Analyzing Crime Trends in Toronto: Insights from the Police Annual Statistical Report*

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This paper analyzes crime trends in Toronto using the Police Annual Statistical Report from 2014 to 2023. Data from Open Data Toronto is used to evaluate crime distributions across different categories and regions. Analysis reveals that some areas, particularly in divisions such as D13 and D32, report the highest number of property-related crimes like auto theft. Suburban areas also illustrate rising trends in specific crime subtypes. These findings can help optimize policing strategies and public safety resource allocations.

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*Code and data are available at: https://github.com/YizheChenUT/STA304TermPaper1.git

1 Introduction

Crime and public safety are critical concerns for urban environments like Toronto. Understanding the nature and distribution of crimes helps policymakers and law enforcement agencies allocate resources and develop effective crime prevention strategies. This paper examines Toronto's crime patterns over the past decade, using the Toronto Police Annual Statistical Report to evaluate different types of crimes across the city's divisions (Gelfand 2022).

Our analysis covers from 2014 to 2023 and focuses on two main crime categories: Crimes Against Property and Crimes Against the Person. We explore how incidents vary by division and examine clearance rates (resolved cases) to evaluate the effectiveness of law enforcement strategies. By highlighting regional crime trends, this paper provides insights into public safety concerns that can shape future policies.

The remainder of this paper is structured as follows: Section 2 presents the data and the steps taken to clean and transform it for analysis. Section 3 discusses the results of the study, focusing on crime distribution trends by year, types of crimes by division, and clearance rates for different crime types. Section 4 interprets the findings in the broader context of urban crime trends and offers insights for future research. Finally, Section 5 concludes the paper by summarizing key takeaways and recommending strategies for crime prevention and law enforcement improvement in Toronto.

2 Data

The data used in this analysis was obtained from the Open Data Toronto portal (Gelfand 2022). The data set includes reported incidents categorized by type, division, and year, covering the period from 2014 to 2023.

2.1 Reported Crimes Dataset

The dataset includes multiple fields related to crime, such as:
Crime Category: Broad crime categories like "Crimes Against Property" and "Crimes Against the Person".
Crime Subtype: Specific types of crimes (e.g., "Auto Theft", "Break & Enter").
Division: The Toronto Police divisions where crimes occurred.
Incidents Reported: The total number of reported incidents.
Incidents Cleared: The number of resolved cases.

2.2 Data Cleaning and Transformation

The data was cleaned by removing duplicates and correcting data entry errors(R Core Team 2023) (Wickham et al. 2019) (Firke 2023). Special attention was given to divisions with high and low crime rates, as well as to the clearance rate, which reflects how effectively crimes were resolved by the law enforcement.

3 Results

3.1 Crime Distribution by Year

The dataset reveals fluctuating crime rates between 2014 and 2023. Property crimes such as auto theft have shown consistent increases, while personal crimes, such as sexual violations, remain relatively stable.
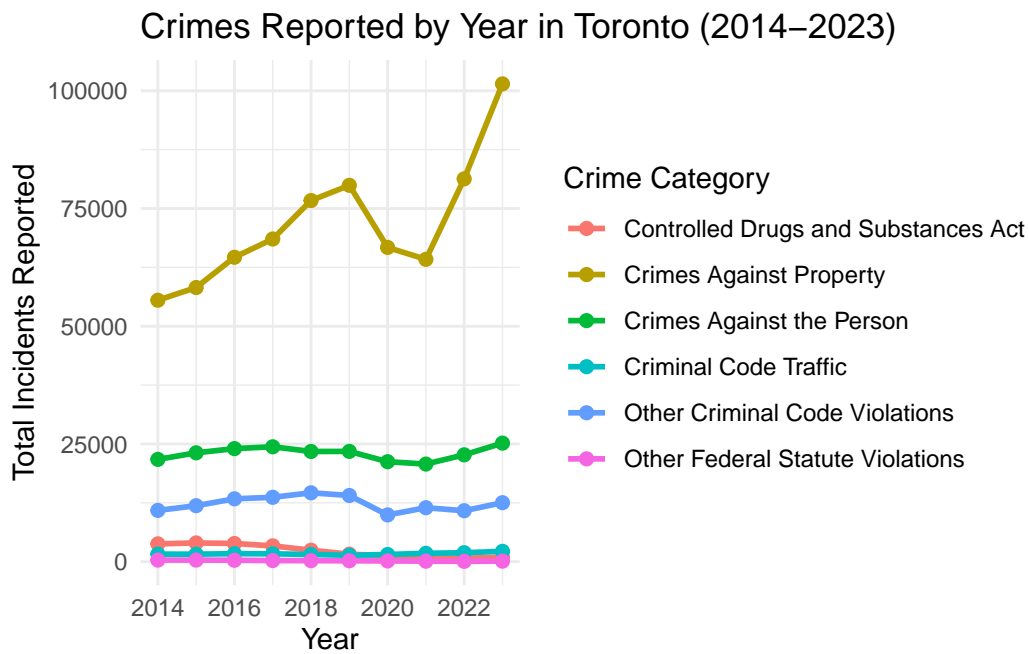

