

USA Violent Cause Mortality: Analysis of Trends and the Political Controversies of Prevention

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Population adjusted violent cause mortality (VCM) is higher in the United States than any of the other developed nations. This paper examines data available to compare international differences as well as U.S. within group patterns of suicide, homicide, murder-suicide, familicide and mass public fatalities (mass shootings) by sex and age. The majority of weapons used in U.S. VCM events are firearms, but they vary in the capacity to injure and kill victims. Adding to the conditions, the estimated rate of private gun possession has recently increased. Our research compares the U.S. with international data from a number of sources. To better understand violent cause mortality within the U.S., we analyze national level data from the Center for Disease Control Web-based Injury Statistics Query and Reporting System (CDC WISQARS), 32 years of FBI Supplemental Homicide Reports (SHR), news surveillance Intimate Partner Homicide Suicide (IPHS) and key findings from a mass shootings data archive. We then describe the cultural and political context across various states in the U.S. and the forces working in favor and against violence prevention.

Keywords: Homicide, Suicide, Murder-Suicide, Mass Shootings, Prevention, Policy.

Introduction

Sociologists have long noted that violent death rates in the form of homicide and suicide have a disruptive influence and signal larger societal distress. Much of this violence can be attributed to available weapons utilized, also referred to as ‘lethal means.’ High levels or increases in violent death mortality indicates a serious threat to public health, and may require legislative or governmental intervention for the sake of individual, family and community health. We illustrate how international comparisons can shine a light on prevalence and policies to deal with violence within a cultural context. Next we examine a number of sources to determine within group differences in the United States for suicide, homicide, murder-suicide, familicide and mass fatalities by sex and age. Relationships are important as well, since much of this violence occurs among acquaintances for male victims and intimate partners and family for their female counterparts. While young women are struck down in the process of leaving a violent relationship, older women are murdered by suicidal husbands who decide to kill her, usually by firearm. Mass killings, whether they are in families (familicide) or among strangers in public, are made possible in part, by access to lethal means --with

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the capacity for widespread fatal injuries. In the discussion, we provide history and cultural context description of American political ideologies and pressures which provide a greater understanding of the conditions which foster these violent cause mortality patterns. U.S. gun laws protect private ownership, and any regulations are controversial. A powerful and well-funded gun lobby has influenced American political election campaigns. Future practice and policy implications for prevention of violent death mortality are discussed.

Literature Review

Most developed nations experience a natural increase quality of life and longevity among residents over time. American life expectancy (LE) was on the same track in the past, however recent decades have shown stunted growth and even a decline in LE for multiple years in a row. The causes of this pattern are attributed to poor access to affordable healthcare, the opioid epidemic, an increase in suicide (National Center for Health Statistics, 2017) and a corresponding uptick in homicide rates as well (Allen, Salari and Buckner, 2018; FBI 2018). This paper focuses on violent cause mortality, so we concentrate on the latter two indicators, and discuss how they relate to U.S. policy and prevention.

Lethal Means

According to the Small Arms Survey (2018) The United States is number one in the world for private possession of guns, and this saturation has increased from 89 per 100 in 2011 to 120 per 100 in 2018. This source estimates Yemen is a distant second with 51 privately held firearms per 100 persons. How does this statistic play out in American homes and families? Not everyone in the U.S. owns a gun. Estimates suggest 42% of American households contain one or multiple firearms. In addition, gun ownership is more common among men, whites and those in rural areas (Parker et al, 2017). Research has found guns in the home are associated with greater risk of suicide among occupants and also increases the chance of being the victim of a homicide (Anglemyer, 2014). A 2016 survey of 1,444 American gun owners found less than half secure all of their weapons (Crafasi et al, 2018). Access to lethal means is a major factor related to the violent cause mortality patterns described in this article.

Most developed nations have legislated some degree of control over the public possession of firearms (Small Arms Survey, 2018). However, in the U.S., states vary with regard to their level of regulation and enforcement. For example, there is no country-wide gun registry for all states, so it is difficult to ascertain exact numbers or to remove lethal means from those banned from possession (such as violent felons, subjects of a protective order or those convicted on domestic violence offenses). In addition, some states require a criminal background check for purchase of guns, while others allow unregulated private sales from online classified ads. Record keeping rules of official gun dealers are also variable, depending upon state. These and many other loopholes have been intentionally

encouraged by the powerful gun lobby, which strives to influence political representatives, and removes or steps back regulations.

The Dickey Amendment has resulted in a barrier to federal funding to the CDC for firearm injury research which could lead to gun control, and this has been in place in the U.S. Federal Budget over 2 decades. Over that time period, 500,000 American lives have been lost to gunfire, and 1.5 million additional persons have been injured (Rajan et al, 2018). Why does the U.S. ignore this costly problem, rather than instituting reforms which would improve public health? The anti-reform perspective is supported by the gun manufacturing lobby and is built upon concerns of a 'slippery slope,' where one gun regulation, lawsuit or education about household injury risk is feared to result in additional limitations, thus reducing 'gun freedoms' set forth in the Second Amendment of the U.S. Constitution.

Only states committed to gun control (mostly in New England, such as New York or other states with major metropolitan areas, such as California or Illinois), have instituted gun registries and restrictions for purchase and possession. Rural states and those with pro-gun culture (such as the Intermountain West and Deep South) may intentionally lack documentation which would serve as barriers to enforcement of firearm laws. As an example, after the 2012 Sandy Hook Newtown Connecticut massacre where 20 first graders and 6 teachers were gunned down, 109 laws went into effect 39 tightened gun restrictions (including New York State), while 70 loosened gun restrictions (e.g., Utah, etc.) making it easier to obtain a firearm (New York Times, 2013). Siegel et al (2017) have collected a comprehensive State Firearm Law Database to examine suicide and homicide rates in states with varying levels of regulation. They have found evidence to suggest states with more regulations have reduced levels of VCM from firearms (Siegel and Rothman, 2016; Siegel et al, 2019).

