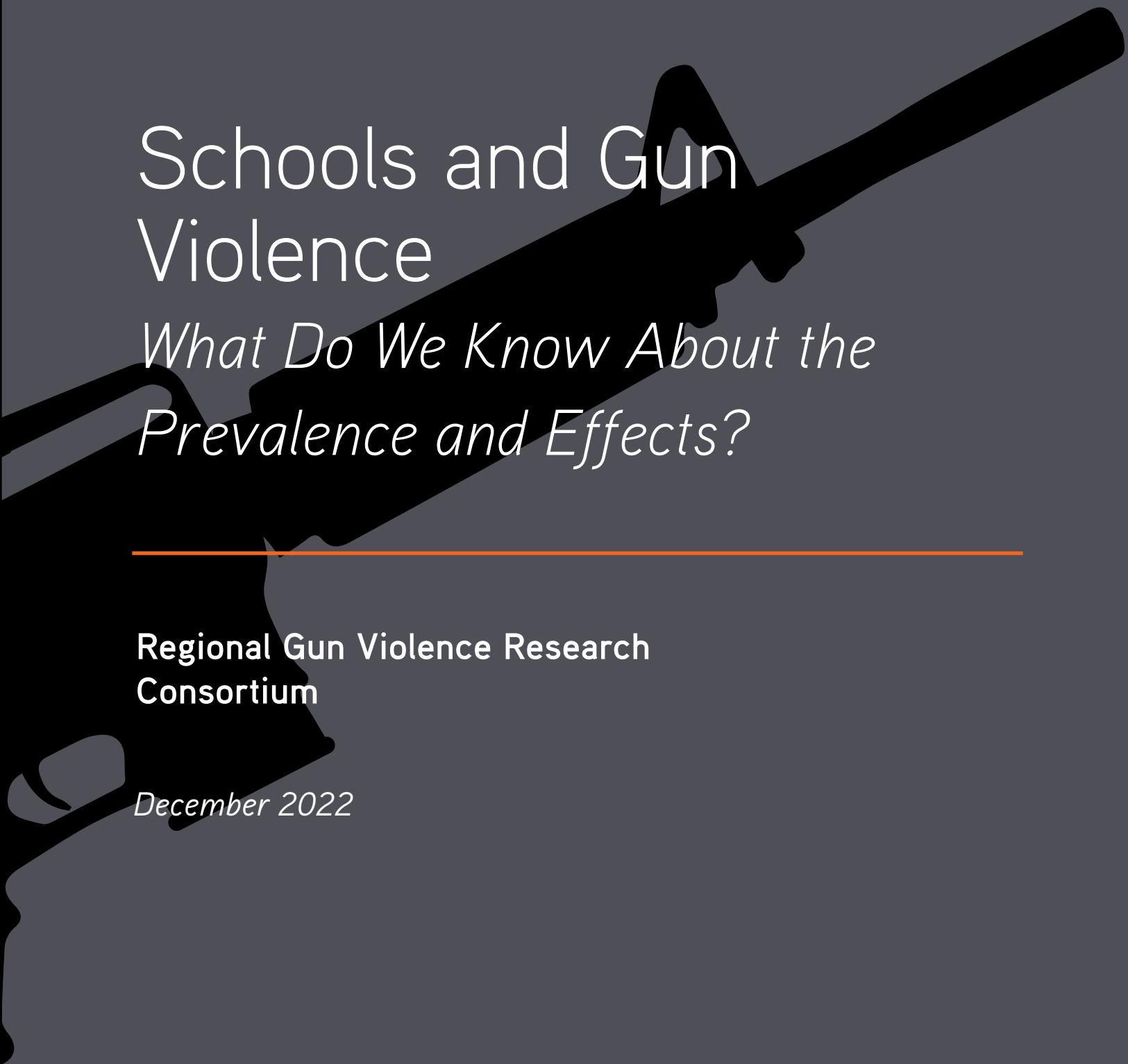


Schools and Gun Violence

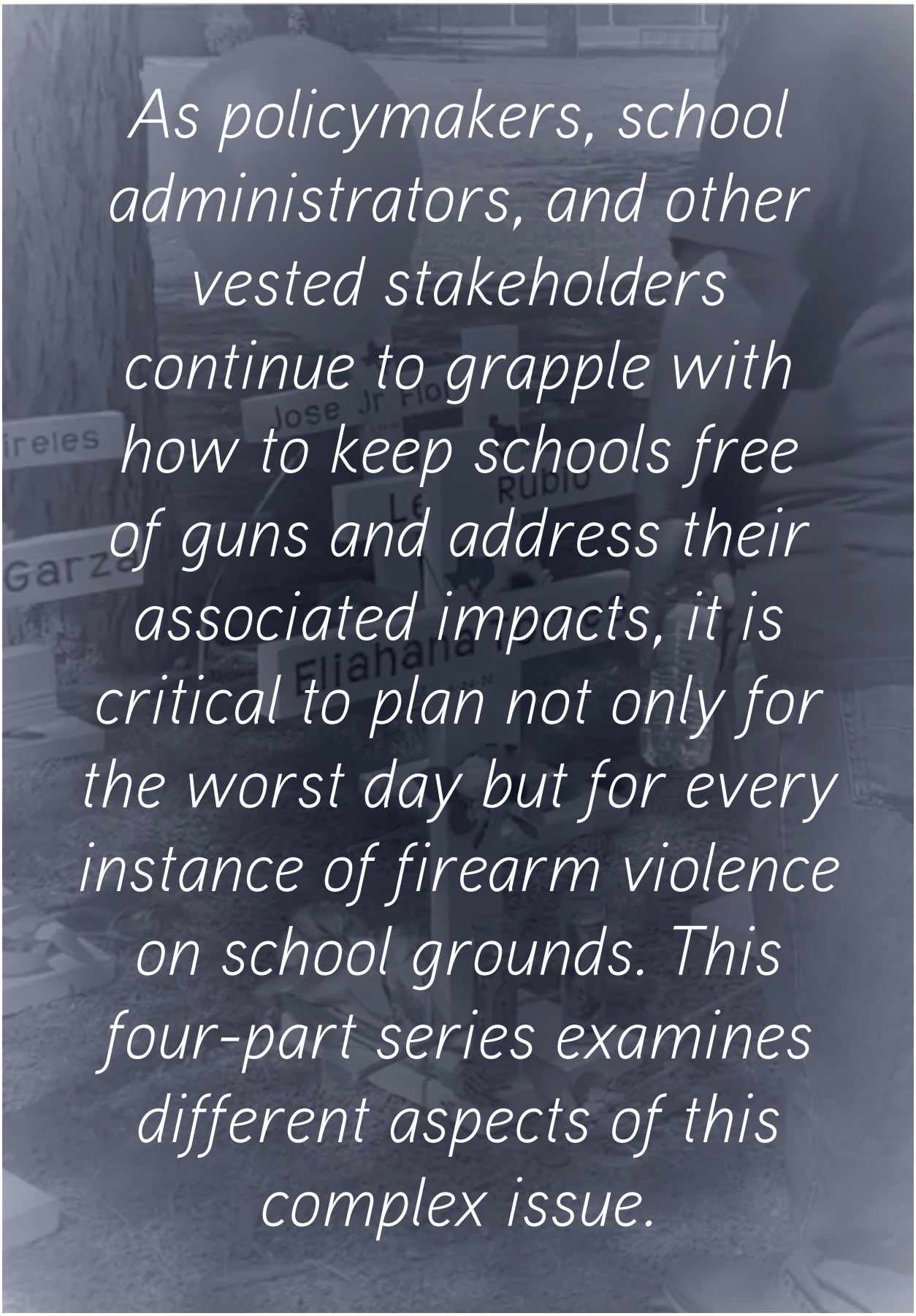
What Do We Know About the Prevalence and Effects?

Regional Gun Violence Research Consortium

December 2022

Rockefeller SUNY Institute of Government

Regional Gun Violence Research Consortium



As policymakers, school administrators, and other vested stakeholders continue to grapple with how to keep schools free of guns and address their associated impacts, it is critical to plan not only for the worst day but for every instance of firearm violence on school grounds. This four-part series examines different aspects of this complex issue.

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Schools and Gun Violence

What Do We Know About the Prevalence and Effects?

As the 2021-22 academic year came to a close, the United States was rocked by the news of another school mass shooting, this time at Robb Elementary School in Uvalde, Texas. Nineteen fourth-grade students and two of their teachers were killed when an 18-year-old former student entered the school through an unlocked door, made his way to his former fourth-grade classroom, and opened fire during a 77-minute rampage. Seventeen others were injured in the attack.

The tragedy in Uvalde conjured up memories of the shooting at Sandy Hook Elementary School in Newtown, Connecticut. Nearly 10 years earlier, 20 first-grade students and six of their educators, including the school's principal, were killed after a 20-year-old shot his way into the building. Two others were injured during the six-minute attack.

In the aftermath of the shooting in Uvalde, administrators and policymakers struggled to implement policies and procedures that would prevent a similar attack in their schools or minimize the loss of life if one did occur. These included, but were not limited to, increases in the numbers and presence of school resource officers,[1] authorization to arm teachers,[2] and even supplying schools with ballistics shields,[3] despite the lack of evidence to suggest these measures would achieve their intended goals in situations like Uvalde.

Amid growing fear and apprehension about another Sandy Hook or Uvalde happening and the proliferation of purported school safety measures, two questions occupy the minds of many: Are schools a safe place for children to be? And what actually works to make them safer?

According to data analyzed by the National Center for Education Statistics, there were 1,508 youth homicides (ages 5–18) perpetrated by any means during the 2018–19 school year (the most recent year available).[4] Of these, 10—less than 0.7 percent—occurred at school and not all were the result of a firearm. Thus, while schools are relatively safe from gun violence, events like Uvalde—and the pervasive media coverage that follows—makes mass school shootings appear as the norm rather than a rarity.[5]

Importantly, any incident of gun violence at schools can have a significant impact on students and teachers. Everytown for Gun Safety, for example, found that between 2013 and 2021, there were 573 incidents of gun violence on K–12 school campuses across the United States.[6] Of these, 210 (37 percent) resulted in no physical harm. Similarly, regardless of outcome, nearly 15 percent of incidents were the result of accidental or unintentional discharge rather than intent to cause injury. Still, students may experience both short- and long-term psychological effects following exposure to any form of firearm violence, including posttraumatic stress and symptoms,[7] anger and aggression,[8] withdrawal,[9] and desensitization to violence.[10]

Data released by the Centers for Disease Control (CDC) deepened the concern over the effects of firearm violence on youth. Just days before the Uvalde shooting, a study published in the *New England Journal of Medicine* analyzing the CDC data found that firearm violence surpassed motor vehicle crashes in 2020 to become the leading cause of death among youth and adolescents (ages 1–19).[11] The researchers also found that the relative increase in firearm-related deaths among these groups was "more than twice as high as the relative increase in the general population."

With growing concerns about the impacts and effects of firearm violence on America's youth, evidence-based solutions are more essential than ever. Ahead of the 2022-23 academic year, expert researchers at the Rockefeller Institute's Regional Gun Violence Research Consortium authored a series of policy briefs to assist the public and policymakers with better understanding firearm violence in schools. This four-part series, released in August 2022, examined different aspects of this complex issue.

In the first piece, *What We Know About Foiled and Failed Mass School Shootings*, Consortium members Jason Silva and Emily Greene-Colozzi examine what is known about school shooting plots that share similarities with Uvalde but never fully come to fruition.[12] Foiled shootings refer to those plots that are thwarted before the attack is initiated; better understanding these cases has important implications for threat assessment and similar prevention efforts. Comparatively, failed mass shootings, or those cases that are initiated but not completed due to the rapid response of individuals at the scene (e.g., school resource officers, other students), can help to inform response efforts that emphasize intervention before victims are physically harmed.

While the ideal outcome is to prevent mass school shootings before they occur, it is also necessary to have plans in place to respond if they do happen. Such response strategies should focus on minimizing the loss of life and injury. The second piece of the series, *Lockdown Drills: A Widely Used Yet Often Misunderstood Practice*, by the Consortium's executive director Jaclyn Schildkraut, explores a strategy used in 95 percent of public K–12 schools in the nation.[13] Lockdown drills, which became commonplace after the 1999 shooting at Columbine High School in Jefferson County, Colorado, involve specific steps to protect students and staff by training them to move out of sight in secured spaces to build distance between themselves and the threat.

The third piece of the series, *Overview of The American School Shooting Study*, seeks to situate events like Uvalde in the broader data of shootings in schools.[14] Co-authored by Consortium members Joshua Freilich and Emily Greene-Colozzi with colleagues Steven Chermak, Nadine Connell, and Brent Klein, this brief introduces The American School Shooting Study (TASSS), a national-level database compiled using open-source information and accompanying case studies. By classifying cases based on intent rather than solely location, it provides policymakers and other vested stakeholders with the necessary context to develop a robust and layered approach to school safety rather than trying to find a "one-size-fits-all" solution that is doomed to fail.

As noted, regardless of the intent, gun violence has significant consequences for children. In the final piece of the series, *The Effects of Firearm Violence on Children* by Consortium members Amanda Nickerson and Sonali Rajan, the authors consider a range of psychological, social, and emotional impacts.[15] Protective factors, such as social support, may help to buffer the deleterious effects of gun violence exposure, but it is important to recognize that reducing exposure must be a primary objective of policies. Social institutions including schools, healthcare settings, and the communities themselves play a critical role in helping to reduce gun violence and its harmful effects on children.

