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NOT ALL SCHOOL SHOOTINGS ARE THE SAME AND THE DIFFERENCES MATTER

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ABSTRACT

This paper examines student exposure to school shootings in the United States since the 1999 shooting at Columbine High School. We analyze shootings that occurred during school hours on a school day and resulted in a death. These shootings are likely to be uniformly reported and have a greater potential to cause harm – either directly or indirectly – to enrolled students. We measure the number and characteristics of children who were exposed to them, along with measures of the economic and social environment in which these shootings occur. We distinguish between indiscriminate shootings, suicides, personal attacks and crime-related shootings. The primary finding of our analysis is the importance of separating these types of shootings. Indiscriminate shootings and suicides more commonly affect white students, schools in more rural locations, and those in locations where incomes are higher. The opposite geographic and socioeconomic patterns are apparent for personal attacks and crime-related shootings. Analyses that ignore these distinctions or focus on a particular type may provide a misleading impression of the nature of school shootings. Policy discussions regarding approaches to reducing school shootings should take these distinctions into account.

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Not All School Shootings are the Same and the Differences Matter

School shootings are a distinctly American social problem that matters far beyond the tragic loss of life. Every student that experienced the shooting at that school carries the baggage of the event with them for the rest of their lives. Recent reports in the media document some of the difficulties that survivors experience (cf. Gaudiano, 2019; and Fetters, 2019).[1] The startling statistic reported by the *Washington Post* that 228,000 students (as of May 8, 2019) have lived through this experience since the 1999 shooting at Columbine High School highlights the magnitude of the problem (Cox, et al., 2019).

Yet we document that it is difficult to accurately capture the data on school shootings, making it hard to draw definitive conclusions regarding their frequency, who is affected, and where they occur. The conclusions provided by prior analyses about the frequency of shootings are invariably shocking, but they are also all over the map, literally (Beauchamp, 2014). For instance, Everytown for Gun Safety (2019) reports that 465 shootings have taken place since 2013 with 181 deaths (77 shootings and 30 deaths per year). CNN (2019), however, reports that 180 shootings occurred since 2009 with 114 deaths (18 shootings and 11 deaths per year, respectively). The *New York Times* indicates that 111 shootings and 202 deaths have taken place since 1970 (2.3 shootings and 4.2 deaths per year; Cai and Patel 2019). Even the lower values are alarming, but the discrepancy across data sources is extensive.

Reports regarding patterns in school shootings also present a confusing picture. Depending on the source, school shootings are said to be increasing in frequency or not or perhaps we cannot tell (Katsiyannis, Whitford, and Ennis, 2018; Kaste, 2018; and Harper, Ryberg and Temkin, 2018). School shootings are also said to affect black students more, even

[1]In an academic context, Rossin-Slater, et al. (2019) find greater use of anti-depressants among students who survived school shootings.

though the majority of shooters are said to be white (Everytown for Gun Safety, 2019; and Cai and Patel, 2019), which is implausible based on the extent of racial segregation in America's schools (Frankenberg, et al. 2019).

We argue in this paper that a critical contributor to these discrepancies is what gets counted as a school shooting. A fundamental problem in tracking school shootings is "reporting bias." Whether a shooting gets reported may differ dramatically by when and where the event took place. It is impossible to credibly identify any patterns in school shootings unless the shootings are counted in a consistent manner. Prior analyses have not addressed this issue.

After addressing reporting bias, one must then determine what types of shootings should be counted. We group shootings in the following categories: suicides, crime-related events, personal attacks, indiscriminate shootings, and other shootings. Should all categories be included or not? Should we count all shootings that take place on school grounds regardless of the extent of injuries or the day and time they occur? Prior analyses have relied on different definitions of school shootings, contributing to seemingly contradictory findings.

The purpose of our analysis is to resolve these data problems, make clear assumptions about which shootings are included in our analysis and why, fully evaluate these data, and draw conclusions regarding the nature of school shootings in the United States. Specifically, we include all categories of school shootings, but focus our analysis on only those that occurred during the school day during school hours and resulted in a death. Shootings that satisfy these conditions are likely to be uniformly reported. These criteria also focus the analysis on shootings that have the potential to cause external harm to students enrolled in a school where one occurred.

We rely on the recently released, exhaustive data collection effort conducted by the Center for Homeland Defense and Security (CHDS). We augment these data with other publicly available data sources that provide context regarding the school and community environment in which these shootings take place. Our analysis examines overall patterns in the data as well as difference in those patterns by the nature of the shooting.

The primary finding of our analysis is that school shootings that fall into different categories affect very different populations. Suicides are the most common category of school shooting and, therefore, students are much more likely to be exposed to them than to other types of school shootings. Indiscriminate shootings lead to the most fatalities, but fewer students are exposed to them. White students are more likely to be exposed to indiscriminate shootings and suicides; black and Hispanic students are disproportionately exposed to personally-targeted and crime-related shootings. The socioeconomic status (SES) of the students exposed to the different types of shootings also differs; high SES students are more likely to be exposed to indiscriminate shootings and suicides. These types of shootings are also more likely to occur outside of urban areas and in areas where gun sales are high and gun laws are less restrictive.

These findings can help inform public discussions of school shootings. First, indiscriminate shootings draw the most media attention, but even with their higher death rate, they represent a minority of deaths and an even smaller share of events, and fewer students are directly exposed to them. Failure to focus on other types of school shootings provides less attention to the experiences of under-represented minorities and students from a lower SES background. Second, aggregating all forms of school-shootings into a single group can generate misleading conclusions about the appropriate policy responses. Reducing the incidence of different types of school shootings almost certainly requires different policy responses. Third,

our results contribute to our understanding of the potential impacts of gun control legislation, even though we do not attempt to establish a causal relationship between shootings and these laws. The fact that crime-related school shootings tend to occur in locations where stricter gun control laws are already in place suggests that other policy responses may be required to reduce the incidence of these shootings. On the other hand, indiscriminate shootings tend to occur in locations where gun laws are weaker, so gun control legislation may be a viable approach to preventing these shootings.

I. DESCRIPTION OF THE DATA

A. Data Sources

We rely heavily on a recently released, comprehensive database of school shootings provided by the Center for Homeland Defense and Security (CHDS) at the Naval Postgraduate School. These data seek to catalog "each and every instance a gun is brandished on school property for any reason, regardless of the number of victims (including zero), time, day of week, or category (e.g. planned attack, accidental, domestic violence, gang-related)" since 1970 (Riedman and O'Neill, 2018). News reports from the mainstream media are a key source of initial information for most of the shootings in this database. The CHDS endeavors to verify all of this information with police reports and court records, although most reports have not yet completed this process. The data provide extensive information regarding each shooting, as we detail in the Data Appendix, but for our purposes we primarily rely on the school location, number of fatalities (if any), and the time and day the shooting occurred.[2]

We also take advantage of the categories that CHDS creates for these shootings. They separate shootings into 19 categories, including accidental discharge of a firearm, bullying, gang-

[2] The CHDS data contain only limited information about the demographic characteristics of shooters and victims. As a result, we do not attempt to analyze this information, although we do analyze information about the demographics of the schools where shootings occur.

related shootings, self-defense, and others. Although this detail is valuable, for our analytical purposes we believe it is useful to aggregate these categories into a smaller number of broader categories. We filter their categories to five:

(1) indiscriminate shootings (with primarily random targets)[3]

(2) suicide (which may also include a murder, in some cases)

(3) personal attacks (including bullying, escalation of a dispute, and others)

(4) crime-related (including gang-related, robbery, drug-related and others)

(5) other (various, less frequent incidents, like self-defense, accidental shootings, and others).

We augment these data with additional information from several alternative sources to describe the environment in which the shooting occurred.[4] These additional data include: (1) school-level data on levels of enrollment and characteristics of enrolled students (including race/ethnicity and recipients of free/reduced price lunches) and school zip code from the National Center for Education Statistics, Common Core Data, (2) population density in the zip code and county in which the school is located based on data from the U.S. Census Bureau, (3) labor market characteristics of the county in the year in which the shooting took place from the U.S. Bureau of Labor Statistics, (4) measures of the economic and social environment in the county and zip code of the school, available at opportunityinsights.org[5], (5) measures of gun sales proxied by background check data from the Federal Bureau of Investigation, and (6) measures of the strength of gun control laws from the Brady Campaign.

