Wasted Money: Toronto Police Budget and Crime Number*

Analyzing the changes in annual police budget and its effects on the number of crimes within Toronto from 2020 to 2023

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September 24, 2024

An analysis of Toronto's annual police budget and crime counts was conducted using R to determine the effectiveness of the budget in preventing crime within the city from 2020 to 2023. It was found that the number of reported crimes steadily increased while the rate of cleared crimes decreased over time. Changes in the police budget, including raises from 2020 to 2022 and a reduction from 2022 to 2023, were uninfluential toward crime rates. The finding that the police budget does not have positive or negative relationships with crime insdicates that Toronto's current mode of crime prevention is unproductive, and the police budget is potentially being wasted. It calls for a need to reconsider how the safety of Toronto's citizens should be facilitated.

1 Introduction

In recently years, personal safety has developed into one of the most prominent concerns among Toronto's citizens. Parsaud (2021) illustrated the recent rise in the number of violent crimes; the annual number of shootings in 2020 was 462, almost double the average annual number from 2004 to 2015. The finding of Putrik et al. (2019) constructs the connection between violence and the lack of subjective safety, showing that people's perception of higher rates of violent crimes, among other forms of crime, was the only factor that had a positive correlation with feeling unsafe. The objective increase in violent crimes and the subjective safety concerns compel individuals to question whether the city's police department is fulfilling its purpose, especially since the police consume a significant proportion of the city budget.

*Code and data supporting this analysis are available at: https://github.com/YisuHou1/Toronto-Police-Budget-Statistics.

To date, no comprehensive study has addressed the relationship between the police budget and the number of crimes in Toronto. However, such an analysis is essential to assess the effectiveness of the police department in preventing crime and protecting the safety of citizens. The study was conducted with the purpose to fill this particular gap in the literature.

Relying on official data provided by Open Data Toronto Gelfand (2022) and utilizing R, a programming language created by R Core Team (2023), the annual police budget, the sum of reported crimes, and the sum of cleared crimes were extracted for years 2020 to 2023. Using the data, it was identified that the number of crimes consistently rose while the number of cleared crimes remained relatively stable, leading to a reduction in the clearance ratio. The total annual budget of the police department, calculated through subtracting revenues from the money spent, increased slightly from 2020 to 2022 but fell by over 40% in 2023. The drastic change observed in the police budget data and the consistency of the crime number data demonstrates Toronto police's lack of influence on crime. Thus, this paper encourages a thorough analysis of why the investment toward Toronto's police department was not translated into fewer crimes and increased safety.

The subsequent sections of this paper includes an introduction and justification of the data source, an overview of the relevant variables, and a preliminary analysis of the temporal trend between police budget and the number of crimes in Toronto.

2 Data

Two separate datasets were extracted from Open Data Toronto Gelfand (2022), one recording all instances of expenditure and revenue since 2020, the other storing the number of reported crimes in different categories and the corresponding number of cleared crimes until the end of 2023. The summary statistics of the disaggregated data are located in the Appendix. They are not included in the body of this paper because they are not used for analysis; the paper emphasizes aggregate budgets and reported crime counts instead of individual paychecks and crime categories.

Open Data Toronto was selected to be the data source because it provides official data from the City of Toronto, ensuring a decent level of credibility, variety, and depth. The only alternative source of datasets on crime and police budget is the data portal of Toronto Police, and the datasets are identical to those in Open Data Toronto. The measurements of the data, as provided by Gelfand (2022), are not perfectly reliable. The police budget dataset is measured by addressing approved budgets from Toronto Police Services Board and City Council and operation expenses incurred. Expenses or revenues that were not officially reported were excluded from the dataset. The dataset for crime reports and cleared crimes relies on reports filed by officers, so undiscovered crimes are not included, and unfounded reports are included. The biases in the measurements increases the difficulty when interpreting trends. For example, if the number of reported crimes increased over time, it might be due to an actual increase in the number of crimes or an improvement in officers' ability to find crimes.

The cleaned, aggregated datasets are as follows:

Table 1: Total Police Budget Over Years

Year	Yearly Budget	Change From Last	Percent Change
2020	2249095580	NA	NA
2021	2251806074	2710494	0.12
2022	2334406349	82600275	3.67
2023	1220043900	-1114362449	-47.74

Table 2: Total Crime Reports Over Years

Year	Yearly Crimes	Cleared Crimes	Percent Cleared
2020	118568	41984	35.41
2021	120397	39384	32.71
2022	141136	42757	30.29
2023	169620	51161	30.16

Data cleaning and calculations were used to arrive at the variables in Table 1 and Table 2. "Year" was limited to 2020-2023 because the oldest data in the police budget dataset is 2020, and the most recent data in the crime report dataset is 2023. "Yearly Budget" was calculated by summing all individual expenses and revenues in the disaggregated dataset, which stores positive values for expenses and negative values for revenues. "Change From Last" was acquired by subtracting the previous year's "Yearly Budget" from the current year, except 2020 because the previous year does not exist. "Percent Change" was calculated by dividing the prevous year's "Yearly budget" by the current "Change From Last". For Table 2, "Yearly Crimes" and "Cleared Crimes" were calculated by summing the reported cases and cleared cases of all crime categories in the disaggregated dataset, respectively. The data cleaning proecss was aided by the R package tidyverse Wickham et al. (2019).