Figure 1: Crimes Reported by Year

According to Figure 1, There was a sharp increase in crimes against property in 2023, reaching the highest number of incidents reported during the 2014-2023 period, with over 100,000 incidents. Crimes against the person maintained a relatively stable trend from 2014 to 2023, consistently reporting between 20,000 and 25,000 incidents annually. Traffic-related criminal code violations showed a decline from 2018, especially during 2020, where the number of reported incidents dropped below 15,000. Other categories, including "Controlled Drugs and

Substances Act" and "Other Federal Statute Violations", remained consistently low over the years, each with less than 5,000 incidents reported annually.

3.2 Crime Types by Division

Different divisions across Toronto report varying types of crimes. Divisions located in more urbanized areas, show higher concentrations of property crimes, such as auto theft and break-ins. At the same time, suburban areas report a higher frequency of violent crimes.
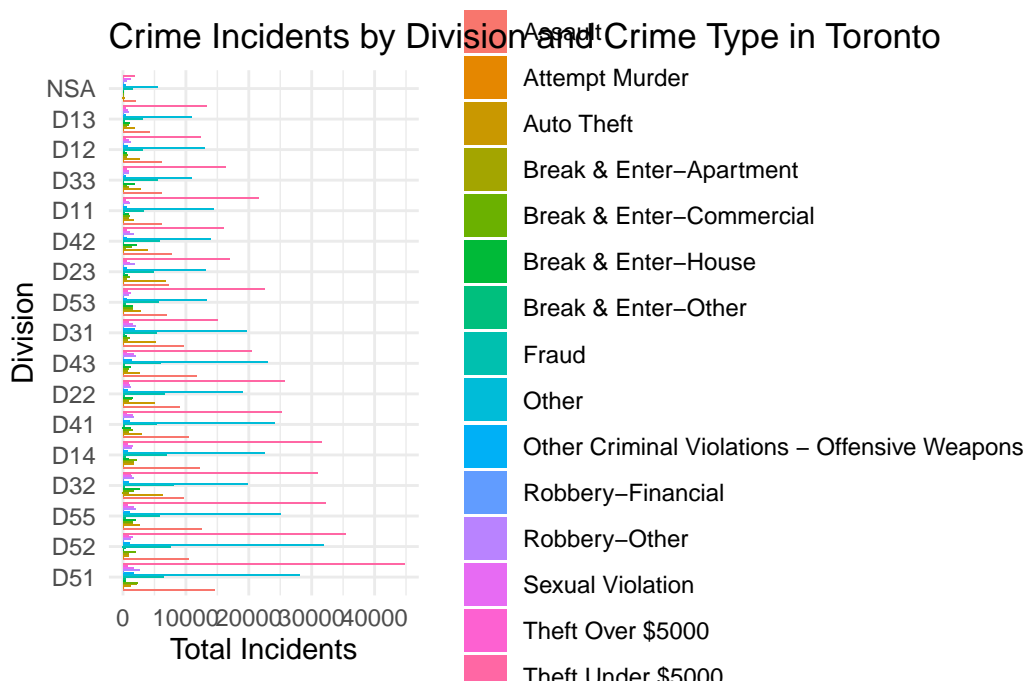

Figure 2: Crimes by Division and Crime Type

Based on Figure 2, 32 Division reports high rates of auto theft than other divisions. 12 Division and 53 Division show large number reports in break-ins and residential thefts, especially in apartment.