[3] In their report of the count of school shootings in the *New York Times*, the Cai and Patel (2019) were clear that they were focusing on only indiscriminate shootings. This distinction, though, is easily lost on the reader, who may not recognize the different types that can and do occur and the impact of this distinction on the conclusions drawn.
[4] See the data appendix for a complete description of the data we used.
[5] As detailed in the data appendix, we created zip code-level data from this source starting with its census tract information and calculating population-weighted averages at the zip code-level.

B. Reporting Bias

Any analysis of patterns of school shootings needs to rely on a consistent measure of their incidence. If those shootings are more likely to be captured in the data at certain times or certain places, the reported patterns may not be an accurate reflection of experience. Despite the incredible strength of the CHDS data, it is subject to this problem because it relies heavily on media reports.

Over time, the media may be more focused on school shootings – and, therefore, more likely to report an occurrence of one – if it occurs at a time of heightened sensitivity, such as after a high-profile shooting. Our analysis of the CHDS data supports this concern. In Table 1, we examine reports of school shootings since 1999, distinguishing the 12 months following a high-victimization shooting (10 or more deaths), and specifically focusing on the 2018 Parkland, Florida shooting, from other months. The months following a high victimization event include more reported shootings, more shootings reported with no fatalities, fewer fatalities per shooting, and a lower percentage of shootings with any fatalities. These findings are consistent with the possibility that shootings with no injuries are considered more newsworthy in the aftermath of a high-victimization event. This pattern is particularly striking following Parkland.[6]

An alternative explanation for this pattern is that copycat shootings are more common in those months, but those events would need to have fewer fatalities to generate this pattern in the data. Regardless, the fact that reporting bias is a plausible explanation for these patterns should cause concern about ignoring this potential bias.

Across locations, school shootings may be more likely to be reported in places with a greater local media presence, overlooking incidents in more rural locations. The collapse of local

[6]Parkland is included in the category of all high victimization shootings, but it does not drive all of the differences between this broader group and the other months.

newspapers in recent years in those locations exacerbates the problem (Hagey, Alpert and Serkez, 2019). Indeed, we see patterns in the data consistent with this form of bias as well. Distinguishing counties by population density, we see that 31 percent of reported school shootings in urban counties (defined here to be in the top quartile of schools based on county population density in 2000) result in at least one death, whereas 49 percent of reported school shootings in rural counties (bottom quartile of schools based on county population density in 2000) do so. Perhaps school shootings in rural areas really are more lethal than those in urban areas, but reporting bias due to differential media coverage certainly is a plausible alternative that cannot be easily dismissed.

C. Sample Restrictions

Although we have no definitive solution to the potential problem of reporting bias, we impose data restrictions that we believe will minimize its likelihood. In our analysis, we restrict the sample of shootings to those that led to at least one fatality, under the assumption that reporting bias is more likely to occur among shootings with no fatalities.

We also limit the sample to those shootings that occur on school grounds during school hours and on school days. This additional restriction also is likely to reduce the likelihood of reporting bias, since a shooting that results in a death while school is in session almost certainly would receive some form of media coverage. It also focuses our analysis on shootings that are most likely to have an impact on children attending the school.[7] Schools should always be a safe zone, but considerably more students are exposed to the violence if a shooting occurs when school is in session.

[7] We also recognize that students beyond the school may be affected when a shooting occurs, perhaps even nationally due to media coverage, increased active shooter drills, and the like. Yet the localized impact of the shooting is almost certainly greater.

These restrictions are not always necessary depending on the focus of the exercise and we commend the CHDS researchers for their exhaustive research. For the purposes of comparing patterns over time and location and to focus on exposure of other students, we believe our restrictions are appropriate. We also recognize that our sample limitations may understate exposure to shootings among other students. Our sample almost certainly excludes some events that are traumatic and harmful to students but, since we do not observe these events consistently over time and across locations, it would be misleading to include them. We take our approach because we view the need to overcome the limitations of reporting bias to be greater than this potential undercount for our purposes.

We also implement two additional minor restrictions. First, we limit the sample to shootings that occurred between 1999 and 2019, representing each complete year in the post-Columbine world. While there were unquestionably school shootings – including some that resulted in multiple fatalities – prior to the Columbine shooting, much attention has been focused on the two decades since that shooting. Second, we limit the sample to shootings that occurred in traditional public schools. This restriction is necessary for us to accurately describe the characteristics of schools where school shootings occur. In the end, we focus our attention on 143 school shootings that satisfy all of these conditions.

D. Comparison to Washington Post Data

The time period we investigate corresponds closely to the one used by the *Washington Post* (Cox, et al., 2019) in their analysis of student exposure to school shootings. Their analysis is based on their own data collection effort. Over essentially the same time period, their analysis focuses on 238 shootings compared to the 143 that we consider. When we compare the two sets of shootings, it turns out that only 66 are included in both.

A detailed comparison of the two sets of shootings illustrates some of the issues raised in constructing an appropriate school shooting data set. Starting from the 238 in their database, we find no fatalities in 158 of them and therefore we exclude them from our data set. Again, we focus on those with fatalities to reduce the likelihood of reporting bias. Another 14 shootings are omitted for a variety of unrelated issues (we cannot merge a few shootings with the outside data sources we use, primarily because they occurred in private schools, for instance). On the other hand, of our 143 shootings, they exclude 92, because they were the result of a suicide. We believe suicides are important; exposure to one certainly could be traumatic for a student. Another five school shootings in our sample occurred after April 2019, the end of the *Washington Post*'s sample period. Finally, 26 of the shootings in our data set are missing in their data for unknown reasons.

In the end, we believe that our data set is well-constructed to accurately evaluate patterns in – and assess student exposure to – school shootings over time, across locations, and across a variety of categories. Other assumptions/restrictions are plausible, but we believe the ones we use are best-suited to accomplish our goals.

II. RESULTS

A. Incidence

Figure 1 presents the trend over time in the number of shootings that occur, along with the trend in the number of fatalities.[8] The most notable feature of this figure is the spikes in fatalities that occur in 1999, 2005, 2012, and 2018. It is not surprising that these are the years in which one or two high-victimization school shootings took place (Columbine in 1999, Red Lake

[8]Following the CHDS' approach, we include the shooter in the count of fatalities when the shooter dies during the incident. Other analyses, such as the one conducted by the *Washington Post*, do not count the shooter's death.

in 2005, Sandy Hook in 2012, and Parkland and Santa Fe in 2018).[9] Most shootings result in a single or perhaps two fatalities. When one occurs with several victims, it is noticeable in the data. The spike in 2012 is so large because of the large number of casualties at Sandy Hook and the even larger spike in 2018 is because two high victimization shootings took place that year. Aside from those spikes, there is no obvious trend in the number of fatalities over time.

There is no apparent trend in the number of shootings either. Indeed, more shootings did occur in 2018 relative to prior years – 16 occurred that year when that level never topped 10 before that – but the incidence of these events returned to more typical levels in 2019.

It is noteworthy that indiscriminate shootings account for much of the increase in 2018. Before then, no more than two of these events occurred in a single year. In 2018, we observe five, even after addressing the issues of reporting bias as we described earlier. Indeed, indiscriminate shootings are becoming more common. Between 1999 and 2011, five of these types of shootings occurred (0.4 per year, on average). Between 2012 and 2019, 15 of them occurred (1.9 per year).[10] Yet, since they account for a small share of the total number of school shootings that occur, as documented below, this trend had little impact on overall patterns.

