

The Internist's Role in the Firearm Public Health Crisis



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This is to acknowledge that Stephanie Brinker, MD has disclosed that she does not have any financial interests or other relationships with commercial concerns related directly or indirectly to this program. Dr. Brinker will not be discussing off-label uses in her presentation.

Biosketch

Dr. Stephanie K. Brinker is an Assistant Professor of Internal Medicine at UT Southwestern Medical Center in the Division of General Internal Medicine. Dr. Brinker graduated from UT Houston Medical School in 2008, and then completed her internal medicine residency training at Southwestern in 2011. She stayed at Southwestern for a research fellowship in Hypertension and joined the faculty in 2013 in the Division of General Internal Medicine. She practices primary care medicine in the Solomon General Internal Medicine Clinic and works in undergraduate medical education as the co-director of the Internal Medicine Clerkship. She also serves as a mentor of the medical school's Colleges course. Dr. Brinker's most important and cherished role is of mother to her two children, Charles and Beatrice. She grew up in a home containing firearms and learned to shoot at age six. A childhood dream was to compete in the Biathlon in the Olympics.

Purpose and Overview

Approximately 96 people are killed every day in the United States with a firearm. Firearm related death is the third leading cause of death for children and adolescents and the 13th leading overall cause of death. The majority of firearm deaths are suicides followed by homicides and unintentional injury. Firearm related death and injury cost an estimated 42 billion dollars per year in medical costs and lost wages. This presents a public health crisis and merits a physician response. Internists have a role in better understanding firearm violence through research, identifying patients at risk of firearm violence, counseling patients on firearm violence with a specific focus on reducing lethal means in suicide and providing patients with practical knowledge on firearm safety. Finally, internists have a potential role providing evidence-based information to inform public policy on firearms.

Educational objectives

1. Identify firearm public health crisis.
2. Understand the role of firearms in suicide and the importance of lethal means reduction.
3. At the conclusion of this lecture, the listener should be able to describe potential roles for internists in addressing the firearm public health crisis including: research, identification of patients at risk of firearm violence, providing firearm counseling with practical knowledge to decrease firearm harm risk and participation in firearm public policy formation.

Firearms in the United States

It is difficult to accurately report the number of firearms in the United States as there is no comprehensive federal registry of firearms. Federal law (Firearm Owners Protection Act) prohibits the use of the National Instant Criminal Background Check System from creating a registry of firearms or firearm owners. However, it is estimated that there are anywhere from 265-300 million firearms in the United States[1]. The overwhelming majority of firearms in the United States are legally imported or manufactured here and are introduced to the gun market through federally licensed gun dealers. After this, guns exchange hands through federally licensed firearm dealers, gifts, inheritance or non-purchase transfers (theft and borrowing). There has been a rapid increase in both the manufacture and importation of firearms into the United States in the last 15 years with approximately 3.7 million firearms produced and 1 million imported per year in 2000 to 9.3 million manufactured and 5 million imported in 2016[2].

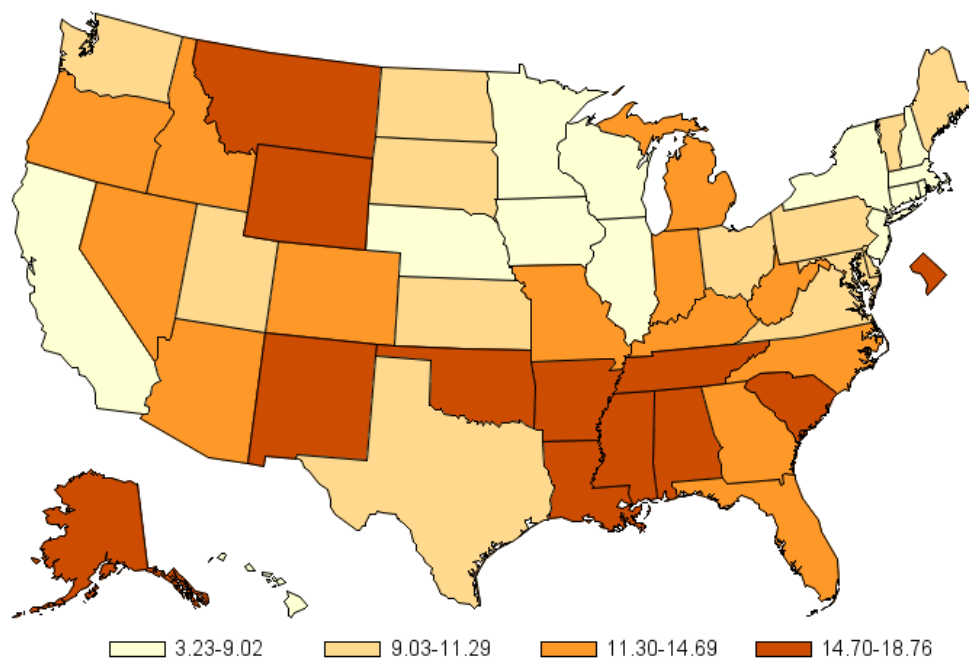
Knowledge of firearm ownership in the US primarily comes from self-reporting surveys. A 2017 survey from the PEW Research Center suggests that 30% of Americans personally own a firearm and 42% live in a home with firearms. 39% of men and 22% of women reported owning a firearm[3]. The National Firearms Survey indicates 42% of firearms in the US are handguns with 53% being long guns. While overall firearm ownership is more common in older, white, men from rural areas in the South, if you look at people who own handguns only, they are more likely to be female, nonwhite, and living in urban areas. While the average number of guns per owner is 4.8 firearms (range 1-140), the median firearm owner has two guns. This is skewed by a small percentage of owners with 10+ firearms. Half of all guns in the United States are owned by this 14% of gun owners[1].

