Recommendations for the Application of the Public Health Approach and Epidemiologic Methods for Armed Conflict Prevention and Resolution

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2012

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An abstract of
A thesis submitted to the Faculty of Rollins School of Public Health of Emory University in partial fulfillment of the requirements for the degree of Master of Public Health in Global Health
2017

ABSTRACT

Recommendations for the Application of Public Health Approach and Epidemiologic Methods for Armed Conflict Prevention and Resolution

By Molly R. Morse

Background
Traditionally, public health practitioners conducting research and programmatic work to reduce mortality and morbidity due to armed conflict have focused on the response phase. However, epidemiologic methods and the public health approach may also be well-suited for application to armed conflict prevention and resolution, given its emphasis on broad, population-based, preventive, and cost-effective approaches to problems; appeal to a common sense of duty to improve the health and wellbeing of others; and reliance on empirical evidence and resulting ability to depoliticize highly contentious issues.

Objectives
The main objectives of this project were to increase the knowledge base surrounding the intersection between armed conflict and public health and forming recommendations for CDC's Emergency Response and Recovery Branch capacity to apply the public health approach and epidemiologic methods for armed conflict prevention and resolution projects. More specific objectives included describing how various fields define armed conflict, the historical context and phases of armed conflict, describing and defining public health and epidemiologic methods and the public health approach.

Methods
A scoping literature review was conducted across a variety of multidisciplinary literature databases using search terms around the topic such as 'health' and 'conflict.' Additional reviews of grey literature including situation reports, white papers, policy briefs and other relevant sources of information were conducted throughout the project to increase the knowledge base of the topical area surrounding public health, epidemiology, research methods, and armed conflict. Interviews with subject matter experts were also conducted on specific sub topics either in person or via email when necessary.

Recommendations
The first steps that should be taken by a public health organization such as ERRB when starting an armed conflict prevention project are: developing a case definition for armed conflict, identifying risk and protective factors for individuals and/or groups, and implementing a two-part surveillance system consisting of a remote monitoring and an in depth case confirmation process. This project should be accompanied by a monitoring and evaluation component to measure effectiveness. If this first step proves to be effective at accurately identifying cases of armed conflict where prevention interventions may be effective, methods for implementing chosen interventions should be explored.

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Finally, I would really like to thank my friends and family for the support, laughs, and compassion you all have given me during this process. It wasn't easy but I've learned so much from all of you, about armed conflict, public health, and maybe most importantly, how to handle something that seems like such a big deal but too shall pass. Thank you.

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Chapter 1: Introduction

Fundamentally, public health interventions are intended to decrease morbidity and mortality and traditionally, it was thought that morbidity and mortality resulting from disease were the main concerns of the public health community. As the field developed, other problems affecting community health such as physical activity and violence were included in this fundamental goal. Even more recently, a strong case has been made within the public health academic community to include armed conflict within the public health professional's scope as well. Public health professionals and epidemiologists have worked within conflict contexts and on violence-related issues, such as violence against children, elder abuse, and intimate partner violence but until somewhat recently, the intersection between armed conflict, the social sciences, and public health has not been explored.

It is the opinion of this paper that the public health approach and epidemiologic methods may be well-suited for application to armed conflict prevention and resolution due to their population-, prevention-, and evidence-based approach to problems. Additionally, public health professionals strive to maintain a common sense of duty to improve health, wellbeing, and livelihoods of all people, regardless of political, ethnic, cultural, religious, or other differences. The framing of armed conflict as a public health problem may also deescalate a very controversial issue. By framing this issue as common to all people, regardless of political affiliation, while still considering the political grievances and motivations of individuals and groups, public health professionals may be able to appeal to the common humanity of all parties.

These epidemiologic methods and the public health approach have been effectively applied to violence prevention and reduction efforts by the United States Centers for Disease Control and Prevention (CDC) as well as at other public health and development organizations

around the world. By increasing the scope of these efforts to include armed conflict, public health professionals might— as with most public health efforts— be able to minimize the morbidity and mortality caused by one of the most significant global issues.

This paper summarizes the initial findings of an ongoing project initiated to determine whether CDC's Emergency Response and Recovery Branch (ERRB) should use the public health approach and/or epidemiologic methods to address armed conflict prevention and resolution.

This paper will first summarize and analyze relevant literature explored related to public health, including public health and epidemiologic methods, the public health approach, and applications of this approach to address challenges in public health and other fields. This will be followed by an analysis of literature explored concerning armed conflict. Topics will include definitions of armed conflict and related terms used by different fields, a description of populations involved in and/or affected by armed conflict, and an outline of the phases of armed conflict. Finally, the academic basis for the intersection between public health and armed conflict will also be explored.

Recommendations will be made on whether ERRB has the technical expertise and resources necessary to completely undertake armed conflict prevention and/or resolution projects. Recommendations will also include which types of tools, settings, populations, and partners would be most useful for these types of projects if deemed possible.

Chapter 2: Literature Review

2.1: Public Health

A. What is public health?

Public health is defined by the CDC Foundation as "the science of protecting and improving the health of families and communities through promotion of healthy lifestyles, research for disease and injury prevention and detection and control of infectious disease (CDC Foundation, 2017)." Overall, public health is concerned with protecting the health of entire populations. These populations can be as small as local neighborhoods or as big as entire countries or regions of the world. In contrast to clinical professionals like doctors and nurses, who focus primarily on treating individuals after they become sick or injured, public health professionals try to prevent problems from occurring or recurring at the population level by implementing educational programs, recommending policies, administering services and conducting research. Public health professionals also work to limit health disparities by promoting healthcare equity, quality and accessibility.

B. What is epidemiology?

Any discussion of epidemiology should include explanations of methods, measures, and tools used in this field. Epidemiology is defined by WHO as "the study of the distribution and determinants of health-related states or events (including diseases), and the application of this study to the control of diseases and other health problems, (WHO, 2017)."

Epidemiology employs research methods to define, quantify, and illustrate the burden of disease and other health concerns within populations. These methods include quantitative research methods such as surveys and surveillance, qualitative research methods such as key

informant interviews and focus group discussions, and statistical research methods. These methods are employed to gather and utilize specific measures such as risk, prevalence and incidence. Specific tools—such as symptom-based screening instruments and mobile data collection platforms—assist in the collection and analysis of these measures. Together these research methods, measures and tools provide epidemiologists and the public health community with information about what diseases and other problems are harming populations, why those diseases and problems are occurring, and what risk and protective factors worsen or ameliorate the susceptibility of individuals within those populations. A full list of research methods, measures and tools with definitions and current uses is included in Appendix 1 of this paper.

One particular area of epidemiological methods worth mentioning for its potential applications to armed conflict prevention and resolution might be integrated surveillance systems. Traditionally, surveillance systems are used by public health professionals in order to monitor populations for particular diseases. For example, the National Notifiable Diseases Surveillance System run by the CDC mandates that physicians across the United States report cases or suspected cases of certain diseases determined by the CDC to be of importance either due to their transmissibility or potential effect on the population. Physicians act as beacons to notify CDC, other national public health authorities, and state and local health departments about the potential for outbreaks in particular locations. The information works its way up through established channels to decision makers who determine if the case needs immediate intervention. A case of measles—a highly infectious disease with the potential for a widespread outbreak—would need such an intervention, while other less worrisome health events would merely merit further observation. This system allows the public health community in the United States to sift through all individuals for pieces of important information, i.e. cases of infectious disease.

A similar system could be applied to armed conflict prevention. If one were to treat armed conflict as a disease with the presence or absence of given characteristics that would predict a 'case' of armed conflict among a given population, the presence of these variables could alert an organization to the presence of potential armed conflict to prevent some of these negative consequences and avoid needless suffering before the negative consequences of armed conflict, including morbidity and mortality.

C. What is the public health approach?

The public health approach aims to provide a clear framework to identify a problem and strategies for remedying that problem followed by continuous monitoring and evaluation of the interventions' effectiveness in order to ensure widespread intervention adoption and eradication of the problem. The public health approach comprises four cyclical steps, visualized in Figure 1, The Public Health Approach (WHO, 2017) below from the Violence Prevention Alliance at WHO.

