, EPI_ISL_426701, EPI_ISL_426702, EPI_ISL_426703, EPI_ISL_426705, EPI_ISL_426706, EPI_ISL_426707, EPI_ISL_426709, EPI_ISL_426711, EPI_ISL_426714, EPI_ISL_426715, EPI_ISL_426717, EPI_ISL_426718, EPI_ISL_426721, EPI_ISL_426725, EPI_ISL_426727, EPI_ISL_426729, EPI_ISL_426730, EPI_ISL_426732, EPI_ISL_426733, EPI_ISL_426734, EPI_ISL_426735, EPI_ISL_426736, EPI_ISL_426737, EPI_ISL_426740, EPI_ISL_426741, EPI_ISL_426743, EPI_ISL_426745, EPI_ISL_426746, EPI_ISL_426747, EPI_ISL_426750, EPI_ISL_426751, EPI_ISL_426752, EPI_ISL_426753, EPI_ISL_426754, EPI_ISL_426756, EPI_ISL_426761, EPI_ISL_426763, EPI_ISL_426765, EPI_ISL_426766, EPI_ISL_426767, EPI_ISL_426768, EPI_ISL_426769, EPI_ISL_426770, EPI_ISL_426771, EPI_ISL_426772, EPI_ISL_426773, EPI_ISL_426774, EPI_ISL_426775, EPI_ISL_426777, EPI_ISL_426778, EPI_ISL_426779, EPI_ISL_426781, EPI_ISL_426782, EPI_ISL_426783, EPI_ISL_426784, EPI_ISL_426786, EPI_ISL_426788, EPI_ISL_426789, EPI_ISL_426790, EPI_ISL_426792, EPI_ISL_426793, EPI_ISL_426796, EPI_ISL_426797, EPI_ISL_426798, EPI_ISL_426799, EPI_ISL_426800, EPI_ISL_426801, EPI_ISL_426802, EPI_ISL_426803, EPI_ISL_426804, EPI_ISL_426805, EPI_ISL_426806, EPI_ISL_426807, EPI_ISL_426809, EPI_ISL_426810, EPI_ISL_426811, EPI_ISL_426812, EPI_ISL_426813, EPI_ISL_426814, EPI_ISL_426816, EPI_ISL_426817, EPI_ISL_426819, EPI_ISL_426821, EPI_ISL_426822, EPI_ISL_426824, EPI_ISL_426825, EPI_ISL_426826, EPI_ISL_426827, EPI_ISL_426828, EPI_ISL_426830, EPI_ISL_426831, EPI_ISL_426832, EPI_ISL_426833, EPI_ISL_426835, EPI_ISL_426836, EPI_ISL_426837, EPI_ISL_426838, EPI_ISL_426839, EPI_ISL_426840, EPI_ISL_426841, EPI_ISL_426842, EPI_ISL_426844, EPI_ISL_426846, EPI_ISL_426847, EPI_ISL_426848, EPI_ISL_426850, EPI_ISL_426851, EPI_ISL_426852, EPI_ISL_426853, EPI_ISL_426854, EPI_ISL_426855, EPI_ISL_426856, EPI_ISL_426858, EPI_ISL_426860, EPI_ISL_426861, EPI_ISL_426862, EPI_ISL_426864, EPI_ISL_426865, EPI_ISL_426866, EPI_ISL_426870, EPI_ISL_426872, EPI_ISL_426873, EPI_ISL_426874, EPI_ISL_426875, EPI_ISL_426876, EPI_ISL_426877, EPI_ISL_426878, EPI_ISL_426881, EPI_ISL_426882, EPI_ISL_426923, EPI_ISL_426924, EPI_ISL_426926, EPI_ISL_426927, EPI_ISL_426929, EPI_ISL_426930, EPI_ISL_426931, EPI_ISL_426932, EPI_ISL_426933, EPI_ISL_426934, EPI_ISL_426935, EPI_ISL_426940, EPI_ISL_426941, EPI_ISL_426942, EPI_ISL_426943, EPI_ISL_426947, EPI_ISL_426948, EPI_ISL_426951, EPI_ISL_426952, EPI_ISL_426953, EPI_ISL_426954, EPI_ISL_426955, EPI_ISL_426956, EPI_ISL_426957, EPI_ISL_426958, EPI_ISL_426959, EPI_ISL_426960, EPI_ISL_426961, EPI_ISL_426962, EPI_ISL_426963, EPI_ISL_426964, EPI_ISL_426965, EPI_ISL_426968, EPI_ISL_426970, EPI_ISL_426971, EPI_ISL_426972, EPI_ISL_426973, EPI_ISL_426974, EPI_ISL_426975, EPI_ISL_426976, EPI_ISL_426977, EPI_ISL_426978, EPI_ISL_426980, EPI_ISL_426981, EPI_ISL_426985, EPI_ISL_426986, EPI_ISL_426988, EPI_ISL_426989, EPI_ISL_426993, EPI_ISL_426994, EPI_ISL_426995, EPI_ISL_426997, EPI_ISL_426999, EPI_ISL_427001, EPI_ISL_427002, EPI_ISL_427003, EPI_ISL_427006, EPI_ISL_427007, EPI_ISL_427010, EPI_ISL_427011, EPI_ISL_427012, EPI_ISL_427013, EPI_ISL_427014, EPI_ISL_427015, EPI_ISL_427016, EPI_ISL_427017, EPI_ISL_427018, EPI_ISL_427019, EPI_ISL_427020, EPI_ISL_427022, EPI_ISL_427023, EPI_ISL_427024, EPI_ISL_427025, EPI_ISL_427026, EPI_ISL_427028, EPI_ISL_427029, EPI_ISL_427031, EPI_ISL_427036, EPI_ISL_427038, EPI_ISL_427040, EPI_ISL_427041, EPI_ISL_427045, EPI_ISL_427046, EPI_ISL_427048, EPI_ISL_427049, EPI_ISL_427079, EPI_ISL_427080, EPI_ISL_427081, EPI_ISL_427082, EPI_ISL_427151, EPI_ISL_427153, EPI_ISL_427155, EPI_ISL_427157, EPI_ISL_427159, EPI_ISL_427160, EPI_ISL_456410, EPI_ISL_456589			
see above	Victorian Infectious Diseases Reference Laboratory (VIDRL)	Microbiological Diagnostic Unit Public Health Laboratory and Victorian Infectious Diseases Reference Laboratory, Doherty Institute	Caly L.; Druce J.; Sait, M.; Schultz M.; Seemann T.; Sherry, N.
EPI_ISL_436689	Victorian Infectious Diseases Reference Laboratory (VIDRL)	Microbiological Diagnostic Unit Public Health Laboratory and Victorian Infectious Diseases Reference Laboratory, The Peter Doherty Institute for Infection & Immunity	Caly L.; Druce J.; Sait, M.; Schultz M.; Seemann T.; Sherry, N.
EPI_ISL_430473, EPI_ISL_430474, EPI_ISL_430478, EPI_ISL_430479, EPI_ISL_430480, EPI_ISL_430481, EPI_ISL_430482, EPI_ISL_430484, EPI_ISL_430486, EPI_ISL_430507, EPI_ISL_430521, EPI_ISL_430523, EPI_ISL_430527, EPI_ISL_430528, EPI_ISL_430542, EPI_ISL_430543, EPI_ISL_430545, EPI_ISL_430551, EPI_ISL_430552, EPI_ISL_430554, EPI_ISL_430556			
see above	Victorian Infectious Diseases Reference Laboratory (VIDRL)	Microbiological Diagnostic Unit Public Health Laboratory and Victorian Infectious Diseases Reference Laboratory, The Peter Doherty Institute for Infection and Immunity	Caly L.; Druce J.; Sait, M.; Schultz M.; Seemann T.; Sherry, N.
EPI_ISL_521897, EPI_ISL_521898, EPI_ISL_521900, EPI_ISL_521901, EPI_ISL_521902, EPI_ISL_563817, EPI_ISL_563820, EPI_ISL_563832, EPI_ISL_563880, EPI_ISL_564270			
see above	Victorian Infectious Diseases Reference Laboratory (VIDRL)	VIDRL and MDU-PHL	Caly L.; Caly, L.; Druce J.; M. B.; Sait, M.; Schultz; Schultz M.; Seemann T.; Seemann, T.; Sherry, N.
EPI_ISL_416410, EPI_ISL_416411, EPI_ISL_416412, EPI_ISL_416413, EPI_ISL_416415, EPI_ISL_416514, EPI_ISL_419733, EPI_ISL_419736, EPI_ISL_419737, EPI_ISL_419739, EPI_ISL_419740, EPI_ISL_419741, EPI_ISL_419742, EPI_ISL_419743, EPI_ISL_419744, EPI_ISL_419745, EPI_ISL_419746, EPI_ISL_419747, EPI_ISL_419748, EPI_ISL_419749, EPI_ISL_419750, EPI_ISL_419751, EPI_ISL_419752, EPI_ISL_419753, EPI_ISL_419754, EPI_ISL_419755, EPI_ISL_419756, EPI_ISL_419757, EPI_ISL_419758, EPI_ISL_419759, EPI_ISL_419760, EPI_ISL_419761, EPI_ISL_419762, EPI_ISL_419763, EPI_ISL_419764, EPI_ISL_419765, EPI_ISL_419766, EPI_ISL_419767, EPI_ISL_419768, EPI_ISL_419769, EPI_ISL_419770, EPI_ISL_419771, EPI_ISL_419772, EPI_ISL_419773, EPI_ISL_419774, EPI_ISL_419775, EPI_ISL_419776, EPI_ISL_419777, EPI_ISL_419778, EPI_ISL_419779, EPI_ISL_419780, EPI_ISL_419781, EPI_ISL_419782, EPI_ISL_419783, EPI_ISL_419784, EPI_ISL_419785, EPI_ISL_419786, EPI_ISL_419787, EPI_ISL_419788, EPI_ISL_419789, EPI_ISL_419790, EPI_ISL_419791, EPI_ISL_419792, EPI_ISL_419793, EPI_ISL_419794, EPI_ISL_419795, EPI_ISL_419796, EPI_ISL_419797, EPI_ISL_419798, EPI_ISL_419800, EPI_ISL_419801, EPI_ISL_419802, EPI_ISL_419803, EPI_ISL_419804, EPI_ISL_419805, EPI_ISL_419806, EPI_ISL_419808, EPI_ISL_419809, EPI_ISL_419810, EPI_ISL_419811, EPI_ISL_419812, EPI_ISL_419813, EPI_ISL_419814, EPI_ISL_419816, EPI_ISL_419817, EPI_ISL_419818, EPI_ISL_419819, EPI_ISL_419820, EPI_ISL_419821, EPI_ISL_419822, EPI_ISL_419826, EPI_ISL_419834, EPI_ISL_419836, EPI_ISL_419837, EPI_ISL_419838, EPI_ISL_419839, EPI_ISL_419840, EPI_ISL_419841, EPI_ISL_419842, EPI_ISL_419843, EPI_ISL_419844, EPI_ISL_419845, EPI_ISL_419846, EPI_ISL_419847, EPI_ISL_419848, EPI_ISL_419849, EPI_ISL_419850, EPI_ISL_419851, EPI_ISL_419852, EPI_ISL_419853, EPI_ISL_419854, EPI_ISL_419855, EPI_ISL_419856, EPI_ISL_419857, EPI_ISL_419859, EPI_ISL_419860, EPI_ISL_419861, EPI_ISL_419862, EPI_ISL_419863, EPI_ISL_419864, EPI_ISL_419865, EPI_ISL_419866, EPI_ISL_419867, EPI_ISL_419868, EPI_ISL_419869, EPI_ISL_419870, EPI_ISL_419871, EPI_ISL_419872, EPI_ISL_419873, EPI_ISL_419874, EPI_ISL_419875, EPI_ISL_419876, EPI_ISL_419877, EPI_ISL_419878, EPI_ISL_419879, EPI_ISL_419880, EPI_ISL_419881, EPI_ISL_419882, EPI_ISL_419883, EPI_ISL_419884, EPI_ISL_419885, EPI_ISL_419886, EPI_ISL_419887, EPI_ISL_419888, EPI_ISL_419889, EPI_ISL_419890, EPI_ISL_419891, EPI_ISL_419892, EPI_ISL_419893, EPI_ISL_419894, EPI_ISL_419895, EPI_ISL_419896, EPI_ISL_419897, EPI_ISL_419898, EPI_ISL_419899, EPI_ISL_419900, EPI_ISL_419901, EPI_ISL_419902, EPI_ISL_419903, EPI_ISL_419904, EPI_ISL_419905, EPI_ISL_419906, EPI_ISL_419907, EPI_ISL_419908, EPI_ISL_419909, EPI_ISL_419910, EPI_ISL_419911, EPI_ISL_419912, EPI_ISL_419913, EPI_ISL_419914, EPI_ISL_419915, EPI_ISL_419916, EPI_ISL_419917, EPI_ISL_419918, EPI_ISL_419919, EPI_ISL_419920, EPI_ISL_419921, EPI_ISL_419922, EPI_ISL_419923, EPI_ISL_419924, EPI_ISL_419925, EPI_ISL_419926, EPI_ISL_419927, EPI_ISL_419928, EPI_ISL_419929, EPI_ISL_419931, EPI_ISL_419932, EPI_ISL_419933, EPI_ISL_419934, EPI_ISL_419935, EPI_ISL_419936, EPI_ISL_419937, EPI_ISL_419938, EPI_ISL_419939, EPI_ISL_419940, EPI_ISL_419941, EPI_ISL_419942, EPI_ISL_419943, EPI_ISL_419944, EPI_ISL_419945, EPI_ISL_419946, EPI_ISL_419947, EPI_ISL_419948, EPI_ISL_419949, EPI_ISL_419950, EPI_ISL_419951, EPI_ISL_419952, EPI_ISL_419953, EPI_ISL_419954, EPI_ISL_419955, EPI_ISL_419956, EPI_ISL_419957, EPI_ISL_419958, EPI_ISL_419959, EPI_ISL_419960, EPI_ISL_419961, EPI_ISL_419962, EPI_ISL_419963, EPI_ISL_419964, EPI_ISL_419965, EPI_ISL_419966, EPI_ISL_419967, EPI_ISL_419968, EPI_ISL_419969, EPI_ISL_419970, EPI_ISL_419971, EPI_ISL_419972, EPI_ISL_419973, EPI_ISL_419974, EPI_ISL_419975, EPI_ISL_419976, EPI_ISL_419977, EPI_ISL_419978, EPI_ISL_419979, EPI_ISL_419982, EPI_ISL_419983, EPI_ISL_419984, EPI_ISL_419985, EPI_ISL_419986, EPI_ISL_419987, EPI_ISL_419988, EPI_ISL_419989, EPI_ISL_419990, EPI_ISL_419991, EPI_ISL_419992, EPI_ISL_419993, EPI_ISL_419994, EPI_ISL_419995, EPI_ISL_419996, EPI_ISL_419997, EPI_ISL_419998, EPI_ISL_420004, EPI_ISL_420005, EPI_ISL_420036			
see above	Victorian Infectious Diseases Reference Laboratory (VIDRL)	Victorian Infectious Diseases Reference Laboratory and Microbiological Diagnostic Unit Public Health Laboratory, Doherty Institute	Caly L.; Druce J.; Sait, M.; Schultz M.; Seemann T.; Sherry, N.; Taiaroa, G.
EPI_ISL_468313	Vigilancia Epidemiologica de São Bernardo do Campo	Instituto Adolfo Lutz, Interdiciplinary Procedures Center, Strategic Laboratory	Claudia Regina Gonçalves; Claudio Tavares Sacchi; Erica Valessa Ramos Gomes

EPI_ISL_451668, EPI_ISL_451669, EPI_ISL_451670, EPI_ISL_451672, EPI_ISL_451673, EPI_ISL_451674, EPI_ISL_451675, EPI_ISL_451676, EPI_ISL_451677, EPI_ISL_451678, EPI_ISL_451680, EPI_ISL_451681, EPI_ISL_451682, EPI_ISL_451683, EPI_ISL_451684, EPI_ISL_451685, EPI_ISL_451688, EPI_ISL_451689, EPI_ISL_451690, EPI_ISL_451691, EPI_ISL_451692, EPI_ISL_451693, EPI_ISL_451694, EPI_ISL_451695, EPI_ISL_451696, EPI_ISL_451697, EPI_ISL_451698, EPI_ISL_451699, EPI_ISL_451701, EPI_ISL_451702, EPI_ISL_451703, EPI_ISL_451704, EPI_ISL_451705, EPI_ISL_451706, EPI_ISL_451707, EPI_ISL_451708, EPI_ISL_451709, EPI_ISL_451711, EPI_ISL_451712, EPI_ISL_451713, EPI_ISL_451714, EPI_ISL_451716, EPI_ISL_451717, EPI_ISL_451718, EPI_ISL_451719, EPI_ISL_451720, EPI_ISL_451721, EPI_ISL_451722, EPI_ISL_451723, EPI_ISL_451724, EPI_ISL_451725, EPI_ISL_451727, EPI_ISL_451728, EPI_ISL_451730, EPI_ISL_451731, EPI_ISL_451732, EPI_ISL_451734, EPI_ISL_451736, EPI_ISL_451738, EPI_ISL_451740, EPI_ISL_451741, EPI_ISL_451742, 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	see above	Viollier AG	Department of Biosystems Science and Engineering, ETH Zürich	Chaoran Chen; Christian Beisel; Christiane Beckmann; Christoph Noppen; David Dreifuss; Elodie Burcklen; Ina Nissen; Ivan Topolsky; Katharina Jahn; Lara Fuhrmann; Maurice Redondo; Mirjam Feldkamp; Natascha Santacroce; Niko Beerenwinkel; Noemie Santamaria de Souza; Olivier Kobel; Pedro Ferreira; Philipp Jablonski; Rebecca Denes; Sarah Nadeau; Sophie Seidel; Susana Posada-Céspedes; Tanja Stadler; Tobias Schär
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	see above	Viral Respiratory Lab, National Institute for Biomedical Research (INRB)	Pathogen Sequencing Lab, National Institute for Biomedical Research (INRB)	Allison Black; Amuri Aziza; Andrew Rambaut; Catherine Pratt; Eddy Kinganda-Lusamaki; Edith Nkwembe; Emmanuel Lokilo Lofiko; Francisca Muyembe Mawete; Ian Goodfellow; James Hadfield; Jean-Claude Makangara Cigolo; Jean-Jacques Muyembe Tamfum; Josh Quick; Kristian Andersen; Matthias Pauthner; Michael Wiley; Nick Loman; Placide Mbala-Kingebeni; Steve Ahuka-Mundeke; Trevor Bedford
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	see above	Virginia DCLS	Virginia DCLS	Virginia DCLS
	EPI_ISL_416488	ViroGenetics - BSL3 Laboratory of Virology; Human Genome Variation Research Group & Genomics Centre MCB; Bioinformatics Research Group Department of Virology	ViroGenetics - BSL3 Laboratory of Virology; Human Genome Variation Research Group & Genomics Centre MCB; Bioinformatics Research Group Department of Virology	Adrianna Klajmon; Agata Jarosz; Agnieszka Koakowska-Kulesza; Aleksandra Milewska; Ewelina Hallman-Szeliska; Ewelina Popiech; Kamila Marszaek; Katarzyna Pancer; Katarzyna Zacharczuk; Krzysztof Pyr; Magdalena Rzeczkowska; Natalia Wolaniuk; Pawe P abaj; Tomasz Wokowicz; Wojciech Branicki
EPI_ISL_428925, EPI_ISL_428926, EPI_ISL_428927, EPI_ISL_428928, EPI_ISL_428929, EPI_ISL_428930, EPI_ISL_428931, EPI_ISL_428932				
	see above	ViroGenetics - BSL3 Laboratory of Virology; Human Genome Variation Research Group & Genomics Centre MCB; Bioinformatics Research Group; Wojewódzka Stacja Sanitarno-Epidemiologiczna w Krakowie	ViroGenetics - BSL3 Laboratory of Virology; Human Genome Variation Research Group & Genomics Centre MCB; Bioinformatics Research Group	Adrianna Klajmon; Agnieszka Starowicz; Aleksandra Pisarek; Aleksandra Synowiec; Danuta Piniewska-Róg; Ewelina Popiech; Inga Drebot; Jarosaw Foremny; Kamila Marszaek; Katarzyna Dudek; Katarzyna Gua; Katarzyna Kopera; Krzysztof Pyr; Magda Pachota; Marek Sanak; Micha Kowalski; Pawe P abaj; Tomasz Gromowski; Wojciech Branicki
EPI_ISL_416744, EPI_ISL_418183, EPI_ISL_435403, EPI_ISL_435404, EPI_ISL_435405, EPI_ISL_435406, EPI_ISL_435407, EPI_ISL_435408, EPI_ISL_435409, EPI_ISL_435410, EPI_ISL_435411, EPI_ISL_435412, EPI_ISL_435413, EPI_ISL_435414, EPI_ISL_435415, EPI_ISL_435416, EPI_ISL_435417, EPI_ISL_435419, EPI_ISL_435420, EPI_ISL_435421, EPI_ISL_435422, EPI_ISL_435423, EPI_ISL_435424, EPI_ISL_435425, EPI_ISL_435426, EPI_ISL_435427, EPI_ISL_435428, EPI_ISL_435429, EPI_ISL_435430, EPI_ISL_435431				
	see above	Virological Research Group, Szentágothai Research Centre	Bioinformatics Research Group, Szentágothai Research Centre	Attila Gyenesei; Endre Gábor Tóth; Ferenc Jakab; Gábor Kemenesi; Péter Urbán; Róbert Herczeg
	EPI_ISL_416426	Virological Research Group, Szentágothai Research Centre, University of Pécs	Bioinformatics Research Group, Szentágothai Research Centre, University of Pécs	Attila Gyenesei; Endre Gábor Tóth; Ferenc Jakab; Gábor Kemenesi; Péter Urbán; Róbert Herczeg
	EPI_ISL_710487, EPI_ISL_710488, EPI_ISL_710489, EPI_ISL_710490, EPI_ISL_710491	Virology (microbiology), Hospital Universitario Central de Asturias	Virology (microbiology), Hospital Universitario Central de Asturias	Abreu, F.; Alvarez-Argueelles; Boga; Castello, C.; Costales, I.; Coto, E.; Gomez-deOna, J.; J.A.; M.E.; Martin-Rodriguez, G.; Melon, S.; Perez-Martinez, Z.; Rojo, S.; Sandoval, M.
	EPI_ISL_415629, EPI_ISL_415640	Virology Department, Royal Infirmary of Edinburgh, NHS Lothian	Virology Department, Royal Infirmary of Edinburgh, NHS Lothian	Dewar R; McHugh M; O'Toole Á; Rambaut A; Templeton K; Williams TC
EPI_ISL_487648, EPI_ISL_487652, EPI_ISL_487654, EPI_ISL_487673, EPI_ISL_487678, EPI_ISL_487684, EPI_ISL_487685, EPI_ISL_487695, EPI_ISL_487698, EPI_ISL_487710, EPI_ISL_487728, EPI_ISL_487764, EPI_ISL_487788, EPI_ISL_487794, EPI_ISL_487802, EPI_ISL_487811, EPI_ISL_487812, EPI_ISL_487817, EPI_ISL_487822, EPI_ISL_487824, EPI_ISL_487828, EPI_ISL_487845, EPI_ISL_487846, EPI_ISL_487865, EPI_ISL_487869, EPI_ISL_487876, EPI_ISL_487883, EPI_ISL_487918, EPI_ISL_487919, EPI_ISL_487933, EPI_ISL_487940, EPI_ISL_487957, EPI_ISL_487965, EPI_ISL_487969, EPI_ISL_487991, EPI_ISL_488887, EPI_ISL_488892, EPI_ISL_488899, EPI_ISL_488900, EPI_ISL_488901, EPI_ISL_488902, EPI_ISL_488905, EPI_ISL_488906, EPI_ISL_488909, EPI_ISL_488912, EPI_ISL_488918, EPI_ISL_488924, EPI_ISL_488925, EPI_ISL_488926, EPI_ISL_488937, EPI_ISL_488940, EPI_ISL_488943, EPI_ISL_488947, EPI_ISL_488955, EPI_ISL_488958, EPI_ISL_488961, EPI_ISL_488964, EPI_ISL_488965, EPI_ISL_488969, EPI_ISL_488970, EPI_ISL_488977, EPI_ISL_488980, EPI_ISL_488984, EPI_ISL_488985, EPI_ISL_488988, EPI_ISL_488995, EPI_ISL_488996, EPI_ISL_488997, EPI_ISL_489002, EPI_ISL_489003, EPI_ISL_489006, EPI_ISL_489015, EPI_ISL_489016, EPI_ISL_489018, EPI_ISL_489020, EPI_ISL_489025, EPI_ISL_489026, EPI_ISL_489028, EPI_ISL_489033, EPI_ISL_489039, EPI_ISL_489041, EPI_ISL_489047, EPI_ISL_489054, EPI_ISL_489060, EPI_ISL_489062, EPI_ISL_491574, EPI_ISL_491605, EPI_ISL_491689, EPI_ISL_501632				
	see above	Virology Department, Royal Infirmary of Edinburgh, NHS Lothian / School of Biological Sciences, University of Edinburgh	Wellcome Sanger Institute for the COVID-19 Genomics UK (COG-UK) consortium	Colquhoun R; Cordelia Langford; David K. Jackson; Dewar R; Dominic Kwiatkowski; Ewan Harrison; Hill V; Ian Johnston; Jackson B; John Sillitoe on behalf of the Wellcome Sanger Institute COVID-19 Surveillance Team (http://www.sanger.ac.uk/covid-team); McCrone JT; McHugh M; O'Toole Á; Rambaut A; Roberto Amato; Rooke S; Scher E; Sonia Goncalves; Templeton K and Alex Alderton; Yu X
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	see above	Virology Department, Royal Infirmary of Edinburgh, NHS Lothian / School of Biological Sciences, University of Edinburgh / Institute of Genetics and Molecular Medicine,	COVID-19 Genomics UK (COG-UK) Consortium	Balcaza C; Colquhoun R; Dewar R; Gallagher M; Hill V; Jackson B; McCrone JT; McHugh M; O'Toole A; O'Toole Á; O'Á6Toole Á; Rambaut A; Rooke S; Scher E; Templeton K; Williams TC; Yu X

	University of Edinburgh		
EPI_ISL_414500, EPI_ISL_414501	Virology Department, Sheffield Teaching Hospitals NHS Foundation Trust	Department of Infection, Immunity and Cardiovascular Disease, The Florey Institute, The Medical School, University of Sheffield	Cariad Evans; Matthew Parker; Matthew Wyles; Mehmet Yavuz; Mohammad Raza; Thushan de Silva
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see above	Virology Department, Sheffield Teaching Hospitals NHS Foundation Trust	Department of Infection, Immunity and Cardiovascular Disease, The Florey Institute, The Medical School, University of Sheffield	Adri Angyal; Alex Keeley; Benjamin Lindsey; Cariad Evans; Danielle Groves; Dave Partridge; Luke Green; Matthew Parker; Matthew Wyles; Mehmet Yavuz; Mohammad Raza; Paul Parsons; Rachel Tucker; Rebecca Brown; Thushan de Silva
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see above	Virology Department, Sheffield Teaching Hospitals NHS Foundation Trust / Virology Department, Sheffield Teaching Hospitals NHS Foundation Trust	COVID-19 Genomics UK (COG-UK) Consortium	Adri Angyal; Alex Keeley; Benjamin Lindsey; Cariad Evans; Danielle Groves; Dave Partridge; Luke Green; Matthew Parker; Matthew Wyles; Mehmet Yavuz; Mohammad Raza; Paul Parsons; Rachel Tucker; Rebecca Brown; Thushan de Silva
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see above	Virology Department, Sheffield Teaching Hospitals NHS Foundation Trust/Department of Infection, Immunity and Cardiovascular Disease, The Medical School, University of Sheffield	COVID-19 Genomics UK (COG-UK) Consortium	Adri Angyal; Alex Keeley; Benjamin Lindsey; Cariad Evans; Danielle Groves; Dave Partridge; Katie Johnson; Laura Carrilero; Luke Green; Matthew Parker; Matthew Wyles; Mehmet Yavuz; Mohammad Raza; Nikki Smith; Paul Parsons; Rachel Tucker; Rebecca Brown; Thushan de Silva
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see above	Virology Lab,Department of Pathology, National Cheng Kung University Hospital	Virology Lab,Department of Pathology, National Cheng Kung University Hospital	Huey-Pin Tsai; et al
EPI_ISL_448864, EPI_ISL_448866, EPI_ISL_448894	Virology Laboratory, Castle Hill Hospital, Hull University Teaching Hospitals NHS Trust/Department of Infection, Immunity and Cardiovascular Disease, The Medical School, University of Sheffield	COVID-19 Genomics UK (COG-UK) Consortium	Adri Angyal; Alex Keeley; Benjamin Lindsey; Cariad Evans; Danielle Groves; Dave Partridge; Katie Johnson; Laura Carrilero; Luke Green; Matthew Parker; Matthew Wyles; Mehmet Yavuz; Mohammad Raza; Nikki Smith; Paul Parsons; Rachel Tucker; Rebecca Brown; Thushan de Silva
EPI_ISL_417491	Virology Laboratory, Department of Biomedical Sciences and Public Health, University Politecnica delle Marche	Virology and Legal Medicine Laboratories, Department of Biomedical Sciences and Public Health, University Politecnica delle Marche	Alessandrini, F.; Bagnarelli, P.; Caucci, S.; Di Sante, L.; Menzo, S.; Onofri, V.; Tagliabracci, A.; Turchi, C.
EPI_ISL_856869, EPI_ISL_856870, EPI_ISL_856872, EPI_ISL_856873, EPI_ISL_856874, EPI_ISL_856875, EPI_ISL_856876, EPI_ISL_856877, EPI_ISL_856878, EPI_ISL_856879, EPI_ISL_856882, EPI_ISL_856883, EPI_ISL_856885			
see above	Virology Laboratory, Scientific Department, Army Medical Center	Virology Laboratory, Scientific Department, Army Medical Center	Anella Monte; Anna Anselmo; Antonella Fortunato; Filippo Molinari; Florigio Lista; Francesco Giordani; Giancarlo Petralito; Giovanni Faggioni; Nino D'Amore; Riccardo De Sanctis; Silvia Fillo; Vanessa Vera Fain
EPI_ISL_677635, EPI_ISL_677636	Virology Unit, Institut Pasteur de Madagascar	Virology Unit, Institut Pasteur de Madagascar	Cara E. Brook; Christian Ranaivoson; Cristina M. Tato; Helisoa Razafimanjato; Jean-Michel Heraud; Joseph L. DeRisi; Michelle Tan; Norosoa Razanajatovo; Philippe Dussart; Soa Fy Andriamandimby; Tsiry Randriambolamanantsoa; Vida Ahyong; Vololoniaina Raharinosy
EPI_ISL_416458	Virology laboratory Ministry of Health Kuwait sequenced at Dasman Diabetes Institute	Dasman Diabetes Institute	Ebaa alOzairi; Fahd Al-Mulla; Motasem Melhem; Qais Al-Duwairi; Rasheeba iqbal; Sara Alqabandi; Sumi John
EPI_ISL_779254	Virology, CHU Pitie Salpetriere Charles Foix	Virology, CHU Pitie Salpetriere Charles Foix	A.-G.; Boutolleau, D.; Bruel, T.; Burrel, S.; Calvez; Dorgham, K.; Gorochov, G.; Gothland, A.; Jary, A.; Leducq, V.; Malet, I.; Marot, S.; Planas, D.; Schwartz, O.; Sterlin, D.; V. and Marcelin; Zafilaza, K.
EPI_ISL_707943, EPI_ISL_707947, EPI_ISL_707948, EPI_ISL_707950, EPI_ISL_707951, EPI_ISL_707954, EPI_ISL_707956, EPI_ISL_707959, EPI_ISL_708003			
see above	Virology, Universitätsklinikum des Saarlandes	Epigenetics, Saarland University	Jörn Walter; Kathrin Kattler; Markus Vogelgesang; Sascha Tierling; Sigrun Smola; Stefan Lohse
EPI_ISL_568579	Virus Molecular Laboratory of the Microbiology and Virology Department	INMI Lazzaro Spallanzani IRCCS	Antonino Di Caro; Barbara Bartolini; Cesare E.M. Gruber; Concetta Castilletti; Edoardo Vecchio Nepita; Elena Percivalle; Fausto Baldanti; Francesca Colavita; Francesco Messina; Irene Cassaniti; Maria R. Capobianchi; Martina Rueca; Silvia Meschi
EPI_ISL_1039249, EPI_ISL_1055383	Virus Research and Diagnostic Laboratory, Medical College Level, Kasturba Hospital for Infectious Diseases	Indian Council of Medical Research-National Institute of Virology, Microbial Containment Complex	Jayanti Shastri; Pragya D. Yadav
EPI_ISL_1055384, EPI_ISL_1055768, EPI_ISL_1055770, EPI_ISL_1055771, EPI_ISL_1055785	Virus Research and Diagnostic Laboratory, Medical College Level, Kasturba Hospital for Infectious Diseases	National Institute of Virology-Microbial Containment Complex, Indian Council of Medical Research	Jayanti Shastri; Pragya D. Yadav
EPI_ISL_418771, EPI_ISL_418772, EPI_ISL_418773, EPI_ISL_418774, EPI_ISL_418775, EPI_ISL_418776, EPI_ISL_418777, EPI_ISL_418778, EPI_ISL_418779, EPI_ISL_418780, EPI_ISL_418781, EPI_ISL_418782, EPI_ISL_418783, EPI_ISL_418784, EPI_ISL_418785, EPI_ISL_418786, EPI_ISL_418787, EPI_ISL_418788, EPI_ISL_418789, EPI_ISL_418790, EPI_ISL_418791, EPI_ISL_419555, EPI_ISL_426436, EPI_ISL_426437, EPI_ISL_426438, EPI_ISL_426439, EPI_ISL_426440, EPI_ISL_426441, EPI_ISL_426442, EPI_ISL_426443, EPI_ISL_426444, EPI_ISL_426445, EPI_ISL_426446, EPI_ISL_426447, EPI_ISL_426448, EPI_ISL_426449, EPI_ISL_426450, EPI_ISL_426451, EPI_ISL_426452, EPI_ISL_426453		
see above	WA State Department of Health	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Anna Uehara; Brian Hiatt; Clinton R. Paden; Denny Russell; Haibin Wang; Jasmine Padilla; Jesica Jacobs; Jessica Gant; Jing Zhang; Justin Lee; Krista Queen; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_415710, EPI_ISL_420080, EPI_ISL_420081, EPI_ISL_427307, EPI_ISL_427308, EPI_ISL_427309, EPI_ISL_427310, EPI_ISL_427311, EPI_ISL_427312, EPI_ISL_427315, EPI_ISL_427337, EPI_ISL_427338, EPI_ISL_427339, EPI_ISL_430112, EPI_ISL_507291			
see above	WHO National Influenza Centre Russian Federation	WHO National Influenza Centre Russian Federation	Andrey Komissarov; Anna Ivanova; Artem Fadeev; Daria Danilenko; Mariia Sergeeva
EPI_ISL_576179, EPI_ISL_576180, EPI_ISL_576181, EPI_ISL_576182, EPI_ISL_576183, EPI_ISL_576184, EPI_ISL_576185, EPI_ISL_576186, EPI_ISL_576187			
see above	WI State Laboratory of Hygiene	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Anna Uehara; Brian Lynch; Clinton R. Paden; Haibin Wang; Jing Zhang; Krista Queen; Peter Cook; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_425224, EPI_ISL_525575, EPI_ISL_525576, EPI_ISL_525577, EPI_ISL_525579, EPI_ISL_525580, EPI_ISL_525582, EPI_ISL_525583, EPI_ISL_525584, EPI_ISL_525585, EPI_ISL_525587, EPI_ISL_525588, EPI_ISL_525589, EPI_ISL_525590, EPI_ISL_525591, EPI_ISL_525592, EPI_ISL_525593, EPI_ISL_525594, EPI_ISL_525595, EPI_ISL_525596, EPI_ISL_525597, EPI_ISL_525598, EPI_ISL_525599, EPI_ISL_525600, EPI_ISL_525601, EPI_ISL_525602, EPI_ISL_525605, EPI_ISL_525606, EPI_ISL_525607, EPI_ISL_525608, EPI_ISL_525609, EPI_ISL_525610, EPI_ISL_525611, EPI_ISL_525612, EPI_ISL_525613, EPI_ISL_525614, EPI_ISL_525615, EPI_ISL_525616, EPI_ISL_525617, EPI_ISL_525618, EPI_ISL_525619, EPI_ISL_525620, EPI_ISL_525621, EPI_ISL_525622, EPI_ISL_525623, EPI_ISL_525624, EPI_ISL_525625, EPI_ISL_525626, EPI_ISL_525627, EPI_ISL_525628, EPI_ISL_525629, EPI_ISL_525630, EPI_ISL_525631, EPI_ISL_525632, EPI_ISL_525633, EPI_ISL_525634, EPI_ISL_525635, EPI_ISL_525636, EPI_ISL_525637, EPI_ISL_525638, EPI_ISL_525639, EPI_ISL_525640, EPI_ISL_525641, EPI_ISL_525642, EPI_ISL_525643, EPI_ISL_525645, EPI_ISL_525646, EPI_ISL_525647, EPI_ISL_529033, EPI_ISL_529034, EPI_ISL_534731, EPI_ISL_676648		
see above	Wadsworth Center, New York State Department of Health	Wadsworth Center, New York State Department of Health	Daryl M. Lamson; Erica Lasek-Nesselquist; Jonathan Plitnick; Kirsten St. George; Matthew D. Shudt; Navjot Singh; Sara Griesemer
EPI_ISL_426290	Wadsworth Center, New York State Department of Health	Wadsworth Center, New York State Department.of Health	Daryl M. Lamson; Erica Lasek-Nesselquist; Jonathan Plitnick; Kirsten St. George; Matthew D. Shudt; Navjot Singh; Sara Griesemer

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see above	Wadsworth Center, New York State Department.of Health	Wadsworth Center, New York State Department.of Health	Alexis Russel; Daryl M. Lamson; Erasmus Schneider; Erica Lasek-Nesselquist; John Kelly; Jonathan Plitnick; Kirsten St. George; Matthew D. Shudt; Navjot Singh; Sara Griesemer
EPI_ISL_456160, EPI_ISL_456168, EPI_ISL_456190, EPI_ISL_456191, EPI_ISL_456192, EPI_ISL_456193, EPI_ISL_579118, EPI_ISL_579121			
see above	Waikato Hospital	Institute of Environmental Science and Research (ESR)	Anja Werno; Antje van der Linden; Arlo Upton; Chris Mansell; David Hammer; Dragana Drinkovic; Erasmus Smit; Gary McAuliffe; Hana Sofia Andersson; Hermes Perez; James Ussher; Jill Sherwood; Jing Wang; Joep de Ligt; Josh Freeman; Julia Howard; Juliet Elvy; Lauren Jelly; Mary DeAlmeida; Matt Blakiston; Matt Storey; Matthew Rogers; Max Bloomfield; Michael Addidle; Michelle Balm; Muhammad Faisal; Nikki Freed; Olin Silander; Sally Roberts; Sarah Jefferies; Sharmini Muttaiyah; Susan Morpeth; Susan Taylor; Timothy Blackmore; Vani Sathyendran; Veronica Playle; Virginia Hope; Xiaoyun Ren
EPI_ISL_479862, EPI_ISL_479863, EPI_ISL_479864	Wakayama Prefectural Research Center of Environment and Public Health	Pathogen Genomics Center, National Institute of Infectious Diseases	Fumio Terasoma; Hajime Kamiya; Kentaro Itokawa; Makoto Kuroda; Masanori Hashino; Motoi Suzuki; Rina Tanaka; Tsuyoshi Sekizuka; Yosuke Hamajima
EPI_ISL_415041, EPI_ISL_415655, EPI_ISL_415656, EPI_ISL_415657, EPI_ISL_415659, EPI_ISL_415920, EPI_ISL_416024, EPI_ISL_416026, EPI_ISL_418093, EPI_ISL_418096, EPI_ISL_418103, EPI_ISL_418110, EPI_ISL_418117, EPI_ISL_418120, EPI_ISL_418122, EPI_ISL_418136, EPI_ISL_418137, EPI_ISL_418139, EPI_ISL_418140, EPI_ISL_418143, EPI_ISL_418144, EPI_ISL_418145, EPI_ISL_418147, EPI_ISL_418149, EPI_ISL_418150, EPI_ISL_418151, EPI_ISL_418155, EPI_ISL_418156, EPI_ISL_418158, EPI_ISL_418159, EPI_ISL_418163, EPI_ISL_419399, EPI_ISL_419406, EPI_ISL_419407, EPI_ISL_419409, EPI_ISL_419412, EPI_ISL_419418, EPI_ISL_419420, EPI_ISL_419421, EPI_ISL_419422, EPI_ISL_419424, EPI_ISL_419425, EPI_ISL_419428, EPI_ISL_419434, EPI_ISL_419438, EPI_ISL_419439, EPI_ISL_419440, EPI_ISL_419443, EPI_ISL_419448, EPI_ISL_419449, EPI_ISL_419453, EPI_ISL_419472, EPI_ISL_419474, EPI_ISL_419496, EPI_ISL_419498, EPI_ISL_419499, EPI_ISL_419508, EPI_ISL_420929, EPI_ISL_420937, EPI_ISL_420940, EPI_ISL_420943, EPI_ISL_420944, 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see above	Wales Specialist Virology Centre	Public Health Wales Microbiology Cardiff	Alec Birchley; Alexander Adams; Amy Gaskin; Bree Gatica-Wilcox; Catherine Moore; Jason Coombes; Joanne Watkins; Joanne watkins; Johnathan Evans; Laura Gifford; Lauren Gilbert; Lee Graham; Malorie Perry; Matt Bull; Matthew Bull; Nicole Pacchiarini; Sally Corden; Sara Kumziene-Summerhayes; Sara Rey; Sarah Taylor; Simon Cottrell; Simon Cottrell Sara Rey; Sophie Jones; Tom Connor
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see above	Wales Specialist Virology Centre Sequencing lab: Pathogen Genomics Unit	COVID-19 Genomics UK (COG-UK) Consortium	Alec Birchley; Alexander Adams; Amy Gaskin; Angela Marchbank; Bree Gatica-Wilcox; Catherine Moore; Jason Coombes; Joanne Watkins; Joel Southgate; Johnathan Evans; Laura Gifford; Lauren Gilbert; Lee Graham; Malorie Perry; Matthew Bull; Nicole Pacchiarini; Sally Corden; Sara Kumziene-Summerhayes; Sara Rey; Sarah Taylor; Simon Cottrell; Sophie Jones; Tom Connor
EPI_ISL_407214, EPI_ISL_407215	Washington State Department of Health	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Diseases Control and Prevention	Anna Uehara; Azaibi Tamin; Clinton R. Paden; Haibin Wang; Janna' R. Murray; Jennifer Harcourt; Jing Zhang; Krista Queen; Natalie Thornburg; Rashi Gautam; Shifaq Kamili; Stephen Lindstrom; Susan I. Gerber; Suxiang Tong; Xiaoyan Lu; Yan Li; Ying Tao
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see above	Washington State Department of Health	Seattle Flu Study	Barry Lutz; Chu et al; Chu etl al; Deborah Nickerson; Helen Chu; Janet Englund; Jay Shendure; Lea Starita; Mark Rieder; Matthew Thompson; Michael Boeckh; Michael Famulare; and Trevor Bedford
EPI_ISL_413457, EPI_ISL_413458	Washington State Public Health Lab	UW Virology Lab	Alexander Greninger; Arun Nalla; Hong Xie; Keith Jerome; Pavitra Roychoudhury
EPI_ISL_413455	Washington State Public Health Lab	University of Washington Virology Lab	Alexander Greninger; Arun Nalla; Hong Xie; Keith Jerome; Pavitra Roychoudhury
EPI_ISL_594450, EPI_ISL_594451, EPI_ISL_594452, EPI_ISL_594453, EPI_ISL_594454, EPI_ISL_594459	Washington State Public Health Laboratories	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Anna Uehara; Clinton Paden; Haibin Wang; Jing Zhang; Julu Bhatnagar; Krista Queen; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_445221	Wasterlakarna	The Public Health Agency of Sweden	Anna Risberg; Anna-Malin Linde; Frida Ahlfors; Karin Tegmark-Wisell; Maria Lind Karlberg; Mia Brytting; Olov Svartstrom; Oskar Karlsson Lindsjo; Theresa Enkirch

EPI_ISL_416538, EPI_ISL_416539	Wellington Hospital	Institute of Environmental Science and Research (ESR)	Craig Thornley; Erasmus Smit; Joep de Ligt; Lauren Jelly; Matt Storey; Maxim Bloomfield; New Zealand; Newtown; Riddiford Street; Wellington 6021; Wellington Hospital; Wellington SCL; Xiaoyun Ren
EPI_ISL_456161, EPI_ISL_456165, EPI_ISL_456169, EPI_ISL_456170, EPI_ISL_456182, EPI_ISL_456183, EPI_ISL_456184, EPI_ISL_456185, EPI_ISL_456186, EPI_ISL_456187, EPI_ISL_456188, EPI_ISL_456319, EPI_ISL_456320			
see above	Wellington SCL	Institute of Environmental Science and Research (ESR)	Anja Werno; Antje van der Linden; Arlo Upton; Chris Mansell; David Hammer; Dragana Drinkovic; Erasmus Smit; Gary McAuliffe; Hana Sofia Andersson; James Ussher; Jill Sherwood; Joep de Ligt; Josh Freeman; Julia Howard; Juliet Elvy; Lauren Jelly; Mary DeAlmeida; Matt Blakiston; Matt Storey; Matthew Rogers; Max Bloomfield; Michael Addidle; Michelle Balm; Sally Roberts; Sarah Jefferies; Sharmini Muttaiyah; Susan Morpeth; Susan Taylor; Timothy Blackmore; Vani Sathyendran; Veronica Playle; Virginia Hope; Xiaoyun Ren
EPI_ISL_579418	Wellington SCL (WN)	Institute of Environmental Science and Research (ESR)	Anja Werno; Antje van der Linden; Arlo Upton; Chris Mansell; David Hammer; Dragana Drinkovic; Erasmus Smit; Gary McAuliffe; Hana Sofia Andersson; Hermes Perez; James Ussher; Jill Sherwood; Jing Wang; Joep de Ligt; Josh Freeman; Julia Howard; Juliet Elvy; Lauren Jelly; Mary DeAlmeida; Matt Blakiston; Matt Storey; Matthew Rogers; Max Bloomfield; Michael Addidle; Michelle Balm; Muhammad Faisal; Nikki Freed; Olin Silander; Sally Roberts; Sarah Jefferies; Sharmini Muttaiyah; Susan Morpeth; Susan Taylor; Timothy Blackmore; Vani Sathyendran; Veronica Playle; Virginia Hope; Xiaoyun Ren
EPI_ISL_451076, EPI_ISL_451313, EPI_ISL_451314, EPI_ISL_451315, EPI_ISL_451316, EPI_ISL_451318, EPI_ISL_451319, EPI_ISL_451320, EPI_ISL_451321, EPI_ISL_451322, EPI_ISL_451325, EPI_ISL_451326, EPI_ISL_451327, EPI_ISL_451328, EPI_ISL_451329, EPI_ISL_451330, EPI_ISL_451331, EPI_ISL_451334, EPI_ISL_451337, EPI_ISL_451338, EPI_ISL_451344, EPI_ISL_451345, EPI_ISL_451346, EPI_ISL_451348, EPI_ISL_451353, EPI_ISL_451354, EPI_ISL_451356, EPI_ISL_451357, EPI_ISL_451359, EPI_ISL_451360, EPI_ISL_451365, EPI_ISL_451369, EPI_ISL_451370, EPI_ISL_451371, EPI_ISL_451374, EPI_ISL_451376, EPI_ISL_451378, EPI_ISL_451379, EPI_ISL_451380, EPI_ISL_451381, EPI_ISL_451382, EPI_ISL_451383, EPI_ISL_451384, EPI_ISL_451385, EPI_ISL_451386, EPI_ISL_451387, EPI_ISL_451388, EPI_ISL_451389, EPI_ISL_451390, EPI_ISL_451391, EPI_ISL_451392, EPI_ISL_451393, EPI_ISL_451394, EPI_ISL_451395, EPI_ISL_451398			
see above	West China Hospital of Sichuan University	State Key Laboratory of Biotherapy of Sichuan University	Baowen Du; Binwu Ying; Chao Tang; Chao Tanga; Chuan Chen; Chuan Chena; Han-Cheng Wei; Hancheng Wei; Jia Geng; Jing-wen Lin; Lu Chen; Mingxia Yu; Minjin Wang; Weimin Li; Yongzhao Zhou
EPI_ISL_414027, EPI_ISL_415630, EPI_ISL_415631	West of Scotland Specialist Virology Centre, NHSGGC	MRC-University of Glasgow Centre for Virus Research	Alasdair MacLean; Ana da Silva Filipe; Antonia Ho; Daniel Mair; David L Robertson; Emma Thomson; Emma Thomson.; Kathy Li; Kathy Smollett; Natasha Jesudason; Richard Orton; Rory Gunson; Rory Gunson.; Stephen Carmichael
EPI_ISL_425647, EPI_ISL_425648, EPI_ISL_425650, EPI_ISL_425651, EPI_ISL_425652, EPI_ISL_425653, EPI_ISL_425654, EPI_ISL_425656, EPI_ISL_425657, EPI_ISL_425658, EPI_ISL_425659, EPI_ISL_425660, EPI_ISL_425662, EPI_ISL_425663, EPI_ISL_425668, EPI_ISL_425669, EPI_ISL_425670, EPI_ISL_425671, EPI_ISL_425672, EPI_ISL_425674, EPI_ISL_425675, EPI_ISL_425676, EPI_ISL_425677, EPI_ISL_425678, EPI_ISL_425679, EPI_ISL_425682, EPI_ISL_425684, EPI_ISL_425685, EPI_ISL_425687, EPI_ISL_425688, EPI_ISL_425692, EPI_ISL_425693, EPI_ISL_425695, EPI_ISL_425696, EPI_ISL_425697, EPI_ISL_425698, EPI_ISL_425699, EPI_ISL_425700, EPI_ISL_425701, EPI_ISL_425702, EPI_ISL_425703, EPI_ISL_425704, EPI_ISL_425705, EPI_ISL_425707, EPI_ISL_425708, EPI_ISL_425709, EPI_ISL_425711, EPI_ISL_425713, EPI_ISL_425715, EPI_ISL_425716, EPI_ISL_425717, EPI_ISL_425720, EPI_ISL_425721, EPI_ISL_425722, EPI_ISL_425724, EPI_ISL_425725, EPI_ISL_425726, EPI_ISL_425727, EPI_ISL_425728, EPI_ISL_425729, EPI_ISL_425730, EPI_ISL_425731, 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EPI_ISL_439125, EPI_ISL_439126, EPI_ISL_439127, EPI_ISL_439130, EPI_ISL_439132, EPI_ISL_439134, EPI_ISL_439135, EPI_ISL_439140, EPI_ISL_439142, EPI_ISL_453006, EPI_ISL_456756, EPI_ISL_456889, EPI_ISL_461705, EPI_ISL_473782, EPI_ISL_493741, EPI_ISL_512436			
see above	West of Scotland Specialist Virology Centre, NHSGGC / MRC-University of Glasgow Centre for Virus Research	COVID-19 Genomics UK (COG-UK) Consortium	Alasdair MacLean; Alice Broos; Ana da Silva Filipe; Antonia Ho; Daniel Mair; David L Robertson; Elihu Aranday-Cortes; Emma Thomson; James Shepherd; Jenna Nichols; Joseph Hughes; Kathy Li; Kathy Smollett; Kirstyn Brunker; Kyriaki Nomikou; Lily Tong; Marc Niebel; Natasha Jesudason; Natasha Johnson; Patawee Asamaphan; Rajiv Shah; Richard Orton; Rory Gunson; Rory Gunson.; Sarah McDonald; Sreenu Vattipally; Stephen Carmichael; Yasmin Parr
EPI_ISL_509706	Wisconsin Department of Health Services	Pathogen Discovery, Respiratory Viruses Branch, Division of Viral Diseases, Centers for Disease Control and Prevention	Anna Uehara; Clinton Paden; Haibin Wang; Jing Zhang; Krista Queen; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_470540	Wisconsin State Laboratory of Hygiene Communicable Disease Division	Wisconsin State Laboratory of Hygiene Communicable Disease Division	Kelsey R Florek
EPI_ISL_471178, EPI_ISL_471180, EPI_ISL_471181, EPI_ISL_471199, EPI_ISL_471201, EPI_ISL_471202, EPI_ISL_471203, EPI_ISL_471205, EPI_ISL_471207, EPI_ISL_471211, EPI_ISL_471212, EPI_ISL_471213, EPI_ISL_471219, EPI_ISL_471220, EPI_ISL_471221, EPI_ISL_471225, EPI_ISL_471230, EPI_ISL_471235, EPI_ISL_471249, EPI_ISL_471250, EPI_ISL_471251, EPI_ISL_471252, EPI_ISL_471253, EPI_ISL_471254, EPI_ISL_471255, EPI_ISL_471256, EPI_ISL_471258, EPI_ISL_471260, EPI_ISL_471261, EPI_ISL_471262, EPI_ISL_471264, EPI_ISL_471265, EPI_ISL_471266, EPI_ISL_578335, EPI_ISL_578337, EPI_ISL_578366, EPI_ISL_578367, EPI_ISL_578368, EPI_ISL_578369, EPI_ISL_578370, EPI_ISL_578371, EPI_ISL_578372, EPI_ISL_578373, EPI_ISL_578374, EPI_ISL_578375, EPI_ISL_578376, EPI_ISL_578377, EPI_ISL_578378, EPI_ISL_578379, EPI_ISL_578380, EPI_ISL_578381, EPI_ISL_578382, EPI_ISL_578383, EPI_ISL_578384, EPI_ISL_578385, EPI_ISL_578386, EPI_ISL_578387, EPI_ISL_578388, EPI_ISL_578389, EPI_ISL_578390, EPI_ISL_578392, EPI_ISL_578393, EPI_ISL_578394, EPI_ISL_578419, EPI_ISL_578420, EPI_ISL_578421, EPI_ISL_578422, EPI_ISL_578423, EPI_ISL_578424, EPI_ISL_578425, EPI_ISL_578426, EPI_ISL_578427, EPI_ISL_578428, EPI_ISL_578429, EPI_ISL_578430, EPI_ISL_578431, EPI_ISL_578432, EPI_ISL_578433, EPI_ISL_578434, EPI_ISL_578435, EPI_ISL_578436, EPI_ISL_578437, EPI_ISL_578471, EPI_ISL_578472, EPI_ISL_578473, EPI_ISL_803306, EPI_ISL_803307, EPI_ISL_803327, EPI_ISL_803638			
see above	Wisconsin State Laboratory of Hygiene Communicable Disease Division	Wisconsin State Laboratory of Hygiene Communicable Disease Division	Abigail C. Shockey; Kelsey R. Florek
EPI_ISL_454904, EPI_ISL_454905, EPI_ISL_454906, EPI_ISL_454907, EPI_ISL_454908, EPI_ISL_454909, EPI_ISL_454910, EPI_ISL_454911, EPI_ISL_454912, EPI_ISL_454913, EPI_ISL_454914, EPI_ISL_454915, EPI_ISL_454916, EPI_ISL_454917, EPI_ISL_454918, EPI_ISL_454919, EPI_ISL_454920, EPI_ISL_454921, EPI_ISL_454923, EPI_ISL_454924, EPI_ISL_454926, EPI_ISL_454927, EPI_ISL_454928, EPI_ISL_454929, EPI_ISL_454930, EPI_ISL_454931, EPI_ISL_454932, EPI_ISL_454933, EPI_ISL_454934, EPI_ISL_454935, EPI_ISL_454936, EPI_ISL_454937, EPI_ISL_454938, EPI_ISL_454939, EPI_ISL_454940, EPI_ISL_454941, EPI_ISL_454942, EPI_ISL_454943, EPI_ISL_454944, EPI_ISL_454946, EPI_ISL_454947, EPI_ISL_454948, EPI_ISL_454949, EPI_ISL_454950, EPI_ISL_454951, EPI_ISL_454952, EPI_ISL_454953, EPI_ISL_454954, EPI_ISL_454955, EPI_ISL_454956, EPI_ISL_454957, EPI_ISL_454958, EPI_ISL_454960, EPI_ISL_454961, EPI_ISL_454962, EPI_ISL_454963, EPI_ISL_454965, EPI_ISL_454967, EPI_ISL_454968, EPI_ISL_454969, EPI_ISL_454971, EPI_ISL_454972, EPI_ISL_454973, EPI_ISL_454974, EPI_ISL_454975, EPI_ISL_454976, EPI_ISL_454977, EPI_ISL_454978, EPI_ISL_454979, EPI_ISL_454980, EPI_ISL_454981, EPI_ISL_454982, EPI_ISL_454983, EPI_ISL_454984, EPI_ISL_454988, EPI_ISL_454989, EPI_ISL_454990, EPI_ISL_454991, EPI_ISL_454992, EPI_ISL_454993, EPI_ISL_454995, EPI_ISL_454996, EPI_ISL_454997, EPI_ISL_455363, EPI_ISL_455364, EPI_ISL_455365, EPI_ISL_455366, EPI_ISL_455367, EPI_ISL_455368, EPI_ISL_455369, EPI_ISL_455370, EPI_ISL_455371, EPI_ISL_455372, EPI_ISL_455373, EPI_ISL_455374, EPI_ISL_455375, EPI_ISL_455376, EPI_ISL_455377, EPI_ISL_455378, EPI_ISL_455379, EPI_ISL_455380, EPI_ISL_455381, EPI_ISL_455382, EPI_ISL_455383, EPI_ISL_455384, EPI_ISL_455386, EPI_ISL_455388, EPI_ISL_455389, EPI_ISL_455390, EPI_ISL_455391, EPI_ISL_455392, EPI_ISL_455394, EPI_ISL_455395, EPI_ISL_455397, EPI_ISL_455398, EPI_ISL_455399, EPI_ISL_455406			
see above	Wuhan Chain Medical Labs (CMLabs)	State Key Laboratory of Biotherapy of Sichuan University	Baowen Du; Binwu Ying; Chao Tang; Chuan Chen; Hancheng Wei; Jia Geng; Jing-wen Lin; Lu Chen; Mingxia Yu; Minjin Wang; Weimin Li; Yongzhao Zhou
EPI_ISL_450489	Wuhan Institute of Virology, Chinese Academy of Sciences	Wuhan Institute of Virology, Chinese Academy of Sciences	Lin, H.; Shi; Si, H.; Xie, S.; Z. and Zhou, P.; Zhu, Y.
EPI_ISL_402132, EPI_ISL_412898, EPI_ISL_412899	Wuhan Jinyintan Hospital	Hubei Provincial Center for Disease Control and Prevention	Bin Fang; Bo Yang; Bo Yu; Faxian Zhan; Guojun Ye; Jing Li; Junqiang Xu; Kun Cai; Linlin Liu; Xiang Li; Xiao Yu; Xixiang Huo; Yongzhong Jiang.
EPI_ISL_402124, EPI_ISL_402127, EPI_ISL_402128, EPI_ISL_402129, EPI_ISL_402130	Wuhan Jinyintan Hospital	Wuhan Institute of Virology, Chinese Academy of Sciences	Ding-Yu Zhang; Hao-Rui Si; Lei Zhang; Peng Zhou; Xing-Lou Yang; Yan Zhu; Zhengli Shi
EPI_ISL_412982	Wuhan Lung Hospital	Hubei Provincial Center for Disease Control and Prevention	Bin Fang; Bo Yang; Bo Yu; Faxian Zhan; Guojun Ye; Jing Li; Junqiang Xu; Kun Cai; Linlin Liu; Xiang Li; Xiao Yu; Xixiang Huo; Yongzhong Jiang.
EPI_ISL_631504, EPI_ISL_631808, EPI_ISL_631811, EPI_ISL_631995, EPI_ISL_632129, EPI_ISL_632141, EPI_ISL_632157, EPI_ISL_632159			
see above	Wyckoff Heights Medical Center	New York City Public Health Laboratory	Jade Wang; et al.
EPI_ISL_421272, EPI_ISL_421346, EPI_ISL_421543, EPI_ISL_421544, EPI_ISL_421545, EPI_ISL_421548, EPI_ISL_421549, EPI_ISL_421550, EPI_ISL_421551, EPI_ISL_421552, EPI_ISL_462912, EPI_ISL_462915, EPI_ISL_462917, EPI_ISL_462918, EPI_ISL_462919, EPI_ISL_462924, EPI_ISL_462927, EPI_ISL_462929, EPI_ISL_462932, EPI_ISL_462933, EPI_ISL_462935, EPI_ISL_462936, EPI_ISL_462940, EPI_ISL_462952, EPI_ISL_462956, EPI_ISL_462957, EPI_ISL_462958, EPI_ISL_462965, EPI_ISL_462966, EPI_ISL_462969, EPI_ISL_462975, EPI_ISL_462976, EPI_ISL_462977, EPI_ISL_462979, EPI_ISL_462982			
see above	Wyoming Public Health Laboratory	Center for Global Health, University of New Mexico Health Sciences Center	Cari Sloma; Darrell Dinwiddie; Daryl Domman; Kurt Schwalm; Noah Hull; Rob Christensen; Wanda Manley
EPI_ISL_493061, EPI_ISL_493062	Wyoming Public Health Laboratory	Wyoming Public Health Laboratory	Cari Sloma; Jim Mildenberger; Joel Sevinsky; Noah Hull; Rob Christensen; and Wanda Manley

