An Analysis of Crime Rates in Toronto Neighbourhoods: from 2014-2023*

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This paper analyzes crime trends in Toronto neighborhoods, highlighting a concerning increase in auto theft and assault rates over the years. It visualizes these trends, identifies areas with the highest crime rates, and suggests implications for further research.

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*Code and data are available at: https://github.com/RayanAlim/Toronto_Crime_Rate_Exploration

1 Introduction

In this paper, we delve into the landscape of crime within Toronto's neighborhoods, seeking to shed light on significant trends and patterns that have emerged over recent years. Our analysis encompasses a range of criminal offenses, including Assault, Auto Theft, Break and Enter, Robbery, Theft Over, Homicide, and Shootings etc.. The focal result of this exploration is the discernible rise in Auto Theft and Assault rates, which warrants closer examination and consideration.

Furthermore, we investigate the distribution of these crimes across Toronto, pinpointing areas with the highest crime rates and identifying potential areas for further research. By using several visualizations, we aim to provide a comprehensive overview of the current state of crime in Toronto, offering insights that may inform policy decisions and future studies in the field.

The remainder of this paper is structured as follows: In the next section, we provide details about the data source and variables under consideration. Subsequently, we present our findings, including a discussion of the most noteworthy trends in crime rates. The paper concludes by addressing its limitations and suggesting potential avenues for future research.

2 Data

2.1 Data Source and Context

The dataset used was obtained from Toronto Open Data[1] in this analysis comprises of crime data by Neighbourhood. It includes counts for various criminal offenses, including Assault, Auto Theft, Break and Enter, Robbery, Theft Over, Homicide, and Shooting. Additionally, the dataset incorporates crime rates per 100,000 population, computed using population estimates supplied by Environics Analytics. [1]

2.2 Data Summary

Consistent with the standard definition outlined by Statistics Canada (StatsCan), the crime rate is determined as the number of reported crimes per 100,000 population* per annum. This metric serves to facilitate equitable comparisons of crime levels across distinct geographic areas characterized by varying population sizes. In contrast to the raw crime count, the crime rate offers a more impartial assessment of crime trends over time, accounting for fluctuations in regional population figures. Using this data, the averages of each crime was taken for each year as displayed in Table 1. Continuing on for each year from 2014 to 2023.

Table 1: Average crime counts by type over the years. ’ ’ represents data for 2016-2018

Crime Type	2014	2015	’ ’	2019	2020	2021	2022	2023
ASSAULT	104.62	113.13	’ ’	130.39	113.76	120.33	133.06	154.28
AUTOTHEFT	22.63	20.65	’ ’	33.44	36.27	41.64	61.15	76.03
BIKETHEFT	19.13	20.85	’ ’	23.44	24.78	19.96	18.60	19.04
BREAKENTER	45.47	43.74	’ ’	53.41	43.76	35.89	38.21	48.30
HOMICIDE	0.37	0.37	’ ’	0.50	0.45	0.53	0.44	0.45
ROBBERY	23.22	21.97	’ ’	22.20	17.55	14.20	17.76	19.93
SHOOTING	1.12	1.82	’ ’	3.11	2.92	2.58	2.40	2.16

3 Results

3.1 Not all crimes are equal

The average crime counts for different crime types are displayed in Figure 1. Figure 1 provides a visual representation of how crime counts have evolved over the years for different crime types. Auto theft and assault have shown significant increases compared to other crimes.