U.S. Suicide

Self-harm in the form of suicide has grown in recent years and accounts for 44,876 recorded deaths in 2016, or 13.89 per 100,000 population (Centers for Disease Control and Prevention CDC, 2017). In that year there were 123 suicides per day in the U.S., which works out to one every 11 minutes (Violence Policy Center, 2018a). Firearm suicides accounted for 22,938 deaths and a population adjusted rate of 7.10 suicides per 100,000 population (CDC, 2017). Miller & Hemenway (2008) note that suicide tends to be an impulsive decision by many, and readily available firearms make this combination particularly lethal.

Suicide patterns emerge as they are broken down by age and sex. Teen suicide is a big problem in the U.S., and has been traditionally a male behavior. However, teen girls have shown a marked increase in lethal self-harm in recent years (Washington Post, 2019). Suicide is the 2nd leading cause of death for 10-34 year olds). Rates are also high in mid (4th leading cause of death 45-54) and later life (8th for 55-64). Older (mostly white) men have been known to be highly suicidal, and that trend has only accelerated with the aging of the Baby Boom cohort (Washington Post, 2013) and those in the younger generations of people who are

shown to have even higher rates (Phillips, 2014).

Fatal self-harm is four times higher among males (22.4) compared to females (6.1), especially among older men (31 per 100,000) (CDC Fatal Injury Data, WISQARS, 2017). Women are less likely to kill themselves, and if they do, their methods differ from their male counterparts. Specifically, men and boys tend to suicide using highly lethal means (e.g., firearms), and the fatal intentions are more often completed. Girls and women are as likely to attempt suicide, but tend to use less violent methods (poison or pills), and to survive, when compared to male patterns.

U.S. Homicide

In the United States 2016, there were 19,103 homicides (5.91 per 100,000) (CDC 2017). The FBI Uniform Crime Reports indicate an 8.4 percent increase from 2015 to 2016 (FBI, 2018). While the patterns have declined since the peak 1980s/early 1990s, the rates seem to again be on the rise. The U.S. also holds the distinction of having the highest population adjusted homicide in the developed world (Grinshteyn & Hemenway, 2016), and the majority of these deaths are caused by discharge of a firearm (Washington Post, 2012). In 2016 gun discharge mortality accounted for 4.46 homicides and 14,415 individuals lost (CDC, 2017).

Homicide victims and offenders are most often male. In 2015, females made up 21 percent of U.S. homicide victims (Office for Victims of Crime, 2018). Their assailant was typically a current or former intimate partner (Allen, Salari & Buckner, 2018). Women age 50+ comprised 26% of female homicides (representing the largest female age group), by contrast men of that age range comprised only 15% of male homicide victims (Office for Victims of Crime, 2018). Young adults have the highest rate of homicide among any age group, measured at 11.9 per 100,000 (Smith & Cooper, 2013). Among leading causes of death, homicide ranks as the 3rd for those 15 to 44 years old in 2016. For individuals aged 40-54, homicide continued to rank in the top 10 LCD. Above age 50, disease surpasses injury causes of death, but suicide remains salient (14th LCD) (CDC, 2017). Interestingly, the percent of homicides increased for people age 50 and over between 2007 (14.4%) and 2015 (17%) VPC 2015 and recent years have marked an increased frequency of arrest among older offenders (Carson & Sabol, 2016).

U.S. Murder-Suicides, Familicide and Other Mass Killings

Many intimate partner murders of women are followed by suicide of the perpetrator. Murder-suicides are estimated to comprise 1,000 to 1,500 deaths per year and the majority (2/3rds) involved intimate partnership (Violence Policy Center, 2018). The exact figures are unclear, because linked homicides and suicides have traditionally been counted separately. Salari and Sillito have examined intimate partner murder suicides (IPHS) across age categories for over a decade, and found age and sex patterns. Men were the perpetrators and they most frequently utilized firearm methods. Younger male perpetrators more likely

exhibited ‘homicidal’ motives, driven by rage toward their current or former partner. Older men typically exhibited secretive, inward, suicidal motivations, and decided to kill their wives in the process (Salari & Sillito 2016). Secondary victims are potentially injured or killed during IPHS events, and Sillito and Salari (2011) examined the child outcomes among parents age 18 to 44. ‘Familicide’ is the term used to describe kinship relations with multiple fatalities in an event. These types of mass killings have been occurring in American families for decades, but without adequate attention to paid to the problem. Now ‘mass killings’ have spilled over into public places. These may or may not include the suicide of the perpetrator. However, guns with high powered capabilities and ammunition magazines are more often used intentionally to cause maximum death and damage.

Our research utilizes a variety of datasets and cumulative expertise on these topics to examine violent cause mortality (VCM) differences, highlighting firearm homicides and suicides, murder-suicide, familicide and mass public killings--asking how do U.S. and other countries in the developed world compare? This is important because those other nations have more tightly regulated guns, even when the culture has a pro-gun stance. Secondly, we ask, what are the within group differences found in the United States, particularly as it relates to patterns of VCM by age and sex—and state differences in regulation and firearm culture? Finally, we will bring this information together with firearm laws to propose potential solutions for VCM prevention.

Methodology

This research article is primarily descriptive, to bring a better understanding of graphic depictions illustrating violent cause mortality. The research questions will be addressed, with the use of national level data sets to improve our understanding of homicide and suicide mortality by sex and age, along with cultural and political explanations of these trends. This paper is based on research from a compilation of sources to examine US homicide and suicide and mass victim mortality, along with data on state firearms laws.

A comparison of the most recent data for violent death mortality figures around the world can be found at <https://www.gunpolicy.org>. These data were utilized to create figures comparing international developed countries to the United States. The countries chosen include Japan, France, Finland, Switzerland, Australia, Canada, Israel and the UK.

Suicide and homicide cause of death within the United States can be obtained using the Centers for Disease Control Web-based Injury Statistics Query and Reporting System—(WISQARS) CDC 2017 Data <https://webappa.cdc.gov/sasweb/ncipc/leadcause.html>. This source was used to map official population adjusted suicide rates on a U.S. map using the program called Map Chart <https://mapchart.net/usa.html>. In order to see the variations in population adjusted mortality, we noted the top 5 states in red, those above the national average of 13.24 in pink and white represents below the average suicide rates.

We utilized FBI Supplemental Homicide Reports (SHR) to determine patterns

of single victim, single offender homicides over 32 years, 1980-2011. The figures show jittered scatterplots for individual homicides, by age (10 year increments) and sex broken down by offender and victim. Jittering allows us to distinguish among data points, which may have laid on top of one another if this technique of smearing the results were omitted.