EPI_ISL_455332	Xerencia de Xestión Integrada de Pontevedra e o Salnés	Instituto de Salud Carlos III	A. Monzón; F. Casas; I; I. Jiménez; Iglesias-Caballero; M. Camarero; M. Cuesta; M. Garcia; M. González-Esguevillas; M. Molinero Calamita; M. Zaballos; P. Jiménez; S. Juliá; S. Pozo; S. Varona
EPI_ISL_428387, EPI_ISL_431080, EPI_ISL_435709	Yale COVID-19 Biorepository	Grubaugh Lab - Yale School of Public Health	Adam Moore; Akiko Iwasaki; Albert Ko; Alice Lu; Allison Nelson; Anderson Brito; Anne Wyllie; Arnau Casanovas; Catherine Muenker; Chaney Kalinich; Chantal Vogels; Charlese Dela Cruz; Cole Jensen; Isabel Ott; Joseph Fauver; Maria Tokuyama; Mary Petrone; Nathan Grubaugh; Patrick Wong; Peiwen Lu; Richard Martinello; Saad Omer; Shelli Farhadian; Tara Alpert
EPI_ISL_419517, EPI_ISL_419518, EPI_ISL_419524, EPI_ISL_419525, EPI_ISL_419528, EPI_ISL_435720, EPI_ISL_463138, EPI_ISL_463141, EPI_ISL_463151, EPI_ISL_463156, EPI_ISL_463157, EPI_ISL_463158, EPI_ISL_463164, EPI_ISL_476517, EPI_ISL_476518, EPI_ISL_476521, EPI_ISL_476522, EPI_ISL_476523, EPI_ISL_476525, EPI_ISL_476526, EPI_ISL_476527, EPI_ISL_476528, EPI_ISL_476531, EPI_ISL_476542, EPI_ISL_476545			
see above	Yale Clinical Virology Laboratory	Grubaugh Lab - Yale School of Public Health	Adam Moore; Akiko Iwasaki; Albert Ko; Alice Lu; Allison Nelson; Anderson Brito; Anne Wyllie; Arnau Casanovas; Catherine Muenker; Chaney Kalinich; Chantal Vogels; Charlese Dela Cruz; Cole Jensen; Ellen Foxman; Isabel Ott; Joseph Fauver; Maria Tokuyama; Marie Landry; Mary Petrone; Nathan Grubaugh; Patrick Wong; Peiwen Lu; Richard Martinello; Saad Omer; Shelli Farhadian; Tara Alpert
EPI_ISL_684798, EPI_ISL_684799	Yamagata Prefectural Institute of Public Health	Pathogen Genomics Center, National Institute of Infectious Diseases	Kentaro Itokawa; Makoto Kuroda; Masanori Hashino; Rina Tanaka; Tsuyoshi Sekizuka
EPI_ISL_408478	Yongchuan District Center for Disease Control and Prevention	Chongqing Municipal Center for Disease Control and Prevention	Chen Shuang; Li Qing; Ling Hua; Rong Rong; Su Kun; Tan ZhangPing; Tang Wenge; Tang Yun; Ye Sheng; Yu zhen
EPI_ISL_475889, EPI_ISL_475890, EPI_ISL_475891, EPI_ISL_475893, EPI_ISL_475905, EPI_ISL_475906, EPI_ISL_475907, EPI_ISL_475908, EPI_ISL_475909			
see above	Zentralinstitut für medizinische und chemische Labordiagnostik, Universitätskliniken Insbruck	Bergthaler laboratory, CeMM Research Center for Molecular Medicine of the Austrian Academy of Sciences	Alexander Lercher; Alexandra Popa; Andreas Bergthaler; Benedikt Agerer; Christoph Bock; Daniela Schmid; Dorothee von Laer; Elisabeth Puchhammer-Stoeckl; Franz Allerberger; Gregor Hörmann; Guenter Weiss; Henrique Colaco; Jakob-Wendelin Genger; Jan Laine; Judith Aberle; Kinga Rigler-Hohenwarter; Lukas Endler; Manfred Nairz; Mark Smyth; Martin Senekowitsch; Michael Schuster; Peter Hufnagl; Rainer Gattringer; Stephan Aberle; Thomas Penz; Wegene Borena
EPI_ISL_404227, EPI_ISL_404228	Zhejiang Provincial Center for Disease Control and Prevention	Department of Microbiology, Zhejiang Provincial Center for Disease Control and Prevention	Chen Chen; Chongqao Hu; Enfu Chen; Fang Xu; Haiyan Mao; Hanping Zhu; Hao Yan; Jian Gao; Jianmin Jiang; Junhang Pan; Juying Yan; Liming Gong; Qiong Ge; Wen Shi; Wenwu Yao; Xinying Wang; Xiuyu Lou; Yan Feng; Yanjun Zhang; Yi Sun; Yin Chen; Yisheng Sun; Yiyu Lu; Zhangnv Yang; Zhen Li; Zhen Wang; Zhiping Chen
EPI_ISL_422425	Zhejiang Provincial Center for Disease Control and Prevention	Zhejiang Provincial Center for Disease Control and Prevention	Yanjun Zhang; Yi Sun
EPI_ISL_408479	Zhongxian Center for Disease Control and Prevention	Chongqing Municipal Center for Disease Control and Prevention	Chen Shuang; Li Qin; Ling Hua; Rong Rong; Su Kun; Tan ZhangPing; Tang Wenge; Tang Yun; Ye Sheng; Yu zhen; Zhang Hong
EPI_ISL_467430	Zoonotic and Exotic infection Diseases Division	Zoontic and Exotic infection Diseases Division	Jinlang Wang; Zhigao Bu
EPI_ISL_459909	Zoonotic and Exotic infection Diseases Division, Harbin Veterinary Research Institute, CAAS	Zoonotic and Exotic infection Diseases Division, Harbin Veterinary Research Institute, CAAS	Jinliang Wang; Zhigao Bu
EPI_ISL_468134, EPI_ISL_468135, EPI_ISL_468136, EPI_ISL_468137, EPI_ISL_468138, EPI_ISL_468139, EPI_ISL_468140, EPI_ISL_468141, EPI_ISL_468143, EPI_ISL_468144, EPI_ISL_468145			
see above	[Romania, Bucharest] National Institute for Infectious Diseases "Prof. Dr. Matei Bal"	[Romania, Bucharest] National Institute for Infectious Diseases "Prof. Dr. Matei Bal"	Corina Casangiu; Leontina Banica; Marius Cotic; Marius Surleac; Simona Paraschiv
EPI_ISL_450196	bumrungrad international hospital	National Institute of Health. Department of medical Sciences, Ministry of Public Health, Thailand	Chittaganpitch; Malinee; Okada; Pannmen; Phuygun; Pilailuk; Siripaporn; Sittiporn; Sunthareeya; Thanadachakul; Thanutsapa; Waicharoen; Warawan; Wongboot
EPI_ISL_417536, EPI_ISL_417537, EPI_ISL_417538, EPI_ISL_417539, EPI_ISL_417540, EPI_ISL_417541, EPI_ISL_417542, EPI_ISL_417543, EPI_ISL_417544, EPI_ISL_417545, EPI_ISL_417548, EPI_ISL_417549, EPI_ISL_417552, EPI_ISL_417590, EPI_ISL_417655, EPI_ISL_417659, EPI_ISL_417660, EPI_ISL_417664, EPI_ISL_417668, EPI_ISL_417670, EPI_ISL_417676, EPI_ISL_424377, EPI_ISL_424533, EPI_ISL_424535, EPI_ISL_424536, EPI_ISL_424545, EPI_ISL_424546, EPI_ISL_424551, EPI_ISL_424560, EPI_ISL_424562, EPI_ISL_424567, EPI_ISL_424568, EPI_ISL_424570, EPI_ISL_424608, EPI_ISL_424609			
see above	deCODE genetics	deCODE genetics	Agnar Helgason; Alma Moller; Arna B Agustsdottir; Arnaldur Gylfason; Asgeir Sigurdsson; Aslaug Jonasdottir; Berglind Eiriksdottir; Bjarni Thorbjornsson; Brynjar O Jensson; Daniel F Gudbjartsson; Droplaug N Magnusdottir; Elisabet E Gardarsdottir; Emil A Thorarensen; Gardar Sveinbjornsson; Gisli Masson; Gudmundur Georgsson; Gudmundur L Norddahl; Gudrun Sigmundsdottir; Hakon Jonsson; Hilma Holm; Ingileif Jonsdottir; Jona Saemundsdottir; Kamilla S Josefsdottir; Kari Stefansson; Karl G Kristinsson; Kjartan R Gudmundsson; Kristin E Sveinsdottir; Louise le Roux; Maney Sveinsdottir; Olafia S Gretarsdottir; Olafur T Magnusson; Pall Melsted; Patrick Sulem; Run Fridriksdottir; Thora R Gunnarsdottir; Thordur Kristjansson; Thorolfur Gudnason; Unnur Thorsteinsdottir
EPI_ISL_560591, EPI_ISL_560592, EPI_ISL_560593, EPI_ISL_560594, EPI_ISL_560596	hopital	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Etienne Simon-Lorière; Fabiana Gambaro; Maud Vanpeene; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_560569, EPI_ISL_560570, EPI_ISL_560573, EPI_ISL_560574, EPI_ISL_560577, EPI_ISL_560578	hôpital	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Etienne Simon-Lorière; Fabiana Gambaro; Maud Vanpeene; Sylvie Behillil; Sylvie van der Werf; Vincent Enouf
EPI_ISL_447909, EPI_ISL_447910, EPI_ISL_447911, EPI_ISL_447912, EPI_ISL_447913, EPI_ISL_447914, EPI_ISL_447915, EPI_ISL_447916, EPI_ISL_447917, EPI_ISL_447918, EPI_ISL_447919, EPI_ISL_447920, EPI_ISL_447921			
see above	n/a	National Institute of Health. Department of medical Sciences, Ministry of Public Health, Thailand	Chittaganpitch; Malinee; Okada; Pannmen; Phuygun; Pilailuk; Siripaporn; Sittiporn; Sunthareeya; Thanadachakul; Thanutsapa; Waicharoen; Warawan; Wongboot
EPI_ISL_458286	unknown	Bundeswehr Institute of Microbiology	Antwerpen; Bestehorn-Willmann; Eckstein, S.; Handrick, S.; M.C.; M.H.; M.S.; Naija, H.; R. and Ben Moussa, M.; Rehn, A.; Stoecker, K.; Walter; Woelfel
EPI_ISL_450500, EPI_ISL_450501, EPI_ISL_450502, EPI_ISL_450503, EPI_ISL_450504	unknown	CAS Key Laboratory of Special Pathogens and Biosafety and Center for Emerging Infectious Diseases	Lin, H.; Shi, Z.; Si, H.; Xie, S.; Zhou, P.; Zhu, Y.
EPI_ISL_486429	unknown	Clinical Laboratory, Hospital Israelita Albert Einstein	Amgarten, D.; C.L. and Pinho; F.G.; Guedes; J.R.; Malta, F.; Mangueira; R.A.; R.L.; Santana; de Menezes
EPI_ISL_463001, EPI_ISL_463002, EPI_ISL_463003, EPI_ISL_463005, EPI_ISL_463006	unknown	Clinical virology	Fares, W.; Triki, H.
EPI_ISL_468063, EPI_ISL_468064, EPI_ISL_468065	unknown	Computer Science and Engineering	A.B.; Adcock; Alejandro, B.; Arnold; Carrico, R.; Chariker; Chung, D.; E.C.; F.W.; Hwang; J.H.; J.W.; J.Y.; K.E.; L.A.; Lasnik; Palmer; Park; R.S.; Ramirez, J.; Rouchka; Waigel, S.; Wolf; Zacharias, W.; Zhang, M.
EPI_ISL_450484, EPI_ISL_450485, EPI_ISL_450486, EPI_ISL_450487	unknown	Data Science	C.J.; Carroll; Cohen; Miller; N.K.; S.H.; T.D.; Tran
EPI_ISL_447635, EPI_ISL_447636, EPI_ISL_447637, EPI_ISL_447638, EPI_ISL_447639, EPI_ISL_447640, EPI_ISL_447641, EPI_ISL_447642, EPI_ISL_447643, EPI_ISL_447644, EPI_ISL_447645, EPI_ISL_447646, EPI_ISL_447647, EPI_ISL_447648, EPI_ISL_447649, EPI_ISL_447650, EPI_ISL_447651, EPI_ISL_447652, EPI_ISL_447653, EPI_ISL_447832, EPI_ISL_447833, EPI_ISL_447834, EPI_ISL_447835, EPI_ISL_447836			
see above	unknown	Department of Medicine	Bampali, M.; Dovrolis, N.; Froukala, E.; Gatzidou, E.; Kassela, K.; N. and Karakasiliotis, I.; Spanakis; Stavropoulou, A.; Tsakris, A.; Veletza, S.
EPI_ISL_455683, EPI_ISL_455684, EPI_ISL_455685, EPI_ISL_455686, EPI_ISL_455687, EPI_ISL_455688, EPI_ISL_455689, EPI_ISL_455690, EPI_ISL_455691, EPI_ISL_455692, EPI_ISL_455693, EPI_ISL_468726			
see above	unknown	Department of Microbiology	Bao, L.; Cai, F.; Deng, W.; Gao, H.; Gao, Q.; Ge, X.; Gong, X.; Hu, Y.; Jiang, D.; Jiang, L.; Kan, B.; Li, C.; Li, J.; Li, Y.; Liu, J.; Lou, X.; Lu, J.; Lv, Z.; Mao, H.; Peng, H.; Qi, Z.; Qin, C.; Shi, W.; Sun, Y.; Tang, H.; Wang, L.; Wang, N.; Wang, X.; Wu, D.; Xu, K.; Yang, M.; Yin, W.; Yin, Y.; Zhang, H.; Zhang, Y.; Zhao, P.; Zhu, L.
EPI_ISL_449480, EPI_ISL_449481, EPI_ISL_449484, EPI_ISL_449486	unknown	Department of Respiratory and Critical Care	Bai, X.; Chang, Y.; Deng, T.; Gao, Y.; He, Y.; Jiang, N.; Liang, L.; Liu, L.; Liu, W.; Ma, L.; Ma, X.; Pan, T.; Shi, H.; W.L. and Gao, Z.; Wang, G.; Wang, X.; Wei, X.; Xu, Y.; Yang, B.; Yang, D.; Zhai, B.; Zhang, J.; Zhang, Z.; Zheng, Y.; Zhou, Q.

EPI_ISL_413584	unknown	Erasmus Medical Center	Anne van der Linden; Annemiek van der Eijk; Aura Timen; Bas Oude Munnink; Claudia Schapendonk; Corien Swaan; Corine GeurtsvanKessel; David Nieuwenhuijse; Irina Chestakova; Jeroen van Kampen; Jolanda Voermans; Madelief Mollers; Manon Haverkate; Marion Koopmans; Mark Pronk; Mart Stein; Pascal Lexmond; Reina Sikkema; Richard Molenkamp; Sandra Kengne Kamga Mobou; on behalf of the Dutch national COVID-19 response team.
EPI_ISL_437602, EPI_ISL_437603, EPI_ISL_437604, EPI_ISL_437605, EPI_ISL_437606, EPI_ISL_437607, EPI_ISL_437608, EPI_ISL_437609, EPI_ISL_437610, EPI_ISL_437611, EPI_ISL_437612, EPI_ISL_437613, EPI_ISL_437614, EPI_ISL_437615, EPI_ISL_437616, EPI_ISL_437617, EPI_ISL_437618, EPI_ISL_437619, EPI_ISL_437620, EPI_ISL_437621, EPI_ISL_437622, EPI_ISL_437623, EPI_ISL_437624			
see above	unknown	Faculty of Medicine	Buathong, R.; Bunprakob, S.; Ghai, S.; Joyjinda, Y.; Mungaomklang, A.; Petcharat, S.; Plipat; Prasithsirikul, W.; Rodpan, A.; Sirichan, N.; T. and Hemachudha, T.; Wacharapluesadee, S.
EPI_ISL_507010, EPI_ISL_507011, EPI_ISL_507012, EPI_ISL_507013, EPI_ISL_507014, EPI_ISL_507015, EPI_ISL_507016, EPI_ISL_507017, EPI_ISL_507018, EPI_ISL_507019, EPI_ISL_507020, EPI_ISL_507021, EPI_ISL_507022, EPI_ISL_507023, EPI_ISL_507024, EPI_ISL_507025, EPI_ISL_507032, EPI_ISL_507033, EPI_ISL_507034, EPI_ISL_507035, EPI_ISL_507036, EPI_ISL_507037, EPI_ISL_507038			
see above	unknown	Infectious Diseases Research, King Abdullah International Medical Research Center (KAIMRC)	Alghoribi; M.F.
EPI_ISL_453813, EPI_ISL_453814, EPI_ISL_453815, EPI_ISL_453816, EPI_ISL_453817, EPI_ISL_453818, EPI_ISL_453820, EPI_ISL_453821, EPI_ISL_453822, EPI_ISL_453823, EPI_ISL_453824, EPI_ISL_453825, EPI_ISL_453826, EPI_ISL_453827, EPI_ISL_453828, EPI_ISL_453829, EPI_ISL_453830, EPI_ISL_453832, EPI_ISL_453833, EPI_ISL_453834, EPI_ISL_453835, EPI_ISL_453836, EPI_ISL_453839, EPI_ISL_453840, EPI_ISL_453844, EPI_ISL_453845, EPI_ISL_453846, EPI_ISL_453847, EPI_ISL_453848, EPI_ISL_453850, EPI_ISL_453851, EPI_ISL_453852, EPI_ISL_453853, EPI_ISL_453854, EPI_ISL_453855, EPI_ISL_453856, EPI_ISL_453859, EPI_ISL_453860, EPI_ISL_453865, EPI_ISL_453866, EPI_ISL_453868, EPI_ISL_453869, EPI_ISL_453870, EPI_ISL_453872, EPI_ISL_453873, EPI_ISL_453875, EPI_ISL_453876, EPI_ISL_453877, EPI_ISL_453879, EPI_ISL_453881, EPI_ISL_453884, EPI_ISL_453885, EPI_ISL_453887, EPI_ISL_453889, EPI_ISL_453890, EPI_ISL_453891, EPI_ISL_453892, EPI_ISL_453893, EPI_ISL_453894, EPI_ISL_453895, EPI_ISL_453896, EPI_ISL_453898, EPI_ISL_453901, EPI_ISL_453906, EPI_ISL_453911, EPI_ISL_453912, EPI_ISL_453913, EPI_ISL_453914, EPI_ISL_453915, EPI_ISL_453916, EPI_ISL_453917, EPI_ISL_453922, EPI_ISL_453924, EPI_ISL_453925, EPI_ISL_453927, EPI_ISL_453929, EPI_ISL_453931, EPI_ISL_453933, EPI_ISL_453939, EPI_ISL_453942, EPI_ISL_453943, EPI_ISL_453944, EPI_ISL_453946, EPI_ISL_453947, EPI_ISL_453951, EPI_ISL_453958, EPI_ISL_454000, EPI_ISL_454001, EPI_ISL_454003, EPI_ISL_454004, EPI_ISL_454005, EPI_ISL_454006, EPI_ISL_454007, EPI_ISL_454008, EPI_ISL_454009, EPI_ISL_454010, EPI_ISL_454011, EPI_ISL_454012, EPI_ISL_454013, EPI_ISL_454014, EPI_ISL_454015, EPI_ISL_454017, EPI_ISL_454018, EPI_ISL_454019, EPI_ISL_454020, EPI_ISL_454021, EPI_ISL_454022, EPI_ISL_454023, EPI_ISL_454025, EPI_ISL_454026, EPI_ISL_454029, EPI_ISL_454030, EPI_ISL_454031, EPI_ISL_454032, EPI_ISL_454033, EPI_ISL_454034, EPI_ISL_454035, EPI_ISL_454036, EPI_ISL_454037, EPI_ISL_454038, EPI_ISL_454039, EPI_ISL_454040, EPI_ISL_454041, EPI_ISL_454042, EPI_ISL_454043, EPI_ISL_454044, EPI_ISL_454045, EPI_ISL_454046, EPI_ISL_454047, EPI_ISL_454048, EPI_ISL_454049, EPI_ISL_454050, EPI_ISL_454051, EPI_ISL_454052, EPI_ISL_454053, EPI_ISL_454055, EPI_ISL_454057, EPI_ISL_454059, EPI_ISL_454060, EPI_ISL_454061, EPI_ISL_454062, EPI_ISL_454063, EPI_ISL_454064, EPI_ISL_454065, EPI_ISL_454066, EPI_ISL_454067, EPI_ISL_454068, EPI_ISL_454069, EPI_ISL_454070, EPI_ISL_454071, EPI_ISL_454072, EPI_ISL_454074, EPI_ISL_454076, EPI_ISL_454077, EPI_ISL_454078, EPI_ISL_454080, EPI_ISL_454081, EPI_ISL_454082, EPI_ISL_454083, EPI_ISL_454085, EPI_ISL_454086, EPI_ISL_454087, EPI_ISL_454089, EPI_ISL_454090, EPI_ISL_454091, EPI_ISL_454092, EPI_ISL_454093, EPI_ISL_454094, EPI_ISL_454095, EPI_ISL_454096, EPI_ISL_454097, EPI_ISL_454098, EPI_ISL_454099, EPI_ISL_454100, EPI_ISL_454101, EPI_ISL_454103, EPI_ISL_454104, EPI_ISL_454127, EPI_ISL_454128, EPI_ISL_454129, EPI_ISL_454130, EPI_ISL_454131, EPI_ISL_454132, EPI_ISL_454133, EPI_ISL_454134, EPI_ISL_454135, EPI_ISL_454137, EPI_ISL_454139, EPI_ISL_454141, EPI_ISL_454142, EPI_ISL_454143, EPI_ISL_454144, EPI_ISL_454145, EPI_ISL_454146, EPI_ISL_454147, EPI_ISL_454149, EPI_ISL_454150, EPI_ISL_454154, EPI_ISL_454158, EPI_ISL_454159, EPI_ISL_454162, EPI_ISL_454163, EPI_ISL_454167, EPI_ISL_454168, EPI_ISL_454169, EPI_ISL_454171, EPI_ISL_454172, EPI_ISL_454173, EPI_ISL_454174, EPI_ISL_454202, EPI_ISL_454203, EPI_ISL_454204, EPI_ISL_454205, EPI_ISL_454206, EPI_ISL_454207, EPI_ISL_454208, EPI_ISL_454209, EPI_ISL_454210, EPI_ISL_454222, EPI_ISL_454223, EPI_ISL_454224, EPI_ISL_454225, EPI_ISL_454226, EPI_ISL_454227, EPI_ISL_454228, EPI_ISL_454229, EPI_ISL_454230, EPI_ISL_454232, EPI_ISL_454233, EPI_ISL_454234, EPI_ISL_454235, EPI_ISL_454236, EPI_ISL_454237, EPI_ISL_454238, EPI_ISL_454240, EPI_ISL_454241, EPI_ISL_454242, EPI_ISL_454243, EPI_ISL_454244, EPI_ISL_454245, EPI_ISL_454246, EPI_ISL_454247, EPI_ISL_454248, EPI_ISL_454249, EPI_ISL_454287, EPI_ISL_454288, EPI_ISL_454294, EPI_ISL_454295, EPI_ISL_454297, EPI_ISL_454300, EPI_ISL_454301, EPI_ISL_454302, EPI_ISL_454303, EPI_ISL_454307, EPI_ISL_454311, EPI_ISL_454314, EPI_ISL_454315, EPI_ISL_454318, EPI_ISL_454319, EPI_ISL_454320, EPI_ISL_454321, EPI_ISL_454322, EPI_ISL_454326, EPI_ISL_454327, EPI_ISL_454328, EPI_ISL_454329, EPI_ISL_454330, EPI_ISL_454331, EPI_ISL_454332, EPI_ISL_454333, EPI_ISL_454334, EPI_ISL_454335, EPI_ISL_454337, EPI_ISL_454338, EPI_ISL_454339, EPI_ISL_454340, EPI_ISL_454341, EPI_ISL_454342, EPI_ISL_454343, EPI_ISL_454344, EPI_ISL_454345, EPI_ISL_454346, EPI_ISL_454347, EPI_ISL_454348, EPI_ISL_454349, EPI_ISL_454350, EPI_ISL_455626, EPI_ISL_582516, EPI_ISL_582517, EPI_ISL_582519			
see above	unknown	Instituto Nacional de Saude (INSA)	Borges et al
EPI_ISL_582523	unknown	Instituto Nacional de Saude (INSA) and Instituto Gulbenkian de Ciencia (IGC)	Borges et al
EPI_ISL_476559	unknown	Laboratoire Sciences et Technologies de la Santé (STS) Institut Supérieur des Sciences de la Santé Université Hassan 1er, Settat, Morocco	Abderraouf Hilali; Amal Souiri; Hajar Lemriss; Jawad Bouzid; Mustapha Mouallif; Narjis Amar; Sanaâ Lemriss; Saâd EL Kabbaj; Touria Essayagh
EPI_ISL_450212, EPI_ISL_450213, EPI_ISL_450214	unknown	Microbiological Diagnostic Unit Public Health Laboratory (MDU-PHL) and Victorian Infectious Disease Reference Laboratory (VIDRL)	Alpren, C.; B.P.; Ballard; C.R.; Caly, L.; Catton, M.; D.A.; Dougal, S.; Druce, J.; Duchene, S.; Easton, M.; Goncalves da Silva, A.; Hoang, T.; Horan, K.; Howden; Lane; M.B.; N.L.; S.A.; Sait, M.; Schultz; Seemann, T.; Sherry; Stinear; Sutton, B.; T.P.; Williamson; van Diemen, A.
EPI_ISL_434570, EPI_ISL_450408, EPI_ISL_450409, EPI_ISL_450410, EPI_ISL_450411, EPI_ISL_450412	unknown	Microbiology	K.-Y.; K.K.W.; K.K.W. and Yuen; To; Yuen
EPI_ISL_483060	unknown	Microbiology, Canterbury Health Laboratories	Anderson, T.; Dilcher, M.
EPI_ISL_478669	unknown	Microbiology, Koc University	Can, F.; Dogan, O.; Nurtop, E.; Ozer, B.
EPI_ISL_434563, EPI_ISL_434564, EPI_ISL_434565, EPI_ISL_434566, EPI_ISL_434567, EPI_ISL_434568, EPI_ISL_434569			
see above	unknown	Microbiology, The University of Hong Kong	K.-Y.; K.K.W. and Yuen; To
EPI_ISL_444518	unknown	Molecular Infectious Disease	Anderson; B.P.; Gerasimova, A.; Kagan; R.M. and Owen, R.; Rosenthal; S.H.
EPI_ISL_434697, EPI_ISL_434708	unknown	National Institute of Health. Department of medical Sciences, Ministry of Public Health, Thailand	Chittaganpitch; Malinee; Okada; Pamnen; Phuygun; Pilailuk; Siripaporn; Sittiporn; Sunthareeya; Thanadachakul; Thanutsapa; Waicharoen; Warawan; Wongboot
EPI_ISL_414626, EPI_ISL_415649, EPI_ISL_415651, EPI_ISL_415652	unknown	National Reference Center for Viruses of Respiratory Infections, Institut Pasteur, Paris	Angela Brisebarre; Flora Donati Vincent Enouf; Marion Barbet; Maud Vanpeene; Méline Bizard; Mélnie Albert; Sylvie Behillil; Sylvie van der Werf
EPI_ISL_447886	unknown	Pathogen Discovery	Anna Uehara; Clinton R. Paden; Haibin Wang; Jing Zhang; Julu Bhatnagar; Krista Queen; Suxiang Tong; Yan Li; Ying Tao
EPI_ISL_450404, EPI_ISL_450405	unknown	School of Public Health, The University of Hong Kong	Brackman; C.J.; Chu; D.K.W.; D.N.C.; L.D.; L.L.M. and Peiris, M.; Perera; Poon; R.A.P.M.; Sims; Sit; T.H.S.; Tsang
EPI_ISL_524798, EPI_ISL_848624, EPI_ISL_848625, EPI_ISL_848626, EPI_ISL_848627, EPI_ISL_848628, EPI_ISL_848629			
see above	Evandro Chagas Institute	Evandro Chagas Institute	A.M.; Barbagelata; E.C.; E.M.A.; Ferreira; G.M.R; H.R; J.A.; Junior; K.C.; L.C.; L.S.; M.C.; Martins; P.S.; Pinheiro; Resque; Santos; Silva; Sousa; Sousa Junior; Viana; W.D.C.; da Silva

Table S4. County data for non-EHC sequences.

Sequence ID	County
EPI_ISL_420786	Polk
EPI_ISL_420787	Cobb
EPI_ISL_424859	Fulton
EPI_ISL_424861	Fulton
EPI_ISL_424864	Fayette
EPI_ISL_426417	Fulton
EPI_ISL_419556	Fulton
EPI_ISL_419557	Fulton
EPI_ISL_420788	Fulton
EPI_ISL_424858	Gwinnett

Table S5. Sequence names and accession numbers for sequences included in the weighted downsampling maximum likelihood analysis