Taken together, these pieces provide important context for understanding the prevalence and effects of firearm violence in schools. As policymakers, school administrators, and other vested stakeholders continue to grapple with how to keep schools free of guns and address their associated impacts, it is critical to plan not only for the worst day like Uvalde but for every instance of firearm violence on school grounds. In doing so, it is important to implement strategies that are based in research where evidence supports their efficacy in achieving prevention and/or harm mitigation. At the same time, it is imperative to consider not only the short-term effects but also longer-term impacts of both gun violence and the associated strategies for prevention and response on students. Researchers will be key in cultivating this evidence and must continue to work closely with policymakers, school administrators, and the public to protect children from the harmful effects of gun violence.

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What We Know About Foiled and Failed Mass School Shootings

by Jason R. Silva and Emily A. Greene-Colozzi

This policy brief examines what is known about those plots that share similarities with Uvalde but never fully come to fruition. Foiled shootings refer to those plots that are thwarted before the attack is initiated; better understanding these cases has important implications for threat assessment and similar prevention efforts. Comparatively, failed mass shootings, or those cases that are initiated but not completed due to the rapid response of individuals at the scene (e.g., school resource officers, other students), can help to inform response efforts that emphasize intervention before victims are physically harmed.

Tragic gun violence incidents in schools—including Columbine High (1999), Sandy Hook Elementary (2012), Marjory Stoneman Douglas High (2018), and Robb Elementary (2022)—have made mass school shootings one of the greatest social and political concerns of the 21st century.[1] Although these events are rare relative to other forms of school violence and gun violence at large, their negative impact on the emotional well-being of students, teachers, parents, and society cannot be understated. To address this concern, much academic research has been directed at understanding mass school shootings as a subtype of the public mass shooting phenomenon. Public mass shooting research has largely focused on completed incidents involving four or more victim fatalities.[2] Despite these advancements, current research often excludes relevant cases that are characterized by mass shooting intent—resulting in fewer

than four fatalities.[3] In other words, research thus far has largely overlooked foiled and failed mass school shootings: incidents that are planned (foiled) or initiated (failed) but never manifest into an attempted or completed shooting (i.e., involving gunshot casualties).

There are a variety of ways that mass school shootings may be foiled or fail. Some mass school shooting plots are foiled before an offender can progress past the planning and preparation stage into actualized attack initiation.[4] For example, in 2019, a 19-year-old student was planning to carry out a mass shooting at his university.[5] He had been studying previous mass shootings for over a year so he could learn how to complete his attack. He purchased two firearms a week before his intended attack; however, his plot was foiled by fellow students who reported him to campus security after seeing the guns. During a search of his dorm room, police found ammunition and detailed plans (including a timeline) for completing his attack in addition to the firearms. In the end, the other students' recognition of this potential threat and notification to school officials and police lead to the prevention of this mass school shooting attack.

Although these events are rare relative to other forms of school violence and gun violence at large, their negative impact on the emotional well-being of students, teachers, parents, and society cannot be understated.

In other situations, initiated mass school shootings may fail due to the rapid response of potential victims and guardians at the scene.[6] For example, in 2018, a 19-year-old student arrived at his high school with a semiautomatic rifle, intending to commit a mass shooting during graduation rehearsal in the gymnasium.[7] At the entrance of the gymnasium, however, the offender ran into a wrestling coach and opened fire, alerting students, faculty, and the school resource officer (SRO), all of whom responded quickly. Students and faculty engaged in lockdown procedures and the SRO pursued the shooter out of the building. Ultimately, the offender's intentions failed, as he was the only casualty during the attack after being shot and injured by the SRO.

This research brief explores what we know about both foiled and failed mass school shootings—referring to plots and incidents that resulted in zero victim casualties. These thwarted mass shootings—whether foiled or failed—are the ideal outcomes of a planned mass shooting. They are particularly useful for determining effective strategies to prevent incidents or intervene before innocent victims are harmed.

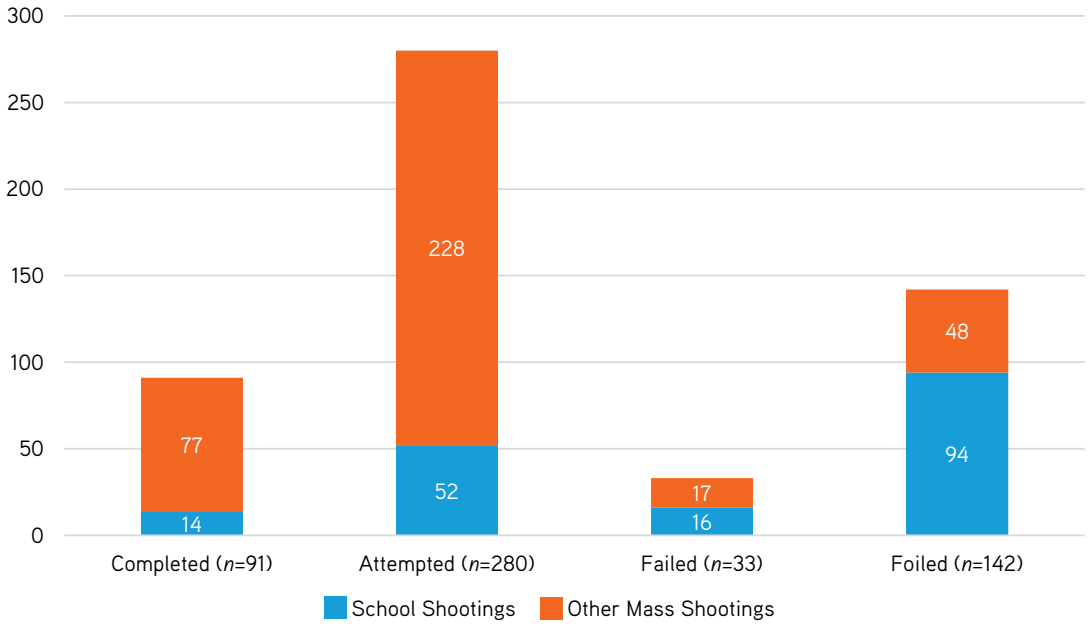
Mass School Shooting Outcome Data

This research brief utilizes data from Jason R. Silva's recent examination of completed, attempted, failed, and foiled mass shootings occurring in the United States between 2000 and 2019.[8] In this study, a mass shooting is defined as:

> "A gun violence incident carried out (or intended to be carried out) by one or two offenders, in one or more public or populated locations, within a 24-hour period. The offender needed to kill, attempt to kill, or intend to kill at least four victims. At least some of the victims (or intended victims) needed to be chosen at random or for their symbolic value."[9]

According to these four outcome categories, a *completed mass shooting* refers to an incident involving four or more fatalities. An *attempted mass shooting* refers to an incident involving less than four deaths, but at least one victim casualty (fatality or injury). A *failed mass shooting* refers to an incident that was set into motion and stopped during the incident. In other words, the incident progresses beyond the preparation stage (meaning it was not pre-operationally foiled) and the shooter successfully arrives at and opens fire (or tries to open fire) on their intended target(s). During the arrival, event, and resolution of the shooting, however, they did not incur any victim casualties. A foiled mass shooting refers to a plan that was set into motion and stopped before the incident began. In other words, the offender's plan did not fail during the incident, as they were thwarted before they could try and shoot victims at their intended target.[10]

FIGURE 1. Number of Mass Shooting Incidents Involving School Locations



Schools were the most common target (*n* = 176) for all mass shootings (*n* = 546), accounting for one-third of incidents (Figure 1). This highlights the need to identify intervention techniques to thwart a potential attack or interrupt one in progress at these school locations to help reduce the impact to the school and broader communities. Importantly, the chances of completing a mass school shooting became less likely (in comparison to non-mass school shootings) when progressing through each of the four outcome stages: foiled (66 percent), failed (48 percent), attempted (19 percent), and completed (15 percent). To this end, all foiled (*n* = 94) and failed (*n* = 16) mass shootings involving school targets are examined in this brief. For further context, some comparisons with attempted (*n* = 52) and completed (*n* = 14) mass school shootings are also discussed.

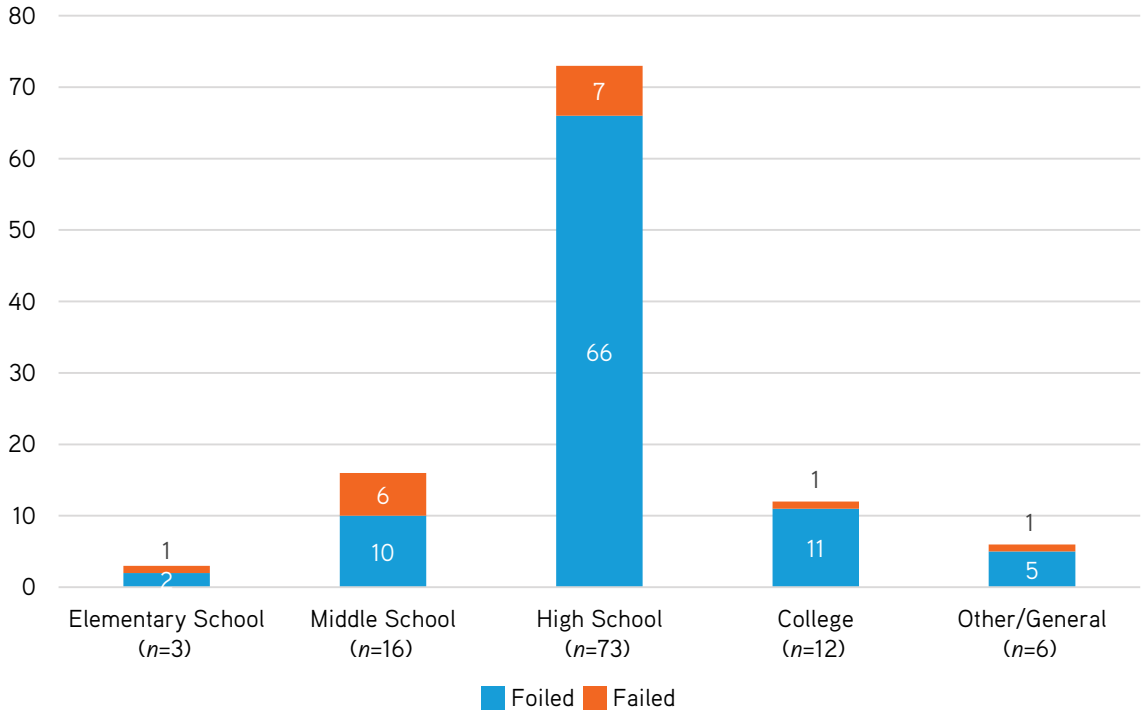
School Shooting Locations

As shown in Figure 2, high schools were the most common target for thwarted mass school shootings, accounting for two-thirds of all foiled and failed incidents. The remaining incidents involved middle schools (15 percent), colleges (11 percent), and elementary schools (3 percent). This corresponds to school shootings in general, with research indicating high schools are more often the location of non-mass gun violence as compared to other types of schools.[11] Previous research, however, finds that school shootings at elementary schools tend to be more lethal than in other school locations and are more likely to be perpetrated by adult offenders.[12] The latter was also the case in foiled and failed mass school shootings, which all involved adult offenders with no connection to the school. A review of the data also finds that completed and attempted mass school shootings were largely similar in location-based percentages (i.e., high schools were more commonly targeted than middle schools and elementary schools), although completed mass school shootings involved more college attacks (43 percent).

School Shooting Offenders

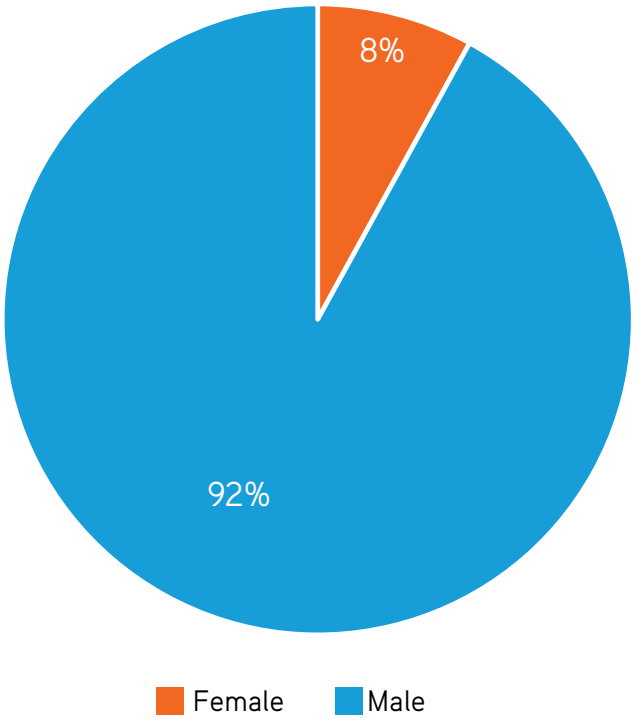
The 110 foiled and failed mass school shooting incidents had 137 associated offenders, with 27 incidents involving two offenders. None of the failed mass school shootings had more than one offender: all co-offender incidents were foiled plots. Similarly, in the post-Columbine era (2000-19), only one attempted mass school shooting involved co-offenders, and none of the completed incidents involved co-offenders. While these data are correlational, they suggest that plots with more than one offender are more likely to be foiled. Co-offenders may risk being overheard or noticed by teachers and other students when discussing or organizing their planned attack together, thereby increasing the chances of foiling these plots before they can progress past planning.