Note that these patterns contradict some media reports about patterns over time in the incidence of school shootings. For instance, CNN (2019) reports a steady rise in shootings. These discrepancies are likely attributable to the reporting bias phenomenon that we described earlier and our efforts to reduce its impact, especially by focusing on shootings that resulted in a fatality. Alternatively, it is possible that non-fatal shootings have truly increased and our sample

[9] Note that the West Nickel Mines school shooting in which five students were killed is not included in these data because it is a private school, which is omitted because of the inconsistent availability of data on private schools in the NCES Common Core data.
[10] This difference is statistically significant.

restrictions overlook them. If so, we would need to also conclude that shootings are becoming more common and less lethal.

B. Types of Shootings

We extend this analysis to consider the relative frequency of the different types of school shootings.[11] Figure 2 shows that suicides are the most common by a large margin. Fifty five of them occurred between 1999 and 2019, almost twice the number of the next most frequent category, personally targeted shootings (32). Indiscriminate shootings typically receive the most public attention, but they are relatively uncommon among school shootings. Of course, any is too many, but 20 of the 143 shootings (14 percent) were categorized as indiscriminate.

Indiscriminate shootings likely receive the most attention, though, because they are the most deadly. Over 100 people died as the result of an individual entering a school and randomly shooting victims. Suicides generate the next most deaths: suicides are the most common type of shooting and, as a result, account for a substantial share of deaths. Personally-targeted shootings and those that are crime-related account for a moderate share of shooting events and fatalities.

C. Student Exposure

We calculate the number of students exposed to a school shooting by merging NCES data on school enrollment to our school shooting data set (incorporating the restrictions described above). The results of this exercise are reported in Table 2. Overall, we find that 180,000 students were exposed to a school shooting that resulted in a fatality between 1999 and 2019. Although this figure is below the 228,000 estimate that the *Washington Post* provided, it is roughly the same order of magnitude. Much of the difference between our estimate and the

[11] Accidental shootings are rare in our sample and are therefore included with other uncommon categories in the "Other" category. It is worth noting, however, that accidental shootings that are included in the CHDS have relatively low fatality rates so, if we did not exclude shootings with no fatalities, accidental shootings would be considerably more common.

Washington Post's is likely attributable to their inclusion of reported shootings with no fatalities. Either way, a lot of students have had the misfortune of experiencing such an event.

When we disaggregate the shootings by category, we see some striking patterns. Although indiscriminate shootings generate the greatest number of direct victims, they generate the smallest number of indirect victims. Consistent with their lower incidence, around 25,000 of the 180,000 students (13.9 percent) who were exposed to a school shooting faced one that was indiscriminate in nature. Almost three times that level (69,000) attended schools in which a suicide using a firearm took place. Another 63,000 attended schools where personal attacks and crime-related events led to a school shooting.

Table 2 shows that substantial racial and ethnic differences exist as well. White students are far more likely to attend schools where an indiscriminate shooting or gun-related suicide occurs, relative to black and Hispanic students. The exact opposite pattern is true for personal attacks and crime-related shootings. Indeed, the two patterns offset: if we compare the racial/ethnic composition of students facing any type of shooting, it is comparable to the overall student population (shown in the first column). If we do not disaggregate the shootings, we would overlook these important differences.

A similar pattern occurs when we consider the percentage of students at a school receiving free or reduced-price lunches. These services are provided to students with household incomes below 130 percent and 185 percent of the federal poverty line, respectively. In the full sample of shootings, 36.4 percent of students enrolled in those schools receive free or reduced-price lunches, a level that is approximately representative of all school students (38.2 percent). Yet examining shootings separately by category reveals that suicides and indiscriminate shootings tend to affect schools with fewer students receiving subsidized lunches. The opposite

is true for personal attacks and crime-related shootings, which tend to affect schools where more students receive subsidized lunches. That is, socioeconomic status among those who are exposed to a school shooting varies with the nature of the shooting.

D. Geographic Variation

The simplest way to see the geographic variation in the incidence of school shootings is with a map. Figure 3 reports the locations of each category of school shooting between 1999 and 2019. Again, important differences are apparent when we compare geographic patterns in indiscriminate shootings and suicides from crime-related shootings and personal attacks. The latter two categories are much more likely to occur in more densely populated areas, like California, Southern Florida, and the District of Columbia. Fewer of them occur in the less-densely populated middle of the country. But suicides and indiscriminate shootings are more likely to occur in those locations. The line of suicides in Texas – seemingly along the I-35 corridor – is particularly striking. This geographic variation would not be apparent in maps that represent all school shootings; combining categories of shootings makes them appear more like a uniform national problem (Beauchamp, 2014). That assessment is too simplistic.

Of course, these locational differences are also correlated with other differences regarding the social and economic environment of these locations. Table 3 documents these patterns. The first column indicates the national school average of each statistic and the second column indicates the value of the same statistic at those schools where a shooting has occurred. The remainder of the table breaks down those schools by the category of shooting and reports the same statistics. Statistics are reported at the state, county, and/or zip code of the school, depending on availability.

These data confirm the visual impressions observed in the maps – school shootings as a whole are largely uniformly distributed across the country, but separating them by type reveals clear differences. The population density (population per square mile, measured in 2000) of the counties and zip codes in which school shootings occurred roughly matches the national averages. This is not true once we disaggregate the shootings into categories. Those counties/zip codes in which indiscriminate shootings or suicides took place in a school have population densities that are less than half the national average. These are more rural locations. Personal attacks and crime-related school shootings, in contrast, occurred in locations with population density that is well above the national average. These are more urban locations.

The next three panels of the table present differences across locations in racial composition, poverty rates, and the percentage of single parent households in the county and zip code of the school (all measured in 2000). The conclusions of the analysis are comparable, regardless of the geographic level at which we measure these characteristics. Indiscriminate shootings and suicides are more likely to occur in locations with a lower percentage of under-represented minorities, lower poverty rates, and lower rates of single parenthood relative to national averages. Personal attacks and crime-related shootings display the exact opposite pattern; all these rates are higher than the national average. However, if we aggregate these shootings, they appear to be roughly nationally representative.

Indeed, when we compare these results between county-level and zip code-level measures, we see that the differences are even more extreme at the zip code level. The third line in the reported results for each factor is the ratio between the zip code level value and the county level value. The fact that these ratios are greater than one for personal attacks and crime-related

shootings and less than one for suicides and indiscriminate shootings support that point. The more localized the measure, the greater the disparity.

The remainder of the table provides statistics about other social and economic characteristics of these locations. The Gini Coefficient is a measure of income inequality (higher values indicate greater inequality).[12] Interestingly, the personal attacks and crime-related shootings occurred in counties with greater income inequality. Labor market conditions (measured at the time the shooting occurred) tend to be weaker, in those area where crime-related shootings took place.

Communities where these shootings occurred also differ meaningfully in terms of their gun culture. Indiscriminate shootings and suicides are more likely to occur in locations with weaker gun control laws, as measured by the state's "Brady Score" (higher scores reflect more restrictive laws, measured as the average of 2007 through 2011 values). Gun sales (measured as the average number of guns sold per capita in the state between 1999 and 2019) are also 34 percent higher than the national average in states where indiscriminate shootings occur. Personal attacks and crime-related shootings, however, take place in states with at least the national-level average on the Brady score.

III. DISCUSSION

This analysis presents a number of findings that are relevant for public discussions regarding the incidence of school shootings and the students who are exposed to them. We focus our methods on identifying those shootings that are less likely to be subject to reporting bias and more likely to have affected students enrolled in the school. These goals limit our attention to

[12] These data reflect adult incomes of individuals born between 1980 and 1982 contained in the "core sample" from Chetty et al. (2014).

those shootings that resulted in at least one death and that took place during school hours on a school day.

The incidence of these shootings and the number of fatalities associated with them have not changed much over time. The most notable pattern in these data is that fatalities spike in the handful of years when high-victimization events occurred. These high-profile shootings occur infrequently enough that it would be inappropriate to draw any conclusions regarding a trend. This pattern appears to differ from the general trend towards more frequent mass shootings (not restricted to a school environment), as documented elsewhere (Follman, Aronsen, and Pan, 2019; and U.S. Department of Justice, Federal Bureau of Investigation, 2019).[13] Since those events are defined by the large number of deaths that occur in each one, the likelihood of reporting bias seems considerably lower.