Sequence Name	GISAID Accession	Pass ML Clock Filter	Sequence Name	GISAID Accession	Pass ML Clock Filter	Sequence Name	GISAID Accession	Pass ML Clock Filter	Sequence Name	GISAID Accession	Pass ML Clock Filter	Sequence Name	GISAID Accession	Pass ML Clock Filter
Algeria/G0638_2264/2020	EPI_ISL_418241	TRUE	Germany/BW-UKT-039/2020	EPI_ISL_581480	TRUE	Italy/LOM-UniMI-L71/2020	EPI_ISL_542417	TRUE	Spain/CT-IBV-003165/2020	EPI_ISL_510261	TRUE	USA/IL-NM091/2020	EPI_ISL_444581	TRUE
Algeria/G0640_2265/2020	EPI_ISL_418242	TRUE	Germany/BW-UKT-a033/2020	EPI_ISL_723088	TRUE	Italy/LOM-UniMI-L73/2020	EPI_ISL_542418	TRUE	Spain/CT-IBV-003726/2020	EPI_ISL_480989	TRUE	USA/IL-NM097/2020	EPI_ISL_444585	TRUE
Algeria/G0860_2262/2020	EPI_ISL_420037	TRUE	Germany/BW-UKT-a035/2020	EPI_ISL_723089	TRUE	Italy/LOM-UniMI-L74/2020	EPI_ISL_542419	TRUE	Spain/CT-IBV-003727/2020	EPI_ISL_480961	TRUE	USA/IL-QDX-686/2020	EPI_ISL_571435	TRUE
Andorra/202552/2020	EPI_ISL_539496	TRUE	Germany/BW-UKT-a037/2020	EPI_ISL_723091	TRUE	Italy/LOM-UniMI-L75/2020	EPI_ISL_542420	TRUE	Spain/CT-IBV-004154/2020	EPI_ISL_510066	TRUE	USA/IL_0089/2020	EPI_ISL_424851	TRUE
Argentina/C3013/2020	EPI_ISL_420598	TRUE	Germany/BW-UKT-a043/2020	EPI_ISL_723097	TRUE	Italy/LOM-UniMI-L76/2020	EPI_ISL_542421	TRUE	Spain/CT-IBV-005591/2020	EPI_ISL_508640	TRUE	USA/IN-CDC-2013/2020	EPI_ISL_452131	TRUE
Argentina/PAIS-D0009/2020	EPI_ISL_792451	TRUE	Germany/BW-UKT-a110/2020	EPI_ISL_723086	TRUE	Italy/LOM-UniMI-L77/2020	EPI_ISL_542422	TRUE	Spain/CT-IBV-005594/2020	EPI_ISL_508642	TRUE	USA/IN-Lilly-IPB0173-01bc13/2020	EPI_ISL_902955	TRUE
Argentina/PAIS-D0021/2020	EPI_ISL_792463	TRUE	Germany/BW-UKT-a118/2020	EPI_ISL_723090	TRUE	Italy/LOM-UniMI-L78/2020	EPI_ISL_542423	TRUE	Spain/CT-IBV-005595/2020	EPI_ISL_508643	TRUE	USA/IN-Lilly-IPB0173-02bc01/2020	EPI_ISL_902970	TRUE
Argentina/PAIS-D0042/2020	EPI_ISL_792484	TRUE	Germany/BY-BIM-Pat3/2020	EPI_ISL_414521	TRUE	Italy/LOM-UniMI-L80/2020	EPI_ISL_542425	TRUE	Spain/CT-IBV-005599/2020	EPI_ISL_508646	TRUE	USA/IN-Lilly-IPB0173-02bc07/2020	EPI_ISL_902976	TRUE
Argentina/PAIS-G0003/2020	EPI_ISL_792527	TRUE	Germany/BY-ChVir-1017/2020	EPI_ISL_450209	TRUE	Italy/LOM-UniMI-L81/2020	EPI_ISL_542426	TRUE	Spain/CT-IBV-005608/2020	EPI_ISL_508653	TRUE	USA/IN-Lilly-IPB0173-02bc19/2020	EPI_ISL_902986	TRUE
Australia/NSW108/2020	EPI_ISL_427804	TRUE	Germany/BY-ChVir-3171-5707/2020	EPI_ISL_806526	TRUE	Italy/LOM-UniMI-L84/2020	EPI_ISL_542428	TRUE	Spain/CT-IBV-005635/2020	EPI_ISL_508676	TRUE	USA/IN-Lilly-IPB0173-02bc25/2020	EPI_ISL_902990	TRUE
Australia/NSW119/2020	EPI_ISL_427669	TRUE	Germany/BY-ChVir-929-2/2020	EPI_ISL_450198	TRUE	Italy/LOM-UniMI-L87/2020	EPI_ISL_542431	TRUE	Spain/CT-ISCIII-202042/2020	EPI_ISL_862633	TRUE	USA/IN-Lilly-IPB0173-03bc07/2020	EPI_ISL_903219	TRUE
Australia/NSW141/2020	EPI_ISL_427802	TRUE	Germany/BY-ChVir-W1058-5732/2020	EPI_ISL_754026	TRUE	Italy/LOM-UniMI-L88/2020	EPI_ISL_542432	TRUE	Spain/CT-ISCIII-202044/2020	EPI_ISL_539549	TRUE	USA/IN-Lilly-IPB0173-04bc04/2020	EPI_ISL_911354	TRUE
Australia/NSW2177/2020	EPI_ISL_509507	TRUE	Germany/BY-ChVir-W1122-5753/2020	EPI_ISL_754029	TRUE	Italy/LOM-UniMI-L89/2020	EPI_ISL_542433	TRUE	Spain/CT-ISCIII-209815/2020	EPI_ISL_539554	TRUE	USA/IN-Lilly-IPB0173-04bc21/2020	EPI_ISL_911362	TRUE
Australia/NSW2231/2020	EPI_ISL_500678	TRUE	Germany/BY-ChVir-W1125-5729/2020	EPI_ISL_754031	TRUE	Italy/LOM-UniMI-L90/2020	EPI_ISL_542434	TRUE	Spain/CT-IrsiCaixa-2020030095/2020	EPI_ISL_510689	TRUE	USA/IN-Lilly-IPB0173-05bc27/2020	EPI_ISL_911425	TRUE
Australia/NSW2262/2020	EPI_ISL_500698	TRUE	Germany/BY-ChVir-W1126-5740/2020	EPI_ISL_754032	TRUE	Italy/LOM-UniMI-L92/2020	EPI_ISL_542436	TRUE	Spain/EX-IBV-005003/2020	EPI_ISL_510312	TRUE	USA/IN-Lilly-IPB0173-06bc01/2020	EPI_ISL_911443	TRUE
Australia/NSW371/2020	EPI_ISL_451632	TRUE	Germany/BY-ChVir-W1169-5750/2020	EPI_ISL_754035	TRUE	Italy/LOM-UniMI-L93/2020	EPI_ISL_542437	TRUE	Spain/EX-IBV-005004/2020	EPI_ISL_510313	TRUE	USA/IN-Lilly-IPB0173-06bc02/2020	EPI_ISL_911444	TRUE
Australia/NSW513/2020	EPI_ISL_455053	TRUE	Germany/BY-ChVir-W1175-5759/2020	EPI_ISL_754038	TRUE	Italy/LOM-UniMI-L94/2020	EPI_ISL_542438	TRUE	Spain/EX-IBV-005006/2020	EPI_ISL_510315	TRUE	USA/IN-Lilly-IPB0173-06bc29/2020	EPI_ISL_911468	TRUE
Australia/NSW594/2020	EPI_ISL_478706	TRUE	Germany/BY-IMB01432/2020	EPI_ISL_732544	TRUE	Italy/LOM-UniMI-L95/2020	EPI_ISL_542439	TRUE	Spain/EX-IBV-005010/2020	EPI_ISL_510319	TRUE	USA/IN-Lilly-IPB0173-07bc07/2020	EPI_ISL_911552	TRUE
Australia/NSW69/2020	EPI_ISL_427705	TRUE	Germany/BY-MVP-0017/2020	EPI_ISL_437218	TRUE	Italy/LOM-UniMI-L96/2020	EPI_ISL_542440	TRUE	Spain/EX-IBV-005011/2020	EPI_ISL_510320	TRUE	USA/IN-Lilly-IPB0173-08bc05/2020	EPI_ISL_911567	TRUE
Australia/QLDID927/2020	EPI_ISL_418807	TRUE	Germany/BY-MVP-0023/2020	EPI_ISL_437223	TRUE	Italy/LOM-UniMI-L97/2020	EPI_ISL_542441	TRUE	Spain/EX-IBV-005012/2020	EPI_ISL_510321	TRUE	USA/IN-Lilly-IPB0173-09bc10/2020	EPI_ISL_911612	TRUE
Australia/SAP029/2020	EPI_ISL_450193	TRUE	Germany/BY-MVP-0029/2020	EPI_ISL_437228	TRUE	Italy/LOM-UniMI01/2020	EPI_ISL_417445	TRUE	Spain/EX-IBV-005013/2020	EPI_ISL_510322	TRUE	USA/IN-Lilly-IPB0173-09bc15/2020	EPI_ISL_911617	TRUE
Australia/SAP075/2020	EPI_ISL_451112	TRUE	Germany/BY-MVP-0030/2020	EPI_ISL_437229	TRUE	Italy/LOM-UniMI03/2020	EPI_ISL_417447	TRUE	Spain/EX-IBV-005015/2020	EPI_ISL_510324	TRUE	USA/IN-Lilly-IPB0173-09bc18/2020	EPI_ISL_911620	TRUE
Australia/SAP216/2020	EPI_ISL_468000	TRUE	Germany/BY-MVP-0035/2020	EPI_ISL_437234	TRUE	Italy/LOM-UniMI05/2020	EPI_ISL_779704	TRUE	Spain/EX-IBV-005016/2020	EPI_ISL_510325	TRUE	USA/IN-Lilly-IPB0173-09bc22/2020	EPI_ISL_911624	TRUE
Australia/VIC1275/2020	EPI_ISL_430687	TRUE	Germany/BY-MVP-0037/2020	EPI_ISL_437236	TRUE	Italy/LOM-UniMI08/2020	EPI_ISL_779712	TRUE	Spain/EX-IBV-005017/2020	EPI_ISL_510326	TRUE	USA/IN-Lilly-IPB0173-09bc23/2020	EPI_ISL_911625	TRUE
Australia/VIC143/2020	EPI_ISL_419840	TRUE	Germany/BY-MVP-0038/2020	EPI_ISL_437237	TRUE	Italy/LOM-UniMI09/2020	EPI_ISL_779713	TRUE	Spain/EX-IBV-005020/2020	EPI_ISL_510329	TRUE	USA/IN-Lilly-IPB0173-11bc05/2020	EPI_ISL_911737	TRUE
Australia/VIC1992/2020	EPI_ISL_521898	TRUE	Germany/BY-MVP-0045/2020	EPI_ISL_437244	TRUE	Italy/LOM-UniMI10/2020	EPI_ISL_779714	TRUE	Spain/EX-ISCIII-201247/2020	EPI_ISL_862654	TRUE	USA/IN-Lilly-IPB0173-11bc14/2020	EPI_ISL_911744	TRUE
Australia/VIC320/2020	EPI_ISL_420011	TRUE	Germany/BY-MVP-0050/2020	EPI_ISL_437249	TRUE	Italy/LOM-UniMI13/2020	EPI_ISL_780378	TRUE	Spain/EX-ISCIII-201259/2020	EPI_ISL_871975	TRUE	USA/IN-Lilly-IPB0173-12bc15/2020	EPI_ISL_911753	TRUE
Australia/VIC487/2020	EPI_ISL_426918	TRUE	Germany/BY-MVP-0053/2020	EPI_ISL_437252	TRUE	Italy/LOM-UniMI14/2020	EPI_ISL_780381	TRUE	Spain/EX-ISCIII-201788/2020	EPI_ISL_871979	TRUE	USA/IN-QDX-1973/2020	EPI_ISL_604223	TRUE
Australia/VIC736/2020	EPI_ISL_427015	TRUE	Germany/BY-MVP-0054/2020	EPI_ISL_437253	TRUE	Italy/LOM-UniSR-1/2020	EPI_ISL_413489	TRUE	Spain/GA-IBV-004025/2020	EPI_ISL_510268	TRUE	USA/IN-QDX-1990/2020	EPI_ISL_604332	TRUE
Australia/VIC959/2020	EPI_ISL_430663	TRUE	Germany/BY-MVP-0067/2020	EPI_ISL_437264	TRUE	Italy/MAR-ISS-2330/2020	EPI_ISL_855552	TRUE	Spain/GA-IBV-004029/2020	EPI_ISL_510271	TRUE	USA/IN-QDX-2619/2020	EPI_ISL_604935	TRUE
Australia/VIC966/2020	EPI_ISL_430653	TRUE	Germany/BY-MVP-0073/2020	EPI_ISL_437269	TRUE	Italy/MAR-ISS-2591/2020	EPI_ISL_856895	TRUE	Spain/GA-IBV-004032/2020	EPI_ISL_510273	TRUE	USA/IN-QDX-830/2020	EPI_ISL_571602	TRUE
Australia/WA315/2020	EPI_ISL_596858	TRUE	Germany/BY-MVP-0075/2020	EPI_ISL_437270	TRUE	Italy/MAR-ISS-2596/2020	EPI_ISL_856896	TRUE	Spain/GA-IBV-004041/2020	EPI_ISL_510280	TRUE	USA/KS-KHEL-0005/2020	EPI_ISL_875679	TRUE
Australia/WA46/2020	EPI_ISL_470863	TRUE	Germany/BY-MVP-0079/2020	EPI_ISL_437273	TRUE	Italy/MAR-UnivPM-1/2020	EPI_ISL_417491	TRUE	Spain/GA-IBV-004044/2020	EPI_ISL_510283	TRUE	USA/KY-KSPHL-100007/2020	EPI_ISL_965828	TRUE
Australia/WA531/2020	EPI_ISL_794703	TRUE	Germany/BY-MVP-0082/2020	EPI_ISL_437276	TRUE	Italy/MAR-UnivPM-32898/2020	EPI_ISL_516079	TRUE	Spain/GA-IBV-004049/2020	EPI_ISL_510288	TRUE	USA/KY-KSPHL-100022/2020	EPI_ISL_966356	TRUE
Austria/CeMM0033/2020	EPI_ISL_437922	TRUE	Germany/BY-MVP-0123/2020	EPI_ISL_451940	TRUE	Italy/MAR-UnivPM-34117/2020	EPI_ISL_516081	TRUE	Spain/GA-IBV-004052/2020	EPI_ISL_510291	TRUE	USA/LA-ALSR-0059-NBG/2020	EPI_ISL_434518	TRUE
Austria/CeMM0035/2020	EPI_ISL_437924	TRUE	Germany/BY-MVP-0124/2020	EPI_ISL_451941	TRUE	Italy/MAR-UnivPM-71205/2020	EPI_ISL_516083	TRUE	Spain/GA-IBV-004053/2020	EPI_ISL_510292	TRUE	USA/LA-EVTL141/2020	EPI_ISL_455984	TRUE
Austria/CeMM0038/2020	EPI_ISL_437927	TRUE	Germany/BY-MVP-V2011675/2020	EPI_ISL_420907	TRUE	Italy/MAR-UnivPM-73696/2020	EPI_ISL_516084	TRUE	Spain/GA-IBV-004055/2020	EPI_ISL_510294	TRUE	USA/LA-QDX-1195/2020	EPI_ISL_571941	TRUE
Austria/CeMM0084/2020	EPI_ISL_437949	TRUE	Germany/BY-UHR-3ZK/2020	EPI_ISL_513300	TRUE	Italy/MAR-UnivPM-73702/2020	EPI_ISL_516085	TRUE	Spain/GA-IBV-004058/2020	EPI_ISL_510296	TRUE	USA/LA-QDX-1203/2020	EPI_ISL_571944	TRUE
Austria/CeMM0098/2020	EPI_ISL_437959	TRUE	Germany/BY-UHR-4ZK/2020	EPI_ISL_513301	TRUE	Italy/MAR-UnivPM-78952/2020	EPI_ISL_516086	TRUE	Spain/GA-IBV-004062/2020	EPI_ISL_510300	TRUE	USA/LA-QDX-2055/2020	EPI_ISL_604340	TRUE
Austria/CeMM0111/2020	EPI_ISL_437969	TRUE	Germany/BY-V2010486/2020	EPI_ISL_420898	TRUE	Italy/MOL-AMVRC-2389/2020	EPI_ISL_457728	TRUE	Spain/GA-IBV-004064/2020	EPI_ISL_510302	TRUE	USA/LA-QDX-2100/2020	EPI_ISL_604453	TRUE
Austria/CeMM0126/2020	EPI_ISL_437982	TRUE	Germany/ChVir2127/2020	EPI_ISL_729513	TRUE	Italy/MOL-ISS-1408/2020	EPI_ISL_856881	TRUE	Spain/GA-ISCIII-201796/2020	EPI_ISL_455330	TRUE	USA/LA-QDX-742/2020	EPI_ISL_571531	TRUE
Austria/CeMM0127/2020	EPI_ISL_437983	TRUE	Germany/ChVir3001/2020	EPI_ISL_729514	TRUE	Italy/MOL-ISS-4926/2020	EPI_ISL_856897	TRUE	Spain/GA-ISCIII-202076/2020	EPI_ISL_455332	TRUE	USA/LA-SR0140/2020	EPI_ISL_435445	TRUE
Austria/CeMM0133/2020	EPI_ISL_437986	TRUE	Germany/ChVir3137/2020	EPI_ISL_729534	TRUE	Italy/PAD-UOP-1/2020	EPI_ISL_812968	TRUE	Spain/GA-ISCIII-202230/2020	EPI_ISL_455333	TRUE	USA/LA-SR0141/2020	EPI_ISL_435446	TRUE
Austria/CeMM0135/2020	EPI_ISL_437988	TRUE	Germany/HB-ChVir2101/2020	EPI_ISL_729503	TRUE	Italy/PIE-ISS-1461/2020	EPI_ISL_856899	TRUE	Spain/GA-ISCIII-202282/2020	EPI_ISL_455334	TRUE	USA/LA-SR0267/2020	EPI_ISL_445122	TRUE
Austria/CeMM0172/2020	EPI_ISL_438017	TRUE	Germany/HH-hpi-p1412/2020	EPI_ISL_775941	TRUE	Italy/PIE-SLL-MS46/2020	EPI_ISL_569867	TRUE	Spain/IB-IBV-2496/2020	EPI_ISL_468989	TRUE	USA/LA-UW-MAYO90/2020	EPI_ISL_501078	TRUE
Austria/CeMM0178/2020	EPI_ISL_438021	TRUE	Germany/HH-hpi-p1422/2020	EPI_ISL_775946	TRUE	Italy/PIE-SLL-MS54/2020	EPI_ISL_569870	TRUE	Spain/IB-IBV-2504/2020	EPI_ISL_468961	TRUE	USA/MA-MGH-00016/2020	EPI_ISL_460101	TRUE
Austria/CeMM0180/2020	EPI_ISL_438022	TRUE	Germany/HH-hpi-p1427/2020	EPI_ISL_775948	TRUE	Italy/PIE-SLL-MS56/2020	EPI_ISL_569872	TRUE	Spain/IB-IBV-2506/2020	EPI_ISL_468976	TRUE	USA/MA-MGH-00021/2020	EPI_ISL_460150	TRUE
Austria/CeMM0193/2020	EPI_ISL_438034	TRUE	Germany/HH-hpi-p1437/2020	EPI_ISL_775957	TRUE	Italy/PIE-SLL-MS57/2020	EPI_ISL_569873	TRUE	Spain/IB-IBV-2507/2020	EPI_ISL_469004	TRUE	USA/MA-MGH-00023/2020	EPI_ISL_460149	TRUE
Austria/CeMM0194/2020	EPI_ISL_438035	TRUE	Germany/HH-hpi-p1438/2020	EPI_ISL_775958	TRUE	Italy/PIE-SLL-MS59/2020	EPI_ISL_569875	TRUE	Spain/IB-IBV-2511/2020	EPI_ISL_469013	TRUE	USA/MA-MGH-00024/2020	EPI_ISL_460324	TRUE
Austria/CeMM0195/2020	EPI_ISL_438036	TRUE	Germany/HH-hpi-p1441/2020	EPI_ISL_775960	TRUE	Italy/SAR-AMC-11-4608/2020	EPI_ISL_856882	TRUE	Spain/IB-IBV-2514/2020	EPI_ISL_468988	TRUE	USA/MA-MGH-00050/2020	EPI_ISL_460104	TRUE
Austria/CeMM0198/2020	EPI_ISL_438039	TRUE	Germany/HH-hpi-p1444/2020	EPI_ISL_775963	TRUE	Italy/SAR-AMC-12-4618/2020	EPI_ISL_856883	TRUE	Spain/IB-IBV-2521/2020	EPI_ISL_468953	TRUE	USA/MA-MGH-00054/2020	EPI_ISL_460143	TRUE
Austria/CeMM0245/2020	EPI_ISL_438075	TRUE	Germany/HH-hpi-p1445/2020	EPI_ISL_775964	TRUE	Italy/SAR-ATS-AMC1-4634/2020	EPI_ISL_457825	TRUE	Spain/IB-IBV-2522/2020	EPI_ISL_469000	TRUE	USA/MA-MGH-00136/2020	EPI_ISL_460364	TRUE
Austria/CeMM0265/2020	EPI_ISL_438094	TRUE	Germany/HH-hpi-p1446/2020	EPI_ISL_775965	TRUE	Italy/SIC-AMVRC-4411/2020	EPI_ISL_457721	TRUE	Spain/IB-IBV-2525/2020	EPI_ISL_469014	TRUE	USA/MA-MGH-00160/2020	EPI_ISL_460394	TRUE
Austria/CeMM0269/2020	EPI_ISL_438097	TRUE	Germany/HH-hpi-p1447/2020	EPI_ISL_775966	TRUE	Italy/SIC-ISS-3779/2020	EPI_ISL_856900	TRUE	Spain/IB-IBV-2526/2020	EPI_ISL_469012	TRUE	USA/MA-MGH-00166/2020	EPI_ISL_460290	TRUE
Austria/CeMM0287/2020	EPI_ISL_438112	TRUE	Germany/HH-hpi-p1456/2020	EPI_ISL_775971	TRUE	Italy/SIC-ISS-3784/2020	EPI_ISL_856901	TRUE	Spain/IB-IBV-2537/2020	EPI_ISL_468977	TRUE	USA/MA-MGH-00177/2020	EPI_ISL_460209	TRUE
Austria/CeMM0291/2020	EPI_ISL_438115	TRUE	Germany/HH-hpi-p1460/2020	EPI_ISL_775973	TRUE	Italy/TAA-ISS-219/2020	EPI_ISL_856884	TRUE	Spain/IB-IBV-2538/2020	EPI_ISL_468992	TRUE	USA/MA-MGH-00419/2020	EPI_ISL_460300	TRUE
Austria/CeMM0292/2020	EPI_ISL_438116	TRUE	Germany/HH-hpi-p1474/2020	EPI_ISL_775985	TRUE	Italy/TAA-ISS-3192/2020	EPI_ISL_856903	TRUE	Spain/IB-IBV-2543/2020	EPI_ISL_468990	TRUE	USA/MA-MGH-00422/2020	EPI_ISL_460384	TRUE
Austria/CeMM0300/2020	EPI_ISL_475776	TRUE	Germany/HH-hpi-p1475/2020	EPI_ISL_775986	TRUE	Italy/TE-IZSGC-TE5476/2020	EPI_ISL_420565	TRUE	Spain/IB-IBV-2544/2020	EPI_ISL_468993	TRUE	USA/MA-MGH-00440/2020	EPI_ISL_460116	TRUE
Austria/CeMM0313/2020	EPI_ISL_475785	TRUE	Germany/HH-hpi-p1476/2020	EPI_ISL_775987	TRUE	Italy/TUS-C266/2020	EPI_ISL_738243	TRUE	Spain/IB-IBV-2546/2020	EPI_ISL_468968	TRUE	USA/MA-MGH-00441/2020	EPI_ISL_460428	TRUE
Austria/CeMM0368/2020	EPI_ISL_475815	TRUE	Germany/HH-hpi-p1478/2020	EPI_ISL_775989	TRUE	Italy/TUS-C44/2020	EPI_ISL_738147	TRUE	Spain/IB-IBV-2553/2020	EPI_ISL_468960	TRUE	USA/MA-MGH-00484/2020	EPI_ISL_460286	TRUE
Austria/CeMM0371/2020	EPI_ISL_475816	TRUE	Germany/HH-hpi-p1484/2020	EPI_ISL_775994	TRUE	Italy/TUS-DBM-1/2020	EPI_ISL_582123	TRUE	Spain/IB-IBV-99007192/2020	EPI_ISL_541951	TRUE	USA/MA-MGH-00551/2020	EPI_ISL_460338	TRUE
Austria/CeMM0376/2020	EPI_ISL_475820	TRUE	Germany/HH-hpi-p1485/2020	EPI_ISL_775995	TRUE	Italy/TUS-DBM-10/2020	EPI_ISL_583954	TRUE	Spain/IB-IBV-99007217/2020	EPI_ISL_541958	TRUE	USA/MA-MGH-00563/2020	EPI_ISL_460186	TRUE
Austria/CeMM0377/2020	EPI_ISL_475821	TRUE	Germany/HH-hpi-p1486/2020	EPI_ISL_775996	TRUE	Italy/TUS-DBM-11/2020	EPI_ISL_583955	TRUE	Spain/IB-IBV-h2502/2020	EPI_ISL_468982	TRUE	USA/MA-MGH-00581/2020	EPI_ISL_460426	TRUE
Austria/CeMM0379/2020	EPI_ISL_475822	TRUE	Germany/HH-hpi-p1491/2020	EPI_ISL_775999	TRUE	Italy/TUS-DBM-4/2020	EPI_ISL_583959	TRUE	Spain/IB-IBV-h2536/2020	EPI_ISL_468954	TRUE	USA/MA-MGH-00597/2020	EPI_ISL_460279	TRUE
Austria/CeMM0392/2020	EPI_ISL_475832	TRUE	Germany/HH-hpi-p1494/2020	EPI_ISL_776002	TRUE	Italy/TUS-DBM-7/2020	EPI_ISL_583961	TRUE	Spain/IB-IBV-h2551/2020	EPI_ISL_468999	TRUE	USA/MA-MGH-00683/2020	EPI_ISL_460146	TRUE
Austria/CeMM0425/2020	EPI_ISL_475853	TRUE	Germany/HH-hpi-p1497/2020	EPI_ISL_776003	TRUE	Italy/TUS-DBM-8/2020	EPI_ISL_583962	TRUE	Spain/MC-IBV-002894/2020	EPI_ISL_474934	TRUE	USA/MA-QDX-1455/2020	EPI_ISL_603822	TRUE
Austria/CeMM0427/2020	EPI_ISL_475855	TRUE	Germany/HH-hpi-p1500/2020	EPI_ISL_776006	TRUE	Italy/TUS-ISS-4096/2020	EPI_ISL_856904	TRUE	Spain/MD-H12-16/2020	EPI_ISL_430718	TRUE	USA/MA-QDX-1456/2020	EPI_ISL_603823	TRUE
Austria/CeMM0439/2020	EPI_ISL_475863	TRUE	Germany/HH-hpi-p1501/2020	EPI_ISL_776007	TRUE	Italy/TUS-UOS-07/2020	EPI_ISL_591334	TRUE	Spain/MD-H12-20/2020	EPI_ISL_428684	TRUE	USA/MA-QDX-1505/2020	EPI_ISL_603837	TRUE
Austria/CeMM0449/2020	EPI_ISL_475866	TRUE	Germany/HH-hpi-p1502/2020	EPI_ISL_776008	TRUE	Italy/TUS-UOS-10/2020	EPI_ISL_591327	TRUE	Spain/MD-H12-23/2020	EPI_ISL_428686	TRUE	USA/MA-QDX-1817/2020	EPI_ISL_604109	TRUE
Austria/CeMM0494/2020	EPI_ISL_583583	TRUE	Germany/HH-hpi-p1513/2020	EPI_ISL_775906	TRUE	Italy/TUS-UOS-11/2020	EPI_ISL_591328	TRUE	Spain/MD-H12-2410/2020	EPI_ISL_421180	TRUE	USA/MA-QDX-32/2020	EPI_ISL_467857	TRUE
Austria/CeMM0505/2020	EPI_ISL_583592	TRUE	Germany/HH-hpi-p1516/2020	EPI_ISL_776018	TRUE	Italy/TUS-UOS-4/2020	EPI_ISL_591332	TRUE	Spain/MD-H12-25/2020	EPI_ISL_428688	TRUE	USA/MA-QDX-54/2020	EPI_ISL_467860	TRUE
Austria/CeMM0513/2020	EPI_ISL_583598	TRUE	Germany/HH-hpi-p1522/2020	EPI_ISL_776023	TRUE	Italy/TUS-UOS-6/2020	EPI_ISL_591333	TRUE	Spain/MD-H12-30/2020	EPI_ISL_428693	TRUE	USA/MA_3653/2020	EPI_ISL_424920	TRUE
Austria/CeMM0516/2020	EPI_ISL_475889	TRUE	Germany/HH-hpi-p1529/2020	EPI_ISL_776027	TRUE	Italy/TUS-UOS-8/2020	EPI_ISL_591335	TRUE	Spain/MD-H12-33/2020	EPI_ISL_428696	TRUE	USA/MD-HP00029/2020	EPI_ISL_457752	TRUE
Austria/CeMM0554/2020	EPI_ISL_475905	TRUE	Germany/HH-hpi-p1533/2020	EPI_ISL_776028	TRUE	Italy/TUS-UniSI-1/2020	EPI_ISL_454733	TRUE	Spain/MD-H12-3304/2020	EPI_ISL_428703	TRUE	USA/MD-HP00044/2020	EPI_ISL_434640	TRUE
Austria/CeMM0555/2020	EPI_ISL_475906	TRUE	Germany/HH-hpi-p1537/2020	EPI_ISL_776031	TRUE	Italy/TUS-UniSi01/2020	EPI_ISL_803881	TRUE	Spain/MD-H12-3607/2020	EPI_ISL_428706	TRUE	USA/MD-HP00076/2020	EPI_ISL_438234	TRUE
Austria/CeMM0559/2020	EPI_ISL_475910	TRUE	Germany/HH-hpi-p1551/2020	EPI_ISL_776037	TRUE	Italy/TUS-UniSi03/2020	EPI_ISL_803882	TRUE	Spain/MD-H12-49/2020	EPI_ISL_529982	TRUE	USA/MD-HP00120/2020	EPI_ISL_457813	FALSE
Austria/CeMM0581/2020	EPI_ISL_475928	TRUE	Germany/HH-hpi-p1558/2020	EPI_ISL_776040	TRUE	Italy/TUS-UniSi04/2020	EPI_ISL_803883	TRUE	Spain/MD-H12-H12-1502/2020	EPI_ISL_421172	TRUE	USA/MD-HP00133/2020	EPI_ISL_457821	TRUE
Austria/CeMM0642/2020	EPI_ISL_583619	TRUE	Germany/HH-hpi-p1559/2020	EPI_ISL_776041	TRUE	Italy/TUS-UniSi05/2020	EPI_ISL_803884	TRUE	Spain/MD-H12-LP19-4952/2020	EPI_ISL_428676	TRUE	USA/MD-HP00155/2020	EPI_ISL_457784	TRUE
Austria/CeMM0648/2020	EPI_ISL_583622	TRUE	Germany/HH-hpi-p1563/2020	EPI_ISL_776044	TRUE	Italy/TUS-UniSi07/2020	EPI_ISL_803886	TRUE	Spain/MD-H12-LP20-2327/2020	EPI_ISL_428677	TRUE	USA/MD-HP00159/2020	EPI_ISL_457788	TRUE
Austria/CeMM0650/2020	EPI_ISL_583623	TRUE	Germany/HH-hpi-p1565/2020	EPI_ISL_776045	TRUE	Italy/TUS-UniSi08/2020	EPI_ISL_803887	TRUE	Spain/MD-H12-LP23-5852/2020	EPI_ISL_428679	TRUE	USA/MD-QDX-2299/2020	EPI_ISL_604534	TRUE
Austria/CeMM0655/2020	EPI_ISL_583626	TRUE	Germany/HH-hpi-p1568/2020	EPI_ISL_776047	TRUE	Italy/TUS-UniSi11/2020	EPI_ISL_803892	TRUE	Spain/MD-H12-LP33/2020	EPI_ISL_430721	TRUE	USA/ME-HETL-J0002/2020	EPI_ISL_513415	TRUE
Austria/CeMM0893/2020	EPI_ISL_583746	TRUE	Germany/HH-hpi-p1574/2020	EPI_ISL_776052	TRUE	Italy/TUS-UniSi12/2020	EPI_ISL_803893	TRUE	Spain/MD-HLP-H10-39/2020	EPI_ISL_417963	TRUE	USA/ME-HETL-J0028/2020	EPI_ISL_513440	TRUE
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Austria/CeMM0905/2020	EPI_ISL_583758	TRUE	Germany/HH-hpi-p1583/2020	EPI_ISL_776058	TRUE	Italy/UMB-ISS-3857/2020	EPI_ISL_856905	TRUE	Spain/MD-HLP-LP10-12/2020	EPI_ISL_417969	TRUE	USA/ME-HETL-J0056/2020	EPI_ISL_513467	TRUE
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Austria/CeMM0936/2020	EPI_ISL_583788	TRUE	Germany/HH-hpi-p1597/2020	EPI_ISL_776064	TRUE	Italy/VEN-IZSVe-14-30/2020	EPI_ISL_636468	TRUE	Spain/MD-IBV-001911/2020	EPI_ISL_467066	TRUE	USA/ME-QDX-649/2020	EPI_ISL_571311	TRUE
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Austria/CeMM1066/2020	EPI_ISL_583879	TRUE	Germany/HH-hpi-p1615/2020	EPI_ISL_776069	TRUE	Italy/VEN-IZSVe-17-11/2020	EPI_ISL_452183	TRUE	Spain/MD-IBV-004906/2020	EPI_ISL_481086	TRUE	USA/MI-MDHHS-SC20063/2020	EPI_ISL_437150	TRUE
Bahrein/BAH-02/2020	EPI_ISL_483543	TRUE	Germany/HH-hpi-p1616/2020	EPI_ISL_776070	TRUE	Italy/VEN-IZSVe-18-48/2020	EPI_ISL_452184	TRUE	Spain/MD-IBV-004908/2020	EPI_ISL_481077	TRUE	USA/MI-MDHHS-SC20070/2020	EPI_ISL_437157	TRUE
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Canada/QC-JUS-V5311004/2020	EPI_ISL_889952	TRUE	Germany/NW-HHU-152/2020	EPI_ISL_602522	TRUE	Luxembourg/LNS4254328/2020	EPI_ISL_429737	TRUE	Spain/RI-IBV-99005908/2020	EPI_ISL_537446	TRUE	USA/MN-MDH-1433/2020	EPI_ISL_514652	TRUE
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Canada/QC-JUS-V6020494/2020	EPI_ISL_1241209	TRUE	Germany/NW-HHU-156/2020	EPI_ISL_717977	TRUE	Luxembourg/LNS5358505/2020	EPI_ISL_429735	TRUE	Spain/RI-IBV-99005913/2020	EPI_ISL_537451	TRUE	USA/MN-MDH-1444/2020	EPI_ISL_514663	TRUE
Canada/QC-LSPQ-L00215858/2020	EPI_ISL_535740	TRUE	Germany/NW-HHU-167/2020	EPI_ISL_602489	TRUE	Luxembourg/LNS7721101/2020	EPI_ISL_429769	TRUE	Spain/RI-IBV-99005931/2020	EPI_ISL_537466	TRUE	USA/MN-MDH-1450/2020	EPI_ISL_514669	TRUE
Canada/QC-LSPQ-L00231271/2020	EPI_ISL_535949	TRUE	Germany/NW-HHU-178/2020	EPI_ISL_602500	TRUE	Luxembourg/LNS8188502/2020	EPI_ISL_419598	TRUE	Spain/RI-IBV-99010923/2020	EPI_ISL_732762	TRUE	USA/MN-MDH-146/2020	EPI_ISL_427285	TRUE
Canada/QC-LSPQ-L00241782/2020	EPI_ISL_536290	TRUE	Germany/NW-HHU-18/2020	EPI_ISL_417463	TRUE	Luxembourg/LNS9074543/2020	EPI_ISL_744843	TRUE	Spain/RI-IBV-99010925/2020	EPI_ISL_732764	TRUE	USA/MN-MDH-1476/2020	EPI_ISL_518870	TRUE
Canada/Qc-LSPQ-L00213861/2020	EPI_ISL_535721	TRUE	Germany/NW-HHU-189/2020	EPI_ISL_602463	TRUE	Luxembourg/LNS9371718/2020	EPI_ISL_417526	TRUE	Spain/RI-IBV-h2285/2020	EPI_ISL_468764	TRUE	USA/MN-MDH-1482/2020	EPI_ISL_518876	TRUE
Canada/Qc-LSPQ-L00216909/2020	EPI_ISL_535753	TRUE	Germany/NW-HHU-19/2020	EPI_ISL_417464	TRUE	Luxembourg/LNS9512434/2020	EPI_ISL_419603	TRUE	Spain/RI-IBV-h2286/2020	EPI_ISL_468763	TRUE	USA/MN-MDH-1505/2020	EPI_ISL_518898	TRUE
Canada/Qc-LSPQ-L00228636/2020	EPI_ISL_535874	TRUE	Germany/NW-HHU-191/2020	EPI_ISL_602465	TRUE	Luxembourg/LNS9598665/2020	EPI_ISL_429750	TRUE	Spain/RI-ISCIII-201277/2020	EPI_ISL_455336	TRUE	USA/MN-MDH-1628/2020	EPI_ISL_530224	TRUE
Canada/Qc-LSPQ-L00234537/2020	EPI_ISL_536057	TRUE	Germany/NW-HHU-193/2020	EPI_ISL_602467	TRUE	Luxembourg/LNS9862689/2020	EPI_ISL_419606	TRUE	Spain/VC-FISABIO-1/2020	EPI_ISL_414495	TRUE	USA/MN-MDH-72/2020	EPI_ISL_460062	TRUE
Canada/Qc-LSPQ-L00238342/2020	EPI_ISL_536207	TRUE	Germany/NW-HHU-20/2020	EPI_ISL_417465	TRUE	Malaysia/0121/2020	EPI_ISL_501176	TRUE	Spain/VC-FISABIO-102/2020	EPI_ISL_436197	TRUE	USA/MN-MDH-84/2020	EPI_ISL_460068	TRUE
Canada/Qc-LSPQ-L00239296/2020	EPI_ISL_536243	TRUE	Germany/NW-HHU-21/2020	EPI_ISL_417466	TRUE	Malaysia/0931/2020	EPI_ISL_501180	TRUE	Spain/VC-FISABIO-106/2020	EPI_ISL_436201	TRUE	USA/MN-QDX-1007/2020	EPI_ISL_571733	TRUE
Canada/Qc-LSPQ-L00240479/2020	EPI_ISL_536272	TRUE	Germany/NW-HHU-22/2020	EPI_ISL_417467	TRUE	Malaysia/0956/2020	EPI_ISL_501181	TRUE	Spain/VC-FISABIO-107/2020	EPI_ISL_436202	TRUE	USA/MN-QDX-1008/2020	EPI_ISL_571734	TRUE
Canada/Qc-LSPQ-L00241924/2020	EPI_ISL_536296	TRUE	Germany/NW-HHU-25/2020	EPI_ISL_419542	TRUE	Malaysia/1713/2020	EPI_ISL_501186	TRUE	Spain/VC-FISABIO-108/2020	EPI_ISL_436203	TRUE	USA/MN-QDX-1011/2020	EPI_ISL_571737	TRUE
Canada/Qc-LSPQ-L00243345/2020	EPI_ISL_536359	TRUE	Germany/NW-HHU-27/2020	EPI_ISL_419544	TRUE	Malaysia/2063/2020	EPI_ISL_501188	TRUE	Spain/VC-FISABIO-114/2020	EPI_ISL_436209	TRUE	USA/MN-QDX-1012/2020	EPI_ISL_571738	TRUE
Canada/Qc-LSPQ-L00243417/2020	EPI_ISL_536361	TRUE	Germany/NW-HHU-29/2020	EPI_ISL_419546	TRUE	Malaysia/2065/2020	EPI_ISL_501189	TRUE	Spain/VC-FISABIO-116/2020	EPI_ISL_436211	TRUE	USA/MN-QDX-1013/2020	EPI_ISL_571739	TRUE
Changzhou/JS27/2020	EPI_ISL_455680	TRUE	Germany/NW-HHU-30/2020	EPI_ISL_419547	TRUE	Malaysia/2875/2020	EPI_ISL_501198	TRUE	Spain/VC-FISABIO-117/2020	EPI_ISL_436212	TRUE	USA/MN-QDX-1015/2020	EPI_ISL_571741	TRUE
Chile/BI-ISPCH-1/2020	EPI_ISL_445271	TRUE	Germany/NW-HHU-33/2020	EPI_ISL_419550	TRUE	Malaysia/3611/2020	EPI_ISL_501207	TRUE	Spain/VC-FISABIO-125/2020	EPI_ISL_436220	TRUE	USA/MN-QDX-1018/2020	EPI_ISL_571744	TRUE
Chile/LI-ISPCH-1/2020	EPI_ISL_445273	TRUE	Germany/NW-HHU-38/2020	EPI_ISL_425122	TRUE	Malaysia/IMR-WC9185/2020	EPI_ISL_489994	TRUE	Spain/VC-FISABIO-129/2020	EPI_ISL_436224	TRUE	USA/MN-QDX-1019/2020	EPI_ISL_571745	TRUE
Chile/MA-30037/2020	EPI_ISL_1167793	TRUE	Germany/NW-HHU-40/2020	EPI_ISL_425124	TRUE	Malaysia/IMR_WC1097/2020	EPI_ISL_430441	TRUE	Spain/VC-FISABIO-134/2020	EPI_ISL_436229	TRUE	USA/MN-QDX-1322/2020	EPI_ISL_572111	TRUE
Chile/MA-CMM-31600/2020	EPI_ISL_459861	TRUE	Germany/NW-HHU-41/2020	EPI_ISL_425125	TRUE	Malaysia/MKAK-CL-2020-5047/2020	EPI_ISL_416866	TRUE	Spain/VC-FISABIO-135/2020	EPI_ISL_436230	TRUE	USA/MN-QDX-1330/2020	EPI_ISL_572119	TRUE
Chile/MA-ISPCH-4/2020	EPI_ISL_445282	TRUE	Germany/NW-HHU-42-2/2020	EPI_ISL_425127	TRUE	Malaysia/MKAK-CL-2020-6430/2020	EPI_ISL_416886	TRUE	Spain/VC-FISABIO-142/2020	EPI_ISL_436237	TRUE	USA/MN-QDX-1334/2020	EPI_ISL_572123	TRUE
Chile/MA-ISPCH-7/2020	EPI_ISL_445288	TRUE	Germany/NW-HHU-42-3/2020	EPI_ISL_425128	TRUE	Malaysia/UNIMAS-0099/2020	EPI_ISL_718163	TRUE	Spain/VC-FISABIO-145/2020	EPI_ISL_436240	TRUE	USA/MN-QDX-1340/2020	EPI_ISL_572129	TRUE
Chile/RM-ISPCH-32/2020	EPI_ISL_445311	TRUE	Germany/NW-HHU-42/2020	EPI_ISL_425126	TRUE	Malaysia/UNIMAS-0136/2020	EPI_ISL_718152	TRUE	Spain/VC-FISABIO-147/2020	EPI_ISL_436242	TRUE	USA/MN-QDX-1341/2020	EPI_ISL_572130	TRUE
Chile/RM-ISPCH-34/2020	EPI_ISL_445313	TRUE	Germany/NW-HHU-47/2020	EPI_ISL_425131	TRUE	Malaysia/UNIMAS-0172/2020	EPI_ISL_718150	TRUE	Spain/VC-FISABIO-152/2020	EPI_ISL_436247	TRUE	USA/MN-QDX-1358/2020	EPI_ISL_572147	TRUE
Chile/RM-ISPCH-48/2020	EPI_ISL_445327	TRUE	Germany/NW-HHU-60/2020	EPI_ISL_523931	TRUE	Mexico/CMX-INER-0008/2020	EPI_ISL_837610	TRUE	Spain/VC-FISABIO-155/2020	EPI_ISL_436250	TRUE	USA/MN-QDX-1359/2020	EPI_ISL_572148	TRUE
Chile/Santiago-PUC_MVL_0024/2020	EPI_ISL_801615	TRUE	Germany/NW-HHU-63/2020	EPI_ISL_523934	TRUE	Mexico/CMX-INER-0009/2020	EPI_ISL_837611	TRUE	Spain/VC-FISABIO-156/2020	EPI_ISL_436251	TRUE	USA/MN-QDX-1364/2020	EPI_ISL_572153	TRUE
Chile/Santiago-PUC_MVL_0027/2020	EPI_ISL_801618	TRUE	Germany/NW-HHU-78/2020	EPI_ISL_523949	TRUE	Mexico/CMX-InDRE-06/2020	EPI_ISL_424673	TRUE	Spain/VC-FISABIO-17/2020	EPI_ISL_419681	TRUE	USA/MN-QDX-1367/2020	EPI_ISL_572156	TRUE
Chile/Santiago-PUC_MVL_0041/2020	EPI_ISL_801632	TRUE	Germany/NW-HHU-79/2020	EPI_ISL_523950	TRUE	Mexico/CMX-InDRE_15/2020	EPI_ISL_455439	TRUE	Spain/VC-FISABIO-170/2020	EPI_ISL_436265	TRUE	USA/MN-QDX-1374/2020	EPI_ISL_572163	TRUE
Chile/Santiago-PUC_MVL_0051/2020	EPI_ISL_801641	TRUE	Germany/NW-RKI-N-0002/2020	EPI_ISL_481256	TRUE	Mexico/GUA-IBT-IMSS-428/2020	EPI_ISL_1301621	TRUE	Spain/VC-FISABIO-171/2020	EPI_ISL_436266	TRUE	USA/MN-QDX-1378/2020	EPI_ISL_572167	TRUE
Chile/Santiago-PUC_MVL_0075/2020	EPI_ISL_801659	TRUE	Germany/NW-UBI-1/2020	EPI_ISL_602282	TRUE	Mexico/NLE-UANL-126/2020	EPI_ISL_648595	TRUE	Spain/VC-FISABIO-173/2020	EPI_ISL_436268	TRUE	USA/MN-QDX-1386/2020	EPI_ISL_572175	TRUE
Chile/Santiago-PUC_MVL_0083/2020	EPI_ISL_801667	TRUE	Germany/NW-UBI-11/2020	EPI_ISL_602292	TRUE	Morocco/6895/2020	EPI_ISL_459973	TRUE	Spain/VC-FISABIO-174/2020	EPI_ISL_436269	TRUE	USA/MN-QDX-1565/2020	EPI_ISL_603975	TRUE
Chile/Santiago-op9d0/2020	EPI_ISL_801590	TRUE	Germany/NW-UBI-3/2020	EPI_ISL_602284	TRUE	Morocco/RMPS-04/2020	EPI_ISL_469052	TRUE	Spain/VC-FISABIO-188/2020	EPI_ISL_436283	TRUE	USA/MN-QDX-1601/2020	EPI_ISL_603981	TRUE
Chongqing/ZX01/2020	EPI_ISL_408479	TRUE	Germany/NW-UBI-47/2020	EPI_ISL_632311	TRUE	Morocco/refstage1/2020	EPI_ISL_476559	TRUE	Spain/VC-FISABIO-19/2020	EPI_ISL_419683	TRUE	USA/MN-QDX-1664/2020	EPI_ISL_604003	TRUE
Colombia/ANT-UdeA-200325-01/2020	EPI_ISL_536399	TRUE	Germany/NW-UKB-06586/2020	EPI_ISL_983583	TRUE	NanChang/JX216/2020	EPI_ISL_417420	TRUE	Spain/VC-FISABIO-190/2020	EPI_ISL_436285	TRUE	USA/MN-QDX-1694/2020	EPI_ISL_604008	TRUE
Colombia/BOL-INS-84730/2020	EPI_ISL_497738	TRUE	Germany/SH-ChVir2000/2020	EPI_ISL_729498	TRUE	Nanchang/JX14/2020	EPI_ISL_421243	TRUE	Spain/VC-FISABIO-195/2020	EPI_ISL_436290	TRUE	USA/MN-QDX-1702/2020	EPI_ISL_604061	TRUE
Colombia/BOY-GUR-0210/2020	EPI_ISL_447741	TRUE	Germany/SH-ChVir2105/2020	EPI_ISL_729504	TRUE	Nanchang/JX149/2020	EPI_ISL_421247	TRUE	Spain/VC-FISABIO-196/2020	EPI_ISL_436291	TRUE	USA/MN-QDX-1732/2020	EPI_ISL_604074	TRUE
Colombia/HUI-GUV-92061/2020	EPI_ISL_447759	TRUE	Germany/SH-ChVir2109/2020	EPI_ISL_729505	TRUE	Nanchang/JX39/2020	EPI_ISL_421248	TRUE	Spain/VC-FISABIO-202/2020	EPI_ISL_436297	TRUE	USA/MN-QDX-1733/2020	EPI_ISL_604075	TRUE
Colombia/VAC-INS-82320/2020	EPI_ISL_456151	TRUE	Germany/SH-ChVir2114/2020	EPI_ISL_729507	TRUE	Nanchang/JX90/2020	EPI_ISL_421245	TRUE	Spain/VC-FISABIO-206/2020	EPI_ISL_436301	TRUE	USA/MN-QDX-1754/2020	EPI_ISL_604084	TRUE
CostaRica/INC-0025/2020	EPI_ISL_491437	TRUE	Germany/SH-ChVir2119/2020	EPI_ISL_729510	TRUE	Nanchang/JXN3T4/2020	EPI_ISL_421246	TRUE	Spain/VC-FISABIO-219/2020	EPI_ISL_436314	TRUE	USA/MN-QDX-2030/2020	EPI_ISL_604349	TRUE
Crimea/SRC-80603/2020	EPI_ISL_428901	TRUE	Germany/SH-ChVir2125/2020	EPI_ISL_729512	TRUE	Netherlands/Flevoland_1/2020	EPI_ISL_415460	TRUE	Spain/VC-FISABIO-221/2020	EPI_ISL_436316	TRUE	USA/MN-QDX-2036/2020	EPI_ISL_604350	TRUE
Croatia/52085_ID1647_2/2020	EPI_ISL_985400	TRUE	Germany/SH-ChVir3032/2020	EPI_ISL_729515	TRUE	Netherlands/GE-EMC-217/2020	EPI_ISL_523199	TRUE	Spain/VC-FISABIO-222/2020	EPI_ISL_436317	TRUE	USA/MN-QDX-2717/2020	EPI_ISL_605029	TRUE
Croatia/52087_ID1647_4/2020	EPI_ISL_985405	TRUE	Germany/SH-ChVir3034/2020	EPI_ISL_729516	TRUE	Netherlands/LI-EMC-83/2020	EPI_ISL_523288	TRUE	Spain/VC-FISABIO-223/2020	EPI_ISL_436318	TRUE	USA/MN-QDX-2725/2020	EPI_ISL_605031	TRUE
Croatia/52089_ID1647_6/2020	EPI_ISL_985407	TRUE	Germany/SH-ChVir3035/2020	EPI_ISL_729517	TRUE	Netherlands/Leiden-0008/2020	EPI_ISL_482745	TRUE	Spain/VC-FISABIO-230/2020	EPI_ISL_436325	TRUE	USA/MN-QDX-954/2020	EPI_ISL_571755	TRUE
Croatia/52091_ID1647_8/2020	EPI_ISL_985433	TRUE	Germany/SH-ChVir3037/2020	EPI_ISL_729518	TRUE	Netherlands/Limburg_13/2020	EPI_ISL_461001	TRUE	Spain/VC-FISABIO-231/2020	EPI_ISL_436326	TRUE	USA/MN-QDX-967/2020	EPI_ISL_571766	TRUE
Cuba/USAFSAM-S030/2020	EPI_ISL_513312	TRUE	Germany/SH-ChVir3054/2020	EPI_ISL_729524	TRUE	Netherlands/Limburg_2/2020	EPI_ISL_414424	TRUE	Spain/VC-FISABIO-241/2020	EPI_ISL_436336	TRUE	USA/MN-QDX-972/2020	EPI_ISL_571771	TRUE
Cyprus/001/2020	EPI_ISL_463741	TRUE	Germany/SH-ChVir3058/2020	EPI_ISL_729525	TRUE	Netherlands/Limburg_5/2020	EPI_ISL_414448	TRUE	Spain/VC-FISABIO-247/2020	EPI_ISL_436342	TRUE	USA/MN-QDX-988/2020	EPI_ISL_571786	TRUE
CzechRepublic/FNHK-00401/2020	EPI_ISL_895786	TRUE	Germany/SH-ChVir3065/2020	EPI_ISL_729528	TRUE	Netherlands/NA_1/2020	EPI_ISL_415465	TRUE	Spain/VC-FISABIO-250/2020	EPI_ISL_436345	TRUE	USA/MN-QDX-992/2020	EPI_ISL_571790	TRUE
CzechRepublic/FNHK-010/2020	EPI_ISL_895738	TRUE	Germany/SH-ChVir3192/2020	EPI_ISL_729538	TRUE	Netherlands/NA_100/2020	EPI_ISL_422649	TRUE	Spain/VC-FISABIO-260/2020	EPI_ISL_436355	TRUE	USA/MN-QDX-994/2020	EPI_ISL_571791	TRUE
CzechRepublic/FNHK-022/2020	EPI_ISL_895779	TRUE	Germany/SH-ChVir3193/2020	EPI_ISL_729539	TRUE	Netherlands/NA_11/2020	EPI_ISL_415467	TRUE	Spain/VC-FISABIO-272/2020	EPI_ISL_436367	TRUE	USA/MN-QDX-998/2020	EPI_ISL_571795	TRUE
CzechRepublic/FNHK-030/2020	EPI_ISL_895776	TRUE	Germany/SH-ChVir3196/2020	EPI_ISL_729540	TRUE	Netherlands/NA_156/2020	EPI_ISL_422691	TRUE	Spain/VC-FISABIO-273/2020	EPI_ISL_436368	TRUE	USA/MN-UW266/2020	EPI_ISL_418051	TRUE
CzechRepublic/FNHK-04701/2020	EPI_ISL_895800	TRUE	Germany/SH-ChVir3201/2020	EPI_ISL_729542	TRUE	Netherlands/NA_167/2020	EPI_ISL_422702	TRUE	Spain/VC-FISABIO-274/2020	EPI_ISL_436369	TRUE	USA/MN-UW335/2020	EPI_ISL_418902	TRUE
CzechRepublic/FNHK-06401/2020	EPI_ISL_895784	TRUE	Germany/SH-ChVir3210/2020	EPI_ISL_729465	TRUE	Netherlands/NA_174/2020	EPI_ISL_422709	TRUE	Spain/VC-FISABIO-281/2020	EPI_ISL_436376	TRUE	USA/MN31-MDH31/2020	EPI_ISL_417469	TRUE
CzechRepublic/FNHK-06801/2020	EPI_ISL_895810	TRUE	Germany/SH-ChVir3214/2020	EPI_ISL_729544	TRUE	Netherlands/NA_177/2020	EPI_ISL_422712	TRUE	Spain/VC-FISABIO-296/2020	EPI_ISL_436391	TRUE	USA/MN62-MDH62/2020	EPI_ISL_419390	TRUE
CzechRepublic/FNHK-09701/2020	EPI_ISL_895830	TRUE	Germany/SH-ChVir3219/2020	EPI_ISL_729547	TRUE	Netherlands/NA_186/2020	EPI_ISL_422721	TRUE	Spain/VC-FISABIO-30/2020	EPI_ISL_420115	TRUE	USA/MO-MSPHL-000007/2020	EPI_ISL_1362558	TRUE
CzechRepublic/FNHK-103/2020	EPI_ISL_895736	TRUE	Germany/SH-hpi-p1578/2020	EPI_ISL_776555	TRUE	Netherlands/NA_19/2020	EPI_ISL_415475	TRUE	Spain/VC-FISABIO-302/2020	EPI_ISL_436397	TRUE	USA/MO-MSPHL-000022/2020	EPI_ISL_1362573	TRUE
CzechRepublic/FNHK-116/2020	EPI_ISL_895794	TRUE	Germany/SH-hpi-p1886/2020	EPI_ISL_776556	TRUE	Netherlands/NA_193/2020	EPI_ISL_422728	TRUE	Spain/VC-FISABIO-31/2020	EPI_ISL_420116	TRUE	USA/MO-QDX-530/2020	EPI_ISL_571382	TRUE
CzechRepublic/IAB20_006_207/2020	EPI_ISL_889308	TRUE	Germany/SL-SU-10428103/2020	EPI_ISL_707954	FALSE	Netherlands/NA_197/2020	EPI_ISL_422732	TRUE	Spain/VC-FISABIO-316/2020	EPI_ISL_436411	TRUE	USA/MO-QDX-535/2020	EPI_ISL_571386	TRUE
CzechRepublic/IAB20_006_29/2020	EPI_ISL_889313	TRUE	Germany/TH-IIMK-CaSe-22/2020	EPI_ISL_763087	TRUE	Netherlands/NA_203/2020	EPI_ISL_422738	TRUE	Spain/VC-FISABIO-43/2020	EPI_ISL_420127	TRUE	USA/MS-CDC-6569/2020	EPI_ISL_648021	TRUE
CzechRepublic/IAB20_006_31/2020	EPI_ISL_889315	TRUE	Germany/TH-IIMK-CaSe-23/2020	EPI_ISL_763088	TRUE	Netherlands/NA_206/2020	EPI_ISL_422741	TRUE	Spain/VC-FISABIO-45/2020	EPI_ISL_420129	TRUE	USA/MS-CDC-6571/2020	EPI_ISL_648023	TRUE
CzechRepublic/IAB20_006_38/2020	EPI_ISL_889321	TRUE	Germany/TH-IIMK-CaSe-24/2020	EPI_ISL_763089	TRUE	Netherlands/NA_21/2020	EPI_ISL_415478	TRUE	Spain/VC-FISABIO-471/2020	EPI_ISL_447471	TRUE	USA/NC-CDC-6999/2020	EPI_ISL_452124	TRUE
CzechRepublic/IAB20_006_42/2020	EPI_ISL_889322	TRUE	Greece/154/2020	EPI_ISL_434469	TRUE	Netherlands/NA_217/2020	EPI_ISL_422752	TRUE	Spain/VC-FISABIO-50/2020	EPI_ISL_420131	TRUE	USA/NC-UNC-LCCC0001/2020	EPI_ISL_877585	TRUE
CzechRepublic/IAB20_016_056/2020	EPI_ISL_889375	TRUE	Greece/216_34732/2020	EPI_ISL_447641	TRUE	Netherlands/NA_236/2020	EPI_ISL_422770	TRUE	Spain/VC-FISABIO-51/2020	EPI_ISL_420132	TRUE	USA/NC_0024/2020	EPI_ISL_424872	TRUE
CzechRepublic/IAB_1/2020	EPI_ISL_426883	TRUE	Greece/247_32207/2020	EPI_ISL_447647	TRUE	Netherlands/NA_261/2020	EPI_ISL_422795	TRUE	Spain/VC-FISABIO-55/2020	EPI_ISL_425179	TRUE	USA/NC_6999/2020	EPI_ISL_424871	TRUE
CzechRepublic/Seq3/2020	EPI_ISL_426356	TRUE	Greece/259_31928/2020	EPI_ISL_447651	TRUE	Netherlands/NA_268/2020	EPI_ISL_422579	TRUE	Spain/VC-FISABIO-551/2020	EPI_ISL_447493	TRUE	USA/NJ-NYUMC111/2020	EPI_ISL_421723	TRUE
Denmark/ALAB-HH57/2020	EPI_ISL_429305	TRUE	Greece/264_32497/2020	EPI_ISL_437908	TRUE	Netherlands/NA_271/2020	EPI_ISL_422582	TRUE	Spain/VC-FISABIO-565/2020	EPI_ISL_447497	TRUE	USA/NJ-NYUMC553/2020	EPI_ISL_444670	TRUE
Denmark/ALAB-SSI-1272/2020	EPI_ISL_444841	TRUE	Greece/42_36236/2020	EPI_ISL_437899	TRUE	Netherlands/NA_275/2020	EPI_ISL_422586	TRUE	Spain/VC-FISABIO-569/2020	EPI_ISL_447500	TRUE	USA/NJ-QDX-1210/2020	EPI_ISL_571971	TRUE
Denmark/ALAB-SSI-246/2020	EPI_ISL_437661	TRUE	Greece/55_36015/2020	EPI_ISL_447834	TRUE	Netherlands/NA_289/2020	EPI_ISL_422598	TRUE	Spain/VC-FISABIO-570/2020	EPI_ISL_447501	TRUE	USA/NJ-QDX-1213/2020	EPI_ISL_571974	TRUE
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England/CAMB-79A04/2020	EPI_ISL_433813	TRUE	India/WB-IK3/2020	EPI_ISL_511900	TRUE	Portugal/PT1006/2020	EPI_ISL_511553	TRUE	Switzerland/GE-HUG-8102/2020	EPI_ISL_415458	TRUE	USA/NY-PV09418/2020	EPI_ISL_450097	TRUE
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England/LEED-2A890D/2020	EPI_ISL_539028	TRUE	Indonesia/JI-ITD-853Sp/2020	EPI_ISL_437187	TRUE	Portugal/PT1325/2020	EPI_ISL_511284	TRUE	Switzerland/SZ-ETHZ-100096/2020	EPI_ISL_451688	TRUE	USA/NY-PV09483/2020	EPI_ISL_450155	TRUE
England/LEED-2A9DE2/2020	EPI_ISL_538773	TRUE	Indonesia/JK-EIJK-0317/2020	EPI_ISL_435282	TRUE	Portugal/PT1337/2020	EPI_ISL_511296	TRUE	Switzerland/SZ-ETHZ-100140/2020	EPI_ISL_451724	TRUE	USA/NY-PV09504/2020	EPI_ISL_450170	TRUE
England/LIVE-1D2AAE/2020	EPI_ISL_612405	TRUE	Indonesia/KI-EIJK-05/2020	EPI_ISL_467374	TRUE	Portugal/PT1393/2020	EPI_ISL_511352	TRUE	Switzerland/SZ-UZH-1000478990/2020	EPI_ISL_524484	TRUE	USA/NY-QDX-100/2020	EPI_ISL_468576	TRUE
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Finland/25MS3E61/2020	EPI_ISL_1240101	TRUE	Israel/CVL-n2875/2020	EPI_ISL_649083	TRUE	Scotland/EDB153/2020	EPI_ISL_433074	TRUE	Turkey/HSGM-5769/2020	EPI_ISL_428717	TRUE	USA/NY-Wadsworth-11690-01/2020	EPI_ISL_525588	TRUE
Finland/29M13S2/2020	EPI_ISL_1240179	TRUE	Israel/CVL-n3767/2020	EPI_ISL_649082	TRUE	Scotland/EDB2797/2020	EPI_ISL_488887	TRUE	Turkey/HSGM-674/2020	EPI_ISL_437304	TRUE	USA/NY-Wadsworth-12437-01/2020	EPI_ISL_676730	TRUE
Finland/29M25S2/2020	EPI_ISL_1240181	TRUE	Israel/CVL-n4109/2020	EPI_ISL_649072	TRUE	Scotland/EDB283/2020	EPI_ISL_425963	TRUE	Turkey/HSGM-7718/2020	EPI_ISL_428719	TRUE	USA/NY-Wadsworth-13978-01/2020	EPI_ISL_525608	TRUE
Foshan/20SF207/2020	EPI_ISL_406534	TRUE	Israel/n14269/2020	EPI_ISL_483704	TRUE	Scotland/EDB5665/2020	EPI_ISL_487648	TRUE	Turkey/HSGM-8001/2020	EPI_ISL_428720	TRUE	USA/NY-Wadsworth-14427-04/2020	EPI_ISL_676735	TRUE
Foshan/20SF210/2020	EPI_ISL_406535	TRUE	Italy/ABR-AMVRC-TE7859/2020	EPI_ISL_429236	TRUE	Scotland/GCVR-16FD25/2020	EPI_ISL_489597	TRUE	Turkey/HSGM-8003/2020	EPI_ISL_428721	TRUE	USA/NY-Wadsworth-144456-01/2020	EPI_ISL_676981	TRUE
Foshan/20SF211/2020	EPI_ISL_406536	TRUE	Italy/ABR-IZSGC-484/2020	EPI_ISL_457749	TRUE	Scotland/GCVR-1705CF/2020	EPI_ISL_459700	TRUE	Turkey/HSGM-8010/2020	EPI_ISL_428722	TRUE	USA/NY-Wadsworth-16084-01/2020	EPI_ISL_676737	TRUE
France/ARA-0591/2020	EPI_ISL_508934	TRUE	Italy/ABR-IZSGC-TE4880/2020	EPI_ISL_418256	TRUE	Scotland/GCVR-1707E7/2020	EPI_ISL_501635	TRUE	Turkey/HSGM-8968/2020	EPI_ISL_429861	TRUE	USA/NY-Wadsworth-16480-01/2020	EPI_ISL_426317	TRUE
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France/ARA-07055/2020	EPI_ISL_508938	TRUE	Italy/ABR-IZSGC-TE5166/2020	EPI_ISL_420563	TRUE	Scotland/GCVR-171713/2020	EPI_ISL_489666	TRUE	Turkey/KOC-IST-B316/2020	EPI_ISL_613462	TRUE	USA/NY-Wadsworth-29389-01/2020	EPI_ISL_525631	TRUE
France/ARA-07639/2020	EPI_ISL_508872	TRUE	Italy/ABR-IZSGC-TE5173/2020	EPI_ISL_528924	TRUE	Scotland/GCVR-1721E7/2020	EPI_ISL_469943	TRUE	UnitedArabEmirates/L5621/2020	EPI_ISL_435136	TRUE	USA/NY-Wadsworth-31786-01/2020	EPI_ISL_676779	TRUE
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France/ARA-08067/2020	EPI_ISL_508946	TRUE	Italy/ABR-IZSGC-TE5473/2020	EPI_ISL_436718	TRUE	Serbia/Pancevo-007910104/2020	EPI_ISL_676576	TRUE	UnitedArabEmirates/skmc-004/2020	EPI_ISL_582613	TRUE	USA/NY-Wadsworth-33279-01/2020	EPI_ISL_525638	TRUE
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France/ARA-SC150/2020	EPI_ISL_634818	TRUE	Italy/CAM-CRGS-26/2020	EPI_ISL_876990	TRUE	Shanghai/SH0025/2020	EPI_ISL_416334	TRUE	Wuhan/HB-WH2-158/2020	EPI_ISL_454926	TRUE	USA/TX-HMH035/2020	EPI_ISL_434744	TRUE
France/ARA-SC154/2020	EPI_ISL_634822	TRUE	Italy/CAM-CRGS-27/2020	EPI_ISL_876991	TRUE	Shanghai/SH0027/2020	EPI_ISL_416336	TRUE	Wuhan/HB-WH2-159/2020	EPI_ISL_454927	TRUE	USA/TX-HMH0351/2020	EPI_ISL_434945	TRUE
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France/IDF_HB_112003000900/2020	EPI_ISL_940532	TRUE	Italy/LOM-ASST-6/2020	EPI_ISL_486662	TRUE	Sichuan/SC-WCH-308/2020	EPI_ISL_451379	TRUE	Wuhan/WH03/2020	EPI_ISL_406800	TRUE	USA/VA-DCLS-0604/2020	EPI_ISL_526821	TRUE
France/IDF_HB_112003008027/2020	EPI_ISL_1296406	TRUE	Italy/LOM-ASST-7/2020	EPI_ISL_486663	TRUE	Sichuan/SC-WCH-310/2020	EPI_ISL_451380	TRUE	Wuhan/WHU01/2020	EPI_ISL_406716	TRUE	USA/VA_NIDDL_2768/2020	EPI_ISL_491916	TRUE
France/IDF_HB_112003012438/2020	EPI_ISL_940272	TRUE	Italy/LOM-ASST-8/2020	EPI_ISL_486664	TRUE	Sichuan/SC-WCH-311/2020	EPI_ISL_451381	TRUE	Wuhan/WHU02/2020	EPI_ISL_406717	TRUE	USA/VI-CDC-3688/2020	EPI_ISL_452123	TRUE
France/IDF_HB_112003047812/2020	EPI_ISL_940375	TRUE	Italy/LOM-ASST-CDG1/2020	EPI_ISL_412973	TRUE	Sichuan/SC-WCH-315/2020	EPI_ISL_451382	TRUE	Wuhan/WHUH005/2020	EPI_ISL_449480	TRUE	USA/WA-NH22/2020	EPI_ISL_418789	TRUE
France/IDF_HB_112003050136/2020	EPI_ISL_940384	TRUE	Italy/LOM-INMI-10734/2020	EPI_ISL_568579	TRUE	Sichuan/SC-WCH1-005/2020	EPI_ISL_451376	TRUE	Wuhan/WHUH006/2020	EPI_ISL_449481	TRUE	USA/WA-NH7/2020	EPI_ISL_418776	TRUE
France/IDF_HB_112003050264/2020	EPI_ISL_940386	TRUE	Italy/LOM-INMI-11550/2020	EPI_ISL_460090	TRUE	Sichuan/SC-WCH2-006/2020	EPI_ISL_451076	TRUE	Wuhan/WHUH011/2020	EPI_ISL_449484	TRUE	USA/WA-QDX-1118/2020	EPI_ISL_571909	TRUE
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France/IDF_HB_112003050508/2020	EPI_ISL_940392	TRUE	Italy/LOM-INMI-12578/2020	EPI_ISL_460093	TRUE	Sichuan/SC-WCH3-255/2020	EPI_ISL_451384	TRUE	Wuhan/WIV06/2019	EPI_ISL_402129	TRUE	USA/WA-QDX-2319/2020	EPI_ISL_604732	TRUE
France/IDF_HB_112003052315/2020	EPI_ISL_940401	TRUE	Italy/LOM-INMI-13075-B/2020	EPI_ISL_451308	TRUE	Sichuan/SC-WCH4-284/2020	EPI_ISL_451386	TRUE	Wuhan/YB012504/2020	EPI_ISL_450489	TRUE	USA/WA-S100/2020	EPI_ISL_417153	TRUE
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France/IDF_HB_112003053402/2020	EPI_ISL_940413	TRUE	Italy/LOM-INMI-13221/2020	EPI_ISL_460085	TRUE	Sichuan/SC-WCH4-288/2020	EPI_ISL_451390	TRUE	Xinyu/JX122/2020	EPI_ISL_421249	TRUE	USA/WA-S115/2020	EPI_ISL_417168	TRUE
France/IDF_HB_112003053405/2020	EPI_ISL_940414	TRUE	Italy/LOM-INMI-5314-N/2020	EPI_ISL_451307	TRUE	Sichuan/SC-WCH4-290/2020	EPI_ISL_451392	TRUE	Yichun/JX2325/2020	EPI_ISL_455460	TRUE	USA/WA-S122/2020	EPI_ISL_417175	TRUE
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France/IDF_HB_112003064497/2020	EPI_ISL_940438	TRUE	Italy/LOM-INMI-7070/2020	EPI_ISL_460086	TRUE	Sichuan/SC-WCH4-293/2020	EPI_ISL_451394	TRUE	Zhejiang/CN1/2020	EPI_ISL_455683	TRUE	USA/WA-S142/2020	EPI_ISL_430179	TRUE
France/IDF_HB_112003064531/2020	EPI_ISL_940440	TRUE	Italy/LOM-INMI-8058/2020	EPI_ISL_460094	TRUE	Sichuan/SC-WCH4-301/2020	EPI_ISL_451395	TRUE	Zhejiang/CN4/2020	EPI_ISL_455687	TRUE	USA/WA-S146/2020	EPI_ISL_430183	TRUE
France/IDF_HB_112003064601/2020	EPI_ISL_940441	TRUE	Italy/LOM-INMI-9206/2020	EPI_ISL_460087	TRUE	Singapore/1016/2020	EPI_ISL_574501	TRUE	Zhejiang/HZ103/2020	EPI_ISL_422425	TRUE	USA/WA-S147/2020	EPI_ISL_430184	TRUE
France/IDF_HB_112003065776/2020	EPI_ISL_940448	TRUE	Italy/LOM-INMI-9214/2020	EPI_ISL_460088	TRUE	Singapore/174/2020	EPI_ISL_462292	TRUE	Zhejiang/OS1/2020	EPI_ISL_455688	TRUE	USA/WA-S170/2020	EPI_ISL_430208	TRUE
France/IDF_HB_112003065861/2020	EPI_ISL_940449	TRUE	Italy/LOM-INMI-9491/2020	EPI_ISL_460089	TRUE	Singapore/367/2020	EPI_ISL_482677	TRUE	Zhejiang/OS2/2020	EPI_ISL_455692	TRUE	USA/WA-S182/2020	EPI_ISL_430220	TRUE
France/IDF_HB_112003066174/2020	EPI_ISL_940450	TRUE	Italy/LOM-INMI-9675/2020	EPI_ISL_460095	TRUE	Singapore/48/2020	EPI_ISL_428827	TRUE	Zhejiang/OS3/2020	EPI_ISL_455691	TRUE	USA/WA-S192/2020	EPI_ISL_430230	TRUE
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France/IDF_HB_112003081573/2020	EPI_ISL_940489	TRUE	Italy/LOM-INMI-BG-9209/2020	EPI_ISL_460082	TRUE	Slovakia/UKBA-212/2020	EPI_ISL_577742	TRUE	Zhejiang/OS6/2020	EPI_ISL_455690	TRUE	USA/WA-S277/2020	EPI_ISL_430131	TRUE
France/IDF_HB_112003096373/2020	EPI_ISL_940507	TRUE	Italy/LOM-INMI-BS-12256/2020	EPI_ISL_460084	TRUE	Slovenia/5551/2020	EPI_ISL_635219	TRUE	Zhejiang/WZ-02/2020	EPI_ISL_404228	TRUE	USA/WA-S280/2020	EPI_ISL_430134	TRUE
France/IDF_HB_112003096879/2020	EPI_ISL_940517	TRUE	Italy/LOM-ISS-3337/2020	EPI_ISL_855554	TRUE	Slovenia/6051/2020	EPI_ISL_635226	TRUE	USA/AR-QDX-680/2020	EPI_ISL_571409	TRUE	USA/WA-S288/2020	EPI_ISL_430142	TRUE
France/IDF_HB_112003101119/2020	EPI_ISL_940212	TRUE	Italy/LOM-ISS-4534/2020	EPI_ISL_855553	TRUE	Slovenia/6456/2020	EPI_ISL_635230	TRUE	USA/AZ-CDC-1911/2020	EPI_ISL_452118	TRUE	USA/WA-S29/2020	EPI_ISL_417082	TRUE
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France/IDF_HB_112003105783/2020	EPI_ISL_940236	TRUE	Italy/LOM-UniMI-ICCS2/2020	EPI_ISL_584049	TRUE	SouthAfrica/KRISP-0040/2020	EPI_ISL_467442	TRUE	USA/AZ-QDX-275/2020	EPI_ISL_571019	TRUE	USA/WA-S356/2020	EPI_ISL_434116	TRUE
France/IDF_HB_112003109841/2020	EPI_ISL_940249	TRUE	Italy/LOM-UniMI-L100/2020	EPI_ISL_542098	TRUE	SouthAfrica/KRISP-0057/2020	EPI_ISL_467446	TRUE	USA/AZ-TG268915/2020	EPI_ISL_426518	TRUE	USA/WA-S358/2020	EPI_ISL_434118	TRUE
France/IDF_HB_112003900001/2020	EPI_ISL_940529	TRUE	Italy/LOM-UniMI-L101/2020	EPI_ISL_542099	TRUE	SouthAfrica/KRISP-109/2020	EPI_ISL_455639	TRUE	USA/AZ-TG269358/2020	EPI_ISL_426523	TRUE	USA/WA-S36/2020	EPI_ISL_417089	TRUE
France/IDF_PSL_100/2020	EPI_ISL_1015098	TRUE	Italy/LOM-UniMI-L102/2020	EPI_ISL_542100	TRUE	SouthAfrica/NHLS-UCT-GS-0055/2020	EPI_ISL_1040822	TRUE	USA/AZ-TG269439/2020	EPI_ISL_426524	TRUE	USA/WA-S361/2020	EPI_ISL_434121	TRUE
France/IDF_PSL_105/2020	EPI_ISL_1015012	TRUE	Italy/LOM-UniMI-L105/2020	EPI_ISL_542103	TRUE	SouthAfrica/NHLS-UCT-GS-0066/2020	EPI_ISL_1040819	TRUE	USA/AZ-TG269863/2020	EPI_ISL_426529	TRUE	USA/WA-S370/2020	EPI_ISL_434130	TRUE
France/IDF_PSL_106/2020	EPI_ISL_1015326	TRUE	Italy/LOM-UniMI-L106/2020	EPI_ISL_542104	TRUE	SouthAfrica/NHLS-UCT-GS-0073/2020	EPI_ISL_1040818	TRUE	USA/AZ-TG273280/2020	EPI_ISL_426558	TRUE	USA/WA-S375/2020	EPI_ISL_434135	TRUE
France/IDF_PSL_115/2020	EPI_ISL_1015222	TRUE	Italy/LOM-UniMI-L108/2020	EPI_ISL_542106	TRUE	SouthKorea/A3/2020	EPI_ISL_485002	TRUE	USA/AZ-TG666143/2020	EPI_ISL_696226	TRUE	USA/WA-S377/2020	EPI_ISL_434137	TRUE
France/IDF_PSL_121/2020	EPI_ISL_1015224	TRUE	Italy/LOM-UniMI-L109/2020	EPI_ISL_542107	TRUE	SouthKorea/BA-ACH_2718/2020	EPI_ISL_420800	TRUE	USA/AZ-TG720690/2020	EPI_ISL_1113276	TRUE	USA/WA-S426/2020	EPI_ISL_434186	TRUE
France/IDF_PSL_123/2020	EPI_ISL_1015237	TRUE	Italy/LOM-UniMI-L111/2020	EPI_ISL_542108	TRUE	SouthKorea/BA-ACH_2719/2020	EPI_ISL_420801	TRUE	USA/AZ-TG724332/2020	EPI_ISL_1113457	TRUE	USA/WA-S451/2020	EPI_ISL_434211	TRUE
France/IDF_PSL_126/2020	EPI_ISL_1015056	TRUE	Italy/LOM-UniMI-L112/2020	EPI_ISL_542109	TRUE	SouthKorea/Chosun-CoV32_NP/2020	EPI_ISL_1007662	TRUE	USA/CA-ALSR-0183/2020	EPI_ISL_529151	TRUE	USA/WA-S492/2020	EPI_ISL_434252	TRUE
France/IDF_PSL_144/2020	EPI_ISL_1015332	TRUE	Italy/LOM-UniMI-L113/2020	EPI_ISL_542110	TRUE	SouthKorea/Chosun-CoV46_SP/2020	EPI_ISL_1007668	TRUE	USA/CA-ALSR-0483-SAN/2020	EPI_ISL_483171	TRUE	USA/WA-S52/2020	EPI_ISL_417105	TRUE
France/IDF_PSL_151/2020	EPI_ISL_1015247	TRUE	Italy/LOM-UniMI-L115/2020	EPI_ISL_542111	TRUE	SouthKorea/IHC3486/2020	EPI_ISL_541001	TRUE	USA/CA-ALSR-0687-SAN/2020	EPI_ISL_483303	TRUE	USA/WA-S569/2020	EPI_ISL_434329	TRUE
France/IDF_PSL_153/2020	EPI_ISL_1015080	TRUE	Italy/LOM-UniMI-L117/2020	EPI_ISL_542113	TRUE	SouthKorea/IHC614/2020	EPI_ISL_540995	TRUE	USA/CA-ALSR-0696-SAN/2020	EPI_ISL_483307	TRUE	USA/WA-S6/2020	EPI_ISL_416461	TRUE
France/IDF_PSL_165/2020	EPI_ISL_1015004	TRUE	Italy/LOM-UniMI-L118/2020	EPI_ISL_542114	TRUE	SouthKorea/KCDC05/2020	EPI_ISL_412869	TRUE	USA/CA-ALSR-0699-SAN/2020	EPI_ISL_483310	TRUE	USA/WA-S79/2020	EPI_ISL_417132	TRUE
France/IDF_PSL_188/2020	EPI_ISL_1015091	TRUE	Italy/LOM-UniMI-L119/2020	EPI_ISL_542115	TRUE	SouthKorea/KCDC15-NCCP43331/2020	EPI_ISL_812961	TRUE	USA/CA-ALSR-0704-SAN/2020	EPI_ISL_483313	TRUE	USA/WA-S84/2020	EPI_ISL_417137	TRUE
France/IDF_PSL_189/2020	EPI_ISL_1015257	TRUE	Italy/LOM-UniMI-L120/2020	EPI_ISL_542116	TRUE	SouthKorea/KCDC2007/2020	EPI_ISL_426169	TRUE	USA/CA-ALSR-0707-SAN/2020	EPI_ISL_483316	TRUE	USA/WA-S98/2020	EPI_ISL_417151	TRUE
France/IDF_PSL_197/2020	EPI_ISL_1015054	TRUE	Italy/LOM-UniMI-L122/2020	EPI_ISL_542118	TRUE	SouthKorea/KCDC2012/2020	EPI_ISL_426182	TRUE	USA/CA-ALSR-0718-SAN/2020	EPI_ISL_483321	TRUE	USA/WA-UW-1287/2020	EPI_ISL_422969	TRUE
France/IDF_PSL_199/2020	EPI_ISL_1015082	TRUE	Italy/LOM-UniMI-L123/2020	EPI_ISL_542119	TRUE	SouthKorea/KCDC2014/2020	EPI_ISL_426187	TRUE	USA/CA-ALSR-0939-SAN/2020	EPI_ISL_483425	TRUE	USA/WA-UW-1327/2020	EPI_ISL_422975	TRUE
France/IDF_PSL_200/2020	EPI_ISL_1015256	TRUE	Italy/LOM-UniMI-L126/2020	EPI_ISL_542122	TRUE	SouthKorea/KCDC2018/2020	EPI_ISL_427812	TRUE	USA/CA-ALSR-1435/2020	EPI_ISL_494601	TRUE	USA/WA-UW-1417/2020	EPI_ISL_422981	TRUE
France/IDF_PSL_213/2020	EPI_ISL_1015073	TRUE	Italy/LOM-UniMI-L127/2020	EPI_ISL_542123	TRUE	SouthKorea/KCDC2020/2020	EPI_ISL_471425	TRUE	USA/CA-ALSR-1451/2020	EPI_ISL_494611	TRUE	USA/WA-UW-1441/2020	EPI_ISL_423025	TRUE
France/IDF_PSL_216/2020	EPI_ISL_1015234	TRUE	Italy/LOM-UniMI-L128/2020	EPI_ISL_542124	TRUE	SouthKorea/KCDC2021/2020	EPI_ISL_471426	TRUE	USA/CA-ALSR-1456/2020	EPI_ISL_494615	TRUE	USA/WA-UW-1574/2020	EPI_ISL_423019	TRUE
France/IDF_PSL_22/2020	EPI_ISL_1015248	TRUE	Italy/LOM-UniMI-L129/2020	EPI_ISL_542125	TRUE	SouthKorea/KCDC2023/2020	EPI_ISL_471439	TRUE	USA/CA-ALSR-1651/2020	EPI_ISL_494716	TRUE	USA/WA-UW-1593/2020	EPI_ISL_423002	TRUE
France/IDF_PSL_226/2020	EPI_ISL_1015333	TRUE	Italy/LOM-UniMI-L130/2020	EPI_ISL_542126	TRUE	SouthKorea/KCDC2025/2020	EPI_ISL_471441	TRUE	USA/CA-ALSR-1687/2020	EPI_ISL_494744	TRUE	USA/WA-UW-1646/2020	EPI_ISL_424187	TRUE
France/IDF_PSL_228/2020	EPI_ISL_1015075	TRUE	Italy/LOM-UniMI-L131/2020	EPI_ISL_542127	TRUE	SouthKorea/KCDC2034/2020	EPI_ISL_497955	TRUE	USA/CA-CSMC12/2020	EPI_ISL_475596	TRUE	USA/WA-UW-1695/2020	EPI_ISL_424219	TRUE
France/IDF_PSL_44/2020	EPI_ISL_1015109	TRUE	Italy/LOM-UniMI-L132/2020	EPI_ISL_542128	TRUE	SouthKorea/KCDC2038/2020	EPI_ISL_497959	TRUE	USA/CA-CSMC29/2020	EPI_ISL_475639	TRUE	USA/WA-UW-1728/2020	EPI_ISL_424193	TRUE
France/IDF_PSL_45/2020	EPI_ISL_1015059	TRUE	Italy/LOM-UniMI-L135/2020	EPI_ISL_542131	TRUE	SouthKorea/KCDC2041/2020	EPI_ISL_471447	TRUE	USA/CA-CSMC79/2020	EPI_ISL_475694	TRUE	USA/WA-UW-1792/2020	EPI_ISL_424253	TRUE
France/IDF_PSL_52/2020	EPI_ISL_1015097	TRUE	Italy/LOM-UniMI-L136/2020	EPI_ISL_542132	TRUE	SouthKorea/KCDC2042/2020	EPI_ISL_471448	TRUE	USA/CA-CSMC89/2020	EPI_ISL_475705	TRUE	USA/WA-UW-1797/2020	EPI_ISL_424259	TRUE
France/IDF_PSL_56/2020	EPI_ISL_1015108	TRUE	Italy/LOM-UniMI-L138/2020	EPI_ISL_542134	TRUE	SouthKorea/KCDC2047/2020	EPI_ISL_471453	TRUE	USA/CA-CZB-1124/2020	EPI_ISL_445172	TRUE	USA/WA-UW-1801/2020	EPI_ISL_424251	TRUE
France/IDF_PSL_64/2020	EPI_ISL_1015327	TRUE	Italy/LOM-UniMI-L139/2020	EPI_ISL_542135	TRUE	SouthKorea/KCDC2055/2020	EPI_ISL_481375	TRUE	USA/CA-CZB-1125/2020	EPI_ISL_445173	TRUE	USA/WA-UW-1870/2020	EPI_ISL_424293	TRUE
France/IDF_PSL_72/2020	EPI_ISL_1015225	TRUE	Italy/LOM-UniMI-L140/2020	EPI_ISL_542136	TRUE	SouthKorea/KCDC2082/2020	EPI_ISL_497983	TRUE	USA/CA-CZB-1197/2020	EPI_ISL_450446	TRUE	USA/WA-UW-1965/2020	EPI_ISL_424324	TRUE
France/IDF_PSL_73/2020	EPI_ISL_1015214	TRUE	Italy/LOM-UniMI-L141/2020	EPI_ISL_542137	TRUE	SouthKorea/KCDC2088/2020	EPI_ISL_497989	TRUE	USA/CA-CZB-1198/2020	EPI_ISL_450447	TRUE	USA/WA-UW-2036/2020	EPI_ISL_477696	TRUE
France/IDF_PSL_75/2020	EPI_ISL_1015331	TRUE	Italy/LOM-UniMI-L142/2020	EPI_ISL_542138	TRUE	SouthKorea/KCDC2102/2020	EPI_ISL_498003	TRUE	USA/CA-CZB-1218/2020	EPI_ISL_450467	TRUE	USA/WA-UW-2044/2020	EPI_ISL_717768	TRUE
France/IDF_PSL_8/2020	EPI_ISL_1015216	TRUE	Italy/LOM-UniMI-L144/2020	EPI_ISL_542139	TRUE	SouthKorea/KCDC2104/2020	EPI_ISL_498005	TRUE	USA/CA-CZB-1219/2020	EPI_ISL_450468	TRUE	USA/WA-UW-2087/2020	EPI_ISL_426083	TRUE
France/IDF_PSL_81/2020	EPI_ISL_1015062	TRUE	Italy/LOM-UniMI-L145/2020	EPI_ISL_542140	TRUE	SouthKorea/KCDC2110/2020	EPI_ISL_498011	TRUE	USA/CA-CZB-1423/2020	EPI_ISL_468395	TRUE	USA/WA-UW-2100/2020	EPI_ISL_426086	TRUE
France/IDF_PSL_82/2020	EPI_ISL_1015027	TRUE	Italy/LOM-UniMI-L147/2020	EPI_ISL_542142	TRUE	SouthKorea/KCDC2129/2020	EPI_ISL_498030	TRUE	USA/CA-CZB-1579/2020	EPI_ISL_468510	TRUE	USA/WA-UW-2146/2020	EPI_ISL_426100	TRUE
France/IDF_PSL_85/2020	EPI_ISL_1015099	TRUE	Italy/LOM-UniMI-L149/2020	EPI_ISL_542144	TRUE	SouthKorea/KCDC2130/2020	EPI_ISL_498031	TRUE	USA/CA-CZB-1588/2020	EPI_ISL_468518	TRUE	USA/WA-UW-2192/2020	EPI_ISL_426109	TRUE
France/IDF_PSL_87/2020	EPI_ISL_1015071	TRUE	Italy/LOM-UniMI-L151/2020	EPI_ISL_542146	TRUE	SouthKorea/KCDC2132/2020	EPI_ISL_498033	TRUE	USA/CA-CZB-1758/2020	EPI_ISL_476775	TRUE	USA/WA-UW-2219/2020	EPI_ISL_426118	TRUE

