



## **Firearm Injuries and Children A Position Statement of the American Pediatric Surgical Association**

John K. Petty, MD<sup>1</sup>, Marion C.W. Henry, MD, MPH<sup>2</sup>, Michael L. Nance, MD<sup>3</sup>, Henri R. Ford, MD, MHA<sup>4</sup> and the APSA Board of Governors

**Affiliations:** <sup>1</sup>Department of General Surgery, Wake Forest School of Medicine, Winston-Salem, North Carolina <sup>2</sup>Department of Surgery, University of Arizona College of Medicine, Tucson, Arizona <sup>3</sup>Department of Surgery, Perelman School of Medicine at the University of Pennsylvania, Philadelphia, Pennsylvania <sup>4</sup>Dean, University of Miami Miller School of Medicine, Miami, Florida

**Address correspondence to:** John K. Petty, MD, Section of Pediatric Surgery, Department of General Surgery, Wake Forest School of Medicine, Medical Center Boulevard, Winston-Salem, NC, 27157, [jpetty@wakehealth.edu](mailto:jpetty@wakehealth.edu), (336) 716-0546

**Short title:** Firearm Injuries and Children APSA Position Statement

**Funding Source:** No external funding for this manuscript.

**Financial Disclosure:** The authors have no financial relationships relevant to this article to disclose.

**Conflict of Interest:** The authors have no potential conflicts of interest to disclose.

**Clinical Trial Registration:** None

**Abbreviations:** APSA—American Pediatric Surgical Association, PTSD—post-traumatic stress disorder

### **Table of Contents Summary**

The increase in firearm injuries affects all pediatric care providers. APSA recommends improved trauma care, research, prevention and policy to address this public health problem.

## **Contributors' Statement**

Drs Petty, Henry, and Nance performed the literature reviews to acquire relevant data, analyzed and interpreted these data, and drafted the article.

All authors provided substantial contribution to conception and design, revised the article for critically important intellectual content, agree to be accountable for all aspects of the accuracy and integrity of the work, and give final approval of the version to be published.

## **Abstract**

Firearm injuries are the second most common cause of death in children who come to a trauma center, and pediatric surgeons provide crucial care for these patients. The American Pediatric Surgical Association (APSA) desires to help solve this pediatric health problem. APSA is committed to comprehensive pediatric trauma readiness, including firearm injury prevention. APSA supports a public health approach to firearm injury, and it supports availability of quality mental health services. APSA endorses policies for universal background checks, restrictions on assault weapons and high capacity magazines, strong child access protection laws, and a minimum purchase age of 21 years. APSA opposes efforts to keep physicians from counseling children and families about firearms. APSA promotes research to address this problem, including increased federal research support and research into the second victim phenomenon. APSA supports school safety and readiness, including bleeding control training. While it may be daunting to try to reduce firearm deaths in children, the U.S. has seen success in reducing motor vehicle deaths through a multidimensional approach—prevention, design, policy, behavior, trauma care. APSA believes that a similar public health approach can succeed to save children from death and injury from firearms. APSA is committed to building partnerships to accomplish this.

“You can’t talk of the dangers of snake poisoning and not mention snakes”<sup>1</sup>

--C. Everett Koop

The American Pediatric Surgical Association (APSA) is an organization comprised of more than 1,300 surgeons who are dedicated to the care of ill and injured children. We serve children and communities all across the United States and 18 countries. Members of our association are the leaders of most of the pediatric trauma centers across the United States

More children will die from trauma than any other cause. Of those children that die in our Trauma Centers, the second most common cause is a firearm injury. When firearms injure children or adolescents, it is our job (and the job of many of our adult trauma colleagues) to care for these victims. We have all felt the devastation alongside a family who has lost a child. The conversations with the parents are never forgotten.<sup>2</sup> We enter the lives of the victims and families irreversibly pierced by gun violence. A recent survey of APSA members demonstrated that over 90% of respondents provide pediatric trauma care, confirming our daily, personal commitment to care for injured children. Over 80% believe APSA should give high priority to reducing gun-related injuries through research, education, outreach, prevention, and advocacy. [Table 1] The surgeons of the American Pediatric Surgical Association endorse the positions outlined herein. [Table 2]

### **Pediatric Trauma Care**

The seemingly endless firearms-related mass casualty incidents such as occurred at Columbine, Virginia Tech, Tucson, Aurora, Orlando and Las Vegas serve as vivid, continuing reminders of our gun violence epidemic. However, the shootings at Sandy Hook Elementary School (claiming 26 lives, including 20 first graders), and more recently at Marjory Stoneman

Douglas High School (14 students and 3 staff members killed) were singularly disconcerting due to the number of lives lost and the weaponry employed. Gun violence occurs every day, respecting no age, no gender, and no ethnicity. Firearms claim the lives of more than 38,000 Americans annually including nearly 15,000 homicides and nearly 23,000 suicides.<sup>3</sup> Additionally, another 85,000 are injured each year by guns but survive, their lives forever changed.<sup>3</sup> Every day surgeons in our trauma centers witness the deaths of children from firearm injuries. Since 2010, there were 2,711 children (age 0-19 years) who died by gunshot with another 15,576 injured. In children (age 0-19 years), firearms are associated with one of the highest case fatality rates (22%) of all injury mechanisms, even higher (37%) in the youngest children (0-10 years). Firearms are the second leading cause (behind motor vehicles) of trauma death in the pediatric population, resulting in more than 25% of all pediatric deaths reported in our Trauma Centers.<sup>4</sup> [Figure 1] Since the last version of the APSA position statement following the Sandy Hook shooting in 2012, there have been over 1,500 mass shooting events and over 17,000 children killed or injured by firearms.<sup>5,6</sup> In addition, since the sentinel mass shooting at Columbine High School 1999 (data for 1999-2016), more than 52,000 children (age 0-19 years) have died as a result of a firearm injury.<sup>3</sup> **APSA fundamentally commits to pediatric trauma care, pediatric trauma readiness, pediatric trauma centers, and pediatric trauma systems as the optimal resources for pediatric firearm injuries when they occur. APSA endorses firearm injury prevention as part of comprehensive pediatric trauma care.**