To examine the most common form of murder-suicide (VPC 2018), we utilized data collected by Salari and Sillito documenting news surveillance of 728 intimate partner homicide suicide IPHS events nationwide, which documented the details of approximately 1600 deaths between 1999 and 2005. Key words were searched for over 1200 television transcripts and newspaper sources from an online clearinghouse as well as Lexis-Nexis, google alerts, library articles and several other sources. Murder-suicides and joint suicides were added if they included a current or former intimate partner. Violence among other family relationships (such as siblings, parent-child), neighbors or co-workers were excluded. However, secondary victims to the IPHS were included in the sample and content analysis. Additional data collection is in progress, which will include 20 years of cases between 1999 and 2019. The analysis will be informed by research which is published and under review (Salari & Sillito 2016; under review). These IPHS cases had the potential to include additional secondary victims, such as children and other family members. Sillito and Salari 2011 provides information about child outcomes in these violent events, including those who witnessed IPHS, others who were killed or the children orphaned but not present.

Mass public shootings among strangers, acquaintances or current/former family members are another form of violent cause mortality in the United States. Journalists and others have kept track of these incidents and catalogued their details. One such database includes 'indiscriminant rampages,' which are defined as mass shootings with four or more deaths (not counting the offender) for the years between 1982 and 2019. Gang violence and deaths in the commission of traditional crimes are excluded. These cases are publicly available at https://docs.google.com/spreadsheets/d/1b9o6uDO18sLxBqPwl_Gh9bdhW-ev_dABH83M5Vb5L8o/htmlview#gid=0 (Follman, Aronsen and Pan, 2019). Their methods of inclusion represent a conservative estimate, since President Obama's Public Law 112-265 encouraged government accounting of incidents and defined 'mass killings' as 3 or more fatalities (Follman, Aronsen and Pan, 2019).

Policy regarding firearms will also be addressed in the discussion section of this research article. To inform this topic, we will rely on studies of violent cause mortality using the State Firearm Law Database – from Boston University. These data are publicly available with permission and a comprehensive report of the contents is available at http://www.statefirearmlaws.org/sites/default/files/2017-12/report_0.pdf

With the shortage of space, we describe work we have done with these data and report the main findings from the Siegel et al's (2016) research team.

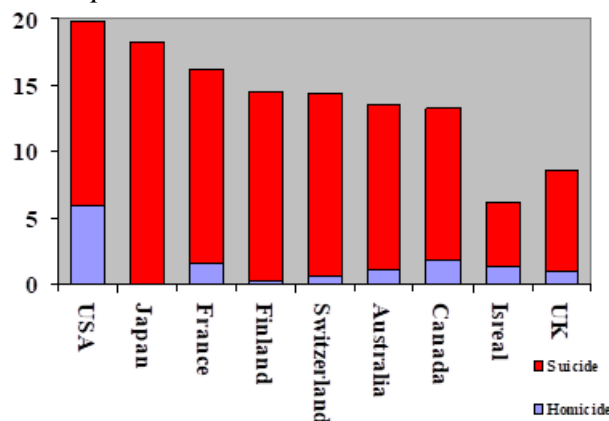
Findings/Results

We use a variety of sources to bring together a picture about VCM in the United States, particularly as it relates to suicide, homicide, murder-suicide and familicide/mass homicides. Using official statistics, we find in 2016, in the US is higher than other developed countries (NCHS, 2017).

International Comparisons

Figure 1 illustrates homicides and suicides from all methods, indicating suicide outpaces homicide in all the selected countries, particularly in Japan. While the Japanese regulate guns, the high pressure and collectivist attitude results in a great deal of self-harm from non-firearm methods. Still, the United States has the greatest rate of mortality from homicide and suicide causes combined, and also by far the highest population adjusted homicide rate.

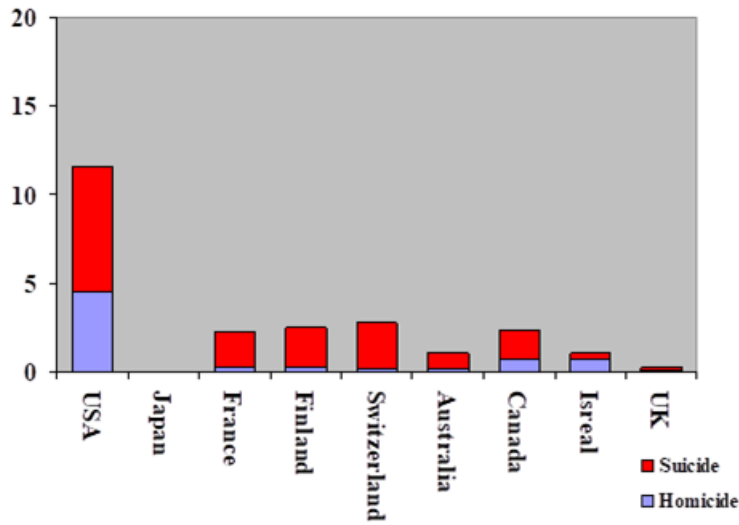
Figure 1. All Cause Homicide and Suicide per 100,000 Population Selected Developed Nations



