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Seeing and Treating Violence as a Health Issue

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Violence should be defined globally as primarily a health issue-and health approaches should be utilized to understand, detect, interrupt, and prevent events and outbreaks and reduce its spread. Although violence is commonly understood by the general public and mostly treated by our governmental and nongovernmental institutions as a problem of "bad" people, the health sector understands it differently. Violence is not a human universal-it does not occur in all societies (e.g., Robarchek 1980). Rather, violence is a behavior or set of behaviors that are acquired mostly through social learning (Bandura, Ross, and Ross 1961; Akers 1985). Further, relatively standard and well-tested and highly effective public health approaches are being increasingly applied to the problem of violence and are showing strong evidence of impact among individuals and communities. The active involvement of the health sector in the treatment of violence is long overdue, specifically through more operational and vigorous implementation of the means of prevention and epidemic control that the health sector knows well.

In this chapter, we make the case for viewing violence primarily as a health issue and we define the roles of the health sector in addressing violence. We also address how the health sector's response to violence fits into a larger context that also includes the community, schools, mental health, and social services. It should be noted that appropriately defining violence as a health issue should not be read as redefining or changing the role of law enforcement or other sectors, because critical roles for law enforcement are important even in more ordinarily accepted epidemic disease control situations (e.g., Patil 2014). Law enforcement and the health approach are complementary and in many ways law enforcement works toward prevention and incorporates many health-based principles and approaches as well. We will

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clarify the value of defining and understanding violence as a health issue and then describe how the health sector can quickly increase its involvement and efficacy in treating violence, to save lives, and accomplish better outcomes for individuals and communities.

Evolution of Violence as a Public Health Issue

Violence is both a health and a public health problem. It is a health problem because there is a specific health lens that helps us in science and in the application of science in getting better outcomes. By understanding violence as a health problem, we can recognize that the *people* themselves doing violence as well as those who have been affected through injury and exposure essentially *have a personal health problem*—a problem of exposure, contagion, and trauma or pain. Violence is a public health problem because it is also a serious *threat to the health of populations and* because *public health techniques* are effectively utilized to reduce the prevalence and incidence of violence and make communities safer and healthier. We will introduce some of the public health discussion first and then come back to health.

For decades, violence has been viewed as a public health issue (Dahlberg and Mercy 2009), motivated initially by the fact that violence injures and kills *many people* (Cron 1986). Internationally, it is estimated that more than 1 billion children—half of all children in the world—are exposed to violence every year (CDC 2015) and over 1 million are estimated to be killed every year as a result of all forms of violence (Krug *et al.* 2002).

Increasingly, violence has also been viewed as a public health issue because of the extremely harmful effects of exposure to violence on a wide array of other types of very serious health problems, including life threatening chronic diseases such as cancer and heart disease (Felitti *et al.* 1998), infectious diseases such as HIV (Jewkes *et al.* 2010), as well as serious mental health problems (Singer *et al.* 1995). Exposure to violence is therefore an enormous concern to both public health and health practitioners—and to all of us.

Typical public health approaches to violence involve multiple disciplines, emphasize collective action, and are based on the scientific approach—which includes gathering information, identifying causes and other factors, exploring methods of prevention, and disseminating evidence-based approaches (Krug *et al.* 2002; Mercy *et al.* 1993). Public health approaches are also frequently categorized as primary (early intervention before manifestation or problem), secondary (more immediate responses to violence), or tertiary (long-term care in the wake of violence) (Krug *et al.* 2002). Public health approaches can be further characterized by the groups that they target—general population, at risk, and actively involved (Krug *et al.* 2002).

The vision of violence as a public health issue is an important shift in the approach to addressing violence—from reactive to preventative through a focus on social, behavioral, and environmental factors (Mercy *et al.* 1993). The utilization of the scientific approach has also ensured that effective approaches are utilized and

replicated. Furthermore, the public health lens has helped people to understand the problem of violence as a community problem and has led to community-level solutions (Mercy and Hammond 1998).

Why Violence Should Be Seen as a Health Issue

The health perspective on violence prevention is a much more fundamental shift in our understanding of violence and suggests a more comprehensive and deeper understanding of the people involved themselves and why violence is present. The *health* perspective is about *understanding* based in physiology, biology, neuroscience, psychology, and sociology. It is ethnic, cultural, racial, gender, class, and sexual orientation neutral, though it accounts for different influences and manifestations. There is no role for punishment in health-based solutions. Harm is to be avoided at all costs. Thinking about good and bad people is replaced by good and bad outcomes and with people viewed under contextual, biological, environmental, and social influences. Although all of our systems are imperfect, the biases ofhealth-based solutions are prevention, behavior change, and helping those in greatest need. The health system provides education, guidance, and care. *Care* is the fundamental guiding principle of health and health systems, and prevention is a way of giving care in advance of things going too far.[1]

The emergence of the public health framing of violence is an incredibly important innovation and has been instrumental in reversing the rates of violence in many countries throughout the world (Krug *et al.* 2002; Kieselbach and Butchart 2015). Public health then is a subset of health and is an application of health principles to the community. This broader framing of violence as a health issue therefore includes applying public health methods and helps make the case for a prevention and public health approach. The health and public health ideas share the need to involve multiple disciplines, emphasize collective action, and utilize the scientific approach including using evidence-based and evidence-informed models. However, where the health approach adds the most is in the seeing and understanding of the person him/herself through the health lens-and as fundamentally having a health problem.