FIGURE 2. Number of Foiled and Failed Mass School Shootings by School Type (n = 110)



As shown in Figure 3, foiled and failed offenders were overwhelmingly male (92 percent), corresponding to public mass shooting demographics in general.[13] Nonetheless, 8 percent of offenders being female is higher than the percentage of attempted (1 percent) and completed (0 percent) mass school shooting offenders. Interestingly, all the thwarted female offender incidents were foiled plots, and half of these female offenders were involved in co-offender incidents, most often alongside a male. Understood together, these findings indicate females are substantially less driven to plan and initiate mass school shooting attacks, and when they do, in some cases, this may be due to male coercion.[14] This also aligns with broader research on female violence, which finds that females who engage in violence more often use personal weapons (e.g., hands, feet, or teeth) or knives, and only when they co-offend with males are they likely to use guns.[15]

FIGURE 3. Foiled and Failed Mass School Shootings by Offender's Sex (*n* = 137)



As shown in Figure 4, nearly half of all foiled and failed offenders were between the ages of 16 and 18. This aligns with high schools being the most common target (Figure 2) and current students being the most common offenders (Figure 5). Nearly two-thirds of all thwarted offenders were under 18-years-old, and 83 percent of offenders were under the age of 21. On average, thwarted mass school shooting offenders were younger (foiled mean age = 19; failed mean age = 21) than attempted (mean age = 24) and completed (mean age = 26) shooters. This suggests the life experience that comes with age may play a role in the ability to avoid apprehension during planning, as well as incurring casualties during attack initiation. Older offenders are also more commonly former students or they have no connection to the school, making it difficult for traditional school-based channels to detect leakage. Even when older offenders are current students—such as during completed college incidents—the number of students at colleges (versus elementary, middle, and high schools) is often much larger. This likely makes it easier for offenders to avoid detection during planning and preparation, as it is easier to go unnoticed in such a large community setting.

FIGURE 4. Foiled and Failed Mass School Shootings by Offender's Age (*n* = 137)

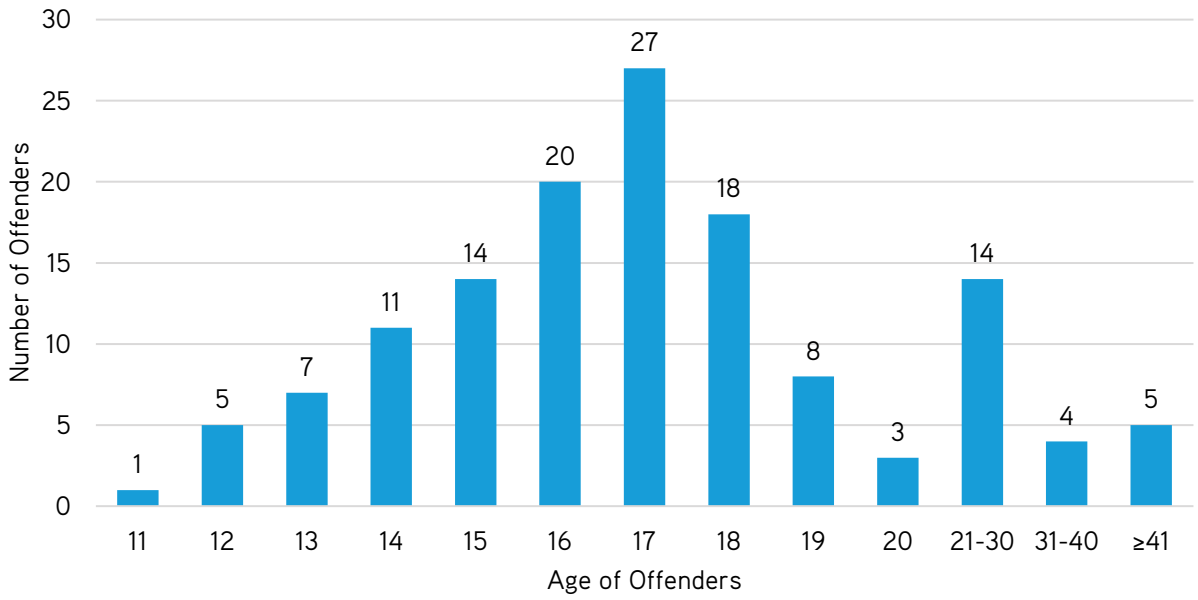
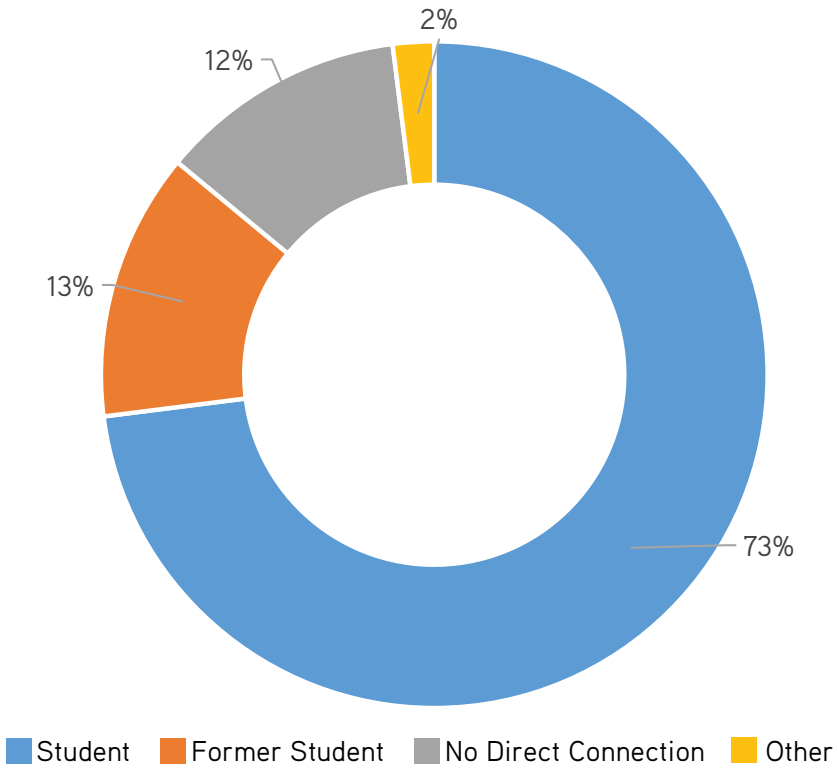


FIGURE 5. Foiled and Failed Mass School Shootings by Offender's Connection to the School (*n* = 137)



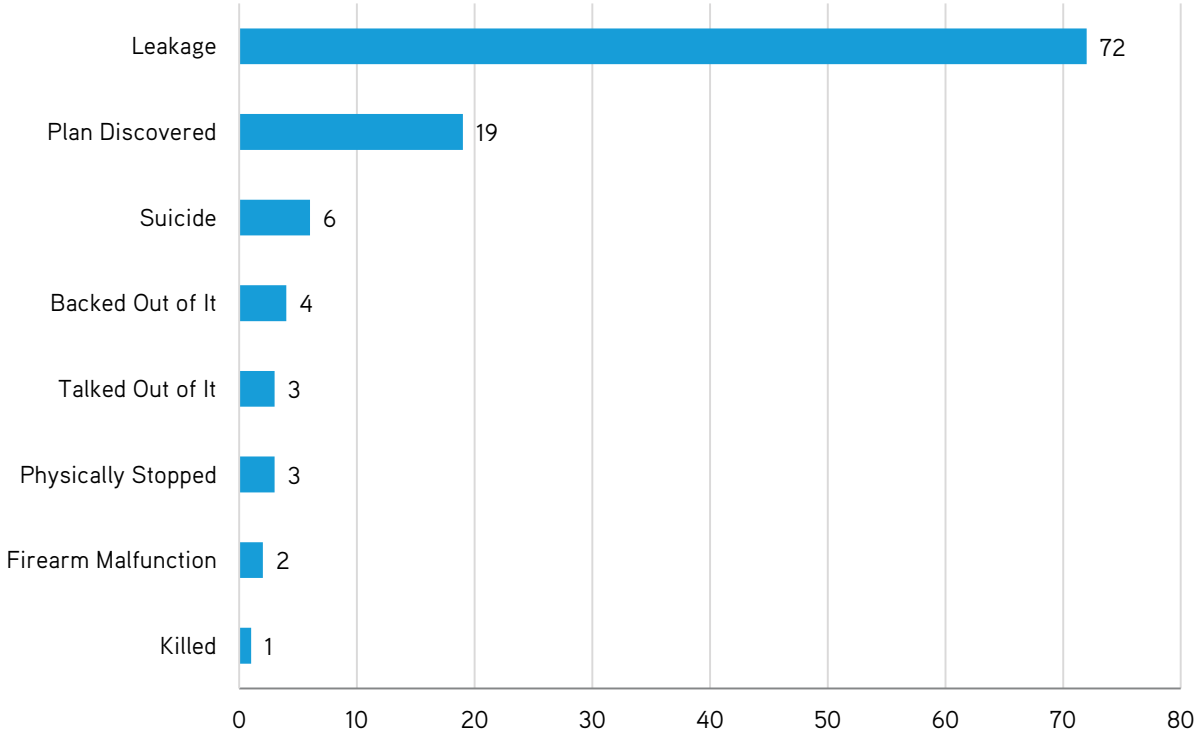
Threats largely came from those connected to, and subsequently familiar with, the school location. Figure 5 displays the offenders' relationships to the targeted school, showing a clear majority (73 percent) were currently enrolled students. Another 13 percent of offenders were former students, who had familiarity with the school layout and procedures. Only 12 percent of offenders had no apparent connection to the school; even still, three of these offenders were involved in co-offender plots with students or former students (and thus were still somewhat connected to the school). This suggests most threats against schools are either completely internal, stemming from students, or partially internal, with student/outsider co-offenders. With this insight, it is important to consider how these threats are foiled, and how incidents fail, by examining the mechanisms of obstruction.

Mechanisms for Prevention

Overall, foiled mass school shooting plots (n = 94) were substantially more common than failed mass school shootings (n = 16). All the failed mass school shootings involved a single offender, indicating mass school shooting plots with more than one offender are far more likely to be preoperationally foiled. While there were 16 failed mass school shootings, only 12 offenders got the chance to fire their guns, and only six offenders were able to fire more than two bullets.

Figure 6 illustrates the primary methods that prevented any casualties during these foiled mass shooting plots and failed mass shooting incidents. The majority (66 percent) of incidents were prevented because of offenders' verbal or written leakage of violent intent, followed by a plan being discovered by someone due to suspicious offender behavior or planning materials being noticed (17 percent). In three incidents, the offender was talked out of completing the shooting, and in four cases, the offender backed out of the attack after starting it. In six incidents, the offender died by suicide before they could incur any casualties. In two incidents, the firearm malfunctioned and prevented the individuals from continuing with their plans. In three incidents, the offender was physically stopped by someone on the scene. Finally, the offender was killed in one incident. These findings offer valuable implications for preventing future mass school shootings, including identifying and reporting leakage and warning signs of mass violence, changing offenders' minds, and using crime prevention and security techniques to safeguard schools.

FIGURE 6. How the Mass School Shooting was Prevented (*n* = 110)



Policy Implications

Understanding Leakage and Warning Signs

Most mass school shooters do not just suddenly "snap" and start killing people. Offenders may be involved in weeks, months, or even years of interest, fantasizing, planning, and preparation before their shooting incident.[16] This means there is often an extended period of opportunity for threat assessment, intervention, and prevention. Importantly, during this time offenders frequently engage in leakage and other identifiable warning signs of violent intent—often termed "red flags." For example, a 13-year-old boy's mass school shooting plot was foiled after students overheard him threatening to shoot students and staff members.[17] These students notified their teachers and administrators, who immediately notified the police. After searching the boy's home, the police found a list of intended targets and a hand-drawn layout of the school, as well as an AR-15 rifle and 100 rounds of ammunition. In general, leakage is defined as any verbal or written intent to potentially engage in a mass shooting.[18] It can be intentional and explicit, or it can involve vague allusions to violence and death. However, leakage is often easiest to interpret when it appears as a direct threat or statement of intent.

Importantly, the high rate of foiled co-offender incidents suggests the presence of additional offenders increases the chances of thwarting a mass school shooting. In other words, the communication required for planning an attack between two shooters would likely increase the chances of leakage and a plot being discovered. This is

especially relevant in school settings, where students are potentially more aware of their peers' behaviors and discussions than parents or teachers. For example, two 16-year-old boys were overheard by a fellow student discussing plans to shoot up their high school and they described their planned attack as being bigger than Columbine.[19] The person who overheard the discussion secretly took a photo of the students and informed the SRO about the potential threat. Investigators discovered the boys had recently researched previous school shootings as well as strategies for obtaining firearms.