A key finding from our analysis is the importance of taking into account the category in which each school shooting falls. The different types affect very different populations. Ignoring these distinctions makes it appear that school shootings roughly equally affect different population subgroups. That is not true. Indiscriminate shootings and suicides more commonly affect white students, schools in more rural locations, and those where incomes are higher. The opposite patterns are apparent for personal attacks and crime-related shootings. On net, they balance, but conclusions drawn from analyses of aggregated data are likely to be misleading.

This also means that limiting the types of shootings that analysts consider has the potential to provide a skewed impression of the nature of school shootings. The *New York Times*' examination of school shooting data (Cai and Patel, 2019), for instance, restricted its attention to indiscriminate shootings. Perhaps that is the form of shooting that draws the greatest public

[13] Perhaps the increase in indiscriminate school shootings in the past several years is consistent with the overall increase in mass shootings, but the frequency of this type of school shooting is small relative to the broader category of mass shootings.

attention, but it also means that the results presented are more likely to pertain to higher income whites outside of cities. Overlooking the impact on other population subgroups is problematic. Other children are just as likely to attend a school in which a shooting fatality occurs, but those shootings are overlooked because they fall into a different category.

Our findings can help inform public policy discussions. It is important to recognize that our analysis is not intended to identify factors that have a causal effect on the likelihood of a school shooting. An important goal of public policy should be to reduce the occurrence of school shootings, but we do not directly address potential approaches to achieving that goal.

Nonetheless, there are lessons that are suggested by our results. First, it is unlikely that a single policy response can help reduce the occurrence of school shootings. The existence of multiple types of school shootings makes this virtually impossible. Perhaps community policing, stricter enforcement of drug laws or some other policy that is directed at reducing crime in and around schools would help reduce crime-related shootings, but those policies would be unlikely to affect indiscriminate shootings. Perhaps improved provision of mental health services could help reduce indiscriminate shootings, but it is less likely to have an impact on crime-related shootings. Without taking a stand on what the correct policies are to address these problems, it is nevertheless clear that a multi-pronged approach is necessary.

Second, our results suggest that stricter gun control laws are unlikely to uniformly address the problem. If school shootings were more likely to take place in locations where gun control laws were particularly lax, then strengthening them would have the potential to reduce the shootings (although, again, we are only raising the possibility of a causal effect – we do not provide sufficient evidence to definitely support that conclusion). This is true in locations where indiscriminate shootings and suicides take place. Alternatively, if locations in which shootings

occur already have more substantive restrictions in place, additional restrictions are less likely to be effective. This is the case in locations in which personal attacks and crime-related shootings occur. Background check laws, for instance, may already be in place in those locations, reducing the number of potential gun policy levers.

It is also important to put in perspective the magnitudes of the numbers presented here. For instance, we report 143 school shootings in which one fatality occurred over the past 21 years. Mass shootings, more generally, are considerably more common and deadly. Only seven of the school shootings we include in our analysis qualify as mass shootings by the *Mother Jones* definition (4 or more fatalities – see Follman, Aronsen, and Pan, 2019). [14] *Mother Jones* identifies 73 other mass shootings that occurred in the same time frame. Moreover, teen suicide is a vastly bigger problem than those that occur in a school as the result of a discharged firearm. We identify 55 such suicides between 1999 and 2019, but 28,707 suicides took place among those between the ages of 12 and 18 between 1999 and 2017, with 12,466 of them using a firearm (U.S. Department of Health and Human Services, multiple years)

Schools are a special place, though, and our children deserve a safe location to learn and grow. We need to find ways to enable that to happen free from the threat of gun violence. An important first step is a better understanding of the nature of the problem, as we have tried to provide in this analysis. In future research, we will also explore the impact on the subsequent well-being of children who are exposed to school shootings.[15]

[14] *Mother Jones* also includes two mass shootings that we excluded (West Nickel Mines and Rancho Tehama) because of difficulties associated with merging these shootings with other databases.
[15] Rossin-Slater, et al. (2019) have examined this issue in the context of anti-depressant use.

Table 1: Reports of School Shootings following High Victimization Shootings and at Other Times

	12 months following high victimization Shooting	12 months following Parkland	Other Months (since 1999)
Reported shootings per month	5.3	9.7	3.4
Reported shootings per month with no fatalities	3.8	7.0	2.3
Average number of fatalities per reported shooting	0.31	0.37	0.40
Percentage of reported shootings with any fatalities	28%	28%	33%

Note: High victimization shootings include Columbine High School (4/1999), Red Lake Senior High School (3/2005), Sandy Hook Elementary School (12/2012), Marjory Stoneman Douglas High School, Parkland (2/2018), and Santa Fe High School (5/2018). All high victimization shootings include Parkland.

Table 2: Students Exposed to School Shootings During the School Day that Result in a Fatality

	All Students	Total Exposed	Indiscriminate	Suicide	Personal Attack	Crime-Related	Other
Number Exposed	---	179,917	24,781	69,314	35,434	27,535	22,853
				Characteristics of Exposed Students			
White	55.7%	47.5%	68.5%	60.2%	40.7%	20.8%	28.1%
Black	16.2%	19.5%	3.5%	13.5%	35.1%	30.2%	18.3%
Hispanic	20.6%	25.4%	16.9%	18.7%	19.6%	44.0%	42.0%
Free/Reduced Price Lunch	38.3%	36.8%	25.5%	28.1%	39.8%	50.4%	55.9%

Table 3: Characteristics of Communities where School Shootings Have Occurred, by Category

	all schools	all schools with shootings	Indis-criminate	suicide	crime-related	Personally targeted	Other
population density (county)	1,482	1,218	536	637	2,238	1,708	1,809
population density (zip)	1,450	1,617	705	883	3,223	1,902	2,556
percent non-white (county)	26.8%	30.5%	21.0%	26.4%	43.5%	28.5%	44.1%
percent non-white (zip)	27.3%	34.6%	12.6%	22.7%	60.9%	40.5%	55.9%
percent non-white (zip/county ratio)	1.02	1.13	0.60	0.86	1.40	1.42	1.27
poverty rate (county)	12.4%	12.7%	10.8%	12.1%	15.0%	11.9%	16.0%
poverty rate (zip)	12.8%	14.4%	8.0%	11.5%	18.2%	16.6%	21.9%
poverty rate (zip/county ratio)	1.3	1.13	0.75	0.95	1.21	1.40	1.37
percent single parent (county)	27.5%	28.7%	26.6%	27.0%	30.2%	30.9%	30.8%
percent single parent (zip)	28.3%	31.4%	21.3%	26.3%	37.6%	39.3%	36.8%
percent single parent (zip/county ratio)	1.03	1.09	0.80	0.97	1.25	1.27	1.20
Gini coefficient (county)	0.435	0.460	0.433	0.436	0.512	0.474	0.485
unemployment rate (county)	5.8	5.6	5.1	5.2	6.1	5.6	6.7
Brady Score (state)	23.7	22.6	16.5	19.1	41.9	21.4	20.8
Gun Sales per 1,000 pop (state)	53.8	56.0	71.9	48.8	45.1	69.5	48.5

Note: shootings are restricted to those that took place during school hours on a school day and resulted in a fatality. Population density, percent non-white, poverty rate, and percent single parent reflect 2000 values. The unemployment rate and gun sales are measured in the year of the shooting. The Brady Score reflects the average values between 2007 and 2011. The Gini coefficient represents individuals born between 1980 and 1982 contained in the "core sample" from Chetty, et al. (2014).

