Rapid Communication

Disaggregating Fatal and Non-Fatal Shootings in Boston, 2015-2023

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Citation: Piquero, Alex R., Andrew Wheeler. "Disaggregating Fatal and Non-Fatal Shootings in Boston, 2015-2023." International Journal of Police Science 3, no. 1 (2024).

https://doi.org/10.56331/20240122/IJPS3

Abstract: Community gun violence is a serious public safety issue. Unfortunately, limitations surrounding data on shootings have made it difficult for members of the public and the research community to understand the nature and trends associated with gun violence and have also hampered policy officials' attempts to reduce the incidence of shootings. This paper makes use of shooting data from the Boston Police Department that contains the location of the shooting as well as whether the shooting was fatal or non-fatal. Results show that two police districts, Roxbury and Mattapan, account for over half of the shootings and that the risk of being fatally shot in these two districts for a black male is almost double that in other districts. Findings have implications for police allocations as well as policy interventions.

Keywords: fatal shootings, non-fatal shootings, Boston Police Department, race differences

Introduction

Community gun violence plagues many cities in the United States[1,2], and compared to other countries around the world, the United States has exceptionally high mortality rates due to firearm violence.[3] Yet, except for a few online data archives, we do not have a very firm understanding of the nature of community gun violence concerning fatal and non-fatal shootings.[4] And when such data do exist, as a recent Expert Panel on Firearms Data Infrastructure noted, they are "difficult to access, collections are narrow in scope, public release of data can lag by years, and few datasets and systems can be integrated. Firearms data often cannot be accessed because of policy restrictions (ATF data and background check data), or firearms data can be accessed and do have valuable data but need a slight change to accurately identify firearm injury cases (such as the UCR, NIBRS, and hospital data systems) or firearms data are simply not collected (e.g., state-level data on firearm ownership rates) (p. 2)".[5]

Why is it, then, that in a world awash in so much data, firearm data is lacking? In large part, this is because, much like crime and arrest data in the United States, firearm shooting data are not required to be collected nor disseminated to the public, and this is especially the case for non-fatal shootings.[6]. This dearth of accessible data harms the publics and policymakers' understanding of the true nature of community gun violence which also limits their shared ability to inform and guide policymaking undermines our understanding of what is known about the health and mental health consequences associated with non-fatal shootings which are much more common[7], and limits police agencies' ability to prevent gun violence[8] by targeting, testing, and tracking their responses to gun violence.[9]

More importantly, perhaps when these data do exist, they tend not to provide the level of data disaggregation that permits a deep-dive analysis of community gun violence by demographic and aerial locations. The importance of disaggregated policing and crime data is key in promoting equity in law enforcement data collection, use, and transparency[10], as reinforced in a recent report produced by the Criminal Justice Statistics Interagency Working Group of the Office of Science and Technology Council.[11] Such data could also help inform a community about who is impacted and what community factors (disparities, vulnerability, etc.) are specific to the place/neighborhood that can inform interventions.

Data

The Boston Police Department offers a public-facing data portal that permits some analysis of the patterning of community gun violence.[i] Using data on 1,904 fatal and non-shooting incidents from January 2015 through October 2023, we carried out a descriptive analysis of fatal and non-fatal shootings by demographic groups as well as police command districts. Our purpose in showcasing these data was to highlight their power in showing how are fatal and non-fatal shootings distributed in the city of Boston, help inform communities of individuals and neighborhoods most impacted to inform underlying causes and correlates and study prevention strategies, and encourage other agencies to adopt Boston's approach.

Results

Table 1 demonstrates a few differences in gender and race between fatal (n=319) and non-fatal (n=1,585) shootings. While fatality rates for males are slightly higher than for females (17% vs 12% respectively), the overall proportions across the different demographic categories are quite stable. While shooting victimization is highly concentrated among young males in a sample of US cities[12], fatalities following a shooting are largely due to chance.[13] Subsequently, monitoring the prevalence of shootings will provide more signals as to the efficacy of different gun violence interventions than monitoring gun deaths in isolation.

Table 1. Fatal and Non-Fatal Shootings in Boston, 1/1/2015 through 10/24/2023

	Fatal	Non-Fatal
Gender		
-Male	17%	83%
-Female	12%*	88%
Race		
-Black	17%	83%
-Non-Black	15%	85%
Hispanic/LatinX		
-No	15%	85%
-Yes	18%	82%
Black Male		
-No	15%	85%
-Yes	18%	82%

Note: * p <.05, two tail.