Sources: See bottom Figure 2

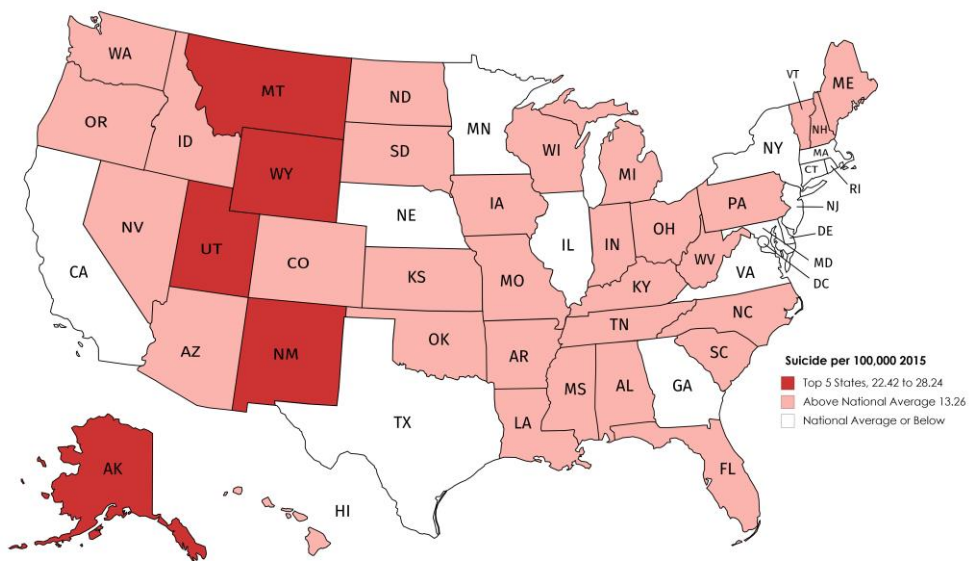
To get a better indication of the role of guns as the mode of killing in the United States, we examine Figure 2 which shows the homicides and suicides, specifically from firearm methods. The United States has the greatest firearm ownership in the world, and the highest population adjusted homicide as well. That, along with the high suicide rate reveals a pattern of the violent cause mortality by firearms which far outstrips other developed countries, not just those which applied strict removal and regulations (i.e, Australia in 1996), but even ‘pro-gun’ cultures such as Switzerland (Brueck, 2018) with the 4th highest possession of private firearms in the world (Small Arms Survey, 2018).

Figure 2. Firearm Homicide and Suicide per 100,000 Pop. Selected Nations



Multiple Sources: Figure 1 and 2: Australia 2017; Canada 2018; CDC 2017, Switzerland, 2019; WHO 2016; 2019

Figure 3. Suicide Rate Per 100,000 by State, 2015



Created with mapchart.net

Source: CDC Data and Statistics, Fatal Injury Report, 2015

U.S. Suicide

In the United States, suicide is a major cause of death and rates differ by state and region. Figure 3 utilizes CDC information for 2015 to illustrate differences on

a map. White states have suicide rates below the national average of 13.26. States in the Northeast tend to be depicted in this category, such as New York with a rate of 7.81 per 100,000 population. The pink states are above the national average and red indicates the top 5 states with the highest population adjusted suicide rates. Wyoming has the highest rate of 28.24 per 100,000. Interestingly, the intermountain west and Alaska represent areas with very 'pro-gun' cultural attitudes, along with few state gun regulations-- and findings indicate the suicide rate is very high (CDC 2017). Siegel and Rothman (2016) found a strong relationship between state-level firearm ownership and gun suicide rates among both men and women, but for men only when examining suicide from all causes.

U.S. Homicide

Taking a closer look at murder in the U.S., we present jittered scatterplot graphs by age and sex utilizing data from 297,110 homicides in the FBI Supplemental Homicide Reports (SHR) over 32 years 1980-2011. Jittering adds a random number between 0 and 1 to victim and offender ages, to reduce overlap. We found men are far more likely to die from VCM. Figure 4 illustrates our jittered scatterplot for male homicide offenders by age, whose victims are other males. These made up 64% of the homicides examined. Infant victims are visible near the horizontal axis. The darkest area of the graph indicates deaths are most likely to occur in the teen and early adult years. In another article by two of us, Allen et al, 2018 found these male on male offenders were mostly acquaintances, and it is relatively rare for murdered men to die at the hands of an intimate partner.

Figure 4. *Jittered Scatterplot of Male Homicide Offenders Who Killed Male Victims by Age N=190,187*

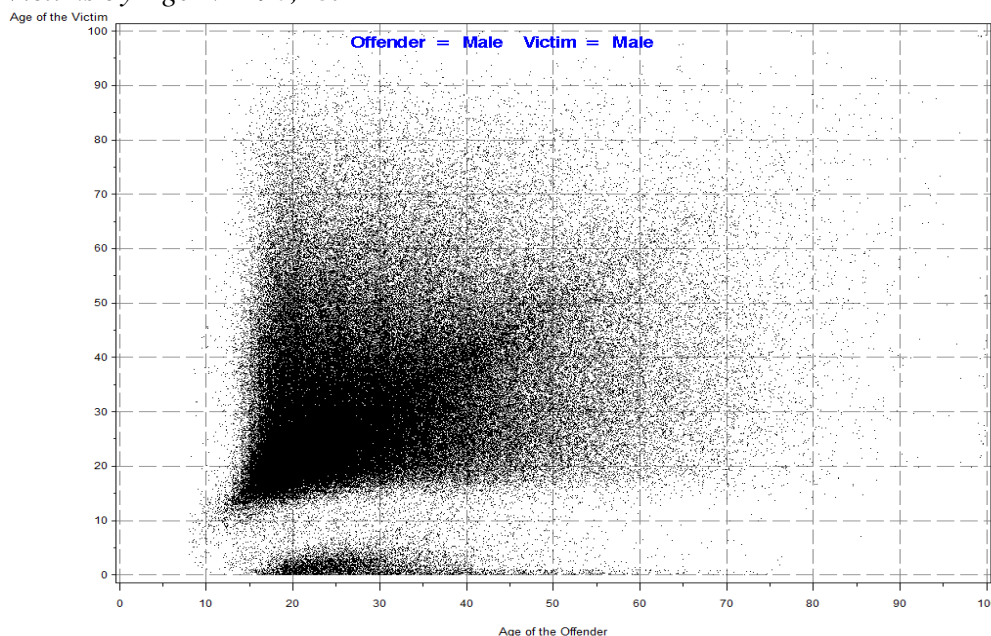


Figure 5 indicates the pattern for male offenders who kill females (23.4%).

Women's killers are also usually male, but the offenders have a closer relationship—typically a husband, boyfriend, or ex-partner. Intimate partner killings show up graphically in Figure 5, where male offenders kill female victims by age. A line of data points can be seen, representing similar ages of those involved (indicative of couples). This linear pattern continues into old age, indicating husbands and other types of partners continue the killings into later life. Compared to their female counterparts, older women 50 and over have proportionally the highest rates of femicide (female homicide), so these patterns are important to study across the life course.