Firearm Deaths

Firearm Deaths in the United States, 2014 [4]

	Number of deaths	Rate per 100,000 persons
Total firearm deaths	33,594	10.5
Unintentional deaths	461	0.1
Suicides	21,386	6.7
Homicides	11,008	3.5
Undetermined	275	0.1
Legal intervention/war	464	0.1

2008-2014, United States
Death Rates per 100,000 Population
 Firearm, All Intents, All Races, All Ethnicities, Both Sexes, All Ages
 Annualized Crude Rate for United States: 10.44



Reports for All Ages include those of unknown age.

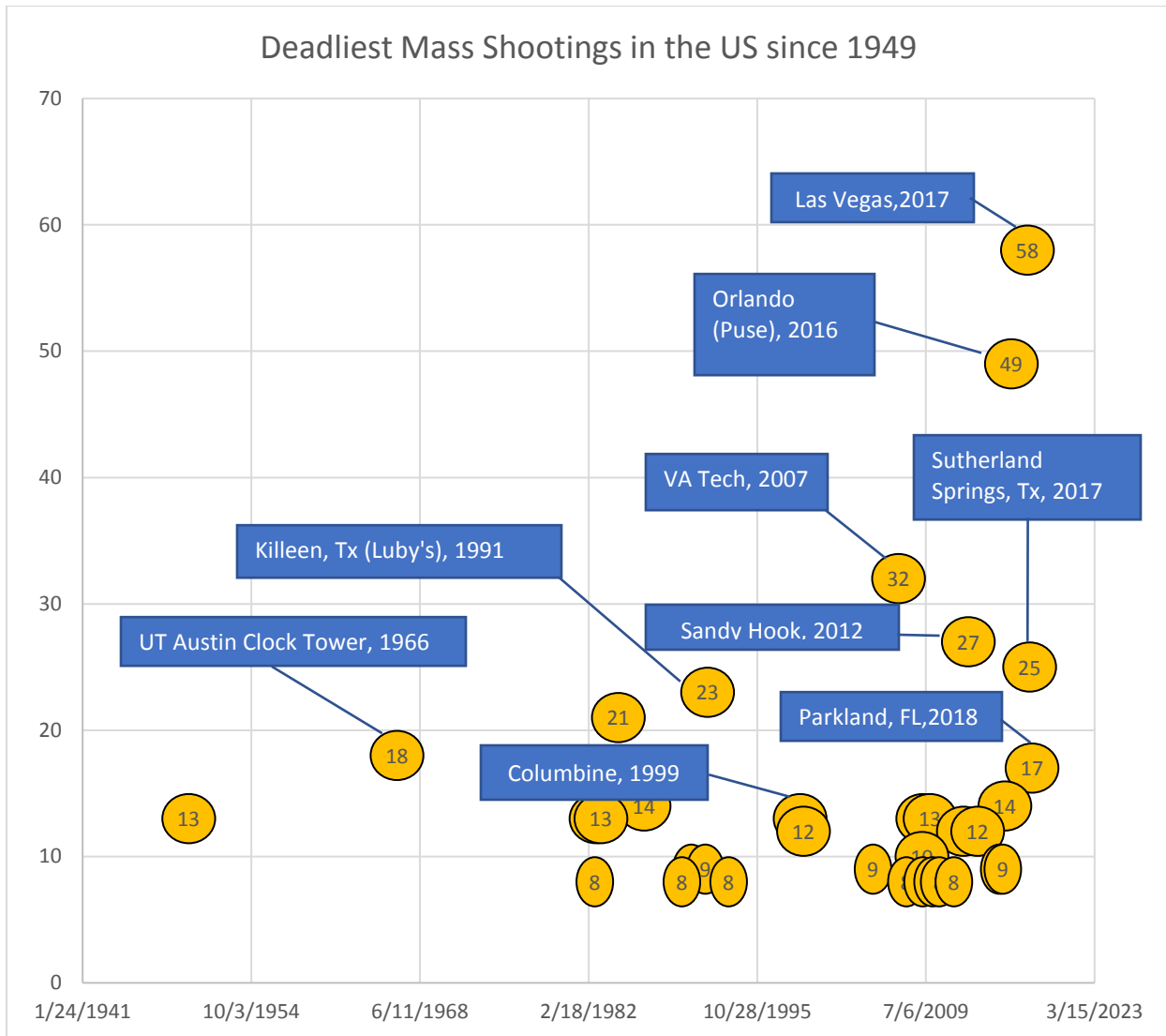
* Rates based on 20 or fewer deaths may be unstable. States with these rates are cross-hatched in the map (see legend above). Such rates have an asterisk.

