Emergency Homeless Shelter Availabilities Across Toronto*

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In this paper I analyze the occupancy and capacity of emergency homeless shelters across Toronto.

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*Code and data are available at: https://github.com/cher-ning/shelter_occupancies

1 Introduction

Much like many other large cities around the world, Toronto is facing a homelessness crisis that seems to be ever-increasing. Whether it is because of environmental factors such as rising housing prices and lack of employment opportunities, or other issues such as drug abuse and mental health struggles, the homeless population of Toronto has risen to an alarming 10,811 in May 2023 (Draaisma 2023). The city council has recognized the urgency of this problem, declaring homelessness an emergency, and pledged their full efforts towards helping the homeless population move into safe homes (Draaisma 2023). Since then, the city of Toronto has focussed on securing more financial support from the provincial and federal government, requesting up to $25 million to fund various housing projects. Notably, the Canada-Ontario Housing Benefit (COHB) aimed to move 1,600-2,000 households access and transition into permanent housing in 2023-2024 (Draaisma 2023).

So, how did these efforts turn out? Analyzing Toronto's shelter occupancy data from 2024, we do not see optimistic results. Average occupancy rate of emergency shelters per night remains at 99%, with no significant decrease across the months (ZipDataMaps, n.d.). Despite the evident high demand, there is even a decrease, albeit small, in shelters' funding capacity over the months (ZipDataMaps, n.d.).

In this paper, emergency shelter occupancy and availability will be compared across different months as well as different regions of Toronto to search for patterns or fluctutations in demand. The region of each shelter will be determined by its forward sorting area (FSA) code, or the first three digits of its postal code. As well, the regions that observe the highest frequency of failing to make efficient use of funding are identified as potential problem areas; further investigation into potential causes would be beneficial to understand if there are improvements that can be made so that the limited available funding can be maximized.

To achieve this, Section 2 will introduce the Toronto Shelter & Support Services dataset used for the present analysis and the data cleaning methods applied. The following Section 3 will then go more into depth to apply context to the patterns present in the data, aiming to understand the scope and urgency of the issues at hand.

2 Data

2.1 Overview

The dataset used for analysis is of shelter occupancy in the year 2024 (ZipDataMaps, n.d.), from Open Data Toronto (Gelfand 2022). The data is updated daily by the Toronto Shelter & Support Services and has the Open Data License (Section A.1). However, one limitation it faces is that it is unaudited, therefore there are limited verification methods to ensure that the shelter programs' records are accurate to their actual situation.

All shelters in this dataset are classified as either Emergency or Transitional programs, with Transitional locations providing more specialized programming and being exclusively offered to eligible individuals (ZipDataMaps, n.d.). With consideration for the greater accessibility of Emergency programs to the entire homeless population as well as the greater number of them shelters compared to Transitional, this analysis will focus on Emergency programs only (ZipDataMaps, n.d.). As well, all recorded shelters either measure capacity based on number of beds or rooms; similarly, this analysis will focus only on bed-based capacity shelters due to its greater prevalence (ZipDataMaps, n.d.). This means that all entries pertaining to non-Toronto based, Transitional type, or room-based capacity shelters were not considered in this analysis. It should also be noted that as this dataset contains only data from this year, only data from January 1 to September 26 is accessible.

With the remaining data entries, the variables of interest were the shelter's location, funding capacity, actual capacity, occupied beds, unoccupied beds, unavailable beds, and occupancy rate. Funding capacity refers to the maximum number of beds the location is able to offer, and represents the sum of actual capacity and unavailable beds. Unavailable beds refers to the number of spaces that are out of service due to logistical reasons (ZipDataMaps, n.d.). Actual capacity represents the number of beds that are usable per night, and should be the sum of occupied and unoccupied beds. After the dataset was cleaned for entries with empty values and invalid negative values, all entries in the remaining set were shown to adhere to these relations when tested.

The R Programming language (R Core Team 2023) was used for all data cleaning, testing, and analysis. The packages `opendatatoronto` (Gelfand 2022), `tidyverse` (Wickham et al. 2019), `dplyr` (Wickham et al. 2023), and `readr` (Wickham, Hester, and Bryan 2024) were used to simulate and download data. Packages `tidyverse` (Wickham et al. 2019) and `janitor` (Firke 2023) were then used to clean and test the downloaded dataset.

2.2 Results

This following section will use packages `ggplot2` (Wickham 2016) and `knitr` (Xie 2024) to generate several plots and tables to assist with visualizing patterns in the dataset.