Figure 5. *Jittered Scatterplot of Male Homicide Offenders Who Killed Female Victims by Age N=69,593.*

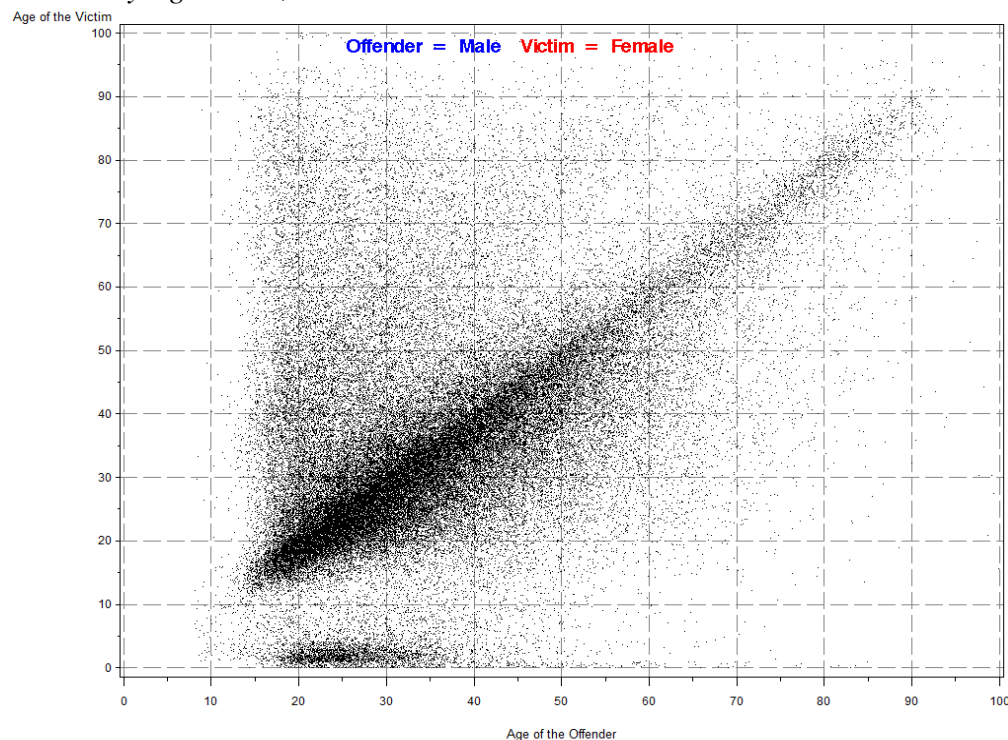


Figure 4-7 Source Federal Bureau of Investigation FBI Supplemental Homicide Reports, for single offender/single victim, 32 years 1980-2011

Female offenders are noted in Figures 6 and 7. The first impression of these graphs is unmistakable, specifically the relative lightness in the scatterplot densities. In general, female offenders are more uncommon than males. Figure 6 indicates the results for female killers of male victims, 10% of the cases in the SHR data set. The darkest pattern illustrates a line, where the victim offender ages are similar (indicating potential intimate partnerships). Infants are also victims, shown down along the horizontal axis, these might be victims of a mother with post-partum psychosis. Interestingly, in Allen et al (2018) we found the time of greatest safety from homicide for children, was between the ages of 6 and 12. This time represents an age where children are in school part of the day, they can perceive and run away from danger and their same age peers are not yet old enough to target them as victims of lethal behavior.

Figure 6. *Jittered Scatterplot Female Homicide Offenders Who Kill Male Victims by Age N=29,806*

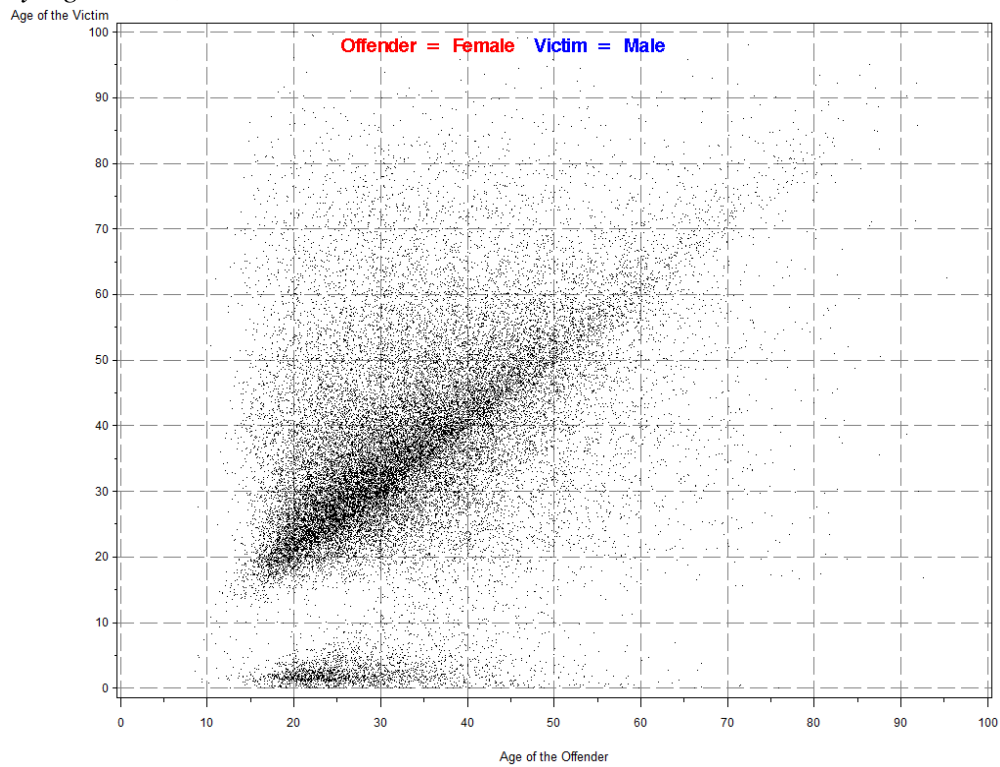


Figure 7. *Jittered Scatterplot Female Homicide Offenders who Killed Female Victims by Age N=7,524*