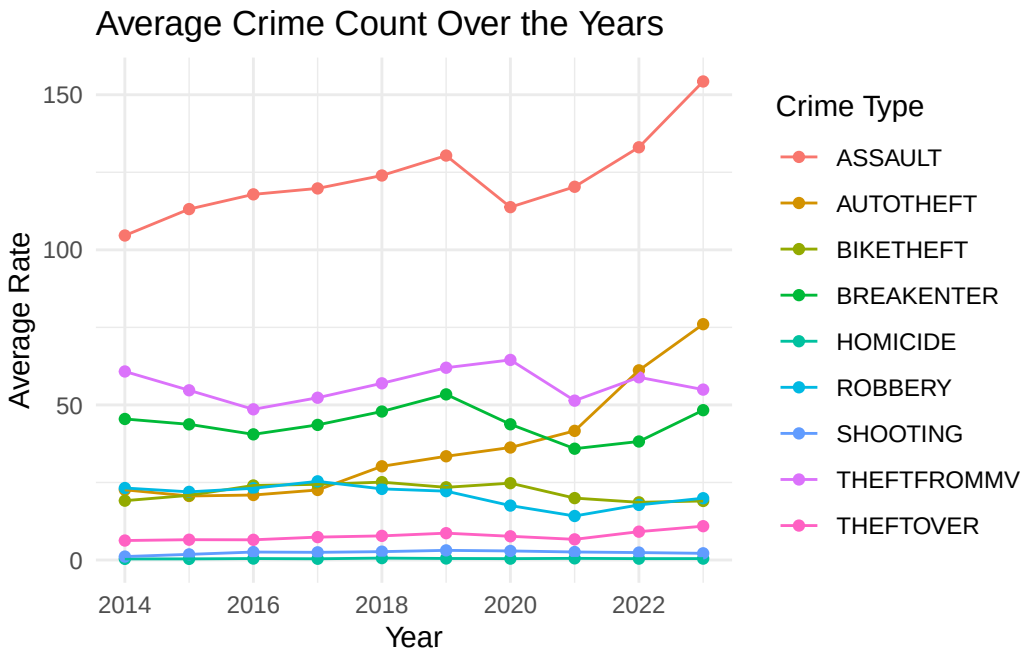

Figure 1: Average crime count by type over the years

3.2 Downtown Danger:

The distribution of total crimes over the years reveals that the Yonge-Bay corridor has the highest crime rate, followed by Kensington-Chinatown and Downtown Yonge East. These findings highlight downtown areas as having higher crime rates in the city.

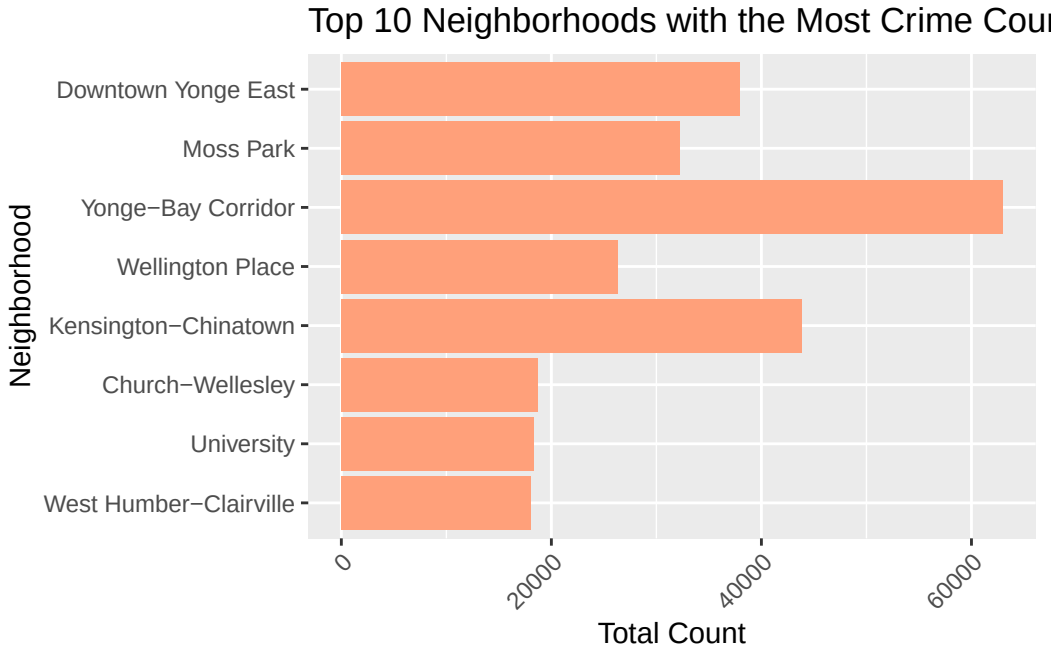

Figure 2: 10 least safe neighborhoods by total crime count (2014-2023)

3.3 Bigger Picture: City-wide crime distribution

4 Discussion

4.1 Weaknesses and next steps

Weaknesses and next steps should also be included.Try and explore relationships between crime and other socioeconomic factors, which have been linked in literature and try and apply it to Toronto such as: Education [1], Poverty[], Policing []. As next steps I would want to explore how the relationships between these factors align with crim in neighbourhoods. Another avenue to extend is o cluster crims types together based on similarity and see if any pattern emerge.

5 References