As noted, advance discovery of an individual's planned attack has also led to the prevention of mass school shootings. For instance, one 19-year-old offender's planned college shooting was discovered by a drugstore photo clerk after the offender developed pictures of himself surrounded by guns.[20] The clerk immediately notified the police, and after searching his home, the police found massive amounts of writings and a 19-minute audiotape detailing his plot to kill as many people at the college as possible in emulation of the Columbine High School shooters. The clerk noticed the warning signs and prevented this attack, which the offender planned to carry out just one day later. This emphasizes the value of informing the public about the different forms of warning signs to help discover potential mass school shooting offenders' plans. These warning signs could include a constellation of concerning behaviors, such as past violent threats or actions, planning and preparation (e.g., stockpiling of guns, target practice), observable fixation on a target, and animal abuse.[21]

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Reporting Red Flags

In an ideal situation, leakage and warning signs raise red flags that alert individuals connected to the shooter sufficiently to inform authorities of a potential threat. This, however, is not always the case.[22] In nine failed and foiled mass school shooting incidents, the offender engaged in leakage, but this leakage was overlooked and the attack was thwarted through other means. In general, research finds leakage often occurs prior to completed and attempted mass shootings.[23] In other words, most mass school shooting offenders make direct communication of intent to harm a target, and/or reveal clues to a third party about their violent intentions, rendering these incidents highly preventable. Yet, individuals made aware of threats often failed to report them for a variety of reasons: they did not take them seriously; they did not want to make trouble for the offender; and/or they did not want to bear the responsibility for reporting.[24]

Individuals surrounding a potential mass school shooter are in the best position to recognize warning signs, leakage, and preparatory behavior—better positioned than mental health professionals and law enforcement, who are often only made aware of leakage after it has been reported. As such, there is an urgent need for public education and training to raise awareness about the importance of recognizing leakage and warning signs and reporting these indicators to authorities. Scholars also illustrate the need for developing and utilizing anonymous tip lines to thwart mass school shooters.[25] When students identify warning signs, these systems can provide a valuable resource for those who do not want to be viewed as "snitches," as well as those who may not feel connected to a teacher or staff member who they would trust with the information.[26]

...most mass school shooting offenders make direct communication of intent to harm a target, and/or reveal clues to a third party about their violent intentions, rendering these incidents highly preventable.

The responsibility for using red flags to prevent mass school shootings, however, does not lie solely with peers, students, teachers, and other civilians. For red flags to be useful, they must first be reported to authorities—including mental health professionals, school administrators, and law enforcement personnel. Subsequently, they must be taken seriously by these authorities. For instance, current law enforcement training often focuses on attack response and resolution instead of threat assessment.[27] Even when law enforcement professionals are notified about warning signs and leakage suggestive of an impending attack, they may struggle to overcome popular misconceptions about who is at risk for committing a mass school shooting. For example, a police officer who receives a tip about a potential threat may first investigate the suspect's criminal record and/or interview the suspect. However, many mass school shooters do not have a criminal record—especially if they are young students—and they may successfully convince law enforcement that they are not a threat because they lack this preexisting criminality.[28]

Ultimately, encouraging students and teachers to report potential threats remains one of the most effective strategies for reducing school shootings.[29] Yet some offenders may have little or no connection to the targeted school. For instance, the foiled and failed elementary school incidents all involved adult offenders with no connection to the school. Available evidence suggests all offenders during these incidents were suffering from a mental health crisis, but none of these individuals would have been identified through warning signs and leakage by those associated with the school (i.e., students, teachers, or administrators) because they did not have any affiliation with or connection to the location. Instead, the shootings were thwarted by attentive civilians and law enforcement personnel. In one case, the offender leaked clues to the impending attack, which were observed and reported to authorities by the offender's wife. In another incident, suspicious co-offenders were identified and stopped by a nearby deputy on their way to the shooting. This

emphasizes the importance of also educating civilians, as well as law enforcement, to recognize, report, and address red flags.

Changing Offenders' Minds

In three incidents, the offenders were talked out of continuing with their planned attack, and in an additional four incidents, offenders backed out of their planned mass shooting after preliminary attack engagement. For instance, a 13-year-old boy brought a .22-caliber pistol and 50 rounds of ammunition to his middle school.[30] He also had a written will and a hit list of eight school officials who he planned to shoot. However, after pulling out the handgun in his classroom, his brother—who was also present—was able to convince the boy to let the students leave the room. After police arrived, the brother and a fellow officer were able to talk the boy out of continuing his planned attack, eventually convincing him to put his gun down and allowing the police to arrest him. This demonstrates that some offenders who plan an attack may be susceptible to counter-messaging from trusted family members or authorities. It also may be the case that planning an attack provides a psychological reward that is unmatched in reality.

Scholars suggest planning a mass school shooting plot is like daydreaming and the enjoyment of premeditated mass violence often occurs during planning and preparation. However, Levin and Wiest propose that for some shooters, "that dream ends the moment the event begins, and the reality is rarely as fulfilling as the fantasy."[31] For example, a 22-year-old man planned to kill "at least 70 students" at his former high school, wanting to become the "biggest mass murderer in history."[32] He was fascinated with previous mass shootings (particularly Columbine) and fantasized about "some sort of violent act" nearly every day. But after killing his family to spare them from living with the guilt of his actions, the event became "all too real" and he gave up on his planned school attack. Instead, he wrote on the wall of his family home, "I will never forgive myself, I don't know why I did this." This case exemplifies the stark difference between fantasizing and actualization of an attack, especially concerning the anticipated benefits to the offender. For this offender, the attack initiation—killing his family—failed to provide the psychological reward he anticipated and instead forced him back to an unpleasant reality that convinced him against continuing the violence. Currently, it is not clear how common this type of offender-initiated change-of-heart occurs, though these preliminary findings suggest this is a valuable avenue for future research on preventing mass school shootings.

In six incidents, the offender died by suicide before killing anyone. For example, one 15-year-old boy—who idolized the Columbine shooters and dreamed of engaging in a similar copycat attack—developed detailed plans for a mass school shooting.[33] But after arriving at his middle school and firing one shot, he recognized reality versus fantasy and decided to die by suicide. While only six offenders died by suicide, available evidence identified suicidal ideation in nearly one-third of the thwarted mass school shooting offenders. To this end, scholars emphasize the importance of suicide prevention as a form of mass school shooting prevention. Expanding

on this idea, researchers emphasize the need for "holistic violence prevention" in schools that addresses mental health, nurtures supportive environments and strong relationships, and adopts crisis intervention/de-escalation techniques for at-risk students.[34] Research finds most mass school shooters had school-related problems (i.e., potential warning signs), and peers, fellow students, and teachers are the ones most likely to notice their concerning behaviors.[35] As such, teachers, counselors, and SROs are increasingly being trained to detect and assess students in crisis.

Additionally, research finds that some mass shooting offenders are motivated to imitate prior shooters in an effort to seek infamy.[36] As illustrated in many of the outlined examples, offenders often idolize the Columbine shooters and want to garner similar recognition and celebrity. Available evidence indicates nearly half (44 percent) of thwarted mass school shooters were fame-seeking. These fame-seeking offenders may demonstrate comorbid suicidal ideation and further, may be more likely to unintentionally leak their plans due to their fascination with previous mass shooters.[37] For example, students who idolize mass shooters often draw pictures, write stories, or make statements that showcase their interest in guns and violence—all of which are often observable to other students and teachers.

Importantly, fame-seeking offenders, like suicidal offenders, may be susceptible to prevention strategies that address their mental health and redirect their negative cognitions and emotions. For instance, media outlets can play a unique role in discouraging fame-seeking attacks.[38] The No Notoriety campaign advocates that media coverage should focus on the victims instead of the offenders by describing and honoring the backgrounds and heroic actions of victims rather than the offenders' pathways to violence.[39] This type of media attention demonstrates to potential shooters that victims' lives are more worthy of public attention than shooters' actions, thus removing the anticipated reward of fame. The de-emphasis of offender-focused media coverage could help disengage those offenders who are strongly motivated by a desire for violent infamy and change their minds about the realistic consequences versus rewards of committing a mass school shooting.

Mitigating Harm through Situational Crime Prevention

If an attack does occur, situational crime prevention—which is a policy-oriented approach to crime prevention that aims to reduce opportunity in the environment—may be effective for avoiding, or at least reducing, casualties.[40] The effects of target hardening via situational crime prevention are more likely to be observed in the context of attempted mass school shootings, rather than failed or foiled, which are the focus of this brief. Nevertheless, it is useful to consider how situational crime prevention may have contributed to failed mass school shootings and to review potential strategies for creating defensible space in schools.

Standardizing the best practices and requiring rigorous assessment of lockdown drills at a national level would help to ensure that schools are equally prepared across states and districts.

In many of the failed cases, situational crime prevention techniques—including entry control measures, lockdowns, and SROs—helped prevent casualties. Entry control measures such as door locks enable both prevention and mitigation by denying access to the location and limiting access to the victims if shooters make it inside. Mitigation measures, like lockdown drills, are designed to reduce the number of victim casualties and are especially important for building the muscle memory that facilitates swift action in a crisis situation. Similar to a fire drill, lockdown drills provide practice and training with procedures and alert systems so that students and teachers can engage in familiar behaviors even if cognition is impaired by fear or distress.[41] Even in the event of an insider attack, school safety procedures—including lockdowns—can remove the number of available targets from all offenders, students, or outsiders, thereby mitigating harm.

Ultimately, when implementing school security measures, the goal is to find a balance between restrained caution and intrusive hypervigilance.

Research on public mass shootings in general—not limited to schools—suggests that lockdowns exert a significantly protective effect on casualty outcomes when they are properly implemented.[42] While most schools run lockdown drills as part of their school safety plans, there is considerable variability in their procedural details, as well as the consistency of responses.[43] Some schools incorporate frequent and specific active shooter survivability techniques in school safety plans; others may run a less-intensive lockdown drill—without incorporating silence and moving to safe zones—once or twice per year. Standardizing the best practices and requiring rigorous assessment of lockdown drills at a national level would help to ensure that schools are equally prepared across states and districts.

Schools, unlike other public locations, are relatively controlled facilities, meaning authorities and administrators can implement procedures and policies intended to secure the building and promote safe practices and responses in the event of a crisis. The effects of these procedures can be observed in the failed incidents mentioned above. In many of these incidents, place managers—teachers, principals, and security guards—responded rapidly to threats or took advantage of the shooter's failure (experiencing gun malfunction) to intervene. Students and teachers engaged in lockdown responses, likely reflecting the success of drills and practice. Ultimately, when implementing school security measures, the goal is to find a balance between restrained caution and intrusive hypervigilance.[44] There is emerging research indicating the utility of lockdown drills and SRO efficacy for school safety,[45] and future research should continue to explore how these efforts can harden the school environment. These strategies can protect intended victims during mass school shootings, which often involve firearms capable of producing many casualties.[46]

A Roadmap for Policymakers

Since the turn of the century, mass school shootings have been a consistent threat and concern in America. However, these attacks are not inevitable, and this research brief illustrates methods for addressing and preventing future attacks. Current findings surrounding foiled and failed mass school shooting cases emphasize the importance of educating the public to recognize leakage and warning signs, encouraging red flag reporting and accurate identification of potential threats, utilizing techniques to change offenders' minds, and implementing standardized, empirically supported school security procedures.

Offenders often spend an extended period of time fantasizing, planning, and preparing for an attack, providing critical opportunities for threat assessment, intervention, and prevention. During this time, leakage was the most common occurrence that led to foiled plots instead of actualized mass school shootings, although it was not consistently reported or addressed. Public safety campaigns should raise awareness about frequent types of leakage and warning signs, as well as when and where to report red flags, similar to the "See Something, Say Something" campaign to address terrorist and extremist violence. Since most offenders were current students at the school, students and teachers would be the most likely to notice these red flags, although they must report them, and SROs and law enforcement officials must take these reports seriously for prevention to be effective. Additionally, it appears some offenders may be susceptible to counter-messaging strategies aimed at addressing suicidal ideations and celebrity seeking. School-based efforts to identify and assist students in crisis, as well as altering media reporting practices, can contribute to changing offenders' minds about whether to engage in an attack.

If red flags do go unnoticed or are overlooked, and an offender is able to initiate an attack, there are still opportunities to avoid or reduce casualties. Situational crime prevention efforts like door locks and lockdowns provided valuable techniques for saving lives during failed attacks. However, to reduce the number of attempted and completed mass school shootings, policymakers should consider standardizing guidelines for lockdowns and active shooter drills, based on empirically tested and supported drill techniques. Additionally, different prevention techniques may be necessary for different school

Current findings surrounding foiled and failed mass school shooting cases emphasize the importance of educating the public to recognize leakage and warning signs, encouraging red flag reporting and accurate identification of potential threats, utilizing techniques to change offenders' minds, and implementing standardized, empirically supported school security procedures.

environments. Elementary schools have been more vulnerable to outsider attacks, and while school safety and threat assessment should never exclude one type of prevention for another, elementary schools might be better served with outside threat prevention and security procedures limiting outsider access versus prevention efforts that mostly focus on threats from within the school. Comparatively more insider threats occur at high schools, which also tend to have more open campuses than middle or elementary schools. Thus, while high schools are more challenging to secure from outsiders through situational crime prevention, since they are more vulnerable to insider threats, they may be better addressed through student education and awareness about leakage, warning signs, and reporting.