### **Public Health Issue**

In firearm ownership, the United States has no peers among the highest-income countries.<sup>7,8</sup> Firearm-related injury and death are also distinctly more common in America.<sup>9,10</sup> [Figure 2] The

risk of firearm homicide, suicide and unintentional injuries is more than 5-fold greater in the United States than 23 other high-income countries considered collectively.<sup>10</sup> Firearm-related injury and death are issues for all Americans, in all communities. The risk of dying by firearm is the same for residents of the largest cities as it is for the residents of the smallest counties and holds true for adult and pediatric patients alike.<sup>11, 12</sup>[Figure 3] This parity in risk is due to the predominance of firearm suicides and unintentional firearms deaths in the rural counties and the predominance of firearm homicides in the urban counties. All Americans should share concern about firearms-related mortality. Because of the regularity, complexity and geographic variability of the problem, it is best addressed as a public health issue. Simply stated, the public health approach views firearm injury in a disease framework with an epidemiology, pathophysiology, treatment, and prevention. As physicians, we have the most credibility when we approach firearms as an issue of health rather than an issue of law, politics, or personal freedom. A public health model has been profoundly effective in reducing motor vehicle mortality despite an overall increase in vehicle miles traveled. [Figure 4] A similar approach should be applied to studying firearm injury. **APSA supports addressing firearm injury as a public health issue that requires resources and commitment to solve.**

### **Mental Health Services**

Suicide ranks as the 10<sup>th</sup> most common cause of death in America (all ages) but is the 2<sup>nd</sup> leading cause of death in our youth (ages 10-19).<sup>13</sup> While precise data regarding attempted suicides are not available, it is estimated that there are 25 suicide attempts for every completed suicide.<sup>14</sup> Firearms were utilized in 43% of completed suicides in 2016, equal to suffocation as a means of completed suicide in children ages 10-19 years.<sup>15</sup> Most adolescent suicides occur in the home with

a firearm owned by the parent.<sup>16</sup> In youth suicide attempts, the use of a firearm was fatal 95.3% of the time.<sup>17</sup> And while some troubled youth may simply choose another method to attempt suicide if a firearm is not accessible, none will be as lethal. Most people who attempt suicide once do not attempt suicide again. Thus, decreasing the lethality of the first attempt would save lives. In addition, the presence of a firearm in the home may impart a greater risk of suicide than baseline.<sup>18</sup> In many cases, firearm suicide is accompanied by the murder of others. It is estimated that between 1,000 and 1,500 deaths each year (1992 estimates) occur as a result of murder-suicide.<sup>19</sup> In 95% of cases, a firearm was used for both the murder(s) and suicide.<sup>20</sup> Improving mental health services to reduce the firearm suicide rate is crucial. **APSA supports efforts to improve the availability and quality of mental health services for both children and adults.**

### **Background Checks**

As a result of the Brady Handgun Violence Prevention Act of 1993, the National Instant Criminal Background Check System (NICS) was created.<sup>21</sup> The NICS was employed to perform background checks of individuals purchasing firearms from licensed dealers in the U.S. However, this system did not address firearms sales by unlicensed dealers, creating a serious loophole that still excludes an estimated 40% of gun transactions in the United States.<sup>22</sup> This loophole includes private firearms sales and sales that occur at gun shows. Individual state variances further compromise the integrity of the system of background checks. A total of 19 states allow licensed dealers to waive the background check and 4 states do not consider mental illness as a reason to deny a firearm purchase.<sup>23</sup> In addition, the criteria for mental health reporting to the national system by the states is inconsistent. Despite the shortcomings in the system, since its inception, the NICS has resulted in the denial of sale of 1.5 million firearms with more than 250 million

transactions processed.<sup>24, 25</sup> But, with loopholes that circumvent the system, reforms are necessary to eliminate transactions without appropriate background checks. **APSA supports an enforceable and strong system of universal background checks for all firearms transactions, including private sales.**

## **Firearms Research**

As physicians, we aspire to practice based on the best evidence available for a condition. Scientific evidence is crucial when trying to understand a problem as complex as firearm injury. Research generates evidence to inform care. Yet in 1996, Congress passed legislation limiting the Centers for Disease Control from funding firearms-related research (the Dickey Amendment).<sup>26</sup> Later that moratorium was extended to all Department of Health and Human Services agencies, including the National Institute of Health. These actions effectively shut off public funds to nearly all firearms research. Currently, cancer research receives approximately \$4 billion in federal funds annually for research or about \$4,200 per year of potential life lost.<sup>27</sup> Firearms injury research, in comparison, receives just \$2 million per year or just \$2.70 per year of potential life lost. Without research, claims regarding the efficacy of existing, former or proposed legislation are based on anecdote or conjecture. Better scientific evidence is desperately needed. A repeal of the Dickey Amendment would facilitate increased firearms research. A promising research tool to help understand the circumstances of violent death is the National Violent Death Reporting System (NVDRS), initially funded by Congress in 2002.<sup>28</sup> This system, modeled after the highly successful Fatal Accident Reporting System for motor vehicle crashes, has been functional in just 18 states. Lack of funding has limited its full implementation, which has in turn limited our understanding of gun violence and its causes. Correct categorization of firearm deaths

(determining unintentional from potentially self-inflicted or vice-versa) is not always possible and frequently inaccurate. The NVDRS data collection methodology is far more robust than other existing repositories and can help clarify many of these potentially misclassified firearm deaths.<sup>29</sup> In 2004, a blue-ribbon panel was convened by the National Academy of Science to study the state of firearms research.<sup>30</sup> The authors noted that “Adequate data and research are essential to judge both the effects of firearms on violence and the effects of different violence control policies.” And “...many of the shortcomings described in this report stem from the lack of reliable data itself rather than the weakness of methods.” The panel concluded, “... if policy makers are to have a solid empirical and research base for decisions about firearms and violence, the federal government needs to support a systematic program of data collection and research that specifically addresses that issue.” The panel also renewed their support for the "development and maintenance of NVDRS." **APSA recommends removal of policy barriers that prevent firearms-related research and recommends expansion of the NVDRS to all states and territories.**

### **Assault Weapons**

On October 2, 2006, a man barricaded himself and 10 girls, ages 6-13, into a one-room schoolhouse in Nickel Mines, Pennsylvania, in the heart of Amish country. Before the ordeal ended, he would shoot all 10 girls “execution style” and then himself. Eight girls survived long enough to receive medical treatment, five girls survived to discharge from the hospital. On December 14, 2012, a man forcibly entered Sandy Hook Elementary and murdered 26 people including 20 children. Not one child survived to receive medical treatment. One difference between the two incidents; the man in Nickel Mines used a 9mm handgun; the other man chose an assault-style rifle at Sandy Hook. A recent review of mass shooting deaths from 1981-2017

revealed that assault weapons accounted for 85.8% of these deaths.<sup>31</sup> From the years 2014-17 1,333 mass shooting events occurred, claiming the lives of 1,521 people and injuring 5,760 more.<sup>6</sup> While assault-style rifles are responsible for a minority of overall gun deaths in the US, they have become a weapon of choice for the assailant whose intent is chaos and casualties. The high muzzle energy, large capacity magazines and ability to fire rapidly make these weapons particularly devastating. Their place in a civilian arsenal must be questioned. During the federal ban on assault weapons from 1994-2004, mass shooting fatalities were 70% less likely to occur.<sup>31</sup> While the Supreme Court firmly upheld the second amendment's guarantee of the right to bear arms, it did so with certain stipulations.<sup>32</sup> Justice Scalia, in his majority opinion noted that, "like most rights, the Second Amendment right is not unlimited. It is not a right to keep and carry any weapon whatsoever in any manner whatsoever and for whatever purpose." **APSA supports restrictions on civilian access to high capacity magazines and assault-style weaponry.**

