

Close-Range Gunfire around DC Schools

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Mass school shootings like the tragedies at Newtown and Columbine loom large in our national dialogue about gun violence around schools. Fortunately, these events, though devastating, are rare. A more common occurrence, however, and something often absent from conversations that arise from mass shootings, is the level of gun violence (through the sounds of gunfire) to which youth are exposed in some neighborhoods. Though Washington, DC's violent crime has declined dramatically since the 1990s,¹ bursts of gunfire around schools persist. Using information garnered from gunfire-detection technology ShotSpotter, we provide a first look at gunfire as a new measure of violence around schools.

Scope of Harms

Youth exposed to gun violence report numerous psychological challenges, including anger, disassociation, anxiety, and depression (Singer et al. 1995; Slovak and Singer 2001). Exposure to violence also makes youth more likely to develop post-traumatic stress disorder (Campbell and Schwarz 1996; Fitzpatrick and Baldizar 1993), face sleep disturbances, have difficulty concentrating in the classroom, and decline in academic performance and educational aspirations, especially when exposure to violence results in post-traumatic stress disorder (Garbarino, Bradshaw, and Vorrasi 2002; Layne, Pynoos, and Cardenas 2001; Pynoos and Nader 1998; Saltzman et al. 2001).

Witnessing, hearing, or experiencing violent firearm victimization may also perpetuate a cycle of violence among youth. As youth encounter gun violence and hear about other youth obtaining firearms, they acquire their own firearms for defense or prestige (Fagan and Wilkinson 1998; Garbarino, Bradshaw, and Vorrasi 2002). This cycle becomes self-perpetuating as youth obtain firearms to protect themselves from other youth with firearms (Blumstein and Cork 1996; Finkelhor and Ormrod 2001). Moreover, youth exposed to gun violence or suffering from post-traumatic stress disorder as a result of exposure to violence are in turn more likely to use violence, thus continuing the cycle (Begić and Jovic-Begić 2002; Singer et al. 1999; Bingenheimer, Brennan, and Earls 2005). However, research has yet to produce consistent estimates of how much gun violence youth are exposed to in and around school, in spite of these harms and the immense amount of time youth spend in a school setting.

While youth are safer in school than in most other settings (Garbarino, Bradshaw, and Vorrasi 2002), estimates of youth exposure to violence in the school environment vary substantially. Most prior research that measures youth exposure to violence has relied on either crime or self-reported survey data. These approaches have yielded vastly differing estimates of exposure to violence. In a 2011 national survey by the Bureau of Justice Statistics, about 7 percent of students reported being threatened with a weapon (knife, gun, or club) on school property, a statistic that has remained stable since 1993 despite a national drop in violent crime (Robers et al. 2013). Other research suggests immense variation in victimization among students: a study of 10 inner-city high schools in five cities and four states found that 23 percent of students could be classified as victims of a threatened or actual firearm attack (Sheley, Mcgee, and Wright 1992). Another survey placed the estimate of youth exposure even higher: large shares of middle and elementary school students (40 to 88 percent depending on the measure used) reported being exposed to gun violence as a result of either knowing a victim, witnessing an event, or being victimized (Campbell and Schwarz 1996; Schwab-Stone et al. 1995). Because gunshot-detection technology collects data

A Look at the 2011–12 School Year in DC

- A disproportionate volume of gunfire occurred near a small number of DC schools.
- Fifty-four percent of DC schools covered by gunfire-detection technology had at least one burst of gunfire occur within 1,000 feet of the school.
- Nine percent of schools experienced 48 percent of gunfire incidents within 1,000 feet; and
- Four schools, including two middle schools and an elementary school, had 9 to 11 incidents within 500 feet.

consistently, it represents a unique opportunity to develop a consistent measure of youth exposure to violence across dozens of schools.

Data

Through a partnership with SST Inc., DC first deployed gunshot detection technology, ShotSpotter, in 2005, after the Federal Bureau of Investigation relocated sensors that had previously been used for tracking a sniper in Ohio. ShotSpotter uses a network of acoustic sensors spread throughout the city. These sensors are calibrated to identify the unique audio signature of gunfire and to triangulate that sound across multiple sensors to pinpoint the location of gunfire. This technology was deployed selectively in high-crime areas and initially provided only limited coverage. ShotSpotter coverage in DC has steadily expanded since 2005, and full installation was completed in 2014, providing coverage for 17 square miles of the city.

ShotSpotter data for the 2011–12 school year were used to investigate the volume of gunfire around schools in DC. ShotSpotter data provide the latitude and longitude location of a gunfire incident, the time of the incident down to the minute, and whether the incident consisted of a single gunshot or multiple gunshots.

Method

This research focused on DC Public Schools and DC Public Charter Schools. A total of 175 of these schools, excluding early child care and special-needs schools, were open during the 2011–12 school year. Of these schools, 59 did not fall within the area currently covered by ShotSpotter; so this report studies the remaining 116 schools covered by ShotSpotter in the DC area.

We used a conservative approach to estimate the volume of gunfire that took place during the school day. A gunshot was counted as being part of the school day if it occurred between 7 a.m. and 7 p.m. to account for both early arrivals and after-school programming Monday through Friday from September 1, 2011, to June 30, 2012. Gunshots were excluded if they occurred during a holiday, professional day, or half-day when children would not be in school. Based on these restrictions, a total of 336 incidents of gunfire occurred during the 2011–12 school year. These shots were mapped to determine which incidents occurred near schools.

