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K-12 School Shootings: Implications for Policy, Prevention, and Child Well-Being

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Abstract

Schools should be considered safe spaces for children in society, as children need to feel secure in order to grow and learn. This chapter argues that when a school shooting occurs, the harm can go beyond just those who are injured or killed, as the presumption of security is shattered, and the mental and emotional health of the students exposed to the violence is threatened. There are many possible interventions for preventing these attacks, including on the school, state, and federal level. This chapter explores the evidence behind some these interventions and describes the delicate balance in implementing these interventions without introducing undue stress and anxiety into a child's everyday life.

Keywords

School shootings; school safety; school violence; gun violence; active shootings; mass shootings

Introduction

On December 14th, 2012, a 20-year-old male, not yet legally old enough to carry a handgun, would go on to commit the deadliest K-12 school shooting in United States history.¹ Earlier in the morning, he would first murder his mother, a firearms enthusiast, and steal her Bushmaster XM15-E2S rifle, Izhmash Canta-12 12 gauge shotgun, SIG Sauer P226, and a Glock 20SF handgun, all of which were bought legally.² He then drove ten minutes away to Sandy Hook Elementary School in Newtown, Connecticut, a kindergarten through fourth grade primary school where over 400 were students enrolled. The school had security measures in place; for example: visitors needed to be identified and buzzed into the building, which was locked once the school day began.¹ Using the Bushmaster rifle, the perpetrator bypassed this system by shooting through plate glass in the front of the school. After killing the principal, school psychologist, and wounding a teacher who tried to stop the attack, he opened fire on two first-grade classrooms.¹ In one of the classrooms, he shot and killed a

teacher and behavioral specialist who had attempted to shelter the students in the bathroom. He then murdered all the students except a six-year-old girl; she survived by hiding in the corner of the bathroom and playing dead, likely underneath her murdered classmates. Fifteen children perished in this classroom.¹ In the second classroom, the teacher and special needs teacher put themselves between the perpetrator and the children, and several students were able to escape the room when the shooter reloaded his firearm. Tragically, five students were still killed, including both teachers. Within approximately six minutes, twenty children (only 6–7 years old) and six adults were killed before the gunman committed suicide using the handgun.¹ This tragedy relaunched a national conversation about the occurrence of mass shootings, specifically the physical, psychological, and educational harm inflicted on children. Despite being touted as the “tipping point” in gun violence prevention,³ only individual states have been successful in passing legislation in hopes of reducing mass shootings. To this day, there has not been significant legislation passed at the federal level to prevent these incidents from occurring in the future.⁴

Using the most commonly used definition of a mass shooting—an incident where four or more individuals are killed by a single (or sometimes pair) of perpetrators⁵—studies have found that children and teens (individuals under the age of 18) make up a surprisingly high percentage of the victims killed in these tragedies. In 2019, children comprised 22% of the population in the United States,⁶ and accounted for approximately 25% of victims in all mass shootings.⁷ Children are even more likely to be victimized with a gun if the event occurs in the home. Between 2009 and 2016 there were 102 mass shootings, of which 71 occurred in the home, and 31 in public. Children under the age of 18 accounted for nearly half (44%) of the deaths in domestic mass shootings and 10% of the victims in public mass shootings.⁸

Although children and teens are usually not targeted in public mass shootings,⁸ school shootings in K-12 schools - which include mass shootings - remain one unfortunate exception. These tragedies primarily impact children and teens and are especially concerning given the age of the victims. The definition of a school shooting, like mass shootings, can vary widely, ranging from an accidental discharge of a gun at school, to the injury or death of a student by a firearm, to a school mass shooting.⁹ Using the definition of any incident of interpersonal gunfire in a K-12 school, the *Washington Post* created a dataset that details any school shooting since the Columbine School Shooting, in 1999.¹⁰ Using this data, the number of school shootings per year, with some of the most infamous school shootings labeled, is presented in Figure 1. Regardless how a school shooting is defined, all of these events can have detrimental effects on a child’s well-being, development, and critical learning outcomes. This is particularly evident if we consider that school shootings impact not just those children who are physically injured and killed, but those who witness the shooting, hear gunshots, know a friend or family member who was killed, among other levels of exposure.¹¹ Indeed the short- and long-term implications of school shootings on communities across the U.S. can be devastating.^{12,13}