Table 1 provides an initial summary of the shelters' mean occupancy rates over the months. As observed, there is consistent and high demand for emergency shelters regardless of the time of year.

Table 1: 2024 Shelter Occupancy Rate Over the Months

Month	Occupancy Rate
Jan	98.82
Feb	99.17
Mar	98.53

Month	Occupancy Rate
Apr	98.94
May	99.13
Jun	98.77
Jul	99.12
Aug	99.37
Sep	99.36

The occupancy rate can then be broken down into the mean funding capacity, actual capacity, and real number of occupied beds per month. The high occupancy rate observed in Table 1 makes it unsurprising to see the number of occupied beds consistently match so closely to the shelters' actual capacity. Notably, there is a significant decrease in funding around March, which will be further discussed in Section 3. It is also important to note that despite the near 100% occupancy rate, there is often a gap between the funding capacity and actual capacity, suggesting that sometimes the given facilities may not be utilized at their maximum potential.

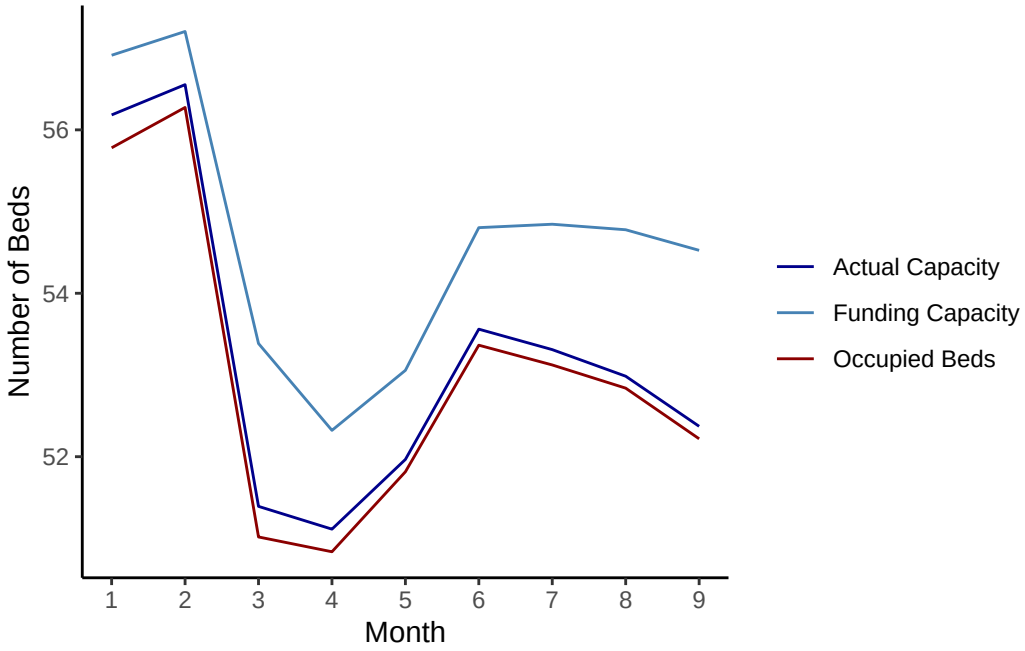

Figure 1: Shelter Capacity and Occupancy From Jan to Sep 2024

Another dimension to consider is the geographical region of the shelters. Still focussing on the mean number of occupied beds, Figure 2 shows a rather wide spread across different FSA regions, ranging from a minimum of 18.60 to a maximum of 87.74. Some of the regions

reporting on the higher end include M5H, M6P, and M2H, which are neighbourhoods in Old Toronto, North York, and around High Park (Toronto Shelter & Support Services 2024).

