Shooting Occurrences Increased Across the City of Toronto Between 2014 and 2019

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Abstract

In 2005, the City of Toronto saw unprecedented levels of gun violence Siciliano (2005). More than a decade later, the number of yearly shooting occurrences across Toronto continued to rise. Using data from the City of Toronto Open Data Portal, this paper illustrates trends in the number of shooting occurrences in different divisions of Toronto, from 2014 to 2019, inclusive. This paper shows that across the City of Toronto, shooting occurrences steadily increased in the six-year period from 2014 to 2019.

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1 Introduction

Canada has the fifth-highest rate of gun fatalities in the world among high-income countries, and between 2008 and 2012, firearms caused more deaths in young men ages 18-24 than cancer, falls, drowning, and fires combined. Owens (2019)

2 Data

The data used throughout this paper was obtained through the City of Toronto's Open Data Portal, OpenDataToronto. Gelfand (2022) OpenDataToronto is a publicly-funded, widely accessible data portal, with data relating to various topics including, but not limited to, social services, public services, elections, public safety, policing, education, and public health. Data was collected, cleaned, and analyzed using statistical programming language R R Core Team (2022). Additionally, tidyverse Wickham et al. (2019), dplyr Wickham et al. (2023), janitor Firke (2023), ggplot2 Wickham (2016), and knitr Xie (2014) were used for the data analysis and visualizations.

The data set used in this paper is titled "Shooting Occurrences (2014-2019). It includes all shooting-related events reported to Toronto Police Service from 2014 to 2019 Gelfand (2022). The data is divided between Toronto's police divisions. The data set contains 96 rows; one row for each of Toronto's geographical divisions for each of the six years from 2014 to 2019 inclusive. Further information about the individual shooting events is not provided. More specifically, each row in the data set contains the number of shooting occurrences in each geographical division each year from 2014 to 2019.

The data includes a unique row identifier, the geographical division, year the shootings occurred, and the number of shootings that occurred in that geographical division that year. The precise location, date, time, injury levels, and resulting charges of each shooting are not included in this data set. The data set provides only very high-level data: the general area of where the shootings occurred and how many shootings occurred. The data analysis examines trends in the number of shooting occurrences across the City of Toronto and within each geographical division from 2014 to 2019. Additionally, variation in the number of shooting occurrences between geographical divisions each year from 2014 to 2019 will be analyzed.

Analysis

The data analysis component of this paper explores the details of shooting occurrence trends across all geographical divisions of the City of Toronto from 2014 to 2019.

D12, D23, and D31 consistently had more shooting occurrences than other geographical divisions. On the contrary, D52 and D53 consistently had fewer shooting occurrences than other geographical divisions.

Conclusion

This paper investigates how patterns in the number of shooting occurrences across Toronto changed between 2014 and 2019. The data clearly showed that while the overall total number of shooting occurrences across the City of Toronto increased year-over-year between 2014 and 2019, this pattern varied between divisions. Further research and investigation will be required