K-12 school shootings are of particular interest given the expectation of safety within a school’s walls and the right of every child to learn and thrive in a safe school environment. An apt comparison can be made between school shootings and plane crashes. Deaths due to

both are rare,^{14,15} and planes and classrooms are also presumed to be safe places. However, due to the presumption of safety, if something goes wrong, the event is rightfully seen as not only tragic, but also preventable. As a result, both are more likely to make international news than more frequent tragedies such as car crashes or domestic shootings.^{16,17} This heightened media response may be one reason why many are terrified of these events; in 2018, Americans rated mass shootings, including school shootings, as the second most important event of the year (with the first being the economy).¹⁸ And the impact of a school shooting may feel particularly devastating, as schools are intended to be safe spaces within which children should be able to thrive and foster their physical, social, and emotional development. The notion that schools could be the site of such violence is counter to our understanding - and expectations of - what schools can and should be. At the same time, an argument can also be made that the fear associated with the anticipation of gun violence in schools is also due to a loss of control by the victims.¹⁹ Just as a passenger on a plane has no way of preventing a mechanical dysfunction or error by the pilot, a parent has little ability to stop a school shooting in the moment. Importantly, however, the two scenarios differ in the way society responds to them. Despite how rare plane crashes prove to be, if one occurs, there is an immediate investigation and steps are made to prevent a future occurrence with significant investments of money and research. The airline industry continues to produce safer airplanes, stricter safety regulations, and a commitment to bringing the number of the accidents to zero. This same mentality should exist with shootings in schools—they are tragedies that should not exist in modern society. Yet, the number of school mass shootings, which had been relatively consistent year-to-year since the 1999 Columbine High School mass shooting, has started to increase in incidence since 2015.⁹ In fact, data indicate that more mass school shootings occurred in K-12 schools in 2017 than any other year.⁹ Furthermore, the solutions to preventing a school shooting are not as straightforward as preventing a mechanical failure in a machine, as they need to consider the mental and educational well-being of children.

Harm Beyond Injury and Death

Research has confirmed that the implications of youth being exposed to gun violence - particularly a school shooting - can occur, even if no one is killed or injured.¹¹ For example, a significant body of work has demonstrated that the anticipation of violence more generally can lead to heightened anxiety, fear, and depression across a range of populations.^{20–22} According to the *Washington Post*, well over 200 instances of gunfire in K-12 schools have occurred in the U.S. in the twenty years since the Columbine shooting in Colorado,¹⁰ the most publicly notable being mass shooting tragedies at schools like Sandy Hook Elementary School in Connecticut and at Marjory Stoneman Douglas High School in Florida. While approximately 150 students and educators have been killed and 300 injured by mass shootings in schools, more than 236,000 students have been exposed to gun violence at their K-12 school since Columbine.¹⁰ The number of students exposed to interpersonal gunfire in their schools per year is presented in Figure 2.¹⁰ This number, however, is still an underestimate of the total harm created by these events as the reactions and responses to the school mass shootings could also have negative mental health outcomes for children across

the United States through anxiety of the anticipation that a shooting might take place at their school in the future.