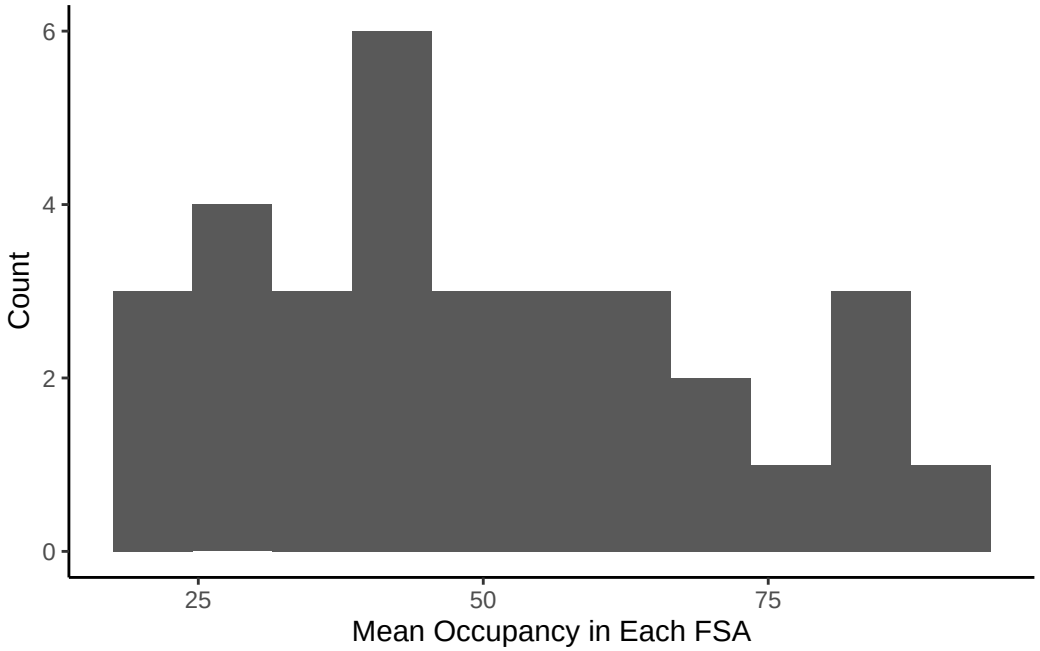

Figure 2: Average Bed Occupancy of Shelters in Each FSA Region

Another dimension to consider in analyzing which regions may be experiencing higher rates of homelessness is the number of distinct shelter locations made available there. Sorting for unique shelter ID's across the 32 FSA regions in this data set, Table 2 and Figure 3 show that regions most commonly have only 1-2 shelters each, but there are areas with particularly high density. Specifically, the region M5A located in Old Toronto (Toronto Shelter & Support Services 2024) has 7 shelters, which is several times the number placed in other regions.