### **Safe Storage**

Pediatric firearm deaths occur both unintentionally and intentionally. The presence of a firearm in the home is associated with an increased risk of injury and death.<sup>33</sup> For every self-protection homicide, there were 1.3 unintentional firearm deaths, 4.6 criminal homicides and 37 gun suicides. Researchers noted a "positive and statistically significant association between gun availability and state level rates of unintentional firearm deaths, homicides, firearm homicides, suicides, and firearm suicides among children (ages 5-14 years)."<sup>34</sup> That is, in states with increased gun availability, death rates from firearms (all categories) for children were higher. Conversely, for each 10% decline in the percentage of households with both firearms and children, firearm

suicide among children 0–19 years of age dropped 8.3%.<sup>35</sup> For households with firearms and children, safe storage practices reduce the risk of unintentional firearm deaths and suicides in children.<sup>36</sup> Each of the four practices of keeping a gun locked, storing a gun unloaded, keeping ammunition locked, and storing ammunition and gun separately were associated with incremental decreases in injury rates. Other safety devices such as load indicators, magazine safeties and personalized devices have shown promise as well.<sup>37</sup> Limiting access to firearms by children limits the risk of injury and death. **APSA supports all efforts to limit access by children to firearms, including the use of gunlocks and safe storage techniques.**

### **Firearm Policy and Children**

Children should not have access to firearms. The presence of a firearm in the home is associated with an increased risk of accidental death and suicide.<sup>36</sup> The risk of firearm injury can be decreased by gun safety devices and safe storage practices. While best evidence supports the use of gun locks and safe storage, these practices are not universally promoted by legislation.<sup>38</sup> Child Access Prevention (CAP) laws impose criminal liability on persons who allow minors access to loaded firearms. Currently, federal law does not require firearm owners to store their firearms safely. Twenty-seven states and the District of Columbia have CAP laws, but these laws vary with regard to the protective measures, the nature of the minor access, and the age of minority. Strong CAP laws impose liability on persons who negligently store firearms, regardless of if the firearm is loaded, or if a minor actually gains access to or uses the firearm. Weak CAP laws impose liability for intentional, knowing, or reckless provision of firearms to minors. As a group, CAP laws are associated with a lower rate of accidental and suicidal injuries among children 12 and under.<sup>39</sup> States that enact CAP laws generally see a decrease in the firearm death rate in the years

that follow such legislation.<sup>40,41</sup> Furthermore, strong CAP laws are associated with a reduction in all pediatric firearm injuries compared to weak CAP laws.<sup>42</sup>

Similarly, minimum age laws intend to prevent unsupervised purchase or possession of firearms by children and adolescents. A more stringent minimum age standard has been invoked for handguns than for long guns (rifles or shotguns). Current federal law prohibits licensed firearm dealers from selling handguns to persons under age 21 and long guns to persons under age 18. However, unlicensed persons may sell handguns to persons age 18 and up, and they may sell long guns to persons of any age. [Table 3] In other words, federal law currently prohibits some citizens who are of age to vote or to serve in the military (age 18) from purchasing certain firearms from certain sellers. It is not a question of IF limitations may be placed on 18-21 year olds for firearms purchase, but WHICH limitations are best. State laws may enact additional restrictions by age for purchase of firearms beyond the federal minimums. It is important to note that federal and state laws permit exceptions to age restrictions based on occupation (e.g. member of the Armed Forces). State laws vary with regard to age limits for purchase and possession of firearms, with unclear effects on firearm mortality.<sup>43</sup> Currently, Hawaii and Illinois restrict the age of purchase to 21 years for all firearms (handguns and long guns). This is analogous to the limits placed on purchase of alcohol or tobacco. A minimum purchase age of 21 years requires that an adult be involved with the purchase of a firearm, even if that adult subsequently allows a younger person to use or possess that firearm. To reduce the risk of pediatric firearm injury, it makes sense to prevent children from purchasing and possessing firearms. **APSA supports strong CAP laws for firearm storage and a legal minimum purchase age of 21 years for all firearms.**

## Physician Counseling

The confidential relationship between physician and patient is central to the practice of medicine. To promote the health of the patient, physicians and patients discuss matters that are sensitive, personal, emotional, and even undesirable. Accordingly, this relationship should be based on trust. Discussions about firearms and children can be delicate, but these discussions should not be limited by legislation or external interference. Healthcare based interventions may improve safe firearm storage in homes with children, and patients (parents of children in particular) are generally agreeable to screening and counseling on firearm safety.<sup>44</sup> APSA and other organizations such as the American College of Surgeons, the American Academy of Pediatrics, and the American Medical Association have maintained that physicians should be free to discuss firearms and health with their patients.

Notwithstanding, discussions between physicians and patients have come under attack recently. Language in the Patient Protection and Affordable Care Act prohibits disclosure or collection of information about the presence, storage, possession, or use of a firearm as part of a wellness and health promotion activity.<sup>45</sup> Physicians may ask about car seats, bicycle helmets, sunscreen, and fluoride, but they may not ask about firearms and ammunition. More significantly, Florida's Firearm Owner's Privacy Act (FOPA) challenged the sanctity of these physician-patient discussions.<sup>46</sup> This legislation was initially upheld by lower courts, before the key restrictions were struck down by the US Court of Appeals for the Eleventh Circuit in *Wollschlaeger v Governor, Florida*. This decision preserved the freedom of physicians to discuss firearm safety for the good of their patients. Judge William Pryor stated, "Health-related information is more important than most topics because it affects matters of life and death. Doctors help patients make deeply personal decisions, and their candor is crucial. If anything, the doctor-patient relationship provides more

justification for free speech, not less.”<sup>47</sup> We do well to remember that “professional speech” with our patients is a privilege, and that additional challenges will likely come. Our best way forward will be to emphasize not only the protection of speech for the physician but the access to relevant health information for the patient.<sup>48,49</sup> **APSA opposes, in the strongest possible terms, any policy or legislation that infringes upon the freedom of physicians and patients to discuss firearm safety.**