3.3 Clearance Rates

Clearance rates, which reflect the number of resolved cases, vary widely between divisions. Many divisions report low clearance rates for property crimes, particularly auto theft, which remains a challenge for law enforcement.

As illustrated by Figure 3, the overall clearance rate for property crimes remains low, with less than 10% of auto theft cases being resolved in most divisions. Crimes against persons, such
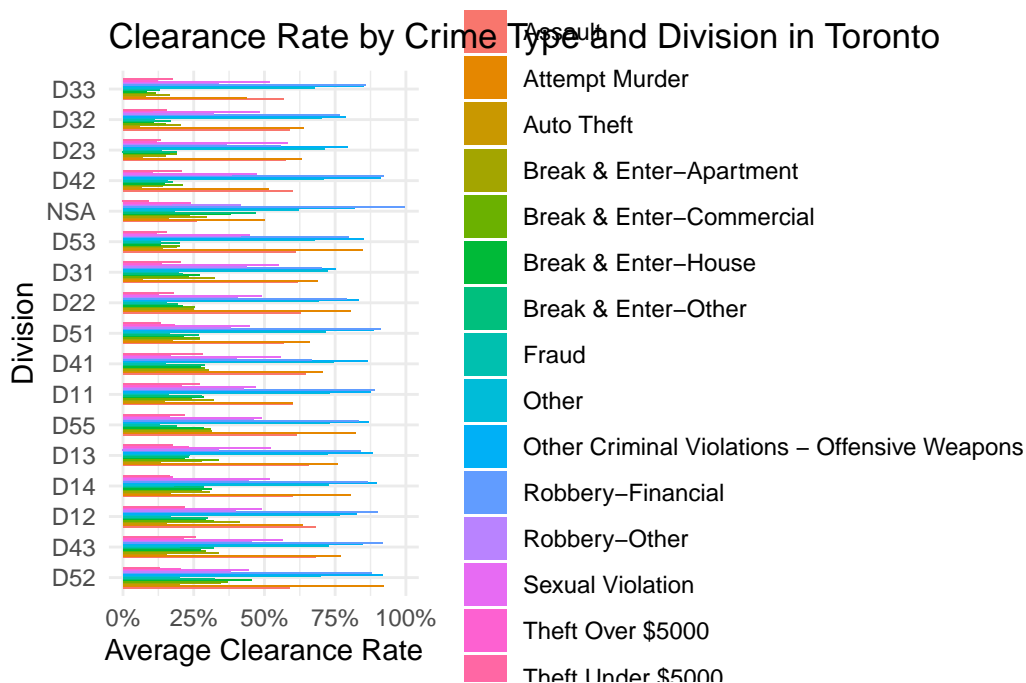
Figure 3: Clearance Rate by Crime Type

as assault and sexual violations, generally have relatively high clearance rates, particularly in suburban areas.

4 Discussion

The results of this analysis show clear trends in crime patterns across Toronto. Downtown areas are significantly affected by property crimes like auto theft and break-ins, driven by dense population and high economic activity. Suburban areas, however, report more violent crimes, which may be influenced by socio-economic factors such as income inequality and access to social services (Mohammadi et al. 2022).

The data also highlights the gap between reported incidents and the number of cleared cases. Low clearance rates for property crimes, particularly auto theft, suggest the need for more effective crime prevention measures. Increasing surveillance and expanding the capacity of law enforcement agencies in high-crime areas may help address this issue.

Further research into socio-economic factors driving these trends is necessary. For example, regions with higher rates of poverty and unemployment may experience more violent crimes. Additionally, strategies like community policing and public engagement in high-risk areas may prove effective in reducing crime rates and improving clearance rates.

5 Conclusion

This paper analyzed crime trends in Toronto using the Police Annual Statistical Report from 2014 to 2023. The findings demonstrate significant varieties in crime distribution across Toronto's police divisions, with property crimes being more concentrated in downtown areas and violent crimes more prevalent in suburban regions. These insights are critical for shaping future crime prevention policies and ensuring the effective allocation of related resources.

Further research should explore the socio-economic factors influencing these trends, including whether community engagement can help lower crime rates in high-risk areas.

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