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Means of Violence—Workshop in Brief

In an average day, there are approximately 4,000 violent deaths across the globe. In 1 week, there are 26,000, and in 1 month, 120,000. Workshop speaker James Mercy of the Centers for Disease Control and Prevention (CDC) highlighted that these figures are directly influenced by the means and methods selected as tools of violence and their degree of lethality; simply put, means matter. The more lethal a given mean or method of violence, the more likely that it will cause a higher burden of both self-directed and interpersonal lethal violence.

In order to explore this relationship in greater depth, the Institute of Medicine's (IOM's) Forum on Global Violence Prevention held a workshop on December 18-19, 2014, with the aim of illuminating the lethal means and methods of both self-directed and interpersonal violence. This broad topic was designed to be an extension of the 2013 IOM/National Research Council (NRC) report *Priorities for Research to Reduce the Threat of Firearm-Related Violence.*¹ The discussion on the lethal means of violence was limited to topical areas selected by the planning committee and did not include certain lethal means and geographic locations. The meeting was not intended to be a full overview of the field and should not be construed as reflecting any group consensus.

The influence of the 2013 report and the interests of the workshop's sponsors (the CDC Foundation, the Joyce Foundation, and the New Venture Fund) led to a particular focus on firearms on the first day of the workshop. This included the production of three commissioned literature reviews that looked at the lethal means in the context of a specific topical area with a focus on firearms violence. Drawn from areas of interest found within the 2013 IOM/NRC report, the three papers focused on alcohol and lethal means of violence; youth acquisition and possession of the lethal means of violence; and at-risk populations and the lethal means of violence.

These papers were featured prominently on workshop day 1, with each author presenting his findings followed by a brief response from an expert in the field of firearms violence and a robust question-and-answer session. This workshop in brief highlights the workshop proceedings outside of the commissioned papers in greater detail while allowing the papers and corresponding presentations to speak for themselves. Additional information and resources from the meeting can be found on the Forum's webpage.²

AN OVERVIEW OF LETHAL VIOLENCE FROM THE 2014 WORLD HEALTH ORGANIZATION'S GLOBAL STATUS REPORTS

Speaker James Mercy of CDC provided an overview of the global burden of the lethal means of violence and their use in both homicides and suicides by presenting snapshots of the World Health Organization's (WHO's) two most recent global status reports highlighting these issues: *Preventing Suicide: A Global Imperative* and the *Global Status Report on Violence Prevention*. Both published in 2014, these reports provide the most current global assessment of these issues,

¹ The IOM/NRC report *Priorities for Research to Reduce the Threat of Firearm-Related Violence* is available for free download at http://www.nap.edu/catalog/18319.

² The Forum webpage is available at iom.nationalacademies.org/globalviolenceprevention.

featuring robust country and regional analyses of the burden of lethal violence and the means used to perpetrate them.

Mercy opened his presentation by suggesting that although violence shares many of the features of an epidemic, it is largely an endemic public health problem—one that has become something of an accepted feature of our regional cultures. This, he argued, is reflected in the relatively minimal efforts put in place to prevent or reduce the high burden of violence. And while the report shows that overall rates of homicide have been declining since 2000, the burden of lethal violence continues to be a public health issue across cultures and communities throughout the world.

According to the WHO *Global Status Report*, in 2012 there were approximately 475,000 homicides perpetrated globally. The report also identified certain "hotspots" for lethal violence. One such hotspot was Central and Latin America, where homicide is the leading cause of years of life lost. And while the United States is not among the highest-ranking countries when compared globally, that ranking changes drastically when extracting the data for high-income countries.

Mercy noted that the global trend for homicides sees a peak in activity among males between the ages of 15 and 29, with a steady drop in homicidal activity in older age brackets. Among females, rates of homicide are much lower. This trend is reflected more starkly within the United States, with homicide rates peaking at a much higher level among males between the ages of 15 and 29, with a more precipitous drop in homicide as age increases. In regard to lethal violence in the United States, Mercy also pointed out that nearly 70 percent of all homicides in the United States are perpetrated with firearms.