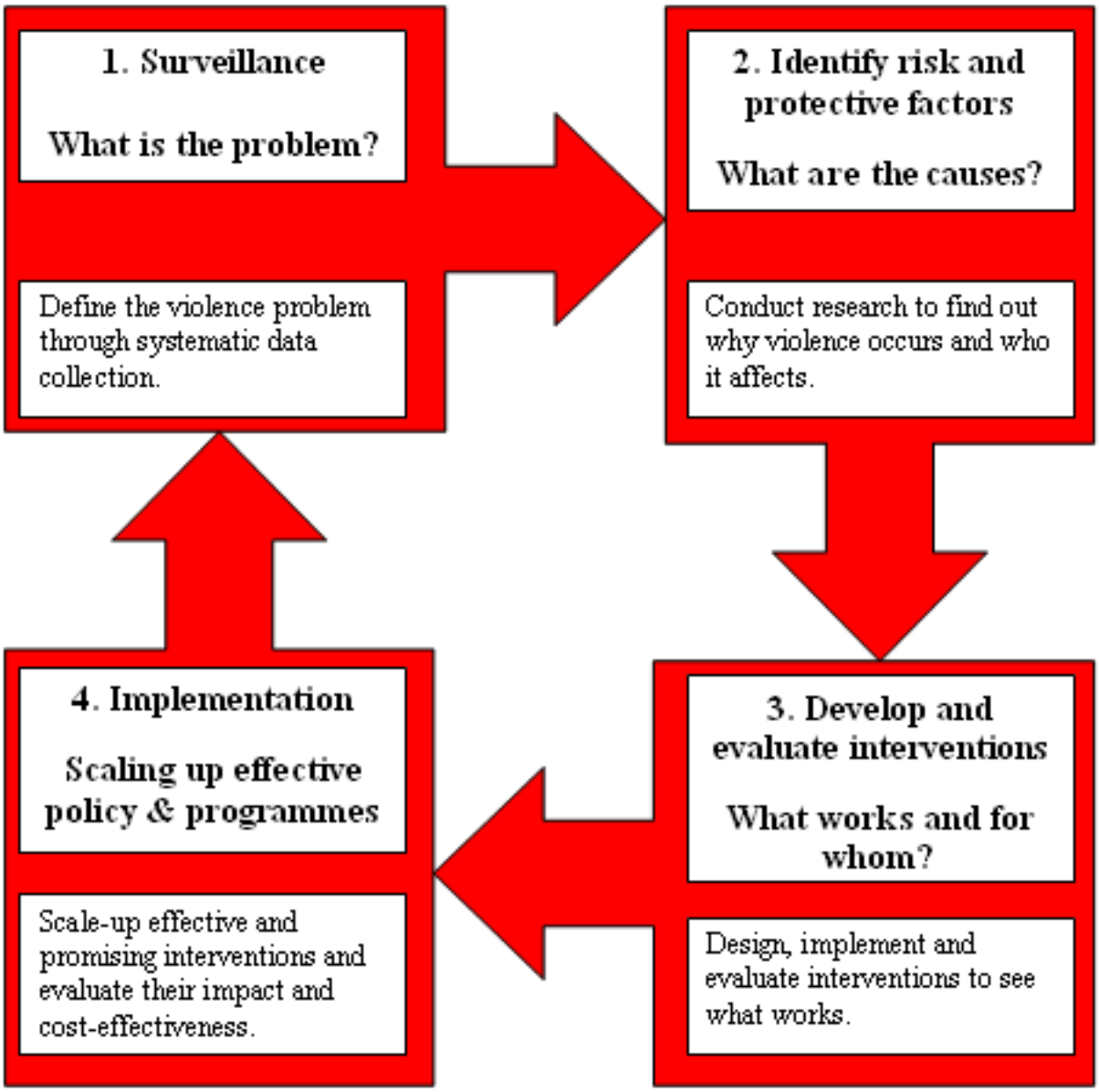

Figure 1

The first step in the public health approach is surveillance. During this period, public health professionals identify the problem to be solved through systematic data collection. Surveillance system activities include developing a case definition, identifying risk and protective factors that contribute to adopting the condition or behavior, identifying populations who might be at risk, and finally systematically collecting information about those populations to

determine which individuals might benefit from intervention. A case definition includes both inclusion and exclusion criteria. Inclusion criteria are those variable values that researchers deem necessary for the case label to be applied and exclusion criteria are those variable values that—if present—preclude researchers from applying the case label. A case is any individual or group who is deemed to have a given disease or exhibit a particular behavior.

The next step is to identify risk and protective factors associated with the problem. Through research, professionals determine why that problem is happening. Risk factors are those variable values that increase an individual's likelihood of contracting a particular condition or engaging in a particular behavior while protective factors are those variable values that reduce an individual's likelihood of contracting the condition or engaging in the behavior.

Next, professionals develop and implement interventions to test which ones best solve the problem. In the absence of resources, or when testing isn't prudent or necessary, public health professionals may choose to review existing interventions.

Finally, professionals implement the intervention that was determined to best solve the problem at hand. The effective and most promising interventions are scaled up from the testable population in this last step three to a larger population affected by the problem.

This final step is followed by continuous monitoring and evaluation of the impact and cost-effectiveness of the applied interventions as well as surveillance (Step 1) to detect potential recurrences of the original problem and/or additional problems stemming from interventions implemented.

D. Current applications of the public health approach to address public health challenges

This approach is already being used by organizations to solve issues that are traditionally thought of as 'public health problems' such as infectious or chronic diseases. Additionally,

organizations such as the World Health Organization are using this approach to tackle other public health challenges such as motor vehicle injury, tobacco and alcohol consumption, and provision of antiretroviral HIV treatment in resource-limited settings. Although these are wide-ranging topics, the public health approach is well-suited for each of them because of its grounding in evidence to solve population-based problems.

E. Current applications of the public health approach to address challenges in other fields

While the public health approach was developed by public health professionals, its evidence- and population-based attributes make it useful in other disciplines. When diagnosing and treating a disease in a patient, for example, medical professionals use systems that identify the problem and risk and protective factors, consider and implement interventions, and monitor and evaluate those interventions for both successful curing of the disease and surveillance for additional disease in that patient and others. Business professionals use similar systems to ensure productivity or supply chain management and similar systems and methods are seen across a wide range of fields. Ultimately, this method codifies the process of critical thinking and systematic evaluation of problem solving.

Additionally, researchers in various fields are currently applying the public health approach to problems that have not always been thought of as public health problems, including gang violence, firearm violence prevention and policy, and reduction of other violent and non-violent injury.

2.2: Armed Conflict

A. What is armed conflict?

Armed conflict is defined by the Department of Peace and Conflict Research at Uppsala University as "a contested incompatibility which concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths within a year' (Hegre, 2010). We have chosen to use this definition for the purposes of this paper, as it allows for broader inclusion of violent events in addition to those between two state actors. This definition would also include conflicts that are traditionally thought of as 'one-sided' such as genocide or ethnic cleansing. Further exploration of this and other definitions can be found in Section B below.

B. Why is it important for organizations working in conflict prevention and resolution to define armed conflict?

It is important for an organization working in conflict prevention and resolution to define armed conflict for three main reasons: in order to identify situations in which the organization's expertise would provide appropriate and effective interventions, to assist this organization in determining whether to intervene and how to organize and implement said interventions, and to help the organization navigate relative language sensitivities among parties involved in the conflict and response in order to develop a common working language.

1. *Identify situations in which appropriate interventions might be applied:*

Any organization aiming to implement a conflict prevention project would need to sift through every possible and ongoing situation that might be armed conflict, decide which would or would not be within the scope of the intervention, and decide if, when and how to intervene.

This first step, of deciding which situations in which an organization's expertise would provide appropriate and effective interventions, is comparable to developing a 'case definition,' a term identified above in the literature review section on public health. It is important to understand that this definition should be flexible enough to allow for all situations in which the organization would be able to successfully implement interventions but sensitive enough to exclude situations in which the intervention would not be effective in achieving its aims.

International humanitarian law often considers situations in which armed conflict, or collective violence of some kind, has occurred, in order to bring cases against individuals and organizations accused of war and other crimes to the International Criminal Court and other fora (Balendra, 2008). Any case definition for armed conflict intervention should take international law into account. The Geneva Convention, for example, refers to two types of armed conflicts, "international armed conflict" and "non-international armed conflict", but does not further define 'armed conflict.' The definition of 'international armed conflict' does not make any claims about "how long the conflict lasts or how much slaughter takes place." The definition of 'non-international armed conflict' describes situations that "'occur in the territory of one of the High Contracting Parties,' which suggests that non-international armed conflicts typically occur within a single State," but these events are "distinguished from 'internal disturbances and tensions [or] isolated and sporadic acts of violence (Balendra, 2008)."

These definitions provide boundaries for what actions specific groups may expect legal protection from and should be considered by organizations that wish to work within the realm of armed conflict prevention and resolution. However, these definitions may not on their own be sufficient; other setting-specific variables must be considered in creating case definitions. Another potential resource is the Commentary to the Geneva Conventions written by the

International Committee of the Red Cross, in which it explains the terms 'armed conflict' and 'war' for humanitarian concerns (Balendra, 2008).

Organizations intending to apply the public health approach and epidemiologic methods for prevention and/or resolution interventions do not necessarily need to use such a specific definition for armed conflict. As stated above, that definition may be more of a confidence interval approach, i.e., a wider set of variables that may be necessary or absent in a given situation in order for specific interventions to be successful. Regardless, due to its wide adoption in a variety of settings, the international humanitarian law definition is a good starting point for organizations and institutions such as ERRB.

2. *Decide if interventions would be successful, when to intervene, and how to organize interventions*

After an organization has deemed a situation 'armed conflict' and that intervention could be appropriate, that organization must decide if it should intervene. This decision should take into account the likelihood that interventions for which the organization has expertise would be successful in obtaining the aims of the intervention (i.e., preventing the conflict). This decision might include consideration of characteristics for that specific situation that would make success of the intervention more or less likely. These variables might be similar to inclusion or exclusion criteria and arise from identification of risk and protective factors of populations involved in the conflict. Inclusion criteria are those variables which, if present, would designate a situation as appropriate for intervention. These inclusion criteria variables would come directly from the definition adopted by the organization but might include additional information such as physical and political accessibility. In other words, the case definition must be specific enough to rule out situations in which interventions would not be successful or appropriate but sensitive enough to

alert an organization to situations in which interventions could successfully prevent and/or resolve a conflict. Exclusion criteria include those variables which, if present, would preclude a situation from being considered armed conflict. For example, if an organization's interventions do not target populations affected by gang violence, the presence of gang violence as the only or major form of violence in a community would rule out this situation from intervention.

3. *Develop a common working language with collaborating partners*

Conflict is a necessarily controversial topic and thus, linguistic choices matter. What one individual or organization may consider 'armed conflict' another may consider 'terrorism'. Individuals who participate in violence may be labeled as 'rebels,' 'liberators,' or 'terrorists' and each different label comes with a different set of meanings for the labeler, the labeled, and the public. Thus one organization's definition of armed conflict may be different from another's. For any organization and its partners, it is important to have a standardized definition and vocabulary for discussing violent situations that may or may not be applicable for intervention. This is especially true when the organization in question is a government agency, such as CDC. A list of synonyms and related terms discovered during the course of this project is included at the end of this paper in Appendix B.

