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Trust and Transparency in Public Health

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Abstract

Trust and transparency are key contributors to the success or failure of public health programs at all levels. Trust and transparent communication must exist among the myriad of stakeholders including health authorities, community members, private actors, regulatory agencies, public health professionals, healthcare providers, and beyond. Variations of trust in public health entities by the community can result in poor compliance with public health measures and thus impaired safety and wellbeing of the people the programs aim to serve. Variation in trust limits the impact of even the most well-designed public health interventions. This systematic literature review explores the reasons for community mistrust of critical actors within the public health sphere by examining past and current public health interventions and how to enhance trust and transparency in public health interventions. The successes and failures of public health interventions are attributable to determinants of trust including religious beliefs and cultural practices, healthcare system capacity, community perception, governments, transparency by public health entities, and modes of information uptake. This review identifies gaps and limitations of current knowledge about the contribution and prevalence of the determinants above. Future research should include the collection of standardized program efficacy data to inform evidence-based public health action, enact positive community engagement, form multidisciplinary partnerships, and create novel policies and programs to ensure a future of healthy people and communities.

Keywords: effective communication, public knowledge, public trust, transparency, trust, distrust, mistrust, community engagement, risk communication, misinformation, emergency preparedness, emergency response, pandemic, epidemic, outbreak, infectious disease.

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Trust and Transparency in Public Health

Chapter 1. Introduction

The ramifications of trust, or the lack thereof, in public health have echoed throughout history. The current COVID-19 pandemic has further elevated awareness of the significance community trust plays in public health. While COVID-19 is a novel virus, public health planning and response to infectious disease outbreaks dates to the seventeenth century [36]. The COVID-19 pandemic has illuminated the gaps in community understanding and trust. Furthermore, it has highlighted different societal responses to similar public health interventions. This raises the question as to how public health officials, governments, and healthcare systems utilize trust and enhance transparency in public health.

Trust entails a belief in the ability of another party to deliver, be accountable, and maintain reliability. It is an innate biological and learned phenomenon. Evoking and retaining trust, however, as an individual or a system is more complicated and evasive. Trust is undeniably intertwined with information, emotion, reason, and values. Measures basing themselves too narrowly on only one of these components of trust are bound to fail. Simply disseminating empirical information and hoping for understanding has proven unsuccessful. Tactics based entirely on emotional persuasion have seen similar failure. Trust must be established through an individualized, multidisciplinary approach that takes into consideration a community's individualized circumstances and characteristics.

The objective of this review is to examine what is currently known about the importance and interplay of trust and transparency in past and current public health and how to enhance trust and transparency. This review aims to create an understanding of what shapes trust in the sphere of

public health. Outlined are the determinants of trust in public health, reasons for community mistrust, and items of action that can improve trust and transparency.

Public health is a cumulative societal responsibility; we are all affected by the success or failure of public health interventions. Therefore, every stakeholder must be involved in trust-building and filling the trust gap in public health.

1.1 Background and Significance

The last great pandemic. The 1918 Influenza pandemic was first observed in Europe, the United States, and Asia before spreading rapidly throughout the world [28]. The 1918 Influenza was the first pandemic to utilize rapid public health interventions to contain the spread of the disease [28]. It was during this time that public health had made remarkable strides in terms of sanitarian campaigns, quarantining, social distancing, and bacteriological science, however, no drugs or vaccines were available to treat or prevent the flu strain [34]. Despite similar public health measures, some cities were hit more severely compared to their counterparts [34]. Cities that implemented early and sustained nonpharmaceutical public health measures such as social distancing resulted in better containment of the disease [34]. In addition, accounts from 1918 show that reasonable compliance with precautionary measures lasted for a period, but not forever [23]. Even in the more obedient social milieu that existed in 1918, San Francisco held demonstrations in which residents removed their masks in defiance [23].

Further, pandemics occur across a spectrum of communities that vary in race, ethnicity, age, gender, and socioeconomic status. There is a sensitive, interrelated balance between virus, host, and social environment. This balance affects transmission, spread, severity, and impact of the pandemic [34]. The 1918 Influenza pandemic resulted in 50 million deaths worldwide [34].

The current COVID-19 pandemic. The COVID-19 pandemic is unique in that it involves an ever-changing novel virus in modern time. Compared to the 1918 Influenza pandemic there are significant technological and societal differences between 1918 and today. Today's increasingly globalized world allows an individual to travel from one country to the next in mere hours. In addition, commuting to densely packed cities is far less of a burden than it was in 1918.