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France/PAC-IHU-0222/2020	EPI_ISL_569386	TRUE	Italy/LOM-UniMI-L272/2020	EPI_ISL_542238	TRUE	Spain/AN-IBV-001987/2020	EPI_ISL_509623	TRUE	USA/CA-QDX-443/2020	EPI_ISL_571165	TRUE	USA/WI-GMF-00498/2020	EPI_ISL_422453	TRUE
France/PAC-IHU-0225/2020	EPI_ISL_569388	TRUE	Italy/LOM-UniMI-L273/2020	EPI_ISL_542239	TRUE	Spain/AN-IBV-001996/2020	EPI_ISL_509626	TRUE	USA/CA-QDX-447/2020	EPI_ISL_571169	TRUE	USA/WI-UW-101/2020	EPI_ISL_425158	TRUE
France/PAC-IHU-0231/2020	EPI_ISL_569394	TRUE	Italy/LOM-UniMI-L274/2020	EPI_ISL_542240	TRUE	Spain/AN-IBV-002003/2020	EPI_ISL_452396	TRUE	USA/CA-QDX-550/2020	EPI_ISL_571273	TRUE	USA/WI-UW-12/2020	EPI_ISL_417506	TRUE
France/PAC-IHU-0232/2020	EPI_ISL_569395	TRUE	Italy/LOM-UniMI-L276/2020	EPI_ISL_542241	TRUE	Spain/AN-IBV-002017/2020	EPI_ISL_509628	TRUE	USA/CA-QDX-662/2020	EPI_ISL_571285	TRUE	USA/WI-UW-167/2020	EPI_ISL_428263	TRUE
France/PAC-IHU-0237/2020	EPI_ISL_569400	TRUE	Italy/LOM-UniMI-L278/2020	EPI_ISL_542242	TRUE	Spain/AN-IBV-002020/2020	EPI_ISL_509630	TRUE	USA/CA-QDX-696/2020	EPI_ISL_571415	TRUE	USA/WI-UW-229/2020	EPI_ISL_428325	TRUE
France/PAC-IHU-0241/2020	EPI_ISL_569403	TRUE	Italy/LOM-UniMI-L281/2020	EPI_ISL_542245	TRUE	Spain/AN-IBV-002038/2020	EPI_ISL_452387	TRUE	USA/CA-QDX-697/2020	EPI_ISL_571416	TRUE	USA/WI-UW-235/2020	EPI_ISL_428331	TRUE
France/PAC-IHU-0246/2020	EPI_ISL_569406	TRUE	Italy/LOM-UniMI-L284/2020	EPI_ISL_542248	TRUE	Spain/AN-IBV-002043/2020	EPI_ISL_452383	TRUE	USA/CA-QDX-797/2020	EPI_ISL_571491	TRUE	USA/WI-UW-238/2020	EPI_ISL_428334	TRUE
France/PAC-IHU-0256/2020	EPI_ISL_569414	TRUE	Italy/LOM-UniMI-L285/2020	EPI_ISL_542249	TRUE	Spain/AN-IBV-002055/2020	EPI_ISL_452374	TRUE	USA/CA-QDX-800/2020	EPI_ISL_571493	TRUE	USA/WI-UW-250/2020	EPI_ISL_428724	TRUE
France/PAC-IHU-0258/2020	EPI_ISL_569416	TRUE	Italy/LOM-UniMI-L286/2020	EPI_ISL_542250	TRUE	Spain/AN-IBV-002841/2020	EPI_ISL_474923	TRUE	USA/CA-QDX-809/2020	EPI_ISL_571502	TRUE	USA/WI-UW-409/2020	EPI_ISL_480391	TRUE
France/PAC-IHU-0261/2020	EPI_ISL_569418	TRUE	Italy/LOM-UniMI-L288/2020	EPI_ISL_542252	TRUE	Spain/AN-IBV-002848/2020	EPI_ISL_474857	TRUE	USA/CA-QDX-83/2020	EPI_ISL_468564	TRUE	USA/WI-UW-52/2020	EPI_ISL_421310	TRUE
France/PAC-IHU-0262/2020	EPI_ISL_569419	TRUE	Italy/LOM-UniMI-L289/2020	EPI_ISL_542253	TRUE	Spain/AN-IBV-002852/2020	EPI_ISL_474842	TRUE	USA/CA-QDX-936/2020	EPI_ISL_571582	TRUE	USA/WI-UW-53/2020	EPI_ISL_421311	TRUE
France/PAC-IHU-0276/2020	EPI_ISL_569426	TRUE	Italy/LOM-UniMI-L292/2020	EPI_ISL_542255	TRUE	Spain/AN-IBV-002867/2020	EPI_ISL_474859	TRUE	USA/CA-QDX-941/2020	EPI_ISL_571586	TRUE	USA/WI-WSLH-200011/2020	EPI_ISL_470540	TRUE
France/PAC-IHU-0303/2020	EPI_ISL_569444	TRUE	Italy/LOM-UniMI-L293/2020	EPI_ISL_542256	TRUE	Spain/AN-IBV-002875/2020	EPI_ISL_474862	TRUE	USA/CA-QDX-97/2020	EPI_ISL_468568	TRUE	USA/WI-WSLH-200015/2020	EPI_ISL_471181	TRUE
France/PAC-IHU-0342/2020	EPI_ISL_569466	TRUE	Italy/LOM-UniMI-L294/2020	EPI_ISL_542257	TRUE	Spain/AN-IBV-002891/2020	EPI_ISL_474868	TRUE	USA/CA-SCCPHD-UC129/2020	EPI_ISL_435608	TRUE	USA/WI-WSLH-200048/2020	EPI_ISL_471213	TRUE
France/PAC-IHU-0344/2020	EPI_ISL_569467	TRUE	Italy/LOM-UniMI-L295/2020	EPI_ISL_542258	TRUE	Spain/AN-IBV-002908/2020	EPI_ISL_474869	TRUE	USA/CA-SCCPHD-UC148/2020	EPI_ISL_435627	TRUE	USA/WI-WSLH-200060/2020	EPI_ISL_471225	TRUE
France/PAC-IHU-0388/2020	EPI_ISL_569483	TRUE	Italy/LOM-UniMI-L296/2020	EPI_ISL_542259	TRUE	Spain/AN-IBV-002910/2020	EPI_ISL_467062	TRUE	USA/CA-SCCPHD-UC200/2020	EPI_ISL_671768	TRUE	USA/WI-WSLH-200085/2020	EPI_ISL_471249	TRUE
France/PAC-IHU-0389/2020	EPI_ISL_569484	TRUE	Italy/LOM-UniMI-L302/2020	EPI_ISL_542261	TRUE	Spain/AN-IBV-002926/2020	EPI_ISL_474872	TRUE	USA/CA-SR0120/2020	EPI_ISL_445111	TRUE	USA/WI-WSLH-200091/2020	EPI_ISL_471255	TRUE
France/PAC-IHU-0401/2020	EPI_ISL_569490	TRUE	Italy/LOM-UniMI-L310/2020	EPI_ISL_542263	TRUE	Spain/AN-IBV-002929/2020	EPI_ISL_474873	TRUE	USA/CA-SR0201/2020	EPI_ISL_437583	TRUE	USA/WI-WSLH-200101/2020	EPI_ISL_471265	TRUE
France/PAC-IHU-0648/2020	EPI_ISL_568912	TRUE	Italy/LOM-UniMI-L311/2020	EPI_ISL_542264	TRUE	Spain/AN-IBV-002930/2020	EPI_ISL_474874	TRUE	USA/CA-SR0428/2020	EPI_ISL_467958	TRUE	USA/WI-WSLH-200143/2020	EPI_ISL_578370	TRUE
France/PAC-IHU-0662/2020	EPI_ISL_568920	TRUE	Italy/LOM-UniMI-L313/2020	EPI_ISL_542265	TRUE	Spain/AN-IBV-002931/2020	EPI_ISL_474875	TRUE	USA/CA-SR0429/2020	EPI_ISL_467959	TRUE	USA/WI-WSLH-200144/2020	EPI_ISL_578371	TRUE
France/PAC-IHU-0668/2020	EPI_ISL_568921	TRUE	Italy/LOM-UniMI-L314/2020	EPI_ISL_542266	TRUE	Spain/AN-IBV-002940/2020	EPI_ISL_474876	TRUE	USA/CA-SR0447/2020	EPI_ISL_467971	TRUE	USA/WI-WSLH-200201/2020	EPI_ISL_578424	TRUE
France/PAC-IHU-0852/2020	EPI_ISL_568986	TRUE	Italy/LOM-UniMI-L316/2020	EPI_ISL_542267	TRUE	Spain/AN-IBV-002953/2020	EPI_ISL_474930	TRUE	USA/CA-SR0460/2020	EPI_ISL_467982	TRUE	USA/WI-WSLH-200205/2020	EPI_ISL_578427	TRUE
France/PAC-MEPHI-0312/2020	EPI_ISL_644404	TRUE	Italy/LOM-UniMI-L317/2020	EPI_ISL_542268	TRUE	Spain/AN-IBV-002980/2020	EPI_ISL_474943	TRUE	USA/CA-UCLA-156/2020	EPI_ISL_537495	TRUE	USA/WI-WSLH-200209/2020	EPI_ISL_578430	TRUE
France/PAC-SC242/2020	EPI_ISL_641527	TRUE	Italy/LOM-UniMI-L318/2020	EPI_ISL_542269	TRUE	Spain/AN-IBV-002983/2020	EPI_ISL_474908	TRUE	USA/CA-UCLA-202/2020	EPI_ISL_537512	TRUE	USA/WI-WSLH-200261/2020	EPI_ISL_578471	TRUE
France/PAC-SC446/2020	EPI_ISL_644710	TRUE	Italy/LOM-UniMI-L319/2020	EPI_ISL_542270	TRUE	Spain/AN-IBV-006080/2020	EPI_ISL_510424	TRUE	USA/CA-UCLA-87/2020	EPI_ISL_537604	TRUE	USA/WI-WSLH-200262/2020	EPI_ISL_578472	TRUE
France/PDL-SC615/2020	EPI_ISL_663261	TRUE	Italy/LOM-UniMI-L321/2020	EPI_ISL_542271	TRUE	Spain/AN-IBV-006115/2020	EPI_ISL_510444	TRUE	USA/CO-QDX-1529/2020	EPI_ISL_603804	TRUE	USA/WY-WYPHL-00043/2020	EPI_ISL_462935	TRUE
France/PDL-SC620/2020	EPI_ISL_663264	TRUE	Italy/LOM-UniMI-L322/2020	EPI_ISL_542272	TRUE	Spain/AN-ISCIII-201373/2020	EPI_ISL_418244	TRUE	USA/CO-QDX-2274/2020	EPI_ISL_604522	TRUE	USA/WY-WYPHL-00060/2020	EPI_ISL_462952	TRUE
France/PDL-SC621/2020	EPI_ISL_649177	TRUE	Italy/LOM-UniMI-L327/2020	EPI_ISL_542274	TRUE	Spain/AN-ISCIII-201488/2020	EPI_ISL_455315	TRUE	USA/CO-QDX-682/2020	EPI_ISL_571428	TRUE	USA/WY-WYPHL-00085/2020	EPI_ISL_462976	TRUE
France/PDL-SC622/2020	EPI_ISL_663265	TRUE	Italy/LOM-UniMI-L329/2020	EPI_ISL_542276	TRUE	Spain/AN-ISCIII-201616/2020	EPI_ISL_455319	TRUE	USA/CO-QDX-877/2020	EPI_ISL_571592	TRUE	USA/WY-WYPHL007/2020	EPI_ISL_421544	TRUE
Fujian/13/2020	EPI_ISL_411066	TRUE	Italy/LOM-UniMI-L334/2020	EPI_ISL_542279	TRUE	Spain/AR-IBV-2388/2020	EPI_ISL_468786	TRUE	USA/CO-USAFSAM-S040/2020	EPI_ISL_512805	TRUE	USA/GA-CDC-2059/2020	EPI_ISL_452125	TRUE
Fujian/3520022Y/2020	EPI_ISL_431785	TRUE	Italy/LOM-UniMI-L342/2020	EPI_ISL_542281	TRUE	Spain/AR-IBV-2389/2020	EPI_ISL_468822	TRUE	USA/CT-CDC-MKY9-1295/2020	EPI_ISL_812141	TRUE	USA/GA-CDC-8427/2020	EPI_ISL_594456	TRUE
Fujian/8/2020	EPI_ISL_411060	TRUE	Italy/LOM-UniMI-L345/2020	EPI_ISL_542283	TRUE	Spain/AR-IBV-2390/2020	EPI_ISL_468800	TRUE	USA/CT-QDX-1183/2020	EPI_ISL_571926	TRUE	USA/GA-CDC-8816/2020	EPI_ISL_452120	TRUE
Fujian/IM3520001T/2020	EPI_ISL_431118	TRUE	Italy/LOM-UniMI-L346/2020	EPI_ISL_542284	TRUE	Spain/AR-IBV-2394/2020	EPI_ISL_468823	TRUE	USA/CT-QDX-1403/2020	EPI_ISL_572099	TRUE	USA/GA-QDX-1073/2020	EPI_ISL_571823	TRUE
Fujian/IM3520002T/2020	EPI_ISL_431180	TRUE	Italy/LOM-UniMI-L348/2020	EPI_ISL_542286	TRUE	Spain/AR-IBV-2395/2020	EPI_ISL_468853	TRUE	USA/CT-QDX-1450/2020	EPI_ISL_603806	TRUE	USA/GA-QDX-115/2020	EPI_ISL_467845	TRUE
Fujian/IM3520003T/2020	EPI_ISL_431240	TRUE	Italy/LOM-UniMI-L350/2020	EPI_ISL_542287	TRUE	Spain/AR-IBV-2397/2020	EPI_ISL_468834	TRUE	USA/CT-QDX-1507/2020	EPI_ISL_603812	TRUE	USA/GA-QDX-116/2020	EPI_ISL_467846	TRUE
Fujian/IM3520014T/2020	EPI_ISL_431782	TRUE	Italy/LOM-UniMI-L352/2020	EPI_ISL_542288	TRUE	Spain/AR-IBV-2398/2020	EPI_ISL_468795	TRUE	USA/CT-QDX-2666/2020	EPI_ISL_604920	TRUE	USA/GA-QDX-122/2020	EPI_ISL_467847	TRUE
Fujian/IM3520016T/2020	EPI_ISL_431783	TRUE	Italy/LOM-UniMI-L354/2020	EPI_ISL_542289	TRUE	Spain/AR-IBV-2412/2020	EPI_ISL_468858	TRUE	USA/CT-QDX-429/2020	EPI_ISL_571181	TRUE	USA/GA-QDX-152/2020	EPI_ISL_467848	TRUE
Fujian/IM3520017T/2020	EPI_ISL_431784	TRUE	Italy/LOM-UniMI-L356/2020	EPI_ISL_542290	TRUE	Spain/AR-IBV-2413/2020	EPI_ISL_468845	TRUE	USA/CT-UW-2435/2020	EPI_ISL_477673	TRUE	USA/GA-QDX-1717/2020	EPI_ISL_604024	TRUE
Fuzhou/JX2012/2020	EPI_ISL_455462	TRUE	Italy/LOM-UniMI-L357/2020	EPI_ISL_542291	TRUE	Spain/AR-IBV-2414/2020	EPI_ISL_468772	TRUE	USA/CT-UW-2441/2020	EPI_ISL_485919	TRUE	USA/GA-QDX-1742/2020	EPI_ISL_604025	TRUE
Ganzhou/JX81/2020	EPI_ISL_421242	TRUE	Italy/LOM-UniMI-L358/2020	EPI_ISL_542292	TRUE	Spain/AR-IBV-2417/2020	EPI_ISL_468797	TRUE	USA/CT-UW-2473/2020	EPI_ISL_477678	TRUE	USA/GA-QDX-1762/2020	EPI_ISL_604026	TRUE
Germany/BAV-PL-virotum_0z2s/2020	EPI_ISL_887357	TRUE	Italy/LOM-UniMI-L362/2020	EPI_ISL_542294	TRUE	Spain/AR-IBV-2422/2020	EPI_ISL_468815	TRUE	USA/CT-UW-3120/2020	EPI_ISL_485938	TRUE	USA/GA-QDX-1771/2020	EPI_ISL_604027	TRUE
Germany/BAV-PL-virotum_3qu7/2020	EPI_ISL_887327	TRUE	Italy/LOM-UniMI-L363/2020	EPI_ISL_542295	TRUE	Spain/AR-IBV-2424/2020	EPI_ISL_468850	TRUE	USA/CT-UW-651/2020	EPI_ISL_476916	TRUE	USA/GA-QDX-1938/2020	EPI_ISL_604222	TRUE
Germany/BAV-PL-virotum_5l8s/2020	EPI_ISL_887361	TRUE	Italy/LOM-UniMI-L364/2020	EPI_ISL_542296	TRUE	Spain/AR-IBV-2426/2020	EPI_ISL_468841	TRUE	USA/CT-UW213/2020	EPI_ISL_417362	TRUE	USA/GA-QDX-2115/2020	EPI_ISL_604449	TRUE
Germany/BAV-PL-virotum_6gmn/2020	EPI_ISL_887364	TRUE	Italy/LOM-UniMI-L367/2020	EPI_ISL_542298	TRUE	Spain/AR-IBV-2434/2020	EPI_ISL_468829	TRUE	USA/CT-UW259/2020	EPI_ISL_418044	TRUE	USA/GA-QDX-2150/2020	EPI_ISL_604450	TRUE
Germany/BAV-PL-virotum_8tam/2020	EPI_ISL_887370	TRUE	Italy/LOM-UniMI-L368/2020	EPI_ISL_542299	TRUE	Spain/AR-IBV-2439/2020	EPI_ISL_468849	TRUE	USA/CT-UW273/2020	EPI_ISL_418058	TRUE	USA/GA-QDX-2158/2020	EPI_ISL_604451	TRUE
Germany/BAV-PL-virotum_97n2/2020	EPI_ISL_887371	TRUE	Italy/LOM-UniMI-L369/2020	EPI_ISL_542300	TRUE	Spain/AR-IBV-2441/2020	EPI_ISL_468809	TRUE	USA/CT-Yale-040/2020	EPI_ISL_419528	TRUE	USA/GA-QDX-2196/2020	EPI_ISL_604527	TRUE
Germany/BAV-PL-virotum_aloq/2020	EPI_ISL_887339	TRUE	Italy/LOM-UniMI-L371/2020	EPI_ISL_542302	TRUE	Spain/AR-IBV-2452/2020	EPI_ISL_468852	TRUE	USA/CT-Yale-230/2020	EPI_ISL_463164	TRUE	USA/GA-QDX-2209/2020	EPI_ISL_604528	TRUE
Germany/BAV-PL-virotum_cofh/2020	EPI_ISL_887331	TRUE	Italy/LOM-UniMI-L372/2020	EPI_ISL_542303	TRUE	Spain/AR-IBV-2454/2020	EPI_ISL_468774	TRUE	USA/DC-CDC-1734/2020	EPI_ISL_436042	TRUE	USA/GA-QDX-2219/2020	EPI_ISL_604529	TRUE
Germany/BAV-PL-virotum_f7t0/2020	EPI_ISL_887341	TRUE	Italy/LOM-UniMI-L373/2020	EPI_ISL_542304	TRUE	Spain/AR-IBV-2455/2020	EPI_ISL_468792	TRUE	USA/DC-CDC-9092/2020	EPI_ISL_436041	TRUE	USA/GA-QDX-2235/2020	EPI_ISL_604530	TRUE
Germany/BAV-PL-virotum_g3hl/2020	EPI_ISL_887381	TRUE	Italy/LOM-UniMI-L378/2020	EPI_ISL_542305	TRUE	Spain/AR-IBV-2463/2020	EPI_ISL_468846	TRUE	USA/DC-DFS-PHL-0012/2020	EPI_ISL_804899	TRUE	USA/GA-QDX-2259/2020	EPI_ISL_604531	TRUE
Germany/BAV-PL-virotum_gnj4/2020	EPI_ISL_887382	TRUE	Italy/LOM-UniMI-L385/2020	EPI_ISL_542308	TRUE	Spain/AR-IBV-2465/2020	EPI_ISL_468810	TRUE	USA/DC-DFS-PHL-0019/2020	EPI_ISL_804851	TRUE	USA/GA-QDX-2367/2020	EPI_ISL_604692	TRUE
Germany/BAV-PL-virotum_hbkr/2020	EPI_ISL_887383	TRUE	Italy/LOM-UniMI-L386/2020	EPI_ISL_542309	TRUE	Spain/AR-IBV-2467/2020	EPI_ISL_468801	TRUE	USA/DC-DFS-PHL-0043/2020	EPI_ISL_804914	TRUE	USA/GA-QDX-2379/2020	EPI_ISL_604693	TRUE
Germany/BAV-PL-virotum_iixy/2020	EPI_ISL_887386	TRUE	Italy/LOM-UniMI-L387/2020	EPI_ISL_542310	TRUE	Spain/AR-IBV-2471/2020	EPI_ISL_468784	TRUE	USA/DC-DFS-PHL-0044/2020	EPI_ISL_804915	TRUE	USA/GA-QDX-2388/2020	EPI_ISL_604694	TRUE
Germany/BAV-PL-virotum_l9pd/2020	EPI_ISL_887347	TRUE	Italy/LOM-UniMI-L388/2020	EPI_ISL_542311	TRUE	Spain/AR-IBV-2475/2020	EPI_ISL_468775	TRUE	USA/DC-DFS-PHL-0064/2020	EPI_ISL_804919	TRUE	USA/GA-QDX-2420/2020	EPI_ISL_604695	TRUE
Germany/BAV-PL-virotum_m4c8/2020	EPI_ISL_887393	TRUE	Italy/LOM-UniMI-L389/2020	EPI_ISL_542312	TRUE	Spain/AR-IBV-2476/2020	EPI_ISL_468769	TRUE	USA/DC-HP00090/2020	EPI_ISL_438243	TRUE	USA/GA-QDX-2421/2020	EPI_ISL_604696	TRUE
Germany/BAV-PL-virotum_uh9o/2020	EPI_ISL_887410	TRUE	Italy/LOM-UniMI-L391/2020	EPI_ISL_542314	TRUE	Spain/AR-IBV-2479/2020	EPI_ISL_468813	TRUE	USA/DC-HP00091/2020	EPI_ISL_457757	TRUE	USA/GA-QDX-2425/2020	EPI_ISL_604697	TRUE
Germany/BAV-PL-virotum_vdni/2020	EPI_ISL_887413	TRUE	Italy/LOM-UniMI-L393/2020	EPI_ISL_542315	TRUE	Spain/AR-IBV-2483/2020	EPI_ISL_468785	TRUE	USA/DC-HP00117/2020	EPI_ISL_457810	TRUE	USA/GA-QDX-2426/2020	EPI_ISL_604698	TRUE
Germany/BAV-PL-virotum_w0y6/2020	EPI_ISL_887352	TRUE	Italy/LOM-UniMI-L395/2020	EPI_ISL_542317	TRUE	Spain/AR-IBV-2485/2020	EPI_ISL_468780	TRUE	USA/DE-DHSS-F917866/2020	EPI_ISL_583248	TRUE	USA/GA-QDX-2442/2020	EPI_ISL_604777	TRUE
Germany/BB-ChVir-D934-5623/2020	EPI_ISL_753813	TRUE	Italy/LOM-UniMI-L396/2020	EPI_ISL_542318	TRUE	Spain/AR-IBV-2489/2020	EPI_ISL_468833	TRUE	USA/DE-DHSS-F917889/2020	EPI_ISL_583246	TRUE	USA/GA-QDX-2443/2020	EPI_ISL_604778	TRUE
Germany/BB-ChVir-W1062-7296/2020	EPI_ISL_753846	TRUE	Italy/LOM-UniMI-L397/2020	EPI_ISL_542319	TRUE	Spain/AR-ISCIII-201673/2020	EPI_ISL_539508	TRUE	USA/DE-DHSS-F917912/2020	EPI_ISL_576154	TRUE	USA/GA-QDX-2461/2020	EPI_ISL_604779	TRUE
Germany/BB-ChVir-W1129-7275/2020	EPI_ISL_753850	TRUE	Italy/LOM-UniMI-L399/2020	EPI_ISL_542321	TRUE	Spain/AR-ISCIII-201778/2020	EPI_ISL_578192	TRUE	USA/DE-DHSS-F918049/2020	EPI_ISL_593940	TRUE	USA/GA-QDX-2511/2020	EPI_ISL_604780	TRUE
Germany/BE-ChVir-3170-a-4370/2020	EPI_ISL_806528	TRUE	Italy/LOM-UniMI-L400/2020	EPI_ISL_542322	TRUE	Spain/AR-ISCIII-201781/2020	EPI_ISL_578193	TRUE	USA/DE-DHSS-F918384/2020	EPI_ISL_593952	TRUE	USA/GA-QDX-2553/2020	EPI_ISL_604781	TRUE
Germany/BE-ChVir-D658-5/2020	EPI_ISL_516633	TRUE	Italy/LOM-UniMI-L401/2020	EPI_ISL_542323	TRUE	Spain/AR-ISCIII-201782/2020	EPI_ISL_539515	TRUE	USA/DE-DHSS-F918464/2020	EPI_ISL_593969	TRUE	USA/GA-QDX-2558/2020	EPI_ISL_604782	TRUE
Germany/BE-ChVir-D670-9/2020	EPI_ISL_516637	TRUE	Italy/LOM-UniMI-L402/2020	EPI_ISL_542324	TRUE	Spain/AR-ISCIII-201785/2020	EPI_ISL_871980	TRUE	USA/DE-DHSS-F918573/2020	EPI_ISL_566084	TRUE	USA/GA-QDX-2571/2020	EPI_ISL_604931	TRUE
Germany/BE-ChVir-D712-1/2020	EPI_ISL_516629	TRUE	Italy/LOM-UniMI-L403/2020	EPI_ISL_542325	TRUE	Spain/AR-ISCIII-201786/2020	EPI_ISL_871981	TRUE	USA/DE-DHSS-F918613/2020	EPI_ISL_574599	TRUE	USA/GA-QDX-53/2020	EPI_ISL_467849	TRUE
Germany/BE-ChVir-D717-D761-12/2020	EPI_ISL_516640	TRUE	Italy/LOM-UniMI-L404/2020	EPI_ISL_542326	TRUE	Spain/AR-ISCIII-201849/2020	EPI_ISL_539518	TRUE	USA/DE-DHSS-F918898/2020	EPI_ISL_561356	TRUE	USA/GA-QDX-575/2020	EPI_ISL_571287	TRUE
Germany/BE-ChVir-D718-3/2020	EPI_ISL_516631	TRUE	Italy/LOM-UniMI-L406/2020	EPI_ISL_542327	TRUE	Spain/AS-HUCA-232025446/2020	EPI_ISL_710491	TRUE	USA/DE-DHSS-F918926/2020	EPI_ISL_561358	TRUE	USA/GA-QDX-577/2020	EPI_ISL_571288	TRUE
Germany/BE-ChVir-D793-8179/2020	EPI_ISL_753920	TRUE	Italy/LOM-UniMI-L407/2020	EPI_ISL_542328	TRUE	Spain/AS-IBV-98006586/2020	EPI_ISL_654635	TRUE	USA/FL-BPHL-0151/2020	EPI_ISL_480802	TRUE	USA/GA-QDX-578/2020	EPI_ISL_571289	TRUE
Germany/BE-ChVir-W1045-5646/2020	EPI_ISL_753925	TRUE	Italy/LOM-UniMI-L409/2020	EPI_ISL_542329	TRUE	Spain/AS-IBV-98006587/2020	EPI_ISL_654636	TRUE	USA/FL-BPHL-0394/2020	EPI_ISL_489803	TRUE	USA/GA-QDX-579/2020	EPI_ISL_571290	TRUE
Germany/BE-ChVir-W1133-5742/2020	EPI_ISL_753936	TRUE	Italy/LOM-UniMI-L410/2020	EPI_ISL_542330	TRUE	Spain/AS-IBV-98006589/2020	EPI_ISL_654637	TRUE	USA/FL-BPHL-0426/2020	EPI_ISL_495332	TRUE	USA/GA-QDX-580/2020	EPI_ISL_571291	TRUE
Germany/BE-ChVir-W1248-16/2020	EPI_ISL_516644	TRUE	Italy/LOM-UniMI-L411/2020	EPI_ISL_542331	TRUE	Spain/AS-IBV-98006592/2020	EPI_ISL_654638	TRUE	USA/FL-BPHL-0482/2020	EPI_ISL_495388	TRUE	USA/GA-QDX-581/2020	EPI_ISL_571292	TRUE
Germany/BE-ChVir1716/2020	EPI_ISL_729481	TRUE	Italy/LOM-UniMI-L412/2020	EPI_ISL_542332	TRUE	Spain/AS-IBV-98006594/2020	EPI_ISL_654639	TRUE	USA/FL-BPHL-0490/2020	EPI_ISL_495396	TRUE	USA/GA-QDX-582/2020	EPI_ISL_571293	TRUE
Germany/BE-ChVir1897/2020	EPI_ISL_729482	TRUE	Italy/LOM-UniMI-L414/2020	EPI_ISL_542334	TRUE	Spain/AS-IBV-98006595/2020	EPI_ISL_654640	TRUE	USA/FL-BPHL-0563/2020	EPI_ISL_508767	TRUE	USA/GA-QDX-594/2020	EPI_ISL_571295	TRUE
Germany/BE-ChVir1968/2020	EPI_ISL_729492	TRUE	Italy/LOM-UniMI-L415/2020	EPI_ISL_542335	TRUE	Spain/AS-IBV-98006598/2020	EPI_ISL_654642	TRUE	USA/FL-BPHL-0565/2020	EPI_ISL_508769	TRUE	USA/GA-QDX-597/2020	EPI_ISL_571296	TRUE
Germany/BE-ChVir2192/2020	EPI_ISL_729499	TRUE	Italy/LOM-UniMI-L418/2020	EPI_ISL_542337	TRUE	Spain/AS-IBV-98006599/2020	EPI_ISL_654643	TRUE	USA/FL-BPHL-0582/2020	EPI_ISL_508786	TRUE	USA/GA-QDX-684/2020	EPI_ISL_571429	TRUE
Germany/BE-ChVir3083/2020	EPI_ISL_729529	TRUE	Italy/LOM-UniMI-L419/2020	EPI_ISL_542338	TRUE	Spain/AS-IBV-98006601/2020	EPI_ISL_654645	TRUE	USA/FL-BPHL-0595/2020	EPI_ISL_508799	TRUE	USA/GA-USAFSAM-S102/2020	EPI_ISL_812330	TRUE
Germany/BW-ChVir1946/2020	EPI_ISL_729488	TRUE	Italy/LOM-UniMI-L420/2020	EPI_ISL_542339	TRUE	Spain/AS-IBV-98006602/2020	EPI_ISL_654646	TRUE	USA/FL-BPHL-0599/2020	EPI_ISL_508803	TRUE	USA/GA-UW-MAYO61/2020	EPI_ISL_500513	TRUE
Germany/BW-FR0012/2020	EPI_ISL_852802	TRUE	Italy/LOM-UniMI-L421/2020	EPI_ISL_542340	TRUE	Spain/AS-IBV-98006603/2020	EPI_ISL_654647	TRUE	USA/FL-BPHL-0661/2020	EPI_ISL_509719	TRUE	USA/GA-UW-MAYO62/2020	EPI_ISL_500514	TRUE
Germany/BW-FR0014/2020	EPI_ISL_852737	TRUE	Italy/LOM-UniMI-L423/2020	EPI_ISL_542342	TRUE	Spain/AS-IBV-98006607/2020	EPI_ISL_654651	TRUE	USA/FL-BPHL-0674/2020	EPI_ISL_509732	TRUE	USA/GA-UW-MAYO63/2020	EPI_ISL_501074	FALSE
Germany/BW-FR0016/2020	EPI_ISL_852801	TRUE	Italy/LOM-UniMI-L425/2020	EPI_ISL_542344	TRUE	Spain/AS-IBV-98006616/2020	EPI_ISL_654657	TRUE	USA/FL-BPHL-0678/2020	EPI_ISL_509736	TRUE	USA/GA-UW-MAYO64/2020	EPI_ISL_500515	TRUE
Germany/BW-FR0024/2020	EPI_ISL_852800	TRUE	Italy/LOM-UniMI-L426/2020	EPI_ISL_542345	TRUE	Spain/AS-IBV-98006618/2020	EPI_ISL_654658	TRUE	USA/FL-BPHL-0682/2020	EPI_ISL_509740	TRUE	USA/GA_1299/2020	EPI_ISL_420787	TRUE
Germany/BW-FR0032/2020	EPI_ISL_852779	TRUE	Italy/LOM-UniMI-L428/2020	EPI_ISL_542347	TRUE	Spain/AS-IBV-98006621/2020	EPI_ISL_654675	TRUE	USA/FL-BPHL-0687/2020	EPI_ISL_509745	TRUE	USA/GA_1320/2020	EPI_ISL_420786	TRUE
Germany/BW-FR0048/2020	EPI_ISL_852798	TRUE	Italy/LOM-UniMI-L429/2020	EPI_ISL_542348	TRUE	Spain/AS-IBV-98006626/2020	EPI_ISL_654662	TRUE	USA/FL-BPHL-0692/2020	EPI_ISL_509750	TRUE	USA/GA_1445/2020	EPI_ISL_420788	TRUE
Germany/BW-FR0050/2020	EPI_ISL_852796	TRUE	Italy/LOM-UniMI-L430/2020	EPI_ISL_542349	TRUE	Spain/AS-IBV-98006629/2020	EPI_ISL_654663	TRUE	USA/FL-BPHL-0699/2020	EPI_ISL_509757	TRUE	USA/GA_1621/2020	EPI_ISL_424858	TRUE
Germany/BW-FR0060/2020	EPI_ISL_852757	TRUE	Italy/LOM-UniMI-L431/2020	EPI_ISL_542350	TRUE	Spain/AS-IBV-98006631/2020	EPI_ISL_654665	TRUE	USA/FL-BPHL-0708/2020	EPI_ISL_509766	TRUE	USA/GA_1847/2020	EPI_ISL_424859	TRUE
Germany/BW-FR0062/2020	EPI_ISL_852753	TRUE	Italy/LOM-UniMI-L432/2020	EPI_ISL_542351	TRUE	Spain/CE-ISCIII-203367/2020	EPI_ISL_862656	TRUE	USA/FL-BPHL-0797/2020	EPI_ISL_514143	TRUE	USA/GA_2070/2020	EPI_ISL_426417	TRUE
Germany/BW-FR0063/2020	EPI_ISL_852752	TRUE	Italy/LOM-UniMI-L433/2020	EPI_ISL_542352	TRUE	Spain/CE-ISCIII-205119/2020	EPI_ISL_862655	TRUE	USA/FL-BPHL-2004/2020	EPI_ISL_653157	TRUE	USA/GA_2118/2020	EPI_ISL_424861	TRUE
Germany/BW-FR0068/2020	EPI_ISL_852735	TRUE	Italy/LOM-UniMI-L435/2020	EPI_ISL_542354	TRUE	Spain/CL-ISCIII-205362/2020	EPI_ISL_862637	TRUE	USA/FL-BPHL-2120/2020	EPI_ISL_653273	TRUE	USA/GA_2343/2020	EPI_ISL_424864	TRUE
Germany/BW-FR0069/2020	EPI_ISL_852733	TRUE	Italy/LOM-UniMI-L436/2020	EPI_ISL_542355	TRUE	Spain/CM-ISCIII-201306/2020	EPI_ISL_455327	TRUE	USA/FL-CDC-2316/2020	EPI_ISL_452132	TRUE	USA/GA_2741/2020	EPI_ISL_419556	TRUE
Germany/BW-FR0072/2020	EPI_ISL_852729	TRUE	Italy/LOM-UniMI-L438/2020	EPI_ISL_542357	TRUE	Spain/CM-ISCIII-201369/2020	EPI_ISL_862642	TRUE	USA/FL-QDX-2177/2020	EPI_ISL_604448	TRUE	USA/GA_2742/2020	EPI_ISL_419557	TRUE
Germany/BW-FR0076/2020	EPI_ISL_852772	TRUE	Italy/LOM-UniMI-L439/2020	EPI_ISL_542358	TRUE	Spain/CM-ISCIII-201371/2020	EPI_ISL_862641	TRUE	USA/FL-QDX-2510/2020	EPI_ISL_604775	TRUE	GA-EHC-009I	GA-EHC-009I	TRUE
Germany/BW-FR0077/2020	EPI_ISL_852784	TRUE	Italy/LOM-UniMI-L440/2020	EPI_ISL_542359	TRUE	Spain/CN-IBV-002595/2020	EPI_ISL_467090	TRUE	USA/FL-QDX-272/2020	EPI_ISL_571027	TRUE	GA-EHC-016P	GA-EHC-016P	TRUE
Germany/BW-FR0080/2020	EPI_ISL_852778	TRUE	Italy/LOM-UniMI-L443/2020	EPI_ISL_542362	TRUE	Spain/CN-IBV-002596/2020	EPI_ISL_474912	TRUE	USA/FL-QDX-785/2020	EPI_ISL_571520	TRUE	GA-EHC-018R	GA-EHC-018R	TRUE
Germany/BW-FR0085/2020	EPI_ISL_852701	TRUE	Italy/LOM-UniMI-L444/2020	EPI_ISL_542363	TRUE	Spain/CN-IBV-002599/2020	EPI_ISL_474915	TRUE	USA/FL-QDX-787/2020	EPI_ISL_571522	TRUE	GA-EHC-023W	GA-EHC-023W	TRUE
Germany/BW-FR0089/2020	EPI_ISL_852792	TRUE	Italy/LOM-UniMI-L445/2020	EPI_ISL_542364	TRUE	Spain/CN-IBV-002600/2020	EPI_ISL_467087	TRUE	USA/FL-QDX-911/2020	EPI_ISL_571595	TRUE	GA-EHC-030D	GA-EHC-030D	TRUE
Germany/BW-FR0101/2020	EPI_ISL_852744	TRUE	Italy/LOM-UniMI-L449/2020	EPI_ISL_542367	TRUE	Spain/CN-IBV-002601/2020	EPI_ISL_467088	TRUE	USA/FL-TGH-0040/2020	EPI_ISL_1379449	TRUE	GA-EHC-031E	GA-EHC-031E	TRUE
Germany/BW-FR0104/2020	EPI_ISL_852738	TRUE	Italy/LOM-UniMI-L450/2020	EPI_ISL_542368	TRUE	Spain/CN-IBV-002602/2020	EPI_ISL_474916	TRUE	USA/FL-TGH-0056/2020	EPI_ISL_1379465	TRUE	GA-EHC-032F	GA-EHC-032F	TRUE
Germany/BW-FR0105/2020	EPI_ISL_852731	TRUE	Italy/LOM-UniMI-L451/2020	EPI_ISL_542369	TRUE	Spain/CN-IBV-002603/2020	EPI_ISL_467086	TRUE	USA/FL-TGH-0072/2020	EPI_ISL_1379481	TRUE	GA-EHC-033G	GA-EHC-033G	TRUE
Germany/BW-FR0109/2020	EPI_ISL_852732	TRUE	Italy/LOM-UniMI-L452/2020	EPI_ISL_542370	TRUE	Spain/CN-IBV-002604/2020	EPI_ISL_474917	TRUE	USA/FL-TGH-0074/2020	EPI_ISL_1379483	TRUE	GA-EHC-034H	GA-EHC-034H	TRUE
Germany/BW-FR0110/2020	EPI_ISL_852782	TRUE	Italy/LOM-UniMI-L453/2020	EPI_ISL_542371	TRUE	Spain/CN-IBV-002605/2020	EPI_ISL_467089	TRUE	USA/FL_5125/2020	EPI_ISL_419559	TRUE	GA-EHC-035I	GA-EHC-035I	TRUE
Germany/BW-FR0150/2020	EPI_ISL_852758	TRUE	Italy/LOM-UniMI-L455/2020	EPI_ISL_542373	TRUE	Spain/CN-IBV-002876/2020	EPI_ISL_474852	TRUE	USA/HI-H200034/2020	EPI_ISL_752619	TRUE	GA-EHC-036J	GA-EHC-036J	TRUE
Germany/BW-FR0152/2020	EPI_ISL_852812	TRUE	Italy/LOM-UniMI-L457/2020	EPI_ISL_542374	TRUE	Spain/CN-IBV-97006482/2020	EPI_ISL_537697	TRUE	USA/IA-CDC-4047/2020	EPI_ISL_647993	TRUE	GA-EHC-037K	GA-EHC-037K	TRUE
Germany/BW-FR0157/2020	EPI_ISL_852746	TRUE	Italy/LOM-UniMI-L458/2020	EPI_ISL_542375	TRUE	Spain/CN-IBV-97006489/2020	EPI_ISL_537703	TRUE	USA/IA-CDC-4052/2020	EPI_ISL_647998	TRUE	GA-EHC-038L	GA-EHC-038L	TRUE
Germany/BW-FR0158/2020	EPI_ISL_852745	TRUE	Italy/LOM-UniMI-L462/2020	EPI_ISL_542378	TRUE	Spain/CN-IBV-97006505/2020	EPI_ISL_537713	TRUE	USA/ID-IBL-611256/2020	EPI_ISL_1164813	TRUE	GA-EHC-040N	GA-EHC-040N	TRUE
Germany/BW-FR0162/2020	EPI_ISL_852803	TRUE	Italy/LOM-UniMI-L463/2020	EPI_ISL_542379	TRUE	Spain/CN-IBV-97006507/2020	EPI_ISL_537715	TRUE	USA/ID-QDX-1090/2020	EPI_ISL_571831	TRUE	GA-EHC-041O	GA-EHC-041O	TRUE
Germany/BW-FR0163/2020	EPI_ISL_852740	TRUE	Italy/LOM-UniMI-L465/2020	EPI_ISL_542381	TRUE	Spain/CN-IBV-97006508/2020	EPI_ISL_537716	TRUE	USA/ID-QDX-1720/2020	EPI_ISL_604029	TRUE	GA-EHC-042P	GA-EHC-042P	TRUE
Germany/BW-FR0166/2020	EPI_ISL_852789	TRUE	Italy/LOM-UniMI-L469/2020	EPI_ISL_542382	TRUE	Spain/CN-ISCIII-201939/2020	EPI_ISL_455326	TRUE	USA/ID-QDX-1777/2020	EPI_ISL_604035	TRUE	GA-EHC-043Q	GA-EHC-043Q	TRUE
Germany/BW-FR0174/2020	EPI_ISL_852780	TRUE	Italy/LOM-UniMI-L470/2020	EPI_ISL_542383	TRUE	Spain/CT-HUVH-14601/2020	EPI_ISL_819305	TRUE	USA/ID-QDX-606/2020	EPI_ISL_571301	TRUE	GA-EHC-044R	GA-EHC-044R	TRUE
Germany/BW-FR0181/2020	EPI_ISL_852724	TRUE	Italy/LOM-UniMI-L471/2020	EPI_ISL_542384	TRUE	Spain/CT-HUVH-16634/2020	EPI_ISL_819307	TRUE	USA/ID-QDX-700/2020	EPI_ISL_571432	TRUE	GA-EHC-048V	GA-EHC-048V	TRUE
Germany/BW-FR0183/2020	EPI_ISL_852722	TRUE	Italy/LOM-UniMI-L475/2020	EPI_ISL_542388	TRUE	Spain/CT-HUVH-16830/2020	EPI_ISL_819308	TRUE	USA/ID-QDX-707/2020	EPI_ISL_571433	TRUE	GA-EHC-049W	GA-EHC-049W	TRUE
Germany/BW-FR0184/2020	EPI_ISL_852721	TRUE	Italy/LOM-UniMI-L477/2020	EPI_ISL_542390	TRUE	Spain/CT-HUVH-51925/2020	EPI_ISL_819302	TRUE	USA/ID-UNM-IBL033/2020	EPI_ISL_632852	TRUE	GA-EHC-050X	GA-EHC-050X	TRUE
Germany/BW-FR0186/2020	EPI_ISL_852720	TRUE	Italy/LOM-UniMI-L478/2020	EPI_ISL_542391	TRUE	Spain/CT-HUVH-52036/2020	EPI_ISL_819304	TRUE	USA/ID-UNM-IBL038/2020	EPI_ISL_632876	TRUE	GA-EHC-051Y	GA-EHC-051Y	TRUE
Germany/BW-FR0187/2020	EPI_ISL_852719	TRUE	Italy/LOM-UniMI-L480/2020	EPI_ISL_542392	TRUE	Spain/CT-HUVH-58300/2020	EPI_ISL_819316	TRUE	USA/ID-UNM-IBL053/2020	EPI_ISL_632853	TRUE	GA-EHC-052Z	GA-EHC-052Z	TRUE
Germany/BW-FR0189/2020	EPI_ISL_852717	TRUE	Italy/LOM-UniMI-L485/2020	EPI_ISL_542393	TRUE	Spain/CT-HUVH-VH1133/2020	EPI_ISL_418860	TRUE	USA/ID-UNM-IBL311/2020	EPI_ISL_632861	TRUE	GA-EHC-053A	GA-EHC-053A	TRUE
Germany/BW-FR0193/2020	EPI_ISL_852715	TRUE	Italy/LOM-UniMI-L486/2020	EPI_ISL_542394	TRUE	Spain/CT-HUVH-VH1449/2020	EPI_ISL_447532	TRUE	USA/ID-UW-1934/2020	EPI_ISL_424322	TRUE	GA-EHC-054B	GA-EHC-054B	TRUE
Germany/BW-FR0195/2020	EPI_ISL_852713	TRUE	Italy/LOM-UniMI-L487/2020	EPI_ISL_542395	TRUE	Spain/CT-HUVH-VH2683/2020	EPI_ISL_418861	TRUE	USA/ID-UW-1935/2020	EPI_ISL_424319	TRUE	GA-EHC-055C	GA-EHC-055C	TRUE
Germany/BW-FR0230/2020	EPI_ISL_852708	TRUE	Italy/LOM-UniMI-L491/2020	EPI_ISL_542396	TRUE	Spain/CT-HUVH-VH5081/2020	EPI_ISL_444981	TRUE	USA/ID-UW-1957/2020	EPI_ISL_424315	TRUE	GA-EHC-060H	GA-EHC-060H	TRUE
Germany/BW-FR0231/2020	EPI_ISL_852707	TRUE	Italy/LOM-UniMI-L492/2020	EPI_ISL_542397	TRUE	Spain/CT-HUVH-VH5325/2020	EPI_ISL_444982	TRUE	USA/ID-UW-2174/2020	EPI_ISL_426061	TRUE	GA-EHC-064L	GA-EHC-064L	TRUE
Germany/BW-FR0237/2020	EPI_ISL_852702	TRUE	Italy/LOM-UniMI-L53/2020	EPI_ISL_542400	TRUE	Spain/CT-HUVH-VH5994/2020	EPI_ISL_444983	TRUE	USA/ID-UW-2195/2020	EPI_ISL_529161	TRUE	GA-EHC-069Q	GA-EHC-069Q	TRUE
Germany/BW-FR0239/2020	EPI_ISL_852699	TRUE	Italy/LOM-UniMI-L54/2020	EPI_ISL_542401	TRUE	Spain/CT-HUVH-VH6552/2020	EPI_ISL_444984	TRUE	USA/ID-UW-3481/2020	EPI_ISL_490996	TRUE	GA-EHC-080B	GA-EHC-080B	TRUE
Germany/BW-FR0248/2020	EPI_ISL_852690	TRUE	Italy/LOM-UniMI-L55/2020	EPI_ISL_542402	TRUE	Spain/CT-HUVH-VH6837/2020	EPI_ISL_444985	TRUE	USA/ID-UW-3888/2020	EPI_ISL_427166	TRUE	GA-EHC-083E	GA-EHC-083E	TRUE
Germany/BW-FR0251/2020	EPI_ISL_852689	TRUE	Italy/LOM-UniMI-L56/2020	EPI_ISL_542403	TRUE	Spain/CT-HUVH-VH7663/2020	EPI_ISL_447533	TRUE	USA/ID-UW-4357/2020	EPI_ISL_426065	TRUE	GA-EHC-086H	GA-EHC-086H	TRUE
Germany/BW-FR0253/2020	EPI_ISL_852688	TRUE	Italy/LOM-UniMI-L57/2020	EPI_ISL_542404	TRUE	Spain/CT-HUVH-VH7924/2020	EPI_ISL_450337	TRUE	USA/ID-UW-4383/2020	EPI_ISL_430948	TRUE	GA-EHC-097S	GA-EHC-097S	TRUE
Germany/BW-FR0262/2020	EPI_ISL_852682	TRUE	Italy/LOM-UniMI-L60/2020	EPI_ISL_542406	TRUE	Spain/CT-IBV-003150/2020	EPI_ISL_510247	TRUE	USA/IL-NM-0675/2020	EPI_ISL_626467	TRUE	GA-EHC-108D	GA-EHC-108D	TRUE
Germany/BW-FR0264/2020	EPI_ISL_852681	TRUE	Italy/LOM-UniMI-L62/2020	EPI_ISL_542408	TRUE	Spain/CT-IBV-003151/2020	EPI_ISL_510248	TRUE	USA/IL-NM0101/2020	EPI_ISL_444587	TRUE	GA-EHC-109E	GA-EHC-109E	TRUE
Germany/BW-FR0271/2020	EPI_ISL_852678	TRUE	Italy/LOM-UniMI-L63/2020	EPI_ISL_542409	TRUE	Spain/CT-IBV-003152/2020	EPI_ISL_510249	TRUE	USA/IL-NM0113/2020	EPI_ISL_444597	TRUE	GA-EHC-110F	GA-EHC-110F	TRUE
Germany/BW-FR0336/2020	EPI_ISL_852670	TRUE	Italy/LOM-UniMI-L64/2020	EPI_ISL_542410	TRUE	Spain/CT-IBV-003153/2020	EPI_ISL_510250	TRUE	USA/IL-NM012/2020	EPI_ISL_444524	TRUE	GA-EHC-111G	GA-EHC-111G	TRUE
Germany/BW-FR0337/2020	EPI_ISL_852766	TRUE	Italy/LOM-UniMI-L66/2020	EPI_ISL_542412	TRUE	Spain/CT-IBV-003154/2020	EPI_ISL_510251	TRUE	USA/IL-NM017/2020	EPI_ISL_444527	TRUE	GA-EHC-112H	GA-EHC-112H	TRUE
Germany/BW-FR0338/2020	EPI_ISL_852669	TRUE	Italy/LOM-UniMI-L68/2020	EPI_ISL_542414	TRUE	Spain/CT-IBV-003161/2020	EPI_ISL_510257	TRUE	USA/IL-NM018/2020	EPI_ISL_444528	TRUE	GA-EHC-113J	GA-EHC-113J	TRUE
Germany/BW-FR0339/2020	EPI_ISL_852764	TRUE	Italy/LOM-UniMI-L69/2020	EPI_ISL_542415	TRUE	Spain/CT-IBV-003164/2020	EPI_ISL_510260	TRUE	USA/IL-NM056/2020	EPI_ISL_444552	TRUE	GA-EHC-114K	GA-EHC-114K	TRUE
												GA-EHC-115L	GA-EHC-115L	TRUE
												GA-EHC-117N	GA-EHC-117N	TRUE
												GA-EHC-118O	GA-EHC-118O	TRUE
												GA-EHC-119P	GA-EHC-119P	TRUE
												GA-EHC-121R	GA-EHC-121R	TRUE
												GA-EHC-022V	GA-EHC-022V	TRUE
												GA-EHC-047U	GA-EHC-047U	TRUE