For example, the hundreds of thousands of students who may have avoided being physically injured by a firearm during these attacks may still experience long term mental health consequences. Any sense of security or safety in their schools—an essential component of learning²³—can be disrupted with insecurity after these tragedies. A review by Lowe and Galea²⁴ published in 2017 examined forty-nine articles covering fifteen mass shootings, four of which were in K-12 settings. Among these articles, the most common psychological outcomes that were assessed and found to be elevated among this population were post-traumatic stress disorder (PTSD) and major depression, although evidence of generalized anxiety disorder, acute stress disorder, alcohol related conditions, drug use disorder, panic disorder, adjustment disorder, and anti-social personality disorder were also found to be significant in individuals' lives who had been affected by a mass shooting.²⁴ Although psychological conditions were found to be more severe for those who had greater exposure (i.e. witnessing the attack or knowing a victim), those with little direct exposure to the shooting still had at least short-term mental distress of some kind following the incident.²⁴ And further, although this review included both adults and minors, children and teens who were exposed to these events often experienced higher rates of psychological disorders, including PTSD, in comparison to their adult counterparts. In another study, depending on the way in which they are exposed, approximately 30 to 40% of children who are exposed to a life threatening event develop symptoms of post-traumatic stress disorder.²⁵ In some cases, mental anguish, often fueled by survivor's guilt and trauma,²⁶ can result in deaths years after the incident. For example, two Marjory Stoneman Douglas students committed suicide a little over a year after the school mass shooting, and a father of a Sandy Hook Elementary School victim committed suicide in 2019.^{27,28}

Indeed, gun violence in K-12 schools persists, with potentially devastating and traumatic implications for communities around the U.S. In the following sections we present evidence in support of several solutions at multiple levels for this endemic, while also evaluating the lack of evidence that exists for other solutions that are currently in place.

Solutions and Gaps in Evidence

Like all public health crises, the solution to the persistence of gun violence in K-12 schools will require a multifaceted and coordinated effort that draws on a wide range of evidence-informed strategies and involves multiple stakeholders. Importantly, these solutions must also consider the well-being of children in their approach. In this section we identify examples of current approaches to gun violence prevention in schools and speak to their strengths and limitations.

School-Level:

Physical security measures—The image of a school has changed since the 1999 Columbine shooting in Littleton, CO with the implementation of security measures, such as metal detectors, armed guards, and zero-tolerance policies.²⁹ In 1999, less than 20% of schools had security cameras; now more than 80% do.²⁹ These policies also

disproportionately affect schools in communities with a lower social-economic status and where the primary population are students of color—regardless of crime rates—and are one facet of the school-to-prison pipeline.^{30,31} Unfortunately, evidence surrounding these policies is limited, and when available, conflicting. Some researchers have found that more security measures in school, such as metal detectors and armed guards, resulted in students feeling less safe compared to schools without these measures.^{32–34} Other researchers have reported the opposite: students felt more safe with these policies,³⁵ or that these security measures have little effect on academic performance.³⁶ Furthermore, while there is evidence in support of some behavior interventions in preventing school violence, such as counseling, mentoring, and peer mediation,^{38–40} most studies evaluating physical security policies have been inconclusive.⁴¹ This dilemma proposes a problem: school districts are not only implementing policies that have not been proven to be effective in reducing violence, but also are doing so without knowing the mental health consequences of these measures. The lives significantly influenced by school shootings are vast and uncountable; therefore, research on the best ways to reduce harm related to these tragedies, both mental and physical, is critical.

Lockdowns and Active Shooter Drills—In the weeks before the school shooting at Sandy Hook Elementary, the school had practiced lockdown and safety procedures; in fact, it is thought that the shooter bypassed one of the first grade classrooms because the teacher had forgotten to remove black construction paper from the window of their classroom door.¹ In the years following, lockdown and active shooting drills have increased in American schools: according to the National Center for Education Statistics, nearly 95% of schools now conduct these drills.³⁷ These drills are meant to help students and teachers practice quickly locking the door and windows/blinds, finding cover in a classroom, and remaining quiet, and in some instances include multi-optional responses such as teaching students and educators how to create barricades, evacuate the school, and actively resist a shooter.⁴² Simulation studies have shown that lockdowns, particularly multi-optional ones, may save lives.⁴² But the implementation of these drills is not without controversy, as there is fear that they might be harmful for a child's emotional and mental wellbeing,⁴³ can be used to the shooter's advantage,⁴⁴ or may numb students' reactions to if a real shooting were to occur.⁴⁵ Indeed, one survey among students between the ages of 14 and 24 found that while 56% reported that they do help to teach students what to do in case of an attack, 60% of the 815 respondents reported that while the drill made them feel "scared and hopeless."⁴⁶ It is therefore important that these drills are implemented appropriately. For example, if the drills are well planned and the students are warned about the drill before it happens (as opposed to being surprised), some of the harm from these practices could be avoided.⁴⁷ Even so, school psychologists should be included in both the planning and aftermath of active shooter drills to prevent trauma from occurring, especially with students of younger ages.⁴⁸