Table 2: Number of Emergency Shelter Locations Reported in Each Toronto FSA

FSA	Number of Shelter Locations
M5A	7
M5R	4
M5C	3
M5S	3
M6H	3
M6K	3

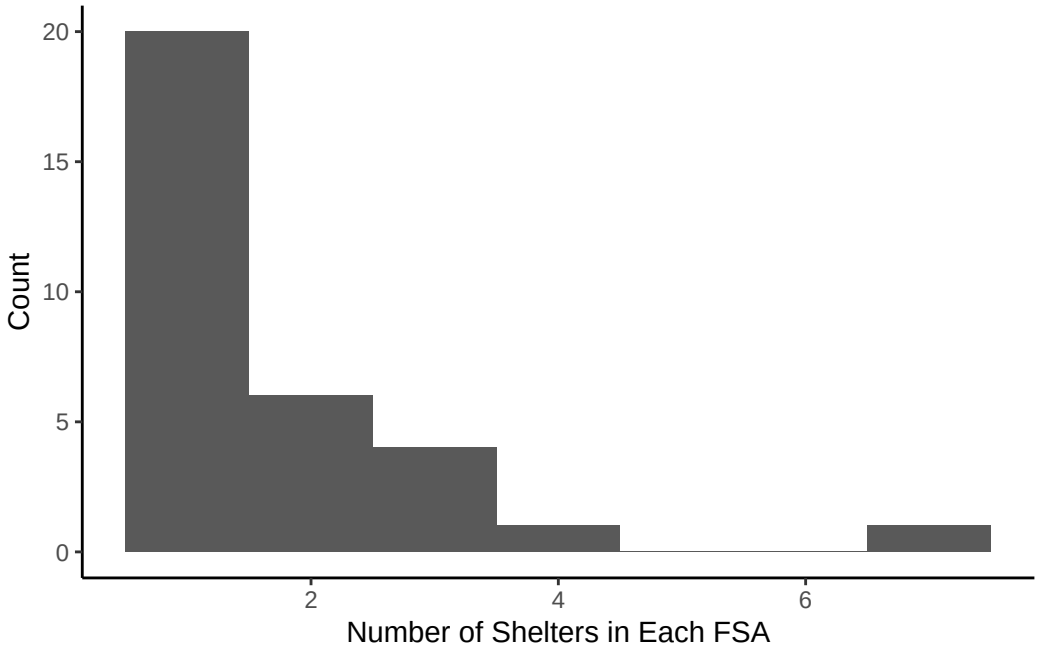

Figure 3: Number of Shelters in Each FSA

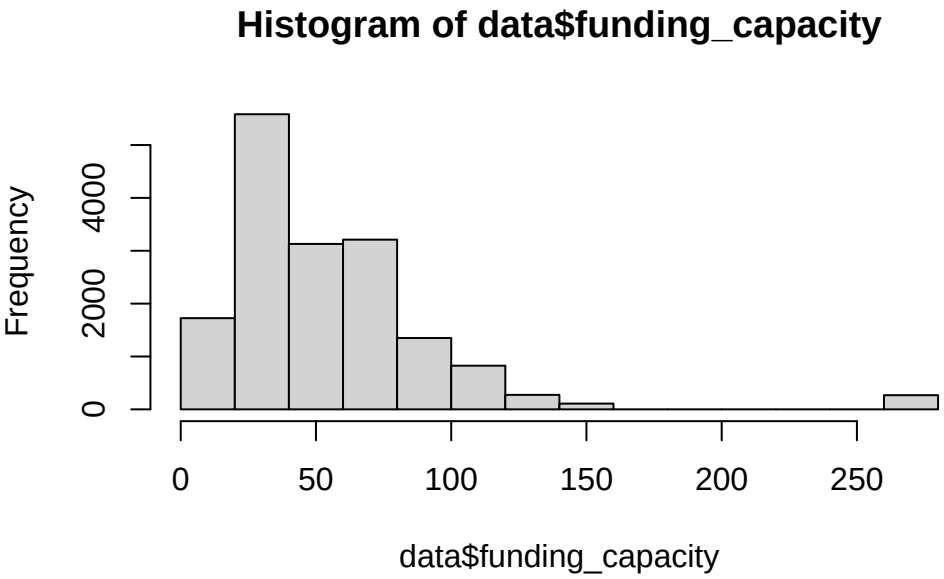

Figure 4: Funding Capacities of Toronto Emergency Shelters

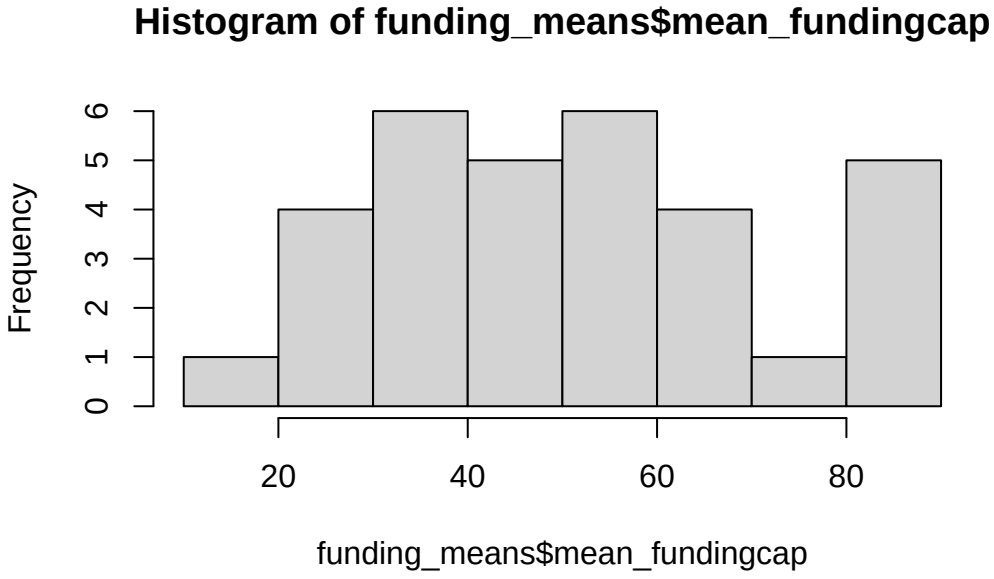

Figure 5: **?(caption)**

Table 3: Number of Unavailable Beds/Night At Different FSAs

FSA	Average Number of Unavailable Beds
M2N	9.225352
M5G	9.140187
M6K	4.385066
M5V	4.248835
M4C	3.630682

Figure 6: **?(caption)**

3 Discussion

Additionally, the distribution of shelter locations across the city's different forward sortation areas (FSA), or the first three digits of a zip code, displays that there are particular areas with higher demand than others. For example, particular blocks in Old Toronto are evidently areas that require higher attention, as they are among the FSAs to receive most funding as well as the ones that have highest number of shelters (#cite dataset).

3.1 First discussion point

3.2 Second discussion point

3.3 Third discussion point

3.4 Weaknesses and next steps

Weaknesses and next steps should also be included.

A Appendix

A.1 Data License Information

"Contains information licensed under the Open Government Licence – Toronto" (City of Toronto, n.d.). # Additional data details

References

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