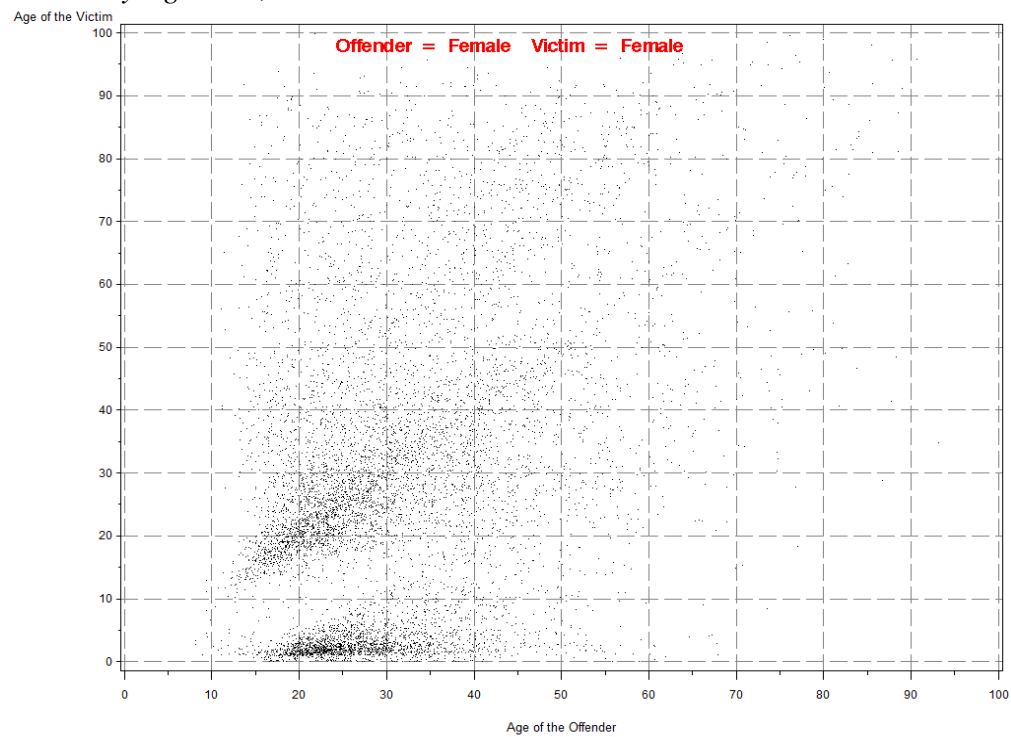


Figure 4-7 Source *Federal Bureau of Investigation FBI Supplemental Homicide Reports, for single offender/single victim, 32 years 1980-2011.*

Figure 7 looks almost blank, when compared to Figures 4-6. Over 32 years, there were relatively few females who killed other females (2.53%). The darkest pattern represents female filicide, where a parent killed a young child. Again, for women, some of these child abuse homicides are hypothesized to relate to mental health problems associated with childbirth.

To add to this information, Siegel, Ross and King (2013) observed a “robust correlation” between higher levels of gun ownership and higher firearm homicide rates and states with higher rates of gun ownership had disproportionately large numbers of deaths by gunshot. Siegel et al (2019) found certain firearm laws in states were related to a reduction in violent gun related deaths.

U.S. Murder-Suicide

Using a sample of 728 intimate partner homicide suicides (IPHS), age and sex patterns were a factor in the 1600 deaths studied. Linked homicide-suicide events are almost exclusively male perpetrated (over 90%), and sometimes multiple secondary victims are harmed or killed. Young victims (18-44 years) were often aware they were in danger just before their deaths, as most of the offenders in that age group were primarily homicidal (showing evidence of intimate terrorism, other crimes against the victim, severe wounds, etc.). In contrast, older female victims were attacked by a partner who may not have shown previous domestic violence behavior. Primarily suicidal husbands in later life seem to incorporate their wives into their own demise—without evidence of consent or terroristic behavior. Unlike younger domestic homicide victims, these women may not realize they are endangered (Salari & Sillito, 2016). News media in the United States has sometimes romanticized accounts of these killings, attributing them to poor health or even ‘mercy killing’ however, there is no evidence the women are consenting—in fact there is evidence to the contrary. The CDC definition of mercy killing requires a request or consent of the person with a terminal and hopeless condition. Careful examination of cases reveal evidence that these do not qualify, and the women are typically unaware, sleeping, have plans for the future or are otherwise uninvolved (Salari, 2015). The post-war baby boom cohort has been particularly suicidal, which is of concern as they move into these stages of vulnerability. Women whose husbands own guns are particularly vulnerable to their husband’s suicidal ideation and behavior.

U.S. Mass Shootings

We just discussed IPHS, focusing on the partnership, but there are often secondary victims included in those lethal events, such as children, other family, neighbors, friends, etc. These represent a form of mass killing, and historical records indicate familicides have been noted in some American households. Violence Policy Center calls these ‘family annihilations’ and they note, they typically end with the suicide of the assailant. Two of the authors of this article, Sillito & Salari (2011) found children of a couple involved in IPHS were at risk of witnessing (54%), being killed (23%) or orphaned, but not present (24%).

Offspring were at greatest risk of violent cause mortality at the hands of their biological fathers (compared to step fathers or mother's boyfriend) and in homes with in-tact marriages. These domestic violence murders break with traditional patterns of perpetration. Bio fathers were homicidal, but for many there was no indication this family tragedy was about to erupt. The suicidal ideation was probably kept from the victims, as many of them were murdered while sleeping in their beds. The majority of perpetrators among young men homicidal (80%), and targeted mostly the female victim. However, for the 20% who were primarily suicidal, the authors suggest the fathers were more suicidal and more likely to kill the whole family as a part of his final fatal event. Older couples were less likely to have young children in the home, so familicide involving more victims was very rare (Sillito & Salari, 2011).

