

Trends in firearm safety—do they correlate with fewer injuries

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Abstract Firearm-related violence within the USA occurs at a much higher rate than other developed countries. While this rate is likely multifactorial in nature, a common debate within households and governments alike involves increased regulation of firearms in hopes of curtailing this violence. This article provides context in which to consider both the pros and cons of increased firearm regulation and a review of the effects certain regulations have had on firearm-related violence thus far.

Keywords Gun policy · Gun control · Firearm violence

Introduction

Firearms are exceedingly common within the USA, with roughly 300 million nonmilitary guns present in the USA [1]. Many studies have shown a correlation between the number of firearms available and the incidence of death related to firearms [2–4]. For example, one study found that for each standard deviation increase in a state's gun ownership rate, there is a 21 % increase in the state's nonstranger homicide rate [5]. This correlation has called many to request greater regulation of firearms within the USA and lead to hotly

contested debates between supporters and opponents of such regulation.

The rate of firearm-related violence

The rate of firearm-related violence within the USA, when compared to other countries, is quite high. Over half of all violent deaths in the USA involve a firearm [6], and the majority of those involve the use of a handgun [7]. The firearm mortality rate per 100,000 people in the USA is nearly double (11) than that of the next highest developed country (Finland, 6) [8] and 12 times higher than the average death rate in 25 other industrialized nations [2]. This is despite the fact that many of these countries have firearm regulations that are similar to (Australia), stricter than (Britain), or much weaker than (Switzerland) the USA. Furthermore, studies have found that a child is 100 times more likely to die of a gunshot if he lives in MO, USA as opposed to Ontario, Canada [1] and that children in the USA are nine times more likely to die from a gun than most other industrialized nations [9]. While this increased risk is likely to be due to a multitude of factors, it seems societal differences influence the firearm-related statistics significantly [10]. Furthermore, those statistics say nothing of the many firearm-related deaths that are attributed to self-harm or accidents that occur in the USA each year [3, 11]. These data, in aggregate, seem to suggest that many of the firearm-related deaths within the USA are preventable.

Protecting society vs individual rights

There are two basic arguments in the debate concerning firearm regulation. One is the idea that if more guns lead to more homicides and suicides, then it should be more difficult to

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obtain or use firearms in an effort to decrease such violence. Proponents of this argument point to the fact that most victims of gun violence are children and young adults who do not own guns themselves and are innocent victims of accidents or crime [2]. Additionally, supporters of increased regulation may note that there appears to be an inverse relationship between the thoroughness of background checks and the number of homicides that occur in states [2] or that those states that have the most strict gun laws are also the states that have the lowest rate of death caused by firearms [12].

Those who seek less regulation of firearms do not necessarily deny that firearms can be used for malicious acts or are associated with violence. They do, however, recognize that firearms have a lot of value outside of being used in violent altercations or suicides [1] and that these values should not be dismissed. The vast minority of guns in the USA are used for criminal activity, and it would seem that having a firearm may be as useful in deterring a violent crime as well as committing one. While it is quite easy to quantify a death related to a firearm, it is much harder to quantify the feeling of safety someone may enjoy from owning a gun. Supporters of less regulation will also note that over the past 20 years, deaths from fire, drowning, and motor vehicle collisions have decreased 38, 52, and 31 %, respectively, without eliminating cars or making pools illegal [13]. In those cases, prevention and safety training seemed to be the solution, not restriction nor regulation. There is also literature to show that a person is 56 times more likely to die from a motor vehicle collision than from a firearm accident and that the overall number of unintentional firearm-related deaths have decreased by around 50 % from 1991 through 2011 [14]. Lastly, this group may feel that it is everyone's right to own a firearm and that this right is infringed upon when restrictions are put in place to make owning or using a firearm more difficult. This line of arguing tends to involve a discussion of the 2nd Amendment of our Constitution. While some have claimed that the 2nd Amendment only applies to militia's, recent supreme court rulings seem to support the idea that Second Amendment grants all individuals the right to possess firearms within their own homes and that state and local governments cannot overrule this right [15].

In reality, both sides of this debate are largely "right" and are able to find data to support their viewpoint. Surely there would likely be few opponents to the general idea of keeping firearms out of the hands of people who intend to use them for malicious intent [16]. The ethical debate arises from whether or not it is right to restrict the purchase of guns for all individuals in an effort to protect innocent victims from harm at the hands of those few people who use firearms criminally [4]. In this framework, there is clearly no "right" or "wrong" answer. The answer simply depends on the situation at hand and how the argument is framed. The more important question may be what effects the various policies and regulations have had on society and individuals, not what the "best" policy may be.

This question, though, of what impact laws and policies have on firearm-related violence is incredibly difficult to answer [17]. Although there are many individual studies that tie firearms to violence, a systematic review of all available literature could not conclusively state that regulatory efforts put in place to curtail gun violence actually impacted such violence at all [8]. Another study looking at the effect of banning specific firearms and its effect on gun-related deaths came to a similar conclusion [8]. So, if regulations have not been found to diminish firearm-related violence, should they be removed in an effort to decrease their impact on individual's rights? There are many variables that likely go into gun-related violence, and singling out one specific law or regulation is almost impossible to do through standard scientific methods. This does not mean that specific laws do not have an effect, just that they may not be measurable by current methods.