Violence as a Contagious Process

Violence is a health issue because it can be addressed through both personal care and broader public health approaches, but it is also a health issue because it fulfills the criteria of an epidemic and contagious disease. Not all health or public health issues do. The management of contagious or epidemic processes are a subspecialty within health and public health-as additional steps and methods are required and a full system is required for personal, family, contact, and community management.

Violence meets both the definitions of contagious and of disease, and also meets the specific individual and population criteria of contagious diseases (Slutkin 2013a).

Violence has been shown to cluster (Sherman, Gartin, and Buerger 1989; Slutkin 2013a; Buhaug and Gleditsch 2008; Gould, Wallenstein, and Kleinman 1990) and spread geographically (Zeoli *et al.* 2014; Cohen and Tita 1999) just like epidemic diseases. Violence also has been shown to transmit (cause more of itself)-and does so between individuals for many types of violence, including child abuse (Widom 1989; Egeland, Jacobvitz, and Sroufe 1988), community violence (Bingenheimer, Brennan, and Earls 2005; Kelly 2010), intimate partner violence (Ehrensaft *et al.* 2003; Black, Sussman, Unger 2010), and suicide (Gould *et al.* 2010) as well as transmit *between* syndromes. For example, those exposed to war violence have an increased risk of perpetrating community violence (MacManus *et aL* 2013) and those exposed to community violence have an increased risk of perpetrating domestic violence (Mullins *et al.* 2004).

Further, in recent years, much progress has been made in understanding *how* violent behavior is transmitted-both in terms of social psychology as well as the underlying brain. At the individual level, violence is transmitted through social learning or modeling. Many behaviors have been shown to spread in this manner (Christakis and Fowler 2009) because much of our behavior is developed through modeling (Slutkin 2013a; Bandura 1977) including, and especially, violence (Bandura, Ross, and Ross 1961; Akers 1985). People not only copy their friends, but also their friends' friends, and their friends' friends' friends (Christakis and Fowler 2009). Neuroscience researchers theorize that mirror neurons may have something to do with this unconscious learning process, as these neurons have been shown to fire both during an action and during observation (lacoboni 2009; Iacoboni *et al.* 2005).

At the group level, violent behavior also transmits through social norms and scripts. For example, in a climate of chronic community violence, violence becomes the accepted or even expected response to conflict, including small disputes, perceived slights, or insults. Such street codes emphasize toughness and quick, violent retribution for transgressions against one's sense of self or insults to one's reputation. Failure to respond can become perceived to be or thought to be perceived to be a sign of weakness with a possible ensuing loss of status which can be thought to predispose the individual to further victimization (Anderson 2000; Wilkinson 2006). Similar norms and expectations also play a significant role in perpetuating other types of violence, including child abuse (Spinetta and Rigler 1972), intimate partner violence (Ahmad *et al.* 2004; Yoshioka, DiNoia, and Ullah 2001), bullying (Nesdale *et al.* 2008), law enforcement violence (Westley 1953; Westley 1970), and post-conflict violent communities (Ember and Ember 1994).

Through the lens of neuroscience, transmission through social norms is thought to occur because social pain associated with exclusion is experienced much like physical pain and in fact the same areas of the brain are involved in processing both types of pain (Eisenberger 2008, 2012; Kross *et al.* 2011; Eisenberger, Lieberman, and Williams 2003; Macdonald and Leary 2005). Similarly, social approval has been linked to dopamine pathways. (Baumeister and Leary 1995; Izuma, Saito, Sadato 2008). In other words, social norms transmit behavior through an innate desire to avoid pain and obtain "pleasure;' in this case anticipation of social acceptance, approval, or status as reward.

Violence has the added effect of being a traumatic experience, which can have a profound mental impact and physiological effects (Slutkin 2013a). Exposure to violence can lead to several adaptive responses including aggression, impulsivity, depression, stress, and exaggerated startle responses (Singer *et al.* 1995; Schuler and Nair 2001; Mead, Beauchaine, and Shannon 2010), as well as changes in our neurochemistry including degrading monoamine neurotransmitters (MAOA), a flood of neuroendocrine responses, and changes to the brain structure (such as hippocampal volume and prefrontal cortex abnormalities) (Child Welfare Information Gateway 2015; McCrory, De Brito, and Viding 2010; Mead, Beauchaine, and Shannon 2010; Wilson, Hansen, and Li 2011; Hanson *et al.* 2010; Perry 2001).