Table S6. Sequence names and accession numbers for sequences included in the Bayesian phylogenetic analysis including select 19B sequences

Sequence Name	GISAID Accession	Pass Clock Filter	Full BEAST	Downsampled BEAST (rep 0)	Downsampled BEAST (rep 1)	Downsampled BEAST (rep 2)	Downsampled BEAST (rep 3)	Downsampled BEAST (rep 4)
Australia/NSW1027/2020	EPI_ISL_593756	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/NSW2063/2020	EPI_ISL_509496	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/NSW213/2020	EPI_ISL_427726	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/NSW214/2020	EPI_ISL_427727	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/NSW215/2020	EPI_ISL_427730	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/NSW216/2020	EPI_ISL_427732	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/NSW2170/2020	EPI_ISL_500641	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/NSW2261/2020	EPI_ISL_500697	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/NSW374/2020	EPI_ISL_451634	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/QLD1203/2020	EPI_ISL_639794	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/SAP154/2020	EPI_ISL_451148	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/SAP216/2020	EPI_ISL_468000	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/SAP453/2020	EPI_ISL_508143	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/VIC100/2020	EPI_ISL_419812	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/VIC103/2020	EPI_ISL_419814	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/VIC108/2020	EPI_ISL_419714	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/VIC112/2020	EPI_ISL_419821	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/VIC117/2020	EPI_ISL_419727	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/VIC150/2020	EPI_ISL_419847	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/VIC17/2020	EPI_ISL_419736	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/VIC182/2020	EPI_ISL_450212	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/VIC209/2020	EPI_ISL_419904	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/VIC215/2020	EPI_ISL_419910	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/VIC27/2020	EPI_ISL_419746	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/VIC28/2020	EPI_ISL_419747	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/VIC32/2020	EPI_ISL_419751	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/VIC33/2020	EPI_ISL_419752	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/VIC330/2020	EPI_ISL_426640	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/VIC349/2020	EPI_ISL_450213	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/VIC35/2020	EPI_ISL_419755	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/VIC350/2020	EPI_ISL_426658	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/VIC51/2020	EPI_ISL_419826	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/VIC53/2020	EPI_ISL_419769	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/VIC56/2020	EPI_ISL_419777	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/VIC73/2020	EPI_ISL_419785	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/VIC76/2020	EPI_ISL_419788	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/VIC77/2020	EPI_ISL_419789	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/VIC85/2020	EPI_ISL_419795	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/VIC86/2020	EPI_ISL_419796	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Australia/WA302/2020	EPI_ISL_596845	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Beijing/IVDC-BJ-005/2020	EPI_ISL_408485	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Canada/AB-76629/2020	EPI_ISL_806416	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Canada/AB-89673/2020	EPI_ISL_806248	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Canada/NS-NML-930/2020	EPI_ISL_579570	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Canada/ON_MU-S7/2020	EPI_ISL_463993	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Canada/QC-JUS-V5230431/2020	EPI_ISL_890488	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Canada/QC-JUS-V5251969/2020	EPI_ISL_890588	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Canada/QC-JUS-V5290502/2020	EPI_ISL_890830	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Canada/QC-JUS-V5291038/2020	EPI_ISL_890798	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Canada/QC-JUS-V6010702/2020	EPI_ISL_1241193	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Canada/QC-LSPQ-L00219020/2020	EPI_ISL_535786	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Canada/QC-LSPQ-L00230159/2020	EPI_ISL_535911	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Canada/Qc-LSPQ-L00236091/2020	EPI_ISL_536117	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Canada/Qc-LSPQ-L00240796/2020	EPI_ISL_465686	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Canada/Qc-LSPQ-L00243560/2020	EPI_ISL_536363	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Canada/Qc-LSPQ-L00244008/2020	EPI_ISL_536387	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Guangdong/20SF115/2020	EPI_ISL_428443	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Guangdong/20SF254/2020	EPI_ISL_428457	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Guatemala/CDC-1234/2020	EPI_ISL_509701	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
HongKong/HKPU1_2101/2020	EPI_ISL_417176	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
HongKong/HKU-001a/2020	EPI_ISL_434571	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
HongKong/VM20001061-2/2020	EPI_ISL_412028	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
NewZealand/20VR0275/2020	EPI_ISL_416538	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
NewZealand/20VR0987/2020	EPI_ISL_456172	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
NewZealand/20VR1275/2020	EPI_ISL_456200	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Peru/LIM-INS-325/2020	EPI_ISL_1111223	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Scotland/CVR113/2020	EPI_ISL_425658	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Scotland/CVR205/2020	EPI_ISL_425735	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Scotland/CVR261/2020	EPI_ISL_433277	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Scotland/CVR634/2020	EPI_ISL_425793	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Scotland/CVR876/2020	EPI_ISL_439126	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Shanghai/SH0029/2020	EPI_ISL_416338	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Shanghai/SH0032/2020	EPI_ISL_416341	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Shanghai/SH0079/2020	EPI_ISL_416381	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Shanghai/SH0128/2020	EPI_ISL_416409	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Sichuan/IVDC-SC-001/2020	EPI_ISL_408484	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Singapore/232/2020	EPI_ISL_462350	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Singapore/833/2020	EPI_ISL_516805	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Singapore/925/2020	EPI_ISL_538456	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Singapore/926/2020	EPI_ISL_538458	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
SouthKorea/KCDC2012/2020	EPI_ISL_426182	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
SouthKorea/KCDC2013/2020	EPI_ISL_426183	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
SouthKorea/KCDC2014/2020	EPI_ISL_426187	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
SouthKorea/KCDC2047/2020	EPI_ISL_471453	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
SouthKorea/KCDC2065/2020	EPI_ISL_497966	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Taiwan/NCKUH-013/2020	EPI_ISL_493206	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
UnitedArabEmirates/P1/2020	EPI_ISL_463740	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
Vietnam/38142/2020	EPI_ISL_416427	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Vietnam/CM99/2020	EPI_ISL_416429	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Wuhan/HB-WH5-231/2020	EPI_ISL_454974	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Wuhan/HB-WH6-246/2020	EPI_ISL_454983	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/AZ-QDX-1568/2020	EPI_ISL_603872	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/AZ-QDX-1729/2020	EPI_ISL_604015	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/AZ-TG268282/2020	EPI_ISL_426504	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/AZ-TG271435/2020	EPI_ISL_426534	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/AZ-TG271575/2020	EPI_ISL_694052	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/CA-CSMC134/2020	EPI_ISL_475612	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/CA-CZB-1280/2020	EPI_ISL_454638	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/CA-CZB043/2020	EPI_ISL_429048	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/CA-QDX-1043/2020	EPI_ISL_571708	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE
USA/CA-QDX-111/2020	EPI_ISL_468563	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/CA-QDX-1434/2020	EPI_ISL_572086	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE
USA/CA-QDX-148/2020	EPI_ISL_467814	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE
USA/CA-QDX-1520/2020	EPI_ISL_603773	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	TRUE
USA/CA-QDX-1528/2020	EPI_ISL_603781	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/CA-QDX-1576/2020	EPI_ISL_603890	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE
USA/CA-QDX-1629/2020	EPI_ISL_603908	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/CA-QDX-1675/2020	EPI_ISL_603924	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/CA-QDX-1975/2020	EPI_ISL_604217	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/CA-QDX-2007/2020	EPI_ISL_604304	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE
USA/CA-QDX-2012/2020	EPI_ISL_604306	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE
USA/CA-QDX-2019/2020	EPI_ISL_604308	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/CA-QDX-2022/2020	EPI_ISL_604310	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/CA-QDX-2039/2020	EPI_ISL_604319	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/CA-QDX-2077/2020	EPI_ISL_604395	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE
USA/CA-QDX-2134/2020	EPI_ISL_604423	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/CA-QDX-2185/2020	EPI_ISL_604446	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE
USA/CA-QDX-2586/2020	EPI_ISL_604881	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE
USA/CA-QDX-2647/2020	EPI_ISL_604909	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE
USA/CA-QDX-2691/2020	EPI_ISL_604998	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE
USA/CA-QDX-449/2020	EPI_ISL_571171	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE
USA/CA-QDX-698/2020	EPI_ISL_571417	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE
USA/CA-QDX-704/2020	EPI_ISL_571421	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/CA-QDX-705/2020	EPI_ISL_571422	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/CA-QDX-797/2020	EPI_ISL_571491	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE
USA/CT-UW260/2020	EPI_ISL_418045	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/DE-DHSS-F917680/2020	EPI_ISL_574586	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/DE-DHSS-F917718/2020	EPI_ISL_561345	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE
USA/DE-DHSS-F917736/2020	EPI_ISL_561346	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE
USA/DE-DHSS-F917751/2020	EPI_ISL_565832	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE
USA/DE-DHSS-F917887/2020	EPI_ISL_584013	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE
USA/DE-DHSS-F917888/2020	EPI_ISL_576160	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE
USA/DE-DHSS-F917914/2020	EPI_ISL_576227	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	TRUE
USA/DE-DHSS-F917930/2020	EPI_ISL_576224	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE
USA/DE-DHSS-F917932/2020	EPI_ISL_576156	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE
USA/DE-DHSS-F917934/2020	EPI_ISL_576225	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE
USA/DE-DHSS-F917945/2020	EPI_ISL_576223	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE
USA/DE-DHSS-F917986/2020	EPI_ISL_576158	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE	TRUE
USA/DE-DHSS-F918161/2020	EPI_ISL_576151	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE
USA/DE-DHSS-F918170/2020	EPI_ISL_593945	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE
USA/DE-DHSS-F918443/2020	EPI_ISL_593963	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/DE-DHSS-F918451/2020	EPI_ISL_593966	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/DE-DHSS-F918613/2020	EPI_ISL_574599	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/FL-BPHL-0487/2020	EPI_ISL_495393	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE
USA/FL-BPHL-0584/2020	EPI_ISL_508788	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE
USA/FL-BPHL-0595/2020	EPI_ISL_508799	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE
USA/FL-BPHL-0597/2020	EPI_ISL_508801	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE
USA/FL-BPHL-0676/2020	EPI_ISL_509734	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE
USA/FL-BPHL-0682/2020	EPI_ISL_509740	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE
USA/FL-BPHL-0714/2020	EPI_ISL_509772	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/FL-BPHL-1227/2020	EPI_ISL_541237	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/FL-BPHL-2100/2020	EPI_ISL_653253	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/FL-CDC-2718/2020	EPI_ISL_452111	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/FL-QDX-2018/2020	EPI_ISL_604326	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE
USA/FL-QDX-2510/2020	EPI_ISL_604775	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE
USA/FL-QDX-2513/2020	EPI_ISL_604776	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	FALSE
USA/FL-QDX-574/2020	EPI_ISL_571286	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE	TRUE
USA/FL-QDX-785/2020	EPI_ISL_571520	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE
USA/FL-QDX-788/2020	EPI_ISL_571523	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE
USA/FL-QDX-943/2020	EPI_ISL_571598	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE
USA/FL-TGH-0043/2020	EPI_ISL_1379452	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE
USA/FL-TGH-0055/2020	EPI_ISL_1379464	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/FL-TGH-0060/2020	EPI_ISL_1379469	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	TRUE
USA/FL-TGH-0062/2020	EPI_ISL_1379471	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	FALSE
USA/FL-TGH-0063/2020	EPI_ISL_1379472	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE
USA/FL-TGH-0080/2020	EPI_ISL_1379487	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE
USA/FL-TGH-0082/2020	EPI_ISL_1379489	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE	FALSE
USA/FL-TGH-0083/2020	EPI_ISL_1379490	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE
USA/FL-UF2/2020	EPI_ISL_434637	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE
USA/FL-UFL-UF2/2020	EPI_ISL_424351	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE
USA/FL-USAFSAM-S009/2020	EPI_ISL_512785	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE
USA/FL_9655/2020	EPI_ISL_424854	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/HI-QDX-759/2020	EPI_ISL_571528	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/IL-NM-0052/2020	EPI_ISL_626360	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/IL-NM-0144/2020	EPI_ISL_626368	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE
USA/IL-NM-0149/2020	EPI_ISL_626370	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/IL-NM-0184/2020	EPI_ISL_626375	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE
USA/IL-NM-0333/2020	EPI_ISL_936497	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE
USA/IL-NM-0367/2020	EPI_ISL_626382	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE

USA/IL-NM-0672/2020	EPI_ISL_626464	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE
USA/IL-NM-0675/2020	EPI_ISL_626467	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE
USA/IL-NM-0676/2020	EPI_ISL_626468	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE	TRUE
USA/IL-NM0103/2020	EPI_ISL_444588	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/IL-NM0109/2020	EPI_ISL_444594	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE
USA/IL-NM0112/2020	EPI_ISL_444596	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	TRUE
USA/IL-NM0113/2020	EPI_ISL_444597	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE
USA/IL-NM0120/2020	EPI_ISL_444603	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE	FALSE
USA/IL-NM0121/2020	EPI_ISL_444604	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE
USA/IL-NM020/2020	EPI_ISL_444530	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	FALSE
USA/IL-NM053/2020	EPI_ISL_444549	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/IL-NM059/2020	EPI_ISL_444555	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE
USA/IL-NM066/2020	EPI_ISL_444561	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/IL-NM067/2020	EPI_ISL_444562	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/IL-NM069/2020	EPI_ISL_444564	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE
USA/IL-NM071/2020	EPI_ISL_444566	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE
USA/IL-NM072/2020	EPI_ISL_444567	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE
USA/IL-NM074/2020	EPI_ISL_444569	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE
USA/IL-NM081/2020	EPI_ISL_444572	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE
USA/IL-NM082/2020	EPI_ISL_444573	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE
USA/IL-NM087/2020	EPI_ISL_444577	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE
USA/IL-NM097/2020	EPI_ISL_444585	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/IL-QDX-280/2020	EPI_ISL_571031	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE
USA/IL-QDX-283/2020	EPI_ISL_571034	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE
USA/IL-QDX-685/2020	EPI_ISL_571434	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/IL-UW-MAYO2/2020	EPI_ISL_501075	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE
USA/IL-UW-MAYO6/2020	EPI_ISL_500535	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	FALSE
USA/IN-CDC-2013/2020	EPI_ISL_452131	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/IN-Lilly-IPB0170-14bcd4/2020	EPI_ISL_437455	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/IN-Lilly-IPB0173-06bc31/2020	EPI_ISL_911470	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/LA-QDX-1193/2020	EPI_ISL_571939	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/LA-QDX-1992/2020	EPI_ISL_604335	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/LA-QDX-2108/2020	EPI_ISL_604454	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/LA-QDX-2131/2020	EPI_ISL_604455	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/LA-QDX-879/2020	EPI_ISL_571604	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MA-MGH-00004/2020	EPI_ISL_460467	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MA-MGH-00143/2020	EPI_ISL_460114	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MA-MGH-00145/2020	EPI_ISL_460170	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MA-MGH-00174/2020	EPI_ISL_460179	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MA-MGH-00555/2020	EPI_ISL_460232	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MA-MGH-00563/2020	EPI_ISL_460186	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MA-MGH-00566/2020	EPI_ISL_460285	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MA-MGH-00614/2020	EPI_ISL_460205	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MA-QDX-1456/2020	EPI_ISL_603823	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MA-QDX-150/2020	EPI_ISL_467855	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MA-QDX-61/2020	EPI_ISL_467862	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MD-HP00030/2020	EPI_ISL_434686	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MD-HP00031/2020	EPI_ISL_457789	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MD-HP00065/2020	EPI_ISL_457807	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MD-HP00076/2020	EPI_ISL_438234	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MD-HP00086/2020	EPI_ISL_457756	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MD-HP00087/2020	EPI_ISL_438241	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MD-HP00104/2020	EPI_ISL_438246	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MD-HP00113/2020	EPI_ISL_457768	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MD-HP00120/2020	EPI_ISL_457813	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MD-HP00153/2020	EPI_ISL_457782	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MD-HP00154/2020	EPI_ISL_457783	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MDH-8144/2020	EPI_ISL_454431	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/ME-HETL-J0030/2020	EPI_ISL_513442	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/ME-HETL-J0051/2020	EPI_ISL_513462	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/MI-MDHHS-SC20050/2020	EPI_ISL_437137	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE
USA/MI-MDHHS-SC20052/2020	EPI_ISL_437139	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE
USA/MI-MDHHS-SC20058/2020	EPI_ISL_437145	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE
USA/MI-MDHHS-SC20132/2020	EPI_ISL_436833	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE
USA/MI-MDHHS-SC20139/2020	EPI_ISL_436820	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE
USA/MI-MDHHS-SC20181/2020	EPI_ISL_436865	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE
USA/MI-MDHHS-SC20202/2020	EPI_ISL_447173	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE
USA/MI-MDHHS-SC20231/2020	EPI_ISL_447201	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE	FALSE
USA/MI-MDHHS-SC20242/2020	EPI_ISL_447212	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE
USA/MI-MDHHS-SC20451/2020	EPI_ISL_452325	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/MI-MDHHS-SC20469/2020	EPI_ISL_460008	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE
USA/MI-MDHHS-SC21094/2020	EPI_ISL_507870	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE
USA/MI-MDHHS-SC21136/2020	EPI_ISL_507912	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MI-MDHHS-SC21590/2020	EPI_ISL_516317	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE
USA/MI-QDX-1306/2020	EPI_ISL_571961	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE
USA/MI-QDX-1681/2020	EPI_ISL_603969	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/MI-QDX-1757/2020	EPI_ISL_604053	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE
USA/MI-QDX-1769/2020	EPI_ISL_604056	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/MI-QDX-2199/2020	EPI_ISL_604537	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MI-QDX-296/2020	EPI_ISL_571040	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE
USA/MI-QDX-309/2020	EPI_ISL_571053	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE
USA/MI-QDX-312/2020	EPI_ISL_571056	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/MI-QDX-364/2020	EPI_ISL_571107	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MI-QDX-58/2020	EPI_ISL_467871	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MI-QDX-593/2020	EPI_ISL_571331	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE
USA/MI-QDX-601/2020	EPI_ISL_571336	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE
USA/MI-QDX-636/2020	EPI_ISL_571361	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	TRUE
USA/MI-QDX-826/2020	EPI_ISL_571543	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE
USA/MI-QDX-888/2020	EPI_ISL_571609	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/MI-UM-2006S000851/2020	EPI_ISL_484710	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MI-UM-2006S000881/2020	EPI_ISL_484731	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	TRUE
USA/MN-MDH-1292/2020	EPI_ISL_483012	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE
USA/MN-MDH-1320/2020	EPI_ISL_495619	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MN-MDH-139/2020	EPI_ISL_460052	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE
USA/MN-MDH-1418/2020	EPI_ISL_514637	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MN-MDH-1420/2020	EPI_ISL_514639	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE
USA/MN-MDH-1428/2020	EPI_ISL_514647	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE
USA/MN-MDH-1436/2020	EPI_ISL_514655	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MN-MDH-1466/2020	EPI_ISL_518860	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MN-MDH-1469/2020	EPI_ISL_518863	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE
USA/MN-MDH-1474/2020	EPI_ISL_518868	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE
USA/MN-MDH-1477/2020	EPI_ISL_518871	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE
USA/MN-MDH-1481/2020	EPI_ISL_518875	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE
USA/MN-MDH-91/2020	EPI_ISL_460072	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE
USA/MN-QDX-1007/2020	EPI_ISL_571733	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE
USA/MN-QDX-1342/2020	EPI_ISL_572131	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MN-QDX-1386/2020	EPI_ISL_572175	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE
USA/MN-QDX-2258/2020	EPI_ISL_604551	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE
USA/MN-QDX-2265/2020	EPI_ISL_604552	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE
USA/MN-QDX-2727/2020	EPI_ISL_605033	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE
USA/MN-QDX-756/2020	EPI_ISL_571548	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE
USA/MN-UW-628/2020	EPI_ISL_476909	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MO-MSPHL-000010/2020	EPI_ISL_1362561	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/MO-MSPHL-000042/2020	EPI_ISL_1362593	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/MS-CDC-6566/2020	EPI_ISL_648018	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MS-CDC-6568/2020	EPI_ISL_648020	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MS-CDC-6574/2020	EPI_ISL_648026	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/MS-CDC-6576/2020	EPI_ISL_648028	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/NC-UNC-LCCC0007/2020	EPI_ISL_877591	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/NJ-QDX-2250/2020	EPI_ISL_604557	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/NY-MSK-9A/2020	EPI_ISL_583461	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE
USA/NY-MSK-9Ai/2020	EPI_ISL_583463	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/NY-MSK-9B/2020	EPI_ISL_583462	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE
USA/NY-MSK-9Bi/2020	EPI_ISL_583464	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE
USA/NY-NYCPHL-000282/2020	EPI_ISL_631808	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE
USA/NY-NYCPHL-000290/2020	EPI_ISL_631816	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	FALSE
USA/NY-NYCPHL-000509/2020	EPI_ISL_631970	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/NY-NYCPHL-000549/2020	EPI_ISL_632009	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE
USA/NY-NYCPHL-000738/2020	EPI_ISL_632119	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	FALSE
USA/NY-NYUMC565/2020	EPI_ISL_444682	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/NY-NYUMC728/2020	EPI_ISL_451443	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/NY-NYUMC754/2020	EPI_ISL_451468	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE
USA/NY-PV08490/2020	EPI_ISL_421426	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE
USA/NY-PV09438/2020	EPI_ISL_450115	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	TRUE
USA/NY-PV09466/2020	EPI_ISL_450139	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE
USA/NY-QDX-1257/2020	EPI_ISL_572021	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE
USA/NY-QDX-19/2020	EPI_ISL_467897	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE
USA/NY-QDX-1941/2020	EPI_ISL_604263	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE
USA/NY-QDX-2008/2020	EPI_ISL_604361	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE
USA/NY-QDX-2711/2020	EPI_ISL_605047	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE
USA/NY-WC-13741-01/2020	EPI_ISL_534731	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE	FALSE
USA/NY-WCMP11A03P/2020	EPI_ISL_427583	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE
USA/NY-Wadsworth-14380-01/2020	EPI_ISL_676734	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE
USA/NY-Wadsworth-14419-01/2020	EPI_ISL_525611	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE
USA/NY-Wadsworth-18124-01/2020	EPI_ISL_676743	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE
USA/NY-Wadsworth-21493-01/2020	EPI_ISL_525621	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/NY-Wadsworth-26730-01/2020	EPI_ISL_525626	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE
USA/NY-Wadsworth-28157-01/2020	EPI_ISL_525630	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE
USA/NY-Wadsworth-29118-01/2020	EPI_ISL_676762	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE
USA/OH-ODH-SC21713/2020	EPI_ISL_435520	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/OH-OSUP0016/2020	EPI_ISL_427288	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/OH-QDX-906/2020	EPI_ISL_571685	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/PA-CDC-8398/2020	EPI_ISL_450802	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/PA-MGEL107/2020	EPI_ISL_454384	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/PA-QDX-1888/2020	EPI_ISL_604279	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/SC-DHEC-0001/2020	EPI_ISL_491097	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE
USA/SC-DHEC-0003/2020	EPI_ISL_491098	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE
USA/SC-DHEC-0008/2020	EPI_ISL_491099	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/SC-DHEC-0014/2020	EPI_ISL_529171	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/SC-DHEC-0031/2020	EPI_ISL_529173	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/SC-DHEC-0032/2020	EPI_ISL_529174	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/SC-DHEC-0046/2020	EPI_ISL_491101	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/SC-DHEC-0048/2020	EPI_ISL_491102	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/SC-DHEC-0050/2020	EPI_ISL_491103	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/SC-DHEC-0055/2020	EPI_ISL_491104	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/SC-DHEC-0064/2020	EPI_ISL_529175	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/SC-USAFSAMS101/2020	EPI_ISL_812343	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/SC_3520/2020	EPI_ISL_424902	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE
USA/SC_3569/2020	EPI_ISL_424841	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE
USA/SC_3570/2020	EPI_ISL_424903	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE
USA/SC_3571/2020	EPI_ISL_424904	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	TRUE
USA/SC_3575/2020	EPI_ISL_424842	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE
USA/SC_6370/2020	EPI_ISL_424888	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/TX-CDC-8001/2020	EPI_ISL_452115	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/TX-DSHS-0200/2020	EPI_ISL_525763	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/TX-GCID-192000051B/2020	EPI_ISL_501167	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE
USA/TX-HMH-1213/2020	EPI_ISL_542587	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE
USA/TX-HMH-1736/2020	EPI_ISL_542803	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE
USA/TX-HMH0105/2020	EPI_ISL_434810	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/TX-HMH0110/2020	EPI_ISL_434812	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE
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USA/TX-HMH0125/2020	EPI_ISL_434825	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE
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USA/TX-HMH0128/2020	EPI_ISL_434828	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE
USA/TX-HMH0129/2020	EPI_ISL_434829	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE
USA/TX-HMH0131/2020	EPI_ISL_434831	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/TX-HMH0141/2020	EPI_ISL_434840	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	FALSE
USA/TX-HMH0150/2020	EPI_ISL_434849	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/TX-HMH0155/2020	EPI_ISL_434854	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE
USA/TX-HMH0156/2020	EPI_ISL_434855	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE
USA/TX-HMH0192/2020	EPI_ISL_434867	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/TX-HMH0198/2020	EPI_ISL_434873	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE
USA/TX-HMH0207/2020	EPI_ISL_434882	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE
USA/TX-HMH0209/2020	EPI_ISL_434884	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE
USA/TX-HMH021/2020	EPI_ISL_434731	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/TX-HMH0212/2020	EPI_ISL_434887	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE
USA/TX-HMH022/2020	EPI_ISL_434732	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE
USA/TX-HMH0234/2020	EPI_ISL_434891	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
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USA/TX-HMH0276/2020	EPI_ISL_434904	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE	FALSE
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USA/TX-HMH0300/2020	EPI_ISL_434923	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
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USA/TX-HMH0322/2020	EPI_ISL_434934	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE
USA/TX-HMH0360/2020	EPI_ISL_434953	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE
USA/TX-HMH0370/2020	EPI_ISL_434961	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE	FALSE
USA/TX-HMH0375/2020	EPI_ISL_434964	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE
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USA/TX-HMH051/2020	EPI_ISL_434760	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/TX-HMH057/2020	EPI_ISL_434766	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	TRUE
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USA/TX-HMH068/2020	EPI_ISL_434777	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
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USA/TX-QDX-1097/2020	EPI_ISL_571903	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE
USA/TX-QDX-1198/2020	EPI_ISL_572036	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/TX-QDX-1201/2020	EPI_ISL_572038	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/TX-QDX-1764/2020	EPI_ISL_604093	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE
USA/TX-QDX-2025/2020	EPI_ISL_604376	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE
USA/TX-QDX-2122/2020	EPI_ISL_604486	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/TX_GCID_1920000135/2020	EPI_ISL_445084	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/UN-UW-527/2020	EPI_ISL_576492	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/UT-QDX-119/2020	EPI_ISL_467910	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE	FALSE
USA/UT-QDX-1462/2020	EPI_ISL_603847	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/UT-QDX-1466/2020	EPI_ISL_603851	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	TRUE
USA/UT-QDX-1825/2020	EPI_ISL_604144	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE
USA/UT-QDX-1833/2020	EPI_ISL_604151	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE
USA/UT-QDX-1847/2020	EPI_ISL_604163	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE
USA/UT-QDX-1936/2020	EPI_ISL_604286	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/UT-QDX-1964/2020	EPI_ISL_604290	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE
USA/UT-QDX-2189/2020	EPI_ISL_604578	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE
USA/UT-QDX-2264/2020	EPI_ISL_604603	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE
USA/UT-QDX-2307/2020	EPI_ISL_604618	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE
USA/UT-QDX-2491/2020	EPI_ISL_604853	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE
USA/UT-QDX-2550/2020	EPI_ISL_604865	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/UT-QDX-2607/2020	EPI_ISL_604969	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE
USA/UT-QDX-49/2020	EPI_ISL_467919	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/UT-QDX-57/2020	EPI_ISL_467920	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE
USA/UT-QDX-63/2020	EPI_ISL_467921	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE
USA/VA-DCLS-0070/2020	EPI_ISL_429970	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/VA-DCLS-0071/2020	EPI_ISL_429971	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/VA-DCLS-0544/2020	EPI_ISL_485845	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/VA-DCLS-0591/2020	EPI_ISL_526811	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/VA-DCLS-0595/2020	EPI_ISL_526815	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/VA_NIDDL_2702/2020	EPI_ISL_491913	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/VI-CDC-3638/2020	EPI_ISL_464167	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/WA-S278/2020	EPI_ISL_430132	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/WA-UW-1255/2020	EPI_ISL_570547	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/WA-UW-2228/2020	EPI_ISL_426119	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/WA-UW-3841/2020	EPI_ISL_427190	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/WA-UW301/2020	EPI_ISL_418869	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/WA-UW330/2020	EPI_ISL_418897	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/WI-UW-166/2020	EPI_ISL_428262	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/WI-UW-184/2020	EPI_ISL_428280	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/WI-UW-189/2020	EPI_ISL_428285	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE
USA/WI-UW-218/2020	EPI_ISL_428314	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE
USA/WI-UW-235/2020	EPI_ISL_428331	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE
USA/WI-UW-245/2020	EPI_ISL_428341	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	TRUE
USA/WI-UW-252/2020	EPI_ISL_428726	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE
USA/WI-UW-28/2020	EPI_ISL_421286	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/WI-UW-33/2020	EPI_ISL_421291	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE
USA/WI-UW-405/2020	EPI_ISL_480387	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/WI-WSLH-200048/2020	EPI_ISL_471213	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/WI-WSLH-200094/2020	EPI_ISL_471258	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE
USA/un-UOM-20x1025/2020	EPI_ISL_884541	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/un-UOM-20x1029/2020	EPI_ISL_884542	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/un-UOM-20x1047/2020	EPI_ISL_884549	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/un-UOM-20x1052/2020	EPI_ISL_884552	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/GA-CDC-8427/2020	EPI_ISL_594456	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/GA-QDX-115/2020	EPI_ISL_467845	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/GA-QDX-116/2020	EPI_ISL_467846	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/GA-QDX-122/2020	EPI_ISL_467847	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE
USA/GA-QDX-152/2020	EPI_ISL_467848	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE
USA/GA-QDX-1717/2020	EPI_ISL_604024	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/GA-QDX-1742/2020	EPI_ISL_604025	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE
USA/GA-QDX-1771/2020	EPI_ISL_604027	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE
USA/GA-QDX-1938/2020	EPI_ISL_604222	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/GA-QDX-2115/2020	EPI_ISL_604449	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/GA-QDX-2150/2020	EPI_ISL_604450	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/GA-QDX-2158/2020	EPI_ISL_604451	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/GA-QDX-2196/2020	EPI_ISL_604527	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/GA-QDX-2219/2020	EPI_ISL_604529	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE	FALSE
USA/GA-QDX-2259/2020	EPI_ISL_604531	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/GA-QDX-2367/2020	EPI_ISL_604692	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE
USA/GA-QDX-2388/2020	EPI_ISL_604694	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE
USA/GA-QDX-2420/2020	EPI_ISL_604695	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE
USA/GA-QDX-2425/2020	EPI_ISL_604697	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE
USA/GA-QDX-2442/2020	EPI_ISL_604777	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/GA-QDX-2443/2020	EPI_ISL_604778	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE
USA/GA-QDX-2461/2020	EPI_ISL_604779	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE
USA/GA-QDX-2553/2020	EPI_ISL_604781	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	TRUE
USA/GA-QDX-2571/2020	EPI_ISL_604931	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE
USA/GA-QDX-53/2020	EPI_ISL_467849	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/GA-QDX-577/2020	EPI_ISL_571288	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/GA-QDX-578/2020	EPI_ISL_571289	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE
USA/GA-QDX-579/2020	EPI_ISL_571290	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE
USA/GA-QDX-580/2020	EPI_ISL_571291	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	FALSE
USA/GA-QDX-582/2020	EPI_ISL_571293	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
USA/GA-QDX-594/2020	EPI_ISL_571295	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE
USA/GA-QDX-597/2020	EPI_ISL_571296	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE
USA/GA-UW-MAYO61/2020	EPI_ISL_500513	TRUE	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE
USA/GA-UW-MAYO63/2020	EPI_ISL_501074	TRUE	TRUE	FALSE	FALSE	FALSE	TRUE	FALSE
USA/GA-UW-MAYO64/2020	EPI_ISL_500515	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE
USA/GA_1320/2020	EPI_ISL_420786	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE
USA/GA_1445/2020	EPI_ISL_420788	TRUE	TRUE	TRUE	FALSE	FALSE	TRUE	TRUE
USA/GA_1847/2020	EPI_ISL_424859	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE	TRUE
USA/GA_2070/2020	EPI_ISL_426417	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
USA/GA_2118/2020	EPI_ISL_424861	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	FALSE
USA/GA_2343/2020	EPI_ISL_424864	TRUE	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE
GA-EHC-009I	GA-EHC-009I	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE
GA-EHC-023W	GA-EHC-023W	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
GA-EHC-030D	GA-EHC-030D	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
GA-EHC-032F	GA-EHC-032F	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
GA-EHC-033G	GA-EHC-033G	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
GA-EHC-035I	GA-EHC-035I	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	TRUE
GA-EHC-037K	GA-EHC-037K	TRUE	TRUE	FALSE	TRUE	FALSE	TRUE	FALSE
GA-EHC-038L	GA-EHC-038L	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
GA-EHC-040N	GA-EHC-040N	TRUE	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE
GA-EHC-042P	GA-EHC-042P	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE
GA-EHC-043Q	GA-EHC-043Q	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
GA-EHC-044R	GA-EHC-044R	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
GA-EHC-048V	GA-EHC-048V	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
GA-EHC-051Y	GA-EHC-051Y	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
GA-EHC-052Z	GA-EHC-052Z	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	TRUE
GA-EHC-053A	GA-EHC-053A	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE
GA-EHC-054B	GA-EHC-054B	TRUE	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE
GA-EHC-060H	GA-EHC-060H	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
GA-EHC-086H	GA-EHC-086H	TRUE	TRUE	FALSE	TRUE	TRUE	FALSE	FALSE
GA-EHC-087I	GA-EHC-087I	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
GA-EHC-097S	GA-EHC-097S	TRUE	TRUE	FALSE	FALSE	FALSE	FALSE	FALSE
GA-EHC-108D	GA-EHC-108D	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
GA-EHC-111G	GA-EHC-111G	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
GA-EHC-113J	GA-EHC-113J	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
GA-EHC-022V	GA-EHC-022V	TRUE	TRUE	FALSE	FALSE	TRUE	FALSE	FALSE
GA-EHC-047U	GA-EHC-047U	TRUE	TRUE	FALSE	TRUE	FALSE	FALSE	TRUE

Table S7. Select parameter prior and posterior estimates from the Bayesian phylogenetic analysis including select-19B sequences

Analysis	Parameter	Prior	Estimate (95% HPD)
Full	Posterior		-45680 (-45787 -45582)
Full	Tree height		0.240 (0.216 0.274)
Full	Proportion invariant	Uniform(0, 1)	0.764 (0.483 0.897)
Full	UCLD Mean	Normal(1.0e-3, 1.0e-4)	1.17e-03 (1.02e-03 1.32e-03)
Full	UCLD σ	Exponential(0.33)	0.64 (0.40 0.88)
Full	κ	Lognormal(1.0, 1.25)	6.513 (5.058 8.292)
Full	γ	Exponential(1.0)	4.93e-01 (1.03e-03 2.38e+00)
Rep 0	Posterior		-43577 (-43652 -43508)
Rep 0	Posterior		0.245 (0.216 0.287)
Rep 0	Tree height	Uniform(0, 1)	0.593 (0.098 0.883)
Rep 0	Proportion invariant	Normal(1.0e-3, 1.0e-4)	1.05e-03 (8.91e-04 1.20e-03)
Rep 0	UCLD Mean	Exponential(0.33)	0.68 (0.31 1.00)
Rep 0	UCLD σ	Lognormal(1.0, 1.25)	6.303 (4.514 8.585)
Rep 0	κ	Exponential(1.0)	4.58e-01 (1.55e-03 2.56e+00)
Rep 0	γ		
Rep 1	Posterior		-43851 (-43926 -43780)
Rep 1	Tree height		0.245 (0.218 0.285)
Rep 1	Proportion invariant	Uniform(0, 1)	0.715 (0.301 0.911)
Rep 1	UCLD Mean	Normal(1.0e-3, 1.0e-4)	1.08e-03 (9.26e-04 1.24e-03)
Rep 1	UCLD σ	Exponential(0.33)	0.60 (0.24 0.93)
Rep 1	κ	Lognormal(1.0, 1.25)	6.103 (4.512 8.079)
Rep 1	γ	Exponential(1.0)	5.03e-01 (1.15e-03 2.36e+00)
Rep 2	Posterior		-43821 (-43893 -43753)
Rep 2	Tree height		0.249 (0.219 0.293)
Rep 2	Proportion invariant	Uniform(0, 1)	0.781 (0.455 0.920)
Rep 2	UCLD Mean	Normal(1.0e-3, 1.0e-4)	1.06e-03 (9.12e-04 1.22e-03)
Rep 2	UCLD σ	Exponential(0.33)	0.62 (0.21 0.94)
Rep 2	κ	Lognormal(1.0, 1.25)	6.644 (4.818 8.941)
Rep 2	γ	Exponential(1.0)	4.57e-01 (1.09e-03 2.18e+00)
Rep 3	Posterior		-43741 (-43812 -43675)
Rep 3	Tree height		0.249 (0.218 0.291)
Rep 3	Proportion invariant	Uniform(0, 1)	0.758 (0.409 0.923)
Rep 3	UCLD Mean	Normal(1.0e-3, 1.0e-4)	1.09e-03 (9.33e-04 1.24e-03)
Rep 3	UCLD σ	Exponential(0.33)	0.66 (0.35 0.95)
Rep 3	κ	Lognormal(1.0, 1.25)	6.220 (4.446 8.205)
Rep 3	γ	Exponential(1.0)	4.69e-01 (1.14e-03 2.41e+00)
Rep 4	Posterior		-43673 (-43742 -43604)
Rep 4	Tree height		0.248 (0.217 0.291)
Rep 4	Proportion invariant	Uniform(0, 1)	0.776 (0.442 0.920)
Rep 4	UCLD Mean	Normal(1.0e-3, 1.0e-4)	1.08e-03 (9.22e-04 1.24e-03)
Rep 4	UCLD σ	Exponential(0.33)	0.55 (0.05 0.85)
Rep 4	κ	Lognormal(1.0, 1.25)	6.196 (4.545 8.296)
Rep 4	γ	Exponential(1.0)	4.43e-01 (1.03e-03 2.35e+00)

Table S8. Traveler data

				Compared to sequences in travel region			Compared to sequences in Georgia, USA			Compared to all publicly available sequences, excluding travel region and excluding Georgia, USA		
Patient ID	Sample ID	Travel region	Number of days prior to symptom onset during which travel occurred	Minimum number of SNPs (and direction*)	Sequences with the minimum number of SNPs	Total sequences	Minimum number of SNPs (and direction*)	Sequences with the minimum number of SNPs	Total sequences	Minimum number of SNPs (and direction*)	Sequences with the minimum number of SNPs	Total sequences
2	GA-EHC-016P	Louisiana, USA	unknown to 2	0	7	85	1 (ancestral)	2	106	0	51	35150
39	GA-EHC-121R	Louisiana, USA	30 to unknown	3 (ancestral)	19	85	3 (ancestral)	2	106	2 (ancestral)	1	34509
5	GA-EHC-031E	Colorado, USA	5 to 1	0	2	45	0	1	107	0	132	35934
14	GA-EHC-043Q	Mississippi, USA	8 to 3	0	1	20	0	6	103	0	28	35037
27	GA-EHC-110F	North Carolina, USA	8 to 6	1 (ancestral)	1	16	1 (ancestral)	2	105	1 (ancestral, descendant)	134 (ancestral); 1 (descendant)	35264
22	GA-EHC-064L	Italy	34 to 0	0	5	847	0	1	106	0	55	34451
22	GA-EHC-064L	Switzerland	34 to 0	0	13	810	0	1	106	0	47	34488
23	GA-EHC-083E	Costa Rica	9 to 1	1 (descendant)	3	21	1 (descendant)	4	107	0	48	35312
8	GA-EHC-036J	Nigeria	14 to 8	no sequences in lineage		15	1 (descendant)	1	105	1 (ancestral, descendant)	1264 (ancestral); 2 (descendant)	35186
33	GA-EHC-069Q	Italy	8 to 2	1 (ancestral)	81	847	0	1	106	1 (ancestral)	1186	34461
33	GA-EHC-069Q	Poland	2 to 0	1 (ancestral)	1	45	0	1	106	1 (ancestral)	1266	35263

*directionality only factors in when not identical; ancestral means the sequence(s) contain all mutations of the traveler sequence except one while child indicates the sequence(s) contain all mutations of the traveler sequence plus one additional

Patient ID	Sample ID	r of SNPs outside travel region(s) and Georgia, USA (alphabetical)
2	GA-EHC-016P	Florida, USA;Illinois, USA;Michigan, USA;Minnesota, USA;Texas, USA;Utah, USA;Washington, USA;Wisconsin, USA
39	GA-EHC-121R	Mississippi, USA
5	GA-EHC-031E	Arizona, USA;Australia;California , USA;Canada;Florida, USA;Iceland;Indiana, USA;Kansas, USA;Maryland, USA;Massachusetts, USA;Michigan, USA;Minnesota, USA;Missouri, USA;Nevada, USA;New Jersey, USA;New Mexico, USA;New York, USA;New Zealand;Ohio, USA;Pennsylvania, USA;Peru;Singapore;Texas, USA;Utah, USA;Virginia, USA;Wisconsin, USA
14	GA-EHC-043Q	California, USA;Delaware, USA;Florida, USA;Illinois, USA;Indiana, USA;Louisiana, USA;Maryland, USA;Massachusetts, USA;Michigan, USA;Minnesota, USA;New York, USA;Pennsylvania, USA;Texas, USA;, USA, USA;Utah, USA;Virgin Islands, USA;Virginia, USA;Washington, USA
27	GA-EHC-110F	Arizona, USA;California, USA;Canada;Louisiana, USA;Michigan, USA;Minnesota, USA;Mississippi, USA;Missouri, USA;New York, USA;Pennsylvania, USA;Rhode Island, USA;Texas, USA;United Kingdom;Utah, USA;Washington, USA
22	GA-EHC-064L	Arizona, USA;Australia;Austria;Belgium;Canada;China;Colombia;France;Mexico;New Mexico, USA;Peru;Portugal;Romania;Singapore;Spain;Switzerland;United Kingdom
22	GA-EHC-064L	Arizona, USA;Australia;Austria;Belgium;Canada;China;Colombia;France;Italy;Mexico;New Mexico, USA;Peru;Portugal;Romania;Singapore;Spain;United Kingdom
23	GA-EHC-083E	Czech Republic;Denmark;Florida, USA;France;Guatemala;Illinois, USA;Indiana, USA;Israel;Italy;Michigan, USA;Missouri, USA;New York, USA;Pennsylvania, USA;Portugal;Russia;Saudi Arabia;Washington, USA
8	GA-EHC-036J	Argentina;Arizona, USA;Australia;Austria;Belgium;Bolivia;Brazil;California, USA;Canada;Chile;Colorado, USA;Connecticut, USA;Cyprus;Czech Republic;Denmark;Ecuador;Finland;Florida, USA;France;Germany;Greece;Guadeloupe;Hong Kong;Hungary;Iceland;Illinois, USA;India;Ireland;Israel;Italy;Japan;Latvia;Maine, USA;Maryland, USA;Massachusetts, USA;Michigan, USA;Minnesota, USA;Missouri, USA;Morocco;Netherlands;Nevada, USA;New York, USA;New Zealand;Oman;Pennsylvania, USA;Peru;Poland;Portugal;Puerto Rico, USA;Russia;Saudi Arabia;Sierra Leone;Singapore;Slovakia;South Africa;South Korea;Spain;Sri Lanka;Sweden;Switzerland;Taiwan;Texas, USA;Turkey;, USA, USA;United Arab Emirates;United Kingdom;Utah, USA;Vietnam;Virgin Islands, USA;Washington, USA;Wisconsin, USA
33	GA-EHC-069Q	Argentina;Arizona, USA;Australia;Austria;Belgium;Bolivia;Brazil;California, USA;Canada;Chile;Colorado, USA;Connecticut, USA;Cyprus;Czech Republic;Denmark;Ecuador;Finland;Florida, USA;France;Germany;Greece;Guadeloupe;Hong Kong;Hungary;Iceland;Illinois, USA;India;Ireland;Israel;Italy;Japan;Latvia;Maine, USA;Maryland, USA;Massachusetts, USA;Michigan, USA;Minnesota, USA;Missouri, USA;Morocco;Netherlands;Nevada, USA;New York, USA;New Zealand;Oman;Pennsylvania, USA;Peru;Portugal;Puerto Rico, USA;Russia;Saudi Arabia;Sierra Leone;Singapore;Slovakia;South Africa;South Korea;Spain;Sri Lanka;Sweden;Switzerland;Taiwan;Texas, USA;Turkey;, USA, USA;United Arab Emirates;United Kingdom;Utah, USA;Vietnam;Virgin Islands, USA;Washington, USA;Wisconsin, USA
33	GA-EHC-069Q	Argentina;Arizona, USA;Australia;Austria;Belgium;Bolivia;Brazil;California, USA;Canada;Chile;Colorado, USA;Connecticut, USA;Cyprus;Czech Republic;Denmark;Ecuador;Finland;Florida, USA;France;Germany;Greece;Guadeloupe;Hong Kong;Hungary;Iceland;Illinois, USA;India;Ireland;Israel;Italy;Japan;Latvia;Maine, USA;Maryland, USA;Massachusetts, USA;Michigan, USA;Minnesota, USA;Missouri, USA;Morocco;Netherlands;Nevada, USA;New York, USA;New Zealand;Oman;Pennsylvania, USA;Peru;Portugal;Puerto Rico, USA;Russia;Saudi Arabia;Sierra Leone;Singapore;Slovakia;South Africa;South Korea;Spain;Sri Lanka;Sweden;Switzerland;Taiwan;Texas, USA;Turkey;, USA, USA;United Arab Emirates;United Kingdom;Utah, USA;Vietnam;Virgin Islands, USA;Washington, USA;Wisconsin, USA