### **School Safety**

Although the majority of pediatric firearm deaths occur outside of schools, school shootings are among the most heinous of these deaths. Columbine. Sandy Hook. Marjorie Stoneman Douglas. These moments of national tragedy call forth action to create safer schools for children to learn. Epidemiologic evidence reveals that school shootings are less likely in states with background check laws and in states with higher per capita mental health expenditure and K-12 education expenditure.<sup>50</sup> These areas deserve primary emphasis in discussions about creating safer schools. Implementation of safety at the school level involves many layers of security, and we endorse ongoing efforts to improve school security in building design, preparedness training, threat reporting, communication systems, and police support. While everyone in school has a role to play in school safety, the use of potentially lethal force belongs to police professionals and not armed civilians. Concealed carry laws have not been demonstrated to suppress crime and may be associated with increased firearm injuries.<sup>51</sup> An FBI study of 160 active shooter situations over 14 years revealed that the majority of active shooter situations ended when the shooter fled the scene or committed suicide. Of the situations that were ended by civilians, four times as many were ended by unarmed citizens as were ended by armed citizens.<sup>52</sup> The majority of active shooter

situations end in 5 minutes or less, and even when armed, trained personnel are on the scene, a significant number of deaths may occur before the shooter is stopped.<sup>52,53</sup> Current evidence does not support arming teachers as a strategy to improve the safety of children. Inasmuch as schools enfold our most vulnerable citizens—our children—the standard of evidence to bring potentially dangerous weapons into the schools should be higher, not lower, than in adult environments. Finally, the readiness of bystanders to care for life-threatening bleeding may be the difference between life and death for the wounded. The “Stop the Bleed “ program was created in the aftermath of the Sandy Hook shooting, to train laypersons to respond to hemorrhage in injured bystanders.<sup>54</sup> Though this training applies to all manner of trauma, its value as a component of school readiness bears special emphasis. **APSA supports school safety and readiness for active shooter situations. APSA does not support arming teachers to improve school safety. APSA supports wide dissemination of “Stop the Bleed” training to school personnel.**

### **Second Victim Phenomenon**

A mass shooting leaves many people struggling in its aftermath. Survivors, first responders, nurses, and physicians all may suffer post-traumatic stress disorder symptoms (PTSD). After the shooting at Sandy Hook, more than two dozen police officers suffered from PTSD. Health care workers may suffer from the “second victim phenomenon” in which they become traumatized or “victimized” by the event. Feelings of guilt and failure may prevail. The scenes from these trauma sites and trauma bays are like scenes out of war: horrific experiences that most are not prepared to handle and process. Short-term reactions can develop into long term crisis reactions if not properly addressed and processed. Critical incident debriefing can help those who suffer both short and long-term stress reactions. Additionally, survivors, both those who were injured and survived and

those who were present in the situation but not actually injured, also may suffer from ongoing psychological effects. PTSD is a common, notable aftereffect of witnessing gun violence that can affect children and adults alike.<sup>55</sup> PTSD can also cause further damage to the brain, affecting the amygdala, which is why many survivors will report to feeling "numb" or seem unable to respond in the immediate aftermath of a crime.<sup>56</sup> These changes and reactions can persist long term as well. A study from 2016 looked at the performance of high school students after school shootings in California. Not only did enrollment drop, but those who stayed in school had a significant drop in math and English test scores. This impact could have many consequences such as an impact on college admissions, future earnings, and lower quality of life.<sup>57</sup> **APSA supports research, education and treatment for the second victim phenomenon and the stress reactions faced by survivors and health care teams in the face of these incidents.**

## **Summary**

A meaningful reduction in the burden of firearms injury and death in children will not happen with a single quick action. We need a steady, enduring commitment. The systematic and dramatic reduction in motor vehicle-related injuries and death in both the adult and pediatric populations should serve as a model for success. Through modifications in the environment (roads), adoption of safety measures (seatbelts), modification of behavior (use of seatbelts) and modifications of vehicle design (e.g. airbags)--a public health approach--change was realized. Former Congressman Dickey, who helped author the bill restricting federal funding for firearms research, recently commented...“like motor vehicle injuries, violence exists in a cause-and-effect world; things happen for predictable reasons. By studying the causes of a tragic — but not senseless — event, we can help prevent another.”<sup>58</sup> With more than 300,000,000 guns in circulation in the United

States, we as an Association and we as a nation need to develop ways to live safely in a world with guns. We cannot know for certain if the positions APSA supports would have prevented the tragedy at Sandy Hook, or Las Vegas, Parkland, or the next location. But, what if they did?

APSA believes that inaction is irrational and indefensible. Our organization strongly supports the continuation of public health and policy recommendations detailed above in an effort to reduce the impact of gun violence on our children and youth.

### **Acknowledgments**

The APSA Board of Governors approved this statement unanimously October 16, 2018.

APSA Trauma Committee: John Petty, Chair; Jeff Upperman, Vice Chair; Reto Baertschiger, Amina Bhatia, Emily Christison-Lagay, Duane Duke, Vincent Duron, Mauricio Escobar, David Gibbs, Harsh Grewal, Brian Gulack, Ramin Jamshidi, Aaron Jensen, Shawn Larson, Robert Letton, Jessica Naiditch, Bindi Naik-Mathuria, Isam Nasr, Mitchell Price, Jose Prince, Carmen Ramos, Robert Russell, Anthony Stallion, Jacob Stephenson, Dylan Stewart, Adam Vogel, Kim Wallenstein, Regan Williams.

APSA Advocacy Committee: Marion Henry, Chair; Kathryn Bass, David Bliss, Mike Chen, Brian Coakley, Cynthia Downard, Audry Durrant, Mary Hilfiker, Leslie Knod, Julius Lister, Duncan Phillips, Kimberly Ruscher, Mary Fallat, Max Langham, Chuck Vinocur and Patrick Bailey.

### **References**

1. Schraufnaegel DE. C. Everett Koop, M.D. (1916–2013) United States surgeon general, 1982–1989. *Ann Am Thorac Soc.* 2013;10(3):276.
2. Masiakos PT, Griggs C. The quiet room. *N Engl J Med.* 2017;377(25):2411-2412.
3. Centers for Disease Control. Fatal injury reports, national, regional, and state 1981-2016. Web-based Injury Statistics Query and Reporting System (WISQARS™) website. <https://webappa.cdc.gov/sasweb/ncipc/mortrate.html> Accessed March 4, 2018.
4. American College of Surgeons. Pediatric data (age 0-19 years) for years 2010-2016. National Trauma Data Bank website. <https://www.facs.org/quality-programs/trauma/ntdb/docpub>. Accessed March 4, 2018.