This interconnected world allows the spread of disease to occur at a rapid pace, posing a challenge for public health entities to act quickly. Public health surveillance, however, has vastly improved since 1918. Another significant difference between 1918 and today is the increase in urbanization, which makes everyone globally vulnerable to disease. At the onset of the 20th century, there were vast differences between urban and rural areas. Now cities have grown larger, more abundant, and significantly more inhabited.

Finally, the current pandemic has occurred in the age of modern information availability. Individuals are exposed to countless modes of information, which they choose to rely on is a result of trust. Prior studies have documented the immeasurable amount of false data and information shared on social media [17]. Early in the pandemic this misinformation regarding COVID-19 influenced heath behaviors and allowed the virus to spread more readily in certain parts of the world. And now, despite an approved COVID-19 vaccine, trust influences vaccine acceptance and thus vaccine uptake [22]. Perceptions of trustworthiness of information can be a major facilitator or detriment in public health effectiveness [6].

As of Dec 2021, there has been a total of 5.2 million deaths worldwide despite a Food and Drug Administration (FDA) approved vaccine, antiviral treatment, and proven preventative measures. The COVID-19 virus continues to evolve, and without universal vaccine coverage will inevitably continue to.

Emerging infectious diseases and health. In the past five decades, there has been a rise in new viral infectious agents in emerging and re-emerging infectious diseases [14]. Many factors contribute to the appearance of these emerging/re-emerging infectious diseases. These factors include virus factors, human factors, and ecological factors [14].

Most of the viral emerging infectious diseases are RNA viruses that have high mutation rates [14]. This high mutation rate allows RNA viruses to rapidly evolve and adapt to their environment. There is a direct relationship between environmental events and viral emergence [14]. For example, many emerging infectious disease outbreaks occur after natural disasters such as floods and droughts. In the 21st century and beyond, extreme climate-related events are expected to increase in number and intensity given the El Niño Southern Oscillation (ENSO) and global warming trends [14]. Thus, the frequency of emerging infectious disease outbreaks will rise in tandem.

Lastly, human factors may be the leading driving force behind disease emergence. After the 18th century Industrial Revolution and medical advancements of the 19th century there was a dramatic increase in the human population. This growth in population entailed a need for more space, therefore, the human population moved into unexplored forest region. These previously uninhabited regions were home to virus reservoirs seeking opportunities for viral transmission from animals to human populations. This is an ongoing phenomenon today. In addition to moving into previously unexplored regions, population growth incites urbanization. Throughout history, an increasing trend of urbanization has been documented, however, in the latter half of the 20th century, the rate of urbanization increased drastically [14].

Increased population density influences a pathogen's transmission. This relationship is demonstrated in the basic reproductive rate (R_0) of an infectious disease. The basic reproductive

rate is proportional to the number of susceptible individuals in a population. Today's modern world allows for rapid and extreme human migration, and thus vector travel. Approximately 60% of known pathogens of humans have a zoonotic origin [8]. Furthermore, 75% of emerging infectious diseases result from exposure to zoonotic pathogens [8]. Human practices such as hunting, agricultural methods, and deforestation/land development exacerbate contact with new animal species and thus viruses. Nonpathogenic viruses in their natural host can cross the species barrier leading to disease in the new human host. Upon adapting the virus can be transmitted to another human being and lead to a pandemic. Lastly, the globalization of commerce has allowed microbial contaminants from imported foods and raw goods, as well as viruses from animal trading to spread disease.

These viral, human, and ecological factors lead to the emergence and re-emergence of many viruses. Given the current trajectory, globally we may experience an increase in disease emergence leading to outbreaks, pandemics, and thus morbidity and mortality in the future.

1.2 Statement of the Problem

Given the (re)emergence of infectious diseases and the global situation at present, trust and transparency must be at the forefront of public health. Variations in public trust in public health messaging and interventions can have catastrophic consequences on health. Furthermore, in an age of knowledge at one's fingertips and misinformation galore, transparency from public health entities is imperative.

The role of trust and transparency in public health has been examined in previous research; however, it has not been examined within the unprecedented pandemic unfolding today. It is for this reason that trust and transparency in public health must be reassessed. As evidenced by the COVID-19 pandemic, gaps remain in our understanding of trust, transparency, and health. This

work will guide what studies need to be conducted, what policies need enacting or amending, and public health program aims for the future. The pandemic has provided insight and revelations that are unique to the current world situation, and thus can help prevent future pandemics.

1.3 Statement of Purpose

This review synthesized existing literature regarding trust and transparency in public health interventions to better understand the current and potential burden of mistrust, variations in trust, transparency, or lack thereof, on public health. It aimed to create an understanding of what shapes trust in the sphere of public health. Identifying the most important determinants of trust in public health and the assorted reasons for mistrust is essential to inform evidenced-based public health interventions. This review can serve as a guide for how to better generate trust and transparency for public health and an insight into the interplay between trust and public health success. Lastly, this review identified limitations and gaps in the current knowledge to aid and guide future research to address critical public health problems with greater efficacy and efficiency.