Table S9: 19B Subclade

Sequence Name	GISAID Accession	Sequence Name	GISAID Accession	Sequence Name	GISAID Accession	Sequence Name	GISAID Accession	Sequence Name	GISAID Accession
USA/MS-CDC-6566/2020	EPI_ISL_648018	USA/FL-QDX-2018/2020	EPI_ISL_604326	NewZealand/20VR1275/2020	EPI_ISL_456200	USA/IL-NM-0675/2020	EPI_ISL_626467	USA/TX-HMH-568/2020	EPI_ISL_546940
USA/GA_1320/2020	EPI_ISL_420786	USA/GA-QDX-2367/2020	EPI_ISL_604692	USA/GA-UW-MAYO63/2020	EPI_ISL_501074	Canada/AB-76629/2020	EPI_ISL_806416	USA/TX-HMH-906/2020	EPI_ISL_545909
USA/GA_1445/2020	EPI_ISL_420788	USA/GA-QDX-2388/2020	EPI_ISL_604694	Australia/VIC350/2020	EPI_ISL_426658	USA/DE-DHSS-F918161/2020	EPI_ISL_576151	USA/TX-HMH-741/2020	EPI_ISL_546747
USA/FL-BPHL-2100/2020	EPI_ISL_653253	USA/GA-QDX-2420/2020	EPI_ISL_604695	Australia/VIC349/2020	EPI_ISL_450213	USA/IL-NM-0676/2020	EPI_ISL_626468	USA/FL-BPHL-1869/2020	EPI_ISL_613945
USA/FL_9655/2020	EPI_ISL_424854	USA/GA-QDX-2425/2020	EPI_ISL_604697	Australia/VIC215/2020	EPI_ISL_419910	Canada/QC-JUS-V5291038/2020	EPI_ISL_890798	USA/TX-HMH-1528/2020	EPI_ISL_542775
USA/GA_1847/2020	EPI_ISL_424859	USA/UT-QDX-1462/2020	EPI_ISL_603847	Australia/VIC209/2020	EPI_ISL_419904	Canada/Qc-LSPQ-L00240796/2020	EPI_ISL_465686	USA/FL-BPHL-1866/2020	EPI_ISL_613944
USA/SC_3520/2020	EPI_ISL_424902	USA/TX-QDX-1201/2020	EPI_ISL_572038	USA/TX-HMH0105/2020	EPI_ISL_434810	Canada/QC-JUS-V5290502/2020	EPI_ISL_890830	USA/FL-BPHL-1871/2020	EPI_ISL_613947
USA/GA-CDC-8427/2020	EPI_ISL_594456	USA/TX-QDX-1198/2020	EPI_ISL_572036	USA/DE-DHSS-F918613/2020	EPI_ISL_574599	USA/FL-UFL-UF2/2020	EPI_ISL_424351	USA/TX-HMH-1003/2020	EPI_ISL_542488
USA/SC-DHEC-0001/2020	EPI_ISL_491097	USA/TX-HMH06/2020	EPI_ISL_434717	USA/FL-BPHL-0584/2020	EPI_ISL_508788	USA/FL-UF2/2020	EPI_ISL_434637	Canada/QC-L00248453/2020	EPI_ISL_1324739
USA/SC_3569/2020	EPI_ISL_424841	USA/GA-QDX-579/2020	EPI_ISL_571290	USA/MD-HP00086/2020	EPI_ISL_457756	USA/AZ-TG271435/2020	EPI_ISL_426534	Scotland/CVR2096/2020	EPI_ISL_490662
USA/GA_2070/2020	EPI_ISL_426417	USA/NY-Wadsworth-18124-01/2020	EPI_ISL_676743	USA/MD-HP00030/2020	EPI_ISL_434686	USA/DE-DHSS-F918170/2020	EPI_ISL_593945	USA/TX-HMH-985/2020	EPI_ISL_545947
Australia/VIC17/2020	EPI_ISL_419736	USA/GA-QDX-1742/2020	EPI_ISL_604025	USA/MI-MDHHS-SC20058/2020	EPI_ISL_437145	USA/MA-MGH-00614/2020	EPI_ISL_460205	USA/VA-DCLS-0098/2020	EPI_ISL_434592
USA/SC_3575/2020	EPI_ISL_424842	USA/NY-WCMP11A03P/2020	EPI_ISL_427583	USA/IL-NM0120/2020	EPI_ISL_444603	USA/TX-HMH0301/2020	EPI_ISL_434924	USA/TX-HMH-973/2020	EPI_ISL_545940
USA/SC_3571/2020	EPI_ISL_424904	GA-EHC-035I	GA-EHC-035I	USA/MI-QDX-296/2020	EPI_ISL_571040	USA/TX-HMH0300/2020	EPI_ISL_434923	Scotland/CVR2147/2020	EPI_ISL_484563
USA/SC_3570/2020	EPI_ISL_424903	USA/NY-QDX-1941/2020	EPI_ISL_604263	USA/MI-QDX-309/2020	EPI_ISL_571053	Canada/QC-JUS-V6010702/2020	EPI_ISL_1241193	USA/TX-QDX-170/2020	EPI_ISL_494541
USA/GA_2118/2020	EPI_ISL_424861	USA/NY-QDX-19/2020	EPI_ISL_467897	USA/OH-ODH-SC21713/2020	EPI_ISL_935520	USA/TX-HMH0322/2020	EPI_ISL_434934	USA/TX-HMH-896/2020	EPI_ISL_545908
USA/SC_6370/2020	EPI_ISL_424888	USA/NY-QDX-1257/2020	EPI_ISL_572021	Canada/QC-LSPQ-L00230159/2020	EPI_ISL_535911	USA/un-UOM-20x1052/2020	EPI_ISL_884552	USA/TX-HMH-815/2020	EPI_ISL_545849
USA/NY-Wadsworth-14419-01/2020	EPI_ISL_525611	USA/MN-QDX-1007/2020	EPI_ISL_571733	USA/FL-QDX-785/2020	EPI_ISL_571520	USA/WI-UW-235/2020	EPI_ISL_428331	Canada/QC-L00248166/2020	EPI_ISL_1241461
USA/GA_2343/2020	EPI_ISL_424864	GA-EHC-032F	GA-EHC-032F	USA/FL-QDX-788/2020	EPI_ISL_571523	USA/TX-HMH0303/2020	EPI_ISL_434925	USA/MN-MDH-470/2020	EPI_ISL_437374
Australia/VIC35/2020	EPI_ISL_419755	USA/MN-QDX-1386/2020	EPI_ISL_572175	USA/FL-TGH-0055/2020	EPI_ISL_1379464	USA/MI-UM-2006S000881/2020	EPI_ISL_484731	USA/MO-MSPHL-000069/2020	EPI_ISL_1362620
GA-EHC-086H	GA-EHC-086H	USA/CA-QDX-2586/2020	EPI_ISL_604881	USA/IL-NM0121/2020	EPI_ISL_444604	USA/VA-DCLS-0070/2020	EPI_ISL_429970	USA/MO-MSPHL-000072/2020	EPI_ISL_1362623
Australia/VIC32/2020	EPI_ISL_419751	USA/CA-QDX-148/2020	EPI_ISL_467814	USA/CA-QDX-449/2020	EPI_ISL_571171	USA/IL-NM-0672/2020	EPI_ISL_626464	Scotland/CVR2129/2020	EPI_ISL_477857
Australia/VIC28/2020	EPI_ISL_419747	Australia/QLD1203/2020	EPI_ISL_639794	USA/MS-CDC-6576/2020	EPI_ISL_648028	USA/WI-UW-245/2020	EPI_ISL_428341	Canada/QC-L00248202/2020	EPI_ISL_1241462
Australia/VIC27/2020	EPI_ISL_419746	Australia/VIC100/2020	EPI_ISL_419812	USA/MN-MDH-139/2020	EPI_ISL_460052	Taiwan/NCKUH-013/2020	EPI_ISL_493206	USA/FL-BPHL-0324/2020	EPI_ISL_489733
Australia/VIC33/2020	EPI_ISL_419752	USA/CA-QDX-2691/2020	EPI_ISL_604998	USA/TX-HMH0128/2020	EPI_ISL_434828	Canada/AB-89673/2020	EPI_ISL_806248	USA/TX-HMH-1011/2020	EPI_ISL_542492
USA/MA-MGH-00004/2020	EPI_ISL_460467	USA/CA-QDX-2647/2020	EPI_ISL_604909	USA/TX-HMH0129/2020	EPI_ISL_434829	USA/VA-DCLS-0591/2020	EPI_ISL_526811	USA/MA-MGH-00908/2020	EPI_ISL_791818
USA/MN-UW-628/2020	EPI_ISL_476909	USA/WA-S278/2020	EPI_ISL_430132	USA/TX-HMH0131/2020	EPI_ISL_434831	USA/VA-DCLS-0595/2020	EPI_ISL_526815	Canada/QC-L00248238/2020	EPI_ISL_1241463
GA-EHC-022V	GA-EHC-022V	USA/AZ-QDX-1568/2020	EPI_ISL_603872	USA/TX-HMH0141/2020	EPI_ISL_434840	USA/IL-NM-0367/2020	EPI_ISL_626382	Canada/NB_271/2020	EPI_ISL_481756
USA/MS-CDC-6568/2020	EPI_ISL_648020	USA/AZ-QDX-1729/2020	EPI_ISL_604015	USA/MI-QDX-826/2020	EPI_ISL_571543	USA/TX-HMH0360/2020	EPI_ISL_434953	USA/TX-QDX-169/2020	EPI_ISL_494540
USA/VA-DCLS-0544/2020	EPI_ISL_485845	USA/AZ-TG268282/2020	EPI_ISL_426504	USA/CA-QDX-797/2020	EPI_ISL_571491	USA/MD-HP00154/2020	EPI_ISL_457783	USA/TX-HMH-625/2020	EPI_ISL_547340
USA/TX-DSHS-0200/2020	EPI_ISL_525763	USA/CA-QDX-1520/2020	EPI_ISL_603773	USA/MI-QDX-312/2020	EPI_ISL_571056	USA/TX-HMH0387/2020	EPI_ISL_434974	USA/TX-HMH-1070/2020	EPI_ISL_542517
USA/UN-UW-527/2020	EPI_ISL_576492	USA/TX-QDX-2025/2020	EPI_ISL_604376	USA/FL-TGH-0063/2020	EPI_ISL_1379472	USA/CA-CSMC134/2020	EPI_ISL_475612	USA/IL-UW-126/2020	EPI_ISL_427433
GA-EHC-060H	GA-EHC-060H	USA/CA-QDX-1043/2020	EPI_ISL_571708	USA/TX-HMH0150/2020	EPI_ISL_434849	USA/NC-UNC-LCCC0007/2020	EPI_ISL_877591	USA/FL-TGH-0114/2020	EPI_ISL_1379518
USA/MD-HP00076/2020	EPI_ISL_438234	USA/MN-QDX-756/2020	EPI_ISL_571548	USA/FL-TGH-0062/2020	EPI_ISL_1379471	GA-EHC-113J	GA-EHC-113J	USA/NC-UNC-LCCC0012/2020	EPI_ISL_877596
USA/UT-QDX-57/2020	EPI_ISL_467920	USA/TX-HMH021/2020	EPI_ISL_434731	Canada/QC-JUS-V5230431/2020	EPI_ISL_890488	GA-EHC-111G	GA-EHC-111G	USA/TX-HMH-675/2020	EPI_ISL_546214
USA/UT-QDX-1936/2020	EPI_ISL_604286	USA/TX-HMH022/2020	EPI_ISL_434732	USA/MI-MDHHS-SC20132/2020	EPI_ISL_436833	GA-EHC-108D	GA-EHC-108D	USA/FL-BPHL-1960/2020	EPI_ISL_653113
USA/UT-QDX-1964/2020	EPI_ISL_604290	USA/FL-QDX-2510/2020	EPI_ISL_604775	USA/FL-TGH-0060/2020	EPI_ISL_1379469	UnitedArabEmirates/P1/2020	EPI_ISL_463740	USA/IL-UW-143/2020	EPI_ISL_427450
GA-EHC-097S	GA-EHC-097S	USA/WI-UW-166/2020	EPI_ISL_428262	USA/FL-QDX-943/2020	EPI_ISL_571598	USA/MO-MSPHL-000042/2020	EPI_ISL_1362593	USA/FL-BPHL-0363/2020	EPI_ISL_489772
USA/UT-QDX-2264/2020	EPI_ISL_604603	USA/MI-QDX-636/2020	EPI_ISL_571361	USA/WI-WSLH-200048/2020	EPI_ISL_471213	USA/TX-HMH-1736/2020	EPI_ISL_542803	USA/TX-HMH-1281/2020	EPI_ISL_542628
USA/UT-QDX-2491/2020	EPI_ISL_604853	USA/NY-PV08490/2020	EPI_ISL_421426	Australia/NSW2261/2020	EPI_ISL_500697	USA/VA-DCLS-0071/2020	EPI_ISL_429971	USA/FL-BPHL-0364/2020	EPI_ISL_489773
USA/UT-QDX-2189/2020	EPI_ISL_604578	USA/MI-QDX-1769/2020	EPI_ISL_604056	USA/MI-MDHHS-SC20231/2020	EPI_ISL_447201	USA/TX-HMH0379/2020	EPI_ISL_434967	USA/TX-HMH-1439/2020	EPI_ISL_542724
Peru/LIM-INS-325/2020	EPI_ISL_1111223	USA/TX-HMH057/2020	EPI_ISL_434766	USA/MA-MGH-00555/2020	EPI_ISL_460232	USA/NY-NYUMC565/2020	EPI_ISL_444682	USA/WI-WSLH-200239/2020	EPI_ISL_578459
Australia/VIC56/2020	EPI_ISL_419777	USA/GA-QDX-578/2020	EPI_ISL_571289	USA/MA-MGH-00563/2020	EPI_ISL_460186	USA/MI-MDHHS-SC21136/2020	EPI_ISL_507912	USA/FL-BPHL-0330/2020	EPI_ISL_489739
Australia/VIC53/2020	EPI_ISL_419769	USA/MI-QDX-1681/2020	EPI_ISL_603969	USA/MA-MGH-00566/2020	EPI_ISL_460285	USA/MD-HP00087/2020	EPI_ISL_438241	USA/IL-NM-0420/2020	EPI_ISL_626400
Australia/VIC51/2020	EPI_ISL_419826	USA/GA-QDX-582/2020	EPI_ISL_571293	USA/GA-UW-MAYO64/2020	EPI_ISL_500515	USA/TX-HMH0381/2020	EPI_ISL_434969	USA/FL-BPHL-0360/2020	EPI_ISL_489769
GA-EHC-023W	GA-EHC-023W	USA/CA-QDX-1528/2020	EPI_ISL_603781	USA/WI-UW-184/2020	EPI_ISL_428280	USA/FL-BPHL-1227/2020	EPI_ISL_541237	USA/FL-BPHL-0361/2020	EPI_ISL_489770
USA/PA-QDX-1888/2020	EPI_ISL_604279	USA/GA-QDX-597/2020	EPI_ISL_571296	USA/DE-DHSS-F917718/2020	EPI_ISL_561345	Canada/Qc-LSPQ-L00243560/2020	EPI_ISL_536363	USA/FL-BPHL-0328/2020	EPI_ISL_489737
USA/NY-WC-13741-01/2020	EPI_ISL_534731	USA/GA-UW-MAYO61/2020	EPI_ISL_500513	USA/DE-DHSS-F917680/2020	EPI_ISL_574586	USA/TX-HMH0375/2020	EPI_ISL_434964	Scotland/CVR2362/2020	EPI_ISL_490686
USA/GA-QDX-152/2020	EPI_ISL_467848	Australia/VIC150/2020	EPI_ISL_419847	USA/TX-HMH0156/2020	EPI_ISL_434855	USA/TX-HMH0399/2020	EPI_ISL_434986	USA/FL-BPHL-1975/2020	EPI_ISL_653128
USA/GA-QDX-122/2020	EPI_ISL_467847	USA/NY-QDX-2008/2020	EPI_ISL_604361	USA/NY-NYCPHL-000549/2020	EPI_ISL_632009	USA/MN-MDH-1436/2020	EPI_ISL_514655	USA/MO-MSPHL-000081/2020	EPI_ISL_1362632
USA/GA-QDX-116/2020	EPI_ISL_467846	USA/MI-QDX-1306/2020	EPI_ISL_571961	USA/FL-BPHL-0487/2020	EPI_ISL_495393	USA/TX-HMH-1213/2020	EPI_ISL_542587	USA/IL-NM-0404/2020	EPI_ISL_626390
USA/GA-QDX-115/2020	EPI_ISL_467845	USA/MI-MDHHS-SC20139/2020	EPI_ISL_436820	USA/IL-NM-0149/2020	EPI_ISL_626370	USA/TX-HMH0396/2020	EPI_ISL_434983	USA/MO-MSPHL-000080/2020	EPI_ISL_1362631
USA/MI-QDX-2199/2020	EPI_ISL_604537	Australia/VIC103/2020	EPI_ISL_419814	USA/IL-NM-0144/2020	EPI_ISL_626368	USA/FL-BPHL-0714/2020	EPI_ISL_509772	USA/MO-MSPHL-000079/2020	EPI_ISL_1362630
USA/UT-QDX-63/2020	EPI_ISL_467921	NewZealand/20VR0987/2020	EPI_ISL_456172	USA/WI-UW-189/2020	EPI_ISL_428285	USA/DE-DHSS-F918451/2020	EPI_ISL_593966	USA/TX-HMH-1351/2020	EPI_ISL_542665
USA/UT-QDX-2550/2020	EPI_ISL_604865	USA/CA-QDX-2185/2020	EPI_ISL_604446	USA/CA-QDX-2019/2020	EPI_ISL_604308	USA/TX-HMH0394/2020	EPI_ISL_434981	USA/IL-UW-349/2020	EPI_ISL_450703
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USA/GA-QDX-53/2020	EPI_ISL_467849	USA/IL-NM069/2020	EPI_ISL_444564	USA/MI-MDHHS-SC20242/2020	EPI_ISL_447212	Scotland/CVR1361/2020	EPI_ISL_433554	USA/FL-BPHL-1994/2020	EPI_ISL_653147
GA-EHC-009I	GA-EHC-009I	USA/IL-NM071/2020	EPI_ISL_444566	Australia/SAP154/2020	EPI_ISL_451148	USA/TX-HMH0400/2020	EPI_ISL_434987	USA/NY-UB-00148/2020	EPI_ISL_1009371
Canada/ON_MU-S7/2020	EPI_ISL_463993	USA/IL-NM072/2020	EPI_ISL_444567	USA/MN-MDH-1469/2020	EPI_ISL_518863	USA/CA-CZB-1281/2020	EPI_ISL_454639	USA/FL-BPHL-0212/2020	EPI_ISL_480863
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Australia/VIC77/2020	EPI_ISL_419789	USA/GA-QDX-594/2020	EPI_ISL_571295	USA/MN-MDH-1292/2020	EPI_ISL_483012	Scotland/CVR1469/2020	EPI_ISL_433594	USA/MO-MSPHL-000088/2020	EPI_ISL_1362639
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USA/MD-HP00113/2020	EPI_ISL_457768	USA/GA-QDX-577/2020	EPI_ISL_571288	USA/un-UOM-20x1025/2020	EPI_ISL_884541	USA/TX-HMH-511/2020	EPI_ISL_544532	USA/MO-MSPHL-000084/2020	EPI_ISL_1362635
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USA/MA-QDX-150/2020	EPI_ISL_467855	USA/FL-QDX-574/2020	EPI_ISL_571286	USA/FL-BPHL-0595/2020	EPI_ISL_508799	Canada/QC-L00245202/2020	EPI_ISL_1241316	USA/MO-MSPHL-000091/2020	EPI_ISL_1362642
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USA/GA-QDX-2553/2020	EPI_ISL_604781	USA/MD-HP00104/2020	EPI_ISL_438246	USA/DE-DHSS-F917736/2020	EPI_ISL_561346	USA/TX-HMH0430/2020	EPI_ISL_435013	USA/GA-EHC-179Y/2020	EPI_ISL_1278059
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USA/CT-UW260/2020	EPI_ISL_418045	USA/MD-HP00120/2020	EPI_ISL_457813	USA/NY-Wadsworth-28157-01/2020	EPI_ISL_525630	USA/UT-UPHL-03753/2020	EPI_ISL_575103	USA/FL-BPHL-0215/2020	EPI_ISL_480866
USA/MN-QDX-2727/2020	EPI_ISL_605033	Australia/NSW2170/2020	EPI_ISL_500641	USA/TX-HMH0198/2020	EPI_ISL_434873	USA/TX-HMH-996/2020	EPI_ISL_545953	USA/FL-BPHL-0369/2020	EPI_ISL_489778
GA-EHC-037K	GA-EHC-037K	USA/ME-HETL-J0051/2020	EPI_ISL_513462	USA/FL-BPHL-0676/2020	EPI_ISL_509734	USA/TX-HMH-520/2020	EPI_ISL_544588	USA/GA-EHC-202V/2020	EPI_ISL_1278062
USA/GA-QDX-2115/2020	EPI_ISL_604449	USA/MI-MDHHS-SC20050/2020	EPI_ISL_437137	USA/WI-UW-28/2020	EPI_ISL_421286	Scotland/CVR1499/2020	EPI_ISL_438829	USA/TX-HMH-1386/2020	EPI_ISL_542689
Canada/QC-LSPQ-L00219020/2020	EPI_ISL_535786	USA/CA-QDX-2022/2020	EPI_ISL_604310	USA/WI-UW-218/2020	EPI_ISL_428314	Scotland/CVR1501/2020	EPI_ISL_448117	USA/TX-HMH-1313/2020	EPI_ISL_542646
Australia/VIC73/2020	EPI_ISL_419785	USA/MI-MDHHS-SC20202/2020	EPI_ISL_447173	USA/NY-Wadsworth-29118-01/2020	EPI_ISL_676762	USA/MD-MDH-0026/2020	EPI_ISL_481272	USA/FL-BPHL-0227/2020	EPI_ISL_480878
USA/LA-QDX-2108/2020	EPI_ISL_604454	USA/MI-MDHHS-SC20451/2020	EPI_ISL_452325	Singapore/925/2020	EPI_ISL_538456	USA/TX-HMH-457/2020	EPI_ISL_543724	USA/FL-BPHL-0371/2020	EPI_ISL_489780
USA/NJ-QDX-2250/2020	EPI_ISL_604557	Australia/VIC117/2020	EPI_ISL_419727	USA/un-UOM-20x1029/2020	EPI_ISL_884542	USA/TX-HMH-464/2020	EPI_ISL_543776	USA/FL-BPHL-1069/2020	EPI_ISL_526555
USA/NY-QDX-2711/2020	EPI_ISL_605047	Australia/VIC182/2020	EPI_ISL_450212	USA/CA-CZB043/2020	EPI_ISL_429048	USA/TX-HMH-751/2020	EPI_ISL_546810	USA/TX-HMH-1120/2020	EPI_ISL_542542
GA-EHC-053A	GA-EHC-053A	USA/TX-HMH079/2020	EPI_ISL_434788	USA/MI-MDHHS-SC21590/2020	EPI_ISL_516317	USA/TX-HMH-749/2020	EPI_ISL_546797	USA/FL-BPHL-0383/2020	EPI_ISL_489792
USA/MS-CDC-6574/2020	EPI_ISL_648026	Guatemala/CDC-1234/2020	EPI_ISL_509701	USA/SC-DHEC-0048/2020	EPI_ISL_491102	USA/TX-HMH-519/2020	EPI_ISL_544585	USA/WI-WSLH-200133/2020	EPI_ISL_578361
GA-EHC-043Q	GA-EHC-043Q	USA/MI-QDX-593/2020	EPI_ISL_571331	USA/FL-TGH-0080/2020	EPI_ISL_1379487	Scotland/CVR1573/2020	EPI_ISL_438841	USA/PA-MGEL-00264/2020	EPI_ISL_681994
GA-EHC-030D	GA-EHC-030D	USA/MI-QDX-601/2020	EPI_ISL_571336	USA/NY-NYCPHL-000509/2020	EPI_ISL_631970	USA/PA-MGEL110/2020	EPI_ISL_454387	USA/TX-HMH-1453/2020	EPI_ISL_542731
GA-EHC-033G	GA-EHC-033G	Scotland/CVR205/2020	EPI_ISL_425735	USA/FL-TGH-0082/2020	EPI_ISL_1379489	USA/FL-BPHL-0193/2020	EPI_ISL_480844	USA/NC-USAFSAM-S124/2020	EPI_ISL_812336
USA/MI-QDX-58/2020	EPI_ISL_467871	USA/MN-MDH-1420/2020	EPI_ISL_514639	USA/FL-TGH-0083/2020	EPI_ISL_1379490	USA/TX-HMH-474/2020	EPI_ISL_544296	USA/IL-NM-0517/2020	EPI_ISL_626439
GA-EHC-044R	GA-EHC-044R	USA/VI-CDC-3638/2020	EPI_ISL_464167	USA/DE-DHSS-F917887/2020	EPI_ISL_584013	USA/VA_NIDDL_2929/2020	EPI_ISL_491923	USA/TX-HMH-1164/2020	EPI_ISL_542562
Australia/SAP453/2020	EPI_ISL_508143	USA/TX-QDX-1764/2020	EPI_ISL_604093	USA/DE-DHSS-F917945/2020	EPI_ISL_576223	USA/FL-BPHL-0617/2020	EPI_ISL_508821	USA/TX-HMH-1935/2020	EPI_ISL_542908
USA/MD-HP00065/2020	EPI_ISL_457807	USA/TX-HMH096/2020	EPI_ISL_434801	USA/DE-DHSS-F917934/2020	EPI_ISL_576225	Canada/QC-L00246066/2020	EPI_ISL_1241363	USA/TX-HMH-1426/2020	EPI_ISL_542717
USA/NY-MSK-9A/2020	EPI_ISL_583461	USA/TX-HMH092/2020	EPI_ISL_434797	USA/DE-DHSS-F917932/2020	EPI_ISL_576156	USA/GA-EHC-147S/2020	EPI_ISL_1278058	USA/TX-HMH-1436/2020	EPI_ISL_542723
GA-EHC-042P	GA-EHC-042P	USA/NY-MSK-9B/2020	EPI_ISL_583462	Canada/NS-NML-930/2020	EPI_ISL_579570	USA/TX-HMH-570/2020	EPI_ISL_546952	USA/NC-UNC-LCCC0235/2020	EPI_ISL_968178
USA/NY-MSK-9Ai/2020	EPI_ISL_583463	USA/NY-MSK-9Bi/2020	EPI_ISL_583464	USA/DE-DHSS-F917914/2020	EPI_ISL_576227	USA/GA-EHC-139K/2020	EPI_ISL_754769	USA/VA-DCLS-0860/2020	EPI_ISL_516656
GA-EHC-047U	GA-EHC-047U	USA/NY-PV09466/2020	EPI_ISL_450139	Scotland/CVR634/2020	EPI_ISL_425793	USA/FL-BPHL-1854/2020	EPI_ISL_613934	USA/IL-IDPH-C-000420/2020	EPI_ISL_848474
Australia/VIC85/2020	EPI_ISL_419795	USA/CA-QDX-2077/2020	EPI_ISL_604395	USA/MN-MDH-1428/2020	EPI_ISL_514647	USA/MD-HP00567/2020	EPI_ISL_511871	USA/NY-NYUMC894/2020	EPI_ISL_467387
Scotland/CVR113/2020	EPI_ISL_425658	Australia/NSW2063/2020	EPI_ISL_509496	USA/DE-DHSS-F917930/2020	EPI_ISL_576224	USA/MI-UM-2006S000954/2020	EPI_ISL_484769	USA/TX-HMH-1449/2020	EPI_ISL_542729
NewZealand/20VR0275/2020	EPI_ISL_416538	USA/IL-QDX-283/2020	EPI_ISL_571034	USA/TX_GCID_192000135/2020	EPI_ISL_445084	USA/TX-HMH-1054/2020	EPI_ISL_542509	USA/TX-HMH-1380/2020	EPI_ISL_542684
GA-EHC-054B	GA-EHC-054B	USA/IL-QDX-280/2020	EPI_ISL_571031	USA/VA_NIDDL_2702/2020	EPI_ISL_491913	USA/TX-HMH-535/2020	EPI_ISL_544705	USA/TX-HMH-1365/2020	EPI_ISL_542674
USA/IL-NM-0052/2020	EPI_ISL_626360	USA/IL-NM087/2020	EPI_ISL_444577	USA/MI-MDHHS-SC20181/2020	EPI_ISL_436865	USA/FL-BPHL-1852/2020	EPI_ISL_613932	USA/NE-11163/2020	EPI_ISL_475201
USA/IL-NM053/2020	EPI_ISL_444549	USA/IL-NM082/2020	EPI_ISL_444573	USA/FL-BPHL-0682/2020	EPI_ISL_509740	USA/MD-HP00549/2020	EPI_ISL_511869	USA/FL-BPHL-0884/2020	EPI_ISL_526553
USA/GA-QDX-2219/2020	EPI_ISL_604529	USA/IL-NM081/2020	EPI_ISL_444572	USA/MA-MGH-00174/2020	EPI_ISL_460179	USA/FL-BPHL-0115/2020	EPI_ISL_450849	USA/WI-UW-936/2020	EPI_ISL_509936
USA/CA-QDX-1975/2020	EPI_ISL_604217	USA/IL-NM0113/2020	EPI_ISL_444597	USA/WA-UW-3841/2020	EPI_ISL_427190	USA/GA-EHC-143O/2020	EPI_ISL_1278055	USA/GA-EHC-246N/2020	EPI_ISL_1278065
USA/LA-QDX-879/2020	EPI_ISL_571604	USA/FL-USAFSAM-S009/2020	EPI_ISL_512785	USA/NY-NYUMC728/2020	EPI_ISL_451443	USA/GA-EHC-144P/2020	EPI_ISL_1278056	USA/TX-HMH-1788/2020	EPI_ISL_542839
USA/MN-MDH-91/2020	EPI_ISL_460072	USA/FL-TGH-0043/2020	EPI_ISL_1379452	USA/MI-MDHHS-SC21094/2020	EPI_ISL_507870	USA/GA-EHC-145Q/2020	EPI_ISL_1278057	USA/FL-BPHL-0410/2020	EPI_ISL_489819
Australia/SAP216/2020	EPI_ISL_468000	USA/OH-QDX-906/2020	EPI_ISL_571685	USA/WI-WSLH-200094/2020	EPI_ISL_471258	USA/TX-HMH-961/2020	EPI_ISL_545935	USA/IL-IDPH-PEO-S-000693/2020	EPI_ISL_1323217
USA/MN-QDX-1342/2020	EPI_ISL_572131	USA/NY-NYUMC754/2020	EPI_ISL_451468	USA/IL-NM-0333/2020	EPI_ISL_936497	Canada/QC-L00247642/2020	EPI_ISL_1241424	USA/FL-BPHL-0408/2020	EPI_ISL_489817
Australia/VIC86/2020	EPI_ISL_419796	USA/NY-NYCPHL-000290/2020	EPI_ISL_631816	USA/TX-HMH0267/2020	EPI_ISL_434896	USA/FL-BPHL-1830/2020	EPI_ISL_613915	USA/TX-HMH-1776/2020	EPI_ISL_542831
USA/UT-QDX-1466/2020	EPI_ISL_603851	USA/IL-UW-MAYO6/2020	EPI_ISL_500535	USA/MI-MDHHS-SC20469/2020	EPI_ISL_460008	Canada/QC-L00247877/2020	EPI_ISL_1241438	SouthKorea/KCDC2291/2020	EPI_ISL_510627
USA/LA-QDX-1992/2020	EPI_ISL_604335	USA/CA-QDX-698/2020	EPI_ISL_571417	USA/MA-MGH-00145/2020	EPI_ISL_460170	USA/FL-BPHL-1820/2020	EPI_ISL_613908	USA/UT-UPHL-04471/2020	EPI_ISL_525338
GA-EHC-052Z	GA-EHC-052Z	USA/CA-QDX-704/2020	EPI_ISL_571421	USA/MA-MGH-00143/2020	EPI_ISL_460114	Canada/QC-L00247643/2020	EPI_ISL_1241425	USA/UT-UPHL-04473/2020	EPI_ISL_525340
USA/IL-NM074/2020	EPI_ISL_444569	USA/IL-NM0112/2020	EPI_ISL_444596	USA/TX-HMH0268/2020	EPI_ISL_434897	Scotland/CVR1856/2020	EPI_ISL_433660	USA/TX-HMH-2145/2020	EPI_ISL_545143
USA/ME-HETL-J0030/2020	EPI_ISL_513442	USA/MI-MDHHS-SC20052/2020	EPI_ISL_437139	Singapore/926/2020	EPI_ISL_538458	USA/FL-BPHL-1818/2020	EPI_ISL_613907	SouthKorea/KCDC2300/2020	EPI_ISL_510636
USA/MN-MDH-1418/2020	EPI_ISL_514637	USA/NY-NYCPHL-000282/2020	EPI_ISL_631808	USA/TX-HMH0263/2020	EPI_ISL_434892	USA/TX-HMH-717/2020	EPI_ISL_546565	USA/MD-MDH-0080/2020	EPI_ISL_509484
USA/MA-QDX-1456/2020	EPI_ISL_603823	USA/IL-NM0109/2020	EPI_ISL_444594	USA/TX-HMH0370/2020	EPI_ISL_434961	USA/TX-HMH-783/2020	EPI_ISL_545653	USA/IL-NM-0933/2020	EPI_ISL_936513
USA/MD-HP00031/2020	EPI_ISL_457789	USA/SC-DHEC-0032/2020	EPI_ISL_529174	Scotland/CVR876/2020	EPI_ISL_439126	USA/TX-HMH-819/2020	EPI_ISL_545852	USA/MD-MDH-0081/2020	EPI_ISL_509485
USA/FL-QDX-2513/2020	EPI_ISL_604776	USA/TX-HMH0110/2020	EPI_ISL_434812	USA/TX-HMH0391/2020	EPI_ISL_434978	USA/TX-HMH-870/2020	EPI_ISL_545887	USA/MD-MDH-0093/2020	EPI_ISL_522829
USA/LA-QDX-1193/2020	EPI_ISL_571939	USA/TX-HMH0111/2020	EPI_ISL_434813	USA/un-UOM-20x1047/2020	EPI_ISL_884549	USA/FL-BPHL-1827/2020	EPI_ISL_613913	USA/MD-MDH-0094/2020	EPI_ISL_522830
USA/GA-QDX-1771/2020	EPI_ISL_604027	USA/TX-HMH0125/2020	EPI_ISL_434825	USA/TX-HMH0274/2020	EPI_ISL_434902	USA/FL-BPHL-1945/2020	EPI_ISL_653098	USA/MD-MDH-0082/2020	EPI_ISL_509486
GA-EHC-040N	GA-EHC-040N	USA/TX-HMH0127/2020	EPI_ISL_434827	USA/TX-HMH0276/2020	EPI_ISL_434904	USA/FL-BPHL-1459/2020	EPI_ISL_549241	USA/MD-MDH-0095/2020	EPI_ISL_522831
USA/GA-QDX-1717/2020	EPI_ISL_604024	USA/TX-QDX-1096/2020	EPI_ISL_571902	USA/TX-HMH0277/2020	EPI_ISL_434905	USA/FL-BPHL-1872/2020	EPI_ISL_613948	USA/MD-MDH-0096/2020	EPI_ISL_522832
USA/WA-UW330/2020	EPI_ISL_418897	USA/TX-QDX-1097/2020	EPI_ISL_571903	USA/TX-HMH0279/2020	EPI_ISL_434907	USA/VA-DCLS-0095/2020	EPI_ISL_434590	USA/MD-MDH-0103/2020	EPI_ISL_522838
USA/WA-UW301/2020	EPI_ISL_418869	USA/TX-QDX-2122/2020	EPI_ISL_604486	GA-EHC-038L	GA-EHC-038L	USA/FL-BPHL-1870/2020	EPI_ISL_613946	USA/TX-HMH-2451/2020	EPI_ISL_545317
USA/WA-UW-1255/2020	EPI_ISL_570547	Scotland/CVR261/2020	EPI_ISL_433277	USA/TX-HMH0290/2020	EPI_ISL_434916	USA/FL-BPHL-1865/2020	EPI_ISL_613943	USA/VA-DCLS-0995/2020	EPI_ISL_914865
								USA/IL-IDPH-COO-C-001507/2020	EPI_ISL_1032699
								USA/GA-CDC-6258/2020	EPI_ISL_527658
								USA/TX-HMH-MCoV-13481/2020	EPI_ISL_788610