Based on interviews with SST Inc. staff, a gunfire incident was counted as having occurred around a school if its origins were within 1,000 feet of the school. This distance represents the range at which gunfire is likely to be audible even indoors, especially if multiple rounds are fired in a single incident. This research also identifies incidents that occurred within 500 feet of a school, where gunfire is even more likely to be heard.

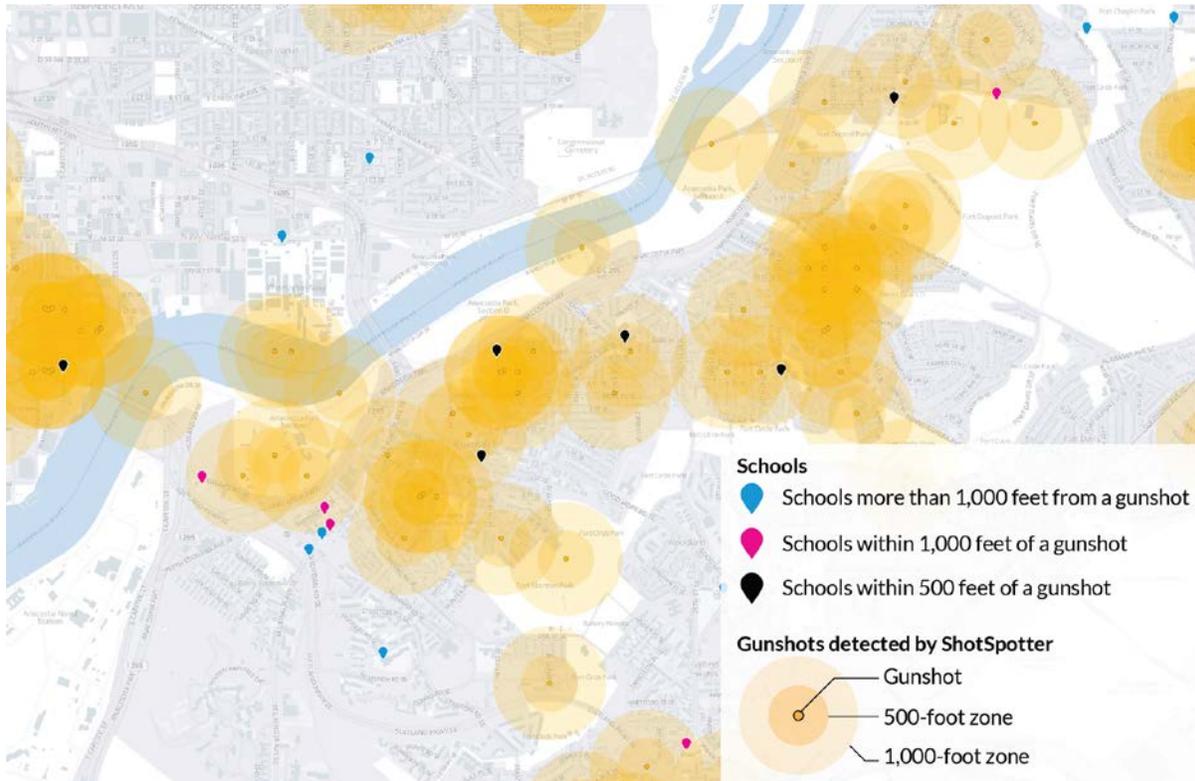
Findings

A small number of schools in DC bore the bulk of gunfire during school hours over the course of the 2011–12 school year. Of the 336 gunshots that occurred during school hours, 54 percent occurred within 1,000 feet of a school, and 54 percent of DC schools were exposed to at least one burst of gunfire within 1,000 feet. Because a single gunshot might occur within 1,000 feet of multiple schools, schools collectively experienced a total of 249 gunfire incidents. The majority of these incidents occurred near a small number of schools: 9 percent of DC schools experienced about 48 percent of the total gunfire within 1,000 feet of a school. There were 8 to 16 gunfire incidents near these schools in the course of the year.

Gunfire within 500 feet was even more tightly concentrated among a small number of schools. Thirty percent of schools experienced at least one gunshot within 500 feet and 11 percent of schools were within 500 feet of two or more gunshots. Two middle schools and two high schools were within range of a disproportionately high volume of close-range gunfire within 500 feet, ranging from 9 to 11 incidents during the school year (see figure 1 for a snapshot).

FIGURE 1

Snapshot of Schools in Southwest DC near Gunfire



Particularly concerning are incidents occurring from 8 to 9 a.m. and from 3 to 4 p.m., when children are arriving to and departing from school; we call these periods “access hours.” During these times, children are most likely to be outside of the building and to be densely concentrated in small areas, such as school entrances. Access-hour incidents occurred near 25 schools (22 percent). One high school, three middle schools, and one elementary school had multiple gunfire incidents during access hours in the course of the year.

Conclusions and Implications

These initial findings suggest that gunfire disproportionately affects a small number of DC schools, but that the exposure to gun violence at these schools is significant. More work is needed to understand the full impact of this exposure on youth: how they perceive gunfire so close to their schools and how it affects their psychological well-being and academic achievement.

Note

1. Between 1991 and 2009 homicides declined more than 70 percent; homicide declined more than 20 percent between 2008 and 2009 alone (Markman and Roman 2010). Aggravated assault has also declined to lows last seen in the 1960s (Cahill and Roman 2010).

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