1.4 Research Questions

This review seeks to address the following questions:

1. What are the determinants of community trust within the context of public health and public health interventions?
2. What are the reasons for community mistrust of public health entities and/or public health interventions?

3. What interventions, policies, or programs that have been implemented have been found effective and are considered best practices for enhancing trust and transparency in public health interventions? Similarly, what efforts have failed and why?

4. What are the existing gaps in knowledge in the intersecting factors of community trust, public health transparency, and community health, and what recommendations can be made going forward to shift the impact of trust from negative to positive?

Chapter 2. Methods

This review utilized general Cochrane methods. This included a well-defined research question, a population, and an outcome of interest [13]. Intervention and comparison groups were not applicable to the research question. The population was not limited by geographic location and included all regions and entities performing public health interventions. Specified inclusion and exclusion criteria were developed and applied to published peer-reviewed literature in PubMed. A meta-analysis was not conducted.

This study involved a review of the literature for articles published in the PubMed database regarding trust and transparency in public health programs and interventions. All searches in PubMed included ("trust" OR "transparency") and combinations of search terms related to trust including ("mistrust", "distrust", "public trust", "community engagement", "community trust", "community mistrust", "community distrust", "institutional trust", "openness") and transparency ("risk communication", "effective communication", "public knowledge", "communication", "misinformation").

Citations were exported to EndNote. Both article titles and abstracts were reviewed for all potentially relevant literature, and subsequently evaluated using established inclusion and exclusion criteria. The inclusion criteria utilized for this review included:

- Literature that assessed the outcome of a public health program or intervention aimed at addressing an infectious disease process (i.e., respiratory diseases, diarrheal diseases, parasitic diseases, or diseases related to water and sanitation) in relation to community trust and public health entity transparency

- Public health entities include government officials, internationally recognized public health organizations, nonprofits, healthcare systems, and public health departments
- Population studied includes all countries, ages, sex, races, and ethnicities that were subject to a public health intervention
- Published between 2012 and 2021
- Published in English; and
- Full text available through the Emory Library or other catalog system.

Exclusion criteria included …

- non-peer reviewed literature, editorials, grey literature such as technical reports or web-based guidelines.
- literature that assessed the outcome of a public health program or intervention aimed at addressing non-communicable disease (cardiovascular disease, respiratory disorders, metabolic disorders) in relation to community trust and public health entity transparency.
- articles published prior to 2012
- articles published in a language besides English; and
- full-text articles not available through the Emory Library or any other catalog system.

To obtain the most accurate and encompassing data available it was necessary to include literature published in the last nine years. Including the last nine years ensured saturation of the articles and thus data to review. Non-peer reviewed articles and various other grey literature were excluded to ensure verified research. Non-English articles were excluded due to language limitations of the reviewer.

Full text was obtained for all literature that met the inclusion criteria and provided quality data. In addition, the reference sections of abstracted articles were examined to identify additional content. These references were manually located in PubMed. If the article contained useful information, it was included. Relevant data were extracted from articles and managed with an evidence table. Abstracted information included reference, population, setting, sample size, region, and country the study was conducted in, diseases(s) studied, study design, study objectives, results, and conclusions. Studies were categorized by which determinant of trust it most accurately related to. Human subject research was not conducted, therefore submission to IRB (Institutional Review Boards) was not required in this review.

Chapter 3. Results

The PubMed database search identified 240 published articles that included the relevant search terms. Limiting the results to articles published within the past nine years reduced the number of relevant articles to 201. Articles and studies addressing non-communicable diseases (n=20) were omitted for the purpose of this review. The citations were exported to EndNote™ and titles and abstracts were screened for eligibility utilizing the exclusion criteria.

Articles that did not meet the inclusion criteria were most often excluded because the disease studied was outside the scope of this review. References of eligible literature were examined to identify additional articles of substance and contribution (n=33). Full text was obtained for the 40 articles included in this synthesis. They were reviewed and essential information was summarized in an evidence table in Excel™.

3.1 Determinants of community trust or mistrust in public health

Religion and culture. Every society has its own religious belief and cultural practice. These can shape a society's perception of public health entities and interventions and influence their trust in public health. A dual systematic review conducted in 2018 explored unvaccinated groups in Europe and their attitudes, beliefs, and rationale for remaining incompletely or un-vaccinated [10]. Fournet *et al.*, defined an unvaccinated group as a group of individuals who shared the same set of beliefs who have, or have had historically low vaccination coverage and experienced outbreaks of vaccine-preventable diseases since 1950. Within each unvaccinated group identified, there were a variety of health beliefs and objections to vaccination [10].