In regard to suicide, the WHO's findings show that approximately 800,000 suicides occurred in 2012, making suicide the 15th overall leading cause of death throughout the world. Research also indicates that for every completed suicide there are 20 additional attempts that are unsuccessful. The WHO report indicates that suicide is the leading cause of death among 15- to 29-year-olds, with pesticides, hangings, and firearms ranking as the most common means used to commit this form of self-directed violence. However, for 72 percent of all suicides the actual means used is unknown—pointing to a lack of data on the subject. In general, the highest burden of suicides is felt among aging male populations and, while rates of suicide are similar across male and female populations in low-income countries, in high-income countries, suicides among males occur at a rate approximately three to four times higher than that of their female counterparts.

In the United States, it is known that approximately half of all suicides are committed using firearms, with suffocations accounting for the next highest percentage at approximately 25 percent. Mercy explained that the lethality of firearms was particularly noticeable in the context of suicide. While in general the case fatality rate of firearms injuries is around 30 percent (which, Mercy explained, is on par with some of the deadliest diseases known to man), and for firearms assaults it is about 16 percent, in the context of suicides, the case fatality rate jumps to a staggering 84 percent.

Speaker Lanny Berman, former President of the American Association of Suicidology, further illuminated this important piece of the puzzle by highlighting that the key factor in a successful suicide attempt is the access to a highly fatal means of violence. He explained those contemplating suicide often take advantage of whatever lethal means is readily available to them. In rural areas of low- and middle-income countries, this often means the use of pesticides. The lethality of pesticides within these communities is compounded by the lack of access to immediate medical care in the wake of a suicide attempt, which might otherwise reverse the lethality of the ingested pesticides.

Berman explained that the most effective tool for suicide prevention is the restriction of access to a given lethal means. This approach, he explained, has proven effective in reducing overall suicide attempts—meaning that restricting access to a given means does not necessarily cause an individual to seek out an alternate means of committing suicide. Berman explained that the four commonly accepted approaches to restricting access to lethal means are withdrawal of a method, making a method safer or less toxic, reducing the amount available of a given agent, and reducing the ease of access to a given means. And while Berman's focus in restricting access to lethal means was limited to suicide prevention, Mercy lauded efforts to reduce access to lethal means in the context of both suicide and homicide. Mercy further explained that the context of lethal violence in the United States is particularly affected by the level of access to firearms—a highly lethal means of violence. In fact, among high-income countries, the United States ranks low in overall levels of violent encounters. However, Mercy explained that when you combine the overall numbers of completed homicides and suicides caused by firearms in the United States, the total figure is at least three times higher than the next highest country: while the United States is not the most violent among high-income countries, it is the most fatal due to the widespread access to and use of firearms.

Both Berman and Mercy stated that there was a global need for more effective and accurate data collection. Mercy highlighted this need by citing the lack of accurate vital registration statistics and police records across the

globe. Strengthening these systems, Mercy suggested, is an excellent way to increase the data pool as a whole, as well as its accuracy, which could contribute to the development of future evidence-based prevention efforts.

COMMISSIONED PAPERS REGARDING THE INTERSECTION OF LETHAL MEANS AND SELECTED TOPICS

While each of the commissioned papers included a variety of lethal means in their analysis, special attention was paid to firearms by each paper's author. The first paper³ presented at the workshop provided an overview of the problem of lethal means and alcohol consumption. It was explained by panel participants that there is an inextricable link between alcohol and violence, with each exacerbating the effects of the other. Charles Branas of the University of Pennsylvania authored the paper and presented his findings, while Garen Wintemute of the University of California, Davis, provided a response.

The second paper⁴ focused on the issue of youth acquisition and possession of the lethal means of violence with particular attention placed on firearms. Daniel Webster of the Johns Hopkins Bloomberg School of Public Health provided a detailed overview of what is known about how youth gain access to firearms and subsequently use them in episodes of lethal violence. Elizabeth Ward of the Violence Prevention Alliance Jamaica, who has extensive experience with violence prevention efforts targeted toward youth, provided the response.

Andrew Anglemyer of the University of California, San Francisco, authored the third paper,⁵ which presented a broad overview of at-risk populations and their access to the lethal means of violence and firearms as well as possible points of intervention targeted for this population. David Hemenway of the Harvard School of Public Health provided a response to Anglemyer's work.