Table S10. Temporally & geographically homogeneous downsampled sequences

Sequence Name	GISAID Accession	Pass ML Clock Filter	Sequence Name	GISAID Accession	Pass ML Clock Filter	Sequence Name	GISAID Accession	Pass ML Clock Filter	Sequence Name	GISAID Accession	Pass ML Clock Filter	Sequence Name	GISAID Accession	Pass ML Clock Filter
Algeria/G0638_2264/2020	EPI_ISL_418241	TRUE	Denmark/DCGC-1053/2020	EPI_ISL_614684	TRUE	India/WB-S3/2020	EPI_ISL_430464	TRUE	Nigeria/OS075-CV12/2020	EPI_ISL_455423	TRUE	Spain/MD-H12-R11/2020	EPI_ISL_530094	TRUE
Algeria/G0640_2265/2020	EPI_ISL_418242	TRUE	Denmark/DCGC-1054/2020	EPI_ISL_614685	TRUE	India/WB-S4/2020	EPI_ISL_455640	TRUE	Nigeria/OS085-CV14/2020	EPI_ISL_455424	TRUE	Spain/MD-HLP-112/2020	EPI_ISL_530041	TRUE
Algeria/G0860_2262/2020	EPI_ISL_420037	TRUE	Denmark/DCGC-1059/2020	EPI_ISL_614690	TRUE	India/WB-S6/2020	EPI_ISL_430466	TRUE	Nigeria/OS122-CV18/2020	EPI_ISL_455426	TRUE	Spain/MD-HLP-113/2020	EPI_ISL_530042	TRUE
Andorra/202552/2020	EPI_ISL_539496	TRUE	Denmark/DCGC-1094/2020	EPI_ISL_614594	TRUE	India/un-OUMRK1090/2020	EPI_ISL_447902	TRUE	Nigeria/OY008-CV29/2020	EPI_ISL_455429	TRUE	Spain/MD-HLP-R5-8/2020	EPI_ISL_417980	TRUE
Argentina/C121/2020	EPI_ISL_420600	TRUE	Denmark/DCGC-1102/2020	EPI_ISL_614600	TRUE	Indonesia/JB-EIJK56/2020	EPI_ISL_889008	TRUE	NorthMacedonia/1236/2020	EPI_ISL_1165139	TRUE	Spain/MD-IBV-004907/2020	EPI_ISL_481097	TRUE
Argentina/C1374/2020	EPI_ISL_420599	TRUE	Denmark/DCGC-1132/2020	EPI_ISL_614598	TRUE	Indonesia/JI-ITD-1238Sp/2020	EPI_ISL_458079	TRUE	NorthMacedonia/1282/2020	EPI_ISL_1165140	TRUE	Spain/MD-IBV-004912/2020	EPI_ISL_481059	TRUE
Argentina/C3013/2020	EPI_ISL_420598	TRUE	Denmark/DCGC-1135/2020	EPI_ISL_614619	TRUE	Indonesia/JI-ITD-1273NT/2020	EPI_ISL_458081	TRUE	NorthMacedonia/1285/2020	EPI_ISL_1165141	FALSE	Spain/MD-IBV-004921/2020	EPI_ISL_481043	TRUE
Argentina/PAIS-A0004/2020	EPI_ISL_430796	TRUE	Denmark/DCGC-1147/2020	EPI_ISL_614635	TRUE	Indonesia/JI-ITD-1273V/2020	EPI_ISL_529964	TRUE	NorthernIreland/NIRE-1020A3/2020	EPI_ISL_441376	TRUE	Spain/MD-IBV-005334/2020	EPI_ISL_510212	TRUE
Argentina/PAIS-A0006/2020	EPI_ISL_430798	TRUE	Denmark/DCGC-1171/2020	EPI_ISL_614630	TRUE	Indonesia/JI-ITD-136N/2020	EPI_ISL_529961	TRUE	NorthernIreland/NIRE-1020D0/2020	EPI_ISL_441379	TRUE	Spain/MD-IBV-99018532/2020	EPI_ISL_1014733	FALSE
Argentina/PAIS-A0007/2020	EPI_ISL_430799	TRUE	Denmark/DCGC-1177/2020	EPI_ISL_614646	TRUE	Indonesia/JI-ITD-150Sp/2020	EPI_ISL_529962	TRUE	NorthernIreland/NIRE-FB976/2020	EPI_ISL_585256	TRUE	Spain/MD-ISCIII-201091/2020	EPI_ISL_871973	TRUE
Argentina/PAIS-A0008/2020	EPI_ISL_430800	TRUE	Denmark/DCGC-1284/2020	EPI_ISL_620146	TRUE	Indonesia/JI-ITD-853Sp/2020	EPI_ISL_437187	TRUE	Norway/1455/2020	EPI_ISL_420135	TRUE	Spain/MD-ISCIII-201105/2020	EPI_ISL_418251	TRUE
Argentina/PAIS-A0011/2020	EPI_ISL_430802	TRUE	Denmark/DCGC-1288/2020	EPI_ISL_619556	TRUE	Indonesia/JI-ITDua-1006NTv/2020	EPI_ISL_759961	TRUE	Norway/1493/2020	EPI_ISL_417488	TRUE	Spain/PV-IBV-000692/2020	EPI_ISL_452772	TRUE
Argentina/PAIS-A0222/2020	EPI_ISL_792303	TRUE	Denmark/DCGC-1371/2020	EPI_ISL_622217	TRUE	Indonesia/JI-ITDua-998NTv/2020	EPI_ISL_759959	TRUE	Norway/1694/2020	EPI_ISL_420136	TRUE	Spain/PV-IBV-000736/2020	EPI_ISL_452744	TRUE
Argentina/PAIS-A0223/2020	EPI_ISL_792304	TRUE	Denmark/DCGC-1372/2020	EPI_ISL_622218	TRUE	Indonesia/JK-EIJK-01/2020	EPI_ISL_437189	TRUE	Norway/1772/2020	EPI_ISL_420137	TRUE	Spain/PV-IBV-000750/2020	EPI_ISL_452738	TRUE
Argentina/PAIS-A0290/2020	EPI_ISL_792364	TRUE	Denmark/DCGC-1375/2020	EPI_ISL_622222	TRUE	Indonesia/JK-EIJK-0141/2020	EPI_ISL_435281	TRUE	Norway/1811/2020	EPI_ISL_420139	TRUE	Spain/PV-IBV-000751/2020	EPI_ISL_452737	TRUE
Argentina/PAIS-D0009/2020	EPI_ISL_792451	TRUE	Denmark/DCGC-1382/2020	EPI_ISL_622233	TRUE	Indonesia/JK-EIJK-02/2020	EPI_ISL_437190	TRUE	Norway/1949/2020	EPI_ISL_470882	TRUE	Spain/PV-IBV-000817/2020	EPI_ISL_452711	TRUE
Argentina/PAIS-D0012/2020	EPI_ISL_792454	TRUE	Denmark/DCGC-1385/2020	EPI_ISL_622238	TRUE	Indonesia/JK-EIJK-03/2020	EPI_ISL_437191	TRUE	Norway/1953/2020	EPI_ISL_420313	TRUE	Spain/PV-IBV-000843/2020	EPI_ISL_452703	TRUE
Argentina/PAIS-D0021/2020	EPI_ISL_792463	TRUE	Denmark/DCGC-1400/2020	EPI_ISL_622479	TRUE	Indonesia/JK-EIJK-0317/2020	EPI_ISL_435282	TRUE	Norway/1986/2020	EPI_ISL_590915	TRUE	Spain/PV-IBV-000853/2020	EPI_ISL_452698	TRUE
Argentina/PAIS-D0029/2020	EPI_ISL_792471	TRUE	Denmark/DCGC-1402/2020	EPI_ISL_622480	TRUE	Indonesia/JK-EIJK-2444/2020	EPI_ISL_435283	TRUE	Norway/1989/2020	EPI_ISL_420147	TRUE	Spain/PV-IBV-000860/2020	EPI_ISL_452692	TRUE
Argentina/PAIS-D0036/2020	EPI_ISL_792478	TRUE	Denmark/DCGC-1447/2020	EPI_ISL_622447	TRUE	Indonesia/JK-EIJK55/2020	EPI_ISL_888982	TRUE	Norway/2086/2020	EPI_ISL_590916	TRUE	Spain/PV-IBV-000867/2020	EPI_ISL_452688	TRUE
Argentina/PAIS-D0040/2020	EPI_ISL_792482	TRUE	Denmark/DCGC-1683/2020	EPI_ISL_622429	TRUE	Indonesia/JT-EIJK-10/2020	EPI_ISL_568686	TRUE	Norway/2087/2020	EPI_ISL_420151	TRUE	Spain/PV-IBV-000894/2020	EPI_ISL_452669	TRUE
Argentina/PAIS-D0042/2020	EPI_ISL_792484	TRUE	Denmark/DCGC-1708/2020	EPI_ISL_617993	TRUE	Indonesia/KI-EIJK-05/2020	EPI_ISL_467374	TRUE	Norway/2088/2020	EPI_ISL_420152	TRUE	Spain/PV-IBV-000928/2020	EPI_ISL_452643	TRUE
Argentina/PAIS-G0002/2020	EPI_ISL_792526	TRUE	Denmark/DCGC-1711/2020	EPI_ISL_617815	TRUE	Indonesia/KI-NIHRDC004160/2020	EPI_ISL_984277	TRUE	Norway/2090/2020	EPI_ISL_420153	TRUE	Spain/PV-IBV-001551/2020	EPI_ISL_467094	TRUE
Argentina/PAIS-G0003/2020	EPI_ISL_792527	TRUE	Denmark/DCGC-1733/2020	EPI_ISL_622201	TRUE	Indonesia/NT-EIJK14/2020	EPI_ISL_766033	TRUE	Norway/2114/2020	EPI_ISL_420312	TRUE	Spain/PV-IBV-001608/2020	EPI_ISL_467161	TRUE
Argentina/PAIS-G0004/2020	EPI_ISL_792528	TRUE	Denmark/DCGC-1854/2020	EPI_ISL_622549	TRUE	Indonesia/PA-EIJK09/2020	EPI_ISL_574603	TRUE	Norway/2160/2020	EPI_ISL_590917	TRUE	Spain/PV-IBV-003237/2020	EPI_ISL_480978	TRUE
Argentina/PAIS-G0007/2020	EPI_ISL_792531	TRUE	Denmark/DCGC-746/2020	EPI_ISL_613541	TRUE	Indonesia/PP-EIJK-11/2020	EPI_ISL_568693	TRUE	Norway/2200/2020	EPI_ISL_447837	TRUE	Spain/PV-IBV-003238/2020	EPI_ISL_480983	TRUE
Argentina/PAIS-G0008/2020	EPI_ISL_792532	TRUE	Denmark/DCGC-787/2020	EPI_ISL_614881	TRUE	Indonesia/SA-EIJK-06/2020	EPI_ISL_467375	TRUE	Norway/2240/2020	EPI_ISL_590914	TRUE	Spain/PV-IBV-003257/2020	EPI_ISL_480953	TRUE
Argentina/PAIS-G0011/2020	EPI_ISL_792535	TRUE	Denmark/DCGC-788/2020	EPI_ISL_614882	TRUE	Indonesia/SA-EIJK-12/2020	EPI_ISL_568694	TRUE	Norway/2358/2020	EPI_ISL_590918	TRUE	Spain/PV-ISCIII-201385/2020	EPI_ISL_455350	TRUE
Aruba/AW-RIVM-10101/2020	EPI_ISL_547445	TRUE	Denmark/DCGC-933/2020	EPI_ISL_614888	TRUE	Indonesia/SA-EIJK13/2020	EPI_ISL_574604	TRUE	Norway/7667/2020	EPI_ISL_1013465	FALSE	Spain/RI-IBV-005945/2020	EPI_ISL_500379	TRUE
Aruba/AW-RIVM-10113/2020	EPI_ISL_547446	TRUE	Denmark/DCGC-942/2020	EPI_ISL_614516	TRUE	Indonesia/SB-NIHRD-C007020/2020	EPI_ISL_910014	TRUE	Norway/Bergen-01/2020	EPI_ISL_541970	TRUE	Spain/RI-IBV-005993/2020	EPI_ISL_500425	TRUE
Aruba/AW-RIVM-10114/2020	EPI_ISL_547447	TRUE	Denmark/DCGC-951/2020	EPI_ISL_614526	TRUE	Indonesia/YO-EIJK08/2020	EPI_ISL_766032	TRUE	Norway/CS-22/2020	EPI_ISL_666602	TRUE	Spain/RI-IBV-98002384/2020	EPI_ISL_537873	TRUE
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Aruba/AW-RIVM-10122/2020	EPI_ISL_547449	TRUE	Denmark/DCGC-956/2020	EPI_ISL_614548	TRUE	Iran/1325/2020	EPI_ISL_594186	TRUE	Norway/Trondheim-E9/2020	EPI_ISL_450351	TRUE	Spain/RI-IBV-99005860/2020	EPI_ISL_537403	TRUE
Aruba/AW-RIVM-10326/2020	EPI_ISL_636513	TRUE	Denmark/DCGC-979/2020	EPI_ISL_614577	TRUE	Iran/GRC-43/2020	EPI_ISL_596453	TRUE	Norway/Trondheim-S10/2020	EPI_ISL_450348	TRUE	Spain/RI-IBV-99005897/2020	EPI_ISL_537437	TRUE
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Austria/CeMM0035/2020	EPI_ISL_437924	TRUE	England/OXON-B3B38/2020	EPI_ISL_534902	TRUE	Israel/701002792/2020	EPI_ISL_447281	TRUE	Peru/LIM-INS-307/2020	EPI_ISL_1111205	TRUE	Sweden/20-50552/2020	EPI_ISL_475146	TRUE
Austria/CeMM0037/2020	EPI_ISL_437926	TRUE	England/SHEF-BFD18/2020	EPI_ISL_416736	TRUE	Israel/990059202/2020	EPI_ISL_447280	TRUE	Peru/LIM-INS-309/2020	EPI_ISL_1111207	TRUE	Sweden/20-50556/2020	EPI_ISL_475147	TRUE
Austria/CeMM0041/2020	EPI_ISL_437929	TRUE	Finland/10MS2A4/2020	EPI_ISL_1184551	TRUE	Israel/990059233/2020	EPI_ISL_447273	TRUE	Peru/LIM-INS-316/2020	EPI_ISL_1111214	TRUE	Sweden/20-50564/2020	EPI_ISL_510818	TRUE
Austria/CeMM0045/2020	EPI_ISL_437932	TRUE	Finland/10MS2E4/2020	EPI_ISL_1184553	TRUE	Israel/990059238/2020	EPI_ISL_447271	TRUE	Peru/LIM-INS-317/2020	EPI_ISL_1111215	TRUE	Sweden/21-50061/2020	EPI_ISL_934322	TRUE
Austria/CeMM0057/2020	EPI_ISL_583557	TRUE	Finland/10MS2F3/2020	EPI_ISL_1184555	TRUE	Israel/990059251/2020	EPI_ISL_447269	TRUE	Peru/LIM-INS-318/2020	EPI_ISL_1111216	TRUE	Sweden/21-50063/2020	EPI_ISL_913323	TRUE
Austria/CeMM0071/2020	EPI_ISL_437941	TRUE	Finland/10MS2H8/2020	EPI_ISL_1184557	TRUE	Israel/990300681/2020	EPI_ISL_447267	TRUE	Peru/LIM-INS-319/2020	EPI_ISL_1111217	TRUE	Sweden/RV-FOI-5/2020	EPI_ISL_549024	TRUE
Austria/CeMM0076/2020	EPI_ISL_437944	TRUE	Finland/13M19/2020	EPI_ISL_418385	TRUE	Israel/CVL-n-5939/2020	EPI_ISL_474965	TRUE	Peru/LIM-INS-320/2020	EPI_ISL_1111218	TRUE	Sweden/RV-FOI-6/2020	EPI_ISL_428201	TRUE
Austria/CeMM0078/2020	EPI_ISL_437946	TRUE	Finland/13M26/2020	EPI_ISL_418386	TRUE	Israel/CVL-n-5991/2020	EPI_ISL_475019	TRUE	Peru/LIM-INS-322/2020	EPI_ISL_1111220	TRUE	Sweden/SVA200327SZ-NSW/2020	EPI_ISL_507008	TRUE
Austria/CeMM0089/2020	EPI_ISL_437952	TRUE	Finland/13M3/2020	EPI_ISL_418389	TRUE	Israel/CVL-n-5999/2020	EPI_ISL_475014	TRUE	Peru/LIM-INS-330/2020	EPI_ISL_1111228	TRUE	Switzerland/AG-ETHZ-100381/2020	EPI_ISL_574882	TRUE
Austria/CeMM0097/2020	EPI_ISL_437958	TRUE	Finland/13M65/2020	EPI_ISL_418395	TRUE	Israel/CVL-n-6106/2020	EPI_ISL_474992	TRUE	Peru/LIM-INS-331/2020	EPI_ISL_1111229	TRUE	Switzerland/AG-ETHZ-101157/2020	EPI_ISL_451823	TRUE
Austria/CeMM0118/2020	EPI_ISL_475769	TRUE	Finland/13M6S4/2020	EPI_ISL_481549	TRUE	Israel/CVL-n-6108/2020	EPI_ISL_474975	TRUE	Peru/LIM-INS-332/2020	EPI_ISL_1111230	TRUE	Switzerland/AG-ETHZ-101165/2020	EPI_ISL_451829	TRUE
Austria/CeMM0119/2020	EPI_ISL_437976	TRUE	Finland/13M77/2020	EPI_ISL_418397	TRUE	Israel/CVL-n-6110/2020	EPI_ISL_475001	TRUE	Peru/LIM-INS-333/2020	EPI_ISL_1111231	TRUE	Switzerland/AG-SNRCI-29940361/2020	EPI_ISL_413999	TRUE
Austria/CeMM0136/2020	EPI_ISL_437989	TRUE	Finland/13M82/2020	EPI_ISL_418399	TRUE	Israel/CVL-n-6118/2020	EPI_ISL_474988	TRUE	Peru/LIM-INS-336/2020	EPI_ISL_1111234	TRUE	Switzerland/AG-UHB-42187967/2020	EPI_ISL_528030	TRUE
Austria/CeMM0140/2020	EPI_ISL_437992	TRUE	Finland/13M83/2020	EPI_ISL_418400	TRUE	Israel/CVL-n-6134/2020	EPI_ISL_475021	TRUE	Peru/LIM-INS-338/2020	EPI_ISL_1111236	TRUE	Switzerland/AG-UZH-1000477914/2020	EPI_ISL_524474	TRUE
Austria/CeMM0143/2020	EPI_ISL_437993	TRUE	Finland/14M12/2020	EPI_ISL_418401	TRUE	Israel/CVL-n-6136/2020	EPI_ISL_475003	TRUE	Philippines/PGC03/2020	EPI_ISL_434555	TRUE	Switzerland/BE-ETHZ-100004/2020	EPI_ISL_466929	TRUE
Austria/CeMM0146/2020	EPI_ISL_437994	TRUE	Finland/14M16/2020	EPI_ISL_418404	TRUE	Israel/CVL-n-6142/2020	EPI_ISL_475015	TRUE	Philippines/PGC06/2020	EPI_ISL_434558	TRUE	Switzerland/BE-ETHZ-100161/2020	EPI_ISL_574914	TRUE
Austria/CeMM0147/2020	EPI_ISL_437995	TRUE	Finland/14M26/2020	EPI_ISL_418406	TRUE	Israel/CVL-n-6751/2020	EPI_ISL_474960	TRUE	Pingxiang/JX151/2020	EPI_ISL_421259	TRUE	Switzerland/BE-ETHZ-101139/2020	EPI_ISL_451806	TRUE
Austria/CeMM0149/2020	EPI_ISL_437997	TRUE	Finland/14M74/2020	EPI_ISL_418409	TRUE	Israel/CVL-n14268/2020	EPI_ISL_514308	TRUE	Pingxiang/JX5/2020	EPI_ISL_421252	TRUE	Switzerland/BE-ETHZ-101166/2020	EPI_ISL_451830	TRUE
Austria/CeMM0159/2020	EPI_ISL_438005	TRUE	Finland/14M77/2020	EPI_ISL_418410	TRUE	Israel/CVL-n14269/2020	EPI_ISL_514309	TRUE	Poland/1109201/2020	EPI_ISL_450525	TRUE	Switzerland/BE-HUG-6651/2020	EPI_ISL_415456	TRUE
Austria/CeMM0165/2020	EPI_ISL_438010	TRUE	Finland/14M82/2020	EPI_ISL_418411	TRUE	Israel/CVL-n14271/2020	EPI_ISL_514311	TRUE	Poland/1110540/2020	EPI_ISL_450528	TRUE	Switzerland/BE-UNIBE-150-5479/2020	EPI_ISL_574791	TRUE
Austria/CeMM0166/2020	EPI_ISL_438011	TRUE	Finland/15MS1D1/2020	EPI_ISL_1217225	TRUE	Israel/CVL-n14285/2020	EPI_ISL_514314	TRUE	Poland/1110551/2020	EPI_ISL_450527	TRUE	Switzerland/BE-UNIBE-165-0657/2020	EPI_ISL_574805	TRUE
Austria/CeMM0167/2020	EPI_ISL_438012	TRUE	Finland/15MS1E1/2020	EPI_ISL_1217227	TRUE	Israel/CVL-n1467/2020	EPI_ISL_649090	TRUE	Poland/1111112/2020	EPI_ISL_450529	TRUE	Switzerland/BE-UNIBE-206-7951/2020	EPI_ISL_574844	TRUE
Austria/CeMM0168/2020	EPI_ISL_438013	TRUE	Finland/16MS3A2/2020	EPI_ISL_1219699	TRUE	Israel/CVL-n1541/2020	EPI_ISL_649064	TRUE	Poland/PL_MCB_14/2020	EPI_ISL_645013	TRUE	Switzerland/BL-42205193/2020	EPI_ISL_581734	TRUE
Austria/CeMM0170/2020	EPI_ISL_438015	TRUE	Finland/17MS1B4/2020	EPI_ISL_1219739	TRUE	Israel/CVL-n1749/2020	EPI_ISL_649098	TRUE	Poland/PL_MCB_15/2020	EPI_ISL_645014	TRUE	Switzerland/BL-42208262/2020	EPI_ISL_581765	TRUE
Austria/CeMM0171/2020	EPI_ISL_438016	TRUE	Finland/17MS1B6/2020	EPI_ISL_1219742	TRUE	Israel/CVL-n1750/2020	EPI_ISL_649099	TRUE	Poland/PL_MCB_16/2020	EPI_ISL_645015	TRUE	Switzerland/BL-42209645/2020	EPI_ISL_581802	TRUE
Austria/CeMM0175/2020	EPI_ISL_438018	TRUE	Finland/17MS1F3/2020	EPI_ISL_1219738	TRUE	Israel/CVL-n1962/2020	EPI_ISL_649067	TRUE	Poland/PL_MCB_17/2020	EPI_ISL_645016	TRUE	Switzerland/BL-42209747/2020	EPI_ISL_581782	TRUE
Austria/CeMM0176/2020	EPI_ISL_438019	TRUE	Finland/17MS1H5/2020	EPI_ISL_1219740	TRUE	Israel/CVL-n2125/2020	EPI_ISL_649069	TRUE	Poland/PL_MCB_19/2020	EPI_ISL_645018	TRUE	Switzerland/BL-ETHZ-100010/2020	EPI_ISL_466935	TRUE
Austria/CeMM0177/2020	EPI_ISL_438020	TRUE	Finland/17MS2D5/2020	EPI_ISL_1219744	TRUE	Israel/CVL-n2200/2020	EPI_ISL_649095	TRUE	Poland/PL_MCB_20/2020	EPI_ISL_645019	TRUE	Switzerland/BL-ETHZ-100081/2020	EPI_ISL_451673	TRUE
Austria/CeMM0179/2020	EPI_ISL_583565	TRUE	Finland/17MS3A12/2020	EPI_ISL_1240990	TRUE	Israel/CVL-n2361/2020	EPI_ISL_649093	TRUE	Poland/PL_MCB_21/2020	EPI_ISL_645020	TRUE	Switzerland/BL-ETHZ-100814/2020	EPI_ISL_451764	TRUE
Austria/CeMM0188/2020	EPI_ISL_438029	TRUE	Finland/19MNS2N3C/2020	EPI_ISL_1222932	TRUE	Israel/CVL-n2440/2020	EPI_ISL_649096	TRUE	Poland/PL_MCB_22/2020	EPI_ISL_645021	TRUE	Switzerland/BL-ETHZ-101150/2020	EPI_ISL_451817	TRUE
Austria/CeMM0190/2020	EPI_ISL_438031	TRUE	Finland/19MS1C12/2020	EPI_ISL_1222939	TRUE	Israel/CVL-n2487/2020	EPI_ISL_649100	TRUE	Poland/PL_MCB_23/2020	EPI_ISL_645022	TRUE	Switzerland/BL-ETHZ-101182/2020	EPI_ISL_451844	TRUE
Austria/CeMM0197/2020	EPI_ISL_438038	TRUE	Finland/19MS1C3/2020	EPI_ISL_1222940	TRUE	Israel/CVL-n2494/2020	EPI_ISL_649086	TRUE	Poland/PL_MCB_24/2020	EPI_ISL_645023	TRUE	Switzerland/BL-SNRCI-29950902/2020	EPI_ISL_414021	TRUE
Austria/CeMM0198/2020	EPI_ISL_438039	TRUE	Finland/19MS1E8/2020	EPI_ISL_1222942	TRUE	Israel/CVL-n2775/2020	EPI_ISL_649101	TRUE	Poland/PL_MCB_25/2020	EPI_ISL_645024	TRUE	Switzerland/BL-UHB-42176771/2020	EPI_ISL_527929	TRUE
Austria/CeMM0204/2020	EPI_ISL_438043	TRUE	Finland/20MS1F9/2020	EPI_ISL_1231211	TRUE	Israel/CVL-n2820/2020	EPI_ISL_649073	TRUE	Poland/PL_P1/2020	EPI_ISL_416488	TRUE	Switzerland/BL-UHB-42186401/2020	EPI_ISL_528006	TRUE
Austria/CeMM0205/2020	EPI_ISL_438044	TRUE	Finland/20MS1G7/2020	EPI_ISL_1231266	TRUE	Israel/CVL-n2875/2020	EPI_ISL_649083	TRUE	Poland/PL_P12/2020	EPI_ISL_451973	TRUE	Switzerland/BL-UHB-42189257/2020	EPI_ISL_528043	TRUE
Austria/CeMM0213/2020	EPI_ISL_438049	TRUE	Finland/20MS4E13/2020	EPI_ISL_1231270	TRUE	Israel/CVL-n2888/2020	EPI_ISL_649080	TRUE	Poland/PL_P14/2020	EPI_ISL_451975	TRUE	Switzerland/BL-UHB-42189647/2020	EPI_ISL_528048	TRUE
Austria/CeMM0224/2020	EPI_ISL_438058	TRUE	Finland/20MS8A5/2020	EPI_ISL_1231277	TRUE	Israel/CVL-n2899/2020	EPI_ISL_649066	TRUE	Poland/PL_P18/2020	EPI_ISL_451979	TRUE	Switzerland/BL-UHB-42191670/2020	EPI_ISL_528104	TRUE
Austria/CeMM0226/2020	EPI_ISL_438060	TRUE	Finland/20MS8B10/2020	EPI_ISL_1231279	TRUE	Israel/CVL-n2910/2020	EPI_ISL_649091	TRUE	Poland/PL_P21/2020	EPI_ISL_451982	TRUE	Switzerland/BL-UHB-42191742/2020	EPI_ISL_528110	TRUE
Austria/CeMM0233/2020	EPI_ISL_438065	TRUE	Finland/20MS8D12/2020	EPI_ISL_1231229	TRUE	Israel/CVL-n2971/2020	EPI_ISL_649088	TRUE	Poland/PL_P24/2020	EPI_ISL_451985	TRUE	Switzerland/BL-UHB-42191804/2020	EPI_ISL_528113	TRUE
Austria/CeMM0236/2020	EPI_ISL_475772	TRUE	Finland/20MS8F8/2020	EPI_ISL_1231285	TRUE	Israel/CVL-n3020/2020	EPI_ISL_649076	TRUE	Poland/PL_P27/2020	EPI_ISL_455440	TRUE	Switzerland/BL-UHB-42192108/2020	EPI_ISL_528125	TRUE
Austria/CeMM0237/2020	EPI_ISL_438067	TRUE	Finland/20MS8H3/2020	EPI_ISL_1231289	TRUE	Israel/CVL-n3021/2020	EPI_ISL_649074	TRUE	Poland/PL_P29/2020	EPI_ISL_455442	TRUE	Switzerland/BL-UHB-42194939/2020	EPI_ISL_528169	TRUE
Austria/CeMM0241/2020	EPI_ISL_438071	TRUE	Finland/22MS6C83/2020	EPI_ISL_1233216	TRUE	Israel/CVL-n3304/2020	EPI_ISL_649079	TRUE	Poland/PL_P3/2020	EPI_ISL_428926	TRUE	Switzerland/BL-UHB-42203375/2020	EPI_ISL_528352	TRUE
Austria/CeMM0245/2020	EPI_ISL_438075	TRUE	Finland/23MS2A33/2020	EPI_ISL_1240118	TRUE	Israel/CVL-n3681/2020	EPI_ISL_649102	TRUE	Poland/PL_P31/2020	EPI_ISL_455444	TRUE	Switzerland/BL-UHB-42203765/2020	EPI_ISL_528368	TRUE
Austria/CeMM0251/2020	EPI_ISL_438081	TRUE	Finland/23MS2E61/2020	EPI_ISL_1240122	TRUE	Israel/CVL-n3707/2020	EPI_ISL_649104	TRUE	Poland/PL_P32/2020	EPI_ISL_455445	TRUE	Switzerland/BS-42204879/2020	EPI_ISL_581731	TRUE
Austria/CeMM0259/2020	EPI_ISL_438088	TRUE	Finland/23MS5E2/2020	EPI_ISL_1240140	TRUE	Israel/CVL-n3767/2020	EPI_ISL_649082	TRUE	Poland/PL_P33/2020	EPI_ISL_455446	TRUE	Switzerland/BS-42206307/2020	EPI_ISL_581747	TRUE
Austria/CeMM0280/2020	EPI_ISL_438107	TRUE	Finland/23MS5H10/2020	EPI_ISL_1240142	TRUE	Israel/CVL-n3782/2020	EPI_ISL_649065	TRUE	Poland/PL_P36/2020	EPI_ISL_455449	TRUE	Switzerland/BS-42210930/2020	EPI_ISL_581809	TRUE
Austria/CeMM0284/2020	EPI_ISL_438110	TRUE	Finland/24MS3B10/2020	EPI_ISL_1239435	TRUE	Israel/CVL-n3862/2020	EPI_ISL_649081	TRUE	Poland/PL_P38/2020	EPI_ISL_455451	TRUE	Switzerland/BS-ETHZ-100002/2020	EPI_ISL_466927	TRUE
Austria/CeMM0300/2020	EPI_ISL_475776	TRUE	Finland/24MS5E6950/2020	EPI_ISL_1239437	TRUE	Israel/CVL-n3975/2020	EPI_ISL_649107	TRUE	Poland/PL_P4/2020	EPI_ISL_428927	TRUE	Switzerland/BS-ETHZ-100006/2020	EPI_ISL_466931	TRUE
Austria/CeMM0307/2020	EPI_ISL_475781	TRUE	Finland/24MSA49/2020	EPI_ISL_1239440	TRUE	Israel/CVL-n4014/2020	EPI_ISL_649078	TRUE	Poland/PL_P40/2020	EPI_ISL_455453	TRUE	Switzerland/BS-HUG-0914/2020	EPI_ISL_415701	TRUE
Austria/CeMM0312/2020	EPI_ISL_475784	TRUE	Finland/24MSF2/2020	EPI_ISL_1239442	TRUE	Israel/CVL-n4094/2020	EPI_ISL_649097	TRUE	Poland/PL_P42/2020	EPI_ISL_492067	TRUE	Switzerland/BS-UHB-42176753/2020	EPI_ISL_527928	TRUE
Austria/CeMM0321/2020	EPI_ISL_475792	TRUE	Finland/25MS3B10/2020	EPI_ISL_1240099	TRUE	Israel/CVL-n4097/2020	EPI_ISL_649071	TRUE	Poland/PL_P5/2020	EPI_ISL_428928	TRUE	Switzerland/BS-UHB-42177236/2020	EPI_ISL_527930	TRUE
Austria/CeMM0362/2020	EPI_ISL_438125	TRUE	Finland/25MS3E61/2020	EPI_ISL_1240101	TRUE	Israel/CVL-n4109/2020	EPI_ISL_649072	TRUE	Poland/PL_P6/2020	EPI_ISL_428929	TRUE	Switzerland/BS-UHB-42177239/2020	EPI_ISL_527931	TRUE
Austria/CeMM0391/2020	EPI_ISL_475831	TRUE	Finland/25MS8C83/2020	EPI_ISL_1240108	TRUE	Israel/CVL-n4115/2020	EPI_ISL_649106	TRUE	Poland/PL_P7/2020	EPI_ISL_428930	TRUE	Switzerland/BS-UHB-42178886/2020	EPI_ISL_527941	TRUE
Austria/CeMM0401/2020	EPI_ISL_475836	TRUE	Finland/25MS8C91/2020	EPI_ISL_1240109	TRUE	Israel/CVL-n4414/2020	EPI_ISL_649085	TRUE	Poland/Wro-02/2020	EPI_ISL_437625	TRUE	Switzerland/BS-UHB-42181461/2020	EPI_ISL_527956	TRUE
Austria/CeMM0403/2020	EPI_ISL_475838	TRUE	Finland/25MS8F38/2020	EPI_ISL_1240111	TRUE	Israel/CVL-n896/2020	EPI_ISL_649094	TRUE	Portugal/CV63/2020	EPI_ISL_413648	TRUE	Switzerland/BS-UHB-42185476/2020	EPI_ISL_527986	TRUE
Austria/CeMM0413/2020	EPI_ISL_475843	TRUE	Finland/25MS8F86/2020	EPI_ISL_1240112	TRUE	Israel/ISR_JP0320/2020	EPI_ISL_419211	TRUE	Portugal/PT0001b/2020	EPI_ISL_417986	TRUE	Switzerland/BS-UHB-42185657/2020	EPI_ISL_527987	TRUE
Austria/CeMM0423/2020	EPI_ISL_475851	TRUE	Finland/25MS8H8/2020	EPI_ISL_1240113	TRUE	Israel/n14268/2020	EPI_ISL_483708	TRUE	Portugal/PT0003/2020	EPI_ISL_417987	TRUE	Switzerland/BS-UHB-42186303/2020	EPI_ISL_528001	TRUE
Austria/CeMM0425/2020	EPI_ISL_475853	TRUE	Finland/29M11S2/2020	EPI_ISL_1240178	TRUE	Israel/n14269/2020	EPI_ISL_483704	TRUE	Portugal/PT0004/2020	EPI_ISL_417988	TRUE	Switzerland/BS-UHB-42186379/2020	EPI_ISL_528003	TRUE
Austria/CeMM0441/2020	EPI_ISL_475864	TRUE	Finland/29M17S2/2020	EPI_ISL_481642	TRUE	Israel/n14271/2020	EPI_ISL_483717	TRUE	Portugal/PT0005/2020	EPI_ISL_417989	TRUE	Switzerland/BS-UHB-42186390/2020	EPI_ISL_528004	TRUE
Austria/CeMM0460/2020	EPI_ISL_475871	TRUE	Finland/29M20S2/2020	EPI_ISL_1240180	TRUE	Israel/n14285/2020	EPI_ISL_483711	TRUE	Portugal/PT0006a/2020	EPI_ISL_417990	TRUE	Switzerland/BS-UHB-42190999/2020	EPI_ISL_528085	TRUE
Austria/CeMM0462/2020	EPI_ISL_475873	TRUE	Finland/29M60S1/2020	EPI_ISL_481646	TRUE	Italy/ABR-IZSGC-TE4880/2020	EPI_ISL_418256	TRUE	Portugal/PT0006b/2020	EPI_ISL_417991	TRUE	Switzerland/BS-UHB-42193780/2020	EPI_ISL_528151	TRUE
Austria/CeMM0484/2020	EPI_ISL_475886	TRUE	Finland/29MSH56/2020	EPI_ISL_1240184	TRUE	Italy/ABR-IZSGC-TE5545/2020	EPI_ISL_436721	TRUE	Portugal/PT0007/2020	EPI_ISL_417992	TRUE	Switzerland/BS-UHB-42197742/2020	EPI_ISL_528218	TRUE
Austria/CeMM0491/2020	EPI_ISL_583580	TRUE	Finland/30M18S2/2020	EPI_ISL_1240701	TRUE	Italy/ABR-IZSGC-TE5547/2020	EPI_ISL_436722	TRUE	Portugal/PT0008/2020	EPI_ISL_417993	TRUE	Switzerland/BS-UHB-42198664/2020	EPI_ISL_528227	TRUE
Austria/CeMM0500/2020	EPI_ISL_583588	TRUE	Finland/30M6S2/2020	EPI_ISL_481656	TRUE	Italy/ABR-IZSGC-TE5551/2020	EPI_ISL_429226	TRUE	Portugal/PT0009/2020	EPI_ISL_417994	TRUE	Switzerland/BS-UHB-42202260/2020	EPI_ISL_528330	TRUE
Austria/CeMM0519/2020	EPI_ISL_475891	TRUE	Finland/30M75S3/2020	EPI_ISL_481657	TRUE	Italy/ABR-IZSGC-TE6202/2020	EPI_ISL_528927	TRUE	Portugal/PT0010/2020	EPI_ISL_417995	TRUE	Switzerland/BS-UHB-42203155/2020	EPI_ISL_528345	TRUE
Austria/CeMM0521/2020	EPI_ISL_475893	TRUE	Finland/30M77S3/2020	EPI_ISL_481658	TRUE	Italy/ABR-IZSGC-TE8387/2020	EPI_ISL_529026	TRUE	Portugal/PT0011/2020	EPI_ISL_417996	TRUE	Switzerland/BS-UHB-42203345/2020	EPI_ISL_528349	TRUE
Austria/CeMM0555/2020	EPI_ISL_475906	TRUE	Finland/30M80S3/2020	EPI_ISL_481659	TRUE	Italy/APU-IZSPB_169APT/2020	EPI_ISL_794745	TRUE	Portugal/PT0012/2020	EPI_ISL_417997	TRUE	Switzerland/BS-UHB-42203366/2020	EPI_ISL_528351	TRUE
Austria/CeMM0558/2020	EPI_ISL_475909	TRUE	Finland/30M83/2020	EPI_ISL_481660	TRUE	Italy/APU-UniMI-857/2020	EPI_ISL_469023	TRUE	Portugal/PT0013/2020	EPI_ISL_417998	TRUE	Switzerland/BS-UHB-42203656/2020	EPI_ISL_528363	TRUE
Austria/CeMM0559/2020	EPI_ISL_475910	TRUE	Finland/30M88S2/2020	EPI_ISL_481661	TRUE	Italy/BAS-UniMI-2161/2020	EPI_ISL_477200	TRUE	Portugal/PT0014/2020	EPI_ISL_417999	TRUE	Switzerland/BS-UHB-42203696/2020	EPI_ISL_528365	TRUE
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Brazil/SP-850/2020	EPI_ISL_792103	TRUE	Germany/NW-ChVir1683/2020	EPI_ISL_729478	TRUE	Japan/PG-2091/2020	EPI_ISL_685696	TRUE	Scotland/CVR100/2020	EPI_ISL_425647	TRUE	Turkey/HSGM-8992/2020	EPI_ISL_429865	TRUE
Brazil/SP-857/2020	EPI_ISL_861633	TRUE	Germany/NW-HHU-01/2020	EPI_ISL_413488	TRUE	Japan/PG-2095/2020	EPI_ISL_685700	TRUE	Scotland/CVR1085/2020	EPI_ISL_433508	TRUE	Turkey/HSGM-942/2020	EPI_ISL_437315	TRUE
Brazil/SP-859/2020	EPI_ISL_833153	TRUE	Germany/NW-HHU-02-1/2020	EPI_ISL_414497	TRUE	Japan/PG-2175/2020	EPI_ISL_685780	TRUE	Scotland/CVR1204/2020	EPI_ISL_433522	TRUE	Turkey/Istanbul-BezmCoV1/2020	EPI_ISL_457824	TRUE
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Brazil/SP-HIAE-ID51/2020	EPI_ISL_861915	TRUE	Germany/NW-HHU-169/2020	EPI_ISL_602491	TRUE	Japan/PG-2713/2020	EPI_ISL_690845	TRUE	Scotland/EDB412/2020	EPI_ISL_426003	TRUE	Uganda/UG011/2020	EPI_ISL_451193	TRUE
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Brunei/1/2020	EPI_ISL_443187	TRUE	Germany/NW-HHU-185/2020	EPI_ISL_602507	TRUE	Japan/PG-2902/2020	EPI_ISL_691028	TRUE	Senegal/003/2020	EPI_ISL_418206	TRUE	Uganda/UG034/2020	EPI_ISL_737954	TRUE
Brunei/2/2020	EPI_ISL_435674	TRUE	Germany/NW-HHU-193/2020	EPI_ISL_602467	TRUE	Japan/PG-3120/2020	EPI_ISL_691242	TRUE	Senegal/016/2020	EPI_ISL_418207	TRUE	Uganda/UG035/2020	EPI_ISL_737955	TRUE
Brunei/3/2020	EPI_ISL_435675	TRUE	Germany/NW-HHU-21/2020	EPI_ISL_417466	TRUE	Japan/PG-3178/2020	EPI_ISL_691298	TRUE	Senegal/020/2020	EPI_ISL_418208	TRUE	Uganda/UG036/2020	EPI_ISL_737956	TRUE
Brunei/4/2020	EPI_ISL_435676	TRUE	Germany/NW-HHU-22/2020	EPI_ISL_417467	TRUE	Japan/PG-3264/2020	EPI_ISL_691379	TRUE	Senegal/026/2020	EPI_ISL_418209	TRUE	Uganda/UG037/2020	EPI_ISL_737957	TRUE
Brunei/5/2020	EPI_ISL_435677	TRUE	Germany/NW-HHU-24/2020	EPI_ISL_419541	TRUE	Japan/PG-7746/2020	EPI_ISL_686848	TRUE	Senegal/073/2020	EPI_ISL_418210	TRUE	Uganda/UG038/2020	EPI_ISL_737958	TRUE
Bulgaria/06/2020	EPI_ISL_480297	TRUE	Germany/NW-HHU-47/2020	EPI_ISL_425131	TRUE	Japan/SMU-0311S2/2020	EPI_ISL_416524	TRUE	Senegal/082/2020	EPI_ISL_418211	TRUE	Uganda/UG039/2020	EPI_ISL_737959	TRUE
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Cambodia/2004/2020	EPI_ISL_956388	TRUE	Germany/SH-ChVir3060/2020	EPI_ISL_729526	TRUE	Jiangsu/JS01/2020	EPI_ISL_411950	TRUE	Senegal/1749/2020	EPI_ISL_480787	TRUE	UnitedArabEmirates/L0881/2020	EPI_ISL_435125	TRUE
Cambodia/2018/2020	EPI_ISL_956389	TRUE	Germany/SH-ChVir3061/2020	EPI_ISL_729527	TRUE	Jiangxi/IVDC-JX-002/2020	EPI_ISL_408486	TRUE	Senegal/306/2020	EPI_ISL_420069	TRUE	UnitedArabEmirates/L0904/2020	EPI_ISL_435126	TRUE
Cambodia/2099/2020	EPI_ISL_956390	TRUE	Germany/SH-ChVir3218/2020	EPI_ISL_729546	TRUE	Jingzhou/HBCDC-HB-01/2020	EPI_ISL_412459	TRUE	Senegal/315/2020	EPI_ISL_420070	TRUE	UnitedArabEmirates/L1014/2020	EPI_ISL_435127	TRUE
Cambodia/2126/2020	EPI_ISL_956391	TRUE	Ghana/2573_S27/2020	EPI_ISL_515082	TRUE	Jiujiang/JX22/2020	EPI_ISL_421237	TRUE	Senegal/370/2020	EPI_ISL_420072	TRUE	UnitedArabEmirates/L1076/2020	EPI_ISL_435128	TRUE
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Cambodia/2928/2020	EPI_ISL_956396	TRUE	Greece/12/2020	EPI_ISL_418264	TRUE	Jordan/SR-036/2020	EPI_ISL_429996	TRUE	Senegal/620/2020	EPI_ISL_420078	TRUE	UnitedArabEmirates/L4184/2020	EPI_ISL_435133	TRUE
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Cambodia/5403/2020	EPI_ISL_956401	TRUE	Greece/142/2020	EPI_ISL_434478	TRUE	Jordan/SR-043/2020	EPI_ISL_430001	TRUE	Shandong/2020C1240145/2020	EPI_ISL_962576	TRUE	UnitedArabEmirates/L5630/2020	EPI_ISL_435137	TRUE
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Canada/NS-NML-969/2020	EPI_ISL_914984	TRUE	Greece/248_32261/2020	EPI_ISL_437900	TRUE	Kuwait/KU12/2020	EPI_ISL_416458	TRUE	Shenzhen/HKU-SZ-005/2020	EPI_ISL_405839	TRUE	Uruguay/Mdeo-1/2020	EPI_ISL_444493	TRUE
Canada/NS_40/2020	EPI_ISL_482469	TRUE	Greece/250_32267/2020	EPI_ISL_447648	TRUE	Kuwait/KU17/2020	EPI_ISL_416542	TRUE	Shenzhen/SZTH-001/2020	EPI_ISL_406592	FALSE	Uruguay/UY-NYUMC850/2020	EPI_ISL_457946	TRUE
Canada/ON-SC0100/2020	EPI_ISL_933616	TRUE	Greece/255_32525/2020	EPI_ISL_447650	TRUE	Kuwait/KU18/2020	EPI_ISL_416543	TRUE	Shenzhen/SZTH-002/2020	EPI_ISL_406593	TRUE	Uruguay/UY-NYUMC852/2020	EPI_ISL_457948	TRUE
Canada/ON_MU-S5/2020	EPI_ISL_463988	TRUE	Greece/259_31928/2020	EPI_ISL_447651	TRUE	Latvia/01/2020	EPI_ISL_421653	TRUE	Sichuan/IVDC-SC-001/2020	EPI_ISL_408484	TRUE	Uruguay/UY-NYUMC856/2020	EPI_ISL_457952	TRUE
Canada/ON_ON-VIDO-01-2/2020	EPI_ISL_425177	TRUE	Greece/260_32216/2020	EPI_ISL_437906	TRUE	Latvia/010/2020	EPI_ISL_437089	TRUE	Sichuan/SC-LZ-079/2020	EPI_ISL_451318	TRUE	Uruguay/UY-NYUMC857/2020	EPI_ISL_457953	TRUE
Canada/ON_QGLO-01/2020	EPI_ISL_459866	TRUE	Greece/262_32443/2020	EPI_ISL_447652	TRUE	Latvia/011/2020	EPI_ISL_437090	TRUE	Sichuan/SC-MY-001/2020	EPI_ISL_661271	TRUE	Uruguay/UY-NYUMC860/2020	EPI_ISL_457956	TRUE
Canada/QC-CHUM-2008200969A/2020	EPI_ISL_1378988	TRUE	Greece/263_32477/2020	EPI_ISL_447653	TRUE	Latvia/012/2020	EPI_ISL_437091	TRUE	Sichuan/SC-MY-059/2020	EPI_ISL_451325	TRUE	Uruguay/UY-NYUMC861/2020	EPI_ISL_457957	TRUE
Canada/QC-CHUM-2008201070A/2020	EPI_ISL_1378960	TRUE	Greece/33_36910/2020	EPI_ISL_437893	TRUE	Latvia/013/2020	EPI_ISL_437092	TRUE	Sichuan/SC-NC-069/2020	EPI_ISL_451329	TRUE	Uruguay/UY-NYUMC862/2020	EPI_ISL_457958	TRUE
Canada/QC-JUS-V5192105/2020	EPI_ISL_890432	TRUE	Greece/34_36284/2020	EPI_ISL_447832	TRUE	Latvia/014/2020	EPI_ISL_437093	TRUE	Sichuan/SC-WCH-082/2020	EPI_ISL_451374	TRUE	Uruguay/UY-NYUMC863/2020	EPI_ISL_457959	TRUE
Canada/QC-JUS-V5200815/2020	EPI_ISL_890428	TRUE	Greece/35/2020	EPI_ISL_434459	TRUE	Latvia/015/2020	EPI_ISL_437094	TRUE	Sichuan/SC-WCH2-006/2020	EPI_ISL_451076	TRUE	Uruguay/UY-NYUMC865/2020	EPI_ISL_457961	TRUE
Canada/QC-JUS-V5220339/2020	EPI_ISL_890379	TRUE	Greece/36/2020	EPI_ISL_434457	TRUE	Latvia/016/2020	EPI_ISL_437095	TRUE	Sichuan/SC-WCH3-254/2020	EPI_ISL_451383	TRUE	Uruguay/UY-NYUMC867/2020	EPI_ISL_457963	TRUE
Canada/QC-JUS-V5230756/2020	EPI_ISL_890400	TRUE	Greece/37/2020	EPI_ISL_434458	TRUE	Latvia/017/2020	EPI_ISL_437096	TRUE	Sichuan/SC-WCH4-285/2020	EPI_ISL_451387	TRUE	Vietnam/19-01S/2020	EPI_ISL_418269	TRUE
Canada/QC-JUS-V5240540/2020	EPI_ISL_890615	TRUE	Greece/38/2020	EPI_ISL_434460	TRUE	Latvia/02/2020	EPI_ISL_421654	TRUE	Sichuan/SC-WCH4-286/2020	EPI_ISL_451388	TRUE	Vietnam/19-02S/2020	EPI_ISL_418267	TRUE
Canada/QC-JUS-V5250296/2020	EPI_ISL_890469	TRUE	Greece/39/2020	EPI_ISL_434461	TRUE	Latvia/03/2020	EPI_ISL_421655	TRUE	Sichuan/SC-WCH4-291/2020	EPI_ISL_451393	TRUE	Vietnam/22/2020	EPI_ISL_654890	TRUE
Canada/QC-JUS-V5260897/2020	EPI_ISL_1241128	TRUE	Greece/40_36244/2020	EPI_ISL_437897	TRUE	Latvia/039/2020	EPI_ISL_486422	TRUE	SierraLeone/KGH-G-8548/2020	EPI_ISL_512811	TRUE	Vietnam/36/2020	EPI_ISL_654891	TRUE
Canada/QC-JUS-V5262107/2020	EPI_ISL_890683	TRUE	Greece/41_36861/2020	EPI_ISL_437898	TRUE	Latvia/04/2020	EPI_ISL_421656	TRUE	SierraLeone/KGH-G-8549/2020	EPI_ISL_512812	TRUE	Vietnam/38142/2020	EPI_ISL_416427	TRUE
Canada/QC-JUS-V5270577/2020	EPI_ISL_890699	TRUE	Greece/42_36236/2020	EPI_ISL_437899	TRUE	Latvia/040/2020	EPI_ISL_486423	TRUE	Singapore/10/2020	EPI_ISL_410716	TRUE	Vietnam/39607/2020	EPI_ISL_416428	TRUE
Canada/QC-JUS-V5270617/2020	EPI_ISL_890661	TRUE	Greece/43_35679/2020	EPI_ISL_437874	TRUE	Latvia/041/2020	EPI_ISL_486424	TRUE	Singapore/1004/2020	EPI_ISL_574487	TRUE	Vietnam/CM295/2020	EPI_ISL_416430	TRUE
Canada/QC-JUS-V5280176/2020	EPI_ISL_889806	TRUE	Greece/44/2020	EPI_ISL_434465	TRUE	Latvia/042/2020	EPI_ISL_486425	TRUE	Singapore/1013/2020	EPI_ISL_574498	TRUE	Vietnam/CM296/2020	EPI_ISL_416431	TRUE
Canada/QC-JUS-V5280467/2020	EPI_ISL_890706	TRUE	Greece/45_35378/2020	EPI_ISL_529148	TRUE	Latvia/044/2020	EPI_ISL_486426	TRUE	Singapore/1016/2020	EPI_ISL_574501	TRUE	Vietnam/CM99/2020	EPI_ISL_416429	TRUE
Canada/QC-JUS-V5290838/2020	EPI_ISL_890859	TRUE	Greece/46/2020	EPI_ISL_434463	TRUE	Latvia/045/2020	EPI_ISL_486428	TRUE	Singapore/1021/2020	EPI_ISL_574506	TRUE	Vietnam/HCMC-05004/2020	EPI_ISL_450738	TRUE
Canada/QC-JUS-V5300545/2020	EPI_ISL_890804	TRUE	Greece/47/2020	EPI_ISL_434462	TRUE	Latvia/046/2020	EPI_ISL_486430	TRUE	Singapore/1029/2020	EPI_ISL_574514	TRUE	Vietnam/HCMC-05006/2020	EPI_ISL_498177	TRUE
Canada/QC-JUS-V5300854/2020	EPI_ISL_890530	TRUE	Greece/48/2020	EPI_ISL_434456	TRUE	Latvia/047/2020	EPI_ISL_486431	TRUE	Singapore/103/2020	EPI_ISL_443195	TRUE	Vietnam/HCMC-05008/2020	EPI_ISL_498179	TRUE
Canada/QC-JUS-V5301970/2020	EPI_ISL_889875	TRUE	Greece/49_36716/2020	EPI_ISL_437909	TRUE	Latvia/048/2020	EPI_ISL_486432	TRUE	Singapore/1031/2020	EPI_ISL_574516	TRUE	Vietnam/HCMC-2712/2020	EPI_ISL_498172	TRUE
Canada/QC-JUS-V5302007/2020	EPI_ISL_889882	TRUE	Greece/50_36277/2020	EPI_ISL_447833	TRUE	Latvia/049/2020	EPI_ISL_486433	TRUE	Singapore/1032/2020	EPI_ISL_574517	TRUE	Vietnam/HCMC-2751/2020	EPI_ISL_498173	TRUE
Canada/QC-JUS-V5310874/2020	EPI_ISL_889976	TRUE	Greece/51/2020	EPI_ISL_434468	TRUE	Latvia/05/2020	EPI_ISL_426285	TRUE	Singapore/1037/2020	EPI_ISL_574522	TRUE	Vietnam/HCMC-3349/2020	EPI_ISL_498175	TRUE
Canada/QC-JUS-V5311172/2020	EPI_ISL_889825	TRUE	Greece/54_37163/2020	EPI_ISL_447835	TRUE	Latvia/050/2020	EPI_ISL_486434	TRUE	Singapore/1044/2020	EPI_ISL_574529	TRUE	Vietnam/HCMC-35003/2020	EPI_ISL_498182	TRUE
Canada/QC-JUS-V5311405/2020	EPI_ISL_889984	TRUE	Greece/55_36015/2020	EPI_ISL_447834	TRUE	Latvia/051/2020	EPI_ISL_486435	TRUE	Singapore/1045/2020	EPI_ISL_574530	TRUE	Vietnam/HCMC-35005/2020	EPI_ISL_450739	TRUE
Canada/QC-JUS-V5311451/2020	EPI_ISL_889991	TRUE	Greece/56_37161/2020	EPI_ISL_437911	TRUE	Latvia/052/2020	EPI_ISL_486436	TRUE	Singapore/1046/2020	EPI_ISL_574531	TRUE	Vietnam/HCMC-35006/2020	EPI_ISL_498183	TRUE
Canada/QC-JUS-V5311818/2020	EPI_ISL_889988	TRUE	Greece/HPI-6465/2020	EPI_ISL_451311	TRUE	Latvia/06/2020	EPI_ISL_426286	TRUE	Singapore/1053/2020	EPI_ISL_574538	TRUE	Vietnam/HCMC-35008/2020	EPI_ISL_498184	TRUE
Canada/QC-JUS-V5311977/2020	EPI_ISL_889913	TRUE	Greece/HPI-6478/2020	EPI_ISL_451310	TRUE	Latvia/07/2020	EPI_ISL_426287	TRUE	Singapore/106nan/2020	EPI_ISL_648063	TRUE	Vietnam/HCMC-35009/2020	EPI_ISL_498185	TRUE
Canada/QC-JUS-V6011272/2020	EPI_ISL_890012	TRUE	Guadeloupe/IPG-7319/2020	EPI_ISL_613419	TRUE	Latvia/08/2020	EPI_ISL_426288	TRUE	Singapore/109/2020	EPI_ISL_443201	TRUE	Vietnam/HCMC-35011/2020	EPI_ISL_450740	TRUE
Canada/QC-JUS-V6011307/2020	EPI_ISL_889841	TRUE	Guadeloupe/IPG-7320/2020	EPI_ISL_613420	TRUE	Latvia/09/2020	EPI_ISL_426289	TRUE	Singapore/11/2020	EPI_ISL_410719	TRUE	Vietnam/HCMC-35012/2020	EPI_ISL_498187	TRUE
Canada/QC-JUS-V6020374/2020	EPI_ISL_890024	TRUE	Guadeloupe/IPG-7321/2020	EPI_ISL_613421	TRUE	Lebanon/LB-LR10/2020	EPI_ISL_498554	TRUE	Singapore/112/2020	EPI_ISL_443204	TRUE	Vietnam/HCMC-35013/2020	EPI_ISL_498188	TRUE
Canada/QC-JUS-V6020411/2020	EPI_ISL_890022	TRUE	Guadeloupe/IPG-7322/2020	EPI_ISL_613422	TRUE	Lebanon/LB-LR9/2020	EPI_ISL_498552	TRUE	Singapore/1135/2020	EPI_ISL_648043	TRUE	Vietnam/HCMC-35018/2020	EPI_ISL_450742	TRUE
Canada/QC-JUS-V6020542/2020	EPI_ISL_889845	TRUE	Guadeloupe/IPG-7323/2020	EPI_ISL_613423	TRUE	Lebanon/LB-R8/2020	EPI_ISL_498551	TRUE	Singapore/1154/2020	EPI_ISL_648072	TRUE	Vietnam/HCMC-35019/2020	EPI_ISL_450743	TRUE
Canada/QC-L00220159/2020	EPI_ISL_1241269	TRUE	Guadeloupe/IPG-7324/2020	EPI_ISL_613424	TRUE	Lebanon/S2_759/2020	EPI_ISL_450509	TRUE	Singapore/12/2020	EPI_ISL_414378	TRUE	Vietnam/HCMC-35020/2020	EPI_ISL_450744	TRUE
Canada/QC-L00221577/2020	EPI_ISL_1241274	TRUE	Guadeloupe/IPG-7325/2020	EPI_ISL_613425	TRUE	Lishui/LS111/2020	EPI_ISL_429852	TRUE	Singapore/122/2020	EPI_ISL_443214	TRUE	Vietnam/HCMC-35030/2020	EPI_ISL_498191	TRUE
Canada/QC-LSPQ-L00212401/2020	EPI_ISL_535717	TRUE	Guadeloupe/IPG-7326/2020	EPI_ISL_613426	TRUE	Lu-an/352/2020	EPI_ISL_1081196	TRUE	Singapore/126/2020	EPI_ISL_443218	TRUE	Vietnam/HCMC-35031/2020	EPI_ISL_498192	TRUE
Canada/QC-LSPQ-L00213013/2020	EPI_ISL_535718	TRUE	Guadeloupe/IPG-7327/2020	EPI_ISL_613427	TRUE	Lu-an/425/2020	EPI_ISL_1081260	TRUE	Singapore/12Clin/2020	EPI_ISL_418995	TRUE	Vietnam/IBT-14Mar/2020	EPI_ISL_448222	TRUE
Canada/QC-LSPQ-L00215022/2020	EPI_ISL_535731	TRUE	Guadeloupe/IPG-7328/2020	EPI_ISL_613428	TRUE	Lu-an/570/2020	EPI_ISL_1081324	TRUE	Singapore/13/2020	EPI_ISL_414379	TRUE	Vietnam/IBT-NIHE-03/2020	EPI_ISL_479756	TRUE
Canada/QC-LSPQ-L00216190/2020	EPI_ISL_535744	TRUE	Guadeloupe/IPG-7330/2020	EPI_ISL_613430	TRUE	Lu-an/678/2020	EPI_ISL_1081326	TRUE	Singapore/131/2020	EPI_ISL_443223	TRUE	Vietnam/IBT-NIHE-05/2020	EPI_ISL_479757	TRUE
Canada/QC-LSPQ-L00217092/2020	EPI_ISL_535758	TRUE	Guadeloupe/IPG-7331/2020	EPI_ISL_613431	TRUE	Lu-an/80/2020	EPI_ISL_1069201	TRUE	Singapore/136nan/2020	EPI_ISL_648080	TRUE	Vietnam/IBT-NIHE-16/2020	EPI_ISL_479758	TRUE
Canada/QC-LSPQ-L00217098/2020	EPI_ISL_535759	TRUE	Guadeloupe/IPG-7333/2020	EPI_ISL_613432	TRUE	Luxembourg/LNS0000001/2020	EPI_ISL_419562	TRUE	Singapore/138/2020	EPI_ISL_443230	TRUE	Vietnam/PIHCM-14/2020	EPI_ISL_654866	TRUE
Canada/QC-LSPQ-L00219089/2020	EPI_ISL_535790	TRUE	Guadeloupe/IPG-7334/2020	EPI_ISL_613433	TRUE	Luxembourg/LNS0158952/2020	EPI_ISL_417534	TRUE	Singapore/14/2020	EPI_ISL_414380	TRUE	Vietnam/PIHCM-237/2020	EPI_ISL_654877	TRUE
Canada/QC-LSPQ-L00220736/2020	EPI_ISL_535802	TRUE	Guadeloupe/IPG-7335/2020	EPI_ISL_613434	TRUE	Luxembourg/LNS0366116/2020	EPI_ISL_419564	TRUE	Singapore/1406/2020	EPI_ISL_648074	TRUE	Vietnam/PIHCM-305/2020	EPI_ISL_654878	TRUE
Canada/QC-LSPQ-L00222448/2020	EPI_ISL_535816	TRUE	Guadeloupe/IPG-7336/2020	EPI_ISL_613435	TRUE	Luxembourg/LNS0641910/2020	EPI_ISL_419566	TRUE	Singapore/141cul/2020	EPI_ISL_574484	TRUE	Vietnam/PIHCM-320/2020	EPI_ISL_654888	TRUE
Canada/QC-LSPQ-L00226858/2020	EPI_ISL_535851	TRUE	Guadeloupe/IPG-7337/2020	EPI_ISL_613436	TRUE	Luxembourg/LNS0709551/2020	EPI_ISL_429781	TRUE	Singapore/143/2020	EPI_ISL_443235	TRUE	Vietnam/PIHCM-321/2020	EPI_ISL_654868	TRUE
Canada/QC-LSPQ-L00230189/2020	EPI_ISL_535912	TRUE	Guadeloupe/IPG-7338/2020	EPI_ISL_613437	TRUE	Luxembourg/LNS0756265/2020	EPI_ISL_429725	TRUE	Singapore/14Clin/2020	EPI_ISL_418998	TRUE	Vietnam/PIHCM-322/2020	EPI_ISL_654869	TRUE
Canada/QC-LSPQ-L00230666/2020	EPI_ISL_535927	TRUE	Guadeloupe/IPG-7339/2020	EPI_ISL_613438	TRUE	Luxembourg/LNS0814393/2020	EPI_ISL_429766	TRUE	Singapore/15/2020	EPI_ISL_418996	TRUE	Vietnam/PIHCM-323/2020	EPI_ISL_654870	TRUE
Canada/Qc-LSPQ-L00210314/2020	EPI_ISL_535716	TRUE	Guadeloupe/IPG-7340/2020	EPI_ISL_613439	TRUE	Luxembourg/LNS0814536/2020	EPI_ISL_421754	TRUE	Singapore/16/2020	EPI_ISL_418997	TRUE	Vietnam/PIHCM-371/2020	EPI_ISL_654882	TRUE
Canada/Qc-LSPQ-L00214488/2020	EPI_ISL_535727	TRUE	Guadeloupe/IPG-7341/2020	EPI_ISL_613440	TRUE	Luxembourg/LNS0945359/2020	EPI_ISL_419569	TRUE	Singapore/161/2020	EPI_ISL_462279	TRUE	Vietnam/PIHCM-372/2020	EPI_ISL_654872	TRUE
Canada/Qc-LSPQ-L00216909/2020	EPI_ISL_535753	TRUE	Guadeloupe/IPG-7342/2020	EPI_ISL_613441	TRUE	Luxembourg/LNS0994857/2020	EPI_ISL_429777	TRUE	Singapore/165/2020	EPI_ISL_462283	TRUE	Vietnam/PIHCM-457/2020	EPI_ISL_654889	TRUE
Canada/Qc-LSPQ-L00218534/2020	EPI_ISL_535784	TRUE	Guadeloupe/IPG-7344/2020	EPI_ISL_613442	TRUE	Luxembourg/LNS1644489/2020	EPI_ISL_421740	TRUE	Singapore/166/2020	EPI_ISL_462284	TRUE	Vietnam/PIHCM-459/2020	EPI_ISL_654874	TRUE
Canada/Qc-LSPQ-L00219066/2020	EPI_ISL_535789	TRUE	Guadeloupe/IPG-7346/2020	EPI_ISL_613443	TRUE	Luxembourg/LNS1874423/2020	EPI_ISL_419573	TRUE	Singapore/167nan/2020	EPI_ISL_648070	TRUE	Vietnam/PIHCM-461/2020	EPI_ISL_654875	TRUE
Canada/Qc-LSPQ-L00232405/2020	EPI_ISL_535985	TRUE	Guadeloupe/IPG-7347/2020	EPI_ISL_613444	TRUE	Luxembourg/LNS1995247/2020	EPI_ISL_429718	TRUE	Singapore/169/2020	EPI_ISL_462287	TRUE	Vietnam/PIHCM-462/2020	EPI_ISL_654886	TRUE
Canada/Qc-LSPQ-L00233585/2020	EPI_ISL_536029	TRUE	Guadeloupe/IPG-7353/2020	EPI_ISL_613445	TRUE	Luxembourg/LNS2334563/2020	EPI_ISL_421737	TRUE	Singapore/17/2020	EPI_ISL_418992	TRUE	Vietnam/PIHCM-506/2020	EPI_ISL_654879	TRUE
Canada/Qc-LSPQ-L00234887/2020	EPI_ISL_536079	TRUE	Guam/GU-NHG-02/2020	EPI_ISL_444610	TRUE	Luxembourg/LNS2614631/2020	EPI_ISL_419578	TRUE	Singapore/173/2020	EPI_ISL_462291	TRUE	Vietnam/PIHCM-634/2020	EPI_ISL_654887	TRUE
Canada/Qc-LSPQ-L00236558/2020	EPI_ISL_536137	TRUE	Guam/GU_NHG_01/2020	EPI_ISL_444998	TRUE	Luxembourg/LNS2886370/2020	EPI_ISL_419579	TRUE	Singapore/175/2020	EPI_ISL_462293	TRUE	Vietnam/VNHN_01097/2020	EPI_ISL_435317	TRUE
Canada/Qc-LSPQ-L00237490/2020	EPI_ISL_536182	TRUE	Guam/GU_NHG_02/2020	EPI_ISL_444999	TRUE	Luxembourg/LNS2913521/2020	EPI_ISL_429746	TRUE	Singapore/17nan/2020	EPI_ISL_648071	TRUE	Vietnam/VNHN_0207/2020	EPI_ISL_511891	TRUE
Canada/Qc-LSPQ-L00239009/2020	EPI_ISL_536230	TRUE	Guam/GU_NHG_03/2020	EPI_ISL_445000	TRUE	Luxembourg/LNS3035957/2020	EPI_ISL_421750	TRUE	Singapore/18/2020	EPI_ISL_418999	TRUE	Vietnam/VNHN_022/2020	EPI_ISL_435303	TRUE
Canada/Qc-LSPQ-L00241168/2020	EPI_ISL_450311	TRUE	Guangdong/20SF012/2020	EPI_ISL_403932	TRUE	Luxembourg/LNS3063798/2020	EPI_ISL_740242	TRUE	Singapore/187/2020	EPI_ISL_462305	TRUE	Vietnam/VNHN_026/2020	EPI_ISL_435305	TRUE
Canada/Qc-LSPQ-L00243317/2020	EPI_ISL_536355	TRUE	Guangdong/20SF013/2020	EPI_ISL_403933	TRUE	Luxembourg/LNS3156434/2020	EPI_ISL_419582	TRUE	Singapore/188/2020	EPI_ISL_462306	TRUE	Vietnam/VNHN_0299/2020	EPI_ISL_435308	TRUE
Canada/Qc-LSPQ-L00243328/2020	EPI_ISL_536358	TRUE	Guangdong/20SF014/2020	EPI_ISL_403934	TRUE	Luxembourg/LNS3212178/2020	EPI_ISL_429728	TRUE	Singapore/19/2020	EPI_ISL_419001	TRUE	Vietnam/VNHN_0300/2020	EPI_ISL_435310	TRUE
Canada/Qc-LSPQ-L00243673/2020	EPI_ISL_536369	TRUE	Guangdong/20SF025/2020	EPI_ISL_403935	TRUE	Luxembourg/LNS3437586/2020	EPI_ISL_429767	TRUE	Singapore/2/2020	EPI_ISL_407987	TRUE	Vietnam/VNHN_0418/2020	EPI_ISL_435311	TRUE
Canada/Qc-LSPQ-L00244008/2020	EPI_ISL_536387	TRUE	Guangdong/20SF028/2020	EPI_ISL_403936	TRUE	Luxembourg/LNS3588186/2020	EPI_ISL_419583	TRUE	Singapore/20/2020	EPI_ISL_418993	TRUE	Vietnam/VNHN_0419/2020	EPI_ISL_435312	TRUE
Chile/AN-23820/2020	EPI_ISL_1167779	TRUE	Guangdong/20SF040/2020	EPI_ISL_403937	TRUE	Luxembourg/LNS3694003/2020	EPI_ISL_417528	TRUE	Singapore/21/2020	EPI_ISL_419000	TRUE	Vietnam/VNHN_0554/2020	EPI_ISL_511892	TRUE
Chile/AR-265171/2020	EPI_ISL_1167830	FALSE	Guangdong/20SF1107/2020	EPI_ISL_428441	TRUE	Luxembourg/LNS3711853/2020	EPI_ISL_419584	TRUE	Singapore/22/2020	EPI_ISL_420099	TRUE	Vietnam/VNHN_0762/2020	EPI_ISL_435313	TRUE
Chile/AR-39887/2020	EPI_ISL_1167807	TRUE	Guangdong/20SF174/2020	EPI_ISL_406531	TRUE	Luxembourg/LNS3879580/2020	EPI_ISL_419585	TRUE	Singapore/220/2020	EPI_ISL_462338	TRUE	Vietnam/VNHN_0764/2020	EPI_ISL_435314	TRUE
Chile/AR-ISPCH-11/2020	EPI_ISL_445345	TRUE	Guangdong/20SF198/2020	EPI_ISL_428454	TRUE	Luxembourg/LNS4040746/2020	EPI_ISL_740405	TRUE	Singapore/223/2020	EPI_ISL_462341	TRUE	Vietnam/VNHN_0837/2020	EPI_ISL_435315	TRUE
Chile/AR-ISPCH-13/2020	EPI_ISL_445347	TRUE	Guangdong/20SF632/2020	EPI_ISL_428468	TRUE	Luxembourg/LNS4107430/2020	EPI_ISL_429772	TRUE	Singapore/224/2020	EPI_ISL_462342	TRUE	Vietnam/VNHN_0847/2020	EPI_ISL_511893	TRUE
Chile/AR-ISPCH-8/2020	EPI_ISL_445343	TRUE	Guangdong/20SF808/2020	EPI_ISL_428474	TRUE	Luxembourg/LNS4134806/2020	EPI_ISL_419586	TRUE	Singapore/228/2020	EPI_ISL_462346	TRUE	Vietnam/VNHN_0899/2020	EPI_ISL_511895	TRUE
Chile/BI-ISPCH-2-2/2020	EPI_ISL_445333	TRUE	Guangdong/GD2020080-P0010/2020	EPI_ISL_413861	TRUE	Luxembourg/LNS4245799/2020	EPI_ISL_429753	TRUE	Singapore/23/2020	EPI_ISL_420100	TRUE	Vietnam/VNHN_1098/2020	EPI_ISL_455694	TRUE
Chile/BI-ISPCH-2/2020	EPI_ISL_445331	TRUE	Guangdong/GD2020087-P0008/2020	EPI_ISL_413863	TRUE	Luxembourg/LNS4569788/2020	EPI_ISL_421752	TRUE	Singapore/232/2020	EPI_ISL_462350	TRUE	Vietnam/VNHN_1167/2020	EPI_ISL_455696	TRUE
Chile/LI-ISPCH-2/2020	EPI_ISL_445274	TRUE	Guangdong/GDFS2020052-P0025/2020	EPI_ISL_413875	TRUE	Luxembourg/LNS4691488/2020	EPI_ISL_419587	TRUE	Singapore/233/2020	EPI_ISL_462351	TRUE	Vietnam/VNHN_1492/2020	EPI_ISL_455699	TRUE
Chile/LL-ISPCH-2/2020	EPI_ISL_445334	TRUE	Guangdong/HKU-SZ-002/2020	EPI_ISL_406030	TRUE	Luxembourg/LNS4818581/2020	EPI_ISL_429786	TRUE	Singapore/24/2020	EPI_ISL_420101	TRUE	Vietnam/VNHN_1713/2020	EPI_ISL_455701	TRUE
Chile/MA-CADIUMAG-1/2020	EPI_ISL_681673	TRUE	Guangzhou/GZMU0030/2020	EPI_ISL_414686	TRUE	Luxembourg/LNS4830703/2020	EPI_ISL_429748	TRUE	Singapore/241/2020	EPI_ISL_462359	TRUE	Vietnam/VNHN_1863/2020	EPI_ISL_511897	TRUE
Chile/MA-CMM-31600/2020	EPI_ISL_459861	TRUE	Guangzhou/GZMU0037/2020	EPI_ISL_429089	TRUE	Luxembourg/LNS4836560/2020	EPI_ISL_419588	TRUE	Singapore/24nan/2020	EPI_ISL_482672	TRUE	Vietnam/VNHN_301/2020	EPI_ISL_455714	TRUE
Chile/MA-ISPCH-1/2020	EPI_ISL_445268	TRUE	Guangzhou/GZMU0041/2020	EPI_ISL_429091	TRUE	Luxembourg/LNS4845603/2020	EPI_ISL_419589	TRUE	Singapore/25/2020	EPI_ISL_420102	TRUE	Vietnam/VNHN_3085/2020	EPI_ISL_455703	TRUE
Chile/MA-ISPCH-11/2020	EPI_ISL_445292	TRUE	Guangzhou/GZMU0044/2020	EPI_ISL_414689	TRUE	Luxembourg/LNS4946091/2020	EPI_ISL_429756	TRUE	Singapore/255/2020	EPI_ISL_462373	TRUE	Vietnam/VNHN_3096/2020	EPI_ISL_455702	TRUE
Chile/MA-ISPCH-17/2020	EPI_ISL_445372	TRUE	Guangzhou/GZMU0048/2020	EPI_ISL_414691	TRUE	Luxembourg/LNS5358505/2020	EPI_ISL_429735	TRUE	Singapore/26/2020	EPI_ISL_420103	TRUE	Vietnam/VNHN_3629/2020	EPI_ISL_455706	TRUE
Chile/MA-ISPCH-2/2020	EPI_ISL_445269	TRUE	Guangzhou/GZMU0049/2020	EPI_ISL_429094	TRUE	Luxembourg/LNS5488745/2020	EPI_ISL_429738	TRUE	Singapore/268/2020	EPI_ISL_462386	TRUE	Vietnam/VNHN_3913/2020	EPI_ISL_455705	TRUE
Chile/ML-CMM-25343/2020	EPI_ISL_459863	TRUE	Guangzhou/GZMU0050/2020	EPI_ISL_429095	TRUE	Luxembourg/LNS5519604/2020	EPI_ISL_429711	TRUE	Singapore/27/2020	EPI_ISL_420104	TRUE	Vietnam/VNHN_3916/2020	EPI_ISL_455704	TRUE
Chile/ML-ISPCH-1/2020	EPI_ISL_414577	TRUE	Guangzhou/GZMU0051/2020	EPI_ISL_429096	TRUE	Luxembourg/LNS5549490/2020	EPI_ISL_429740	TRUE	Singapore/272/2020	EPI_ISL_462390	TRUE	Wales/PHW27/2020	EPI_ISL_415655	TRUE
Chile/ML-ISPCH-2/2020	EPI_ISL_414578	TRUE	Guangzhou/GZMU0074/2020	EPI_ISL_457687	TRUE	Luxembourg/LNS5611124/2020	EPI_ISL_429774	TRUE	Singapore/278nan/2020	EPI_ISL_477178	TRUE	Wales/PHWC-24F36/2020	EPI_ISL_420943	TRUE
Chile/Puerto_Montt-PUC_MVL_0065/2020	EPI_ISL_801651	TRUE	Guangzhou/GZMU0077/2020	EPI_ISL_457689	TRUE	Luxembourg/LNS5677421/2020	EPI_ISL_429784	TRUE	Singapore/28/2020	EPI_ISL_420105	TRUE	Wales/PHWC-2522D/2020	EPI_ISL_420949	TRUE
Chile/RM-22499/2020	EPI_ISL_1167821	TRUE	Guangzhou/GZMU0079/2020	EPI_ISL_457691	TRUE	Luxembourg/LNS6325758/2020	EPI_ISL_429743	TRUE	Singapore/29/2020	EPI_ISL_420106	TRUE	Wales/PHWC-26A9D/2020	EPI_ISL_422130	TRUE
Chile/RM-24451/2020	EPI_ISL_1167789	TRUE	Guangzhou/GZMU0081/2020	EPI_ISL_457692	TRUE	Luxembourg/LNS6479831/2020	EPI_ISL_429794	TRUE	Singapore/3/2020	EPI_ISL_407988	TRUE	Wales/PHWC-26F07/2020	EPI_ISL_422132	TRUE
Chile/RM-CMM-0000B/2020	EPI_ISL_629023	TRUE	Guangzhou/GZMU0092/2020	EPI_ISL_457694	TRUE	Luxembourg/LNS6533667/2020	EPI_ISL_429741	TRUE	Singapore/30/2020	EPI_ISL_420107	TRUE	Wales/PHWC-28433/2020	EPI_ISL_432387	TRUE
Chile/RM-CMM-25669/2020	EPI_ISL_459862	TRUE	Guangzhou/GZMU0095/2020	EPI_ISL_457695	TRUE	Luxembourg/LNS6603085/2020	EPI_ISL_419593	TRUE	Singapore/315/2020	EPI_ISL_462433	TRUE	Wuhan/0125-A142/2020	EPI_ISL_493150	TRUE
Chile/RM-CMM-27991/2020	EPI_ISL_459857	TRUE	Guangzhou/GZMU0101/2020	EPI_ISL_457697	TRUE	Luxembourg/LNS6783622/2020	EPI_ISL_429734	TRUE	Singapore/323nan/2020	EPI_ISL_538457	TRUE	Wuhan/0126-C77/2020	EPI_ISL_493178	TRUE
Chile/RM-CMM-29192/2020	EPI_ISL_459860	TRUE	Guangzhou/GZMU0117/2020	EPI_ISL_457698	TRUE	Luxembourg/LNS6897699/2020	EPI_ISL_421755	TRUE	Singapore/33/2020	EPI_ISL_420110	TRUE	Wuhan/HB-WH1-122/2020	EPI_ISL_454904	TRUE
Chile/RM-ISPCH-1/2020	EPI_ISL_414579	TRUE	Guangzhou/IQTC05/2020	EPI_ISL_444273	TRUE	Luxembourg/LNS7006156/2020	EPI_ISL_429757	TRUE	Singapore/348/2020	EPI_ISL_469103	TRUE	Wuhan/HB-WH1-123/2020	EPI_ISL_455363	TRUE
Chile/RM-ISPCH-11/2020	EPI_ISL_445254	TRUE	Guatemala/CDC-1227/2020	EPI_ISL_509695	TRUE	Luxembourg/LNS7032690/2020	EPI_ISL_429716	TRUE	Singapore/349/2020	EPI_ISL_469104	TRUE	Wuhan/HB-WH1-124/2020	EPI_ISL_454905	TRUE
Chile/RM-ISPCH-15/2020	EPI_ISL_445258	TRUE	Guatemala/CDC-1228/2020	EPI_ISL_509696	TRUE	Luxembourg/LNS7299024/2020	EPI_ISL_429775	TRUE	Singapore/34nan/2020	EPI_ISL_648062	TRUE	Wuhan/HB-WH1-125/2020	EPI_ISL_454906	TRUE
Chile/RM-ISPCH-17/2020	EPI_ISL_445260	TRUE	Guatemala/CDC-1229/2020	EPI_ISL_509710	TRUE	Luxembourg/LNS7580831/2020	EPI_ISL_429732	TRUE	Singapore/35/2020	EPI_ISL_422428	TRUE	Wuhan/HB-WH1-126/2020	EPI_ISL_454907	TRUE
Chile/RM-ISPCH-18/2020	EPI_ISL_445261	TRUE	Guatemala/CDC-1230/2020	EPI_ISL_509697	TRUE	Luxembourg/LNS7721101/2020	EPI_ISL_429769	TRUE	Singapore/351/2020	EPI_ISL_469106	TRUE	Wuhan/HB-WH1-127/2020	EPI_ISL_454908	TRUE
Chile/RM-ISPCH-2/2020	EPI_ISL_414580	TRUE	Guatemala/CDC-1231/2020	EPI_ISL_509698	TRUE	Luxembourg/LNS7866283/2020	EPI_ISL_419596	TRUE	Singapore/36/2020	EPI_ISL_422429	TRUE	Wuhan/HB-WH1-132/2020	EPI_ISL_455365	TRUE
Chile/RM-ISPCH-20/2020	EPI_ISL_445263	TRUE	Guatemala/CDC-1232/2020	EPI_ISL_509699	TRUE	Luxembourg/LNS7928872/2020	EPI_ISL_419597	TRUE	Singapore/366/2020	EPI_ISL_469121	TRUE	Wuhan/HB-WH1-133/2020	EPI_ISL_455366	TRUE
Chile/RM-ISPCH-25/2020	EPI_ISL_445304	TRUE	Guatemala/CDC-1233/2020	EPI_ISL_509700	TRUE	Luxembourg/LNS7970956/2020	EPI_ISL_421734	TRUE	Singapore/36nan/2020	EPI_ISL_538435	TRUE	Wuhan/HB-WH1-134/2020	EPI_ISL_454911	TRUE
Chile/RM-ISPCH-28/2020	EPI_ISL_445307	TRUE	Guatemala/CDC-1234/2020	EPI_ISL_509701	TRUE	Luxembourg/LNS8188502/2020	EPI_ISL_419598	TRUE	Singapore/37/2020	EPI_ISL_422430	TRUE	Wuhan/HB-WH1-140/2020	EPI_ISL_454916	TRUE
Chile/RM-ISPCH-3/2020	EPI_ISL_445245	TRUE	Guatemala/CDC-1235/2020	EPI_ISL_509702	TRUE	Luxembourg/LNS8602041/2020	EPI_ISL_421761	TRUE	Singapore/37nan/2020	EPI_ISL_648044	TRUE	Wuhan/HB-WH1-144/2020	EPI_ISL_455368	TRUE
Chile/RM-ISPCH-30/2020	EPI_ISL_445309	TRUE	Guatemala/CDC-1236/2020	EPI_ISL_509703	TRUE	Luxembourg/LNS8639502/2020	EPI_ISL_419599	TRUE	Singapore/38/2020	EPI_ISL_422431	TRUE	Wuhan/HB-WH2-145/2020	EPI_ISL_455369	TRUE
Chile/RM-ISPCH-33/2020	EPI_ISL_445312	TRUE	Hangzhou/HZ162/2020	EPI_ISL_418508	TRUE	Luxembourg/LNS8726389/2020	EPI_ISL_429776	TRUE	Singapore/383/2020	EPI_ISL_469132	TRUE	Wuhan/HB-WH2-149/2020	EPI_ISL_454921	TRUE
Chile/RM-ISPCH-36/2020	EPI_ISL_445315	TRUE	Hangzhou/HZCDC0025/2020	EPI_ISL_421234	TRUE	Luxembourg/LNS9080444/2020	EPI_ISL_419600	TRUE	Singapore/39/2020	EPI_ISL_422432	TRUE	Wuhan/HB-WH2-155/2020	EPI_ISL_454923	TRUE
Chile/RM-ISPCH-38/2020	EPI_ISL_445317	TRUE	Hangzhou/HZCDC0048/2020	EPI_ISL_421233	TRUE	Luxembourg/LNS9086704/2020	EPI_ISL_419601	TRUE	Singapore/3Clin/2020	EPI_ISL_418994	TRUE	Wuhan/HB-WH2-156/2020	EPI_ISL_454924	TRUE
Chile/RM-ISPCH-4/2020	EPI_ISL_445247	TRUE	Hangzhou/HZCDC6111/2020	EPI_ISL_482575	TRUE	Luxembourg/LNS9510711/2020	EPI_ISL_421762	TRUE	Singapore/40/2020	EPI_ISL_422433	TRUE	Wuhan/HB-WH2-159/2020	EPI_ISL_454927	TRUE
Chile/RM-ISPCH-60/2020	EPI_ISL_445356	TRUE	Hangzhou/HZCDC6228/2020	EPI_ISL_482577	TRUE	Luxembourg/LNS9627078/2020	EPI_ISL_419604	TRUE	Singapore/41/2020	EPI_ISL_422434	TRUE	Wuhan/HB-WH2-160/2020	EPI_ISL_454928	TRUE
Chile/RM-ISPCH-62/2020	EPI_ISL_445358	TRUE	Hangzhou/HZCDC6445/2020	EPI_ISL_482578	TRUE	Luxembourg/LNS9862689/2020	EPI_ISL_419606	TRUE	Singapore/42/2020	EPI_ISL_422435	TRUE	Wuhan/HB-WH2-163/2020	EPI_ISL_454930	TRUE
Chile/RM-ISPCH-64/2020	EPI_ISL_445360	TRUE	Hangzhou/HZCDC6706/2020	EPI_ISL_421222	TRUE	Luxembourg/LNS9923262/2020	EPI_ISL_745011	TRUE	Singapore/43/2020	EPI_ISL_428822	TRUE	Wuhan/HB-WH2-169/2020	EPI_ISL_454935	TRUE
Chile/RM-MSHS-op2d1/2020	EPI_ISL_415658	TRUE	Hangzhou/HZCDC6789/2020	EPI_ISL_421221	TRUE	Madagascar/VIRO-2722/2020	EPI_ISL_677635	TRUE	Singapore/437/2020	EPI_ISL_475968	TRUE	Wuhan/HB-WH3-172/2020	EPI_ISL_454938	TRUE
Chile/RM-MSHS-op3d1/2020	EPI_ISL_415660	TRUE	Hangzhou/HZCDC6948/2020	EPI_ISL_482579	TRUE	Madagascar/VIRO-2728/2020	EPI_ISL_677636	TRUE	Singapore/44/2020	EPI_ISL_428823	TRUE	Wuhan/HB-WH3-176/2020	EPI_ISL_454940	TRUE
Chile/RM-MSHS-op4d1/2020	EPI_ISL_415661	TRUE	Hangzhou/HZCDC7184F/2020	EPI_ISL_482583	TRUE	Malaysia/0121/2020	EPI_ISL_501176	TRUE	Singapore/466/2020	EPI_ISL_475997	TRUE	Wuhan/HB-WH3-177/2020	EPI_ISL_455377	TRUE
Chile/Santiago-PUC_MVL_0002/2020	EPI_ISL_801599	TRUE	Hangzhou/HZCDC7328/2020	EPI_ISL_482584	TRUE	Malaysia/0309/2020	EPI_ISL_501177	TRUE	Singapore/470/2020	EPI_ISL_477170	TRUE	Wuhan/HB-WH3-179/2020	EPI_ISL_454941	TRUE
Chile/Santiago-PUC_MVL_0010/2020	EPI_ISL_801602	TRUE	Hangzhou/HZCDC7363/2020	EPI_ISL_482585	TRUE	Malaysia/0478/2020	EPI_ISL_501178	TRUE	Singapore/478/2020	EPI_ISL_476814	TRUE	Wuhan/HB-WH3-180/2020	EPI_ISL_455379	TRUE
Chile/Santiago-PUC_MVL_0013/2020	EPI_ISL_801604	TRUE	Hangzhou/HZCDC7378/2020	EPI_ISL_482586	TRUE	Malaysia/0784/2020	EPI_ISL_501179	TRUE	Singapore/480/2020	EPI_ISL_492978	TRUE	Wuhan/HB-WH3-183/2020	EPI_ISL_454944	TRUE
Chile/Santiago-PUC_MVL_0027/2020	EPI_ISL_801618	TRUE	Hangzhou/HZCDCp145/2020	EPI_ISL_482582	TRUE	Malaysia/0931/2020	EPI_ISL_501180	TRUE	Singapore/49/2020	EPI_ISL_428828	TRUE	Wuhan/HB-WH3-186/2020	EPI_ISL_455381	TRUE
Chile/Santiago-PUC_MVL_0030/2020	EPI_ISL_801621	TRUE	Hangzhou/ZJU-011/2020	EPI_ISL_418991	TRUE	Malaysia/0956/2020	EPI_ISL_501181	TRUE	Singapore/5/2020	EPI_ISL_410536	TRUE	Wuhan/HB-WH3-187/2020	EPI_ISL_455382	TRUE
Chile/Santiago-PUC_MVL_0032/2020	EPI_ISL_801623	TRUE	Harbin/HRB-25/2020	EPI_ISL_467430	TRUE	Malaysia/1121/2020	EPI_ISL_501182	TRUE	Singapore/50/2020	EPI_ISL_428829	TRUE	Wuhan/HB-WH3-188/2020	EPI_ISL_455383	TRUE
Chile/Santiago-PUC_MVL_0034/2020	EPI_ISL_801625	TRUE	Harbin/HRB-26/2020	EPI_ISL_459909	TRUE	Malaysia/1204/2020	EPI_ISL_501183	TRUE	Singapore/50nan/2020	EPI_ISL_538446	TRUE	Wuhan/HB-WH3-189/2020	EPI_ISL_454946	TRUE
Chile/Santiago-PUC_MVL_0039/2020	EPI_ISL_801630	TRUE	Hefei/2/2020	EPI_ISL_412026	TRUE	Malaysia/1399/2020	EPI_ISL_501184	TRUE	Singapore/51/2020	EPI_ISL_428830	TRUE	Wuhan/HB-WH3-190/2020	EPI_ISL_455384	TRUE
Chile/Santiago-PUC_MVL_0040/2020	EPI_ISL_801631	TRUE	Henan/HN01/2020	EPI_ISL_605929	TRUE	Malaysia/1497/2020	EPI_ISL_501185	TRUE	Singapore/52/2020	EPI_ISL_428831	TRUE	Wuhan/HB-WH3-191/2020	EPI_ISL_454947	TRUE
Chile/Santiago-PUC_MVL_0043/2020	EPI_ISL_801633	TRUE	Henan/HN03/2020	EPI_ISL_450442	TRUE	Malaysia/1713/2020	EPI_ISL_501186	TRUE	Singapore/594/2020	EPI_ISL_483617	TRUE	Wuhan/HB-WH4-194/2020	EPI_ISL_454948	TRUE
Chile/Santiago-PUC_MVL_0045/2020	EPI_ISL_801635	TRUE	Henan/HN04/2020	EPI_ISL_605930	TRUE	Malaysia/1798/2020	EPI_ISL_501187	TRUE	Singapore/598/2020	EPI_ISL_483621	TRUE	Wuhan/HB-WH4-197/2020	EPI_ISL_454951	TRUE
Chile/Santiago-PUC_MVL_0047/2020	EPI_ISL_801637	TRUE	Henan/fahzu0010/2020	EPI_ISL_1040034	TRUE	Malaysia/188407/2020	EPI_ISL_417918	TRUE	Singapore/6/2020	EPI_ISL_410537	TRUE	Wuhan/HB-WH4-200/2020	EPI_ISL_454952	TRUE
Chile/Santiago-PUC_MVL_0048/2020	EPI_ISL_801638	TRUE	Henan/fahzu0012/2020	EPI_ISL_1040036	TRUE	Malaysia/189332/2020	EPI_ISL_417917	TRUE	Singapore/608/2020	EPI_ISL_490058	TRUE	Wuhan/HB-WH4-202/2020	EPI_ISL_455388	TRUE
Chile/Santiago-PUC_MVL_0051/2020	EPI_ISL_801641	TRUE	Henan/fahzu0019/2020	EPI_ISL_1040040	TRUE	Malaysia/2063/2020	EPI_ISL_501188	TRUE	Singapore/630/2020	EPI_ISL_493390	TRUE	Wuhan/HB-WH4-204/2020	EPI_ISL_454954	TRUE
Chile/Santiago-PUC_MVL_0053/2020	EPI_ISL_801643	TRUE	Henan/fahzu0020/2020	EPI_ISL_1040041	TRUE	Malaysia/2065/2020	EPI_ISL_501189	TRUE	Singapore/654/2020	EPI_ISL_493414	TRUE	Wuhan/HB-WH4-205/2020	EPI_ISL_454955	TRUE
Chile/Santiago-PUC_MVL_0055/2020	EPI_ISL_801644	TRUE	Henan/fahzu0021/2020	EPI_ISL_1040042	TRUE	Malaysia/2079/2020	EPI_ISL_501190	TRUE	Singapore/661/2020	EPI_ISL_493421	TRUE	Wuhan/HB-WH4-206/2020	EPI_ISL_454956	TRUE
Chile/Santiago-PUC_MVL_0066/2020	EPI_ISL_801652	TRUE	Henan/fahzu0022/2020	EPI_ISL_1040043	TRUE	Malaysia/2297/2020	EPI_ISL_501193	TRUE	Singapore/6nan/2020	EPI_ISL_482680	TRUE	Wuhan/HB-WH4-207/2020	EPI_ISL_455389	TRUE
Chile/Santiago-PUC_MVL_0074/2020	EPI_ISL_801658	TRUE	Henan/fahzu0032/2020	EPI_ISL_1040045	TRUE	Malaysia/2363/2020	EPI_ISL_501194	TRUE	Singapore/7/2020	EPI_ISL_410713	TRUE	Wuhan/HB-WH4-208/2020	EPI_ISL_454957	TRUE
Chile/Santiago-PUC_MVL_0075/2020	EPI_ISL_801659	TRUE	Henan/fahzu0033/2020	EPI_ISL_1040046	TRUE	Malaysia/2735/2020	EPI_ISL_501195	TRUE	Singapore/758/2020	EPI_ISL_507003	TRUE	Wuhan/HB-WH4-211/2020	EPI_ISL_454960	TRUE
Chile/Santiago-PUC_MVL_0076/2020	EPI_ISL_801660	TRUE	Henan/fahzu0034/2020	EPI_ISL_1040047	TRUE	Malaysia/2811/2020	EPI_ISL_501196	TRUE	Singapore/8/2020	EPI_ISL_410714	TRUE	Wuhan/HB-WH4-212/2020	EPI_ISL_454961	TRUE
Chile/Santiago-PUC_MVL_0077/2020	EPI_ISL_801661	TRUE	HongKong/CUHK1/2020	EPI_ISL_416314	TRUE	Malaysia/2813/2020	EPI_ISL_501197	TRUE	Singapore/894/2020	EPI_ISL_536435	TRUE	Wuhan/HB-WH4-213/2020	EPI_ISL_454962	TRUE
Chile/Santiago-PUC_MVL_0078/2020	EPI_ISL_801662	TRUE	HongKong/HKPU-00237/2020	EPI_ISL_1289435	TRUE	Malaysia/2875/2020	EPI_ISL_501198	TRUE	Singapore/895/2020	EPI_ISL_536436	TRUE	Wuhan/HB-WH5-218/2020	EPI_ISL_455390	TRUE
Chile/Santiago-PUC_MVL_0079/2020	EPI_ISL_801663	TRUE	HongKong/HKPU-00248/2020	EPI_ISL_1289436	TRUE	Malaysia/3012/2020	EPI_ISL_501199	TRUE	Singapore/898/2020	EPI_ISL_536439	TRUE	Wuhan/HB-WH5-220/2020	EPI_ISL_454965	TRUE
Chile/Santiago-PUC_MVL_0080/2020	EPI_ISL_801664	TRUE	HongKong/HKPU-00422/2020	EPI_ISL_1289438	TRUE	Malaysia/3133/2020	EPI_ISL_501201	TRUE	Singapore/9/2020	EPI_ISL_410715	TRUE	Wuhan/HB-WH5-222/2020	EPI_ISL_454967	TRUE
Chile/Santiago-PUC_MVL_0081/2020	EPI_ISL_801665	TRUE	HongKong/HKPU-00442/2020	EPI_ISL_1289440	TRUE	Malaysia/3145/2020	EPI_ISL_501202	TRUE	Singapore/900/2020	EPI_ISL_536441	TRUE	Wuhan/HB-WH5-223/2020	EPI_ISL_454968	TRUE
Chile/Santiago-PUC_MVL_0082/2020	EPI_ISL_801666	TRUE	HongKong/HKPU-00477/2020	EPI_ISL_1289441	TRUE	Malaysia/3321/2020	EPI_ISL_501203	TRUE	Singapore/906/2020	EPI_ISL_536447	TRUE	Wuhan/HB-WH5-224/2020	EPI_ISL_454969	TRUE
Chile/Santiago-PUC_MVL_0083/2020	EPI_ISL_801667	TRUE	HongKong/HKPU-00481/2020	EPI_ISL_1289442	TRUE	Malaysia/3479/2020	EPI_ISL_501204	TRUE	Singapore/913/2020	EPI_ISL_538436	TRUE	Wuhan/HB-WH5-227/2020	EPI_ISL_454972	TRUE
Chile/Santiago-PUC_MVL_0084/2020	EPI_ISL_801668	TRUE	HongKong/HKPU-00501/2020	EPI_ISL_1289443	TRUE	Malaysia/3499/2020	EPI_ISL_501205	TRUE	Singapore/919/2020	EPI_ISL_538450	TRUE	Wuhan/HB-WH5-230/2020	EPI_ISL_455392	TRUE
Chile/Santiago-PUC_MVL_0085/2020	EPI_ISL_801669	TRUE	HongKong/HKPU-00613/2020	EPI_ISL_1289444	TRUE	Malaysia/3605/2020	EPI_ISL_501206	TRUE	Singapore/925/2020	EPI_ISL_538456	TRUE	Wuhan/HB-WH5-232/2020	EPI_ISL_454975	TRUE
Chile/Santiago-PUC_MVL_0086/2020	EPI_ISL_801670	TRUE	HongKong/HKPU-00615/2020	EPI_ISL_1289445	TRUE	Malaysia/3611/2020	EPI_ISL_501207	TRUE	Singapore/926/2020	EPI_ISL_538458	TRUE	Wuhan/HB-WH5-233/2020	EPI_ISL_454976	TRUE
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Chile/Santiago-PUC_MVL_0092/2020	EPI_ISL_801674	TRUE	HongKong/HKPU-0422/2020	EPI_ISL_610173	TRUE	Malaysia/3706/2020	EPI_ISL_501209	TRUE	Singapore/933/2020	EPI_ISL_538465	TRUE	Wuhan/HB-WH5-237/2020	EPI_ISL_454978	TRUE
Chile/Santiago-PUC_MVL_0094/2020	EPI_ISL_801675	TRUE	HongKong/HKPU-0440/2020	EPI_ISL_610171	TRUE	Malaysia/6359/2020	EPI_ISL_501220	TRUE	Singapore/934/2020	EPI_ISL_538466	TRUE	Wuhan/HB-WH6-241/2020	EPI_ISL_455395	TRUE
Chile/Santiago-PUC_MVL_0095/2020	EPI_ISL_801676	TRUE	HongKong/HKPU-0442/2020	EPI_ISL_610175	TRUE	Malaysia/7618/2020	EPI_ISL_501221	TRUE	Singapore/967/2020	EPI_ISL_1315626	TRUE	Wuhan/HB-WH6-242/2020	EPI_ISL_454982	TRUE
Chile/Santiago-PUC_MVL_0096/2020	EPI_ISL_801677	TRUE	HongKong/HKPU-0481/2020	EPI_ISL_610168	TRUE	Malaysia/8454/2020	EPI_ISL_501223	TRUE	Singapore/976/2020	EPI_ISL_548984	TRUE	Wuhan/HB-WH6-245/2020	EPI_ISL_455398	TRUE
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Denmark/ALAB-SSI-607/2020	EPI_ISL_436990	TRUE	India/MH-NIV-4369/2020	EPI_ISL_454531	TRUE	NewZealand/20VR1861/2020	EPI_ISL_579154	TRUE	Spain/AS-IBV-98006829/2020	EPI_ISL_654663	TRUE	GA-EHC-018R	GA-EHC-018R	TRUE			
Denmark/ALAB-SSI-608/2020	EPI_ISL_436991	TRUE	India/MH-NIV-5102/2020	EPI_ISL_454536	TRUE	NewZealand/20VR1862/2020	EPI_ISL_456288	TRUE	Spain/CE-ISCII-205115/2020	EPI_ISL_662657	TRUE	GA-EHC-023W	GA-EHC-023W	TRUE			
Denmark/ALAB-SSI-619/2020	EPI_ISL_437000	TRUE	India/MH-NIV-5315/2020	EPI_ISL_454542	TRUE	NewZealand/20VR1863/2020	EPI_ISL_456289	TRUE	Spain/CL-IBV-97006140/2020	EPI_ISL_537288	TRUE	GA-EHC-030D	GA-EHC-030D	TRUE			
Denmark/ALAB-SSI-640/2020	EPI_ISL_437014	TRUE	India/MH-NIV-9813/2020	EPI_ISL_452213	TRUE	NewZealand/20VR1864/2020	EPI_ISL_456290	TRUE	Spain/CL-IBV-97006141/2020	EPI_ISL_537289	TRUE	GA-EHC-031E	GA-EHC-031E	TRUE			
Denmark/ALAB-SSI-650/2020	EPI_ISL_437027	TRUE	India/OR-NCDC-02336/2020	EPI_ISL_435089	TRUE	NewZealand/20VR1867/2020	EPI_ISL_456292	TRUE	Spain/CL-ISCII-201323/2020	EPI_ISL_418248	TRUE	GA-EHC-032F	GA-EHC-032F	TRUE			
Denmark/ALAB-SSI-670/2020	EPI_ISL_437030	TRUE	India/OR-RMRC2/2020	EPI_ISL_455771	TRUE	NewZealand/20VR1868/2020	EPI_ISL_579155	TRUE	Spain/CM-ISCII-201328/2020	EPI_ISL_418245	TRUE	GA-EHC-033G	GA-EHC-033G	TRUE			
Denmark/ALAB-SSI-719/2020	EPI_ISL_444872	TRUE	India/Punjab-ICMR-40/2020	EPI_ISL_1063403	TRUE	NewZealand/20VR1885/2020	EPI_ISL_579156	TRUE	Spain/CN-IBV-002594/2020	EPI_ISL_474491	TRUE	GA-EHC-034H	GA-EHC-034H	TRUE			
Denmark/ALAB-SSI-731/2020	EPI_ISL_444880	TRUE	India/TG-CCMB-2009/2020	EPI_ISL_447557	TRUE	NewZealand/20VR1916/2020	EPI_ISL_579163	TRUE	Spain/CN-IBV-97006489/2020	EPI_ISL_537703	TRUE	GA-EHC-035I	GA-EHC-035I	TRUE			
Denmark/ALAB-SSI-767/2020	EPI_ISL_444895	TRUE	India/TG-CCMB-2014/2020	EPI_ISL_447558	TRUE	NewZealand/20VR1949/2020	EPI_ISL_456319	TRUE	Spain/CN-IBV-97006507/2020	EPI_ISL_537715	TRUE	GA-EHC-036J	GA-EHC-036J	TRUE			
Denmark/ALAB-SSI-799/2020	EPI_ISL_444912	TRUE	India/TG-CCMB-2045/2020	EPI_ISL_447947	TRUE	NewZealand/20VR1985/2020	EPI_ISL_456322	TRUE	Spain/CN-ISCII-201048/2020	EPI_ISL_539531	TRUE	GA-EHC-037K	GA-EHC-037K	TRUE			
Denmark/ALAB-SSI-805/2020	EPI_ISL_444916	TRUE	India/TG-CCMB-2047/2020	EPI_ISL_447862	TRUE	NewZealand/20VR2065/2020	EPI_ISL_579405	TRUE	Spain/CT-HUVH-54120/2020	EPI_ISL_819300	TRUE	GA-EHC-038L	GA-EHC-038L	TRUE			
Denmark/ALAB-SSI-849/2020	EPI_ISL_444940	TRUE	India/TG-CCMB-2057/2020	EPI_ISL_447563	TRUE	NewZealand/20VR3996/2020	EPI_ISL_579418	TRUE	Spain/CT-HUVH-14643/2020	EPI_ISL_819306	TRUE	GA-EHC-040N	GA-EHC-040N	TRUE			
Denmark/ALAB-SSI-857/2020	EPI_ISL_444949	TRUE	India/TG-CCMB-2067/2020	EPI_ISL_447561	TRUE	NewZealand/20VR3135/2020	EPI_ISL_579427	TRUE	Spain/CT-HUVH-22661/2020	EPI_ISL_819313	TRUE	GA-EHC-041O	GA-EHC-041O	TRUE			
Denmark/ALAB-SSI-890/2020	EPI_ISL_444958	TRUE	India/TG-CCMB-2088/2020	EPI_ISL_447562	TRUE	NewZealand/20VR3140/2020	EPI_ISL_579432	TRUE	Spain/CT-HUVH-23216/2020	EPI_ISL_819315	TRUE	GA-EHC-042P	GA-EHC-042P	TRUE			
Denmark/ALAB-SSI-933/2020	EPI_ISL_429335	TRUE	India/TG-GMC-RN443/2020	EPI_ISL_431103	TRUE	NewZealand/20VR3142/2020	EPI_ISL_579434	TRUE	Spain/CT-HUVH-57894/2020	EPI_ISL_819314	TRUE	GA-EHC-043Q	GA-EHC-043Q	TRUE			
Denmark/ALAB-SSI-937/2020	EPI_ISL_429339	TRUE	India/TG-GMC-RK100/2020	EPI_ISL_431101	TRUE	NewZealand/20VR3171/2020	EPI_ISL_579461	TRUE	Spain/CT-HUVH-58300/2020	EPI_ISL_819316	TRUE	GA-EHC-044R	GA-EHC-044R	TRUE			
Denmark/ALAB-SSI-1119/2020	EPI_ISL_429348	TRUE	India/TG-GMC-RK1080/2020	EPI_ISL_438139	TRUE	NewZealand/20VR3179/2020	EPI_ISL_579468	TRUE	Spain/CT-IBV-003150/2020	EPI_ISL_510247	TRUE	GA-EHC-046V	GA-EHC-046V	TRUE			
Denmark/ALAB-SSI-1121/2020	EPI_ISL_429350	TRUE	India/TN-NCDC-02245/2020	EPI_ISL_435091	TRUE	NewZealand/20VR3182/2020	EPI_ISL_579470	TRUE	Spain/CT-IBV-003161/2020	EPI_ISL_510257	TRUE	GA-EHC-046W	GA-EHC-046W	TRUE			
Denmark/ALAB-SSI-1236/2020	EPI_ISL_429354	TRUE	India/TN-NCDC-02309/2020	EPI_ISL_435094	TRUE	NewZealand/20VR3187/2020	EPI_ISL_579476	TRUE	Spain/CT-IBV-003727/2020	EPI_ISL_480981	TRUE	GA-EHC-050X	GA-EHC-050X	TRUE			
Denmark/ALAB-SSI-1239/2020	EPI_ISL_429356	TRUE	India/TN-NCDC-02311/2020	EPI_ISL_435078	TRUE	NewZealand/20VR3197/2020	EPI_ISL_579483	TRUE	Spain/CT-ISCBI-202024697/2020	EPI_ISL_662631	TRUE	GA-EHC-051Y	GA-EHC-051Y	TRUE			
Denmark/ALAB-SSI-1321/2020	EPI_ISL_429357	TRUE	India/TN-NCDC-02312/2020	EPI_ISL_435093	TRUE	NewZealand/20VR3200/2020	EPI_ISL_579485	TRUE	Spain/CT-ISCII-202050/2020	EPI_ISL_539551	TRUE	GA-EHC-052Z	GA-EHC-052Z	TRUE			
Denmark/ALAB-SSI-2036/2020	EPI_ISL_429405	TRUE	India/TN-NCDC-02332/2020	EPI_ISL_435098	TRUE	NewZealand/20VR3202/2020	EPI_ISL_579487	TRUE	Spain/EX-IBV-005011/2020	EPI_ISL_510320	TRUE	GA-EHC-053A	GA-EHC-053A	TRUE			
Denmark/ALAB-SSI29/2020	EPI_ISL_429447	TRUE	India/TN-NCDC-02334/2020	EPI_ISL_435080	TRUE	NewZealand/20VR3203/2020	EPI_ISL_579488	TRUE	Spain/EX-ISCII-201239/2020	EPI_ISL_539557	TRUE	GA-EHC-054B	GA-EHC-054B	TRUE			
Denmark/ALAB-SSI298/2020	EPI_ISL_429449	TRUE	India/UN-7772/2020	EPI_ISL_420551	TRUE	NewZealand/CoV001/2020	EPI_ISL_417211	TRUE	Spain/EX-ISCII-201247/2020	EPI_ISL_662654	TRUE	GA-EHC-055C	GA-EHC-055C	TRUE			
Denmark/ALAB-SSI358/2020	EPI_ISL_429469	TRUE	India/UN-c31/2020	EPI_ISL_426179	TRUE	NewZealand/CoV002/2020	EPI_ISL_417212	TRUE	Spain/EX-ISCII-201248/2020	EPI_ISL_539558	TRUE	GA-EHC-060H	GA-EHC-060H	TRUE			
Denmark/ALAB-SSI364/2020	EPI_ISL_429472	TRUE	India/UN-c32/2020	EPI_ISL_426565	TRUE	Nigeria/ED01-CV155/2020	EPI_ISL_527873	TRUE	Spain/EX-ISCII-201258/2020	EPI_ISL_671974	TRUE	GA-EHC-064L	GA-EHC-064L	TRUE			
Denmark/ALAB-SSI376/2020	EPI_ISL_429481	TRUE	India/UP-NIBRI-N17-TCP057/2020	EPI_ISL_516946	TRUE	Nigeria/ED02-CV156/2020	EPI_ISL_527874	TRUE	Spain/EX-ISCII-201654/2020	EPI_ISL_539559	TRUE	GA-EHC-069Q	GA-EHC-069Q	TRUE			
Denmark/ALAB-SSI384/2020	EPI_ISL_429484	TRUE	India/UP-NIBRI-N19-TCP645/2020	EPI_ISL_516948	TRUE	Nigeria/ED04-CV158/2020	EPI_ISL_527876	TRUE	Spain/GA-IBV-94051/2020	EPI_ISL_510290	TRUE	GA-EHC-080B	GA-EHC-080B	TRUE			
Denmark/ALAB-SSI405/2020	EPI_ISL_429499	TRUE	India/UP-NCDC-01257/2020	EPI_ISL_435060	TRUE	Nigeria/ED07-CV160/2020	EPI_ISL_527878	TRUE	Spain/IB-IBV-2496/2020	EPI_ISL_469989	TRUE	GA-EHC-083E	GA-EHC-083E	TRUE			
Denmark/ALAB-SSI471/2020	EPI_ISL_429551	TRUE	India/UP-NCDC-02321/2020	EPI_ISL_435100	TRUE	Nigeria/ED18-CV161/2020	EPI_ISL_527880	TRUE	Spain/IB-IBV-2511/2020	EPI_ISL_469013	TRUE	GA-EHC-088H	GA-EHC-088H	TRUE			
Denmark/ALAB-SSI472/2020	EPI_ISL_429552	TRUE	India/UP-NCDC-2443/2020	EPI_ISL_436413	TRUE	Nigeria/ED20-CV162/2020	EPI_ISL_527881	TRUE	Spain/IB-IBV-2525/2020	EPI_ISL_469014	TRUE	GA-EHC-097S	GA-EHC-097S	TRUE			
Denmark/ALAB-SSI477/2020	EPI_ISL_429556	TRUE	India/WB-IK2/2020	EPI_ISL_508349	TRUE	Nigeria/NG0783/2020	EPI_ISL_654794	TRUE	Spain/IB-IBV-2526/2020	EPI_ISL_469012	TRUE	GA-EHC-108D	GA-EHC-108D	TRUE			
Denmark/ALAB-SSI479/2020	EPI_ISL_429558	TRUE	India/WB-IK3/2020	EPI_ISL_511900	TRUE	Nigeria/OG007-CV22/2020	EPI_ISL_455412	TRUE	Spain/MD-H12-322/2020	EPI_ISL_426895	TRUE	GA-EHC-109E	GA-EHC-109E	TRUE			
Denmark/DCGC-1045/2020	EPI_ISL_614676	TRUE	India/WB-IK4/2020	EPI_ISL_508368	TRUE	Nigeria/OS016-CV3/2020	EPI_ISL_455413	TRUE	Spain/MD-H12-362/2020	EPI_ISL_426899	TRUE	GA-EHC-110F	GA-EHC-110F	TRUE			
Denmark/DCGC-1047/2020	EPI_ISL_614678	TRUE	India/WB-NCDC-2922/2020	EPI_ISL_436414	TRUE	Nigeria/OS060-CV9/2020	EPI_ISL_455419	TRUE	Spain/MD-H12-3708/2020	EPI_ISL_426707	TRUE	GA-EHC-111G	GA-EHC-111G	TRUE			
Denmark/DCGC-1048/2020	EPI_ISL_614679	TRUE	India/WB-S2/2020	EPI_ISL_430468	TRUE	Nigeria/OS070-CV11/2020	EPI_ISL_455422	TRUE	Spain/MD-H12-49/2020	EPI_ISL_529982	TRUE	GA-EHC-112H	GA-EHC-112H	TRUE			
												GA-EHC-113J	GA-EHC-113J	TRUE			
												GA-EHC-114K	GA-EHC-114K	TRUE			
												GA-EHC-115L	GA-EHC-115L	TRUE			
												GA-EHC-117N	GA-EHC-117N	TRUE			
												GA-EHC-118O	GA-EHC-118O	TRUE			
												GA-EHC-119P	GA-EHC-119P	TRUE			
												GA-EHC-121R	GA-EHC-121R	TRUE			
												GA-EHC-022V	GA-EHC-022V	TRUE			
												GA-EHC-047U	GA-EHC-047U	TRUE			