Vaccination is one of the most impactful public health interventions. Vaccination reduces the risk of contracting vaccine-preventable diseases on the individual level and can confer herd

immunity at the population level if immunization coverage is high enough. Since 2014, a resurgence in the incidence of measles has occurred due to low vaccination rates [27]. The most pertinent reason for low vaccination rates is the prevalence of nonmedical exemptions, which are primarily based on religious and philosophical beliefs [27].

Ebola virus is transmitted principally by direct physical contact with an infected person or their body fluids during the later stages of illness or after death. Contact with the bodies and fluids of loved ones who have died of Ebola was especially common in West Africa during the 2014 Ebola epidemic. Family and community members often touched and washed the body of the deceased in preparation for a funeral. Cultural practices such as those have a direct effect on virus transmission [26]. Cultural practices that propagate the spread of disease need to be managed appropriately and tactfully by public health officials to not encourage hiding of cultural practices, public outrage, or mistrust of public health providers.

Religion and cultural practices play a key role in determining trust in public health interventions. Conversely, poor public health response to religious and cultural practices has the potential to deter community trust in public health and exacerbate the spread of disease.

Healthcare system capacity. Healthcare system capacity is essential to ensure effective management of public health threats including outbreaks, epidemics, and pandemics. Capacity is dependent on several factors such as leadership and governance; health workforce; equitable access to essential medical products and services; sustainable health-financing system; and a well-functioning information system [4].

Health systems face challenges to meet the threshold for skilled health workers. Shortage in the number of skilled health workers is a global crisis. World Health Organization (WHO) estimates a projected shortfall of 18 million health workers by 2030, mostly in low- and lower-middle

income countries [40]. The availability of qualified healthcare workers with sufficient knowledge, skills, and attitudes is crucial to providing quality, efficient, and timely healthcare.

Healthcare workers play a significant role in communication, a major trust-building component. In 2019, a qualitative secondary analysis of interviews with responders of the West Africa Ebola epidemic indicated healthcare providers fostered trust and countered suspicions by engaging families in the Ebola diagnostic process [31]. Healthcare provider openness with patients and thorough education can dispel rumors and distrust [11]. A 2021 rapid scoping review synthesized available evidence on the impact of pandemics and epidemics on essential services and health care systems preparedness and strengthening. Findings indicated existing disparities in healthcare systems and services being further exacerbated by infectious disease outbreaks, with marginalized populations and low- and middle-income countries burdened disproportionately [3]. Findings showed public trust of institutions, of science, and between communities and healthcare systems is key to a successful pandemic response [3].

Community perception. The level of trust in public health will depend on how members of the community perceive the ability of public health entities to address threats. Such perceptions are often influenced by the quality of services, perceived sincerity or intentions of the providers or health authorities, how much they have benefited from services, how many lives have been saved, personal or group risk perception, and experience with or reputation of the health care providers or the organizations they represent.

A 2020 case study analysis indicated that the level of risk perception varies by individual; some perceive early reports of a disease outbreak more severely and personally, while others perceive it less seriously [16]. There are many factors that influence an individuals' risk perceptions; however, a significant amount of research has found that risk perception varies by previous

experience and existing value systems [16]. Krause *et al*. (2020) described that the factual knowledge an individual has about a risk is often less important than what someone they trust tells them about it.

Furthermore, when processing scientific (mis)information, people often rely on "heuristics" that can make complex information easier to understand [33]. When current information contradicts individuals' pre-existing beliefs, they are likely to engage in "motivated reasoning" to defend their own beliefs over the newly presented evidence [18]. Even if the current information succeeds in correcting misperceptions, there is no guarantee that updated beliefs will lead to a change in behavior [18]. Lastly, if an individual is overloaded with information, that individual is then less likely to be able to choose correct information from among the plethora of contradicting messages [16]. For example, in the preliminary period of the COVID-19 pandemic, people were confused as to whether they should wear masks or not because communication channels provided different recommendations [16].

Governments and government authorities. Governments and government authorities work hand-in-hand with public health entities to ensure the safety and wellbeing of their communities. It is for this reason that outbreak responses must be multidisciplinary in nature [21] Countries must have productive local, state, and government collaboration amid an outbreak [1]. Governments must ensure their response to infectious disease outbreaks are politically and publicly sensitive [1]. Further, their response must balance public interest and economic interest [1].