Finally, while beyond the scope of this work, findings raise important questions about how these young offenders are accessing or planning to access firearms. Foiled and failed offenders were often below the legal age for purchasing and possessing firearms in many states, especially handguns.[47] Prior research on completed mass shootings and mass school shootings indicates that most underage offenders steal guns from their homes and family members.[48] In these cases, common sense gun laws that limit and restrict purchases—such as background checks and waiting periods—might have less of an obstructive impact on planned shootings than legislation that encourages or regulates gun storage and safety training in family homes.[49]

...while high schools are more challenging to secure from outsiders through situational crime prevention, since they are more vulnerable to insider threats, they may be better addressed through student education and awareness about leakage, warning signs, and reporting.

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Lockdown Drills: A Widely Used Yet Often Misunderstood Practice

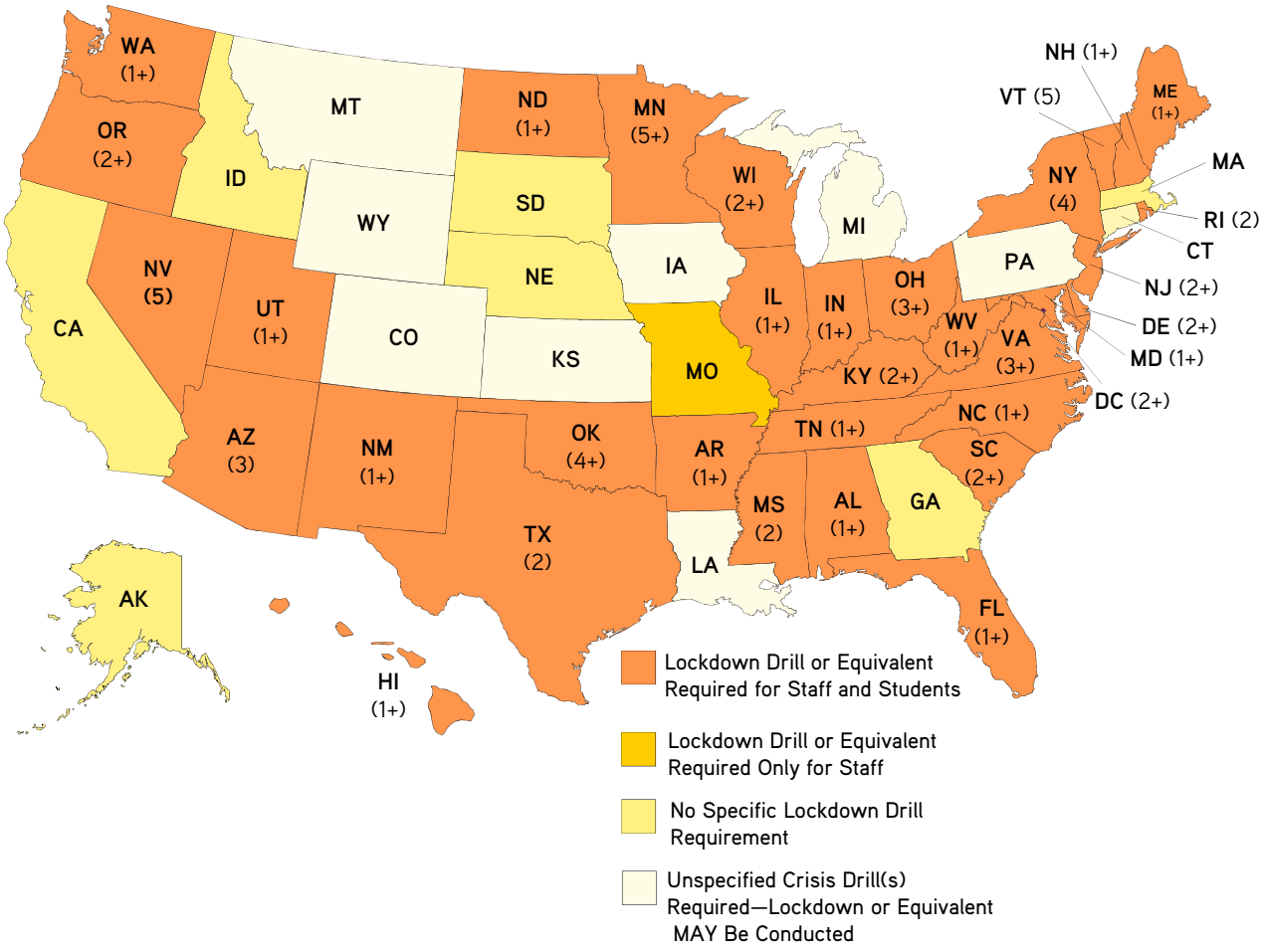
by Jaclyn Schildkraut

This policy brief explores a strategy used in 95 percent of public K–12 schools in the nation. Lockdown drills, which became commonplace after the 1999 shooting at Columbine High School in Jefferson County, Colorado, involve specific steps to protect students and staff out of sight in secured spaces to build distance between themselves and the threat.

The May 24, 2022, mass shooting at Robb Elementary School in Uvalde, TX, where 19 fourth grade students and two of their teachers were killed and 17 others were injured,[1] reignited a national discourse about preparing school communities for similar tragedies. Proposals ranging from armed teachers[2] to clear backpacks[3] were circulated, despite the lack of empirical evidence to support their efficacy in situations like Uvalde. This leaves an important question for stakeholders charged with keeping school communities safe: what is the best way to reduce the harm caused by these events that is evidence-based?

One strategy that has received considerable attention in the aftermath of these tragedies are lockdown drills, which are currently used in more than 95 percent of public K-12 schools in the US each year (see Figure 1 for state requirements).[4] These practices became commonplace after the April 20, 1999, shooting at Columbine High School in Jefferson County, CO. Even without a formal intruder protocol, hundreds of students and teachers engaged in the act of locking down during the shooting, an action that the Columbine Review Commission credited with saving countless lives.[5] Although the perpetrators had an unprecedented 50 minutes that they were in control of the school and were armed with four firearms and nearly 100 improvised explosive devices, they never attempted to breach a locked door.[6]

FIGURE 1. Drill Requirements by State



NOTE: Number of drills required by state listed in parentheses for each state. Those states with "+" indicate that these are the minimum number of lockdown drills or equivalent that must be conducted. FL does not set a required number, noting only that one lockdown drill must be conducted for every fire drill conducted; NV requires monthly emergency drills, of which half must be lockdowns. Several states also have added requirements, including when the drill(s) specifically must take place (AL, IL, KY, LA, MI, MS, NM, NY, OK, PA, RI, SC, TX, VA), the inclusion of law enforcement (AR, NJ, TN), or carrying out the drill in conjunction with other scenarios and/or trainings (e.g., students in/not in the building, panic buttons; AR, AZ, OH, WV).

Despite the widespread use of lockdown drills in US schools, the conversation about their efficacy remains contentious and often is not guided by empirical evidence. This brief provides an overview of the scholarly evidence surrounding lockdown drills, as well as considerations of best practices, an important foundation for policymakers tasked with keeping students and staff safe and for the public to better understand their utility in schools.

What is a Lockdown (Drill)?

A lockdown is a response procedure that can be used to build distance (both physically and in terms of time) between a threat and its intended target(s) when that danger is *inside* of a building.[7] It involves specific steps to achieve this end: (1) lock the door; (2) turn the lights off to provide an added layer of concealment; (3) move out of sight of any interior windows; and (4) maintain silence so as not to call any attention to the individuals' location. Room occupants also are discouraged from responding to any knocks at the door or attempts to gain entry by individuals outside of the secured space, as anyone who would need to gain access (e.g., administrators, law enforcement) would have access to the appropriate keys.

…locking the door—has been identified as the most important [procedure in lockdowns] as this serves as the barrier between individuals within a school building and a threat determined to harm them.

While each step of the lockdown procedure serves an important function, the first step—locking the door—has been identified as the most important as this serves as the barrier between individuals within a school building and a threat determined to harm them. In fact, the first recommendation offered by the Sandy Hook Advisory Commission—the entity responsible for reviewing the December 14, 2012, shooting at the Newtown, CT elementary school and making recommendations out of the lessons learned—in their 2015 report was ensuring that all classrooms and safe areas have doors with locks that can be secured from the interior of the room.[8] Underlying this recommendation was evidence provided to the committee that in no prior school shooting had a perpetrator breached a locked door.

Drills are a type of exercise that allow schools to test a single operation, such as a procedure for lockdowns or fires, while also creating the opportunity for individuals to practice responding to that scenario.[9] The goal of any drill, these included, is to build muscle memory so that in times of crisis where one's thinking may be impaired by stress, that person's body will perform the actions it was trained to.[10] Importantly, drills are one method along a continuum in which schools or other locations can test their procedures; they also may use low-stakes options, such as discussion-based or tabletop exercises, or the more complex and time-consuming full-scale exercises to test multiagency cooperation.[11]

It is important to distinguish lockdowns from options-based protocols such as A.L.I.C.E.[12] or Run Hide Fight.[13] Whereas lockdowns can be used for *any* threat inside of a building, options-based protocols are designed for a single situation—active attackers. Specifically, these options-based protocols teach people to (1) move as far away from the threat as possible by leaving the affected location, (2) conceal themselves by hiding from the danger, or (3) defend oneself if face-to-face with the attacker and it is the only option available. A misconception of lockdown drills is that they teach students and staff to be vulnerable without providing them with options if securing behind a door lock is not possible. In reality, many schools do teach alternate strategies, such as self-evacuation (i.e., exiting the building and getting to a safe location), for such instances.

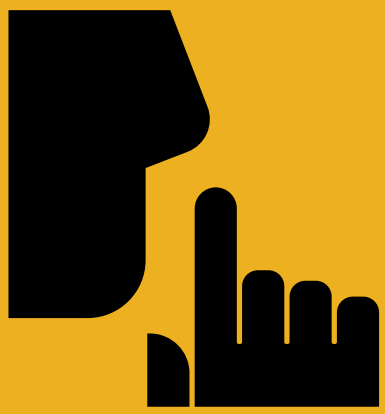
LOCKDOWN IN 5 STEPS

1 Lock the door

2 Turn off lights

3 Move away from the door

4 Maintain silence



5 Do not answer the door

The Research on Lockdown Drills

Despite their widespread use, there is a considerable lack of systematic research on the practice of lockdown drills, although this body of scholarship has been growing in recent years. Additionally, among the available studies, a smaller proportion were conducted in conjunction with participation in actual drills. Still, of what is available, the research shows promising results.

> The goal of any drill... is to build muscle memory so that in times of crisis where one's thinking may be impaired by stress, that person's body will perform the actions it was trained to.

Procedural Integrity of Drills

As noted, one of the main goals of conducting drills of any type is to build muscle memory. To assess whether this has been accomplished, researchers can evaluate the procedural integrity of the drills. Procedural integrity refers to the number of steps that are correctly completed, which serves as a proxy for skill mastery.

In one of the earliest studies, researchers evaluated the procedural integrity of a lockdown drill conducted with fourth, fifth, and sixth grade students.[14] After receiving training on the procedure, which included both verbal instruction and modeling of the steps and an opportunity to practice with feedback, the students participated in a drill that was observed by the research team. Although all students successfully moved to the safe location in the room, they were not successful in maintaining silence for the duration of the drill, though their volume level did decrease during the practice.

Similarly, in a separate study of kindergarten students who were taught their lockdown procedure using behavioral skills training, a process similar to the previous study, researchers found that participants were able to achieve skill mastery (correctly completing six out of seven of the steps) within seven training sessions.[15] Like the previous study, maintaining silence during the drill proved to be an area in need of attention, though they similarly found decreases in volume over the course of the project.

While both of these studies provide important insight into how skill mastery is achieved through the evaluation of lockdown drills, a limitation of each is that they observed the practices over very short time periods (e.g., single days, over a few weeks). In other words, while students were able to achieve skill mastery, it is unclear whether they were able to maintain it over time.

Our ongoing research, however, helps to offer clarification about the maintenance of skill mastery. This project began the fall after the February 14, 2018, shooting at Marjory Stoneman Douglas High School in Parkland, FL and remains in progress as of the time of this report. Conducted in New York's fifth largest school district, the project was designed to deliver standardized training to more than 21,000 students and 4,300 administrators, faculty, staff, and embedded community partners over 30 schools. In an analysis of 288 lockdown drills conducted over the project's first four years,[16] we found that not only was procedural integrity achieved following the introduction of

training on the lockdown protocol, but it also was maintained for practices carried out over three additional school years.[17]

In our study, drills are conducted in a coordinated manner using a procedure that is standardized across all buildings and practices to ensure consistency.[18] The drills are initiated by the school principal over the building's intercom system using a prescripted call, which also is repeated over the campus radios as a form of redundancy and to ensure anyone who may be in a location that does not have a PA speaker still receives the call. The research team, partnered with the district's school security officers, checks each room in the school for compliance on the steps of the practice (locks, lights, out of sight, maintaining silence, not responding to door knocks) and records the outcomes and any notes on drill observation forms.[19] Once all rooms have been checked, the principal is notified and a debrief period is initiated. This allows participants to discuss the drill and ask questions before resuming their regular activities. Feedback is provided to each school based on the data collected, and the school is reassessed in subsequent drills to check that any issues identified have been resolved.