THE INTERSECTION OF TECHNOLOGY AND THE LETHAL MEANS OF VIOLENCE

Stephen Hargarten of the Medical College of Wisconsin provided an overview of the ways in which trauma-informed care has responded to the increasing lethality of the means of violence. Stephen Teret of the Johns Hopkins Bloomberg School of Public Health discussed smart gun technology and the potential promise it shows in preventing unintended injury and death. And lastly, Zainab Al-Suwaij of the American Islamic Congress discussed the manner in which social media can be a tool to inflame violence as well as a potential point of intervention and prevention in the face of violence.

Trauma-Informed Care and the Lethal Means of Violence. Hargarten explained that while there are many agents within the modern-day disease model that can have deleterious effects on the human body at a cellular or systemic level, for the purposes of discussing the lethal means of violence, the two most prevalent agents of disease are chemical (such as poisons and pesticides) and physical (such as the kinetic injury caused by sharp objects or firearms).

Hargarten explained that individuals in the medical field have worked diligently to understand the transfer of kinetic energy in these violent exchanges and how that transfer can affect the manner in which physicians choose to treat a patient. He also explained the rapidity with which kinetic-energy transfers occur—the damage from a bullet discharged into a human body is complete in less than one-tenth of a second. Unlike chronic disease, where a physician is able to provide layers of intervention and treatment over time to stave off the more damaging effects of a given illness, when a patient presents with a life-threatening injury caused by a firearm, the agent of disease is already in full effect, often with devastating consequences.

Given the high fatality rates of firearms injury and other lethal means, Hargarten stated that greater efforts need to be made to prevent these agents of disease from ever having the opportunity to inflict damage on the body in the first place. Hargarten noted the success of this approach in reducing other public health problems and suggested that these primary prevention efforts would be equally successful in the context of firearms violence.

Smart Gun Technology. Teret opened his presentation on smart gun technology by explaining that the term refers to weapons that are specifically designed and constructed with internal mechanisms that allow the weapon to be fired only by its authorized user(s). Teret put forth his belief that by altering the guns themselves the overall burden of firearms injury could be reduced, particularly in relation to unintentional injury, youth suicide, and crimes perpetrated with weapons purchased on the black market. Teret explained that this belief is buttressed by the public health

 $^{^3 \}textit{See} \ \text{http://iom.nationalacademies.org/} \\ \text{~/media/Files/Activity\%20Files/Global/2014-DEC-18/Alcohol-Firearms.pdf.} \\$

⁴ See http://iom.nationalacademies.org/~/media/Files/Activity%20Files/Global/2014-DEC-18/Youth-Acquisition-Carrying-Firearms-US.pdf.

⁵ See http://iom.nationalacademies.org/~/media/Files/Activity%20Files/Global/2014-DEC-18/Firearms-Suicide-Homicide.pdf.

approach to disease itself, where changing the behaviors of individuals is only part of the solution. Public health professionals also seek to alter the very vector of disease or injury itself—in this case the technology behind firearms and ammunition used to cause lethal harm.

In the context of firearms, Teret explained, this technology includes the development and widespread acceptance of personalized or smart guns. Smith & Wesson first developed a childproof weapon using rudimentary technology as early as the mid-1880s. The sale of this particular model ceased in the 1940s and since then the company has not produced weapons with similar childproof technology. Teret could not provide an explanation for this; however, he did note that the United States does not regulate firearms to the same degree that it does other consumer products. As a result, there is little outside incentive to produce smarter, safer weapons.

Today, smart guns are produced with radio-frequency identification, or RFID, technology. This technology requires that the intended user of a given firearm be wearing a watch or similar device that is proximate to the firearm at the time of use. Teret noted that guns using biometrics such as fingerprints, as opposed to RFID technology, will likely be produced in the near future as well. These weapons, he noted, are not foolproof, but they can help ensure that, should the weapon get into the wrong hands, such as of an assailant, child, or depressed youth, it will be inoperable.

Although available elsewhere in the world, weapons using RFID technology are not currently available for sale within the United States. Teret pointed out that while the sale of these weapons does not interfere with the constitutional right to bear arms, they remain a point of contention due to a decade-old law in New Jersey that will start a 3-year countdown from the first sale of a smart gun in the United States, requiring all guns sold within state lines to contain smart technology at the end of the 3-year clock. Despite this, Teret remains confident that these guns will become widely available throughout the country in the not-so-distant future and that their adoption will have a measurable impact on the overall burden of firearms-related injury and death.