Arming our teachers—The shooting at Marjory Stoneman Douglas High School in Parkland, Florida, reignited a national conversation around arming teachers with firearms. Though not a new idea, it brought this concept to the forefront of our national discourse. Unfortunately, and as recent work has illustrated, little is known about the effectiveness of arming teachers in deterring gun violence in schools,⁴⁹ including how its implementation

would work. For example, many law enforcement officers receive over 800 hours of basic training, which includes 168 hours of training specifically on weapon use, self-defense tactics, and the use of force.⁵⁰ However, states that have laws aimed at arming school personnel offer significantly less training - if any - to their school staff.⁴⁹ Research also suggests that arming teachers could heighten levels of anxiety and negatively affect a school's climate, as opposed to serving as an effective deterrence of gun violence.⁵¹ The large majority of teachers and parents are opposed to the idea as well. A recent survey of 500 U.S. teachers found that 73 percent opposed proposals to arm school staff,⁵² and a survey of parents of elementary, middle, and high school students, found that 63 percent oppose arming teachers.⁵³ Arming teachers would also require a contingency plan in place for all possible firearm-related scenarios (whether intentional or accidental), an understanding about the implications of this proposed effort on teacher burden and burnout, a clear sense of how this would resonate or possibly conflict with existing school policies, and an exorbitant cost investment.^{49,54}

Efforts to address early antecedents of violent behavior—The prevention of engagement in violence behavior among children - particular adolescents - has a long and complicated history. As a health crisis, gun violence in schools and its related behavioral antecedents should be addressed, not solely or primarily with punitive measures. In today's school environment, children are often viewed as either perpetrators to be punished or as victims to be protected without building on their agency.⁵⁵ However, investing in evidence-based preventive efforts that are intended to promote critical skill development - and doing so in ways that recognize the resources and agency that children and adolescents bring to the issue - is likely a far more effective way to address both the perceived threat of gun violence and prevent the onset of violent tendencies among youth, while also promoting well-being more broadly. For example, skill-oriented initiatives with a social emotional learning (SEL) focus have been shown to help youth develop healthier coping mechanisms and improve capabilities to address and manage social anxieties, interpersonal conflict with peers and sexual partners, feelings of anger or frustration, challenges with emotion regulation, and engagement in aggressive behaviors.⁵⁶ Investing in such efforts early on in one's developmental trajectory has the potential to be effective, as research demonstrates that experiences with violence beget more violence.⁵⁷ In line with work in developmental epidemiology^{58,59} we anticipate that prevention strategies that reduce the onset of more minor incidents of violence among youth (hypothesized to be "early antecedents" of gun violence), in turn may prevent incidents of gun violence. Other school- and classroom-based initiatives focused on the school climate⁶⁰⁻⁶² and engaging parents in the school community⁶³ have also been shown to have an impact on reducing aggressive and violent behaviors more broadly. At the same time, work on positive youth development programs have identified short-term impacts on reducing violent outcomes, but the long-term efficacy of such efforts is not clear.⁶⁴ Indeed, much of this work has also elucidated that more research is needed to better understand the efficacy of such preventive efforts on reducing gun violence in schools.⁶³ But these efforts can and should be considered part of a broader menu of strategies that schools pursue as they consider how best to keep their communities safe.

Bullying and warning signs—The majority of K-12 school mass shootings are perpetrated by minors,⁹ and in many incidences, research has found that bullying - both being the target or committing the bullying - is a major risk factor for committing school based violence.⁶⁵ An evaluation of fifteen mass shootings found that thirteen of the perpetrators had experienced acute or chronic rejection.⁶⁶ For example, in the case of the Sandy Hook mass shooting, the gunman had been described as “very withdrawn emotionally” and “quiet and socially awkward.”⁶⁷ In response to these commonalities between the perpetrators, *Sandy Hook Promise*, an organization with a mission to “create a culture engaged in preventing shootings, violence, and other harmful acts in schools,” developed the *Start With Hello* program and curriculum.⁶⁸ The goal of this program is to teach students to be more socially inclusive of one another, with hope that this will reduce bullying and rejection that some students might experience.