Figure 2 illustrates the procedural integrity for each step of the practice across each of the drills conducted. As indicated, the proportion of doors locked was particularly high prior to training (Drill 1.1) and remained so over the course of the project. The other steps of the procedure—turning off the lights, remaining out of sight and silent, and not answering door knocks—improved significantly after training (Drill 1.2) and remained high over the following three years. Moreover, as highlighted in Figure 3, perfect checks—or the correct completion of all steps of the drill—nearly doubled immediately after training and continued to improve in the years following.

Taken together, these different assessments of the procedural integrity of lockdown drills highlight several important takeaways. First, skill mastery related to the steps of the procedure can be achieved, particularly when paired with instructional training. Second, continued practice of these steps through ongoing drills can serve to maintain the skills that are developed during training.

Psychological Impacts of Drills

Concern has been raised that lockdown drills produce a range of negative outcomes, particularly among students, including anxiety, depression, and posttraumatic stress disorder (PTSD).[20] The potential for drills to lead to impaired academic performance as well as social, emotional, and/or behavioral problems also has been a cause for concern.[21]

Yet such considerations are not necessarily supported by the scholarly research. Researchers have found, for example, that participating in lockdown drills has led to no change in student anxiety[22] or even lower anxiety[23] after the practice as compared to before it. Importantly, one study found that students' perceived well-being (i.e., feeling calm, content, and relaxed) was higher immediately after the drill as compared to a week before it was conducted.[24]

FIGURE 2. Procedural Integrity of Lockdown Drills by Individual Steps Across Time

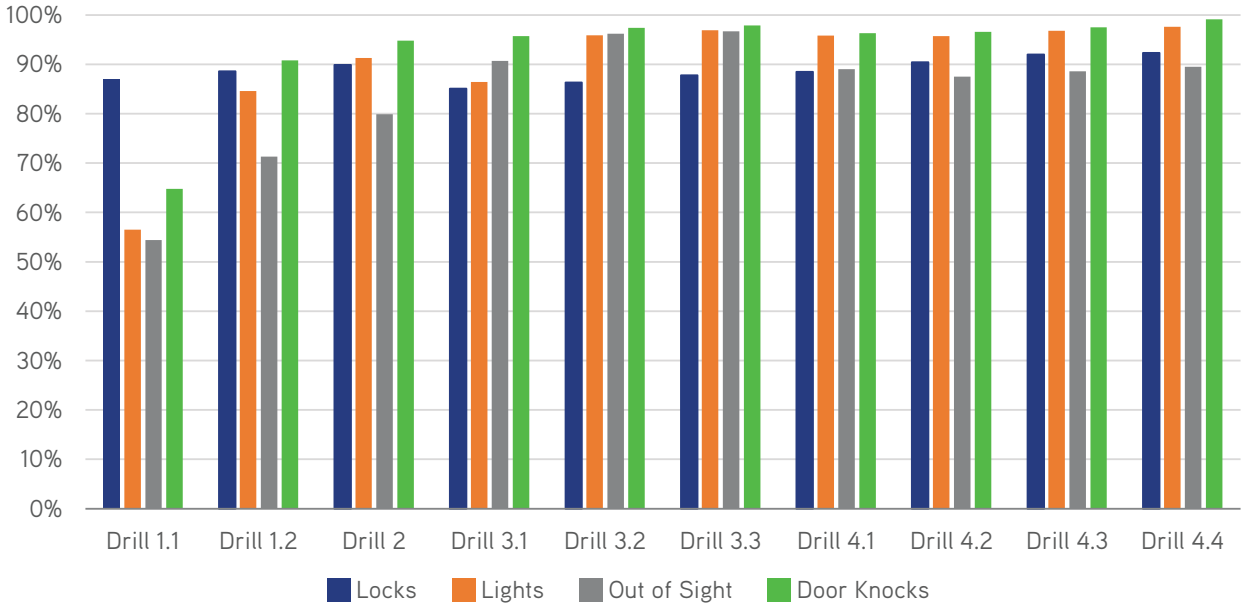
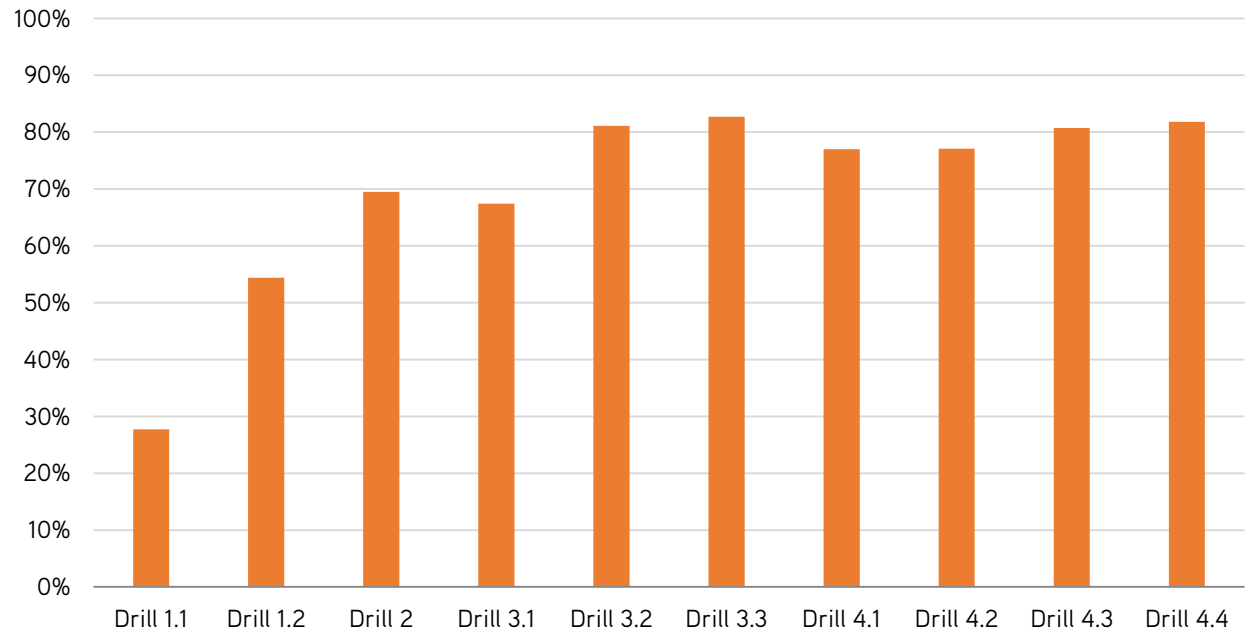


FIGURE 3. Distribution of Rooms with Perfect Checks Across Time



Other positive outcomes also have been recorded. One study found that students' perceptions of their fear of harm was lower after receiving instructional training and participating in a lockdown drill as compared to baseline (no training or drill) or the practice alone (no training).[25] This study also found that perceived risk of a school shooting happening also was lower after the training and drill than time points prior.[26]

Participating in both instructional training and drills also can help both students[27] and staff[28] feel more prepared to respond in emergency situations, including those for which lockdowns may be employed. Importantly, when examining outcomes for staff specifically based on their role in the school, the training component has been found to be especially important in building knowledge and skill acquisition among nonteaching staff, who often may not participate in drills.[29] For faculty, the training was beneficial in teaching procedures for the situations not regularly practiced for (e.g., lockout, shelter-in-place, and hold-in-place) but did not yield significant differences in the perceptions of preparedness relative to those emergencies for which drills are regularly conducted (e.g., lockdown, evacuation/fire).[30] For students, their perceived preparedness improved across all five emergency situations regardless of whether or not they specifically practiced for them.[31]

Participating in both instructional training and drills also can help both students and staff feel more prepared to respond in emergency situations, including those for which lockdowns may be employed.

Research examining perceived school safety related to lockdown drills, however, has provided some mixed results. One study, for example, found that among elementary school students, there was no significant difference in their perceived safety after participating in a lockdown drill as compared to before it.[32] Another found that perceived school safety was lower at the end of the academic year after participating in two lockdown drills (one each before and after receiving instructional training) as compared to the start of the year.[33] Given, however, that the same study simultaneously found reported increases in perceived preparedness, the authors concluded that this outcome may be due to protection motivation theory—in order for people to engage in protective behaviors, such as engaging in lockdown drills, and to take the practice seriously, they must perceive some type of a risk or threat that the action will work to offset.[34]

Importantly, the findings of these studies can only be extrapolated to drills that are conducted in accordance with best practices. Such guidance is offered to specifically counteract the potentially negative harmful effects of lockdown drills and includes the following recommendations:[35]

- Ensure that all practices are announced as a drill so that participants do not think they are in a real-world situation.
- Have teachers and staff model calm behavior for students.
- Avoid the use of any sensorial techniques, such as mock perpetrators, sounds of simulated gunfire, crisis actors, or other props (e.g., fake blood or wounds).

- Include debrief periods at the end of the drill to allow for a review of the practice and an opportunity for students to ask questions and discuss their ideas about how to improve.

When drills are not conducted in accordance with best practices such as these, the opportunity for harm is increased, as evidence by "drills gone wrong" often highlighted by the media. In Indiana, for example, teachers were physically injured when they were shot with pellet guns during a drill;[36] others have developed PTSD as a result of highly sensorial practices.[37] Students also have been exposed to many of these sensorial tactics,[38] leading to calls to abolish these practices.[39]

Using Lockdowns in Real-World Events

While debate about the efficacy of lockdown drills abound, the question then becomes whether these practices translate during real-world events like school mass shootings. While the Sandy Hook Advisory Commission report highlighted that no perpetrator had successfully breached a locked door during their attack, proponents of lockdown drills also point out that in just three school shootings has anyone been killed behind a locked door—and in none of these incidents was it because the door lock had failed.[40]

During the March 20, 2005, attack at Red Lake High School in Red Lake, MN, the perpetrator tried to gain access to one specific classroom.[41] He attempted to breach the door by shooting the lock, but it melted and held. Instead, he was able to make entry by shooting out the window next to the door and entering through the empty frame.

In the September 27, 2006, event at Platte Canyon High School in Bailey, CO, the perpetrator had barricaded in the classroom—behind the locked door—with the students he took hostage.[42] When the SWAT team breached the classroom door, the perpetrator killed one student before he died in the attack.

And more recently, during the Parkland shooting, six students were killed in three classrooms on the first floor of the impacted building.[43] The perpetrator never actually entered a single room, instead shooting through the windows embedded in the classroom doors.[44, 45]

Despite these losses of life, an untold number of students and staff in each of these schools were physically unharmed during their respective shootings because they were able to successfully engage in a lockdown. In fact, following the November 30, 2021, shooting at Oxford High School in Oxford, MI, students publicly credited lockdowns with saving their lives—even amidst conjecture suggesting such practices were ineffective.[46]

While these case studies do provide important insight into the use of lockdowns during real-world shootings, a more objective empirical assessment is warranted. Our recent research, led by fellow Regional Gun Violence Research Consortium member Emily Greene-Colozzi, examined the use of lockdowns during 498 attempted and completed mass shootings across 561 different sites across the United States, 93 (16 percent) of them schools, between 1966 and 2019.[47] The results lend further support to the

employment of lockdowns during such events: schools that engaged in locking down experienced 60 percent fewer total casualties and reduced the number of victims pronounced dead at the scene by 79 percent compared with those that did not. Even more encouraging is that the use of lockdowns in noneducational settings, including workplaces, places of worship, malls, entertainment venues, and other public spaces, also saw impact reductions: total casualties and on-scene deaths were reduced by 38 and 37 percent, respectively.

...schools that engaged in locking down experienced 60 percent fewer total casualties and reduced the number of victims pronounced dead at the scene by 79 percent compared with those that did not.

Translating Research into Policy

While, in the context of offenses known to law enforcement, mass shootings are statistically rare events,[48] their occurrence both in and out of schools continues to increase in frequency.[49] This leaves stakeholders, including school administrators, policymakers, and the public, with the arduous task of not only working to prevent such tragedies but also having plans in place to minimize casualties if they do occur. Such a task can only be successfully accomplished by employing solutions based in evidence.

Research shows that the use of lockdowns during real-world shootings can help save lives. The steps of the lockdown help to build both physical distance and time between perpetrators and those they intend to harm, allowing for the crucial minutes and seconds needed for the shooting to be brought to an end.

As with any emergency, having practiced the plan before tragedy strikes increases the likelihood that the steps will be performed correctly, even in very stressful times. As such, it is imperative that schools engage in practicing their plans for all emergencies, which encompasses lockdowns for any threat that may occur within the building—including, but not limited to, mass shootings. It is critical, however, that such drills be conducted in accordance with best practices. Schools are not set on fire (even by simulation) to practice evacuation drills, so simulating active shooter scenarios is not needed for students and staff to build and maintain their muscle memory. Moreover, research suggests that drills conducted in accordance with best practices may even have positive effects, such as empowering students to feel prepared, which may in turn benefit the overall campus climate.

Based on this up-to-date research, an important next step for policymakers is to ensure that these best practices are incorporated into existing guidance and mandates provided to schools from state education departments. Presently, there is considerable variability in requirements across states, but also within and between districts and even schools within them in respect to how drills are being conducted. Working to standardize procedures further can benefit not only the schools in having a set plan to practice their protocol but also first responders who may assist during a crisis. With school safety continuing to be a priority for all, it is more important than ever to ensure that schools are provided with evidence-based tools to stay safe.