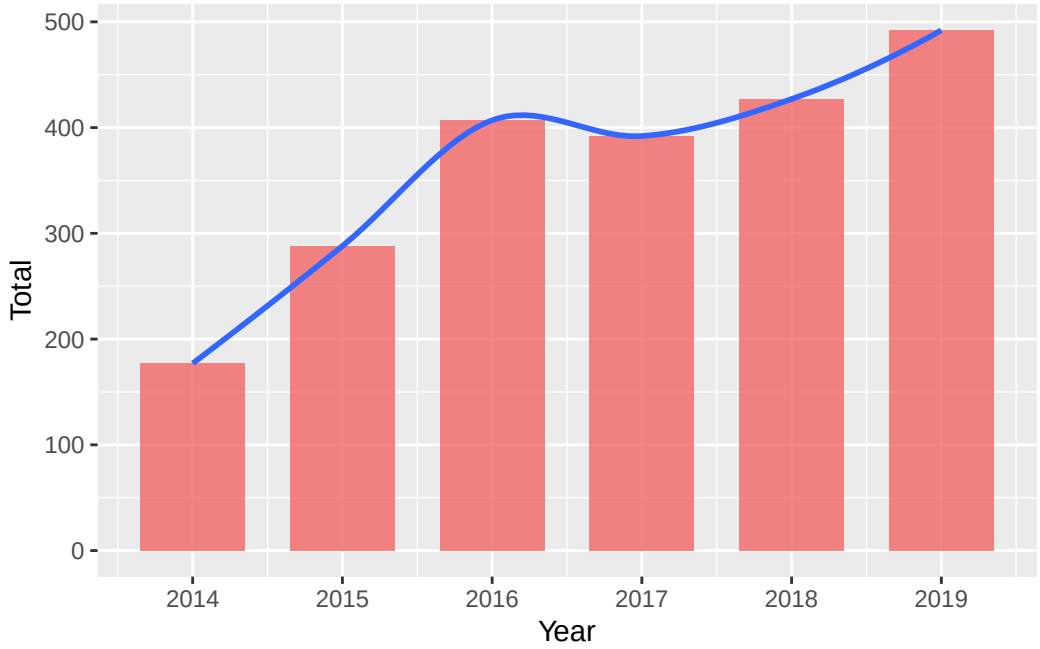

Figure 1: Total Number of Shooting Occurrences Acoross Toronto per year, 2014-2019