A qualitative study of public compliance in Singapore amid the COVID-19 pandemic between January and April of 2020 indicated public trust was based on a perception of government competence, fairness, care, and openness [39]. Singapore is distinguished by a prominent level of

public trust in their government compared to other high-income countries: 24% of people in Singapore report having high confidence in their government, compared to 5.8% in South Korea, 5.5% in Germany or 3.7% in the US [39]. This may have led people to underestimate the risks of COVID-19, and thus reduce their compliance with government risk management measures [39]. This undermined efforts to control the risks and drove the need for stricter institutional enforcement and more stringent government measures [39].

The unique case of Singapore indicated that elevated levels of public trust can result in lower levels of compliance and the belief that individual action is not required to manage risks effectively. Further, during the 2003 severe acute respiratory syndrome (SARS) epidemic, Singapore successfully utilized a ‘defensive pessimism’ strategy in which they perpetually emphasized the seriousness of the risk rather than minimizing the risk. Singapore had minimal success utilizing the same method during the start of COVID-19. This is evidence that every outbreak is unique, and the risk communication employed must be tailored as such.

During the MERS outbreak of 2015, the South Korean government did not initially disclose necessary information to the public to avoid fear among citizens [24]. This lack of transparency caused public distrust as well as tensions with local governments that wanted to disclose pertinent information. The mayor of Seoul Metropolitan City criticized the central government's lack of transparency and released information about the infection paths of patients and exposed hospitals [24]. This caused tension between the central and local government, however, it allowed individual citizens to identify and assess their exposure to infected patients [24]. The MERS outbreak served as a lesson for future infectious disease outbreaks. It served as a cautionary tale for governments to be open and transparent with the public.

Transparency by public health. Uncertainty about public health infectious disease outbreaks provides a breeding ground for misinformation and mistrust. At the beginning of the COVID-19 pandemic, there was no clear explanation of the disease and there was conflicting information and recommendations from various sources. Many recommendations about preventive measures were conflicting or misleading and this created confusion and mistrust of public health authorities (Krause, 2020). This caused the pandemic to spread in places where it could have been effectively prevented. If mass panic, myths, and misinformation ensue, public health entities must address them quickly with information and tools [9].

If rumors or misinformation are not addressed quickly enough, interventions and facts must be put forth to assuage community members and rectify false information. For example, after the failure to dispel rumors about stolen family members bodies being sold in Europe, some Ebola Treatment Centers (ETC) installed plastic sheeting to reassure families and patients and allow them to see one another [31]. Public health entities must disseminate population-specific education and communication [2]. Public health entities must have sensitivity to the diversity of people receiving communication, for example, including all languages spoken in a community [2]. Populations are not completely homogeneous, therefore public health messages and communication should be tailored [1]. Communication should be timely and consistent across platforms, as well as clear, concise, tailored, and accurate in nature to reduce community confusion or panic, the dissemination of misinformation, and the spread of disease.

Effective risk communication helps build the credibility of the public health entities and filter fake news and rumors surrounding an outbreak [24]. Risk communication and crisis communication are unique to each country [2]. The effectiveness of different risk

communication efforts and strategies will vary depending on the stage of the pandemic in each country [2].

Enabling communities to be catalysts for change amid a pandemic is a form of transparency that increases trust [21]. In addition, openness, or the engagement with and a willingness to incorporate multiple perspectives, is a key component of trustworthy relationships [31].

Modes of information uptake (e.g., social media, apps, television, streaming platforms).

Individuals obtain public health information from a myriad of sources. These sources of information can influence how and what information individuals consume, thus influencing their risk perception and behavior. Social media and the internet have become widely used by the public to seek information including health-related information.

Social media use has grown among populations worldwide to stay informed during times of crisis [19]. Available information comes from a variety of sources that are not always official, objective, or factual in nature. Social media platforms such as Facebook™, Instagram™, and Twitter™ continue to pose unique challenges for public health entities [35]. Moreover, effective public health communication is progressively complicated by misinformation. These factors can be due to politicization of interventions, anti-scientific sentiments, and the risk that social networks pose by playing a role in the rapid spread of false information [7].

Misinformation has been actively circulated to undermine trust in government and public health officials [35]. While these threats and challenges are omnipresent, they are magnified in times of health crises such as pandemics, placing distinct pressures on healthcare systems, public health entities, and governments. In summary, social media should be utilized to mobilize the public to

follow quarantine procedures, quickly halt the spread of fears and misinformation, and enhance public trust in public health interventions [9].