In many cases of school violence, there often are also warning signs preceding the event. A study conducted by the Secret Service and the U.S. Department of *Education* reviewed all targeted school violence incidents from 1974 to June 2000 and identified behavioral warning signs in 93% of the cases.⁶⁹ In 81% of the incidents, other people, often the shooter’s peers, had some knowledge of the plans.⁶⁹ In a follow-up study conducted from 2008 to 2017, researchers found that 100% of the perpetrators showed concerning behaviors, and in 77% of school shooting incidents at least one person knew about the attackers plan.⁷⁰ These numbers represent an important place for an intervention, and the *Start With Hello* campaign could be a first step in getting individuals the support that they need. The age-level appropriate curriculum may be effective in helping students identify possible warning signs of potential future attacks, and encourage students to feel comfortable telling an adult or mentor about these warning signs without fear of retribution for themselves or the person they are concerned for.⁶⁸

State and Federal Level:

Red Flag and Extreme Risk Protection Orders—In circumstances where the perpetrator is old enough to own a firearm, data on behavioral warning signs also suggest risk-based firearm removal laws could be an effective tool for prevention. Based on the presumption that a person’s risk for violence can fluctuate over time, these laws may prevent a firearm associated tragedy by temporarily removing the firearm from the individual. These laws, often referred to as “red flag laws” or “extreme risk protection orders”, are in effect in 19 states and the District of Columbia as of July 2020.⁷¹ The law is specific to each state, but in most cases, law enforcement or family members may petition a court to temporarily suspend an individual’s right to possess or purchase a firearm. Current research is limited but shows promising evidence of the effectiveness of these state level risk-based firearm removal policies. Two studies evaluated these laws in Connecticut and Indiana.^{72,73} The results were inconclusive for violence prevention but promising for suicide prevention. However, it is important to recognize that this law would not have prevented the mass shooting at Sandy Hook, and other school shootings like Sandy Hook. Most school shootings are perpetrated by minors who are often already unable to legally possess a firearm. As long as firearms are as widely accessible as they are in the United States, the effectiveness of this strategy against preventing school shootings is still unknown. Further

research is needed in order to adequately assess the realities of both implementing these orders and their resulting effectiveness in addressing violence prevention.

Gun-Free Zones—In 1990, one of the most well-known instances of a federal law intended to prevent shootings in schools, the Gun-Free Zones Act of 1990,⁷⁴ was passed. The bill outlawed any individual from knowingly possessing a firearm within 1000 feet from school (public or private) grounds, with some exceptions.⁷⁴ According to the National Criminal Justice Reference Service (NCJRS), the penalty for breaking this law is a fine up to \$5,000 or imprisonment of up to five years.⁷⁵ This policy has become highly politicized in recent years. Just three days after the 2012 school shooting at Sandy Hook Elementary School in Newtown, Connecticut, editorials began to appear online blaming the shooting on the fact Sandy Hook Elementary was a gun-free zone.⁷⁶ While proponents of the law believe this helps to keep guns away from schools, opponents of gun-free zones believe that perpetrators may target these areas due to the belief that the victims would not be able to defend themselves as they are unarmed. Despite the controversy, there is currently no peer-reviewed evidence to the effectiveness of gun-free zones.⁷⁷

CAP Laws—Given that the majority of school shootings are perpetrated by a minor,⁹ Child Access Prevention (CAP) Laws could be an effective policy to prevent school shootings. CAP laws require that a firearm is properly stored and locked so that a child would not be able to access it. In most cases, some tragedy with a child must occur for these policies to be invoked.