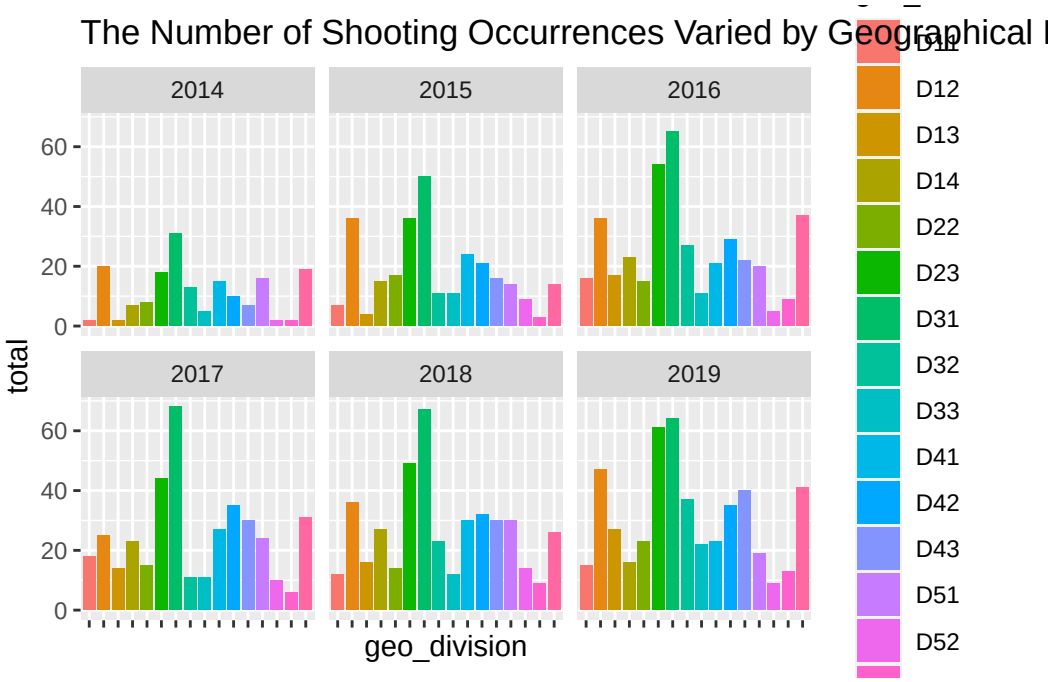

Figure 2: Number of Shooting Occurrences Per Geographical Division, 2014-2019

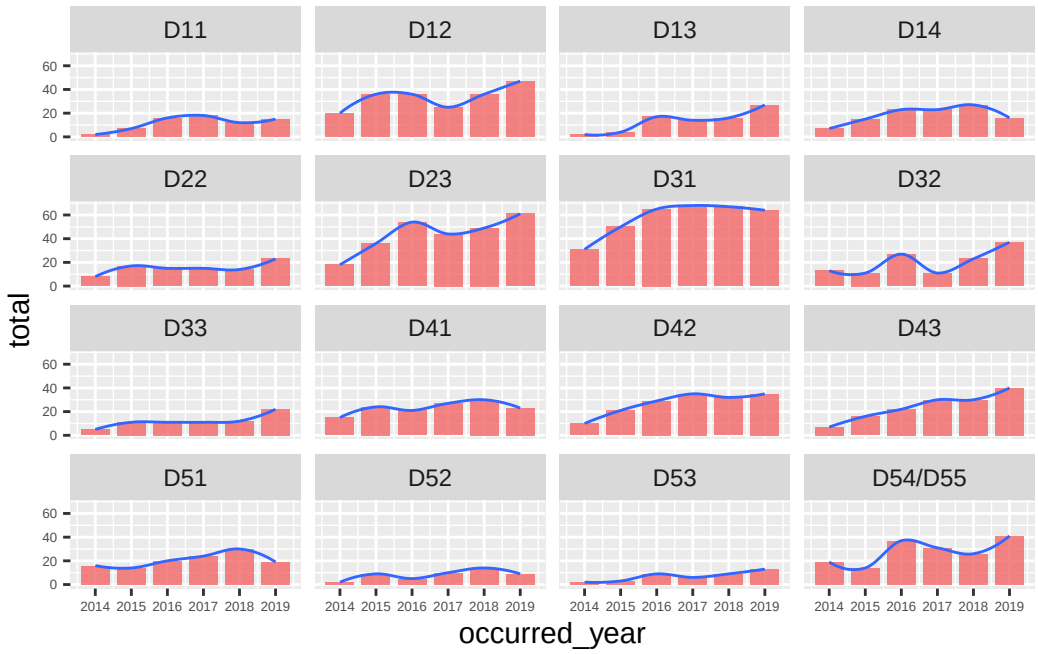

Figure 3: Annual Shooting Occurrences 2014-2019, by Toronto Police Division

to gain a deeper understanding of *why* gun violence widely varies across Toronto's different geographical divisions.

References

Firke, Sam. 2023. *Janitor: Simple Tools for Examining and Cleaning Dirty Data.* https://github.com/sfirke/janitor.

Gelfand, Sharla. 2022. *Opendatatoronto: Access the City of Toronto Open Data Portal.* https://sharlagelfand.github.io/opendatatoronto/.

Owens, Brian. 2019. "Gun Violence Is an Epidemic and 'We Solve Epidemics with Medicine, Not Politics'." *Canadian Medial Association Journal* 191 (2). https://doi.org/10.1503/cmaj.109-5700.

R Core Team. 2022. *R: A Language and Environment for Statistical Computing.* Vienna, Austria: R Foundation for Statistical Computing. https://www.R-project.org/.

Siciliano, Amy Marie. 2005. *Olicing Poverty Race, Space and the Fear of Crime After the Year of the Gun.* https://www.publicsafety.gc.ca/cnt/cntrng-crm/plcng/cnmcs-plcng/rsrch-prtl/dtls-en.aspx?d=PS&i=80215206.

Wickham, Hadley. 2016. *Ggplot2: Elegant Graphics for Data Analysis.* Springer-Verlag New York. https://ggplot2.tidyverse.org.

Wickham, Hadley, Mara Averick, Jennifer Bryan, Winston Chang, Lucy D'Agostino McGowan, Romain François, Garrett Grolemund, et al. 2019. "Welcome to the tidyverse." *Journal*

of Open Source Software 4 (43): 1686. https://doi.org/10.21105/joss.01686.
Wickham, Hadley, Romain François, Lionel Henry, Kirill Müller, and Davis Vaughan. 2023. *Dplyr: A Grammar of Data Manipulation*. https://dplyr.tidyverse.org.
Xie, Yihui. 2014. *Knitr: A Comprehensive Tool for Reproducible Research in r.*