5. Nance ML, Krummel TM, Oldham KT and the American Pediatric Surgical Association Trauma Committee. Firearm injuries and children: a policy statement of the American Pediatric Surgical Association. *J Am Coll Surg*. 2013;217(5):940-946.
6. Gun Violence Archive. Gun Violence Archive website. <http://www.gunviolencearchive.org/>. Accessed September 10, 2018.
7. Graduate Institute of International and Development Studies. Completing the Count: Civilian Firearms. Small Arms Survey website. <http://www.smallarmssurvey.org/fileadmin/docs/A-Yearbook/2007/en/Small-Arms-Survey-2007-Chapter-02-annexe-4-EN.pdf>. Accessed March 4, 2018.
8. Organization for Economic Cooperation and Development. Gross Domestic Product. OECD StatExtracts website. [http://stats.oecd.org/Index.aspx?DatasetCode=SNA\\_TABLE1](http://stats.oecd.org/Index.aspx?DatasetCode=SNA_TABLE1). Accessed March 4, 2018.
9. United Nations Office on Drugs and Crime. Global Study on Homicide. UNODC Homicide Statistics 2013 website. <http://www.unodc.org/unodc/en/data-and-analysis/homicide.html>. Accessed March 4, 2018.
10. Richardson EG, Hemenway D. Homicide, suicide, and unintentional firearm mortality: comparing the United States with other high-income countries, 2003. *J Trauma*. 2011;70(1):238-243.
11. Branas CC, Nance ML, Elliott M, Richmond TS, Schwab CW. Urban-rural shift in intentional firearm death: different causes, same results. *Am J Public Health*. 2004;94(10):1750-1755.
12. Nance ML, Carr BG, Kallan MJ, Branas CC, Wiebe DJ. Variation in pediatric and adolescent firearm mortality rates between rural and urban US counties. *Pediatrics*. 2010;125(6):1112-1118.
13. Centers for Disease Control. Leading causes of death reports, 1981-2016. Web-based Injury Statistics Query and Reporting System (WISQARS™) website. <https://webappa.cdc.gov/sasweb/ncipc/leadcause.html>. Accessed March 4, 2018.
14. McIntosh, J. L. U.S.A. suicide 2007: Official final data. American Association of Suicidology website. <http://www.suicidology.org>. Accessed February 23, 2013.
15. Centers for Disease Control. Leading causes of death reports, 1981-2016. Web-based Injury Statistics Query and Reporting System (WISQARS™) website. <https://webappa.cdc.gov/sasweb/ncipc/leadcause.html>. Accessed September 10, 2018.
16. Johnson RM, Barber C, Azrael D, Clark DE, Hemenway D. Who are the owners of firearms used in adolescent suicides? *Suicide Life Threat Behav*. 2010;40(6):609-611.
17. Shenassa E, Catlin S, Buka S. Lethality of firearms relative to other suicide methods: a population based study. *J Epidemiol Community Health*. 2003;57(2):120-124.
18. Miller M, Barber C, White RA, Azrael D. Firearms and suicide behavior in the United States: is risk independent of underlying suicidal behavior? *Am J Epidemiol*. 2013;178(6):946-955.
19. Marzuk P, Tardiff K, Hirsch C. The epidemiology of murder-suicide. *JAMA*. 1992;267(23):3179-3183.
20. Warren-Gordon K, Byers BD, Brodt SJ, Wartak M, Biskupski B. Murder followed by suicide: a newspaper surveillance study using the New York Times Index. *J Forensic Sci*. 2010;55(6):1592-1597.
21. Federal Bureau of Investigation. About NICS. National Instant Criminal Background Check System website. <http://www.fbi.gov/about-us/cjis/nics>. Accessed March 4, 2018.

22. Cook P, Ludwig J. Guns in America: national survey on private ownership and use of firearms. National Institutes of Justice Research in Brief May 1997. National Criminal Justice Reference Service website. <https://www.ncjrs.gov/pdffiles/165476.pdf>. Accessed March 4, 2018.
23. Record KL, Gostin LO. A systematic plan for firearms law reform. *JAMA*. 2013;309(12):1231-1232.
24. Federal Bureau of Investigation. Federal Denials. National Instant Criminal Background Check System website. [https://www.fbi.gov/file-repository/federal\\_denials.pdf/view](https://www.fbi.gov/file-repository/federal_denials.pdf/view). Accessed March 4, 2018.
25. Federal Bureau of Investigation. 2016 NICS Operations Report. National Instant Criminal Background Check System website. <https://www.fbi.gov/file-repository/2016-nics-operations-report-final-5-3-2017.pdf/view>. Accessed March 4, 2018.
26. Kellermann AL, Rivara FP. Silencing the science on gun research. *JAMA*. 2013;309(6):549-550.
27. Mayors Against Illegal Guns. Access Denied. Everytown website. <https://everytownresearch.org/reports/access-denied/>. Accessed September 14, 2018.
28. Paulozzi LJ, Mercy J, Frazier L Jr, Annett JL. CDC's National Violent Death Reporting System: background and methodology. *Inj Prev*. 2004;10(1):47-52.
29. Barber C, Hemenway D. Too many or too few unintentional firearm deaths in official U.S. mortality data? *Accid Anal Prev*. 2011;43(3):724-731.
30. Wellford CF, Pepper JV, Petrie CV, eds. *Firearms and Violence: A Critical Review. Committee to Improve Research Information and Data on Firearms*. Washington, DC: The National Academies Press, 2005.
31. DiMaggio C, Avraham J, Berry C, et al. Changes in US mass shooting deaths associated with the 1994-2004 federal assault weapon ban: analysis of open-source data. *J Trauma Acute Care Surg*. 2018 Sep 4. doi: 10.1097/TA.0000000000002060. [Epub ahead of print].
32. District of Columbia et al. v Heller. Supreme Court of the United States website. <http://www.supremecourt.gov/opinions/07pdf/07-290.pdf>. Accessed February 23, 2013.
33. Kellermann AL, Reay DT. Protection or peril? An analysis of firearm-related deaths in the home. *N Engl J Med*. 1986;314(24):1557-1560.
34. Miller M, Azrael D, Hemenway D. Firearm availability and unintentional firearm deaths, suicide, and homicide among 5-14 year olds. *J Trauma*. 2002;52(2):267-274.
35. Miller M, Azrael D, Hepburn L, Hemenway D, Lippmann SJ. The association between changes in household firearm ownership and rates of suicide in the United States, 1981-2002. *Inj Prev*. 2006;12(3):178-182.
36. Grossman DC, Mueller BA, Riedy C, et al. Gun storage practices and risk of youth suicide and unintentional firearm injuries. *JAMA*. 2005;293(6):707-714.
37. Vernick JS, O'Brien M, Hepburn, Johnson SB, Webster DW, Hargarten SW. Unintentional and undetermined firearm related deaths: a preventable death analysis for three safety devices. *Inj Prev*. 2003;9(4):307-311.
38. Violano P, Bonne S, Duncan T, et al. Prevention of firearm injuries with gun safety devices and safe storage: an Eastern Association for the Surgery of Trauma systematic review. *J Trauma Acute Care Surg*. 2018;84(6):1003-1011.
39. Lee J, Moriarty KP, Tashjian DB, Patterson LA. Guns and states: pediatric firearm injury. *J Trauma Acute Care Surg*. 2013;75(1):50-53.