Social Media and the Lethal Means of Violence. Al-Suwaij has spent much of her time with the American Islamic Congress working on efforts to reduce the prevalence of violence within her home country of Iraq and the surrounding Middle East region. Al-Suwaij explained that social media has had a profound impact on her work. The strong relationship between social media and violence was seen throughout the Arab Spring and has been used consistently and successfully since then to incite violence and recruit members to terrorist groups. The power of social media in this context is undeniable. In fact, during a discussion regarding extremism, workshop participant Sheldon Greenberg noted that social media has sped the process of radicalization dramatically: a process that once took approximately 6 years now takes less than 2 given the high degree of access to and availability of propaganda on social media platforms. However, Al-Suwaij explained that the relationship between violence and social media is multidirectional and while it can be used as a tool to incite violence it can also be used as an incredibly powerful tool for intervention and prevention. Recognizing this power, Al-Suwaij and the American Islamic Congress have developed a series of programs that have been launched in the region that aim to empower young people and prevent the spread of violence. Al-Suwaij also indicated the promise of using social media platforms as a tool to alter or influence the social norms prevalent within a given culture or region that underlie the acceptance or spread of violences.

THE SOCIOCULTURAL CONTEXT OF THE LETHAL MEANS OF VIOLENCE

The workshop included a panel of experts who explored the context of violence in two different geographic locations: Africa and Central and Latin America, from various perspectives. Included in the panel were former ambassador Lino Gutierrez; Andres Villaveces of the World Bank; and finally, Catholic priest and policy analyst for the Africa Faith and Justice Network, Barthelemy Bazemo.

Diplomatic Approaches to Violence Prevention. Providing a diplomatic approach to violence prevention, Gutierrez explained that the work of an ambassador is incredibly complex and often dangerous. He explained that during the span of his 29 years of service, the nature of risk and violence changed dramatically, with the threat of lethal violence increasing each year. Furthermore, the global drivers of violence are equally, if not more, complex, and the role of the diplomat in helping to solve or defuse those issues can be difficult to navigate. Diplomats, Gutierrez explained, can contribute to the solution by acting as a tool. Diplomacy itself can be used as a method of infusing education, training, support, and democracy to a country or a region with the goal of producing stability, which in turn can help provide the foundation to begin solving problems of lethal violence. However, Gutierrez noted that diplomacy is merely one part of a broader, multisectoral solution.

The Lethal Means of Violence in Central and Latin America. Villaveces explained that current data show that the regional averages for homicides are extremely high throughout Central America, with more than 75 percent of countries showing epidemic levels of violence as outlined by the WHO. These levels reflect a high number of homicides and assaults perpetrated by assailants using firearms, with some countries reporting that up to 90 percent of violent encounters involve the use of a firearm.

Villaveces explained that there are many promising programs and efforts under way to reduce this burden. One such example includes the transnational collaboration of 22 countries in the region who are working to collect incountry data to share for the development of best practices and production of standardized definitions and approaches to violence and violence prevention.

Additionally, many efforts are being made to analyze the physical and spatial environment to develop effective interventions to reduce lethal violence and firearms violence. Villaveces cited examples of these approaches, including the intermittent use of banning concealed carry weapons in Cali, Colombia. Another innovative approach to reducing firearms violence and homicide undertaken by the city of Cali included closing the bars in the city 2 hours earlier, which reduced homicides by 25 percent.

Villaveces explained that there are also efforts in the region to increase social cohesion as a method of reducing violence. This can include creating a "culture of citizenship," which entails a community-based approach to the prevention and reduction of violence as well as more innovative approaches such as increased public transportation across a city.

As is the case in many regions, however, Villaveces cited the need for additional resources and funding in order to analyze and implement effective intervention efforts. Additionally, there is a need for more data collection throughout the region (and, as many workshop participants reminded the audience, the world) in order to develop sound approaches to reducing the overall burden of lethal violence.