Not everyone who is exposed to violence becomes violent, just as not everyone exposed in other epidemics (for example, colds, flu, tuberculosis, etc.) contracts the problem or disease following exposure. As with diseases, many risk factors[2] help determine whether the violence contagion is more or less likely to "take"-or result in its effects being incorporated in the individual as symptoms likely to present at some time in the future. Age is a particularly important factor for violence, as it is for diseases such as influenza (Taubenberger and Morens 2006) and tuberculosis (Comstock 1982). Children and adolescents are more susceptible to picking up violent behaviors in part because their brains are more malleable (Perry *et al.* 1995) and are more prone to making risky choices, particularly when the risk is ambiguous (Van Leijenhorst *et al.* 2010; Tymula *et al.* 2012). Studies have also shown that adolescents have an elevated neurological response to gains that leads to greater reward seeking (Galvan 2010; Van Leijenhorst *et al.* 2010) and that their choices are more driven by occasional outcomes than adults (Van Duijvenvoorde *et al.* 2012). Finally, adolescents are less able to take others' perspectives into account and in general have diminished decision-making capabilities (Van Duijvenvoorde and Crone 2013).

The dose-essentially the amount or intensity of the exposure to violence-can also affect acquisition of violent behavior. Violence exposure has been shown to have a cumulative effect on trauma (Dubow *et al.* 2012) and those with chronic exposure have shown a more than 30 times greater risk of future violent behavior than low exposure (Spano, Rivera, and Bolland 2010). Context is also important; for example, the presence of peers has a clear effect on whether a person chooses to engage in risk-taking behavior (Chein *et al.* 2011). This dose responsiveness implies an acquired and biological phenomena (Nelson and Williams 2014).

It might be worthwhile to consider that *Dorland's Illustrated Medical Dictionary* (Dorland 2010) defines a disease as: "any deviation or interruption of structure or function of a part, organ, or system of the body, as manifested by characteristic symptoms and signs (causing morbidity and mortality); the etiology, pathology, and prognosis may be known or unknown:'

It is known that violence does affect the structure and function of the brain, does have characteristic signs and symptoms, and does causes morbidity and mortality. Violence also shows all of the characteristics of an *epidemic* type of disease-including clustering, spread, and transmission. Further, violence has been shown to be responsive to health approaches, including epidemic control

approaches (Skogan *et al.* 2009; Webster *et al.* 2012; Picard-Fritsche and Cerniglia 2013; Henry, Knoblauch, and Sigurvinsdottir 2014) and hospital-based interventions (Purtle *et al.* 2013).

Even for those not willing to accept violence as a contagious disease, its contagious nature and role as a health problem can still be recognized. There is still much to be worked out in understanding the pathogenesis of violence as a contagious health problem, as is the case for many other health problems, but enough is now known-about how violent behavior is formed, how it affects people including their brain and other systems, and how it spreads in individuals and communities-to change our perspective about how we understand and treat violence.

The Importance of the Health Perspective

The health perspective is important because it is based on a scientific understanding that reveals to us that violence is a behavior developed through exposure and is thereby transmissible, allowing us to see and understand people differently. Every response to violence should be based on this scientific understanding.

The health perspective then allows us to move away from the moralistic perspective that understands violence as caused by "bad" people and "evil:' There is no science in moralistic explanations. Moralism as a perspective on violence is completely subjective. Often, perpetrators of violence believe that they are in the right or that their behavior was appropriate (Fiske and Rai 2014; Kelty, Hall, and O'Brien-Malone 2012). A young person from a violent community may believe he is right or justified in avenging his friend's killing-he may even believe that such vengeance is expected. A police officer might believe he is right or justified in acting violently with a suspected person in certain circumstances. A government might believe it is right or justified in bombing a community. For each of these cases, an opposing moralistic perspective exists. However, from a health perspective, the preferred outcome is objective and clear: to maintain and improve the physical, mental, psychological, and emotional wellbeing of each individual and of the community.

The health perspective is also important because it emphasizes preventing violence rather than simply reacting to it. We can detect and successfully treat people before they become violent by understanding the effects of exposure to violence, the symptoms (and latency) of violent ideation, and the effectiveness of particular methods of behavior change, care, or treatment. Furthermore, understanding and trying to reduce additional risk factors (and enhance protective factors) can and should be used to help persons become less susceptible and increase resistance to the transmission and progression (or pathogenesis) of violence.

Some may not understand health as preventative, instead viewing health in terms of medical treatment for a particular physical condition. However, much of what health sector professionals do is prevention and this is often done through helping people to change and supporting this change. In fact, the "prevention of the three leading causes of death in the United States-heart disease, cancer, and stroke-rests

largely on behavioral modifications"-in these cases exercise, changes in diet, and cessation of smoking (Dahlberg and Mercy 2009). The same approaches used by the health sector against these causes of death can also be utilized to detect and treat violent behavior. Likewise specific community-based methods can be used to interrupt spread and change norms as for epidemic diseases.

With a new scientific understanding of violence as a contagious health problem, our approach to violence can fundamentally change. We recognize health as the proper perspective for other behaviors such as smoking behavior, sexual behavior, eating behavior, drug using behavior, and so on. In the same way, we must recognize that the health perspective is essential to properly and effectively addressing violent behavior.