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Overview of The American School Shooting Study

by Joshua D. Freilich, Steven M. Chermak, Nadine M. Connell, Brent R. Klein, and Emily A. Greene Colozzi

This policy brief introduces The American School Shooting Study (TASSS), a national-level database compiled using open-source information and accompanying case studies. By classifying cases based on intent rather than solely location, it provides policymakers and other vested stakeholders with the necessary context to develop a robust and layered approach to school safety rather than trying to find a "one-size-fits-all" solution that is doomed to fail.

Although rare events, school shootings remain a pressing public policy issue in America. Importantly, available data show a modest upward trend in multiple-casualty school shootings.[1,2] Few crimes are as shocking as the recent mass shooting attack at the Robb Elementary School in Uvalde, Texas, on May 24, 2022, in which 19 students and two teachers were murdered. These high-profile events have led to heated debates about gun control, gun rights, mental health, and privacy rights.

Surveys suggest that Americans today tend to view schools as unsafe, and public fear over school violence has deepened.[3] Indeed, the adverse costs of school shootings go well-beyond the terrible loss of life and grief of the families and communities immediately impacted. The effects reverberate throughout the nation. Not only are teachers and schoolchildren directly exposed, but parents, police, first responders, nurses, surgeons, pastors, counselors, and custodians, to name a few, are also

vicariously affected. In the wake of traumatic attacks, schools struggle to cope, and surviving students' school performance may suffer.[4]

Although research on school shootings has increased recently, much of the literature is inconsistent, primarily due to variations in datasets and school shooting definitions.[5] Most studies employ small nonprobability rather than randomly selected samples of US school shooters or prioritize mass shootings and lethal gun violence.[6, 7] By contrast, the limited quantitative studies tend to be more inclusive by studying fatal and nonfatal gun assaults.[8, 9] Even here, there are disparities in inclusion criteria, as some studies examine school-associated violence that transpires both on and off campus property.[10]

While extensive data have documented school crimes more broadly, there is far less information on school shootings. For instance, the Department of Justice's National Crime Victimization Survey's (NCVS) School Crime Supplement provides homicide numbers but exclude precise statistics on school shootings. This lack of consistent, national-level data has hindered the development of systematic research,[11] limiting our capacity to create and implement public policy that is directed toward reducing school shootings and is rooted in rigorous social science. Accordingly, we created a national-level database using open-source information to examine school shootings in the United States and provide stakeholders with the information they need to develop meaningful policies.[12]

TASSS Inclusion Criteria

- The shooting must have occurred between January 1, 1990, and December 31, 2016.[13]
- The shooting must have occurred in the 50 States or Washington, DC.
- The shooting must have resulted in a criminal justice response that confirmed its occurrence and not merely be an unsubstantiated rumor.
- A firearm must have discharged explosives to propel a projectile. Thus, TASSS excludes plots (no discharge occurred) and cases where the perpetrator used non-gun weapons.
- The shooting injury must have occurred on the K-12 school's (both public and private) grounds, either inside the school building or outside in yards or parking lots that are also on school property.
- The gun discharge must have injured or killed at least one person with a bullet wound.

Methodology

One challenge to adopting effective policy solutions to school shootings is the limited understanding of the problem. Therefore, we sought to extend the literature by creating The American School Shooting Study (TASSS). Six criteria must be satisfied to include a shooting in TASSS:

We reviewed over 40 sources, including existing databases, chronologies/listings, official records, law enforcement reports, scholarly works, newspaper accounts/ listings, online encyclopedias, blogs, and watch-groups/advocacy reports. We also comprehensively searched and scraped the Internet, conducting keyword searches using major search engines and leading newspapers to locate relevant events. We treated each incident and the involved perpetrators as a case study with the goal of compiling virtually all public information about both the shooting and individuals involved. Upon pretesting a data collection strategy, we created a search protocol with over 60 search engines and websites. We searched these sources to identify relevant information about each event and the perpetrators. In doing so, we uncovered a range of information, including media accounts, court records, government records, obituaries, videos and documentaries, blogs, books and biographies, after-action and watch-group reports,[14] scholarly accounts, and social media information.

Upon completion of the search files, we assigned each incident to a different research assistant (RA) to review the collected documents and code relevant variables about the event (e.g., lethality, number of casualties, location, whether school was in session, and type of school) and the offender (e.g., age, sex, race, grade level, psychological issues, school failures/suspension/expulsion, etc.) into an encrypted, online data entry portal. Systematically coding the cases was an iterative process, as the RAs' data entry was repeatedly scrutinized, evaluated, corrected, and updated as needed.

Findings

We identified 652 school shootings—of those, an average of 24 occurred each year. Shooting events were classified into one of four categories based on intent: self-harm/suicides, accidental discharges, intentional, and justified. Events that ended in murder-suicides were categorized as intentional. Over 25 percent involved self-harm/suicides and accidental discharges. Intentional interpersonal school shootings often receive the most public attention and we identified 473 (nearly 75 percent of all shootings) in total. On average, around 18 intentional school shootings occur each year, and mass homicide shootings remained outliers. Table 1 provides a breakdown of the number of school shootings by year and type.

Of the 473 intentional shootings, publicly known perpetrators committed 354 incidents, which averaged 13 per year. In contrast, publicly unknown perpetrators (i.e., open sources did not identify the shooter because of their age or perpetrator was not identified) were responsible for 119 intentional shootings, averaging just five per year. Not surprisingly, we uncovered more open-source information for the known perpetrators.

TABLE 1. Yearly Prevalence of School Shootings

Year	Intentional (72.55%)	Self-Harm (15.64%)	Accidental (11.20%)	Justified (0.61%)	Total Annual Incidents
1990	11	0	0	0	11
1991	22	2	5	0	29
1992	27	1	4	0	32
1993	30	7	4	0	41
1994	25	6	5	0	36
1995	11	2	1	0	14
1996	13	3	0	0	16
1997	10	2	1	0	13
1998	14	3	1	0	18
1999	14	5	3	0	22
2000	14	2	5	0	21
2001	12	6	3	0	21
2002	7	1	0	0	8
2003	9	8	1	0	18
2004	18	3	3	0	24
2005	25	0	7	0	32
2006	24	6	5	0	35
2007	20	9	1	0	30
2008	23	5	4	0	32
2009	25	5	3	1	34
2010	14	3	0	0	17
2011	13	1	4	1	19
2012	9	4	1	1	15
2013	17	5	2	1	25
2014	19	4	4	0	27
2015	18	5	1	0	24
2016	29	4	5	0	38
TOTAL	473	102	73	4	652

SOURCE: The American School Shooting Study (TASSS)

NOTE: Each school shooting represents one event and is categorized based on intent.

Like nonschool firearms violence, intentional school shootings were more frequently nonfatal events. Almost 56 percent of all school shootings resulted in no deaths, and 44 percent (n = 209) were homicides. An average of eight fatal intentional school shootings occurred each year.

What Do These Numbers Tell Us?

While it is common for the US to suffer from around 14,000–15,000 homicide events in a single year—and over 20,000 in 2020[15]—school shootings clearly encapsulate a tiny percent of this violence. Likewise, with more than 50 million students enrolled in grade K-12 schools each year, only a handful may commit school shootings. Even students who share common risk factors as school shooters (e.g., arrest histories, family troubles, gang affiliation, etc.) will likely never open fire at their school.

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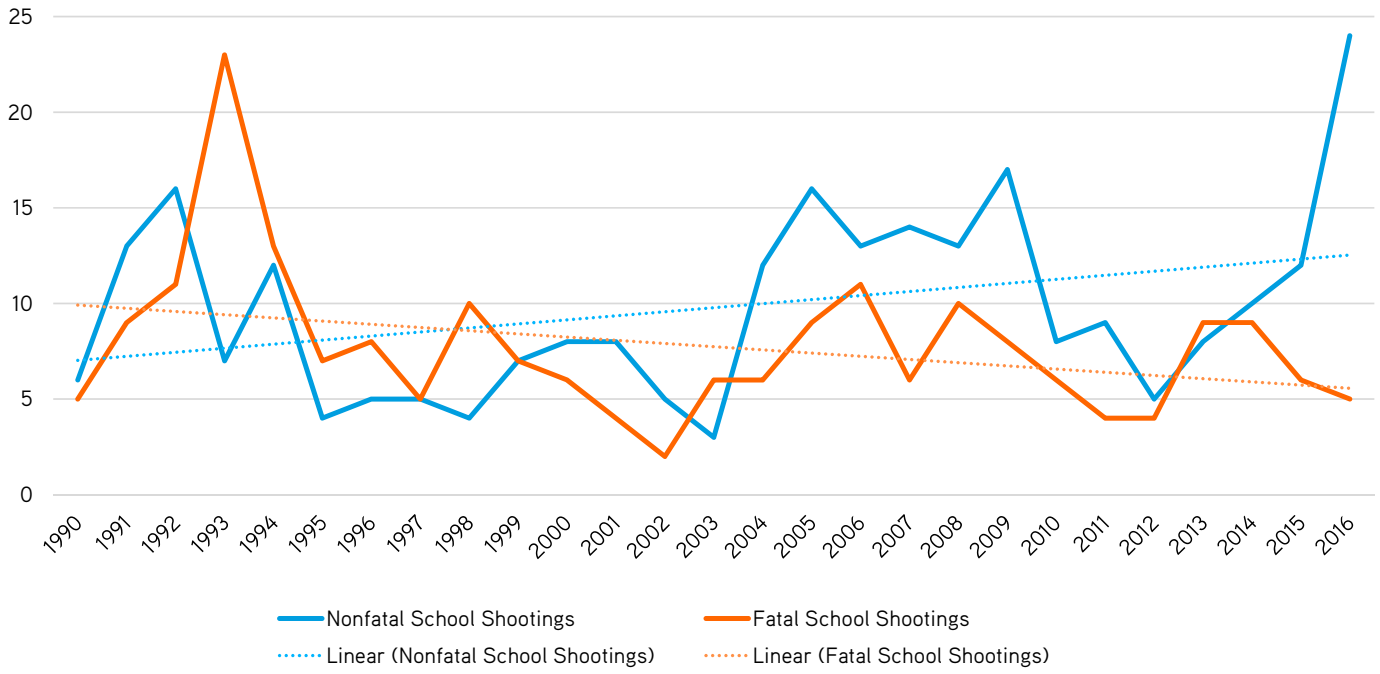
No Clear Time Trend to Shootings

Considering the series of data from 1990 to 2016, no type (intentional, self-harm, etc.) increased and there is no clear time trend. The 1990s had the most fatal shootings in our study compared to 2001 to 2016 (see Figure 1). There has been a consistent increase in nonfatal shootings from 2012 to 2016. Fatal shootings did not follow this pattern. In some ways, these findings mirror general violence trends. For instance US violent crime and youth violence specifically has dropped significantly since 1993. Future research could address whether the consistent increase in nonfatal shootings seen recently was associated with improved medical care, faster emergency response times, and/or changes in policy related to police response.[16]

Self-Harm Versus Intentional Interpersonal Violence

Around 25 percent of school shootings involved suicide/self-harm and accidental shootings, and an additional 75 percent were intentional interpersonal violence. Self-harm may require different responses than intentional shootings, highlighting the need for increased access to mental health care for students. Further, 29 percent (n = 101) of the 354 known intentional shooting offenders were 20 years or older. Proportionately more of the adults committed fatal school shootings than the adolescents. Perhaps these adult shooters were more "capable," more determined, or had greater experience with firearms generally. Regardless, it demonstrates the importance of understanding the different pathways to serious school violence.

FIGURE 1. Yearly Prevalence of Fatal and Nonfatal Intentional US School Shootings



Elementary Versus High School

Similarly, we found that while most attacks targeted high schools, shootings occurring at elementary schools were deadlier. Importantly, adults were almost four times more likely than adolescents (26 percent versus 7 percent) to target an elementary school. It is possible that elementary school shootings are more deadly because of the population of younger victims were more physically vulnerable.

Finally, compared to high school students, elementary school students are less likely to possess or use guns. Middle and high school students often target their own schools (58 percent), whereas adults who target elementary schools (n = 27) sometimes suffer from mental illness (26 percent) or the school location is incidental to the aggressor's motive (i.e., 48 percent were domestic violence). Thus, different opportunity structures across school types may account for some of the variation.

School Shootings Characteristics

We found a high proportion (40 percent) of school shootings were committed by nonstudents who opened fire outside of the school building and during nonschool hours. Many of these shootings were motivated by nonschool issues like interpersonal disputes and gang activity. Thus, contrary to conventional views, student-perpetrated multi-victim attacks motivated by psychological distress represent a minority of cases.

Collectively, these findings imply that many school shootings are nonschool related. As such, they may represent community or neighborhood violence that spills onto the school grounds. Thus, policymakers may want to distinguish between school shootings occurring while school is in session and inside the building and shootings occurring outside the building when school is not in session. For these latter cases, policy responses may do well to incorporate school and community partnerships to address wider social problems.