Religion and Lethal Violence in the Context of Africa. Bazemo analyzed the burden of violence in Africa from a religious perspective. Bazemo highlighted the broad expanse of the African continent, which is home to more than 1 billion people—meaning that providing broad generalities about the region is difficult. Despite this, Bazemo was able to note the high degree of influence that religion holds throughout the country and its complex relationship with violence.

Bazemo explained that although there is limited research on the subject of religion and violence across Africa, it is known that there are three primary religious influences on the continent: traditional African religions, Christianity, and Islam. Furthermore, despite the lack of a strong evidence base, Bazemo explained it is known that religion influences violence across every level of the ecological model.

Bazemo stated that at the individual level religion can influence self-harming behaviors such as self-mutiliation and suicide. At the interpersonal level, it can influence behaviors such as female-genital mutilation, honor killings, forced marriage, and intimate partner violence. At the community and institutional levels, religion can influence practices such as slavery, utilizing child soldiers in combat settings, ethnic cleansing, sectarian killings, and terrorist activities driven by religion such as the Al-Shabaab attack in a Nairobi, Kenya, mall and the Boko Haram attacks in Nigeria. Bazemo noted that these behaviors and influences can be devastating to local and regional infrastructure, resulting in negative effects that are felt for generations.

As a method of combating these religious and ideological bases for violence, Bazemo quoted the preamble of the United Nations Educational, Scientific and Cultural Organization's Constitution: "since wars begin in the minds of men, it is in the minds of men that the defenses of peace must be constructed." Bazemo explained that his work focuses on altering the perspectives and cultural beliefs of the individuals he works with in order to "transform their minds and hearts to deconstruct the old concept of prejudice for change of mind through peace education, therapy, and conflict resolution skills." Furthermore, Bazemo advocated for the use of international instruments and treaties to develop effective laws and policies that seek to reduce the burden of violence across the continent. Lastly, Bazemo urged the disparate religious communities to engage in a meaningful dialogue to foster social cohesion and coexistence with the goal of producing long-term and lasting African societies built on the foundation of inclusion and integration.

INNOVATIVE APPROACHES TO REDUCING FIREARMS VIOLENCE

The workshop included two innovative approaches to reducing the burden of firearms violence. Shannon Frattaroli of the Johns Hopkins Bloomberg School of Public Health shared information regarding the new gun violence restraining

order in California, and Emily Wang and Carley Riley of Yale University's School of Medicine shared their community-based intervention that seeks to reduce gun violence through the development of community relationships and resiliency.

California's Gun Violence Restraining Order. Frattaroli explained that this new law, in its most basic state, allows for immediate family members, intimate partners (in some cases), and law enforcement officials to access and petition the civil courts to remove firearms from the home of a loved one who is acting in a way that causes concern. That concern can be related to either self-harming behavior or the risk that they may harm another person. Once a loved one has petitioned the court, a judge may file a temporary gun restraining order that permits law enforcement agents to remove firearms from the possession of the individual in question for a period of 21 days, at which point a second hearing is held in which the subject of the restraining order may plead his or her case. The ultimate result could be an extension of the restraining order or the return of the firearms.

The inspiration for this law, Frattaroli explained, came from evidence showing that focusing on the mentally ill population is not an effective strategy in the reduction of lethal violence, because predicting who among a population of mental health patients will ultimately commit a violent act is nearly impossible. Instead, the group behind the law recommended focusing on dangerous behaviors and drew from the success of the nationally accepted domestic violence restraining orders—which have consistently reduced the burden of both lethal and nonlethal instances of intimate partner violence—and promising state-level programs that demonstrate proof of concept for the California law wherein law enforcement officials are permitted to remove firearms from an individual they encounter who is acting in a manner they perceive to be dangerous. California's new law combined these approaches in the creation of their gun violence restraining order, which will go into full effect on January 1, 2016. Frattaroli explained that this program has the potential to reduce firearms violence based on the successes of its source material. She also expressed the belief that this law could one day serve as a model for other states as well.

Community Resiliency as a Tool for Reducing Lethal Violence. Wang and Riley shared their innovative intervention being implemented and tested throughout two communities in the New Haven, Connecticut, area. Wang first explained that the area of New Haven has a relatively high burden of violence, particularly firearms violence. Wang stated that in some neighborhoods found within New Haven, there are approximately 20 violent encounters for every 1,000 residents.