The Health Approach to Reducing Violence

Many programs, models, and system changes are already being used in implementing a health approach to violence, although some may not identify their approach as such. Health approaches for preventing violence are those that are based on an understanding of how violent behaviors are formed and of the effects of exposure to violence; that apply a preventative approach; that use evidence-based or evidence-informed approaches; and that are nonjudgmental, have a commitment to do no harm, and approach people through the lens of care. Health approaches to violence typically fall into four categories, which can be implemented in combination or individually.

The first strategy centers on stopping the transmission of violence by detecting situations in the community where the risk of future violence is high and preventing these situations from becoming lethal, thus *interrupting* the contagion where it is potentially occurring. This prevents events and reduces further exposure. Preventing retaliations is one of the ways of working in this area, however, it is equally or even more important that health outreach specialists prevent "first events:' One example of this approach is the violence interrupters from the Cure Violence program, who detect group or individual conflicts and mediate these conflicts before they become lethal (Skogan *et al.* 2009; Webster *et al.* 2012; Ransford, Kane, Slutkin 2013; Slutkin, Ransford, Decker 2015). This approach is now being implemented in over 60 communities in the United States as well as in Latin America and the Caribbean, South Africa, and in early forms of adaptation in the Middle East and elsewhere. An important part of the interrupter and outreach approach is a focus in the hospital in order to prevent retaliation to shooting events (Purtle *et al.* 2013; Cunningham *et al.* 2009; Zun, Downey, and Rosen 2006). It is critical that highly trusted community-based health workers provide these services and in a confidential way so as not to dissuade people from seeking care. Similar health-based outreach methods exist to interrupt ongoing violence for child abuse, intimate partner violence, and elder abuse, often through detecting the abuse and referring to intervention (US Preventive Services Task Force 2013). Interruption itself helps to stabilize communities and also helps to shift norms (Webster *et al.* 2012).

The second strategy focuses on identifying and treating those at highest risk for violent behavior. A health approach can effectively detect cases of potentially violent individuals, in the same way that disease control specialists, case workers, and other health outreach workers detect those suspected of having tuberculosis, syphilis, gonorrhea, HIV/AIDS, or even Ebola-all of which also are not obvious, frequently hide from persons with authority,[3] and are hard to reach without very high and very local credibility, access, and trust that only the right health workers can provide (e.g., Aggleton *et al.* 1994).

The public health community refers to proactive detection as *"active casefinding;'* which differs from "passive case finding" in that it does not rely solely on referrals, but instead actively seeks out cases that need most attention. Programs that have done this type of outreach identify those at high risk and treat them to address their needs and reduce their risk for violent behavior, including for community violence (Spergel, Grossman, and Wa 1998; Skogan *et al.* 2009), suicide (Motto 1979), and war violence (Espie *et al.* 2009).

Identification and treatment of those at risk for violence works because people can be changed and their risk for behaving violently can be diminished. Many effective treatment options exist that both treat existing trauma and help provide resistance and resilience to exposure. For some, a positive role model and mentor may be effective (Tolan *et al.* 2008), while others may need a treatment program such as cognitive behavior therapy or functional family therapy (Lipsey 2009).[4] These types of treatment are particularly important for those at high risk, but it is also important to provide treatment for everyone traumatized by exposure to violence-both direct and indirect exposure. There are many effective treatments for people with differing levels of exposure (see NCTSN 2015 for examples). While not everyone exposed will need treatment, it is important to seek out those who do need more extensive help.

The third type of health strategy addresses environmental factors to reduce the community's susceptibility or increase its resistance to the violence contagion. These approaches typically address two areas of environmental factors: community norms and social determinants of health. Working to change the norms that encourage the use of violence both reduces susceptibility by discouraging and challenging negative norms, and increase resistance by amplifying positive norms. Addressing social determinant of health also work to affect the susceptibility or resistance through other outside factors, including addressing issues related to employment, built environment, and social cohesion and support. Most programs addressing these social determinants do not specifically seek to reduce violence only, but it is one of the many positive effects. One example is the greening of vacant lots to reduce the number of areas where violent events would be likely to occur (Branas *et al.* 2011; Garvin, Cannuscio, and Branas 2013). Other programs seek to build a community's resilience through linking a network of adaptive capacities such as social capital and economic resources (Norris 2008), or through urban upgrading to improve the general conditions and quality of life in a certain communities-for example, through the provision of clean piped water, electricity,

basic health care, and school facilities, or by providing parks and other public places for leisure activities (Kieselbach and Butchart 2015).

The fourth type of health strategy addresses risk factors (and protective factors) that affect an individual's susceptibility or resistance to the violence contagion, and also includes many social determinants of health. One of the primary methods of doing this is by addressing mental health issues that can increase the risk of being traumatized, such as depression, anxiety, and alcohol and drug use. Individuals can also use various approaches to increase resilience, including constructing and maintaining social support networks as well as cognitive and behavioral interventions (Southwick and Charney 2012; Luthar and Cicchetti 2000; Luthar, Cicchetti, and Becker 2000; Masten, Best, and Garmezy 1990) or developing skills in mediation or mindfulness (Farb *et al.* 2007).