Further, linguistic choices describing actions of organizations or individuals working on behalf of those organizations matter in terms of international law, as described earlier in this section. For example, there is debate over whether the United States' conflict with the Islamic State (ISIL) is a 'war' or 'military action' and whether the conflict falls within the bounds of U.S. congressional approval and international law (DeYoung, 2014). This is different from the development of a case definition by an organization interested in armed conflict prevention but it

serves to mention that there are legal consequences to consider when intervening in an armed conflict.

C. What do fields other than public health have to offer public health organizations interested in armed conflict prevention and resolution?

Armed conflict is a problem that spans many fields, including but not limited to anthropology, conflict studies, economics, education, ethics, government, history, human rights, humanitarian assistance and advocacy, international relations, journalism, law, medicine, philosophy, political science, public health, social justice, social psychology, and sociology. It would be useful for any public health stakeholder to investigate and learn from any entities involved in these fields—including non-governmental organizations, think tanks, academic institutions, media outlets, funding institutions, government agencies, and others. These entities can provide significant knowledge about armed conflict prevention and resolution in the form of perspectives, experiential lessons learned, definitions, methods, measures, tools, and frameworks based on their own attempts at relevant research and interventions. Such a multidisciplinary approach could prove especially important when applying a new approach or theory to a problem previously considered external to a field's scope, as we are here suggesting that public health practitioners might when investigating armed conflict prevention and resolution.

D. What populations and subpopulations are involved in armed conflict?

While some may assume that young, able-bodied males are most likely to be affected by armed conflict due to the historic composition of many fighting groups, it is important to remember that all members of a population can be affected—either directly or indirectly—by armed conflict.

However, many population subgroups have not been adequately represented in the scholarly research concerning armed conflict. A majority of the literature appears to concern children involved in fighting forces (e.g., child soldiers) and veterans, while other groups—e.g., women, the elderly, the disabled, or members of ethnic, religious, sexual, or racial minorities—often are not considered. Unfortunately, as is often the case in humanitarian emergencies, these latter subgroups are often very vulnerable both to the direct impacts of conflict—such as proximity-related battle injuries—as well as to the indirect conflict impacts including prolonged hunger, breakdown of water and sanitation systems, inadequate healthcare access, and disruption of humanitarian aid.

E. How do we define fighting groups?

We define "fighting groups" as those individuals actively engaged in violence during an armed conflict. Such groups can be part of organized armies or other armed forces or less structured groups such as terrorist networks, or may be working on their own.

One important consideration to be made when referring to fighting groups is to make a distinction between individuals actively participating in violence and individuals who do not commit violent acts but support the former group by providing funding, material goods, information, or other services. Although members of the latter group may contribute to prolonging or intensifying a conflict, they should not be considered part of the fighting group. It may be possible for conflict prevention or resolution interventions to be aimed specifically at these individuals or organizations, such as economic sanctions to restrict weapons access.

Additionally, it is important to consider motivations for both populations directly involved in armed conflict (i.e., fighting groups) as well as those indirectly involved in armed

conflict. These motivations will necessarily have impacts on the types of interventions that might appeal to specific groups and how successful these interventions might be. An individual who chooses to join a fighting group for ideological reasons will have very different expectations about what might cause him or her to stop fighting or leave the group than an individual who joined a fighting group because he or she needed money but does not care about the mission of the group. Additionally, considerations should be taken to understand the motivations of those who are indirectly affected by a conflict.

F. What are the phases of armed conflict?

It should be said that the timelines of individual armed conflicts are different to some degree. The duration, order and intensity of the phases of conflict vary by situation. Some attempt to provide a general description of common armed conflict phases may be useful in identifying when public health professionals might be successful in implementing prevention strategies and what types of interventions might be successful at different times. An intervention that has the best chance of success during the first few months of a conflict likely will not be the same as an intervention implemented to deescalate a conflict that has been ongoing for years.

The research group Peace Research Institute Oslo (PRIO) has identified four stages of armed conflict (identified by the group as civil war). These phases start with challenging the existing state structure and end with the initiation of violence. The four stages that the group identified as necessary and sufficient to lead to armed conflict are: 1) motivation for change 2) organization 3) a turn to violence and 4) recruitment to violence. These four stages should be thought of as overlapping circles according to PRIO, without one or multiple stages, different types of protest exist, for example individual activism or mob violence (Hegre, 2010).

Motivation for change

PRIO defines the 'motivation for change' phase as the time when "the sense by a political actor that the private and/or public goods to which s/he feels entitled cannot be acquired and/or safeguarded in the existing distributive regime," (Hegre, 2010).

Organization

PRIO argues that in order to engage in civil war or armed conflict, members of a society must first organize into a somewhat cohesive group. This organization may be of the elite, the masses, or a combination of all subgroups in a society and may not initially include intentions to promote violence.

Turn to violence

The "turn to violence" stage consists of a decision by the organized group that their goals cannot be achieved through peaceful means and that violence is a necessary component to success. This realization comes from a weighing of the pros and cons of using violent means and the conclusion that the pros outweigh the cons in that specific situation.

Recruitment to violence

"This stage is characterized by finding individuals who not only agree with the cause of the organization but are also willing to engage in violence with the possible consequences, including injury and/or death, (Hegre, 2010)."

Additionally, the United States Department of Defense (DoD) and the United States Institute of Peace have developed their own distinct but overlapping models of the stages of conflict. Here, the stages defined by DoD are numbered and the roughly similar stages identified by the US Institute of Peace are in parentheses. These stages include:

Phase 0: Pre conflict stabilization of weak or failed states (Stable Peace);

Phase 1: Run up to military hostilities (Unstable Peace);

Phase 2: Onset of Military Action (Crisis);

Phase 3: Major Combat (War);

Phase 4: Post-Conflict Stabilization (Peace Enforcement, Peacekeeping); and

Phase 5: Shift to Civilian Control (Post-Conflict Peace Building).

It would be reasonable to assume that the four stages that lead from challenge to the state to civil war identified by the PRIO research group could be included within the "Run up to military hostilities (Unstable Peace)" phase identified by DoD and the U.S. Institute of Peace. A figure depicting the U.S. Institute for Peace's phases of armed conflict is included below as Figure 2 (U.S. Institute for Peace, 1996).

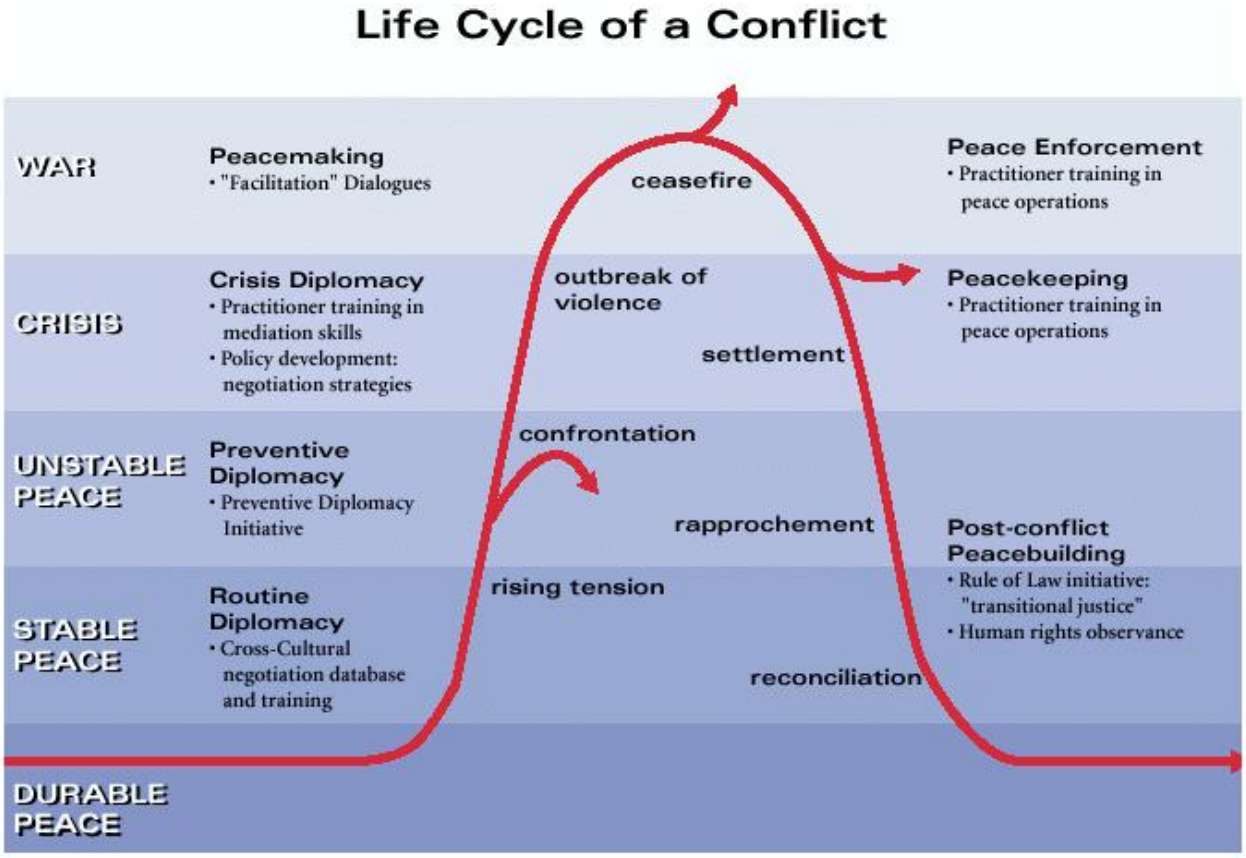

Figure 2

Phases within these models may vary in length and intensity and some may not be present at all. However, such an approach detailing general timelines of armed conflict provide a rough outline for the different temporal spaces during a conflict and in doing so may help an individual or organization to understand how a conflict progresses from peaceful protest to the end of hostilities and where specific interventions are most appropriate.