Produced by: the Statistics, Programming & Economics Branch, National Center for Injury Prevention & Control, CDC
Data Sources: NCES National Vital Statistics System for numbers of deaths; US Census Bureau for population estimates.

Firearms account for 17% of all injury related death. Firearms are the third leading cause of injurious death trailing motor vehicle accidents and poisonings. Taken together firearm injuries are the third leading cause of death among children and adolescents, and the 13th leading overall cause of death with an overall rate of 10.5 deaths per 100,000 persons. It is estimated that 96 Americans are killed with a firearm every day. Suicide accounts for 63.7% of all gun deaths. Homicide accounts for 32.8% of all gun deaths[5].

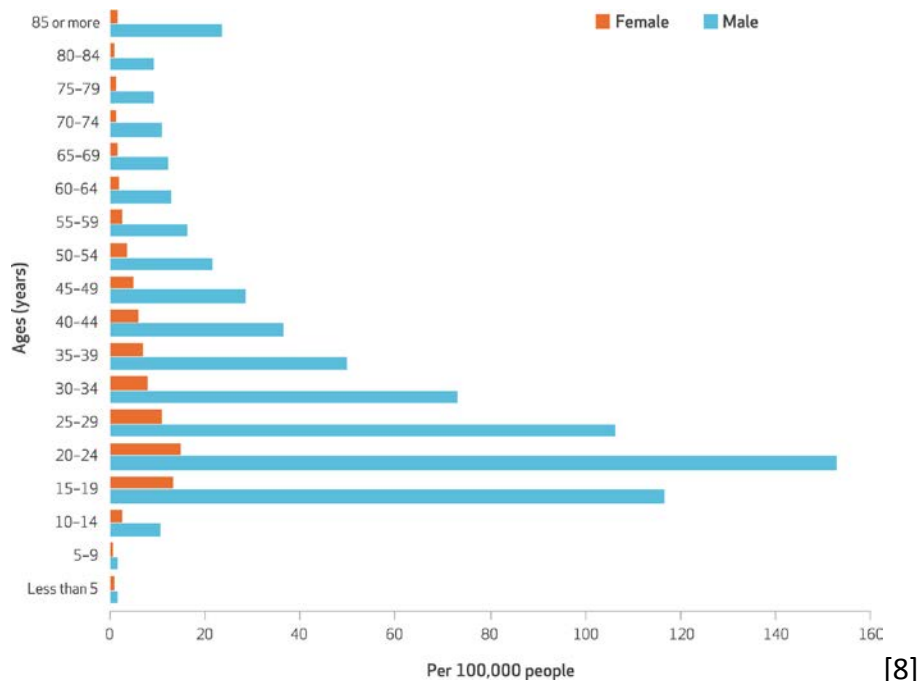
While still a small percentage of all-cause mortality in the United States, mass shootings are changing the American social framework. Mass shootings, defined by the Congressional Research Service as the killing of 4 or more people at random in a public place are increasing in frequency and account for 1.2% of gun deaths. 60% of the deadliest mass shootings since 1949 have occurred in the last 10 years, and 3 out of the 10 deadliest mass shootings in US history have occurred in the last 6 months. The Government Accountability Office found that 67% of school districts now conduct active shooter drills. Mass shootings appear to be a uniquely American problem. A 2016 study of the global distribution of public mass shooters around the world found that 31% of all public mass shootings occur in the United States which comprises

only 5% of the world population, and that this distribution appears to be partially attributable to the difference in firearm availability between nations[6].



The United States does not have the highest rates of firearm related death in the world. Several Central American, Caribbean, African and Asian countries marked by civil unrest, drug trafficking and gang violence have higher rates of firearm death. However, when compared to other high-income nations, the firearm homicide rate is 25.2 times higher in the United States. The firearm suicide rate is 8.0 times higher in the US, and unintentional firearm death is 6.2 times higher than in other developed nations. The overall firearm death rate is 10.0 times higher in the US. Strikingly, 92% of all young people aged 15-24 who are killed by a firearm in the developed world are killed here, and 82% of all firearm deaths in high income nations are in the US[7].

Firearm Injury



Firearm injury disproportionately affects young, nonwhite men and results in significant cost. It is estimated that 80% of admissions for firearm injury are for people aged 15-44[9]. Admission for firearm injury is 9 times more common in men than women, and 10 times higher in black than white Americans[9]. Greater than 60% of all firearm injury admissions are for assault, and 70% of these injuries involved a handgun. An estimated 704,916 people presented to emergency rooms for firearm related injury between 2006-2014. 37.2% of these patients were admitted to the hospital for inpatient care.

Among patients who present to ER's alive, 8.3 % die in the ED or during their inpatient admission. Increased mortality is associated with increased age and increased severity of injury on presentation. Assaults are the most common cause of presentation to the ER for firearm injury, and therefore account for 42% of the hospital deaths. However, the mortality rate for assault is only 7% while the mortality rate for a patient who presented with a firearm suicide attempt is 38.5%[8].