All of these approaches address violence as a health issue and as a behavior and implement health methods that reduce the likelihood of that behavior occurring. Multiple approaches should have a cumulative effect and all approaches should be carefully monitored and adjusted as needed.

The Epidemic Control Approach to Reducing Violence

Epidemic control is a subspecialty of public health with specific considerations, concerns, and methods. The epidemic control requirements for reducing violence begins with clearly recognizing the existing science that violence is contagious (IOM 2013; Slutkin 2013a, 2013b) and therefore that the methods used to stop epidemics, can be successful in stopping violence. The epidemic control method specifically combines many of the elements of a health model outlined above, including stopping transmission, treating the highest risk, and addressing norms. One prominent example of the epidemic control method of violence prevention is the Cure Violence Health Model, which adapts the World Health Organization's model for addressing other epidemics (Heymann 2008). Cure Violence outlines its main components as follows.

1. Detect and interrupt the transmission of violence-by anticipating where violence may occur and intervening before it erupts.
2. Change the behavior of the highest potential transmitters-by identifying those at highest risk for violence and working to change their behavior.
3. Change community norms-by influencing social norms to discourage the use of violence.

A central characteristic of the Cure Violence model is the use of credible messengers as workers-individuals from the same communities who are trusted and have access to the people who are most at risk of perpetrating violence. Those hired can include people who have formerly been involved in violence, but have changed their behavior. Because Cure Violence workers have access and trust, they are able

to talk about violent behavior credibly and persuade high-risk individuals to resist behaving violently. Intensive and very specific training is required, but hiring the right workers is essential to get the access, trust, and credibility required for the job-as for all health workers attempting to access hard to reach populations of any type (McDonnell 2011).

Changing behaviors and norms becomes profoundly easier when the change agents have credibility with the populations being served. The credibility allows access to individuals and communities that can lead to the types of conversation and participation needed to achieve positive outcomes. While it is certainly possible for people from many different backgrounds to be credible, as with other community health workers, people from the same community who have had similar experiences are most likely to be able to be credible.

The Cure Violence approach is being implemented in more than 60 communities across seven countries. The model has been externally evaluated four times, with each evaluation showing large, statistically significant reductions in gun violence. Studies by Northwestern University and Johns Hopkins University showed 41 to 73 percent reductions in shootings in neighborhoods in Chicago (Skogan *et al.* 2009)[5] and as much as a 56 percent decrease in killings in Baltimore (Webster *et al.* 2012), while an evaluation by the Center for Court Innovations showed that the area in New York City in which the program operated went one year without a killing and had 20 percent fewer shootings compared to the trend in the neighboring communities (Picard-Fritsche and Cerniglia 2013). An evaluation of the program from 2012 to 2013 in Chicago found a 31 percent reduction in killings in the two target districts (Henry, Knoblauch, and Sigurvinsdottir 2014).

The international adaptations of the Cure Violence model have also demonstrated large reductions, although formal evaluations are needed to determine causality. In three communities in San Pedro Sula, Honduras, the program implementation has coincided with 73 percent-86 percent reductions in shootings and killings.[6] In the target community in Cape Town, South Africa, there has been a reduction of 52 percent in gang-related killings.[7] In Loiza, Puerto Rico there was a 50 percent reduction in killings associated with first year of implementation of the program.[8] In Ciudad Juarez, Mexico, after implementation of Cure Violence the rate of killing dropped by 24.3 percent.[9]

Activating a Full Health Approach

The health sector can be much more fully utilized to reduce violence than we have seen utilized so far. What is needed from the health sector was identified 30 years ago by the United States Surgeon General C. Everett Koop's Workshop on Violence and Public Health: "education of the public on the causes and effects of violence, education of health professionals as to better care for victims and better approaches to violence prevention, improved reporting and data-gathering, some additional research, and increased cooperation and coordination-networking if you will among

health and health-related professions and institutions" (Cron 1986). In essence, Dr Koop saw the need for a health system to respond to violence as a health problem in a much more energized and comprehensive way.

Despite Dr. Koop's call three decades ago, the health sector today remains severely underutilized. Below we outline a framework for a full health approach to violence. We will describe very briefly the roles for the institutions in the health sector, roles for different types of health professionals, and the ways in which sectors outside of the formal health sector can also utilize elements of the health perspective with the goal of reducing violence.

Ministries of health and health departments

Since it has been decades that violence has been viewed as a public health issue (Dahlberg and Mercy 2009), and since then multiple intervention have been more fully developed (WHO 2015; Krug *et al.* 2002; Skogan *et al.* 2009; David-Ferdon and Simon 2012; Weiss and Kelly 2013; Purtle *et al.* 2013), it is time for ministries of health and health departments to play a much more active and prominent role in violence. As the agency of government responsible for issues related to the health of the populations, ministries of health and health departments assume these responsibilities by assessing and analyzing data on violent events, locations, characteristics, and trends from hospitals, police, medical examiners, universities, the community, and other sources to provide improved information on violence for analysis, intervention, and for educating the public. Educating the public is a critically important role for health leaders.