In developing their intervention for two specific communities with particularly high rates of violent encounters, Wang explained that her team hosted a discussion with residents who provided their perspectives on the burden of violence as well possible solutions. Conversations in these community groups often turned to the need for increased neighbor-to-neighbor ties and a sense of social cohesion. These conversations caused Wang and her team to turn toward the notion of community resiliency. Defined by Wang as the ability of a community to band together and use resources to respond to, withstand, recover from, and even grow from bad events, community resiliency quickly became the basis for the group's intervention in these communities.

Building from a model of disaster response designed to develop social cohesion and community resiliency in the wake of natural disasters, Wang and her team focused on two particular aspects of the eight-lever model: engagement and self-sufficiency. Prior to entering the intervention phase of their study design, Wang and her team first conducted a survey to assess a baseline for their study group as well as to build relationships with their target communities and hear community members' additional ideas for intervention efforts. The results indicated that nearly all respondents had heard gunshots in their neighborhood and experienced violence either directly or indirectly. Additionally, community members suggested intervention efforts, including community get-togethers and cookouts, a place for the community's youth to go when they are not in school, an increased police presence, and other related ideas.

In order to develop community resiliency and social cohesion, Wang and her team developed toolkits for community members that seek to empower them in the face of firearms violence. These toolkits are modeled after similar disaster-based toolkits, but they feature information regarding what to do in a situation where you hear firearms being used outside of your house, and related information.

One of the key factors of the intervention program described by Wang and Riley is the use of community members as implementers. This technique creates a sense of ownership and trust, which will hopefully increase its efficacy. Wang and Riley explained that they expect that their results will show promise in reducing the burden of lethal

⁶ See more information on this topic in the Forum on Global Violence Prevention's workshop Violence and Mental Health: Opportunities for Prevention and Early Intervention.

violence and firearms within a given community and they hope that this program might be replicated elsewhere in the future.

LOOKING FORWARD

The final panel of the workshop featured a broad discussion summarizing previous statements about potential ways to reduce the burden of lethal violence throughout the globe while also raising new areas for future research or focus. One suggestion raised by many speakers and participants alike included limiting access to lethal means—which evidence shows is an effective way to reduce the overall burden of lethal violence. Some workshop presenters and participants also highlighted the importance of social cohesion and community building as methods of intervention and prevention. Additionally, there were repeated calls from some speakers for increased data collection efforts regarding lethal violence and the means or methods used to perpetrate it.

Greenberg highlighted the need for a multisectoral approach in reducing incidences of lethal violence. He also noted the importance of identifying what a successful community might look like. This, he stressed, is important for producing a viable and sustainable goal by which to measure the efforts and interventions being implemented to reduce lethal violence. Arturo Cervantes-Trejo of the National Institute for Educational Evaluation suggested that international doctrines outlining human rights and the rights of children could provide an excellent roadmap for what a community should provide for its residents and from what it should protect them.

Brigid McCaw of Kaiser Permanente also discussed the important role of clinicians in identifying at-risk individuals and intervening when necessary so as to prevent incidences of lethal violence.

Workshop speakers shared a variety of promising suggestions for how to reduce the overall burden of lethal violence. Present in many of those suggestions was the message that means matter; it is important to consider how means and methods contribute to the burden of lethal violence throughout the globe and how they might serve as possible points of intervention and prevention in the future.

DISCLAIMER: This workshop in brief has been prepared by Louise Flavahan as a factual summary of what occurred at the meeting. The statements made are those of the authors or individual meeting participants and do not necessarily represent the views of all meeting participants, the planning committee, or the Academies.

REVIEWERS: To ensure that it meets institutional standards for quality and objectivity, this workshop in brief was reviewed by **Andres Villaveces**, World Bank, and **Shannon Frattaroli**, Johns Hopkins Bloomberg School of Public Health. **Chelsea Frakes**, Institute of Medicine, served as the review coordinator.

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For additional information regarding the meeting, visit http://iom.nationalacademies.org/Activities/Global/ViolenceForum/2014-DEC-18.aspx.

Forum on Global Violence Prevention

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