2.3: Intersection of Armed Conflict and Public Health

A. Why should public health be used to look at armed conflict?

Public Health, epidemiologic methods, and the public health approach are uniquely situated to study and/or collaborate with researchers already working in armed conflict prevention and resolution. Public health professionals have a vested interest in preventing armed conflict because many public health problems are caused either directly or indirectly by armed conflict. Public health contributes an evidence- and population-based approach to prevention, as well as methods, measures, tools and frameworks. Finally public health and health professionals have experience working in these conditions and a history of social justice and neutrality when facing these problems.

Health professionals, particularly those in the humanitarian field, work in active conflict zones, post- and pre-conflict, and in situations with high political, ethnic, cultural, or religious tensions. While working in these environments, health professionals, including epidemiologists and public health professionals, often actively choose to remain non-political and provide services to all individuals, regardless of their affiliation in the conflict. Many non-governmental organizations, such as Medecins Sans Frontieres (MSF) and the International Committee of the Red Cross (ICRC) or International Federation of the Red Cross (IFRC) that work in conflict or post conflict environments have clauses in their mission statements that explicitly mention their commitment to neutrality.

Further, there is a long history of health professionals engaging in advocacy for social justice. As Whitaker argues in his article *Preventing violent conflict: A revised mandate for the public health professional?* "the act of bearing witness is integral to the charter of many humanitarian health agencies, notably MSF and Physicians for Human Rights," (Whitaker,

2013). Further, “medicine has a distinguished history of organized dissent, beginning with the European peace movement during the Prussian-Austrian war,” (Whitaker, 2013).

While health professionals are already working in emergency and conflict environments, their work specifically consists of carefully and systematically collecting data that would be of use to the prevention and/or resolution of armed conflict interventions. This data could consist of mortality studies, demographic information, or nutritional status of the affected population. One direct impact of conflict is the breakdown of health systems. This negatively impacts researcher’s ability to quantify the effects of conflict on the population’s health. Additionally, due to the politicized nature of conflict, information could be intentionally misrepresented. According to the authors of the paper *Armed Conflict as a Public Health Problem*, “the role of the applied epidemiologist [in conflict settings] is to collect valid data,” (Murray, 2002). For example, when trying to quantify the number of deaths that resulted from a conflict, data could be collected through census analysis when health information systems are missing due to the conflict. This method, while often incomplete is far superior to the current methods of relying on press reports or eyewitness accounts. As Murray mentions in the article, “valid data collection is better than anecdotal evidence and hold[s] up better over time,” (Murray, 2002). Additionally, these flawed methods can be merged with new strategies that are more systematic and therefor thorough, such as using the VRA Reader program, an algorithm, to comb press reports for a specific type of information in a specific context which is then used to calculate conflict intensity or the Syria Mapping project at The Carter Center.

The most important benefit the applying public health to armed conflict is the systematic approach to complex problems that public health already employs when countering disease. Public health uses evidence based approaches, developed through valid and careful data

collection that considers various and wide ranging variables to develop and implement programs and interventions aimed at prevention of complex problems. Then monitoring structures are implemented to decide when, or if, the problem recurs in conjunction with evaluation structures for the collection of data on the success or gaps of the implemented intervention. When combined with new technologies, public health professionals and researchers are uniquely situated to approach armed conflict prevention and resolution.

The public health approach specifically has already been successfully applied to individual and small scale levels of violence prevention, such as intimate partner violence, violent radicalization, and firearms prevention. It reasonably follows that this approach could be used to examine armed conflict.

One such new technology that could come out of the combining of public health methods and approaches and armed conflict prevention and resolution might be the Dirty War Index (DWI). The DWI is a "data-driven public health tool that identifies rates of particularly undesirable or prohibited, i.e. 'dirty,' outcomes inflicted on populations during war (e.g. civilian death, child injury, or torture)," (Hicks, 2008). The DWI is a measure, in the public health tradition, of tracking prevalence of a particular variable present in many conflicts and uses that measure as a proxy for the intensity of a given conflict. This is similar to the use of highest education level attained as a proxy for socio-economic status (SES) on many public health and demographic surveys because SES is necessarily difficult to assess but also a useful variable to include in many health studies as it often correlates to access to health services among other variables. Education is used as a proxy for SES because it is often easily identifiable and often correlates with SES. Thus, intensity of conflict is necessarily difficult to assess, as it includes many different, hard to define variables, but by using a measure that approximates the worst of

those variables (i.e. torture, child injury, etc.), one is able to estimate intensity of conflict. The "DWI is developed for systematic, data-driven identification of relatively good versus bad performance, heightening its potential to stimulate positive change," (Hicks, 2008).

B. What is the existing literature on the subject?

There is already a large body of literature on the subject of the applications of public health to armed conflict prevention and resolution, but research on the theory has only occurred fairly recently. Most of these articles are opinion papers, with academics and associations citing the potential applications or situations in which these methods could have been successfully applied. The literature largely advocates for the application of public health methods and the public health approach to armed conflict prevention though there is less mention of resolution interventions.

Most importantly, while the academic basis for investigation into the application of these methods and approach exists, there are apparently very few to no frameworks or existing interventions that are currently employing the public health approach for armed conflict prevention or resolution specifically. Some organizations do approach violence through the lens of epidemiology- such as Chicago-based Cure Violence, which addresses gang violence, and WHO's division of Collective Violence, which collects data and produces reports for stakeholders on violence around the world. While this is an important aspect of applying public health skills to armed conflict prevention and resolution, it is only a first step There are already many organizations and agencies that implement interventions aimed at preventing the causes of armed conflict but often they are not explicitly preventing or resolving armed conflict directly

but rather the causes of conflict. The interventions and policy focus on access to clean water, health services access, democratization, among others.

Sean Whitaker argues, in his article *Preventing violent conflict: A revised mandate for the public health professional* that violent conflict must be "conceptualized as a public health hazard," and "that the role of the public health professional [is] in addressing the underlying causes of conflict, (Whitaker, 2012). This builds on the 2009 American Public Health Association's (APHA) policy statement, "The Role of Public Health Practitioners, Academics and Advocates in Relation to Armed Conflict and War," (Wiist, 2014). A working group grew out of the APHA Peace Caucus to build upon this policy statement "by proposing competencies to understand and prevent the political, economic social, and cultural determinants of war, particularly militarism," and "the working group recommends that schools of public health and public health organizations incorporate these competencies into professional programs, research and advocacy," (Wiist, 2014). These determinants are likely amenable to the same primary, secondary, and tertiary prevention strategies public health professionals employ to counter other population based problems. Wiist goes on to outline why public health professionals are uniquely qualified to implement strategies to prevent armed conflict such as, "their skills in epidemiology; identifying risk and protective factors; planning, developing, monitoring, and evaluating prevention strategies; management of programs and services; policy analysis and development; environmental assessment and remediation; and health advocacy," (Wiist, 2014).

C. What does the literature recommend for further investigation?

Murray argues that "a collaboration between political scientists and public health researchers could provide a firmer basis for attempts to prevent conflicts. Combining their

research would give both sides a more complete approach and would help focus the attention of the international community on efforts to protect populations from the consequences of conflict," (Murray, 2002). Because political scientists and other social science researchers have been examining armed conflict causes and consequences for a long time, they possess much of the current knowledge surrounding these variables. Meanwhile, public health professionals' usefulness in research and programming for conflict prevention and resolution lies in their methods of data collection and analysis and population-based approaches to problems. By combining these knowledge bases and relevant skills, social science researchers could potentially gain more valid data and public health professionals knowledge about the context in which these events take place.

Chapter 3: Methods

This investigation started with a scoping literature review across a variety of multidisciplinary literature databases. The database list and search terms were developed following consultation with a CDC librarian. Literature was deemed relevant if it was within one of the defined inclusion disciplines, published between 1996 and 2016, published in English, and available in the full-text format. The multidisciplinary database platforms EbscoHost, ProQuest, and JSTOR as well as public health and medicine database PubMed were all searched with the same combination of search terms. These search terms started with combining "public health approach" with either "armed conflict," "armed conflict prevention and resolution," "armed conflict prevention," or "armed conflict resolution," and then became more general. The list of all search terms is below.

"Public Health Approach" AND ["armed conflict" OR "armed conflict prevention and resolution" OR "armed conflict prevention" OR "armed conflict resolution"]

"Public Health Approach" AND ["armed conflict" OR "armed conflict prevention and resolution"]

"Public health approach" AND "armed conflict"

"Public health approach" AND "conflict"

"Public health" AND "conflict"

Health AND conflict

Health AND war

Twenty fields of study were included in the multidisciplinary database platforms search: Anthropology, Conflict Studies, Development Studies, Economics, Education, Ethics, Government, History, Human Rights, Humanitarian Assistance and Advocacy, Linguistics,

Medicine (Health, Nursing, etc.), Philosophy, Political Science, Public Health, Religious Studies, Social Justice, Sociology, Psychology, and Women's and Gender Studies. These disciplines were all included in the search of the multidisciplinary database platforms.

Once these databases were searched, relevant literature was added to a project EndNote library and sorted for relevance. This literature- in addition to non-academic literature including white papers, policy briefs, situation reports and other relevant sources of information- was used to inform the literature review above and the project recommendations below. Informational interviews were also conducted with subject matter experts either in person or via email when necessary.