Ministries of health and health departments also need to be involved in identifying, disseminating, and evaluating evidence-based strategies to prevent violence, change behaviors, and reduce susceptibility and enhance resistance to violent behavior. Depending on what the data shows a community most requires, this work may include a full epidemic approach to violence or specific targeted elements of a health approach such as marketing efforts to change norms about violence and promote health behaviors that prevent violence. Since violence always has the potential to act in an epidemic fashion, appropriate health-based strategies need to be put into place.

When there is any type of violence in a community-community violence, child abuse, intimate partner violence, elder abuse, sexual abuse, or suicide-the ministry of health or health department should be "out front:' When the public wants to understand why "senseless" violence is occurring in a community, the ministries of health or health department should be offering answers that help people "make sense" of it-as a contagious issue related to exposure-to understand the scientific explanation for why violence occurs and to explain and likewise outline the response to prevent future events.

Ministries of health and health departments should coordinate community-based efforts as well as the relationship between community-based efforts and hospitals to

prevent events, including the prevention of spread once events have occurred through interrupters and outreach workers based in community organizations, as well as monitor their performance and results (Ransford, Kane, Slutkin 2013).

Hospitals, trauma centers, and emergency rooms

Hospitals are an important setting for health responses to violence because victims of violence often come to hospitals to seek treatment. Hospitals need to implement measures to properly detect and treat victims of violence.

First, hospitals must make an assessment of the types, severity, and amount of violence that the hospital treats to determine what type of approaches should be implemented. At a minimum, hospitals should include violence in their community health needs assessment and implementation plan. Hospitals should also implement a screening tool to determine if a patient has been a victim of violence, and then have a set of referral options for the patient, including resources for conflict mediation, behavior change, domestic violence services, trauma treatment, and mental health care.

If a hospital treats a high volume of victims of community violence, it should implement a hospital-based program to prevent relapses, prevent retaliation, treat mental trauma, and address behavioral effects; such programs have been shown to have significant effects on reducing re-injury (Smith *et al.* 2013). If community outreach programs are available, the hospital should be connected with these programs to provide long-term treatment when needed.

Mental health centers

An important element of preventing violence is the treatment of those who are at risk for becoming violent and those who have been heavily exposed. As described above, exposure to violence is a significant risk factor. For this reason, efforts to prevent violence need to include treatment of the trauma associated with exposure. Mental health centers are an ideal venue for this type of service because of their experience in treating mental health issues generally. Mental health centers need to increase capacity so that they can treat exposure to violence and meet the need of the large amount of untreated people.

Health and mental health centers in schools and prisons

Any institution with a medical facility should adopt strategies to address violent behavior based on their need. In particular, schools and prisons need to implement health approaches to violence prevention based on the needs of the populations that they serve. Schools in all communities should be trained to detect violence

exposure and refer exposed people to appropriate treatment, particularly in high violence communities but also in other communities because domestic violence is so prevalent.

Medical facilities in prison systems are a crucial part of a health system to address violence because very high percentages of persons who are incarcerated have been exposed to violence and suffer trauma from this exposure (James and Glaze 2006). Furthermore, those in prison are victims of violence at very high rates (Wolff and Shi 2009; Mendel 2011). It is well known that trauma can also occur to a person while incarcerated. Our current system is releasing highly traumatized individuals back into the community without any treatment for their serious conditions, which plays a large role in exacerbating violence in communities (IOM 2013). Equipping prisons to treat exposure to violence is a crucial element for stemming the cycle of violence.

Within other institutions, including daycare centers, corporations, government agencies, universities, medical facilities, and people serving medical roles should also be trained to respond to violence exposure. At a minimum this should include training in how to screen for exposure to violence and make appropriate referrals, but could also include more proactive methods such as trainings and group meetings.

Community-based organizations implementing health programs

Many community health issues are addressed by community organizations or community health clinics. As with other medical systems, community health workers come into contact with people who have been exposed to violence; these health workers are crucial actors in identifying and referring people for treatment.

For communities with chronic and severe violence, community organizations are frequently the best entities to implement community-based health approaches to prevent violence. Community organizations, because of their knowledge of and connection to the community, are ideal because health approaches rely on having access to those most likely to commit violence; embedded community organization can often gain this access.

Primary care-pediatricians, doctors, nurses, and other health professionals

Just like hospitals, health professionals are in a position to prevent violence because they come into contact with people who are victims of violence, exposed to violence, or are at risk for becoming violent. All types of health professionals should be included, from pediatricians to family practitioners to community health workers to nurses. Health professionals working in settings like veteran clinics or in chronically violent communities should be given special training so that they are able to respond sufficiently to individuals with higher levels of exposure to violence.

All health professionals should be trained in detection of violence exposure and trauma, and standard screening tools should be universally available. These efforts should focus on identification and ensuring appropriate referral and treatment for violence exposure and risk of behaving violently. These types of screening tools have been shown to be effective in the primary care setting at reducing violence (Borowsky *et al.* 2004).

