Analyzing Toronto Police Statistics between 2014 to 2022*

arrested-and-charged-person

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According to police statistics, as a branch of crime statistics, Toronto Police statistics comprehensively depict the gender,age groups,crime types of individuals arrested,location, in Toronto from 2014 to 2022.This study delves into Toronto's crime dynamics, revealing a distinctive quadratic pattern in crime rates, notably dipping in 2020 during the city-wide closure. A nuanced classification of criminal conduct over nine years underscores a focus on property infringement and personal safety threats. The Controlled Drugs and Substances Act exhibits a noteworthy downward trend, prompting considerations of contributing factors and policy implications. Geographical analysis emphasizes six high-crime blocks, with the NSA neighborhood standing out for its significant crime prevalence. Age-based cartography reveals the persistent dominance of the 25-44 age bracket among offenders, while a surge in juvenile crimes in 2022 calls for collaborative societal interventions.

1 Introduction

Criminal statistics, particularly within the domain of policing, serve as a vital instrument in comprehending and addressing patterns of criminal behavior within society. Toronto Police statistics, as an exemplar in this context, offer a meticulous portrayal of the demographic dynamics and criminal typologies characterizing arrests within the city from the temporal span of 2014 to 2022. Such statistical analyses provide a nuanced understanding of the intricate interplay between law enforcement efforts and the evolving landscape of criminal activities.
 The field of criminal statistics functions as a branch of criminology, offering empirical insights into the prevalence, distribution, and trends of criminal incidents. Policing agencies, including the Toronto Police, routinely engage in the systematic collection, analysis, and interpretation

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*Code and data are available at: https://github.com/siru1366/starter-folder.git.

of data derived from their law enforcement activities. These statistics encapsulate a multi-faceted depiction of criminal occurrences, spanning diverse facets such as the demographics of apprehended individuals, the temporal distribution of criminal incidents, and the categorization of offenses according to their nature and severity.

Toronto Police statistics, with their temporal range extending from 2014 to 2022, encapsulate an extensive period characterized by shifts in societal dynamics, legislative alterations, and advancements in law enforcement strategies. The juxtaposition of gender, age cohorts, and crime types in these statistics elucidates the differential impact of law enforcement efforts across various demographic groups and crime categories. Such granularity facilitates a more nuanced understanding of the socio-criminological landscape, enabling policymakers, researchers, and law enforcement agencies to tailor interventions effectively. This study delves into the multi-faceted facets of Toronto's crime landscape, employing a curious and analytical lens to dissect established patterns and explore emerging dynamics. The Figure 1 representation, resembling a quadratic function, initiates a dialogue on the intriguing interplay between public health interventions and crime rates. The subsequent shift towards a more granular analysis, as proposed, aligns with the pursuit of deeper insights.

You can and should cross-reference sections and sub-sections.

The remainder of this paper is structured as follows. Section 2….

2 Data

The data employed in this paper was sourced from the opendatatoronto Library of the City of Toronto (Gelfand (2022)). Specifically, the dataset utilized is titled Police Annual Statistical Report - Arrested and Charged Persons Toronto Police Services (2023) from the Toronto Police Services. Data cleaning and analysis were conducted using the open-source statistical programming language R (R Core Team (2022)), leveraging functionalities from the tidyverse (Wickham et al. (2019)) suite, including ggplot2 (Wickham (2016)), dplyr (Wickham et al. (2022)), readr (Wickham, Hester, and Seidel (2022)), tibble (Müller and Wickham (2022)), janitor (Firke (2021)), stringr (Wickham (2019)), and knitr (Xie (2014)). The detailed procedures for data extraction and cleaning are expounded upon in the subsequent subsections.

Firstly,upon analyzing the planes Figure 1 representation, discernible fluctuations in Toronto's crime rate over the years are apparent, resembling the characteristic curve of a quadratic function with an upward orientation. The nadir in 2020 coincides notably with the implementation of a city-wide closure policy in response to the COVID-19 outbreak. This correlation suggests a nuanced relationship between public health measures and the dynamics of criminal activity, warranting further exploration into the interplay of societal and environmental factors influencing urban safety trends.