Cost of Firearm Injury and Death

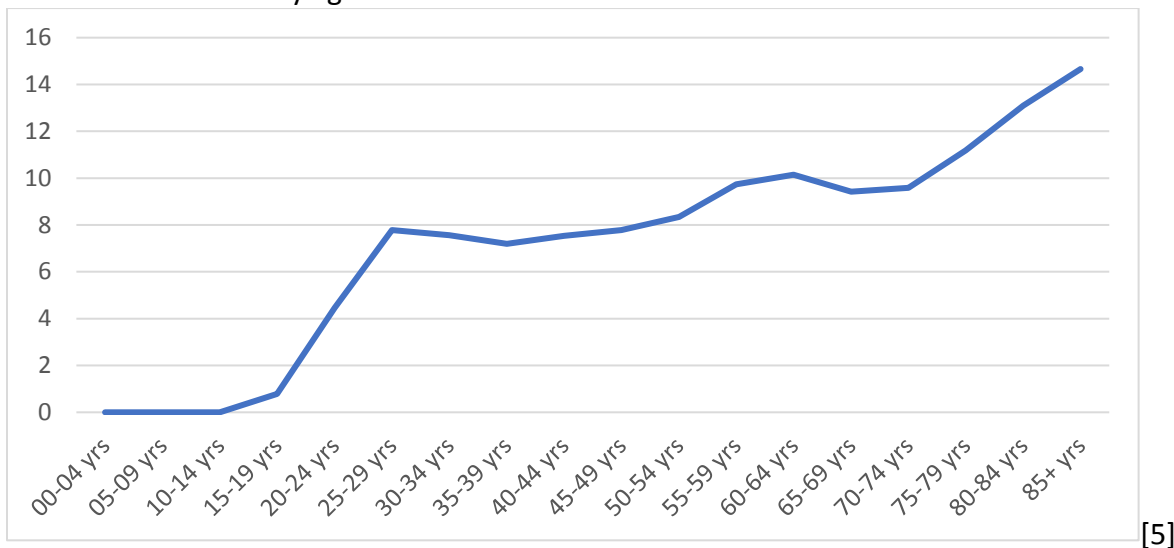
Firearm deaths resulted in \$187 million dollars in medical costs in 2010, and the combined medical and work lost resulted in \$41 billion dollars[5]. The estimated collective cost of fatal and nonfatal firearm related injuries is estimated to be \$622 million in annual inpatient charges,

\$389 million for firearm assaults. Over 30% of firearm injury admissions were covered by Medicaid while 25% were among uninsured patients[9] resulting in significant burden on taxpayers and hospital systems. With a mean ER charge per patient of \$5,254 and a mean inpatient charge of \$95,887, the combined annual cost of ER visits and inpatient stays for firearm injuries is \$2.8 billion [8]. Firearm injuries in total were estimated to cost 174 billion annually in lost work and health care costs, criminal justice claims and decreased quality of life in 2010[10].

Firearm Suicide

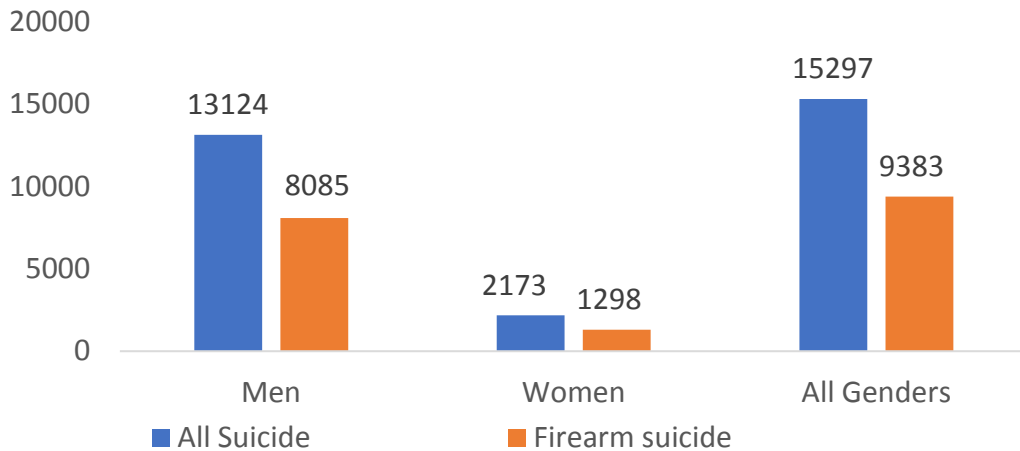
Since 1999, the US suicide rate has increased by 30% with about half of all suicides by firearm. There were 22,938 firearm suicides in 2016. The crude rate of firearm suicide per 100,000 persons increases with age. The firearm suicide rate is steady at about 7.5 per 100,000 for adults age 20 to 44, but then steadily rises with age. The firearm suicide rate is over 14 per 100,000 people over the age of 80[5].