3.2 Insightful public health interventions, recommendations, and programs

Religion and culture. Fournet *et al*., concluded that addressing the concerns and vaccination myths present in religious/cultural unvaccinated groups through a trusted source can establish a reliable relationship with the groups and increase their vaccination uptake. A 2013 study implemented a 2-arm comparative effectiveness trial involving 134 African American women ages 18 to 34 years to compare the effectiveness of the Centers for Disease Control and Prevention-defined evidence-based Sisters Informing Sisters about Topics on AIDS (SISTA) HIV intervention with P4 for Women, an adapted faith-based version of SISTA [38]. P4 for Women, the faith-based version of SISTA, enhanced abstinence and safer sex practices as well as religious social capital [38]. Furthermore, it was more acceptable than SISTA [38]. This study suggests interventions incorporating faith can be useful in responding to the HIV epidemic in African American women.

In the 2014 Ebola epidemic in West Africa, a myriad of national-level and district-level assessments confirmed burial practices, challenges to safe burials, and the need to reduce the transmission of Ebola via cultural burial practices. Recommendations based on the assessments included 1) district-level trainings on the components of the SOP (Standard Operating Procedures) and 2) rapid deployment across the 14 districts of additional trained burial teams supplied with adequate personal protective equipment (PPE), other equipment (e.g., chlorine, chlorine sprayers, body bags, and shovels), and vehicles.

A 2017 rapid qualitative assessment using focus group discussions (FGDs) explored community knowledge, attitudes, and practices towards safe and dignified burials in seven chiefdoms in Bo

District, Sierra Leone [20]. In total, 63 FGDs were conducted among three groups: women >25 years of age, men >25 years of age, and young adults 19-25 years of age [20]. The assessment concluded that people showed recognition that guidelines were established to promote safety, and that dignified medical burial had to be followed [20]. Overall, participants accepted the core concepts of safe, dignified medical burial practices to end Ebola transmission.

To enhance community acceptance the FGD participants suggested several key recommendations: discredit inaccurate rumors about safe and dignified medical burials by explaining what happens at the cemetery to the community members [20]. Respect the deceased by having the burial team place clothing provided by the family on top of the body before the body is placed in the body bag, and by using a white shroud or white body bag to wrap the body in accordance with Muslim traditions. These cumulative public health efforts and recommendations made dignified burial safer and increased community support for these practices [20].

Healthcare system capacity. Communities need assurance that treatments, laboratory tests, and patient care consistently meet quality standards and that those services are inclusive and not discriminatory. Underserved communities can be distrustful of public health institutions and health care [5]. Communities of color and people with disabilities have historically been undertreated or abused through the medical system, and undocumented immigrants fear punitive measures if they seek medical aid [5].

This requires that health care entities emphasize strengthening regulatory and accreditation processes, as well as enforcing policies to safeguard the integrity of the health systems. Health care systems must prove their credibility and competence by establishing health care systems that have the capacity to provide quality services. This is essential to gain the trust of the public

in public health. Additionally, access to health care is essential for enacting trust in public health and the implementation of successful public health interventions. Fournet *et al*., concluded that interventions such as improving access to health care could increase vaccination uptake in Roma and Irish travelers.

Furthermore, WHO developed a toolkit that can be used to evaluate the capacity of health systems for crisis management and in addressing any identified gaps. The overall goal of the toolkit is to help countries minimize the impact of future health crises by assessing the capacity of health systems to respond to various threats and identify gaps. It is an instrument that can be used to break down the complex crisis preparedness process into manageable components and steps. This toolkit can aid and enable ministries of health by identifying shortcomings in the system, developing an action plan to strengthen capacity for the future and fill in the gaps, finally monitoring progress and measuring improvement in their capacity to manage crisis. A qualitative analysis of the core literature that complements the WHO Toolkit for assessing health-system capacity for crisis management identified how health system strengthening can promote resilience and efficient recovery during disasters. Findings support and complement the WHO Toolkit in assessing countries disaster management capacities and identifying priorities for health system strengthening.

Community perception. A rapid systematic review of the evidence and recommendations for influencing community perception of public health messages for managing risks and preventing infectious diseases identified four key recommendations. First, engage communities in the development of public health messaging [12]. Second, address community uncertainty promptly and with transparency [12]. Third, focus on unifying messages from multiple sources. Lastly frame messages to increase understanding, social responsibility, and personal control [12].

Incorporating principles of behavioral science into public health messaging is a crucial step towards more effective risk communication amid public health threats such as epidemics or pandemics [12].