An examination solely focused on the aggregate count of criminal incidents per annum yields a somewhat overarching perspective. To cultivate a more nuanced understanding, it becomes
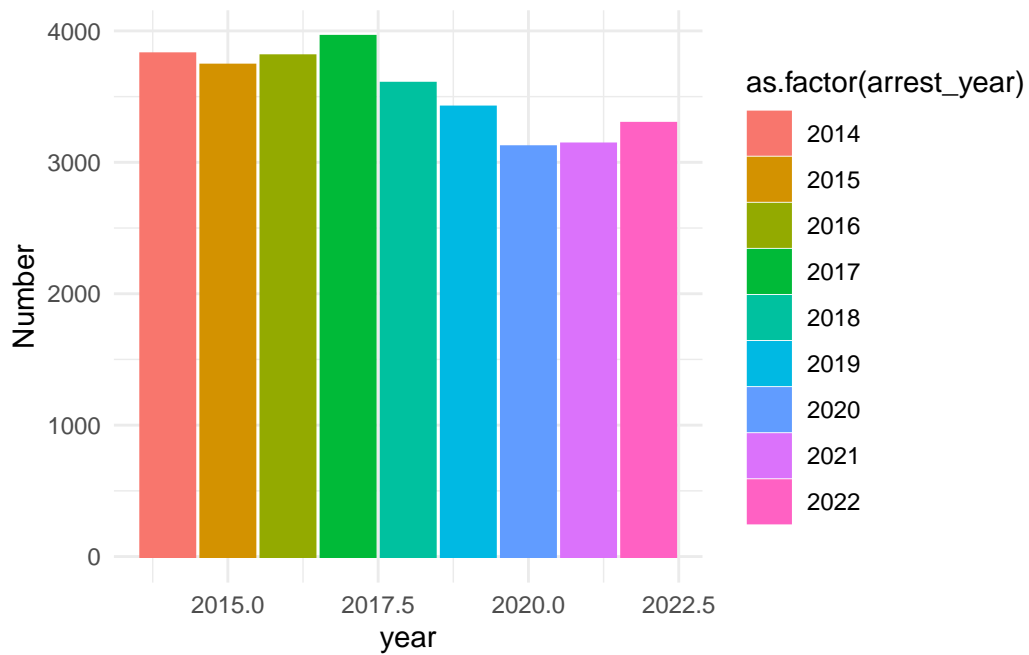
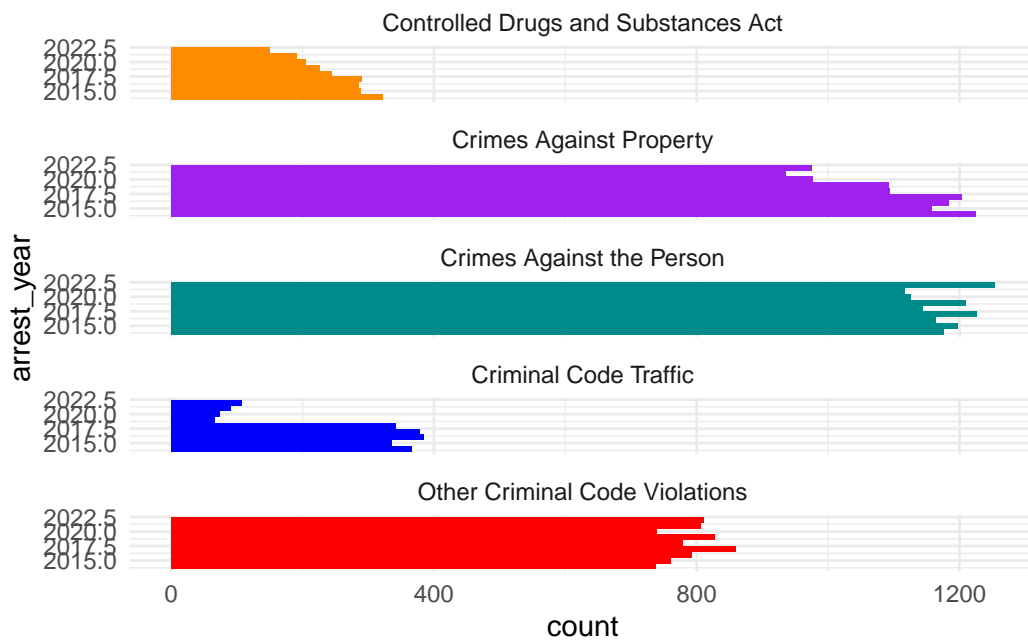Figure 1: Relationship between crimes and year

Figure 2: Relationship between crimes category and year

imperative to conduct a more granular analysis that delves into the intricate details and specific categories of criminal activities. The analysis of criminal conduct in Toronto reveals a discernible classification into five distinct categories. Drawing upon data Figure 2 spanning the preceding nine years, a prominent pattern emerges, underscoring that the primary forms of criminality center around property infringement and threats to personal safety. This nuanced observation underscores the significance of addressing these specific dimensions within the context of Toronto's criminal landscape.