Working with Other Sectors in Applying Health Approaches

Health approaches do not only come from the health sector. Other sectors can take the principles of the health approach and apply them in different settings. For example, schools and educators can learn methods of screening students to determine if they have had exposure to violence and are at risk for becoming violent, and then make appropriate referrals for treatment. Law enforcement is currently and can benefit from even further training in peaceful mediation and de-escalation of conflict. Further, many law enforcement departments are also making real time information and referrals to health and related professionals to be used to detect conflicts and prevent violence as well as for treating trauma.

The entire justice system, including prisons and jails, probation and parole, prosecutors, defense attorneys, and attorneys general can take on a health perspective that recognizes both violence as a behavior and the impacts of exposure to violence. This perspective can result in an increased utilization of treatment services for trauma and mental health care, behavior change, and interruption of conflicts leading to less violence.

Many other agencies that come into contact with people traumatized by violence, such as child welfare agencies, are also important in detecting ongoing violence and identifying those exposed or at risk. Likewise, any agency or organization that is involved in planning or maintaining the built environment, such as parks and public areas, should, and many do, consider a health perspective to reduce risk of violence. Each of these sectors and others have been working toward prevention and incorporating many health-based and related principles and approaches already and will hopefully be continuing this trend.

How Health Fits in a Bigger Picture

We are making the case for prioritizing a health perspective as foundational to how we understand and address violence, but that does not mean that we believe that the health sector alone can solve the problem of violence, any more than the health sector alone can solve cholera or Ebola epidemics or in fact any problem. Health approaches add to, but do not replace existing efforts. Accountability for violent behaviors is still required if we as a society are ineffective at providing health-based prevention to sufficient scale coverage and effectiveness.

There are also other roles that are needed to reduce and prevent violence that fall outside usual law enforcement responsibilities, but are often expected by the general public to be performed by law enforcement officers. Violence against another person is against the law, but that does not mean that those assigned to enforce these laws should also be expected to be held fully and totally responsible for preventing violence, and expected to fill every gap in society's deficiencies. For example, even where deterrence can be shown to reduce violence (e.g., Braga and Weisburd 2012), this should not be the primary focus or limit to society's efforts to do full scale prevention. Likewise, police should not be expected by society to be behavioral scientists, clinicians, social workers, doctors, mentors, or everything to everybody-or every solution to our social problems. In fact, police are being blamed commonly for many societal problems that they did not make and have very understandably limited ability to influence. Based on what we now know about how behaviors are actually formed at home and by peers, how they are maintained, and what the modern science tells us of how behaviors are effectively changed, it is way beyond what punishment is known or could be expected to accomplish.

Therefore, although police have a role of enormous importance, risk, and responsibility, it is unrealistic for us to expect police to provide the full solutions to all of the aspects of violence. It is both unrealistic and scientifically ungrounded-and it is not fair to the police themselves or to the community. Nor is it realistic or aligned with the scientific understanding of the problem. Also, just because two or more professions may be considered connected does not mean that the same people can or should perform all functions.

The health approach helps frame the issue and helps provide an understanding that informs the approaches used, but not all approaches should come from the health sector either. Likewise, other framings of violence can also supplement this health approach. For example, the human rights and child protection framing of violence adds extremely important elements to seeing the effects of violence more fully in certain situations, and keeps us vigilant about equity. Further the women's safety and protection framings help to prioritize certain populations that may be more vulnerable or possibly affected by violence more severely, and thereby also help us guide our interventions geographically as well as in application.

Conclusion

We are proposing a new lens-one different from how much of the general public currently sees violence and how our current governmental and nongovernmental institutions respond to violent events or outbreaks of violence. We are proposing that all of us take in more of the health framing and use a health lens as much as possible. Violence is a very unhealthy and very risky behavior-both to the individual as well as to his/her family and community. It is acquired through contagious brain mechanisms and social processes and can be treated using health methods. If we want to reduce violence in our communities locally and around the globe and in all

of its forms, we must acknowledge that violence is both resultant and predictable. There is no "senseless" violence. Saying it is "evil" or done by "bad" people does not help in deriving solutions and frequently makes violence worse. Violence is a behavior that is modeled, passed on and transmitted by norms and social expectations, and accelerated through mental trauma. Brain processes mediate all of this.

Numerous other factors affect violence, many of which are frequently and largely inaccurately cited as "primary" causes of violence-such as poverty, dysfunctional families, and poor schools, to name a few. These are incredibly important problems-they all need to be addressed-and they are factors that can make violence worse by increasing the likelihood of spread and increasing the susceptibility of individuals, as other factors may do for contagious diseases. These are critical risk factors that we should all aim to address.

What is currently missing and is critically needed is a health understanding of violence that offers a deeper understanding of behavior in individuals and communities. Crucially, the process through which violence spreads must itself be understood-particularly the importance of social approval and norms, both very powerful forces that are neurologically driven. The reversal of violence outbreaks requires working on these processes through the health and other sectors and involving credible health workers with access, trust and skills.