Governments and government authorities. Effective government communication plays a key role in successfully responding to pandemics. The more challenging a pandemic is, the more attention needs to be focused on effective and efficient government communication. There is a plethora of evidence available that many local, national, and international governmental agencies have made serious public communication missteps in responding to public health emergencies by disseminating inconsistent, incorrect, or contradictory messages [16]. To promote the effectiveness of public health interventions on pandemic response and planning, researchers have emphasized public involvement and engagement [16]. Communication is central to connecting the public and policy decision-makers for collaboration and the establishment of policies and initiatives [16]. A 2020 case study analysis of countries amid the COVID-19 pandemic indicated that many countries failed to initiate appropriate early responses to the virus, and governmental leaders misguided the public by their intentional or unintentional ignorance or downplay of the disease [16]. The failure to initiate an appropriate initial response to the COVID-19 pandemic caused devastating damage to many countries [16].

During the COVID-19 pandemic, South Korea actively communicated with citizens to increase their awareness of and engagement in COVID-19 preventative measures [24]. The government did this by providing all necessary information, including up-to-date statistics on infected cases and the fatality rate, in addition to the movement path of each individual infected patient prior to being quarantined [24]. Governments must be transparent and provide their citizens with all necessary information (via utilization of media, technology, apps, etc.). In addition, they must

not ensure premature promises of life returning to pre-outbreak life before that knowledge is confirmed.

Kerala state amid the COVID-19 pandemic emphasized that health systems alone cannot control the spread of a virus. Kerala successfully integrated their local governments into the public health system [32]. In addition, willingness of the government to provide free testing and quality treatment reinforced and built trust with the community [32].

A mixed-methods study performed by Vinck *et al*., (2019) identified low levels of trust in government and government authorities, and widespread belief in misinformation about Ebola. This mistrust and belief in misinformation were associated with a decreased likelihood of implementing preventive measures such as the Ebola vaccine [37]. In addition, exposure to violence reduced political trust. In adults ages 18 years or older in Beni and Bulembo in North Kivu, RD Congo local authorities were more frequently trusted than were provincial and national levels of government [37]. A stable political climate is essential to community trust.

Transparency by public health. Open and transparent conversation has been applauded as one of the key strategies that helped the South Korean Government to have better control of the COVID-19 pandemic, as opposed to the situation with the Middle East Respiratory Syndrome (MERS) in 2015 [24].

Public risk communication played a critical role in planning and preparation efforts for the 1999-2000 West Nile Virus epidemic in New York City [2]. A detailed communication strategy utilizing various media outlets was adopted with the New York City Health Commissioner and the mayor as the primary spokespeople. Although the communication strategy had a few drawbacks, its effectiveness was due to its transparency and sensitivity in disseminating information to the diversity of people living in New York by including the languages spoken [2].

Modes of information uptake (e.g., social media, apps, television, streaming platforms).

COVID-19 was extremely vulnerable to the spread of disinformation, misinformation, and public mistrust due to the initial lack of information regarding the virus [15]. During the COVID-19 pandemic, social media has played a significant role in the spread of misinformation, often leading to panic and mistrust [15].

For example, COVID-19 conspiracies regarding who released the virus and for what purpose ran rampant [15]. Conspiracy theories and misinformation about COVID-19 can lead to lower vaccination rates and an increase in vaccine hesitancy [29]. Misinformation causes confusion and spreads fear, threatening trust between the public and public health entities, thereby derailing the public health response to a pandemic [25].

An example of the effective use of different channels of communication has been seen in the COVID-19 communication by Singapore [39]. The government of Singapore emphasized and used traditional and social media for communicating about the pandemic. Through traditional media they reached the populations with updates and other key information through weekly press conferences by key government officials. Addressing the public using different languages without the use of translators has been crucial in building trust and triggering the affective beliefs about institutional behavior and competence in such a multi-cultural society as Singapore. For example, when the Prime Minister addressed the nation in April 2020 to announce the partial lockdown, he spoke in English, Bahasa Melayu, and Mandarin [39].

Early in the pandemic, the government of Singapore recognized the role WhatsApp™ could play in disseminating information and quickly deployed this platform as a key medium of information [39]. As the first cases were reported in the country in late January of 2020, the government established a meticulous contact tracing procedure and provided essential information about

contact tracing records to the public through WhatsApp™ and other platforms [39]. They provided two to three daily updates along with key prevention messages through the government-designated websites, WhatsApp™, Twitter™, Facebook™, and Telegram™. They countered misinformation through these same platforms [39]. As the pandemic advanced, the government deployed other mobile apps that helped provide reliable information to the public to help them make an appropriate decision and behave in ways that would help reduce collective risk [39].

Social media has become an essential platform for the communication of political, social, economic and health issues in recent years. Governments and public health communicators should capitalize on the accessibility offered by social media platforms to reach vast and differing audience groups. Other channels are equally important, such as the traditional media, village chiefs, community leaders, group leaders, faith leaders, opinion leaders, public health officials, and political leaders.