Significantly, an observable downward trajectory characterizes the incidence of offenses falling within the purview of the Controlled Drugs and Substances Act. This noteworthy trend underscores a discernible reduction in such infractions, prompting a consideration of potential contributing factors or policy implications within the framework of legislative oversight and societal dynamics.
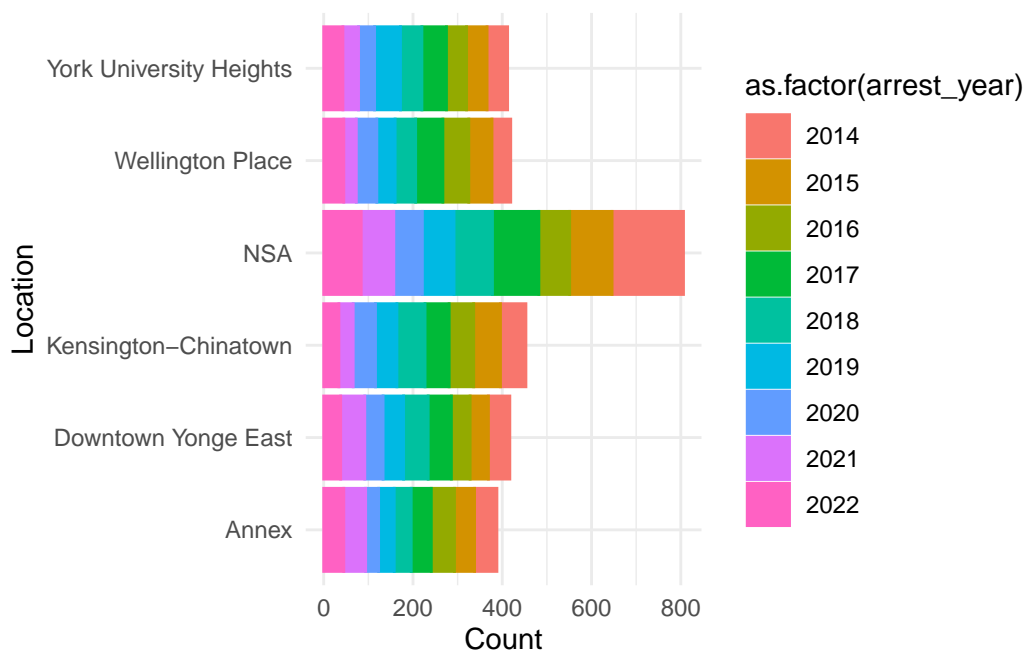

Figure 3: Relationship between crimes category and location

Beyond the classification based on the nature of the crime, the geographical context of criminal incidents also holds paramount significance in crime analysis. The primary dataset encompasses an extensive list of 158 distinct streets in Toronto, rendering it operationally unwieldy for presentation purposes. In the interest of visual clarity and expediency, a pragmatic approach is adopted, focusing specifically on the six blocks that emerge as the most frequent locations for criminal activities. This judicious selection facilitates a more focused and manageable exploration of spatial patterns within the broader landscape of criminal occurrences. Figure 3 The neighborhood known as NSA (Neighborhood Security Analysis) in Toronto registers the highest incidence of criminal activities, exhibiting a prevalence that is nearly twofold compared to the area occupying the second position in the ranking. This noteworthy obser-

vation underscores the pronounced concentration of criminal incidents within the NSA region, necessitating a comprehensive examination to discern underlying factors contributing to such a discernable disparity in crime rates across different locales in Toronto.

Figure 4: Relationship between age and yearly crimes

The cartography of offenders holds a pivotal role in comprehensive crime analysis, particularly when delineating them based on age categories. This stratification allows for the identification of specific age cohorts warranting heightened scrutiny and focused attention. This meticulous categorization aids in discerning nuanced patterns within the demographic landscape of offenders, contributing substantively to a more refined understanding of the interplay between age dynamics and criminal behavior. Over the course of the past nine years, the predominant demographic among offenders in Toronto has consistently manifested within the age bracket spanning from 25 to 44 years. Figure 4 It is crucial to highlight that the incidence of juvenile crimes in Toronto has shown an elevation in the year 2022 when juxtaposed against the preceding year. This discernible rise underscores the necessity for collaborative endeavors from diverse sectors of society to address and mitigate the surge in juvenile criminal activities.