Chapter 4: Project Recommendations for the Application of the Public Health Approach and Epidemiologic Methods for Armed Conflict Prevention and Resolution

4.1: Project Outline

Public health professionals are skilled at defining a disease and its characteristics as well as observing an affected population, accurately identifying true cases of that disease for treatment, and monitoring and evaluating the effectiveness of disease interventions. Thus, the best application of public health methods and the public health approach to armed conflict concerns the classification, data collection and surveillance aspects of armed conflict prevention and resolution. The first steps that should be taken by a public health organization such as ERRB when starting an armed conflict prevention project are: developing a case definition for armed conflict, identifying risk and protective factors for individuals and/or groups, and implementing a two-part surveillance system consisting of a remote monitoring and an in-depth case confirmation process. This project should be accompanied by a monitoring and evaluation component to measure effectiveness. If this first step proves to be effective at accurately identifying cases of armed conflict where prevention interventions may be successful, methods for implementing chosen interventions should be explored.

In order to present the most feasible strategy for testing the application of the public health approach and epidemiologic methods to armed conflict, it is the opinion of the authors to initially focus solely on prevention-level projects. Not only is it more complicated to try to incorporate strategies for both prevention and resolution, it also encourages future researchers to tighten the scope of projects to determine which situations might truly benefit from intervention. The argument can be made that due to armed conflict's cyclical nature, prevention and resolution projects should be implemented at the same time, and while this may be true in certain

circumstances, the potential complications may be too great to undertake such a project at first. Thus, for the remainder of this paper, only conflict prevention interventions will be discussed.

The first step in the recommended project concerns developing a case definition for armed conflict. As discussed earlier, a case definition is necessary in order to know which specific situations are considered appropriate for intervention and which are not. In public health terms, an effective surveillance system should be able to find all cases of violence where interventions might be effective while minimizing the number of 'false cases' of violence where these interventions would not be effective. Let us take, for example, an armed conflict with government actors on one side that has been in progress for less than a year and consisted of one violent event resulting in fewer than 10 deaths. If the intervening organization chooses the definition of armed conflict from Uppsala University ("a contested incompatibility which concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle related deaths," (Hegre, 2010)), then this situation does not currently meet all of the definition's criteria because the number of battle-related deaths does not meet the threshold described the definition. However, this conflict should be observed further because its ongoing nature (and resulting potential for additional deaths) means that the threshold could eventually be reached.

Conversely, if there is a situation in which neither side is a government actor (for example, gang violence), then it might be prudent to exclude this situation from further observation because this criterion is not likely to change (i.e., a government actor is unlikely to become involved in this conflict).

While Uppsala's definition could provide a good starting point, it does not have to be the final case definition for ERRB. If variables were discovered to have a significant impact on the

types of violent events that would benefit from prevention interventions in order to successfully prevent conflict, those variables could also be included in the case definition as a means to accurately identify all situations for which these interventions could prevent violence. For example, if certain interventions were particularly effective in situations that included democratic ideology, a variable identifying this factor (such as democratic ideology as a motivating factor for at least one side in the conflict) could be included in the case definition's inclusion criteria.

The next step in this project would be to identify risk and protective factors for events included in the case definition. Risk factors are those variables that increase an individual's or group's likelihood of contracting a particular condition or engaging in a particular behavior while protective factors are those variables that reduce an individual's or group's likelihood of contracting the condition or engaging in the behavior. In order to identify these factors, researchers would need to consult literature on the subject of violence, radicalization, and escalation of conflict. This would also be an appropriate place for public health professionals to consult political scientists, as recommended in the literature mentioned above. Additional original research could be conducted to identify these factors by sampling groups both in areas where armed conflict occurred and in areas where it was prevented, either retrospectively through literature or prospectively by employing surveys, focus group discussions, in-depth interviews or a combination of all three methods. If possible, risk and protective factors should be identified for both individuals and groups. Populations and individuals within them may exhibit different characteristics or may be placed in different environments, such as those with or without access to violent ideologies or access to education, that encourage or discourage escalation of conflict, and those differences could lead to varying levels of efficacy among different interventions.

Once a case definition and risk and protective factors for individuals and groups have been developed, the surveillance system should be pilot tested. This surveillance system should have two parts: a global remote monitoring system and an in-depth confirmation process. As with any surveillance system, the goal of the system should be to identify all true cases of the event by sifting through all events and evaluating a given set of criteria (inclusion and exclusion variables in the case definition) to decide whether or not a given event is a 'true' event, while minimizing the number of 'false' events (i.e., events that appear to meet the case definition due to a flaw in the surveillance system, case definition, or random error but actually do not meet the case definition). The variables identified when developing the case definition would contribute to evaluating each individual event in the surveillance system.

A similar system already exists within CDC's Global Disease Detection Operations Center (GDDOC). This group comprises a small team of epidemiologists who monitor various sources (media, government, international surveillance systems, etc.) in order to identify potential outbreaks before they are out of hand. This group only looks at diseases (usually infectious diseases but also sometimes due to environmental toxins), but one could imagine a scenario in which a similar group monitored sources for potential armed conflicts before they reached a stage where prevention strategies were no longer effective. Similarly, several organizations worldwide focus on predicting and monitoring armed conflict including Crisis Group, ACAPS, and academic institutions. Public health professionals could begin by collaborating with these groups, offering data collection methods and analysis expertise to improve existing systems. These groups, in turn, have a knowledge base on the subject of armed conflict and monitoring infrastructure which would be of benefit to the public health professionals.

The second phase of this surveillance system concerns the 'double-checking' of the remote monitoring section. Once the surveillance system identifies a case of potential armed conflict—meeting all inclusion criteria but without any exclusion criteria—it should further investigate the situation to confirm that it is not a 'false case.' Confirmation might include further remote analysis of sources or travel by epidemiologists to the area in question to collect data from the populations involved via surveys, focus group discussions, in-depth interviews, or other methods as appropriate. Data would then be analyzed to determine whether and to what extent populations are truly at risk for conflict and to what extent that risk exists. If possible, other measures should be examined to assess each group's risk for imminent armed conflict and inform decisions regarding conflict prevention interventions. The data might in fact disprove the original surveillance alert of armed conflict (i.e., meaning that no to little risk for armed conflict in this population exists at this time) and thus no intervention should be implemented. This type of system would hopefully reduce wasteful interventions with little necessity while also addressing possible armed conflicts before they become catastrophic.

While this surveillance system is being pilot tested, a monitoring and evaluation framework should be developed to assess the efficacy of this system. This framework should include end goals of the project, indicators for progress met to reach those goals, and a system for objectively observing and recording ongoing activities of the project. Depending on the outcome of the evaluation of the surveillance system pilot test, revisions to the system should be made to increase its efficacy. Once these changes to the system have been made, a more robust system might be implemented.

These three steps are the first and most necessary for any project which aims to implement conflict prevention interventions; thus it is recommended to re-evaluate the possible

effectiveness and feasibility of such a project at this stage. If it is determined that the project should be continued and/or expanded, next steps to be considered should include partnering with organizations currently implementing conflict prevention interventions and developing a monitoring and evaluation framework for these interventions while continuing the two-part surveillance system. Application of public health methods and the public health approach to be applied to armed conflict is better suited to identifying cases through surveillance and careful, valid data collection and analysis than to implementing conflict prevention interventions. Identification of cases is a necessary precursor to effectively implementing interventions and thus should be prioritized.

4.2: ERRB Capacity

CDC's Emergency Response and Recovery Branch (ERRB) employs public health professionals including epidemiologists and biostaticians, mental health experts, sexual and reproductive health experts, nutrition experts, and injury experts as well as Epidemiologic Intelligence Service fellows and students with a focus on assessments and projects in humanitarian emergencies including natural disasters and armed conflicts. There are over 80 full time staff and fellows and the branch has been a distinct unit within CDC for over 10 years. ERRB has partnered with organizations all over the world to engage in assessments and other projects. Partner organizations include local non-governmental organizations as well as larger international institutions such as the United Nations and World Health Organization. Technical assistance requests directed to CDC during armed conflicts often come to ERRB; it is often ERRB staff who are deployed in such circumstances and thus many have extensive experience working in conflict, pre-conflict, and post-conflict situations. Given such experiences, ERRB is

best positioned to undertake at least some parts of a conflict prevention project such as the second part of the surveillance system, confirmation of risk for conflict, and the monitoring and evaluation of the surveillance system. Additionally, if there were further prevention interventions implemented, ERRB might have a role to play in conducting needs assessments before the interventions are implemented and conducting additional monitoring and evaluation for the interventions' effectiveness. Additionally, public health professionals and epidemiologists from other parts of CDC such as the Division of Violence Prevention should be consulted in the development of an armed conflict case definition, risk and protective factors, and variables that inform the surveillance system. Ultimately, other groups at CDC and outside conflict monitoring organizations should lead the remote monitoring component of the project with active collaboration from ERRB. Alternatively, a new working group or subset of another branch or ERRB could be constructed for this purpose, especially if new technology makes this component more efficient.

As outlined in the previous project outline section, GDDOC would bring global surveillance expertise including media and government source monitoring to this project. Although the group currently only looks at diseases and not conflict, the technical expertise that members of this team bring to their current work could easily transfer to violence and armed conflict.

4.3: Driving Principles

As with all projects that include human subjects or impact people's lives, the upmost attention to ethical standards and human dignity should be met. A conflict prevention project undertaken at CDC should be conducted in accordance with ERRB's operating values.

First, all data collected should be used to inform future project interventions or to improve the quality of the surveillance system. In other words, data should not be collected just because it is possible to do so; all data collected should have a clear and necessary purpose. Only information that is absolutely necessary to the project's function should be collected, especially when it is sensitive. The context of this project is an already dangerous one, and by working with data collectors at all, participants and researchers may be risking their own personal safety or that of their families and communities.

Additionally, information that is traumatic to recount, (e.g., physical assault, sexual assault, torture, witnessing the death of family or friends, etc.) should only be requested when resources are available to participants for mental health and psychosocial support. Recounting these events might force participants to relive them and add to the trauma or anxiety surrounding the event, negatively impacting their mental health.