Supplementary Tables

Supplementary Table 1: Detailed SARS-CoV-2 sequencing metrics. A total of 54 samples were sequenced using a metagenomic next-generation sequencing (mNGS) approach (from from 50 patients). A total of 10 samples were sequenced using a SARS-CoV-2 multiplex amplicon approach, including 5 samples with low coverage by mNGS and an additional 5 samples that were not attempted by mNGS. Abbreviations: BAL: bronchoalveolar lavage, Ct: cycle threshold, sgRNA: subgenomic RNA, mNGS: metagenomic next-generation sequencing, NP: nasopharyngeal, OP: oropharyngeal

Supplementary Table 2: Detailed clinical data for 54 EHC patients with SARS-CoV-2 infection in March 2020. Abbreviations: BAL: bronchoalveolar lavage, BMI: body mass index, CKD: chronic kidney disease, Ct: cycle threshold, DM: diabetes mellitus, ED: emergency department, ESLD: end-stage liver disease, ESRD: end-stage renal disease, F: female, HIV: human immunodeficiency virus, HTN: hypertension, ICU: intensive care unit, IgG: immunoglobulin G, M: male, N/A: not applicable, NP: nasopharyngeal, OP: oropharyngeal, SLE: systemic lupus erythematosus.

Supplementary Table 3: GISAID acknowledgements table for all sequences used in travel and phylogenetic analyses. We gratefully acknowledge all Authors from the Originating laboratories responsible for obtaining the specimens, as well as the submitting laboratories where the genome data were generated and shared via GISAID, on which this research is based. All Submitters of data may be contacted directly via GISAID.

Supplementary Table 4: County data for non-EHC sequences. Sequence data and additional metadata for included sequences can be accessed via www.gisaid.org.

Supplementary Table 5: Sequence names and accession numbers for sequences included in the weighted downsampling maximum likelihood analysis presented in **Figure 2, Supplementary Figure 4, and Supplementary Figure 5.** Sequence data and additional metadata for included sequences can be accessed via www.gisaid.org.

Supplementary Table 6: Sequence names and accession numbers for sequences included in the Bayesian phylogenetic analysis including select 19B sequences presented in **Figure 3**, **Supplementary Figure 7, Supplementary Figure 8**, **Supplementary Figure 9,** and **Supplementary Table 7**. Sequence data and additional metadata for included sequences can be accessed via www.gisaid.org.

Supplementary Table 7: Select parameter prior and posterior estimates from the Bayesian phylogenetic analysis including select-19B sequences presented in **Figure 3**, **Supplementary Figure 7**, and **Supplementary Figure 8**.

Supplementary Table 8: Travel data and mutational profile for 9 patients who had traveled in the 2 weeks preceding symptom onset. For each patient, the SARS-CoV-2 sequence was compared to other sequences in its ancestral lineage that had been obtained from the region of travel, the state of Georgia, and globally. Columns indicate the minimum number of SNPs between the traveler sequence and any sequence in its lineage, the number of sequences in the lineage that contained the minimum number of SNPs, and the total number of sequences available from the region. For sequences that are not identical, ancestral means the sequence(s) contain all mutations of the traveler sequence except one while child indicates the

sequence(s) contain all mutations of the traveler sequence plus one additional. Abbreviations: SNP: single nucleotide polymorphism

Supplementary Table 9: Sequence names and accession numbers for sequences which match the mutational profile of the 69 closely related 19B Georgia sequences presented in Figure 5. Sequence data and additional metadata for included sequences can be accessed via www.gisaid.org.

Supplementary Table 10: Sequence names and accession numbers for sequences included in the temporally homogeneous downsampling maximum likelihood analysis presented in Supplementary Figure 6 and Supplementary Figure 14. Sequence data and additional metadata for included sequences can be accessed via www.gisaid.org.

Main Figure Alt Text (for screen readers)

Figure 1

Multi-panel figure with two rows. First row contains a single figure, labelled A, and the second row contains two figures, B and C.

The top panel, A, shows both the number of reported cases in Georgia in red, and the number of sequences included in the analysis shown in green. Data is shown between 29 February 2020 and 31 March, 2020. A vertical dotted line is shown at 15 March 2020, the date on which the FDA allowed certified labs to validate tests for SARS-CoV-2.

The number of reported cases in Georgia are as follows: 03 March 2020: 2, 06 March 2020: 1, 07 March 2020: 2, 09 March 2020: 5, 10 March 2020: 7, 11 March 2020: 6, 12 March 2020: 8, 13 March 2020: 11, 14 March 2020: 31, 15 march 2020: 26, 16 March 2020: 22, 17 March 2020: 25, 18 March 2020: 51, 19 March 2020: 90, 20 March 2020: 198, 21 March 2020: 70, 22 March 2020: 66, 23 March 2020: 151, 24 march 2020: 254, 25 Mach 2020: 221, 26 March 2020: 278, 27 March 2020: 475, 28 March 2020: 366, 29 March 2020 285, 30 March 2020: 157, 31 March 2020: 1121.

The number of included sequences sampled in Georgia are as follows: 29 February2020: 2, 3 March 2020: 3, 4 March 2020: 3, 5 March 2020: 1, 6 March 2020: 1, 7 March 2020: 2, 8 March 2020: 1, 9 March 2020: 1, 10 March 2020: 3, 11 March 2020: 3, 12 March 2020: 2, 13 March 2020: 13, 14 March 2020: 9, 15 March 2020: 15, 16 March 2020: 20, 17 March 2020: 6, 18 March 2020: 6, 20 March 2020: 1, 21 March 2020: 1, 22 March 2020: 2, 27 March 2020: 1, 30 March 2020: 12.

The bottom left panel, B, shows a map of Georgia and counties are shaded by the cumulative number of reported cases as of 31 March 2020. The top 10 counties with the most cases are as follows: Fulton: 3409, Dougherty: 1980, Dekalb: 1949, Cobb: 1794, Bartow: 1137, Gwinnett: 1090, Carroll: 548, Cherokee: 514, Clayton: 480, Lee: 396. A total of 1582 cases were reported without county data.

The bottom right panel, C, shows a map of Georgia and counties are shaded by the cumulative number of sampled sequences as of 31 March 2020. County level data is missing for 52 sequences. Amongst those with county-level data, 23 are from Fulton County, 14 from Dekalb, 8 from Gwinnett, 4 from Cobb, 2 from Fayette, 1 from Union, 1 from Polk, 1 from Henry, 1 from Forsyth, and 1 from Cherokee.

Figure 2

Multi-panel figure with three vertically stacked panels. The x-axis for panels A, B, and C is time.

The top panel, A, shows the number of Georgia sequences per-clade per-week. Weeks are assumed to start on Monday. In the week ending 2020-03-01 there are two sequences in

clade 20B and no sequences in other clades. In the second week, ending 2020-03-08 there are seven sequences in clade 19B, four sequences in clade 20B, and no sequences in other clades. In the week ending 2020-03-15 there are 39 sequences in clade 19B, one sequence in clade 20A, one sequence in 20B, and 5 sequences in 20C. In the week ending 2020-03-22 there are 26 sequences in 19B, five sequences in 20A, one sequence in 20B, and four sequences in 20C. In the week ending 2020-03-29 there is one sequence in clade 19B and no sequences in other clades. Finally, in the week ending 2020-04-05 there are four sequences in clade 19B, one in 20A, and seven sequences in clade 20C.

The middle panel, B, shows a maximum-likelihood time aligned phylogenetic tree of 4611 globally sampled sequences which includes 107 sequences from the state of Georgia. Branches are colored based on maximum-likelihood ancestral state reconstruction (inside/outside of Georgia). Georgia tips are colored based on whether they are sampled from an individual with known travel history. Sequences are labelled by clade in a heatmap to the right. Of the 107 Georgia sequences, 69 (including one traveler) are in a single subclade of clade 19B which appears to have been introduced in mid-late February 2020 based on the ancestral state reconstruction. Seven Georgia sequences, including one traveler, are in another subclade of 19B. There are seven Georgia sequences in clade 20A, including one traveler. Most do not cluster together. There are eight Georgia sequences in clade 20B, including two travelers. Two sequences cluster together: one traveler and one non-traveler. Finally, there are 16 Georgia sequences in clade 20C, including three outliers. They do not appear to cluster together, with the exception of tips that descend from large polytomous internal nodes.

The bottom panel, C, is a step plot which shows the cumulative number of introductions into the state of Georgia. The analysis is repeated on 100 bootstrap replicate trees and thus there are 100 individual lines on the figure. The earliest introduction for most lines is mid February (~2020-02-10) and is associated with a set of 69 closely related Georgia tips. The cumulative number of introductions increases relatively linearly from late February through mid-March when it plateaus at roughly 19 introductions. At right is a density plot showing the cumulative number of introductions at the end of the time series (2020-03-31). The density peaks at 19 with a 95% highest-posterior density between 17 and 21.

Figure 3

Two panel figure with the panel at left showing a maximum clade credibility Bayesian time-resolved phylogenetic tree with median node heights of 430 globally sampled sequences which are part of clade 19B. Time is displayed on the x-axis. All sequences share the following genome substitutions: T26729C, G28077C, and T28144C. Median branch lengths are shown and negative branch lengths have manually been adjusted to 0 for the purposes of visualization. Ancestral branches and nodes are annotated based on their sampling region. International sequences are assigned to their country of origin and U.S. sequences are assigned to their state of origin. The MRCA of all sequences in the tree is assigned to China and is dated in early January. The MRCA of all U.S. sequences in the tree is dated between 2020-02-01 and 2020-02-14 (portrayed as a horizontal bar over the node) with a median date of 2020-02-08 and is assigned to Georgia with a posterior probability of 0.65 (portrayed as a pie chart over the node). The direct ancestor of this node is assigned to China with posterior probability of 0.47 probability (portrayed as a pie chart over the node). The posterior probability for the grouping of the U.S. sequences in a distinct clade from the ancestral sequences is 1. Sequences from other U.S. states are nested within the sequences sampled from Georgia. Besides Georgia the most prominent U.S. states with sequences in this subclade are Illinois, Michigan, and Texas. Sequences from Texas fall within a largely monophyletic clade as do sequences from Michigan. Sequences from Illinois are largely found in one of three clades. Panel at right shows a bar plot with the estimated number of introductions of the 19B subclade shown at left into the state of Georgia. The proportion of sampled trees is shown on the y-axis. In 82.5% of the sampled trees

there is only a single introduction into Georgia, there are two estimated introductions in 5.7% of trees, three estimated introductions in 4.3% of sampled trees, four estimated introductions in 0.03% of sampled trees, five estimated introductions in 0.02% of sampled trees, six estimated introductions in 0.01% of sampled trees, six estimated introductions in 0.01% of sampled trees. There is support from less than 0.01% of sampled trees for numbers of introductions greater than six.

Figure 4

Two panel figure with the panels arranged horizontally. Both figures are scatter plots showing sequences related to the sequences sampled from known travelers. Each plot shows the sequence sampled from the traveler, sequences sampled from the region/s the individual traveled to, and sequences sampled from Georgia. The x-axis shows the date of sample collection and the y-axis shows the distance of sequences relative to Wuhan/Hu-1. The x-axis spans from 2020-02-23 to 2020-03-31. Only sequences in the same evolutionary lineage as the traveler's sequence is shown. Only sequences within 1 SNP of the travelers sequence are shown.

The left panel, A, shows data for Patient 22 (Sample 046L) who had known travel history to both Italy and Switzerland and was sampled on 2020-03-04. The sequence sampled from Patient 22 harbors eight SNPs relative to Wuhan/Hu-1 and thus the figure shows sequences in the same lineage that are seven, eight, and nine SNPs from Wuhan/Hu-1. There are 81 sequences sampled from Italy that have seven SNPs relative to Wuhan/Hu-1 distributed throughout the time span. There are five sequences sampled from Italy that are eight SNPs relative to Wuhan/Hu-1, three sampled on 2020-02-29, one sampled on 2020-03-15, and one sampled on 2020-03-30. There is one sequence sampled from Italy that has 9 SNPs and is sampled on 2020-03-22. There are 21 sequences sampled from Switzerland that have seven SNPs, distributed throughout the time frame. There are thirteen sequences sampled from Switzerland that have eight SNPs, distributed throughout the time frame. There are eight sequences sampled from Switzerland that have 9 SNPs, distributed throughout the time frame. Only a single sequence from Georgia besides Patient 22 is shown and it harbors eight SNPs and was sampled on 2020-03-04.

The right panel, B, shows data for Patient 2 (Sample 016P) who had known travel history to Louisiana and was sampled on 2020-03-16. The sequence sampled from Patient 2 also harbors eight SNPs relative to Wuhan/Hu-1 and therefore sequences in the same lineage that harbor seven, eight, and nine SNPs are shown. There are 19 sequences from Louisiana with seven SNPs, sampled between 2020-03-10 and 2020-03-31. There are seven sequences from Louisiana with eight SNPs, sampled between 2020-03-14 and 2020-03-31. There are nine sequences from Louisiana with nine SNPs, also sampled between 2020-03-14 and 2020-03-31. There are only two other samples from Georgia shown, both with seven SNPs sampled on 2020-03-15 and 2020-03-18.

Figure 5

Multi-panel figure with two panels arranged horizontally.

The left panel, A, shows a table of the substitutions shared between all Georgia sequences in the tree shown in A. The substitutions are: T490A, C3177T, C8782T, T18736C, C24034T, T26729C, G28077C, T28144C, A29700G.

The right panel, B, stretches the full width of the figure and shows the number of globally sampled sequences per week which possess the mutational profile shown in panel B over time. The top six locations are shown and the remainder are grouped in Other (USA) or Other (intl.).

In the first week (week ending 2020-03-01) there was one sequence in Other (USA). In the second week (week ending 2020-03-08) there were six sequences from Georgia, two from Florida, one from Australia, and seven from Other (USA). In the week ending 2020-03-15 there

were 33 sequences from Georgia, 15 from Australia, two from Illinois, two from Michigan, one from Texas, 47 from Other (USA), and five from Other (Intl.). In the week ending 2020-03-22 there were 24 sequences from Texas, 21 from Georgia, 20 from Michigan, 17 from Illinois, 16 from Australia, 14 from Florida, 79 from Other (USA), and seven from Other (intl.). For the week ending 2020-03-29 there were 26 sequences from Texas, 10 from Florida, 9 from Illinois, 7 from Michigan, 1 from Australia, 1 from Georgia, 54 from Other (USA), and 14 from Other (intl.). For the week ending 2020-04-05 there were 30 sequences from Texas, 4 sequences from Florida, 4 from Georgia, 2 from Michigan, 23 from Other (USA), and 11 from Other (intl.). For the week ending 2020-04-12 there were 23 sequences from Texas, 18 sequences from Florida, four from Georgia, one from Illinois, one from Michigan, 9 from Other (USA), and 12 from Other (intl.). For the week ending 2020-04-19 there were 15 sequences from Florida, six from Texas, four from Illinois, two from Michigan, one from Georgia, 17 from Other (USA), and two from Other (intl.). For the week ending 2020-04-26 there were six sequences from Florida, six from Texas, one from Georgia, one from Illinois, and five from Other (USA). For the week ending 2020-05-03 there were six sequences from Texas, one from Illinois, three from Other (USA). For the week ending 2020-05-10 there was one sequence from Florida, one from Georgia, and two from Other (USA). For the week ending 2020-05-17 there were two sequences from Florida, two from Texas, and from Illinois. For the week ending 2020-05-24 there was one sequence form Texas, two from Other (USA), and two from Other (intl.). For the week ending 2020-05-31 there was one sequence from Illinois, one from Texas, and nine from Other (USA). For the week ending 2020-06-28 there was one sequence from Illinois. For the week ending 2020-07-05 there was one sequence from Georgia. For the week ending 2020-08-23 there was one sequence from Texas.

Chapter 7

Discussion

As viral pathogens replicate within-hosts and are transmitted between-hosts, they accumulate mutations in their genomes due to errors by the RNA polymerase. Many of these are lethal to the virus and unlikely to be observed and a very small subset improve viral fitness [1]. The remainder, however, are neutral or slightly deleterious (quasi-neutral) to viral fitness. Nevertheless the collection of these quasi-neutral mutations contains clues as to the processes which gave rise to the sampled genetic diversity. Here, I interrogate the patterns in influenza A and SARS-CoV-2 sequence data to reveal the ecological, epidemiological, and evolutionary forces which have shaped these populations.

Within human hosts, the amount of genetic diversity in the form of single nucleotide polymorphisms (SNPs) has been shown to be relatively minimal [2], which limits our understanding of the forces shaping within-host influenza diversity. As a result, in **Chapter 2**, I propose using alternative signal, that which is present in the genomic diversity. Specifically, I focus on the defective viral genomes (DVGs) generated during infection. DVGs are virions which harbor a large internal deletion in at least one segment, rendering them incapable of replicating on their own. Coinfection of cells with wild-type virus allows DVGs to proliferate throughout an infection. Based on this reliance on coinfection and the spatial structure of *in vivo* infections [3] I expect the dynamics of DVG diversity to mimic those of wild-type virus.

I identify DVGs in the deep sequencing data from nearly every sample, primarily in the three polyermase segments consistent with previous findings in the field [4]. The majority of the DVGs I identified have the canonical DVG breakpoints in which the packaging signals on the 5' and 3' ends of the genome are retained and all or the majority of the coding region is deleted. By looking at longitudinal data I show that DVG populations are highly dynamic across time points. However, DVG populations are more similar across shorter time intervals and more abundant DVGs are more likely to persist across time points. These dynamics are consistent with the dominance of genetic drift and consistent with the within-host dynamics of SNPs [2].

To investigate how within-host dynamics translate to dynamics observed at the host population scale, we turn to sequence data from the ongoing SARS-CoV-2 pandemic (reviewed in **Chapter 3**). First, I specifically focus on quantifying the transmission bottleneck, or the number of virions transmitted between a donor and recipient host (**Chapter 4**). By fitting a model to deep sequencing data from 39 transmission pairs, I estimate the bottleneck to be on the order of 1-3 virions. From an evolutionary perspective, this implies that population sizes are extremely small early in infection, which means that genetic drift will dominate the evolutionary dynamics. This will promote the fixation of novel variants either at transmission due to the stochastic transmission of low-frequency donor variations or shortly after transmission due to the fixation of *de novo* variants in the recipient. Consequently, very little genetic diversity is transmitted across chains and within-host selection on beneficial mutations must essentially reset at each transmission event.

Finally, I take advantage of the collection of substitutions present in host-population scale consensus sequence data to reveal the underlying epidemiological scenarios shaping the SARS-CoV-2 pandemic in early 2020. In Israel (**Chapter 5**) I use a Bayesian phylodynamic model to first show that non-pharmaceutical interventions were associated with a significant decrease in the reproductive number of the virus. However, arguably more interestingly, I show that transmission is highly heterogeneous: less than 10% of infected individuals are

responsible for more than 80% of transmissions. I find a consistent pattern in the state of Georgia, USA (**Chapter 6**). While I identify many independent introductions of SARS-CoV-2 into the state, the vast majority of sampled sequences were from a single introduction. This implies that while the transmission chains sparked by the majority of introductions stochastically died out, the successful introduction was likely disseminated throughout the population due to a superspreading event or a high-contact subset of the social network within the state.

Taken together, my results highlight the importance of stochasicity and heterogeneity in disease dynamics, across biological scales. This has important implications for our understanding of how infectious agents spread between people and how their genomes change throughout this spread. My findings that genetic drift is a strong driver of viral dynamics within hosts and transmission bottlenecks are small indicate that selection is likely very inefficient in this context. While not explicitly analyzed here, this hints at the importance of chronic infections (where selection has more time to fix beneficial mutations [5, 6])) or reservoir species (where the evolutionary context may be different [7, 8]) as a source for beneficial viral genotypes. For example, these explanations are currently widely accepted as the most likely source of novel SARS-CoV-2 variants of concern [9].

Epidemiologically, the stochasticity introduced by transmission heterogeneity results in a number of analysis and policy challenges. This long-acknowledged phenomenon decreases the probability that any given introduction of a pathogen into a region will spark sustained transmission (as observed in **Chapter 6**), but increases the speed of an outbreak, given it does not stochastically go extinct [10]. It has been proposed that by "chopping the tail," that is eliminating the scenarios where superspreading occurs, the spread of SARS-CoV-2 could be controlled with relatively limited disruption to most daily activities [11]. However, implementing such strategies differs if superspreading occurs due to superspreaders, i.e. highly infectious individuals, or superspreading events, i.e. social gatherings particularly likely to promote transmission. From my results, I cannot disentengle the contribution of

these two distinct forces to the transmission heterogeneity of SARS-CoV-2. Recent data, however implies that variation in infectiousness between individuals plays at least some role in the superspreading dynamics of SARS-CoV-2 [12]. From a modeling perspective, the effects of superspreading make forecasting disease dynamics difficult [10]. The realized disease trajectory follows only one of the many possible stochastic realizations of the epidemic process. The more superspreading that exists in the transmission process the more variation that exists within these possible realizations. This issue also affects our ability to predict the emergence of new viral lineages which harbor fitness advantages compared to existing lineages. A lineage which stochastically finds itself transmitted during a superspreading event may appear to harbor a genuine fitness advantage based on its increased prevalence in the population (e.g. as described in [13]) regardless of its selective advantage. Alternatively stated, superspreading will increase transient variations in the lineage makeup of a given population which hinders our ability to detect genuine lineages with an evolutionary advantage.

On a different note, our analysis in **Chapter 4** provides a cautionary tale to computational modelers. Initial analyses of the same dataset identified a large transmission bottleneck for SARS-CoV-2 [14]. This finding, however was largely driven by the presence of spurious variants in the deep sequencing data. Similarly, a study out of the U.K. initially reported a large SARS-CoV-2 transmission bottleneck [15], but the estimates were ultimately revised during peer view to support a much smaller bottleneck [16]. Thus, it is not enough to simply apply inference methods to data. One must understand potential sources of error and bias in the data and be familiar with how the inference method can be affected by these biases. Rigorous inference methods applied to biased or error-prone data can, and often will, provide researchers with invalid results.

While great strides in our understanding of human RNA virus ecology, epidemiology, and evolution in recent years, there are a number of important open questions and methodological challenges in the field that remain to be tackled. From a methods standpoint, the number

of SARS-CoV-2 sequenced genomes has greatly eclipsed previous pandemics. This presents considerable challenges, particularly for traditional phylodynamic methods [17, 18], which are incredibly resource intensive. As a result, downsampling the available data has become commonplace [19]. This procedure inherently reduces the signal in the data which leaves considerable opportunity for methods that can operate directly on the scale of available data. In a similar vein, traditional phylodynamic methods (e.g. [20]) are too slow for real-time monitoring of the emergence of lineages with fitness advantages over ancestral lineages. As a result, most monitoring is currently being done by fitting models to the relative proportion of sequences in different lineages [21]. This, however, is inherently a reactive procedure that requires prior identification of the lineages under monitoring. Furthermore, these methods do not account for the underlying genetic diversity within a set of sequences and therefore can provide misleading results if sampling is non-representative. Additionally, most methods for host population scale monitoring of viral evolution rely only on consensus level data and therefore do not consider genetic variation within hosts. This may limit the sensitivity to identifying the selective pressures which act within hosts, as evidenced by the independent within-host evolution of D614G reported in [22]. Finally, my findings in **Chapter 4** indicate that transmission itself fixes mutations in the viral genome. This findings affords an alteranative framing to the popular "molecular clock" framing which states that mutations are acquired at a given rate per unit of calendar time [23]. We propose that this finding can be leveraged to infer the number of transmission and hence epidemiological parameters, from the number of novel mutations in the viral genome [24].

The technology to sequence viral genomes has been transformative in our understanding of their ecology, epidemiology, and evolution. These data are particularly valuable when coupled with quantitative modeling approaches that can tease apart the ecological and evolutionary processes driving viral evolution. Here, I present analyses of influenza and SARS-CoV-2 sequence data with a focus on what the signals in accumulation can tell us about the underlying viral population dynamics. I feel that these studies complement existing and

ongoing work in the field and add to our growing understanding of how viral pathogens change within, between, and amongst human hosts.

Chapter 7 References

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