Analysis of Major Crimes in Toronto And Suggestions on How to Protect Ourselves

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Safety is one of the most important factors that people consider when deciding where to live and go. This report uses data from Open Data Toronto to analyze the occurrences of various types of crimes in different regions of Toronto, as well as the trend over the past ten years. The result shows that Downtown Toronto and evenings have a relatively high occurrences of crimes, which could be used as a suggestion on both individuals and government dicision-making.

Introduction

On Dec 25th, 2023, the Christmas Day, a news has raised huge concerns among people — a man was seriously injured after stabbing in downtown Toronto. This was not the first such incident on that block in December; unfortunately, such distressing news has become more and more prevalent nowadays. As the pandemic comes to an end, there is a noticeable increase in people returning to the office and going out more frequently than in previous years. Naturally, public safety has become particularly crucial, prompting a crucial question: How can we proactively prevent such incidents from affecting ourselves and our loved ones?

Providing information like location and crime types, major crimes statistics is an important tool for resource allocation and law enforcement strategy. It also provides the public a clear picture of the safety, which helps individuals make informed decisions, influence choices such as where to buy a house.

For this paper, I will use open-access data from the OpenDataToronto (Gelfand 2022) to analyze major crime patterns over the years and how ordinary citizens could do to reduce the likelihood of getting hurt. In addition, I will discuss how funding could be allocated for higher efficiency and potential bias in crime data. In this paper, I discuss the data in Section 2, including data source and software (Section 2.1), data collection (Section 2.2), data analysis and visualizations (Section 2.3). In Section 3, I conclude that….

Data

Data Source and Software

The data utilized throughout this paper, in csv format, is obtained from Toronto Police Services on the City of Toronto Open Data Website (Gelfand 2022), with the title "MAJOR CRIME INDICATORS".

This dataset will be processed and analyzed in the open source R (R Core Team 2022) using packages Dplyr (Wickham et al. 2022), Tidyverse (Wickham et al. 2019), Here (Müller 2020), Leaflet (Cheng et al. 2023), and Janitor (Firke 2021). Visualizations including tables and figures will be created using ggplot2 (Wickham 2016) and Knitr(**Knitr?**).

Data Collection

The dataset contains all Major Crime Indicators occurrences by report data. The categories of major crimes are Assault, Break and Enter, Auto Theft, Robbery and Theft Over. The latest refresh was on Jan 11, 2024.

There are two factors that may influence the reliability of the data. First, this dataset includes all occurrences reported to the Toronto Police Station, except those have been considered as unfounded. Second, this data is provided at the offence and victim level, so one occurrence number may have a few rows of data with different major crime indicators types used to categorize the occurrence.

Data Analysis and Visualizations

Table 1: The Number of Major Crimes and the Month with the Most Crimes (2014-2023)

Year	Total Number of Crimes	Month with the Most Crimes
2014	32477	October
2015	32938	August
2016	33654	July
2017	35547	July
2018	37545	October
2019	40098	July
2020	35196	July
2021	34777	October
2022	41299	October
2023	47833	August

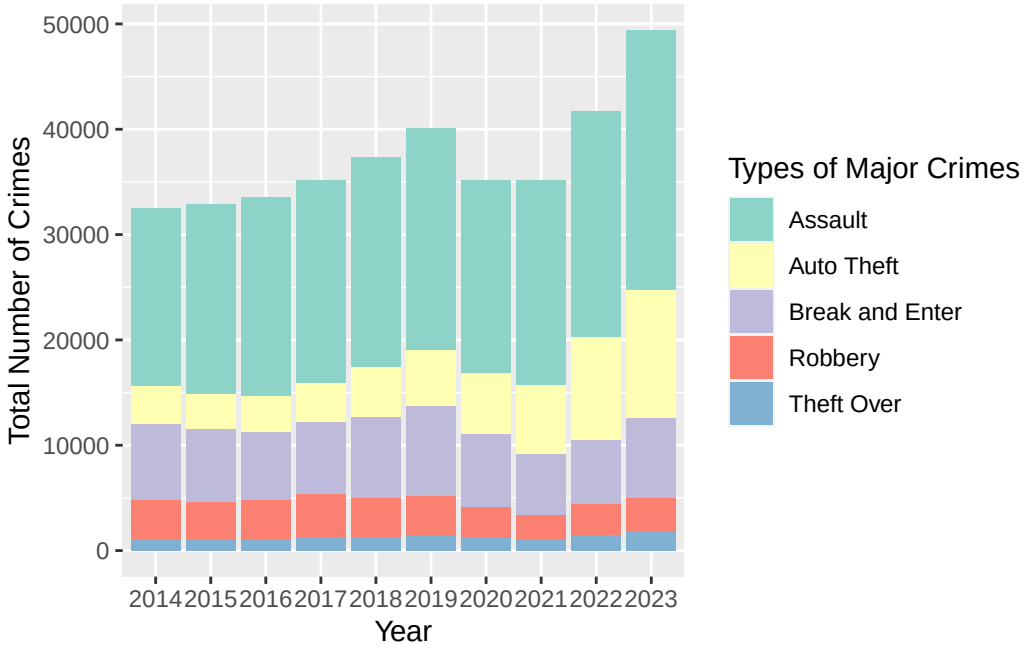

Figure 1: The Number of Crimes Reported, Classified by Crime Types (2014-2023)