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Adolescent School Shooters

An examination of the 253 known adolescent shooters found that most were young males, and many had faced adversity in school, personally, and at home. Around 26 percent had evidence of psychological issues, 19 percent had family problems, 21 percent were expelled or suspended at some point, close to 10 percent had dropped out of school, approximately 31 percent had criminal records, and around 21 percent were gang members. Thus, roughly a quarter of the adolescent school shooters exhibited risk factors (e.g., gang membership, prior suspension), and many had co-occurring ones. The knowledge gained here about these risk factors may benefit school officials going forward. Although the scope of this study to distinguish school shooters from other at-risk youth was limited, this information can nonetheless be integrated into current threat assessment criteria to better weigh the risks when making decisions about appropriate student level interventions.[17]

Takeaways for Policymakers

Rare events like mass shootings, terrorism, and school shootings are difficult to study using quantitative data. The development of rigorous methodologies to manage these challenges is important because these crimes are often newsworthy and initiate national policy decisions about how to respond, prevent, reduce, and manage these social problems. It is crucial that policy decisions be grounded upon solid empirical data, and that scholars and policymakers are made aware of the strengths and weaknesses in publicly sourced data.

Our most important finding is that these shootings encompass various disparate acts that occur on school grounds. Accordingly, this highlights that a one-size-fits-all approach to school violence prevention will likely be insufficient to address this violence. As shown here, there is a need to disaggregate school shootings to respond to the varied threats, harms, types, and locations of school shootings more effectively. Findings from this study can help develop more refined and targeted policy interventions, while also giving schools, communities, and the wider society more accurate information about the nature of serious school gun violence.

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The Effects of Firearm Violence on Children

by Amanda Nickerson and Sonali Rajan

This policy brief examines a range of psychological, social, and emotional impacts. Protective factors, such as social support, may help to buffer the deleterious effects of gun violence exposure, but it is important to recognize that reducing exposure must be a primary objective of policies. Social institutions including schools, healthcare settings, and the communities themselves play a critical role in helping to reduce gun violence and its harmful effects on children.

Exposure to firearm violence persists as an urgent public health problem because of its prevalence and impact. In the United States, firearms are now the leading cause of death among all children, ages 1-19 years old, and nonfatal firearm assaults occur at more than twice the rate for youth compared to the general population.[1,2] Furthermore, recent work has highlighted that 92 percent of all firearm-related deaths of 5- to 14-year-old children in high-income countries occur in the US.[3] Firearm violence affects children not only through direct exposure, such as being threatened, injured, or killed by a firearm, but also through indirect exposure by hearing or witnessing incidents or by losing a peer or family member to this form of violence.[4,5] Tragically, the burden of firearm violence falls disproportionally on children of color,[6,7,8] particularly young Black men between the ages of 15 and 24 in urban settings.[9] Research further illustrates that Black children between the ages of 5 and 17 years were exposed to violence in their neighborhoods 4.44 times more frequently than white children prior

to the COVID-19 pandemic, and that these stark disparities have become even more pronounced since.[10] An analysis of homicides in Washington, DC, in 2021 found that 89 percent of children of color (compared to 57 percent of white children) lived within a half mile of a homicide.[11] In this brief, we describe the impact of exposure to violence on youth, review factors that are protective, highlight prevention and interventions for this urgent issue, and provide implications for policy.

Impact on Children

The impact of firearm violence on youth is significant. Exposure to violence is consistently associated with post-traumatic stress disorder (PTSD) symptoms[12, 13] and other internalizing symptoms, such as anxiety and depression.[14, 15, 16, 17] Youth exposure to violence is also associated with higher risk for suicide attempts and deaths.[18] Some research has found that girls may be more impacted with regard to internalizing symptoms.[19, 20] However, a recent study of first-time male juvenile offenders interviewed nine times over five years found that they experienced an increase in anxiety symptoms during waves where they were exposed directly to or witnessed firearm violence even after controlling for confounding variables (e.g., exposure to non-firearm related violence).[21]

...Black children between the ages of 5 and 17 years were exposed to violence in their neighborhoods 4.44 times more frequently than white children prior to the COVID-19 pandemic, and these stark disparities have become even more pronounced since.

Childhood exposure to violence is also associated with externalizing symptoms, such as aggressive, disruptive, and delinquent behavior and this exposure appears to have a cumulative effect.[22, 23] Specifically, as youth are exposed to more violence, they exhibit more externalizing behaviors.[24, 25] This relationship has been shown to be bidirectional; in other words, witnessing violence predicts physical aggression and physical aggression also predicts subsequent witnessing of violence, suggesting that violence within communities is cyclical and may become self-perpetuating.[26] Exposure to firearm violence in particular is associated more strongly with reactive than proactive aggression.[27] Furthermore, peer victimization is associated with adolescents' attitudes towards guns, particularly in terms of their use as aggressive responses to shame.[28]

It is likely that violence becomes socialized and youth exposed to violence may experience more hyperarousal and thus engage in more aggressive behaviors.[29] Indeed, most studies about motivation to carry firearms among youth have found a perceived need for protection or self-defense as the primary motive.[30] Additional work drawing on a national sample of adolescent youth has highlighted that perceptions of safety and previous experiences with violence are also associated with youth firearm

possession.[31] In addition, gun socialization and masculinity culture may contribute to those who are exposed directly or indirectly to violence view firearms as exuding force that allow the holder to recast themselves as more powerful in their environment.[32] Relatedly, affiliating with deviant peers also increases exposure to violence[33] and firearm possession and carrying,[34] and moderates the association between community violence exposure and aggressive behavior.[35]

Protective Factors

It is important to highlight that not all children exposed to violence experience emotional and behavioral problems, as some show resilience, or adaptative functioning, despite exposure to adversity.[36] A meta-analysis of over 100 studies of protective factors (i.e., variables that enhance adaptive functioning) for youth exposed to violence found significant buffering effects for self-regulation, family support, school support, and peer support.[37] The positive impact of social support from adults has been demonstrated even with high-risk samples, as have other variables such as concern for others, aspirations for working and creating families in the future, and religious beliefs.[38] And a scoping review of adolescent firearm carrying identified the protective factors of school attachment, parenting practices (e.g., monitoring, respect), school-based drug and violence prevention programming, neighborhood collective efficacy, and stricter state-level firearm laws.[39]

In responding to the firearm violence crisis among children in the US, we need concerted efforts to prevent this kind of violence from happening in the first place, coupled with efforts to effectively and equitably support children and their communities in the aftermath of exposure to violence.

In recognition of the critical need to better understand and prevent firearm injury in youth and given that gun violence as a field has been historically deeply underfunded,[40] the National Institutes of Health (NIH) funded the Firearm Safety among Children and Teens (FACTS) Consortium.[41] As part of the FACTS Consortium's work, the researchers conducted a scoping review of primary prevention of firearm injuries among children and adolescents, identifying 46 articles that addressed safe storage, screening, or firearm handling, carrying, or use.[42] Unfortunately, they concluded that few evidenced-based programs exist and that data are lacking. There are some promising approaches to reducing exposure to violence and firearm injury; however, we note that further research is sorely needed.

Prevention and Interventions

In responding to the firearm violence crisis among children in the US, we need concerted efforts to prevent this kind of violence from happening in the first place, coupled with efforts to effectively and equitably support children and their communities in the aftermath of exposure to violence. Below we outline a summary of the existing evidence on interventions in healthcare settings, communities at large, and schools. A brief summary of known effective policy approaches is also presented.

Healthcare Settings

Pediatrician offices, emergency departments, and other healthcare settings are where the most rigorous evaluations have taken place for identifying risk for exposure to violence (e.g., access to firearms, treatment for injuries) and providing education and training for parents and adolescents and supplying gun locks. There is some research to support that screening and education around firearm safety with parents, especially when accompanied by distribution of free gun locks, increases self-reported safe firearm storage.[43] This is consistent with modeling studies indicating that safe storage practices would result in reduced firearm mortality[44] and work showing that pediatricians screening youth for behavioral problems and providing positive parenting skills training results in reduced aggression.[45] Relatedly, there are some promising findings from single-session interventions for adolescents presenting to emergency departments (e.g., Project Sync) in reducing involvement in violent aggression.[46, 47] Project Sync is a therapist-delivered 30-minute intervention that combines motivational interviewing and cognitive skills training (e.g., review of goals, feedback, decision-making, role-playing). Explicitly including gun violence exposure as an adverse childhood experience (ACE), so it can be screened for more routinely across settings, would also help provide more avenues and resources for interventions and other preventive efforts.[48]

Community Investments and Interventions

Given that firearm violence is a multifaceted issue, prevention efforts that subsequently involve a multifaceted public health approach are needed. One such example is the Michigan Youth Violence Prevention Center (MI-YVPC), which includes: (a) Youth Empowerment Solutions curriculum focused on developing leadership skills and empowering youth to improve their communities;[49] (b) Fathers and Sons,[50] a 15-session (45 contact hours) program addressing parenting, culture and ethnicity, and communication about risky behavior; (c) Project Sync (described above); (d) Targeted Outreach Mentoring, developed and delivered by the Boys and Girls Clubs of America, where mentors developed relationships with youth and families and helped develop and meet goals (e.g., obtain driver's license) over a 6-12 month period; (e) Community Policing Mobilization, which distributed crime data analysis and provided technical support for crime prevention; and (f) Clean and Green, a county-funded initiative to work with community groups to maintain and develop (e.g., add gardens) to vacant lots.[51] An evaluation of this prevention approach found that youth victimization and

Mentoring to Manhood, Community Youth Advance, Hyatttsville, MD, https://communityyouthadvance.org/mentoringtomanhood/.

assault injuries decreased in the intervention area but not in the comparison area.[52] Due to the consistent disproportionality in exposure to violence based on race, it is critical that multisector, place-based initiatives that address structural factors related to poverty in segregated neighborhoods are also implemented.[53]

The role of these systemic-level factors, such as racism and poverty, plays out in other ways as well, including via access to community-level interventions, services, and care. Research on the impact of ACEs such as gun violence exposure and on the developing brain[54] has helped us to better understand how such experiences place children at such heightened risk. Exposure to ACEs typically results in serious long-term health outcomes if there are limited protective factors in place and also no early intervention made available in the aftermath of that exposure.[55] Examples of these kinds of early interventions in response to ACEs include increased access to primary care, family therapy, grief support, school-based programming that center trauma-informed practices/care, among many others. Unfortunately, sufficient and ready access to these kinds of support services have always been hard to come by, particularly in communities where ACEs are the most prevalent.[56] Encouragingly, research on street outreach and other community mobilization efforts that contribute to disrupting cycles of disenfranchisement have shown some promise.[57, 58]

School-Based Prevention

In terms of school-based prevention programming, there is some evidence that education and behavioral skills rehearsal (i.e., programs that provide information to increase knowledge about violence and its effects, teach social and regulation skills, provide opportunities for guided practice and feedback, and change social norms) leads to increased knowledge and reduced weapon carrying, but more research is needed.[59, 60] Although many school-based prevention efforts have not targeted exposure to violence or weapon carrying explicitly, it is important to highlight some of the factors that have been shown to impact related outcomes. Meta-analyses of the effects of social-emotional learning, or teaching competencies related to self-awareness, self-management, social awareness, relationship skills, and decision-making, have revealed that these programs not only improve competencies, attitudes, and academic performance, but also reduce aggressive and disruptive behavior as well as emotional distress.[61, 62]

Other aspects of the school environment are also critical for lower levels of violence.[63] More specifically, there is less violence in schools where students perceive rules to be fairly and consistently enforced.[64, 65, 66] Similarly, there is less violence in schools where students perceive their school building to be comfortable and secure.[67, 68] A sense of community,[69] perceptions of teachers and other adults at school as caring and supportive,[70, 71] and teacher and school staff members' use of social-emotional learning instruction[72] are also associated with lower levels of various forms of school violence.

In addition, although prevention is key, it is important that, given the increasing prevalence of gun violence across school communities, school leadership, policymakers, and other community members must also be prepared to effectively support youth exposed to firearm violence in order to mitigate the adverse impact of this. Youth who have PTSD symptoms may need increased access to additional evidence-based interventions. Cognitive-Behavioral Intervention for Trauma in Schools (CBITS)[73] is a school-based group treatment that has been shown to decrease PTSD and related symptoms in racially and ethnically diverse youth.[74, 75, 76] There are also evidence-based treatments provided by community mental health providers to treat trauma in youth, such as individual and group cognitive-behavioral therapies (CBT) and eye movement desensitization and reprocessing (EMDR).[77]

A Roadmap for Policymakers

Lastly, the role of policy in preventing gun violence is critical, and its implications for the physical and mental well-being of children are significant. Recent research has highlighted that more restrictive state-level firearm laws and lower rates of gun ownership are directly associated with lower rates of active shootings specifically in K-12 schools and after controlling for critical covariates.[78] The impact of policies on gun violence outside of school settings is also well established. Examples of effective policies include bans on assault weapons,[79] large capacity magazine bans,[80] and extreme risk laws.[81] Firearm buyback programs have been shown to increase the

number of firearms relinquished, yet it is not known if this leads to reduced firearm injuries for youth.[82] And while policies like these are critical components of the gun violence prevention puzzle, they alone are not sufficient. Indeed, efforts such as place-based initiatives and changes in structural factors are also critical for gun violence prevention and improving community well-being.[83]

It is worth noting that we are at a pivotal moment where the first national bipartisan piece of legislation in nearly 30 years in response to the unabating persistence of gun violence in the US was just passed. This is an encouraging first step and we should do all we can to build upon this momentum. This means expanding gun safety laws in line with the existing evidence and increasing investments in schools and communities to broaden the scope and access of prevention and intervention efforts so that the likelihood of gun violence and its impact on children can be meaningfully and effectively addressed.

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