Mass shootings in public places have increased over time in America. Frollman et al, 2019 dataset documented at least 110 mass shootings each with 4 or more victim deaths caused by a single killer in one event, over the past 4 decades. According to the cases listed there were at least 829 deaths and scores of injured survivors (as of February 15, 2019). Perpetrators utilized 143 firearms in these events and 71% were semi-automatic handguns. Just to name a few, the U.S. population has experienced news of a movie theatre massacre in Aurora Colorado, an elementary school shooting in New Town Connecticut, the assault on concert goers in Las Vegas, Marjorie Stoneman Douglas (MSD) High School in Parkland Florida, several churches, a Jewish Synagogue, shopping malls, government buildings and scores of others. Analysis of these data find a variety of high powered weapons (e.g., AR-15, Semi-automatic assault rifle, and other military style weapons). The majority (49%) of these guns were purchased or acquired legally in the United States (many were missing cases and 12% were illegally obtained). Shooters often had signs of mental health problems prior to the attack. One mass shooter was a woman, but men (mostly white) have predominated as assailants. All but two have acted alone.

Discussion

Violent cause mortality is a public health crisis in the United States, and it has endangered individuals, relationships, families, and communities. Male violent cause mortality surpasses female rates. Examining within group differences has uncovered important distinctions associated with the source and characteristics of the threat.

We are taught from a young age to fear strangers or the schoolyard bully, but with suicide, the risk comes from self-harm. This threat to well-being may be difficult to guard against if one has known or unknown risk-factors. When someone has given up hope for their own future, they may also become a danger to others. Patterns in suicide differ by place, sex and age, among other variables. Figure 3 map illustrated high-risk areas, specifically Alaska and four states in the Intermountain West. Individuals in New York State, known for strong firearm restrictions, had a suicide risk which was 3.5 times lower than that of a person in

Wyoming, where there are few gun regulations. Sex differences show males have the greatest risk of completed suicide, and are also more likely to use a firearm (compared to women). Suicide for women is less likely 'completed,' and more likely to involve poisons or pills (less violent methods). At either end of the spectrum, teens or older persons, males are more suicidal.

A man's killer is typically another man, probably an acquaintance. Women's killer is also more often a male, but with the relationship of current or former intimate partner. Intimate femicide, where women are killed by their current or former partners, is facilitated by access to lethal means. While a beating with a fist can be fatal (and many are), there is a greater chance of escape when the weapon is not a firearm. In terms of place, women are at risk of homicide in their own homes. We envision our residence as a place of safety, surrounded by trusted loved ones. In addition, intimate partner homicide offenders are more likely to take their own lives during the murder, resulting in an IPHS scenario. Men are the vast majority of perpetrators of murder-suicide and familicide, again, usually choosing firearms. These crimes go unpunished because the perpetrator has controlled the entire event and the fate of individuals in the partnership, not to mention secondary victims. Our justice system requires a live defendant to go through a trial, and be found guilty, not guilty or completely exonerated. Without this opportunity, the family and community may find it difficult to heal from the open wound. In contrast, only about 7 percent of male homicide victims are killed by an intimate partner (Cooper & Smith, 2011). Legislation can work to make structural changes in society and promote violence prevention, however enactment is only one component of justice. There must also be enforcement of the laws, and for some firearm laws—this component is lacking. For example, the Violence Against Women Act (VAWA) and the Lautenberg Amendment restrict gun ownership among those who are the subject of a protective order or convicted of a domestic violence related crime. However, Salari & Sillito (under review) present evidence from the IPHS Data showing the majority of murdered women in their sample with an active protective order were killed by their stalker with a firearm (92%). The authors also demonstrated non-firearm attacks were more survivable than gunshots, and states with domestic violence related restrictions were less likely to experience fatal IPHS events. Sadly, VAWA policy has undergone a transformation, where it was widely supported in the 1990s by both the President and Congress. But now, it serves as a lightning rod or dividing point in politics. The reason is related to firearm bans for those who have battered or stalked their partner. Powerful forces in the gun lobby have threatened to weaken the gun restrictions contained in this legislation.

Mass shootings in public are most often perpetrated by men, and they may have origins in household or domestic violence, which spills over onto the streets. For example, Adam Lanza, the killer of 20 6 year old children and their 6 teachers in Sandy Hook Elementary School, began his rampage by shooting his mother to death. While some offenders have visible mental health issues, many do not. It is difficult to pick out of a crowd, the student or concert goer who suddenly turns violent on his (or her) surroundings. When an incident begins a downward spiral out of control, the suicidal individual may become a public health risk. Key to

prevention includes reducing the feelings of hopelessness (suicidal ideation), addressing mental health concerns, and most importantly reducing the access to lethal means. So often in the U.S., conversations about suicide include the first two, but rarely a frank discussion about securing or removing firearms. In fact, when the massacre at Sandy Hook took place, New York State tightened firearm access laws, while Utah made it easier to carry a gun (under the assumption it would be used to save lives). Similarly, school safety plans now involve teachers carrying guns and more armed security.

We have demonstrated much of the instances of American suicide, homicide, murder-suicide and mass homicide have been carried out with firearms. The nature of firearms make it easier to kill others at a distance, when compared to other direct contact methods (e.g., blunt force or knife attack). If carrying a firearm made us safer, the U.S. should be the safest country in the world, since we have the highest saturation of gun among civilians. Unfortunately, Americans are kept in the dark about the health risks and research on household firearms. The Dickey Amendment inserted a barrier to public funding of research into the United States Budget. The result has been a 20+ year ban on federal funding to study firearm related injuries (U.S. Budget, 2018). There is no similar ban on research and public education related to other types of injury to public health. Despite this barrier to funding for public safety, there has been some exciting work done on harm reduction associated with guns. Siegel's research group using the State Firearm Law Data Set have identified firearm laws which make a difference. Specifically, regulations of ammunition, dealers and buyers (including background checks, waiting periods), high-risk possession (e.g., domestic violence or suicidal), assault weapons and large capacity magazines, concealed carry permits, gun trafficking, and child access prevention (Firearm State Laws, 2017). Since the majority of Americans with guns do not lock them up, this might represent a beginning point for public education and action (Crafasi et al, 2018).

In addition to these new ideas, we would emphasize enforcement of laws already enacted such as the VAWA gun bans for domestic violence perpetrators. Some state law enforcement will not even try to remove guns from a domestic violence perpetrator. Very serious cases would require Federal Agents to travel to the state to remove firearms. As a result, it is not done frequently as it would be if local police would handle the matter.