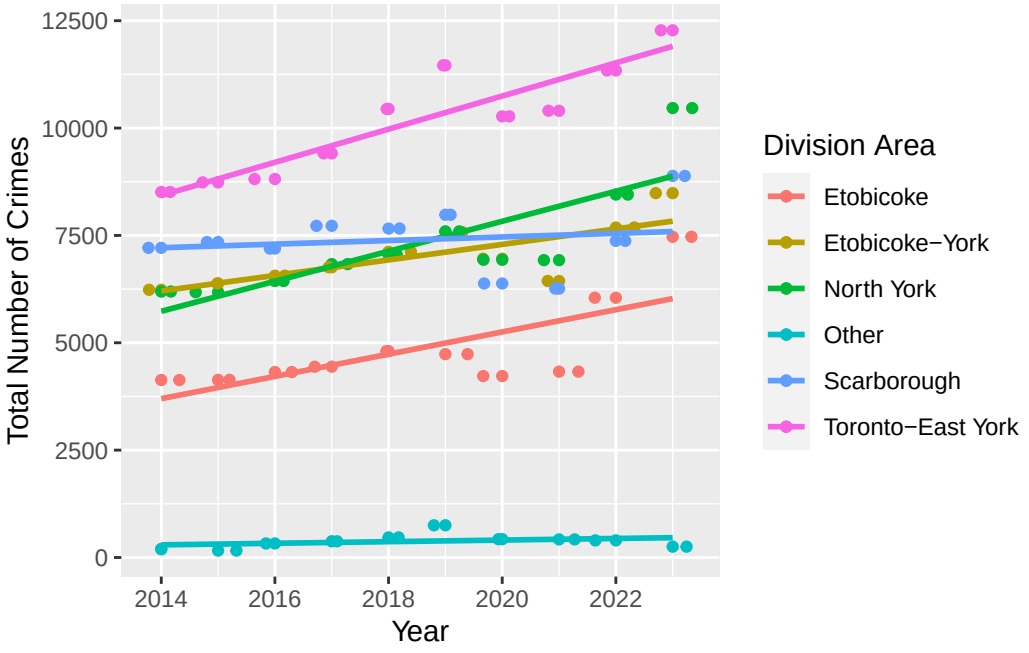

Figure 2: Total Number of Crimes in Different Police Division Areas

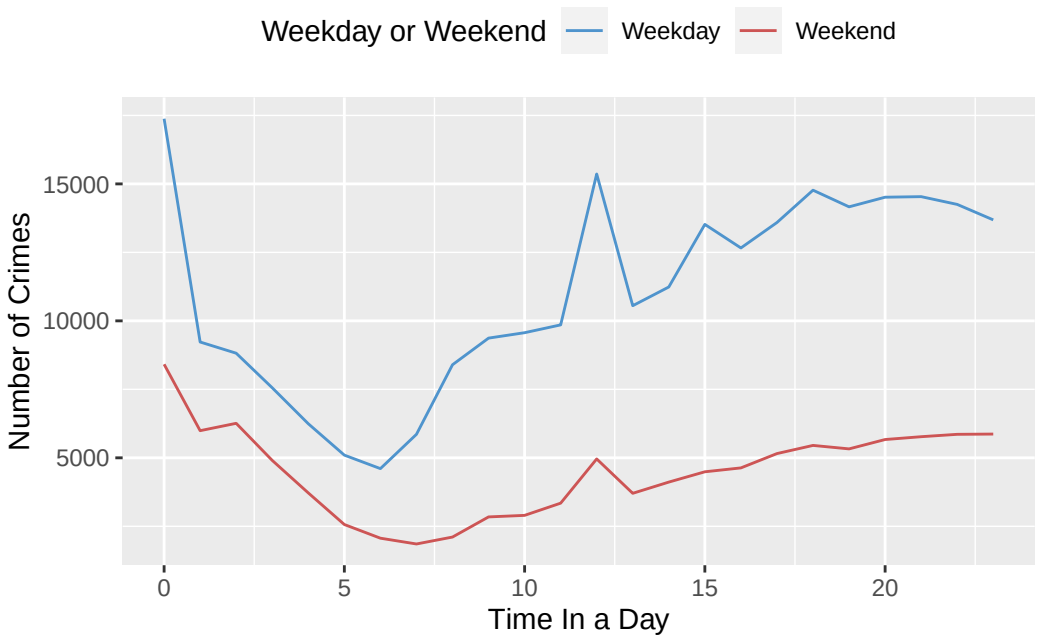

Figure 3: Number of Crimes in a Day

Conclusion

In summary,

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