The consideration of gender, alongside age, constitutes a pivotal aspect of our analytical framework. The chart Figure 5 provides insights into the gender distribution across various age groups among offenders. Regardless of the age cohort, the proportion of female offenders consistently falls significantly below that of their male counterparts. This trend is particularly pronounced in the juvenile and senior age groups, where the number of female offenders represents only about one-quarter of the male demographic. In the middle-aged group, this figure hovers at approximately one-third of the male population.
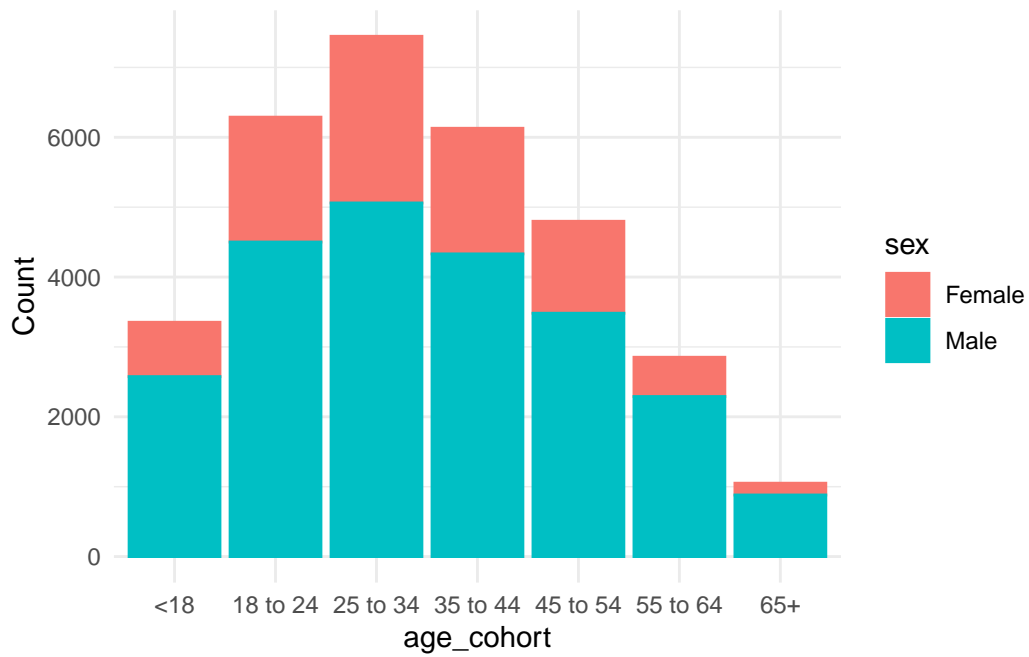
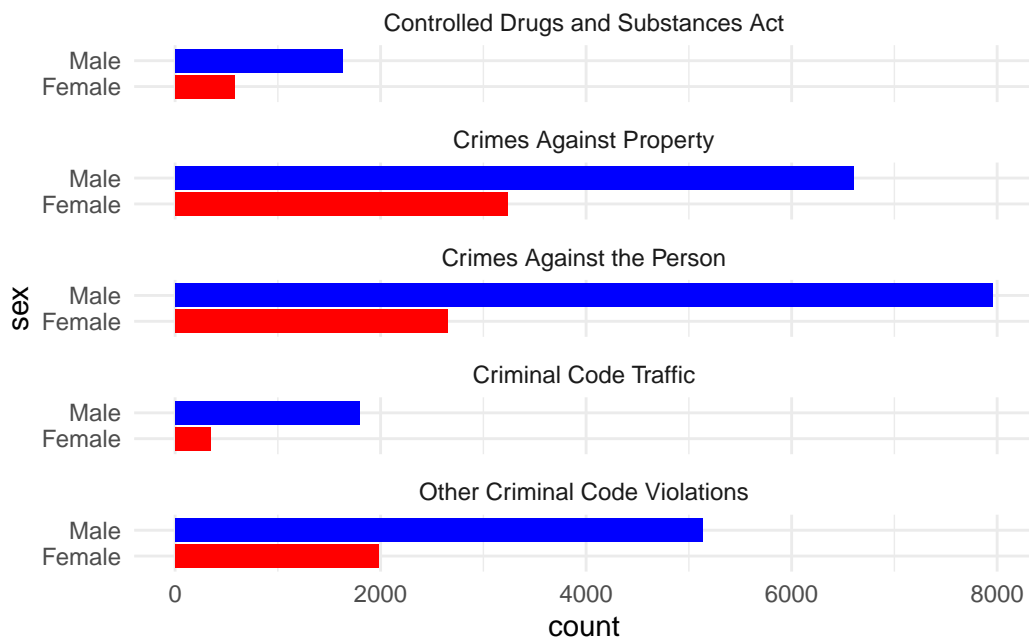Figure 5: Relationship between crimes category and width

Figure 6: Relationship between crimes category and gender

By employing various screening methodologies, we can discern the gender distribution among offenders across distinct crime categories.@fig-gender-category Consistently, the representation of women in the five principal crime types in Toronto is notably lower than that of men. Specifically, the male-to-female ratio is most proximate in offenses against property, standing at approximately 2:1. In contrast, the male-to-female ratio diverges considerably in the category of criminal traffic offenses, where it reaches approximately 5:1.This variance may be attributed to the demographic composition of drivers, where the proportion of female drivers is noticeably smaller than that of their male counterparts.

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