Firearm suicide rate by age:



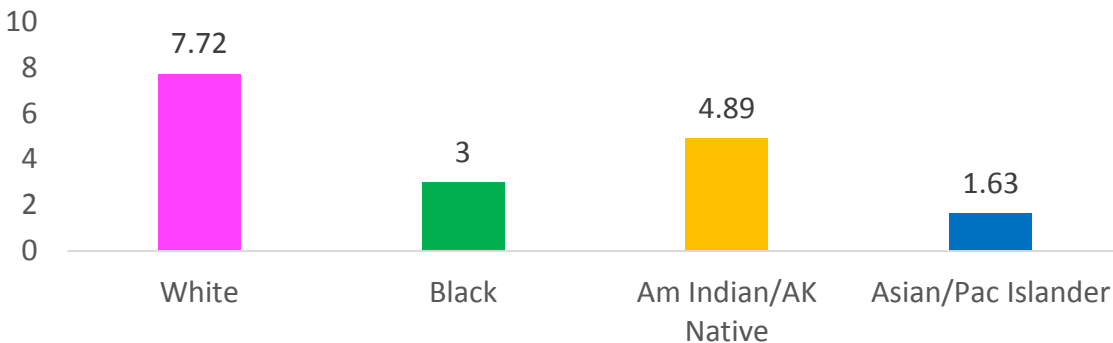
There were 294,816 non-fatal suicide attempts by women and 210,691 non-fatal suicide attempts by men at a respective rate of 192 persons per 100,000 vs. 134 persons per 100,000 in 2015[5]. Men, however, have a far greater rate of suicide completion with an increased rate of firearm suicide. Caucasians have the highest rate of firearm suicide (7.72/100,000 people) followed by Native Americans (4.89/100,000) , African Americans (3/100,000) and Asians (1.63/100,00)[5].

Firearm suicide in 2016 by sex:



[5]

Suicide rate per 100,000 by race:



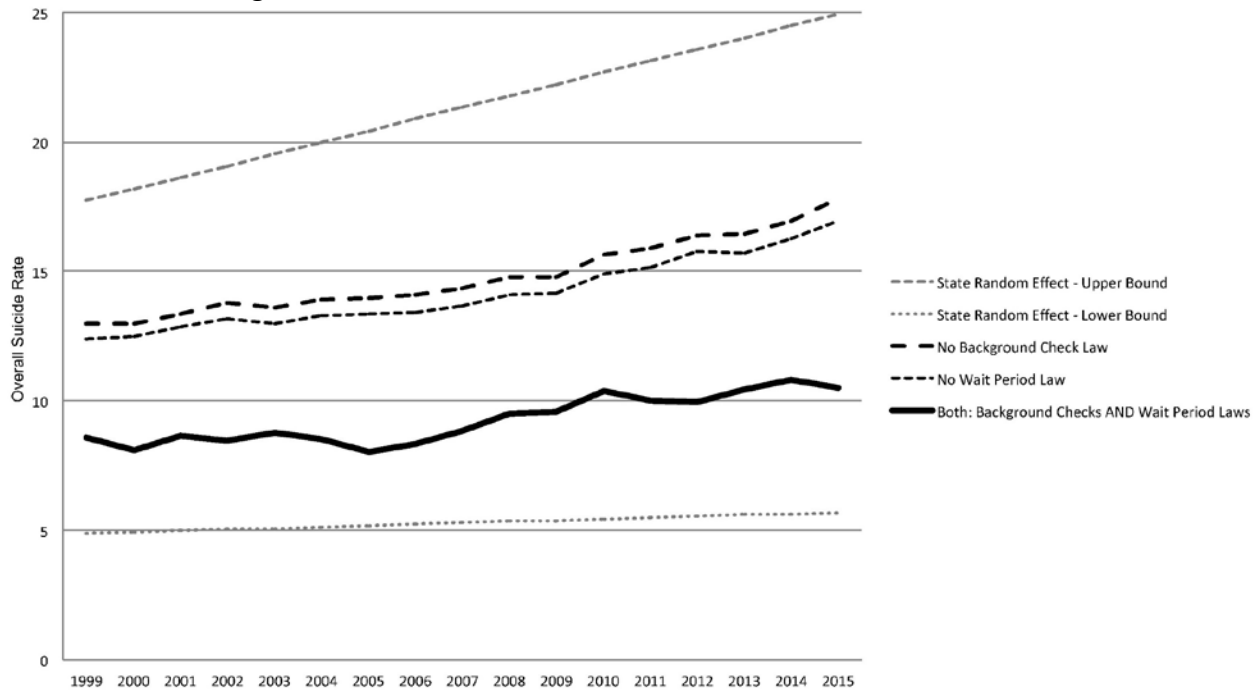
[5]