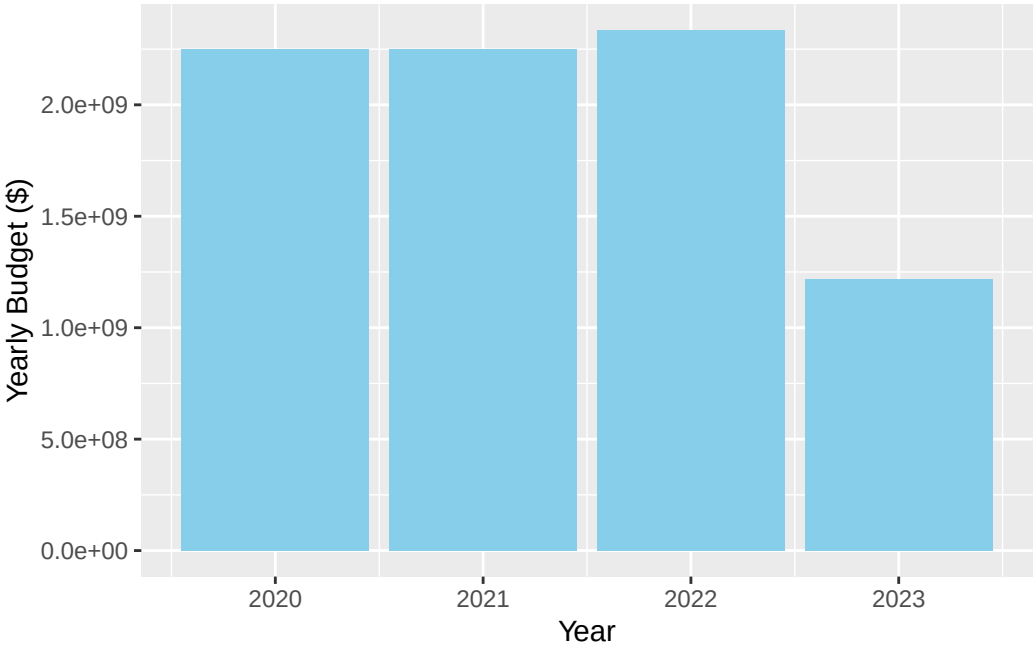

Figure 1: Total Police Budget Over Time

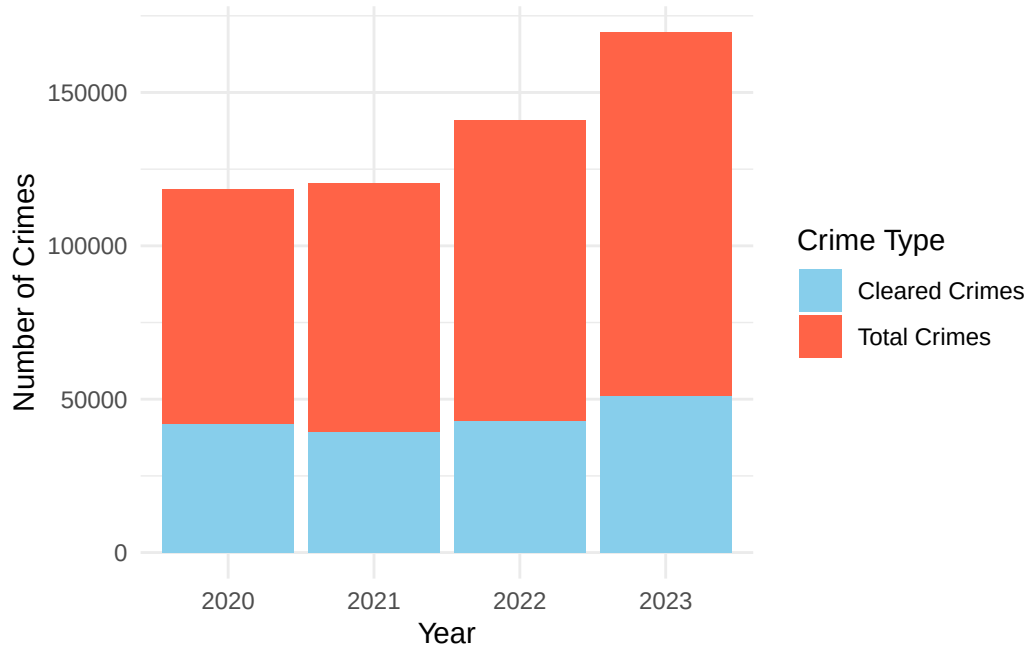

Figure 2: Total Reported Crimes and Cleared Crimes Over Time

Table 1 and Figure 1 shows minor increases in the police budget from 2020 to 2022, and a near-half reduction in 2023. Figure 2 illustrates consistent increases in total crimes from 2021 to 2023, while the cleared cases remained relatively static throughout four years. Thus, it is unsurprising to observe that in Table 2, the rate of cleared crimes decreased steadily, demonstrating the persistent deterioration of the police's ability to prevent crime, regardless of the budget. It can be argued that the amount of resources possessed by Toronto Police does not impact its productivity, and it is necessary to reconsider how the city budget should be allocated. Taking this another step further, the fact that altering the police budget does not impact the number of crimes indicates that our policing is fundamentally ineffective, or that the laws, even enforced through policing, does not prevent crime. Therefore, it is imperative to assess whether the current modes of policing and lawmaking have real impacts on criminals' decision-making.

Appendix

The appendix is left blank for now. I need to add raw tables here and update tests. The plots are created with Xie (2023) and Zhu (2024)

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