All possible security measures should be taken to prevent the disclosure of sensitive information that could be traced back to any individual, group or community. This should be done in order to protect privacy of individuals as well as to protect these individuals from possible retribution by other groups in the conflict or from future prosecution. This could be done by de-identifying information, data storage methods and providing secure locations for data collection.

Finally, data should only be collected from individuals who have given full consent after showing full understanding of the goals and potential impacts of the project.

4.4: Tools

Various public health methods and tools should be employed for this project including media and other forms of remote monitoring (also referred to colloquially as 'big data'), surveys, focus group discussions, and in-depth or key informant interviews. These tools should be deployed at different points in the project. The goal of using each of these tools is to assess a given population's risk for imminent conflict and strategies that might be effective in preventing or mitigating that conflict. Each of these tools adds different elements of information that, when added together, produce a larger picture of the overall risk for conflict. These tools may also produce information from which researchers could infer or estimate other measures such as rate and impact.

Tools might be modeled on existing data collection tools or constructed intentionally for this project. Special attention should be placed on the global versus local context that each might be used in. Each tool used should include some aspects that are common no matter where the tool is deployed geographically, while other aspects must change depending on the geographical and/or cultural norms of the location(s) in which it is deployed. For example, a survey tool used in two settings will include some questions—such those addressing demographic characteristics or access to services—that are the same, while other questions—such as those addressing local perceptions of domestic violence or human rights—may differ considerably. If questions are asked in culturally inappropriate ways, they likely will not produce accurate information or will not collect the exact information the researcher thinks he or she is assessing, thus invalidating

his/her data interpretation. Because it is impossible to outline where the surveillance system might catch a possible case of armed conflict—and thus to predict where the survey would need to be deployed for further investigation—it is impossible to develop a culturally specific version of that survey too far in advance. Likewise, it is inefficient and probably impossible to construct culturally specific tools for all possible scenarios. Thus, globally adaptable frameworks for these tools with core data elements and optional culturally appropriate additions should be considered for all tools.

Additionally, it is important to validate each of these tools in order to confirm that they are assessing the information the researcher thinks he or she is assessing. Validation concerns the This process is especially important where researchers are working in situations that are culturally different from their own, where information may intentionally or unintentionally be misrepresented and conclusions based on data analysis might create large impacts. Validation might mitigate issues related to incorrect translation of terms, application of tools in ways that are unintended or culturally inappropriate, and misunderstandings among researchers and participants, as well as other unforeseen consequences.

In addition to previously discussed tools and methods such as surveys, focus group discussions, and in-depth or key informant interviews, checklists (as described in Atul Gawande's *The Checklist Manifesto*) could prove useful as a tool to quickly identify criteria necessary for inclusion as an armed conflict or the feasibility of given interventions. If standardized and validated correctly, can also provide useful frameworks for remembering criteria or variables.

4.5: Settings

Several organizations worldwide maintain conflict and other prediction modeling systems which could be considered or employed in the proposed surveillance system. One such prediction strategy is outlined by the PRIO research group and ACAPS humanitarian emergency monitoring. Both groups have produced reports outlining predictions for armed conflict—PRIO for the years 2008-2050 and ACAPS for the coming year (2017). Other organizations such as the International Crisis Group produce regular briefings on different settings predicted to imminently engage in armed conflict.

While it could be useful to examine these organizations' armed conflict prevention methods and tools when implementing the proposed conflict surveillance system, it is first necessary to implement a surveillance system and assess risk and protective factors for armed conflict and establish that a particular setting is at risk for conflict.

4.6: Populations

As with recommending particular settings for future research, it is likewise unnecessary and inefficient to recommend specific populations one would need to sample for future conflict prevention interventions. The first step in any intervention would be developing a useful and effective conflict surveillance system and pilot testing that system, leading to a recommendation about specific settings that might be at risk for imminent conflict. At this time, however, it is possible to propose various strategies for the hypothetical sampling of populations within settings identified by a surveillance system at risk for conflict.

Most importantly, when consulting populations at risk for imminent armed conflict, all groups and individuals should be appropriately included in data collection. This is sometimes

difficult when certain groups—such as women, the elderly, or ethnic minorities—are marginalized by the larger society and thus hidden from the larger conversation. Specific sampling methods should be employed to ensure that all affected groups are included when confirming the risk for conflict as in the surveillance system and intervention implementation. For example, 'snowball' sampling could be employed to include hard-to-reach populations. This method, while not random, entails recruiting individuals for data collection and encouraging those individuals to recruit their acquaintances, friends, relatives, or others with a common characteristic to also participate in data collection. This method relies on the assumption that individuals belonging to a certain group better know other individuals of that group than do outsiders, and thus have better access and trust of those individuals. Additionally, members of that hidden group might be less accessible for a reason, such as prosecution, shame, or physical safety. This is a particular concern when assessing risk for conflict as members of an opposition group—who would be a very necessary part of the population to sample—might have very real concerns about being named a member of such a group and thus might not be willing to come forward to participate in data collection despite being a very necessary part of the population to sample. Such sampling methods should be considered to include as many members of at-risk populations as possible.

Innovative methods could also be employed in preparedness projects associated with conflict prevention. One such method, vulnerability mapping, entails assessing a given geographical area for vulnerabilities—in this case, individuals who and areas that would be vulnerable to participating in or being affected by armed conflict. This method could be employed as a second method when confirming risk for conflict to make sure researchers have not forgotten vulnerable individuals.

Remote monitoring methods such as mobile data collection or media monitoring assumes that these technologies are available in some capacity to the population and setting being studied. This might not be true in all cases and should be considered when implementing a surveillance project. This is not to say that these methods should not be included in a surveillance project but that certain considerations also need to be included to ensure that all individuals who are potentially affected by an armed conflict are included in data collection and analysis.

4.7: Partners

It is in ERRB's best interest, if pursuing a conflict prevention project, to partner with organizations that have some experience in the field. These organizations should be based in or connected with the country or countries where the project will be implemented and have a history of successful project implementation, ideally on previous ERRB-affiliated projects. Like other sections in this recommendation, it is not useful to recommend specific organizations that are working in global conflict prevention currently and additionally, many organizations that indeed aim to mitigate armed conflict do not explicitly implement 'conflict prevention' programs and projects. These projects are often aimed at lessening the impact of likely direct and indirect causes of armed conflict such as equal access to clean water, land rights, and increased political access for all groups. Additionally, in some situations the most efficient organization to partner with to implement these programs may not be organizations at all but instead individual advocates or legislators dedicated to specific causes that best align with the conflict prevention project's aims. These individuals may be better integrated into the community they wish to influence, which could potentially lead to more community buy-in and project uptake.

4.8: Resources

A specific budget for the next steps of this project proposal would likely change when the project would be implemented. At this time, however, it is possible to outline the likely categories that would be necessary for the immediate next steps of a conflict prevention project and a short justification with possible examples of necessary materials. These categories are as follows below:

Personnel

As discussed, teams of surveillance specialists, trained in epidemiology and information monitoring preferably should be employed to design and oversee the surveillance aspect of the project. Additional personnel might include a program manager, data manager, survey specialists, qualitative research specialists, and monitoring and evaluation specialists.

Travel

During the second phase of the surveillance system, confirmation of the remote monitoring, it is likely necessary for research teams to deploy to given locations in order to collect data on given populations potentially at risk for conflict in person. These teams might be small and costs might be mitigated by collaborating with in country organizations for data collection, though this choice would incur costs of its own. Additional costs might include airfare, ground transportation, room and board, and incidentals.

Equipment

This section might include items such as computers, tablets, analysis software and other items necessary for conducting the project. If a training were conducted, training materials would also be required.

Supplies

This section could be combined with the above 'equipment' section, or kept as separate to include printing costs and other incidental items such as office supplies.

Consult/Contractual

Experts from fields other than public health, such as anthropology, sociology, history, and especially political science, among others should be consulted and collaborated with. Additionally, translation services, cultural services, enumerators, drivers, and in country staff might be necessary. Rental or office space might also be necessary for training or operational spaces.

4.9: Challenges

This section outlines some of the possible challenges to be anticipated prior to implementing a project on armed conflict prevention. These challenges include limits of research, risks to participants, risks to researchers, challenges in communicating the research aims to decision makers, and challenges in communicating the research outcomes to the public, stakeholders, and participants.

Risks to participants

One of the most dangerous challenges to consider before launching this project would be the risks to participants. These risks include physical safety, emotional/psychological trauma, and legal safety among others. By participating in a conflict prevention research project (pilot testing the confirmation stage of the surveillance system), individuals may reveal themselves as members of groups who are potentially at risk of being involved in or otherwise affected by armed conflict or violence. Even if an individual does not participate in data collection directly, he or she may have family members, friends or acquaintances, or members of his or her community who do, thus associating more individuals with the risk group. Finally, there is a possibility that members of ethnic, cultural, religious, or regional groups even loosely associated with the project or project findings might be labeled, 'at risk for conflict.' This label might stigmatize, ostracize, or otherwise negatively impact an individuals' ability to move, associate, work, or live his or her life freely. This might be especially true if the label puts this individual in opposition to a government or other group with power in the potential conflict.

Surveillance breaks down during conflict

During conflict, often there is a lack of reliable, systematically collected data on a variety of topics including public health measures such as mortality. This is one problem this project would be aiming to solve but it remains a difficult burden to overcome. It is true that the lack of information increases as the conflict intensifies and social services and government control wanes and thus if a conflict prevention project were intended to work in a temporal space before this breakdown in surveillance capacity, valid data would still be available to collect.