40. Hepburn L, Azrael D, Miller M, Hemenway D. The effect of child access prevention laws on unintentional child firearm fatalities, 1979-2000. *J Trauma*. 2006;61(2):423-428.
41. Webster DW, Starnes M. Reexamining the association between child access prevention gun laws and unintentional shooting deaths of children. *Pediatrics*. 2000;106(6):1466-1469.
42. Hamilton EC, Miller CC 3rd, Cox CS Jr, Lally KP, Austin MT. Variability of child access prevention laws and pediatric firearm injuries. *J Trauma Acute Care Surg*. 2018;84(4):613-619.
43. Kalesan B, Mobily ME, Keiser O, Fagan JA, Galea S. Firearm legislation and firearm mortality in the USA: a cross-sectional, state-level study. *Lancet*. 2016;387(10030):1847-1855.
44. Roszko PJ, Ameli J, Carter PM, Cunningham RM, Ranney ML. Clinician attitudes, screening practices, and interventions to reduce firearm-related injury. *Epidemiol Rev*. 2016; 38(1):87-110.
45. Title X. Strengthening quality, affordable healthcare for all Americans. Patient Protection and Affordable Care Act website. <http://www.gpo.gov/fdsys/pkg/BILLS-111hr3590enr/pdf/BILLS-111hr3590enr.pdf>. Accessed February 23, 2013.
46. Florida HB4017. Privacy of Firearms Owners Act. Florida Senate website. <http://www.flsenate.gov/Session/Bill/2013/4017/BillText/Filed/PDF>. Accessed February 23, 2013.
47. Wollschlaeger v. Governor, Florida. 848 F3d 1293 (11<sup>th</sup> Cir 2017) (en banc). United States Court of Appeals website. <http://media.ca11.uscourts.gov/opinions/pub/files/201214009.enbc.pdf>. Accessed March 20, 2018.
48. Lee TT, Curfman GD. Physician speech and firearm safety: Wollschlaeger v Governor, Florida. *JAMA Intern Med*. 2017;177(8):1189-1192.
49. Parmet WE, Smith JA, Miller MJ. Wollschlaeger v. Governor of Florida--The first amendment, physician speech, and firearm safety. *N Engl J Med*. 2016;374(24):2304-2307.
50. Kalesan B, Lagast K, Villarreal M, Pino E, Fagan J, Galea S. School shootings during 2013-2015 in the USA. *Inj Prev*. 2017;23(5):321-327.
51. Crandall M, Eastman A, Violano P, et al. Prevention of firearm-related injuries with restrictive licensing and concealed carry laws: An Eastern Association for the Surgery of Trauma systematic review. *J Trauma Acute Care Surg*. 2016;81(5):952-960.
52. Blair JP, Schweit KW. *A Study of Active Shooter Incidents, 2000 - 2013*. Washington, DC: Texas State University and Federal Bureau of Investigation, U.S. Department of Justice, 2014.
53. Keneally M. Breaking down the NRA-backed theory that a good guy with a gun stops a bad guy with a gun. ABC News, February 27, 2018. <http://abcnews.go.com/US/breaking-nra-backed-theory-good-guy-gun-stops/story?id=53360480>. Accessed March 20, 2018.
54. American College of Surgeons. Stop the bleed website. <https://www.bleedingcontrol.org/>. Accessed March 20, 2018.
55. Berman SL, Kurtines WM, Silverman WK, Serafini LT. The impact of exposure to crime and violence on urban youth. *Am J Orthopsychiatry*. 1996;66(3):329-336.
56. Bremner JD. Traumatic stress: effects on the brain. *Dialogues Clin Neurosci*. 2006;8(4):445-461.
57. Beland LP, Kim D. The effect of high school shootings on schools and student performance. *Eval and Policy Anal*. 2016;38(1):113-126.

58. Dickey J, Rosenberg R. We won't know the cause of gun violence until we look into it. Washington Post, July 27, 2012. <http://wapo.st/MKMI73>. Accessed February 23, 2013.
59. U.S. Government Publishing Office. 18 U.S.C. § 922(b)(1). <https://www.gpo.gov/fdsys/pkg/USCODE-2010-title18/html/USCODE-2010-title18-partI-chap44-sec922.htm>. Accessed May 7, 2018.
60. U.S. Government Publishing Office. 18 U.S.C. § 922(x)(1), (5). <https://www.gpo.gov/fdsys/pkg/USCODE-2010-title18/html/USCODE-2010-title18-partI-chap44-sec922.htm>. Accessed May 7, 2018.
61. U.S. Department of Transportation, Federal Highway Administration. Traffic Volume Trends. Federal Highway Administration website. [https://www.fhwa.dot.gov/policyinformation/travel\\_monitoring/tvt.cfm](https://www.fhwa.dot.gov/policyinformation/travel_monitoring/tvt.cfm). Accessed March 4, 2018.

## Table Legends

Table 1. APSA member survey results (n= 295).

Table 2. Position statements endorsed by the American Pediatric Surgical Association.

Table 3. Minimum age for firearm purchase. Under current federal law, the age for sale, delivery, or transfer of a firearm varies by license status of the seller and type of firearm being sold.<sup>59,60</sup> Additional laws to further restrict age of purchase vary by state.

## Figure Legends

Figure 1. Mortality causes for pediatric (age 0-19 years) patients treated in Trauma Centers, 2000-2016. Data courtesy National Trauma Data Bank, American College of Surgeons, Chicago, IL.<sup>4</sup>

Figure 2. Firearm homicide rate (per 100,000 population) by firearm ownership (firearms per 100 inhabitants) for the 20 Organisation for Economic Co-operation and Development (OECD) countries with the highest gross domestic product per capita. Based on data from Small Arms survey and United Nations Office on Drugs and Crime.<sup>7-9</sup>

Figure 3. Regression-adjusted firearm incidence rate ratios and 95% confidence intervals by county type for firearm suicide and homicide deaths to non-firearm deaths in the United States (1989-1999). County types stratified based on urban-rural continuum codes (1-largest counties to 11-smallest counties) [From Branas et al,<sup>11</sup> with permission]

Figure 4. Comparison of motor vehicle-related mortality (blue line) and firearm mortality (red line). Decline in motor vehicle-related mortality is despite marked increase in average annual vehicle miles driven (green line). Mortality data courtesy National Trauma Data Bank, American College of Surgeons.<sup>4</sup> Motor vehicle travel data courtesy of U.S. Department of Transportation.<sup>61</sup>



Table 1.