The RAND Corporation has determined that there is substantial evidence that CAP laws prevent accidental shootings and suicides (the only policy to achieve a “supportive” rating), and there is some evidence that CAP laws also prevent violent crime.⁷⁸ In 2020, 29 states and the District of Columbia have implemented some form of CAP law, although the details can vary greatly by jurisdiction. With variation, fourteen states and the District of Columbia only require that the individual was negligent in storing and locking the firearm.⁷⁹ However, in the other fourteen states, there is an additional requirement that the individual recklessly endangered their child by not properly locking and storing their firearm in order to be charged. In these states, it must be proven that the individual was aware of the risks but disregarded these dangers in their failure to secure their firearm.⁷⁹ The punishments for improper storage (either negligent or reckless) can also vary in these states from a misdemeanor to a felony.⁷⁹ Therefore, the effectiveness of these laws depends on the specific state.⁸⁰

Conclusions

K-12 school shootings are exceedingly rare events in the United States, but even a single occurrence that places a child and their well-being at-risk is one too many. Schools should be spaces where students are safe, supported, and able to engage, thrive, and learn. When a school shooting occurs, the harm extends far beyond those who have been physically injured or killed and can have significant effects that impact the mental health, learning, and emotional well-being of children within the school community. There are a number of current practices and policy in place with the goal of preventing K-12 school shootings,

however, these solutions must account for the well-being and developmental needs of children and ensure they are not harmful in their own ways. For example, research has illustrated that metal detectors in schools have the potential to make students feel less safe,^{32–34} and arming teachers could increase anxiety of students and teachers alike.⁴⁹ At the same time, there are other school safety efforts (for example, behavioral threat assessments, notification technologies, and emergency preparedness drills and programs – among others), which may be effective in deterring school gun violence. Rigorous research, however, is needed to evaluate the effectiveness of these kinds of tactics independently and, perhaps more importantly, in tandem and as part of a school's larger safety plan.

Additionally, some evidence suggests that investing in the implementation of positive youth development programs, increased access to comprehensive mental health care for children, and/or implementing anti-bullying and inclusion programs ought to be part of a broader and long-term vision for gun violence prevention. Given the critical role schools play in shaping a child's development, schools have the potential to address early antecedents of violence behavior and investing in this kind of evidence-based programming for students could be an important component without waiting for new laws to be passed.⁸¹ Lastly, and from a policy perspective, the evidence is clear that the passing of specific laws intended to prevent school shootings and other types of gun violence should be a goal—CAP laws, for example, have been shown to be effective at preventing children from accessing firearms.⁷⁸ When taken together, this multi-level approach has enormous potential to effectively prevent school shootings and foster the long-term well-being of children.

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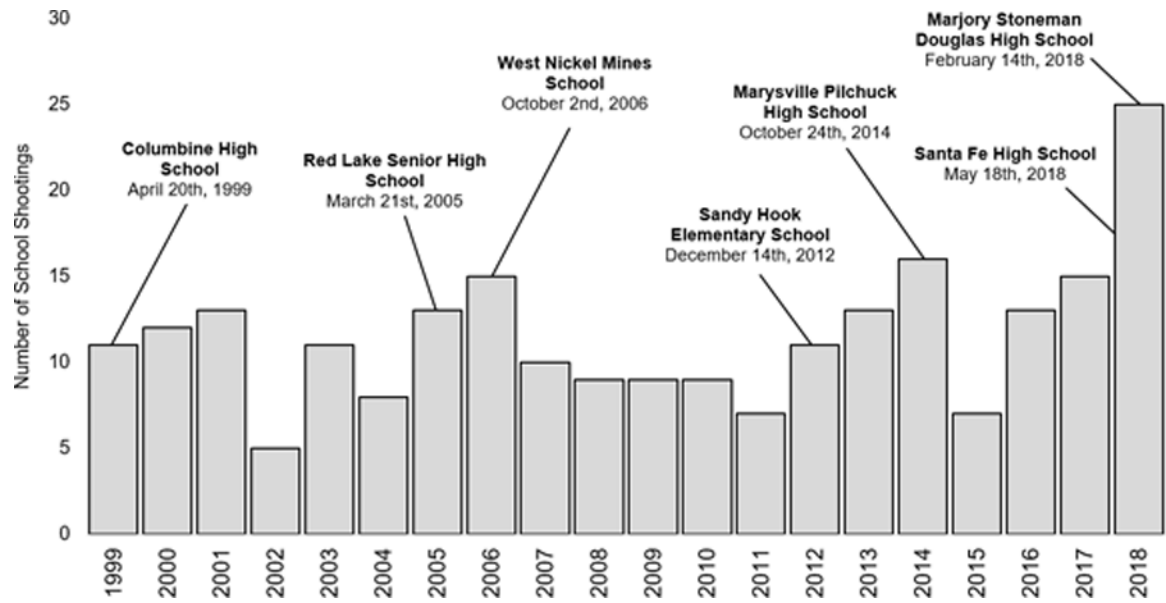
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**FIGURE 1:**