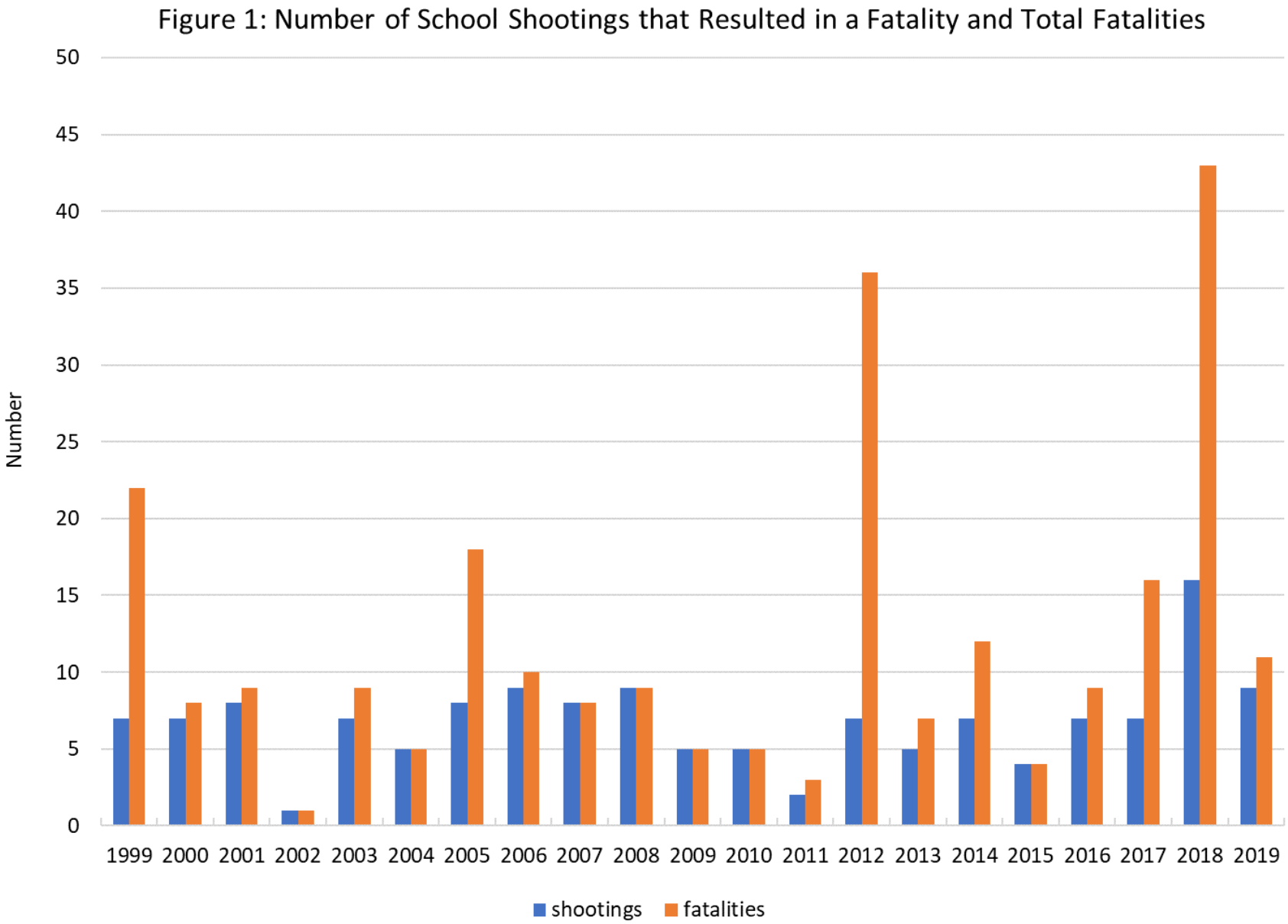


Figure 1: Number of School Shootings that Resulted in a Fatality and Total Fatalities
Number
50
45
40
35
30
25
20
15
10
5
0
1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019
shootings
fatalities

Figure 2: Number of School Shootings between 1999 and 2019 that Resulted in a Fatality, by Category

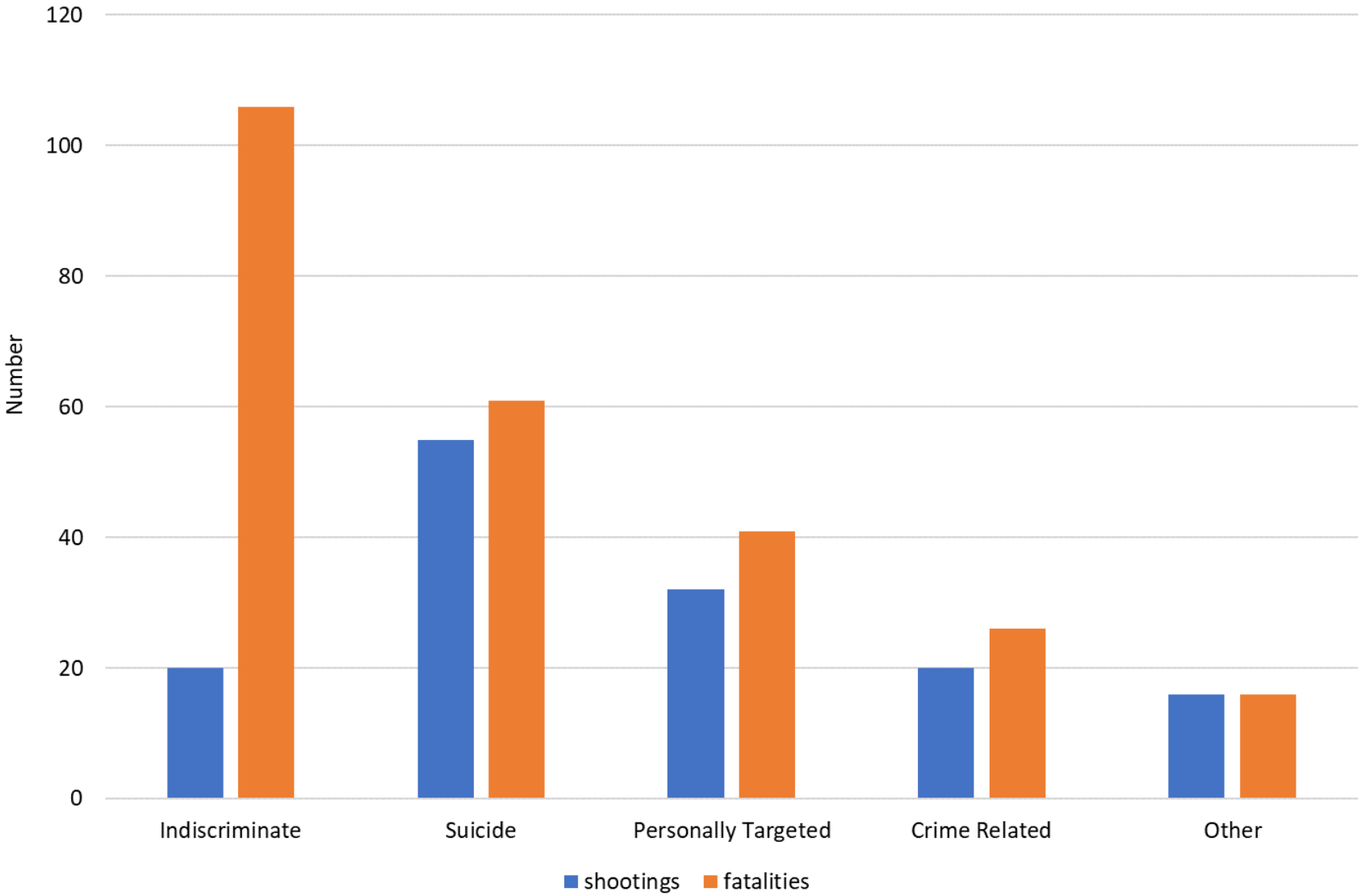
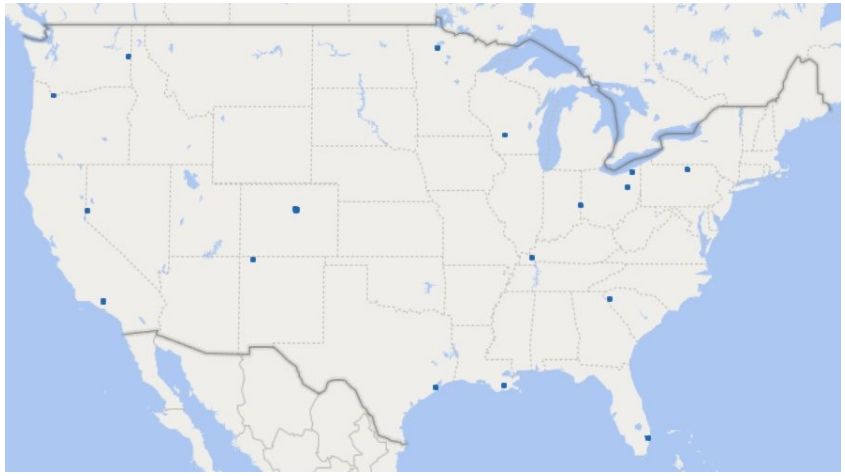
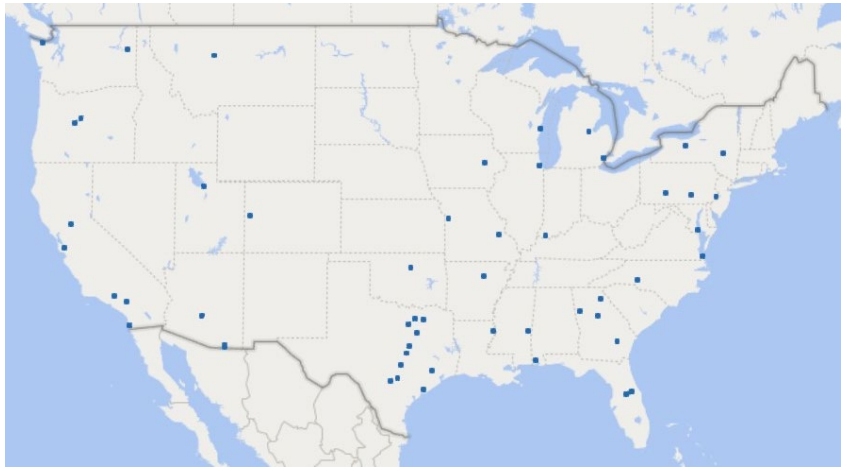