<b>Organization Priorities</b> (% responding)	<b>High</b>	<b>Medium</b>	<b>Low</b>
What level of priority should APSA give to reducing gun-related injuries through non-advocacy related methods, such as research, education, community outreach, injury prevention?	83	13	4
What level of priority should APSA give to advocate for health policy changes in the US, designed to reduce the loss of life caused by firearms, with a specific focus on insuring the safety of children?	84	10	6
<b>Health Policy Issues</b> (% responding)	<b>Support</b>	<b>Neutral</b>	<b>Oppose</b>
Preventing people with mental health illness from purchasing firearms.	95	4	1
Mandatory background checks and licenses/permits for all firearm purchases including those from authorized dealers, gun shows or private sales prior to purchase.	94	4	2
Improve mental health screening and treatment for Americans to help reduce suicides and gun-related violence.	97	2	1
Promoting Child Access Prevention (CAP) laws to prevent children from gaining access to loaded firearms.	95	3	2
Preserving the right of physicians and health care providers to counsel their patients or the parents of their patients on safe firearm ownership.	94	5	1
Requiring safety features to promote gun safety, including child-proof locks and "smart gun" technology.	90	6	4
Requiring firearms owners to be 21 years of age or older.	76	12	12
Identifying and implementing evidence-based injury prevention programs that decrease firearm injuries (either in partnership with or independently of other professional organizations).	94	5	1
Advocacy efforts to restrict civilian access to assault rifles (magazine-fed, semi-automatic, e.g., AR-15)	84	6	10
Advocacy efforts to limit civilian access to types of ammunition designed for military or law enforcement use (e.g., armor piercing, large magazine capacity).	84	8	8
Making funds available for research to better understand gun violence and how to prevent gun violence.	92	6	2

Table 2.

**Positions supported by APSA**

- APSA fundamentally commits to pediatric trauma care, pediatric trauma readiness, pediatric trauma centers, and pediatric trauma systems as the optimal resources for pediatric firearm injuries when they occur. APSA endorses firearm injury prevention as part of comprehensive pediatric trauma care.
- APSA supports addressing firearm injury as a public health issue that requires resources and commitment to solve.
- APSA supports efforts to improve the availability and quality of mental health services for both children and adults.
- APSA supports a system of universal background checks for all firearms transactions, including private sales.
- APSA recommends removal of policy barriers that prevent firearms-related research and recommends expansion of the NVDRS to all states and territories.
- APSA supports restrictions on civilian access to high capacity magazines and assault-style weaponry.
- APSA supports all efforts to limit access by children to firearms, including the use of gunlocks and safe storage techniques.
- APSA supports strong CAP laws for firearm storage and a legal minimum purchase age of 21 years for all firearms.
- APSA opposes, in the strongest possible terms, any policy or legislation that infringes upon the freedom of physicians and patients to discuss firearm safety.
- APSA supports school safety and readiness for active shooter situations. APSA does not support arming teachers to improve school safety. APSA supports wide dissemination of “Stop the Bleed” training to school personnel.
- APSA supports research, education and treatment for the second victim phenomenon and the stress reactions faced by survivors and health care teams in the face of these incidents.

Table 3.

	<b>Handguns</b>	<b>Rifles or Shotguns</b>
<b>Licensed Firearms Seller</b>	21 years or older	18 years or older
<b>Other Persons Selling Firearms</b>	18 years or older	No minimum age

Figure 1.

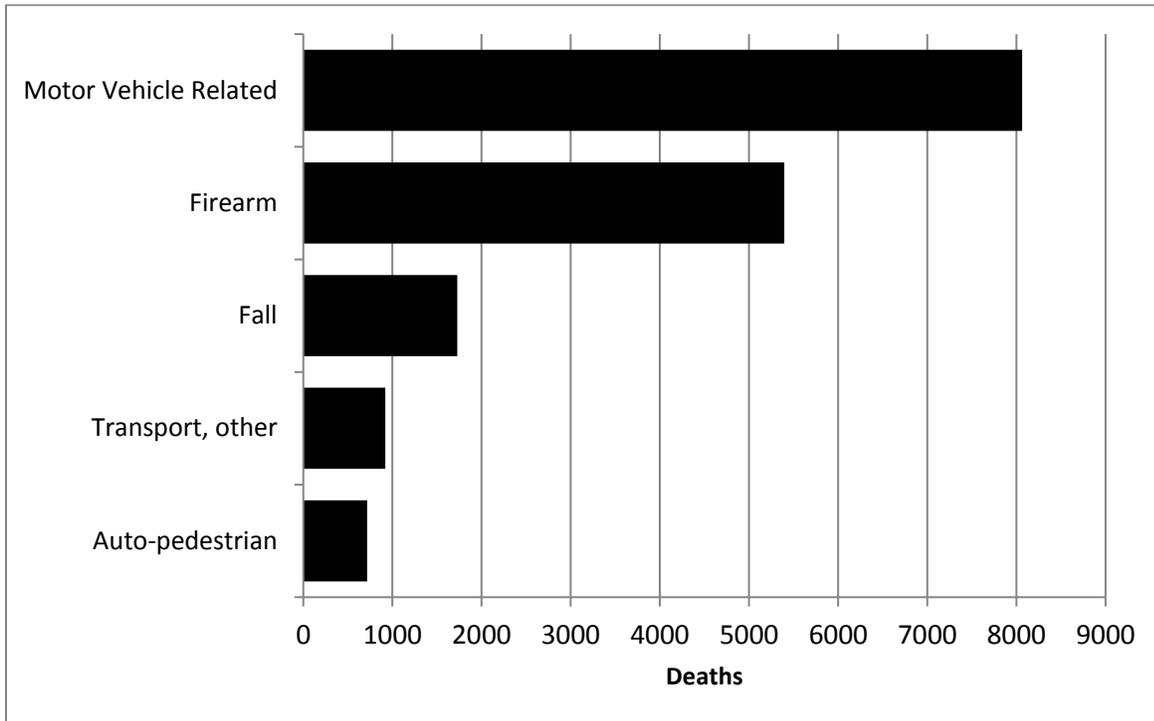


Figure 2.