Specific restrictions

Assault rifles

There have been recent incidences involving assault rifles that have led to many innocent lives being lost. Yet, it is unclear what effect banning these types of firearms have had on the reduction of gun-related violence [8]. One study looked at the 1996 National Firearms Agreement that was passed in Australia and prohibited certain types of firearms like assault rifles. That study found that there was no reduction in unintentional firearm deaths after the ban was put in place [18].

Purchasing of firearms

Restrictions have also been put in place on the purchasing of firearms. While there may be a connection between states with higher incidences of gun ownership and deaths from firearm-related homicides in those states [19], it is difficult to draw a far-reaching conclusion based on the current literature. One study found that making minimum purchasing and possession age laws did not reduce the rate of suicide in adults between the ages of 14 and 20 [16]. Another study found that adding laws that make the purchase of firearms more difficult did not substantially decrease the violent crime rate [8]. These findings may be due to the fact that there are very few 14-year olds that are buying firearms and that if someone is restricted from purchasing a firearm, he still has the ability to obtain one by stealing one or finding his parents', relatives', or friends' gun. Another reason why restricting access to firearms may not decrease violent crime is that many of the guns used for criminal activity are acquired illegally [20]. There are an estimated 500,000 guns stolen per year [4], and in one city, 30 % of all firearms brought to a buyback station were reported stolen [21]. In fact, it may be more prudent of local, state, and federal

officials to focus on the selling and procuring of firearms than the owners themselves. The illegal sale and trafficking of firearms in the USA is substantially worse than that of neighboring Canada which, as opposed to the USA, regulates the sale of firearms on a national scale and not the state level [4]. Regulatory efforts have focused on the registration of firearms to decrease the illegal sale and transportation of firearms. Some of these efforts appear to have been successful on a national scale [8], but the most dramatic effects have been seen locally thus far [7].

There are also federal laws that prohibit certain populations of people from possessing firearms. Those populations include convicted felons and those with certain mental health conditions. The restrictions placed on these populations seem to have more success in decreasing firearm-related violent crime than the restrictions placed on the general population [11]. There have also been waiting periods and extensive background checks put into place during the act of purchasing firearms in an attempt to curtail impulsive, violent activity. This waiting period (the so called “Brady Bill”) has not been found to decrease violent acts or decrease the overall rate of suicide [8]. However, studies have found that extensive background checks performed on those individuals who are trying to purchase a firearm may be associated with fewer homicides and suicides [22, 23].

Concealed carry

Each state has the power to decide their own firearm-carrying laws and policies. Some states have a “shall issue” status whereas others have a “may issue” policy [9]. The shall issue states allow applicants who meet a certain, objective criteria to carry a concealed weapon. The may issue states require individuals to demonstrate a specific need and allow the local authorities to decide whether or not to permit a concealed carrying permit on a case-by-case basis. A list of all state policies on firearms can be found online (http://en.wikipedia.org/wiki/Gun_laws_in_the_United_States_by_state), and it is important to understand that these laws change frequently. States also regulate Stand Your Ground (the right to self defense against the charge of criminal homicide) policies, and these laws may also impact the likelihood of a person being accidentally injured by a firearm [24].

Children and firearms

There are close to 100 million homes in the USA that have both a child and a firearm [1]. Yet, it remains largely unknown if the Child Access Protection (CAP) laws decrease the accidental death of children related to firearms [8, 24]. While the American Academy of Pediatrics recommends that parents who own firearms keep them in a locked safe [10] and CAPs make it illegal to store a gun in a place that is easily accessible

to children [1], many children continue to have access to firearms. At least one firearm is kept loaded and unlocked in 20–50 % of all households with a firearm [25]. Such access is worrisome as kids are often curious and will commonly interact with a firearm found in their home. One study evaluated 8–12-year-old boys who were placed in a room with both real firearms and water guns in drawers. Seventy-five percent of the boys played with the real firearm, despite 75 % of the parents feeling sure that their child would not touch the real firearm and would play with the water gun only [1]. Another study looked at over 60,000 suicides among youth aged 14–20 and found that the CAP laws did not decrease the overall rates of suicide among the youth [7]. Yet, it does appear that CAP has a great effect on morbidity and mortality in states that have more strict penalties related to firearm possession and violence [10]. When looking at over 60,000 youths in 44 states, it was found that states with the most strict firearm laws had 2.2/1000 firearm injuries per trauma compared to 5.9/1000 firearm injuries per trauma in the nonstrict states [26]. This implies that those children in the nonstrict states have significantly more firearm-related traumas than those in the states with strict firearm regulations.

Conclusion

Although the idea of restricting access to firearms in an effort to decrease violence is sound, this review shows that the evidence supporting this thought is mixed. While these mixed results do not necessarily mean that the policies are not working, it is valid to ask when, or if, some of these policies may be redacted based on the lack of evidence supporting them. There were very few firearm restrictions 50 years ago when gun violence was quite low and there are many more regulations in place now when gun violence within the USA is much higher. Does that mean that the regulations have not worked or would the current violence be even worse if none of today’s regulations were in place? These are questions that will never be answered, but the fact remains that many regulations that are put in place in the name of safety are not usually removed. This could leave policies in place that do not provide their intended benefit of protecting society while negatively impacting an individual’s rights.

Compliance with Ethics Guidelines

Conflict of Interest The authors declare that they have no competing interests.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

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