Seeing violence as a health problem does not mean rationalizing violent behavior or excusing an individual who behaves violently. The health approach fundamentally sees violence as negative to the outcomes of the persons affected, community as a whole, and the person exhibiting the behavior. The fundamental shift of the health approach is in understanding violence as resulting from exposure. Violence is the problem itself, and people who are caught up in the cycle of violence-or have "caught" violence-can and should be treated. And individuals who have this health problem need care and support to heal as well as an effective and appropriate regimen as is provided to individuals with other health problems.

Violence can be successfully diagnosed, criteria can be developed and refined to predict it, and people can be successfully and humanely treated to become less violent. People do change. There are programs that help people to stop behaving violently, and there is not an age after which it is too late (Ross *et al.* 2013). Sending persons exposed to violence home without a reliable and effective treatment plan for exposure and mental trauma is irresponsible and unhealthy.

One intention of this framework is to develop a more connected health system to reduce violence, in the same way that our society successfully addresses conditions such as AIDS, TB, diabetes, and asthma. These approaches not only work toward greatly improved health and safety outcomes but also use health methods that cause no additional harm or trauma to the individual or community. These approaches are performed in a way that supports and provides people and communities with healthier lives. Furthermore, as with all health interventions, these approaches respect confidentiality and put a very high value on trust.

This framework also emphasizes the need to focus resources on what has previously been sometimes referred to as "late" or "tertiary" prevention efforts. In reality,

the individuals actively committing the violence today are the center of the spread of violence itself. Science has illuminated the role of exposure in the transmission of violent behavior and therefore we must address ongoing violence, which transmits the violent behavior and limits the effectiveness of primary and secondary approaches. In other words, you can provide increased resistance to the violence through primary and secondary approaches, but it might not be enough if ongoing violence is not addressed and the dose of violence exposure is still high. Young people are being exposed to violence in the community, in their schools, and in their homes, and modeling those who are doing it now.

We have listed some of the elements of the health system and the roles they need to play to prevent violence. However, there are many others that are critical and are part of the system, including teachers, law enforcement, several parts of the youth and social sector, and the media. These other sectors have key roles in spreading the health understanding of violence and its causes, providing effective solutions, and to the extent they are able, screening and providing appropriate referral for treatment of people heavily exposed. In many instances, each of these sectors and others have been incorporating health-based principles and approaches already and our hope is that this discussion further encourages collaboration and even more utilization and adaptations of health approaches by all sectors to help produce and an even healthier and safer society.

We might follow the wisdom laid out by the Surgeon General's Workshop of 30 years ago: "The solution to the problem of violence requires a total community effort, but health care providers can play a special role ... The health care system must help to make victims whole emotionally as well as physically, and help to prevent further violence. Providers must be alert to the special needs of those most at risk of becoming repeat victims" (Cron 1986).

The issue of lethal violent behavior is much broader, deeper, and more specific than the current law enforcement, gun control, and mental health debates. If these areas represent the limit of our response, that response will be ineffective, in particular because they fall short of conveying to the public how violence is formed, maintained, and changed, that is, how violent behavior is an unconsciously acquired unhealthy state perpetuating itself. Effective solutions must be based on this more scientifically grounded understanding of the violent behavior of an individual as an acquired and preventable event which society has the responsibility to prevent. That includes reducing the exposure, transmission, and progression of violence in individuals' brains and in communities-using community-based and health system-based outreach methods used for epidemics and diseases that spread. In this case this includes using peers, outreach, modified expectations, new skills, and changing norms-all specialized skills of the health sector and their partners. Massive reductions in other serious behaviors and problems have been achieved with public health methods. Violence can be reduced to much lower levels in our communities, perhaps to even rare events, when we take the time to understand, explain, and treat violence as a health issue by activating and organizing the health lens, sector, system, and partners to prevent it better. We all look forward to and work toward this realization of safer and healthier communities.

Notes

1 The criminal justice sector has been working more and more toward prevention and incorporating many of the health-based principles and approaches. This is a positive trend that we hope to further encourage.
2 This chapter makes no attempt to list all of the major factors that modulate the risk for developing violent behavior. It is important to note that co-factors affect susceptibility in two primary periods-during exposure to the contagion and during activation of the contagion.
3 This may be particularly true for the poor and other marginalized populations, such as immigrants, refugees, or racial or ethnic minorities.
4 These methods may require that they are maintained by outreach services.
5 Statistically significant reductions specifically attributable to the program were found in six of the seven communities examined-between 16 percent and 28 percent in four communities by time series analysis and between 15 percent and 40 percent in four partially overlapping communities by hot spot analysis.
6 Data source: Honduras site program data.
7 Data source: ***Argus,*** Thursday October 8, 2015 (Cape Town newspaper article based on official Cape Town Police data).
8 Data source: University of Puerto Rico, official police data.
9 Data source: Mesa De Seguridad *Y* Justicia De Ciudad Juarez.

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