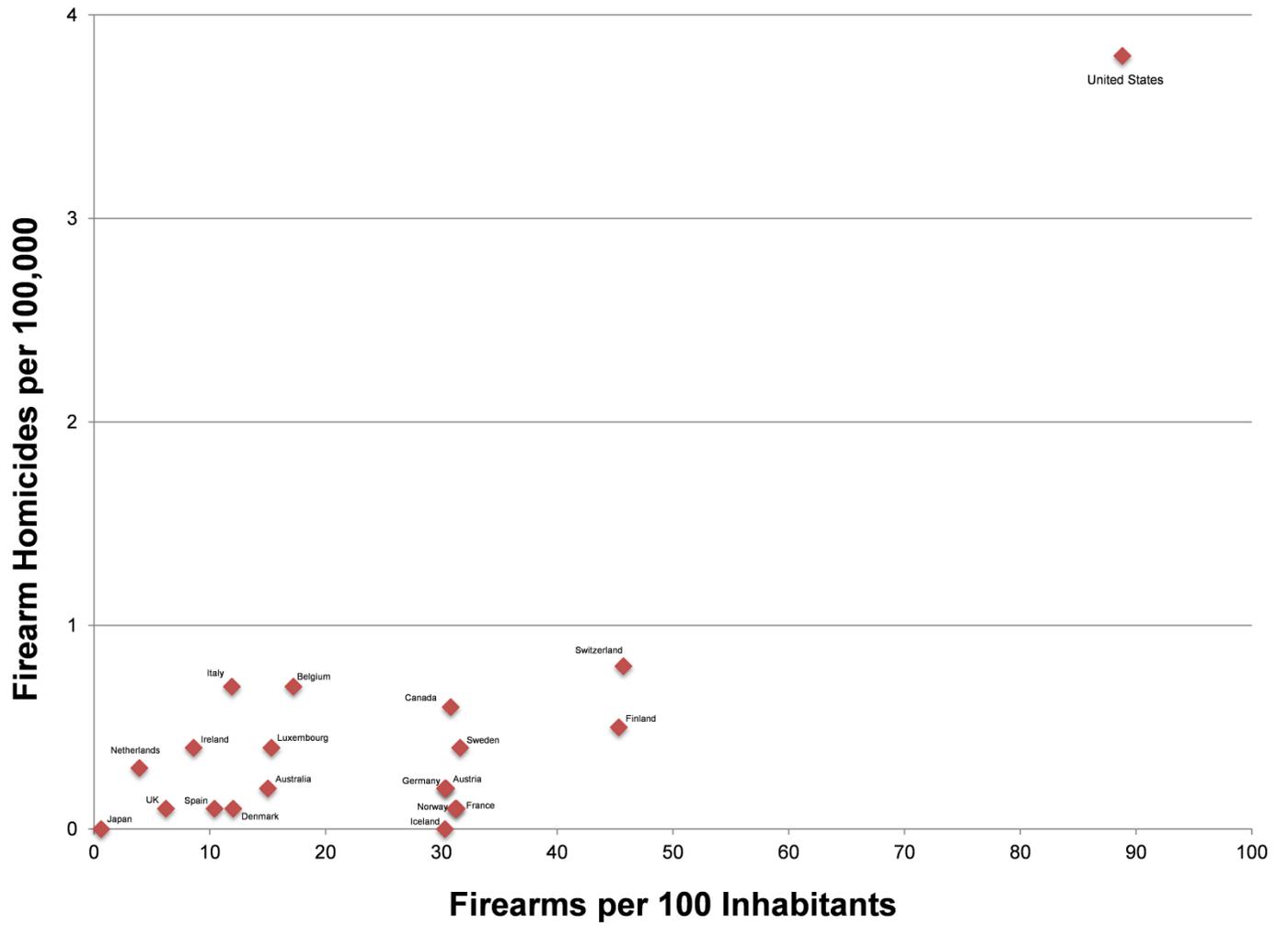


Figure 3.

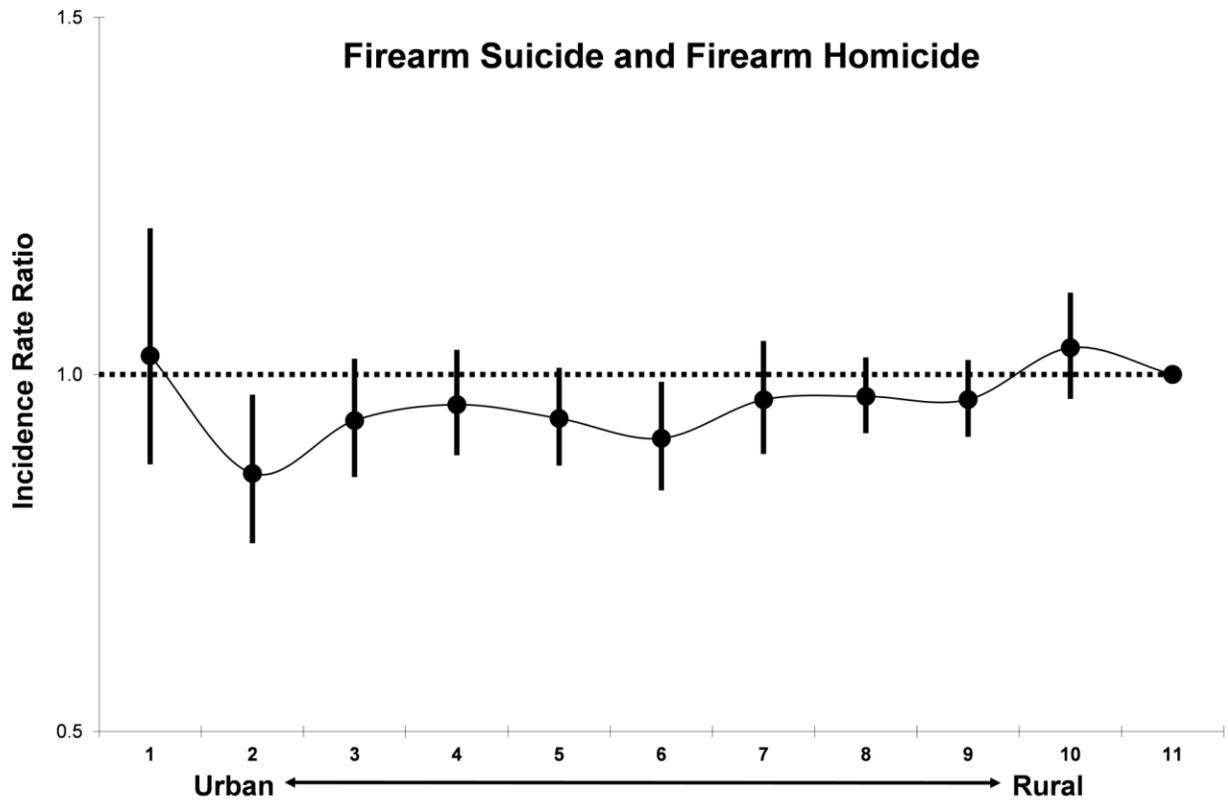


Figure 4.