Figure 3: Locations of School Shootings with Fatalities in the United States, 1999-2019

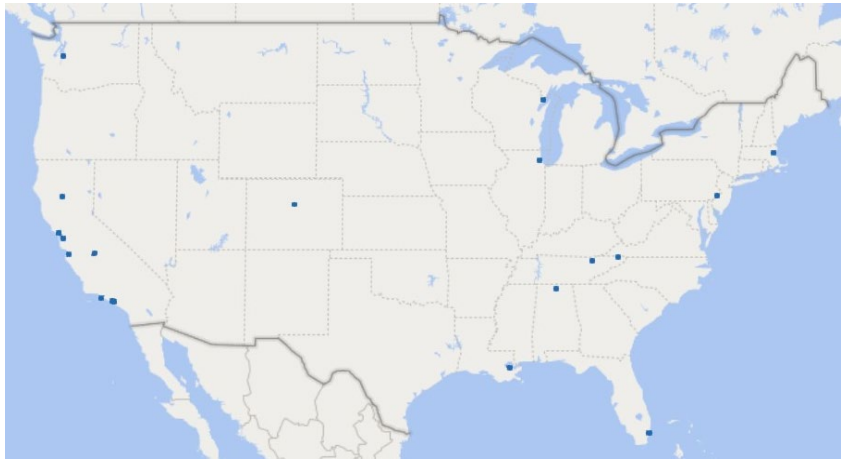
Indiscriminate



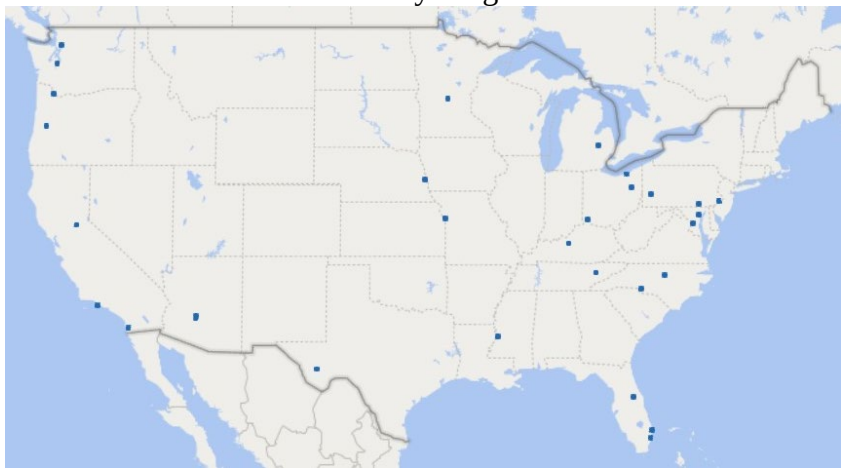
Suicide



Crime-Related



Personally Targeted



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Data Appendix

The CHDS Database

Our primary data source is the K-12 School Shooting Database created by the Naval Postgraduate School's Center for Homeland Defense and Security (CHDS). This database is intended to be a publicly-available resource that systematically and comprehensively catalogs "each and every instance a gun is brandished on school property for any reason, regardless of the number of victims (including zero), time, day of the week, or category (e.g. planned attack, accidental, domestic violence, gang-related)" (Riedman and O'Neill, 2018).

To create the database, the researchers aggregated pre-existing lists of school shootings created by entities ranging from government agencies (e.g., the FBI) to the news media (e.g. the Washington Post) to Wikipedia. They also searched newspaper archives and conducted web searches. All shootings included in the database include a reference to a source that describes the incident, usually a news account. The researchers are in the process of validating all the information in the database with police reports or court records.

While there are many potential definitions of a "school shooting," the CHDS database relies on a broad definition, basely solely on the location of the shooting. Because the database aims to be comprehensive, it includes shootings that range from mass-casualty events such as the 1999 shooting at Columbine High School to shootings with no injuries, such as a 2011 incident in Crown Point, Indiana in which a school bus window was damaged by a bb gun around 6:00 a.m. As discussed in the main text, we rely on a narrower definition of a school shooting in order to ensure that the shootings are consistently reported across locations and over time and to highlight those shootings that are the most likely to affect students attending the affected school.

The CHDS separates shootings into 19 separate categories, including accidental discharge of a firearm. The most common of these 19 categories over the twenty-one-year period of our focus are Escalation of Dispute (224), Unknown (149), Accidental (103), Gang-related (90), and Suicide/Attempted (80). Although this detail is incredibly valuable, for our analytical purposes, we choose to consolidate these categories into a smaller number. We aggregate their categories to five, which are related to the CHDS' categories as follows:

(1) indiscriminate shootings: indiscriminate shootings

(2) suicide: Murder/Suicide, Suicide/Attempted

(3) personal attacks: Escalation of Dispute, Anger Over Grade/Suspension/ Discipline, Bullying, Domestic w/ Targeted Victim, Murder.

(4) crime-related: Gang-related, Hostage Standoff, Illegal Drug Related, Robbery

(5) other: Mental Health, Intentional Property Damage, Officer Involved Shooting, Racial, Self Defense, Accidental, Unknown.

Reporting Bias

As noted in the text, any analysis of patterns of school shootings needs to rely on a consistent measure of their incidence. If shootings are more likely to be captured in the data at certain times or certain places, the reported patterns may not be representative of the actual experience. Despite the incredible strength of the CHDS data, it is subject to this problem because it relies heavily – and necessarily – on media reports. Indeed, the CHDS researchers point out an example of this concern, observing that their database captures a smaller proportion of shootings in the years before on-line news stories became prevalent. They write:

> *Preliminary analysis of the compiled information from the existing databases showed a small number of school shootings organized by year in the 1970's and*

> *1980's compared to years after 1990. After 1990, the increased popularity of the Internet resulted in the widespread availability of online news stories which remain accessible without a need to archive the files. Print newspapers from prior to 1990 were not retroactively archived for online users by most publishers. (Riedman and O'Neill, 2018).*

They are describing a form of reporting bias, in which the reduced access to archival news reports prior to the 1990s implies that the number of school shootings that appear in the database may be artificially low for these years. This bias is one reason that we focus our analysis on data beginning in 1999.