Limits of research

The first challenge to anticipate is that concerning the limits of this research. This project aims to identify armed conflict before it becomes a catastrophic problem for all involved and reaches a point where prevention and de-escalation strategies would no longer be viable. As with all surveillance systems, not all cases of armed conflict will be detected and some instances will be falsely labeled as armed conflict when they are not. The only way to mitigate these challenges is to improve the types of variables that are considered. While staying conscious of asking sensitive information, expanding the scope of the surveillance system to consider variables that would not normally be associated with armed conflict, such as access to water or land rights might alleviate some inherent bias. Additionally, identifying risk and protective factors for behaviors that might lead to armed conflict may prove difficult to define. These variables may be heavily dependent on cultural and environmental factors than previously thought thus making developing a standard definition of factors more difficult if not impossible.

Risks to researchers

It is likely necessary for at least at some point during the project to have data collectors deploy a research tool or implement an intervention. This could be in a context in which the researcher has never been before and would be seen as an 'outsider.' While this label can have positive implications for research- objectivity, a psychological distance from the situation, it is also likely to have negative consequences as well. There could be threats to his or her physical safety as well as miscommunication or cultural misunderstanding. Additionally, the information these researchers would seek may be seen as impolite, offensive or dangerous and communities

may not wish to cooperate or may see the researcher's presence as bringing danger to the community.

Challenges in communicating the research aims to decision makers

Another potential challenge could be communicating the aims of the research to decision makers. Unlike issues like disease, physical activity, and nutrition, armed conflict is not traditionally not considered a public health problem. Although violence prevention, including violence against children, elder neglect, and intimate partner violence, has been studied by public health professionals and researchers for decades, armed conflict and other collective violence have only recently become considered problems with public health implications and/or suitability for public health methods and interventions. Special care should be taken to explain the project rationale and methods.

Further there is a potential challenge to partners by virtue of their collaboration on this project. These organizations would likely undertake most of the 'on the ground' work and thus would be at most risk for physical attacks, either to their offices or personnel directly. Additionally, by partnering with ERRB on a conflict prevention project, these partners might endanger future funding sources, legal retribution from a government or other powerful group, as well as other unforeseen consequences of engaging in this type of project.

Challenges in communicating the research outcomes to the public and participants

Similarly, it should be anticipated that communicating the outcomes and aims of the project to the public and research participants will also be difficult. Not only is armed conflict not traditionally thought of as a public health problem but it is generally controversial, eliciting

strong reactions from many people even if they are not personally involved. Thus, any conclusions drawn from research in a current conflict or pre-conflict situation are likely to be met with skepticism and/or resistance, depending on the background of the individuals involved. It would be important to stress the impartiality and goals of the project to address this challenge.

Chapter 5: Conclusion

In conclusion, it is the opinion of this paper that the public health approach and epidemiologic methods should be applied to armed conflict prevention and resolution and that CDC ERRB does have the capacity and expertise to implement some portions of these projects. CDC ERRB should use its expertise specifically in the development of a case definition, identification of risk and protective factors and the implementation of a two-part surveillance system for armed conflict identification and prevention. Conflict prevention and resolution interventions should be separated and conducted independently, possibly by different types of organizations, and the public health approach and epidemiologic methods as they are investigated in this paper are better suited to conflict prevention projects. CDC and ERRB specifically do have the technical expertise and capacity to undertake aspects of conflict prevention projects but should collaborate or partner with other groups within CDC, particularly groups focused on disease monitoring and surveillance and/or organizations already monitoring armed conflict globally.

This paper recommends that the next step in implementing any conflict prevention project concerns developing a case definition for armed conflict, identifying risk and protective factors for groups and individuals, and pilot testing a two-part surveillance system that includes remote monitoring of possible conflict events and confirmation of surveillance-identified events. These project activities should be accompanied by a monitoring and evaluation framework to assess the project's effectiveness and efficiency in meeting stated project goals.

Finally, if these activities are deemed successful and worthy of continuation by the implementing organization, whether CDC or otherwise, conflict prevention interventions should be considered. It is only by expanding the scope of application of these epidemiologic methods

and the public health approach to include armed conflict as a public health problem that public health professionals and epidemiologists will truly be able to accomplish the foundational goal of all public health projects: to minimize morbidity and mortality of all people, everywhere.

References

Andersen, D., Barten, U., & Jensen, P. S. (2009). Challenges to Civil War Research Introduction to the Special Issue on Civil War and Conflicts. Journal On Ethnopolitics & Minority Issues In Europe, 8(1), 1-9.

A public health approach to understanding and preventing violent radicalization. (2012). BMC Medicine, 10(1), 16-23. doi:10.1186/1741-7015-10-16

Asal, V., Findley, M., Piazza, J. A., & Walsh, J. I. (2016). Political Exclusion, Oil, and Ethnic Armed Conflict. Journal Of Conflict Resolution, 60(8), 1343-1367. doi:10.1177/0022002714567948

Axworthy, L., & Dorn, A. W. (2016). New Technology for Peace & Protection: Expanding the R2P Toolbox. Daedalus, 145(4), 88-100.

Balendra, N. (2008). Defining Armed Conflict. Cardozo Law Review, 29(6), 2461-2516.

Basedau, M., Strüver, G., Vüllers, J., & Wegenast, T. (2011). Do religious factors impact armed conflict? Empirical evidence from Sub-Saharan Africa. Terrorism And Political Violence, 23(5), 752-779. doi:10.1080/09546553.2011.619240

Betancourt, T. S., & Khan, K. T. (2008). The mental health of children affected by armed conflict: Protective processes and pathways to resilience. International Review Of Psychiatry, 20(3), 317-328. doi:10.1080/09540260802090363

Clapham, C. (2000). Peacekeeping and the peacekept : developing mandates for potential intervenors. In e. a. Robert I Rotberg. (Ed.) , Peacekeeping and peace enforcement in Africa : methods of conflict prevention (pp. 34-57). World Peace Foundation.

Coupland, R. (2013). The role of health-related data in promoting the security of health care in armed conflict and other emergencies. International Review Of The Red Cross, 95(889), 61-71.

de Waal, A., Hazlett, C., Davenport, C., & Kennedy, J. (2014). The epidemiology of lethal violence in Darfur: Using micro-data to explore complex patterns of ongoing armed conflict. Social Science & Medicine, 120368-377. doi:10.1016/j.socscimed.2013.12.035

Esteban, J., & Schneider, G. (2008). Polarization and Conflict: Theoretical and Empirical Issues: Introduction. Journal Of Peace Research, 45(2), 131-141.

Gawande, A. (2010). The checklist manifesto: how to get things right. New York: Picador.

Gleditsch, N. P., Nordkvelle, J., & Strand, H. (2014). Peace research – Just the study of war?. Journal Of Peace Research, 51(2), 145-158. doi:10.1177/0022343313514074

Hegre, H., & Nome, M. A. (2010). Democracy, Development, and Armed Conflict. Conference Papers -- American Political Science Association, 1-32.

HEGRE, H., KARLSEN, J., NYGÅRD, H. M., STRAND, H., & URDAL, H. (2013). Predicting Armed Conflict, 2010-2050. International Studies Quarterly, 57(2), 250-270. doi:10.1111/isqu.12007

Hicks, M. H., & Spagat, M. (2008). The Dirty War Index: A Public Health and Human Rights Tool for Examining and Monitoring Armed Conflict Outcomes. Plos Medicine, 5(12), e243.

Horowitz, M. C. (2016). The Ethics & Morality of Robotic Warfare: Assessing the Debate over Autonomous Weapons. Daedalus, 145(4), 25-36. doi:10.1162/DAED_a_00409

Jayasinghe, S. (2014). The post-millennium development goals agenda: include 'end to all wars' as a public health goal!. Global Health Promotion, 21(3), 29-32. doi:10.1177/1757975914528251

Karen, D. (0010, July). In U.S. fight vs. Islamic State, words matter. Washington Post, The.

King, G., & Murray, C. L. (2001). Rethinking Human Security. Political Science Quarterly (Academy Of Political Science), 116(4), 585.

Krause, K. (2016). From Armed Conflict to Political Violence: Mapping & Explaining Conflict Trends. Daedalus, 145(4), 113-126. doi:10.1162/DAED_a_00416

Leaning, J., & Guha-Sapir, D. (2013). Natural disasters, armed conflict, and public health. The New England Journal Of Medicine, 369(19), 1836-1842. doi:10.1056/NEJMra1109877

Leaning, J. (2016). The Path to Last Resort: The Role of Early Warning & Early Action. Daedalus, 145(4), 101-112. doi:10.1162/DAED_a_00415

McDonnell, S. M., Bolton, P., Sunderland, N., Bellows, B., White, M., & Noji, E. (2004). The role of the applied epidemiologist in armed conflict. Emerging Themes In Epidemiology, 14-9. doi:10.1186/1742-7622-1-4

Meier, P. (2015). Digital humanitarians: how big data is changing the face of humanitarian response. Boca Raton, FL: CRC Press.

Murray, C. L., King, G., Lopez, A. D., Tomijima, N., & Krug, E. G. (2002). Armed conflict as a public health problem. BMJ (Clinical Research Ed.), 324(7333), 346-349.

Nilsson, A. (2013). Children and Youth in Armed Conflict. Leiden: Brill | Nijhoff.

Rodik, P., Penzar, D., & Srbljinovic, A. (2003). An Overview of Databases on Conflicts and Political Crises. Interdisciplinary Description Of Complex Systems, 1(1-2), 9-21.

Rothman, K. J., Greenland, S., & Lash, T. L. (2015). Modern Epidemiology. Philadelphia: Wolters Kluwer Health.

Salehyan, I., & Gleditsch, K. S. (2004). Refugee Flows and the Spread of Civil War. Conference Papers -- American Political Science Association, 1-30. doi:apsa_proceeding_28298.pdf

Satcher, D., & Higginbotham, E. J. (2008). The Public Health Approach to Eliminating Disparities in Health. American Journal Of Public Health, 98S8-S11. doi:10.2105/AJPH.2007.123919

Sen, A. (2013). Development as Freedom. Brilliance Corporation.