Lethal Means

While less than 5% of suicide attempts involved a firearm, over half of suicide completions involve a firearm. Firearms are the most lethal means of self-injury with an estimated case fatality rate exceeding 90%[11, 12]. Suicide is routinely an impulsive act. The time between suicidal ideation and the act is short. In 24% of near-lethal suicide attempts, people reported taking less than five minutes from their decision to end their life to the attempt. 70% attempted within one hour of decision[13]. Access to firearms in the home increases the risk of suicide by firearm[13, 14]. Cross-sectionally, states with higher gun ownership have higher suicide rates[13]. States laws that reduce a person's ability to impulsively acquire a firearm including universal background checks and mandatory waiting periods reduce levels of overall suicide[15]. When Missouri and Connecticut passed permit to purchase laws requiring a background check, completion of an application to a law enforcement agency and a waiting period, they saw a 16.1% and 15.4% reduction in firearm suicide rates respectively.[16] Restricting the lethal means in a period of impulsivity prevents suicide, and may represent the most fertile ground for physician intervention in the firearm public health crisis. Reducing the

access to lethal items such as firearms is a recommended, evidence based practice to prevent suicide[17].

Effect of firearm legislation on firearm suicide rates:



[15]

Role of internists in other public health crises

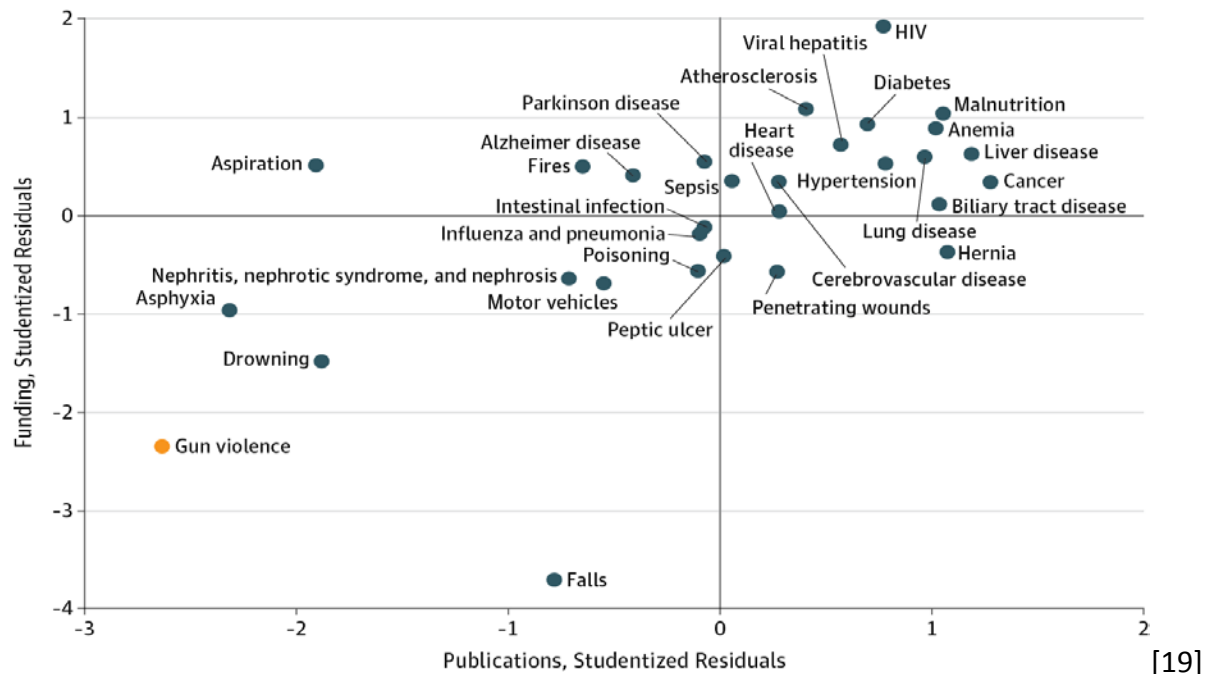
Physicians have a vital role in public health crises and have been at the heart of the public response to crises such as automotive accidents, tobacco harm and HIV. Physicians participate in vigorous research to identify and fully understand public health problems and evaluate solutions. We identify patients at risk from a public health crisis and screen them for potential harm. We provide our patients interventions, usually practical knowledge, to keep them healthy and safe. The HIV crisis provides a clear example. In 1981 a group of physicians in Los Angeles noticed previously rare PCP infections in healthy gay men. They published a report and a storm of similar reports poured in from around the world. The research on HIV has never stopped. Physicians around the world changed their practice to begin routinely asking patients about their sexual practices and drug use in order to identify patients at risk. We began routinely screening our patients for HIV and were at the forefront of normalizing the conversation about HIV. We identified and shared practical knowledge with our patients to reduce their risk of HIV infection counseling patients on condom use, specifically latex condom use, and avoidance of sharing needles, even helping establish needle exchange programs. Finally, physicians have helped inform HIV public policy formation. Firearms present a public health crisis in need of a similar response from physicians.