Since there is no gun registry in our state of Utah, buyers can purchase from private sellers—there is very little paper trail, and difficulty knowing who has what firearm, leading to inadequate enforcement (Salari and Sillito, under review). Suggestions for reform include a reduction in the surplus weapons available to high risk individuals, such as suicidal teenagers or senior citizens (particularly males), those with a history of domestic violence or mental illness (e.g., depression, dementia). A voluntary buy-back policy might alleviate pressure in high risk households, to allow concerned families and individuals to turn in weapons for a small cash reward. This policy, along with public education campaigns and practices such as storing ammunition separately from firearms has worked in places like Switzerland, a country with a pro-gun culture and mandatory military service. The Swiss were able to reduce firearm homicides and suicides

using rational gun reform (Brueck, 2018). For example, they enforce restrictions associated with domestic violence, alcohol or drug problems. Ammunition is kept separately from firearms and it is illegal to carry a gun on the street (Brueck, 2018). Interestingly, Switzerland has recently agreed to comply with the new EU standards for stricter gun regulation (Fiorentino, 2019).

Evidence suggests US states with greater gun restrictions had fewer related fatalities. So, what prevents the U.S. from similar modifications across the board? Many use the argument of the 2nd Amendment of the US Constitution, which conditionally protects the right of the people to “keep and bear arms,” and this argument has been used to justify the perceived need to ‘protect oneself’ from intruders, which invoke scenarios of governmental search and seizure or intruders on one’s home or property (the ‘stranger danger’ anxiety). However, we have learned from this article, the real dangers lie in acquaintances for males, and intimate partnerships for females. Households which stockpile at least one gun endanger inhabitants, who are more likely to die from a suicide and/or homicide incident --with their own firearm (Moyer, 2017; VPC, 2018a; 2018b). The Supreme Court of the United States (SCOTUS) has supported ‘reasonable’ firearm restrictions, but state control predominates. These ‘reasonable’ restrictions can be applied to gun purchase and possession in states whose residents/elected leaders wish to limit access. However, these court opinions may shift with the addition of two new conservative leaning SCOTUS Justices, who have the potential to change to the opinions of the court (Wall Street Journal, 2019).

After the Valentine’s Day 2018 school shooting at Marjorie Stoneman Douglas High School, Parkland Florida—where the offender used a high powered weapon to kill 17 and injure many others-- National Public Radio NPR (2018) polled a sample of Americans. Three-quarters believed “gun laws should be stricter than they are today.” Even before that tragedy, most agreed to some limitations, such as the regulation of purchase or possession of guns for those with known mental health problems or a history of domestic violence. Despite this majority viewpoint, the U.S. gun lobby has exerted influence over laws by contributing to the campaign funds of politicians—who in turn will do nothing to limit guns or hold manufacturers accountable (laws actually prohibit lawsuits aimed at that industry). The national gun lobby protected it’s manufacturers by employing legal strategies to resist lawsuits (like those used to break up the powerful tobacco lobby in the 1990s). In 1994, Congress narrowly passed the Public Safety and Recreational Firearms Use Protections Act and President Clinton signed the assault weapons ban on September 13th. Ten years later, the legislation expired and has not been renewed (Washington Post, 2018). The U.S. continued lack of regulation of high powered military style weapons since 2004, means the violent death mortality risk is increasing exponentially over time during these attacks. The prevalence of such events has tripled in recent years, and some have spread to international locations, such as the Muslim Mosque in New Zealand. The key difference being *New Zealand’s response, which immediately banned these high powered weapons*. Australia responded to the 1996 Port Arthur Massacre with vast reductions in overall firearms, which has drastically reduced mortality for over two decades (Calamur, 2017). In contrast, the United States has

done nothing to address the problem, due to the well-funded opposition and gun lobby—and the intentionally under educated American people. In the U.S., recent massacres using military style weapons, with little government response, have frustrated many Americans. The most recent elections suggests perhaps the political atmosphere has begun to change. The United States has many challenges related to the prevention of violent cause mortality, and research plays an important role to inform the public and change preventable behaviors.

Conclusions

Our research article has mapped out conditions in the United States which have fostered the highest population adjusted violent cause mortality in the developed world. Other high income countries (Australia and Switzerland) have been faced with homicides, suicides and even massacres in the past, but have chosen completely different effective routes to support prevention of further gun violence. In those parts of the world, the workable solutions were less controversial and divisive—where one person's rights did not tread on the safety of another. In contrast, American solutions ignore VCM, mis-inform the populace and avoid prevention methods for of homicide and suicide, if curtailing rights to private possession of firearms is involved. With talk of regulation comes serious resistance from some of the population (rural, white men) and they are heavily influenced by the powerful gun lobby. Constructive action is blocked by concerns of a 'slippery slope.' Honestly, who could have imagined prevention of violent deaths from suicide, family abuse or mass killings could be so political? We are left with some concerns about the future including 1) the powerful gun lobby, which seems unlimited, particularly in light of the Citizen's United campaign finance laws, which permit unlimited funding from special interests 2) the lack of federal funds for firearm injury research and education, 3) the increasing firearm ownership in civilian households 4) the recent increases in suicide and homicide among young and old alike. The aging of the Baby Boom cohort into ages of high self-harm, as they have been highly suicidal all their lives. And new research suggests GenX cohort is even more concerning (Phillips, 2014). And 5) The changing composition of the US Supreme Court, where new justices are thought to support the conservative agenda of doing nothing about gun violence.

We will leave you with positive developments. 1) We are in the process of expanding our IPHS data to cover twenty years 1999 to 2019, so we intend to focus on understanding modern cases of fatal family violence, with an eye toward promoting effective prevention, 2) After the Parkland Florida massacre at MSD High School, the students began a massive movement called #MarchforOurLives. They held very well attended protest marches in cities around the US. country to rally behind the students whose classmates were gunned down before their eyes. They have been fighting for structural changes to reduce access to military style weapons and improve the safety of students so they can learn. They note their assailant purchased his firearms legally, despite his clear mental health problems. These students have socialized adults twice their age, regarding what can be

accomplished by speaking out and becoming politically active. It worked, because mid-term elections were held in 2018, and the U.S. House of Representatives flipped toward philosophies with greater affinity for gun reform—without accepting donations from the gun lobby.

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