The causes of conflict and the promotion of durable peace and sustainable development in Africa. (1998). African Journal of International & Comparative Law, 549.

Utzinger, J., & Weiss, M. G. (2007). Editorial: armed conflict, war and public health. Tropical Medicine & International Health: TM & IH, 12(8), 903-906.

Valentino, B. (2016). Moral Character or Character of War? American Public Opinion on the Targeting of Civilians in Times of War. Daedalus, 145(4), 127-138.

Wallensteen, P. [. (2003). Conflict prevention methodology for knowing the unknown. In F. Möller (Ed.) , Uppsala peace research papers, 1650-2035 Department of peace and conflict research, Uppsala university.

Walzer, M. (2016). Just & Unjust Targeted Killing & Drone Warfare. Daedalus, 145(4), 12-24. doi:10.1162/DAED_a_00408

War: The Anthropology of Armed Conflict and Aggression. (1968). New York: Natural History Pr.

Weed, D. (2001). Methods in epidemiology and public health: does practice match theory?. Journal Of Epidemiology & Community Health, 104-110.

Whitaker, S. (2013). Preventing violent conflict: A revised mandate for the public health professional?. Journal Of Public Health Policy, 34(1), 46-54. doi:10.1057/jphp.2012.65

Wiist, W. H., Barker, K., Arya, N., Rohde, J., Donohoe, M., White, S., & ... Hagopian, A. (2014). The Role of Public Health in the Prevention of War: Rationale and Competencies. American Journal Of Public Health, 104(6), e34-e47. doi:10.2105/AJPH.2013.301778

Wimmer, A., Cederman, L., & Min, B. (2009). Ethnic Politics and Armed Conflict: A Configurational Analysis of a New Global Data Set. American Sociological Review, 74(2), 316-337.

Zifcak, S. (2012). THE RESPONSIBILITY TO PROTECT AFTER LIBYA AND SYRIA. Melbourne Journal Of International Law, 13(1), 59-93.

Appendix A: Public Health Approaches, Frameworks, Methods, Measures and Tools

Approaches and Frameworks

Public Health Approach: Seeks to improve the health and safety of all individuals by addressing underlying risk factors that increase the likelihood that an individual will become a victim or a perpetrator of violence" "Consists of four steps: 1. SURVEILLANCE To define the problem through the systematic collection of information about the magnitude, scope, characteristics and consequences of violence. 2. IDENTIFY RISK AND PROTECTIVE FACTORS To establish why violence occurs using research to determine the causes and correlates of violence, the factors that increase or decrease the risk for violence and the factors that could be modified through interventions. 3. DEVELOP AND EVALUATE INTERVENTIONS To find out what works to prevent violence by designing, implementing and evaluating interventions. 4. IMPLEMENTATION To implement effective and promising interventions in a wide range of settings. The effects of these interventions on risk factors and the target outcome should be monitored and their impact and cost-effectiveness could be evaluated." (FEEDBACK LOOP TO SURVEILLANCE M&E) "Public health aims to provide the maximum benefit for the largest number of people. Programs are designed for the primary prevention of violence based on the public health approach are designed to expose a broad segment of a population to prevention measure and to reduce and prevent violence at a population-level.

Human Security: An emerging paradigm for understanding global vulnerabilities whose proponents challenge the traditional notion of national security by arguing that the proper referent for security should be the individual rather than the state. People centered, multi-

disciplinary understanding of security involving a number of research fields, including development studies, international relations, strategic studies, and human rights." "In order to challenge global inequalities, there has to be cooperation between a country's foreign policy and its approach to global health. However, the interest of the state has continued to overshadow the interest of the people.

Global Burden of Disease: The collective disease burden produced by all diseases around the world. The Global Burden of Disease Study (GBD) is a comprehensive regional and global research program that assesses mortality and disability from major diseases, injuries, and risk factors.

The Ecological Framework: Based on evidence that no single factor can explain why some people or groups are at higher risk of interpersonal violence, while others are more protected from it." "Treats the interaction between factors at the different levels with equal importance to the influence of factors within a single level.

Research Methods and Study Designs

Survey: A systematic canvassing of persons to collect information, often from a representative sample of the population

Individual In-Depth Interview: In-depth interviewing is a qualitative research technique that involves conducting intensive individual interviews with a small number of respondents to explore their perspectives on a particular idea, program, or situation.

Focus Group Discussion: Focus groups are a data collection method. Data is collected through a semi structured group interview process. Focus groups are moderated by a group leader. Focus groups are generally used to collect data on a specific topic.

Modeling: A systematic description of an object or phenomenon that shares important characteristics with an object or phenomenon. Scientific models can be material, visual, mathematical, or computational and are often used in the construction of scientific theories. See also hypothesis, theory.

Surveillance: Surveillance may be carried out to monitor changes in disease frequency or to monitor changes in the levels of risk factors.

Monitoring and Evaluation:

Monitoring: A continuing function that aims primarily to provide the management and main stakeholders of an ongoing intervention with early indications of progress, or lack thereof, in the achievement of results. An ongoing intervention might be a project, programme or other kind of support to an outcome.

Evaluation: A selective exercise that attempts to systematically and objectively assess progress towards and the achievement of an outcome. Evaluation is not a one-time event,

but an exercise involving assessments of differing scope and depth carried out at several points in time in response to evolving needs for evaluative knowledge and learning during the effort to achieve an outcome. All evaluation- even project evaluations that assess relevance, performance and other criteria- need to be linked to outcomes as opposed to only implementation or immediate outputs.

Reporting: An integral part of monitoring and evaluation. Reporting is the systematic and timely provision of essential information at periodic intervals.

Case Control Study: To examine the possible relation of an exposure to a certain disease (called cases) and, for purposes of comparison, a group of people without that disease (called controls). We determine what proportion of the cases were exposed and what proportion were not. We also determine what proportion of the controls were exposed and what proportion were not.

Cohort Study: The investigator selects a group of exposed individuals and a group of non-exposed individuals and follows up both groups to compare the incidence of disease in the two groups. The design may include more than two groups, although only two groups are shown for diagrammatic purposes.

Randomized Controlled Trial: A clinical trial in which persons are randomly assigned to exposure or treatment groups

Cross-Sectional Study: Used to investigate etiology of disease, both exposure and disease outcome are determined simultaneously for each subject; it is as if we were viewing a snapshot

of the population at a certain point in time. Imagine that we have sliced through the population capturing variables and outcomes at the same time. identify prevalent cases

Mixed Methods: Mixed methods research is more specific in that it includes the mixing of qualitative and quantitative data, methods, methodologies, and/or paradigms in a research study or set of related studies.

Epidemiologic Measures

Risk: The probability that an event will occur

Rate: An expression of the relative frequency with which an event occurs among a defined population per unit of time, calculated as the number of new cases or deaths during a specified period divided by either person-time or the average (midinterval) population. In epidemiology, it is often used more casually to refer to proportions that are not truly rates (e.g., attack rate or case-fatality rate).

Odds: The ratio of the number of ways the event can occur to the number of ways the event can occur to the number of ways the event cannot occur

Prevalence: The number of affected persons present in the population at that time, that is, what proportion of the population is affected by the disease at that time?

Incidence Density/Incidence Rate: The number of new cases of a disease that occur during a specified period of time in a population at risk for developing the disease

Mortality Rate: The total number of deaths from all causes in 1 year divided by the number of people in the population at midyear

Risk Ratio: A measure of association that quantifies the association between an exposure and a health outcome from an epidemiologic study, calculated as the ratio of incidence proportions of two groups

Years of Potential Life Lost (YPLL): A measure of premature early mortality or early death. Recognizes that death occurring in the same person at a younger age clearly involves a greater loss of future productive years than death occurring at an older age. Two steps are involved in this calculation: In the first step, for each cause, each deceased person's age at death is subtracted from a predetermined age at death. In the second step, the 'years of potential life lost' for each individual are then added together to yield the total YPLL for the specific cause of death. It is important to note what assumptions the author has made, including what predetermined standard age has been selected.

Quality of Life: Diseases that may not be lethal may be associated with considerable physical and emotional suffering resulting from disability associated with the illness. It is important to consider the total impact of a disease as measured by its effect on a person's quality of life, even though such measures are not, in fact, measures of disease occurrence.

Rate Ratio: A measure of association that quantifies the relation between an exposure and a health outcome from an epidemiologic study, calculated as the ratio of incidence rates or mortality rates of two groups

Reliability: If the results of the test are repeatable

Confidence Interval: A range of values for a measure (e.g. rate or odds ratio) constructed so that the range has a specified probability (often, but not necessarily 95%) of including the true value of the measure

Validity: The tests ability to distinguish between who has a disease and who does not.

Bias: The way in which cases controls or exposed and unexposed individuals were selected is such that an apparent association is observed- even if in reality exposure and disease are not associated the apparent association is a result of selection bias

Confounding: The distortion of the association between an exposure and a health outcome by a third variable that is related to both.

Tools

Mobile Data Collection:

ODK: Open Data Kit is an open source (free and available to the public) set of tools which help organizations author, field, and manage mobile data collection solutions. ODK allows users to build a data collection form or survey, collect the data on a mobile device and send it to a server, and aggregate the collected data on a server and extract it in useful formats.

Appendix B: List of terms related to Armed Conflict

Armed Conflict

War

Civil War

Collective Violence

Genocide

Ethnic Cleansing

Counterinsurgency

Military Operation

Interstate War

Intrastate War

Military Action

Military Campaign

Combat (Active Combat)

Hostilities

State of War

Insurgency

Rebellion

Revolution

Police Action