Another form of reporting bias over time may occur, if the news media are more focused on school shootings – and, therefore, likely to report an occurrence of one – at times of heightened public sensitivity, such as after a high-profile shooting. As discussed in the main text, we find evidence consistent with this concern. As shown in Table 1, the months following a high victimization event include more reported shootings, more shootings reported with no fatalities, fewer fatalities per shooting, and a lower percentage of shootings with any fatalities. These findings are consistent with the possibility that shootings with no injuries are considered more newsworthy in the aftermath of a high-victimization event.

We have similar concerns about the possibility of reporting bias in the cross-section. Across locations, school shootings may be more likely to be reported in some places than others. As the CHDS researchers note,

> *"Even after the widespread adoption of online media reporting, our research found that in some cases, local newspapers continued to have the sole accounts of school shooting incidents into the 2000's" (Riedman and O'Neill, 2018).*

Therefore, locations with a greater local media presence are more likely to have written accounts of school shootings, while incidents in more rural locations with less media presence may be overlooked. The collapse of local newspapers in recent years in those locations exacerbates the problem (Hagey, Alpert and Serkez, 2019). Indeed, as discussed in the main text, we see patterns in the data consistent with this form of reporting bias as well, with a higher relative frequency of reported non-fatal shootings in urban areas than in rural areas. Perhaps school shootings in rural areas really are more lethal than those in urban areas, but reporting bias due to differential media coverage is a plausible alternative that cannot be easily dismissed.

Concerns about such reporting bias dictate most of our choices in modifying the CHDS database for our analysis.

Sample Restrictions

The CHDS database documents over 1,400 shootings from 1970 to the present. We focus on the most recent 21 years in the database, limiting our analysis to 859 shootings that occurred between 1999 and 2019. Among these shootings, 5% have been validated by official records, such as police reports.

Because the decision about whether to write a news article about a shooting with no fatalities may vary across locations or over time, we exclude 584 shootings that did not result in a fatality. This exclusion does not affect all categories of shootings equally. Only 7.8% of the accidental shootings – out of the initial 103 reported accidental shootings since 1999– resulted in a fatality, so most accidental shootings are excluded from our database. Likewise, 16.8% of shootings of "unknown" category resulted in a fatality, so many of these are excluded as well. In contrast, 86.7% of the shootings that were classified as "Murder/Suicide", and 82.5% of those

classified as “Suicide/Attempted” included a fatality, so this restriction affects fewer of these types of shootings.

One of the goals of our analysis is to provide estimates of how many students have been exposed to school shootings that can be compared over time, across locations, and across demographic groups. Students are unlikely, however, to be directly exposed to shootings that occur outside of school hours. We therefore exclude an additional 117 shootings that occurred outside of school hours. This restriction is also likely to reduce the likelihood of reporting bias, since a school shooting that results in a death while school is in session almost certainly would receive some form of media coverage. Personally-targeted shootings and shootings in the “other” category occur disproportionately outside of school hours, so 76 of the 117 fall into these two categories. On the other hand, indiscriminate shootings never occur outside of school hours and suicides are more likely to occur during school hours, so these types of shootings are less affected.

After making these exclusions, our database includes 158 shootings. Another 15 are ultimately excluded because they cannot be matched to our other data sources, as described below.

Additional Data Sources

Our next step is to merge this database to a panel of Common Core data on the universe of public schools from the National Center for Education Statistics (NCES). The NCES data provide a variety of useful information for our purposes. They include the county and mailing zip code for every school, which we use to merge additional information about the school’s local environment to our data set. In addition, we analyze NCES data on school enrollment, broken down by race and by free- and reduced-price lunch status.

While the NCES data has many advantages, there are two disadvantages. First, we must eliminate 15 shootings from our database, because they did not occur at traditional, public schools. These 15 shootings occurred at private, special education, and vocational schools and pre-schools, which cannot be uniformly matched to the NCES data.

Second, NCES data are available only through the 2017-18 school year. To address this issue, we assign values for each school for the 2018-19, and 2019-20 school years based on the values that existed in 2017-18. Since school characteristics are unlikely to change dramatically over such a short period of time, this assignment is unlikely to substantially affect the statistics we report.

To better describe the social and economic environment in schools that experience shootings, we merge information about the share of the local population that is non-white, that is living at incomes below the poverty rate, and the share of single-family households in the area. These data are publicly available from Opportunity Insights (at https://opportunityinsights.org/data/) which provides them at the county and Census tract level; Chetty, et al. (2014) describe the generation of these data. We compute weighted means of the Census tract level data to create zip code level measures that can be merged to our data, in addition to the county-level measures. We use both county- and zip code-level data about the economic and social environment. These merges do not require any additional changes to our database. Zip code level data constructed in this way do not match data from Opportunity Insights for three of the shootings; those schools are dropped when calculating zip-code level characteristics.

We also merge our shooting data to data on population density from the Census Bureau, measured at the county- and zipcode-level in 2000, and data on the unemployment rate, which vary by county and year, from the Bureau of Labor Statistics.

In order to better understand the "gun culture" in areas that have experienced school shootings, we add information about average annual gun sales per capita in each state between 1999 and 2019. These data reflect the annual number of background checks, as measured by the FBI's National Instant Criminal Background Check System, for individuals seeking to purchase a gun through a licensed dealer. The number of background checks measures the number of gun sales with error: some background checks may not lead to a gun sale, others lead to the sale of multiple firearms, and some transactions are not through licensed dealers. However, the number of background checks is highly correlated with other measures of firearm sales and is routinely used as a proxy for gun sales (Depetris-Chauvin 2015; Lang 2013; Lang 2016; Levine and McKnight 2017).

As another measure of the gun environment, we add a state-level measure of the strength of gun control laws that is compiled as "scorecards" by the Brady Campaign to Prevent Gun Violence. They provide a score for every state in each year between 2007 and 2011, which ranges from 0 to 100, with 100 reflecting the strongest gun laws. Since the measures are highly correlated over time, with California always earning the highest score and the same group of states typically earning the lowest scores, we simply take a state-level average of the five annual scores and merge it to our database as a time-invariant assessment of gun laws in each state.

Our Final Database

Our final database includes 143 shootings that occurred during school hours at traditional public schools and resulted in at least one fatality over the two decades between 1999 to 2019.

Among the school shootings in our sample, the information for17% of the shootings has been validated with official records such as police reports. In addition, our final data set includes a wealth of information about the economic and social environment in which the shootings occurred.

Appendix References:

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Appendix Table 1: Schools that Experienced a Shooting that Occurred on a School Day during School Hours and Resulted in a Fatality, 1999-2019.