Chapter 4. Discussion, Recommendations, and Conclusions

4.1 Discussion

Limitations. Many relevant studies that have been conducted exploring the relationship between trust and transparency in public health have inherent biases and limitations due to study design, sample size, differences in scope and study quality, and limited generalizability. Randomized controlled trials are considered the gold standard study design in evaluating public health intervention. Most of the studies in this review were qualitative in nature, with some mixed-method studies. Further, some case study analyses and editorials were included to fully understand the scope of the subject.

However, these types of articles may detract from the review. The review did not encompass all possible populations as the population of the review was incredibly broad in nature. Complete reliance on previously published research, the availability of these studies, and the appropriateness of these studies with the criteria of the inclusion/exclusion criteria is a limiting factor. Articles were omitted if the full text was not available to the Emory University PubMed database. Additionally, there are articles surrounding COVID-19 public health interventions and trust that have yet to be published that could provide valuable insight.

The potential for bias was addressed differently by each researcher which may make interpretation of results challenging. Excluding articles not published in English was an additional limiting factor, however, necessary due to the language abilities of the reviewer. Exclusion of non-English articles may have resulted in the omission of relevant studies with novel evidence and contributions.

Gaps in Knowledge. Most studies of trust and transparency in public health interventions are retrospective and qualitative. There need to be more studies focused on purposeful public health interventions aimed at increasing trust and transparency prior to the onset of a public health crisis. In addition, monitoring and evaluation plans must be established prior to the onset of these public health interventions. Public health surveillance is essential for future public health planning regarding infectious disease preparedness. Specifically, data collection regarding impact of infectious disease outbreaks must be consistent throughout developed and developing countries to assess impact of infectious disease public health interventions.

4.2 Recommendations

(Re)emerging diseases continue to affect the globe and disrupt countries' capacity to function and thrive. The problems surrounding trust, public health, and health are vast and ever-changing. No one solution is going to be sufficient, but a response that is multidisciplinary, multimodal, and anticipatory has a higher likelihood of success. The future of public health planning and response should be purposeful and resilient in anticipation of the world's inevitable changes and challenges.

Foster positive community engagement. To establish trust, there must be a 'feedback loop' between all actors who are working to overcome public health crises, so all needs are addressed. [31]. Public health entities, healthcare workers, and governments must remain open, transparent, and accountable to retain public trust and thus engagement [31]. Furthermore, early and ongoing positive community engagement is feasible when community engagement activities are nonpunitive, palatable, and actionable initiatives that are undertaken by public health entities [1].

The goal of any public health intervention is to limit or prevent morbidity and mortality associated with a disease. Building trust with the communities through constant and open engagement is necessary to achieve this goal.

Form multidisciplinary partnerships. Traditional public health interventions alone will not be sufficient to combat future outbreaks, epidemics, and pandemics. The underlying factors sustaining mistrust of public health entities are multifactorial and thus need to be addressed by all stakeholders, including but not limited to governments, non-governmental organizations, communities, community leaders, religious leaders, health care providers, and public health entities. Combining comprehensive risk management, multisectoral and multidisciplinary approaches can establish trust based on cooperation and effective communicative systems that empower community awareness [21].

Create novel interventions to build trust in public health entities. With an ever-evolving modern world it is necessary we adapt our interventions to match. Social media has become an essential platform for the communication of political, social, economic, and health issues in recent years. Governments and public health entities should capitalize on the accessibility offered by social media platforms to reach different audience groups beyond geographical borders [39]. In areas where social media is not a viable option, other outlets such as the traditional media, village chiefs, community leaders, group leaders, faith leaders, opinion leaders, and political leaders should be utilized.

4.3 Conclusions

Trust entails a belief in the ability of another party to deliver, be accountable, and be reliable. Trust is established through an all-encompassing series of individualized measures that consider the plethora of contributions to decision-making and trust-building, both within the individual

and within the community. With the rise of emerging diseases and the likelihood of future infectious disease outbreaks, it is pertinent that we better understand and implement trust in public health entities. Studies thus far have revealed there are many determinants of trust in public health. Trust's role in the spread of disease is a complex and multifaceted issue that will require timely and collective action to be effectively addressed.

If the recommendations outlined above are followed, there is the promise of a future of healthy people and communities. People will trust public health officials and programming, as their actions will be consistent with their promises. Public health messaging will be presented concisely, accurately, and early. Transparency will be at the forefront of future outbreaks, even when not all is known about the nature and course of the disease. In doing all of this, mistrust of public health entities will be eliminated. Most importantly, people and communities will be empowered to seek public health guidance, use their voices to engage in open dialogue, and take control of their health and others.

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