The internist's role in the firearm crisis: research

Research on firearm related death and injury in the United States is very limited. Following publication of firearm injury research in the 1990s that was perceived to be “pro-gun control,” the NRA lobbied for the exclusion of federal funds for firearms research. In 1996 an amendment was added to a Congressional Appropriations bill by Representative Jay Dickey stipulating that no Centers for Disease Control funds “may be used to advocate or promote gun control.” The CDC’s budget was concurrently cut by the exact dollar amount allocated for firearms injury research the previous year, \$2.6 million. Similar language was then extended to all Health and Human Services agencies including the National Institutes of Health. While the Dickey amendment did not explicitly prohibit federally funded research on firearm injury, it was interpreted as such effectively ending federal firearms research. The CDC budget for firearms research fell to just \$100,000 by 2013. Following the Sandy Hook mass shooting President Obama released a directive to the CDC and HGH to “conduct or sponsor research into the causes of gun violence and the ways to prevent it.” However, Congress has continued to restrict CDC funding for research of firearm related injury[18, 19].

Compared with other leading causes of death, firearm violence is associated with less funding and fewer publications than would be predicted based on the firearm mortality rate. Firearm violence has 1.6% of the predicted funding and only 4.5% of the number of predicted publications. Gun violence research is funded at 0.7% of sepsis research and the number of publications is only 4% of sepsis though firearm related death and sepsis have similar mortality rates. Firearm research is the least published and second least funded (after falls) cause of death relative to mortality rates[19].

Studentized Residual Predicted vs Observed Funding and Publication Volumes for 30 Leading Causes of Death in the United States



The Internist's role in the firearm crisis: identifying risk and counseling

The American Academy of Pediatrics has long recommended physician firearm counseling, and the American College of Physicians recommended screening and counseling patients for firearm risk in their 2014 position statement on firearm injury and death[20]. Physicians overwhelmingly report that they believe firearm injury is a public health threat (85%), and that it is worse than a decade ago (71%). 66% of physicians think they should counsel patients on prevention of firearm injury and death, but 58% report that they have never asked if a patient has a gun in their home[21]. A review of suicidal patients who were discharged home from an emergency room found that 85% did not have any documented lethal means assessment[22]. The reasons physicians do not screen are many fold, but include worry about alienating patients and concerns about infringing on Second Amendment rights. However, most patients including firearm owners think that it is at least sometimes appropriate for their doctor to talk to them about firearms. Patients, including firearm owners, are increasingly receptive to firearm counseling if they understand themselves to have firearm risk such as having a child in the home or believing firearms in the home increases suicide risk[23].

Legal concerns

There are no federal or state laws prohibiting physicians from discussing firearms with patients when it is relevant to their health or the health and safety of others. The Patient Protection and Affordable Care Act (ACA) prohibits required collection of firearm info by "wellness and health promotion" programs and prohibits the collection of information on firearm ownership in a database. Under the ACA an individual cannot be required to disclose any information on firearms and ammunition or their use and storage. However, physicians are not barred from discussing firearms under the ACA. Florida passed a more restrictive statute in 2011, the Florida's Medical Privacy Concerning Firearms. This law barred medical personnel from asking about firearms and prohibited healthcare workers from entering firearm information into the medical record *unless* the practitioner believes the information is relevant to the patient's health or safety. The law also barred providers from discriminating against or "harassing" a patient about firearm ownership. This came with the threat of loss of medical licensure. The US Districted Court ruled this interfered with physicians First Amendment rights. However, this decision was overturned by a three judge panel of the US Court of Appeals for the Eleventh Circuit, but the decision was ultimately vacated by the full court. The Court of Appeals has agreed to rehear the case but has not yet done so. A few other states have also passed legislation regulating the discussion of firearms between physicians and patients, but none are a true "gag law." Montana has a law that firearm information cannot be required as condition for receiving care. Missouri state statute prohibits collection of firearm information unless "necessary," and Minnesota law prohibits collection firearm information by state health commissioner and Mnsure. When relevant to the health and safety of patients and others, the discussion of firearms is always allowed by state and federal law[18].

How to counsel

In the current political climate of contentious firearm legislation debate firearm ownership can be seen as membership in a culture. Firearm counseling by physicians should take a patient centered approach and requires cultural competence that is respectful of different cultures[24]. Ideally, it should occur in a well-established doctor patient relationship. Physicians should always ask permission before screening and sharing information and provide context for their questions explaining why firearm safety counseling is relevant to the patient’s well-being. The physician should respectfully acknowledge that the patient is the expert in their own life and affirm their positive behaviors. Physicians should respectfully and non-judgmentally provide information on firearm safety including information on the risks of injury and death without dictating to patients what to do following the principles of shared decision making[18, 24].

When to counsel

Due to competing clinical priorities, it is unlikely possible screen and counsel every patient for firearm risk. ER physicians and leading firearm violence researchers Drs. Wintemute, Betz and Ranney propose focusing counseling on three groups of patients: those with acute risk (suicidal and homicidal ideation), those with individual risk of firearm violence and members of demographics at increased risk of firearm harm to self or others[18]. The following table adapted from their work details examples of patients in these groups and the appropriate counseling and intervention.