Name	City	State	Date
Indiscriminate			
Columbine High School	Littleton	CO	4/20/1999
Rock L Butler Middle School	Wellsboro	PA	6/4/2003
Red Lake Senior High School	Red Lake	MN	3/21/2005
Weston High School	Cazenovia	WI	9/29/2006
Larose-Cut Off Middle School	Cut Off	LA	5/18/2009
Chardon High School	Chardon	OH	2/27/2012
Sandy Hook Elementary School	Sandy Hook	CT	12/14/2012
Sparks Middle School	Sparks	NV	10/21/2013
Arapahoe High School	Centennial	CO	12/13/2013
Reynolds High School	Troutdale	OR	6/10/2014
Townville Elementary	Townville	SC	9/28/2016
Freeman High School	Rockford	WA	9/13/2017
Aztec High School	Aztec	NM	12/7/2017
Marshall County High School	Benton	KY	1/23/2018
Marjory Stoneman Douglas High School	Parkland	FL	2/14/2018
Jackson Memorial Middle School	Massillon	OH	2/20/2018
Santa Fe High School	Santa Fe	TX	5/18/2018
Dennis Intermediate School	Richmond	IN	12/13/2018
STEM School	Highlands Ranch	CO	5/7/2019
Saugus High School	Saugus	CA	11/14/2019
Suicide			
Central High School	Carrollton	GA	1/8/1999
Richland High School	North Richland Hills	TX	1/21/1999
Jasper County High School	Monticello	GA	8/25/1999
Santa Teresa High School	San Jose	CA	9/9/1999
Carmichael Elementary School	Sierra Vista	AZ	5/10/2000
Hoover Senior High School	San Diego	CA	3/2/2001
Kleb Intermediate School	Klein	TX	4/2/2001
Ennis High School	Ennis	TX	5/15/2001
Taylorsville High School	Salt Lake City	UT	10/12/2001
Page Middle School	San Antonio	TX	10/4/2002
Northeast Lauderdale High School	Meridian	MS	3/21/2003
Forest Hills High School	Sidman	PA	5/13/2003
Crescent School	Joyce	WA	3/17/2004
Lakeside High School	Nine Mile Falls	WA	12/9/2004
Highland Elementary School	Camp Hill	PA	5/17/2005

C M Russell High School	Great Falls	MT	1/30/2006
Castle High School	Newburgh	IN	8/21/2006
Springfield Township High School	Erdenheim	PA	12/12/2006
Crook County High School	Prineville	OR	2/8/2007
H.H. Dow High School	Midland	MI	3/7/2007
Greenville High School	Greenville	TX	3/7/2007
North Mecklenburg High School	Huntersville	NC	4/18/2007
Tidehaven High School	El Maton	TX	5/4/2007
Wp Davidson High School	Mobile	AL	3/6/2008
Madison High School	Tallulah	LA	5/16/2008
Mira Loma High School	Sacramento	CA	9/15/2008
Vasquez High School	Acton	CA	10/20/2008
Sheboygan North High School	Sheboygan	WI	5/1/2009
Canandaigua Academy	Canandaigua	NY	5/5/2009
Banks County High School	Homer	GA	8/24/2012
Stillwater Junior High School	Stillwater	OK	9/26/2012
Davidson Middle School	Southgate	MI	3/21/2013
Temple High School	Temple	TX	4/16/2013
Lanier High School	Austin	TX	10/15/2013
Bend Senior High School	Bend	OR	2/7/2014
Greenwood Lakes Middle School	Lake Mary	FL	9/10/2014
Benton Elementary School	Benton	ME	12/17/2014
Seguin High School	Seguin	TX	4/17/2015
Corona Del Sol High School	Tempe	AZ	5/12/2015
Robinson High School	Robinson	TX	5/20/2015
Thomas Jefferson High School	Cedar Rapids	IA	9/9/2016
Grand Junction High School	Grand Junction	CO	11/2/2016
North Park Elementary School	San Bernardino	CA	4/10/2017
Lee's Summit North High School	Lee's Summit	MO	9/29/2017
Lake Minneola High School	Minneola	FL	11/14/2017
Salem High School	Virginia Beach	VA	11/30/2017
Coronado Elementary School	Hereford	AZ	1/9/2018
Kingston High School	Cadet	MO	3/5/2018
Great Mills High School	Great Mills	MD	3/20/2018
McKinney North High School	McKinney	TX	6/1/2018
Appling County High School	Baxley	GA	9/24/2018
Jefferson High School	Jefferson	NY	12/10/2018
Lake Mary High School	Lake Mary	FL	3/13/2019
Washington Middle School	Lyons	IL	4/17/2019
Concord High School	Concord	AR	4/24/2019
Crime-Related			
Richmond High School	Richmond	CA	12/7/2000

Norland Elementary School	Miami	FL	12/21/2000
Hueneme High School	Oxnard	CA	1/10/2001
John Mcdonogh Senior High School	New Orleans	LA	4/14/2003
TM Peirce Elementary School	Philadelphia	PA	2/11/2004
Proviso East High School	Maywood	IL	8/30/2004
Locke (Alain Leroy) Senior High School	Los Angeles	CA	3/17/2005
Birney Elementary School	Fresno	CA	10/27/2005
Campbell County Comp. High School	Jacksboro	TN	11/8/2005
Venice Senior High School	Los Angeles	CA	6/5/2006
Platte Canyon High School	Bailey	CO	9/27/2006
Barnard-White Middle School	Union City	CA	12/21/2007
Lakota Middle School	Federal Way	WA	8/14/2008
Discovery Middle School	Madison	AL	2/5/2010
Sullivan Central High School	Blountville	TN	8/30/2010
Alisal High School	Salinas	CA	10/1/2010
Marinette High School	Marinette	WI	11/29/2010
Miami Carol City Senior High School	Miami Gardens	FL	11/20/2014
Jeremiah E Burke High School	Dorchester	MA	6/8/2016
Rancho Tehama Elementary School	Corning	CA	11/14/2017
Personally-Targeted			
Martin Luther King High School	Philadelphia	PA	10/26/1999
Buell Elementary School	Flint	MI	2/29/2000
Lake Worth Community Middle School	Lake Worth	FL	5/26/2000
Timken High School	Canton	OH	7/26/2000
Lake Clifton-Eastern High School	Baltimore	MD	1/17/2001
Santana High School	Santee	CA	3/5/2001
Latonia Elementary School	Covington	KY	9/12/2001
Red Lion Area Junior High School	Red Lion	PA	4/24/2003
Vicksburg High School	Vicksburg	MS	9/10/2003
Rocori Senior High School	Cold Spring	MN	9/24/2003
Ballou High School	Washington	DC	2/2/2004
Carrick High School	Pittsburgh	PA	3/16/2005
Weequahic High School	Newark	NJ	7/18/2005
Milwee Middle School	Longwood	FL	1/13/2006
Essex Elementary School	Essex Junction	VT	8/24/2006
SuccessTech Academy School	Cleveland	OH	10/10/2007
E. O. Green Junior High School	Oxnard	CA	2/12/2008
Central High School	Knoxville	TN	8/21/2008
Dillard High School	Fort Lauderdale	FL	11/12/2008
Birney Elementary School	Tacoma	WA	2/26/2010
Millard South High School	Omaha	NE	1/5/2011
Louisiana Schnell Elementary School	Placerville	CA	2/2/2011

West View High School	Avondale	AZ	5/25/2012
Mary Scroggs Elementary School	Chapel Hill	NC	5/25/2012
Raytown Success Academy	Kansas City	MO	2/20/2014
Marysville Pilchuck High School	Marysville	WA	10/24/2014
Independence High School	Glendale	AZ	2/12/2016
Alpine High School	Alpine	TX	9/8/2016
John Hardin High School	Elizabethtown	KY	3/29/2018
Butler High School	Matthews	NC	10/29/2018
Cascade Middle School	Eugene	OR	1/11/2019
Sarah J. Anderson Elementary School	Vancouver	WA	11/26/2019

Other			
Deming Middle School	Deming	NM	11/19/1999
Ridgewood High School	New Port Richey	FL	1/19/2000
Irving Middle School	San Antonio	TX	11/16/2005
Seven Lakes High School	Katy	TX	10/17/2006
Foss High School	Tacoma	WA	1/3/2007
Roosevelt High School	Fresno	CA	4/16/2008
Aplington-Parkersburg High School	Aplington	IA	6/24/2009
Carolina Forest High School	Myrtle Beach	SC	10/16/2009
Cummings Middle School	Brownsville	TX	1/4/2012
Jay High School	San Antonio	TX	6/29/2015
McNair Elementary School	Chicago	IL	6/16/2016
Montpelier High School	Montpelier	VT	1/16/2018
Huffman High School	Birmingham	AL	3/7/2018
Central High School	Philadelphia	PA	9/24/2018
Phoebus High School	Hampton	VA	9/16/2019
Esteban Torres High School	Los Angeles	CA	11/13/2019