Next, we created three maps documenting the total number of shootings, the total number of fatal shootings, and the total number of non-fatal shootings. As community gun violence tends to be concentrated, especially in Boston[14], figure 1 shows that it also does so in the Boston shooting data. Two police districts, (B2 (Roxbury) and B3 (Mattapan), account for over 55% of the shootings in the database.[ii]

Additional analysis shows that the risk of being fatally shot in these two districts for a black male is almost double (OR, 1.7, 95% CI, 1.1-2.7; P = .01) what they are in the other districts (OR, 0.94, 95% CI, 0.6-1.4; P = .75). This latter finding underscores the troubling epidemic of firearm victimization that appears to be highly concentrated among a specific minority group[15,16], with recent research showing that blacks in the United States experience firearm homicide victimization at a rate twelve times higher than whites.[10]

Figure 1: Maps of Shootings in Boston by police districts

Total Shootings — [12-50), [50-100), [100-300), [300-571]

Fatal Shootings — [3-10), [10-20), [20-50), [50-100]

Non-Fatal Shootings — [9-30), [30-60), [60-150), [150-493]
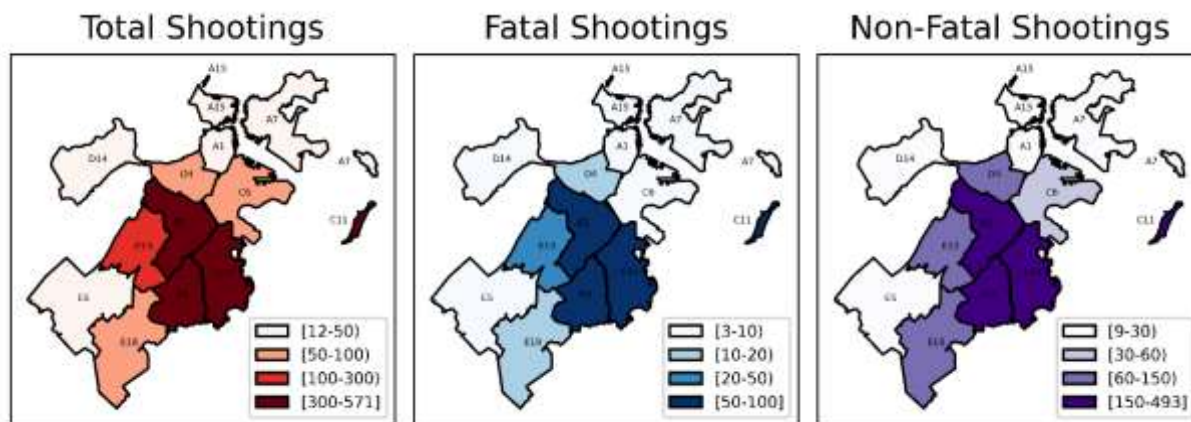
Conclusion

Our work shows the value of accessing publicly disseminated and disaggregated shooting data. Without these data, we would be unable to examine the distribution of fatal and non-fatal shootings across the city of Boston and how the risk of being fatally shot is magnified among black males. These are the types of research findings that can help inform the public about how crime is distributed in their communities as well as how the risk of firearm homicide may be concentrated within certain demographic groups and can help guide community leaders and policymakers in their collaborative efforts to reduce the burden of shootings by developing and evaluating interventions. Cities need to provide access to such data—with improvements such as creating more geospatial locations for the shootings so that true community/neighborhood hotspots can be generated rather than just broadly identifying the precincts with the highest number of shootings. While some cities provide similar open data on shootings, it is not the norm. In short, having real-time data on all shootings – not just shooting homicides – can help cities monitor whether their interventions are (or are not) effective. And perhaps more importantly, as the Criminal Justice Statistics Interagency Working Group of the Office of Science and Technology Council noted, the collection of detailed data can be used to "design more equitable policies, and regularly share data to promote accountability"(p.2).[11]

Data is one thing, but policy intervention is another matter. Boston's Mayor Michelle Wu has been a leader in this space, committing the city of Boston to be part of the University of Maryland's

cohort program aimed at reducing community gun violence led by the University's Center for the Study and Practice of Violence Reduction.[17] Along with Mayor Wu, several other mayors around the United States are deeply committed to this issue and have formed partnerships with both police and community groups not to let the issue of community gun violence go away. Rigorously evaluating these initiatives will be important going forward so as to maximize resource allocation as well as prioritizing public safety in the short- and long-terms.

To be sure, our descriptive work did not go into further details regarding the specific characteristics associated with fatal shootings, but this would be a priority for subsequent research. As well, additional data collection regarding weapon carrying, including reasons for possession as well as means of weapon procurement can help researchers and policymakers understand gun acquisition and gun carrying so as to better craft prevention and intervention efforts.

When a more complete firearms data infrastructure system is fleshed out[18], it would also help to provide additional transparency into the efficacy of different gun violence intervention programs, such as community violence intervention[19,20], focused deterrence[21], hospital-based violence interventions[22], and other efforts. An overall strategy combining police and non-policing prevention and intervention strategies offers the most promise because eliminating gun violence also involves investing in youth to make better decisions in highly volatile contexts.

Acknowledgments

Disclosures

None

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FOOTNOTES

[i] https://data.boston.gov/dataset/shootings (accessed November 1, 2023).

[ii] These two police districts vary across key demographic and socioeconomic indicators. For example, the poverty rate is 25.9% (City of Boston 17.6%), and the following racial/ethnic breakdown: Black or African American (Non-Hispanic) (52.6%), White (Non-Hispanic) (10.9%), Other (Hispanic) (10.2%), Two+ (Hispanic) (6.91%), and White (Hispanic) (5.35%). https://datausa.io/profile/geo/mattapan-roxbury-puma-ma (accessed December 9, 2023).