Condition	Examples	How to respond when patients have firearm access
Acute risk for violence	Suicidal and homicidal ideation	Emergency! Reduce lethal means: work with patient (if possible) to temporarily restrict access to firearm Disclose to others if necessary to reduce risk
Increased individual risk factors for firearm harm to self and others, intentionally and unintentionally	Personal history of violence: both perpetrators and victims of crime Alcohol abuse Serious mental illness, especially: In combination with substance abuse During acute exacerbation After victimization Conditions impairing cognition and judgment: Brain disorders such as Alzheimer’s disease	Counsel on safe storage Counsel on risk reduction When capacity is diminished, consider disclosure to others
Member of demographic at increased risk of violence to self or others, or unintentional firearm injury	Middle-aged and older white males Young African American males Children and adolescents	Counsel on safe storage Counsel on risk reduction For minors, involve parents

[18]

Assessing gun safety and offering practical interventions

Once a patient has reported gun ownership, physicians must ask follow-up questions to assess their patient's and other's safety. Physicians might follow the "5 L's" mnemonic[25]. Is the weapon **L**ocked, **L**oaded? Firearms that are stored loaded or are unlocked are more likely to be used than those that are stored locked and unloaded[26]. Ammunition should preferably be stored separately from the firearm. Are there **L**ittle children in the home? This question isn't just important for pediatricians! Don't forget to ask your older patients as one in twelve children live with their grandparents. Is the patient feeling **L**ow? Patients at risk of suicide should be counseled on lethal means restriction not just patients endorsing an active plan. Is the owner **L**earned? Has the patient received firearm training? Almost half of gun owners have not received firearm training and of those that have a fifth still store their firearms improperly[25]. Physicians should be educated on firearm safety and prepared to provide patients practical interventions to help keep them safe. Physicians should be prepared to discuss basic firearm safety including safe storage and provide simple handouts and websites.

Educational resources for patients

New Hampshire Firearm safety Coalition	Handout focused on suicide	http://www.theconnectprogram.org/sites/default/files/site-content/firearm_storage_options.pdf
Utah Firearm Suicide Prevention	Training Video	https://vimeo.com/176189702
King County Department of Public Health	Firearm violence prevention and safe storage	http://kingcounty.gov/healthservices.health.injury.aspx

Lethal means restriction

As discussed earlier, if your patient does endorse suicidal ideation or has suicidal risk, lethal means reduction is an evidence-based, recommended practice to prevent suicide. HIPAA states that a physician may disclose to "prevent or lessen serious and imminent threat." In Texas there are several options for temporary transfer of firearm for safekeeping because there is no universal background check laws that prohibit transfer of firearms for safekeeping. Therefore, you can counsel a patient to give their firearm and ammunition to a friend or family member, a federally licensed firearm dealer, gun ranges that offer firearm storage, and law enforcement

agencies. Texas Law allows for mandated firearm seizure by law enforcement from a person in a mental crisis[27].

Resources for physicians

Harvard Means Matter	Suicide risk reduction	https://www.hsph.harvard.edu/means-matter/recommendations/clinicians/
Massachusetts Medical Society and MA Office of the Attorney General	Pamphlet on Physician Firearm Counseling and Firearm Safety	http://www.massmed.org/firearmguidanceforproviders/
American College of Physicians	Collection of resources on Firearm Safety Counseling	https://www.acponline.org/physician-counseling-on-firearm-safety

The Internist's role in the firearm crisis: public policy

Can legislative action make a difference in this public health crisis? Other nations have had success in passing sweeping firearm legislation usually following mass shootings which lead to a reduction in firearm violence (Australia, UK, Germany). As discussed above, legislative action in Connecticut and Missouri have successfully lowered firearm suicide rates[16]. States with stricter firearm laws have overall lower firearm death rates. Given the United States' cultural and historic relationship with firearms, a careful public health approach is required.

In response to the firearm public health crisis eight professional societies representing the vast majority of all US physicians issued a joint position statement in 2015 with the American Bar Association advocating for several measures to address firearm injury and death. They call for universal background checks for purchase of a firearm, elimination of physician "gag laws," restriction on the manufacture and sale of military style assault weapons and large-capacity magazines for civilian use, further research to support strategies that can reduce firearm injury and death, improved access to mental health services and blanket reporting laws to compel physicians to report patients who may be of harm to themselves or others[28]. The American Bar Association confirms that none of these recommendations conflict with the Second Amendment or previous rulings of the U.S. Supreme Court[28].

Grassroots physician groups like the Physicians for the Prevention of Gun Violence are involved in testifying on legislation actions in their home states. Physician groups have also partnered with firearm owners, manufacturers and dealers to reduce gun violence. The Gun Shop Project

is a collaborative effort by the New Hampshire Firearm Safety Coalition, a group of mental health and public health practitioners, firearm retailers and firearm rights advocates aimed at reducing firearm suicide[29].

In summary

Firearm injury and death present a public health crisis and merit a physician response. Internists have a role in better understanding firearm violence through research, identifying patients at risk of firearm violence, counseling patients on firearm violence with a specific focus on reducing lethal means in suicide and providing patients with practical knowledge on firearm safety. Finally, internists have a potential role providing evidence-based information to inform public policy on firearms and advocacy for our patients.

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