Number of school shootings in the United State since the Columbine School Shooting

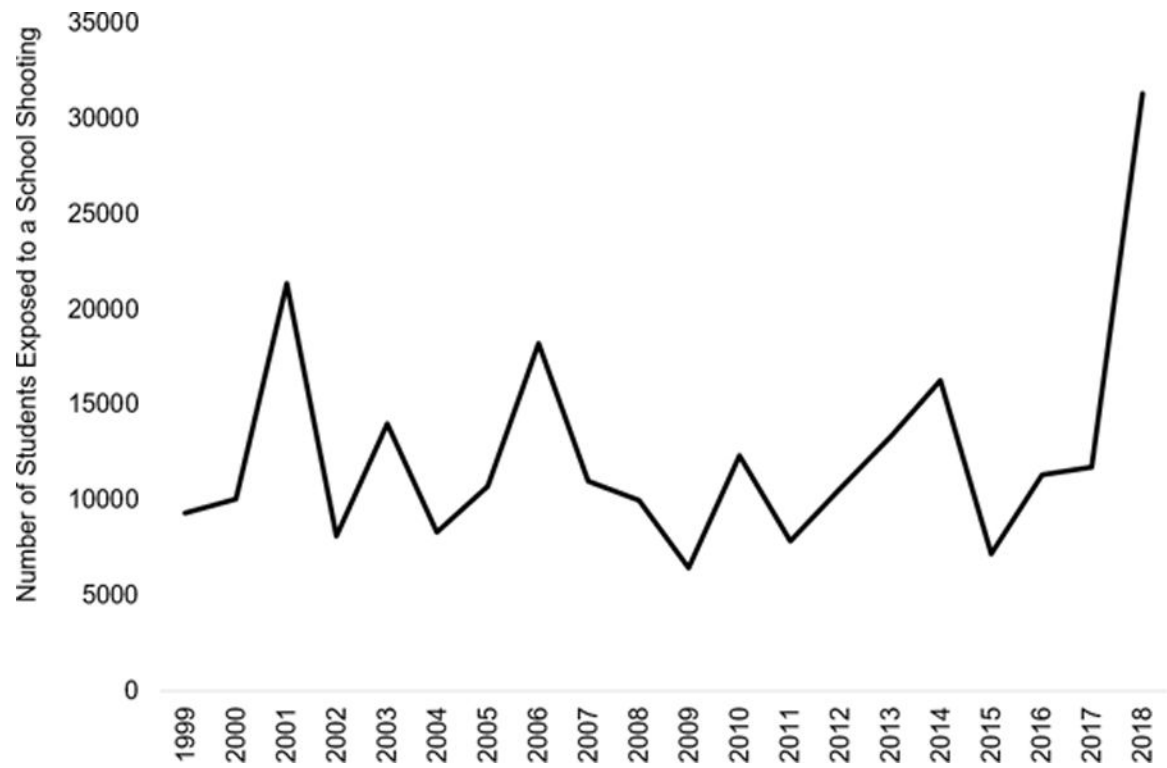


FIGURE 2:
Number of students exposed to interpersonal gunfire in the United States since the Columbine school shooting.