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 (#cite CBC). 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 (#CBC). 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 (#CBC).

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 (#cite dataset). Despite the evident high demand, there is even a decrease, albeit small, in shelters' funding capacity over the months (#cite dataset).

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 (#cite dataset), from Gelfand (2022). The data is updated daily by the Toronto Shelter & Support Services and has the Open Data License City of Toronto (n.d.). 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 (#cite dataset). 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. 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. This means that all entries pertaining to non-Toronto based, Transitional type, or room-based capacity shelters were not considered in this analysis.

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 (#cite dataset). 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 data.

2.2 Results

(# check if occupancy rate varies over months

Table 1: Shelter Occupancy Rate in 2024 Over the Months

Month	Mean Occupancy Rate	Mean Funding Capacity
Jan	98.82139	56.91309
Feb	99.17026	57.20373
Mar	98.53031	53.38536
Apr	98.93704	52.32272
May	99.13200	53.05673
Jun	98.77187	54.80310
Jul	99.12143	54.84483
Aug	99.37291	54.77734
Sep	99.36013	54.52559

(#first find num shelters per fsa

Table 2: Number of Unique Shelters vs FSA

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

Figure 1: **?(caption)**

(#discuss summary stats of funding capacity in text, can consider to only include top few rows of this table

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.

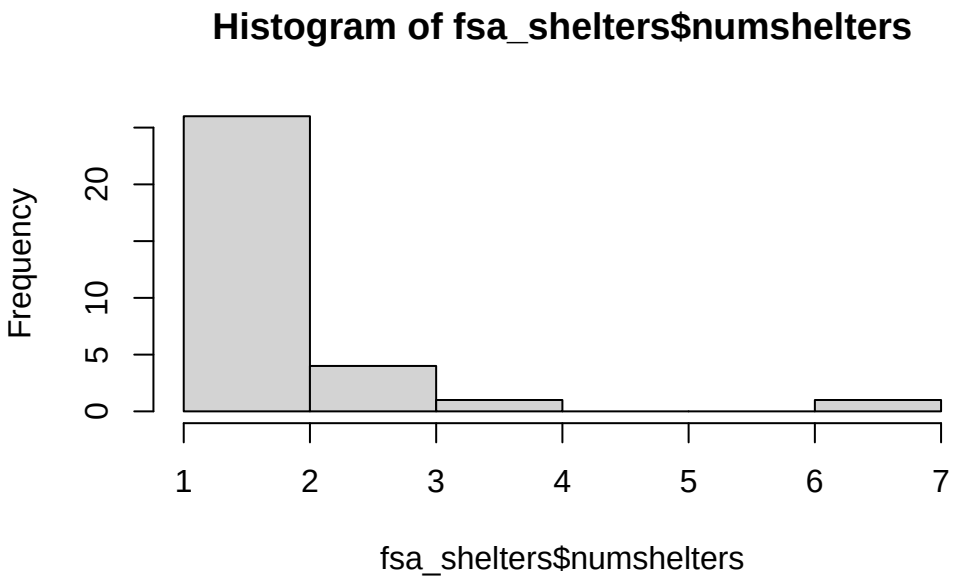

Figure 2: Number of Shelters in Each FSA

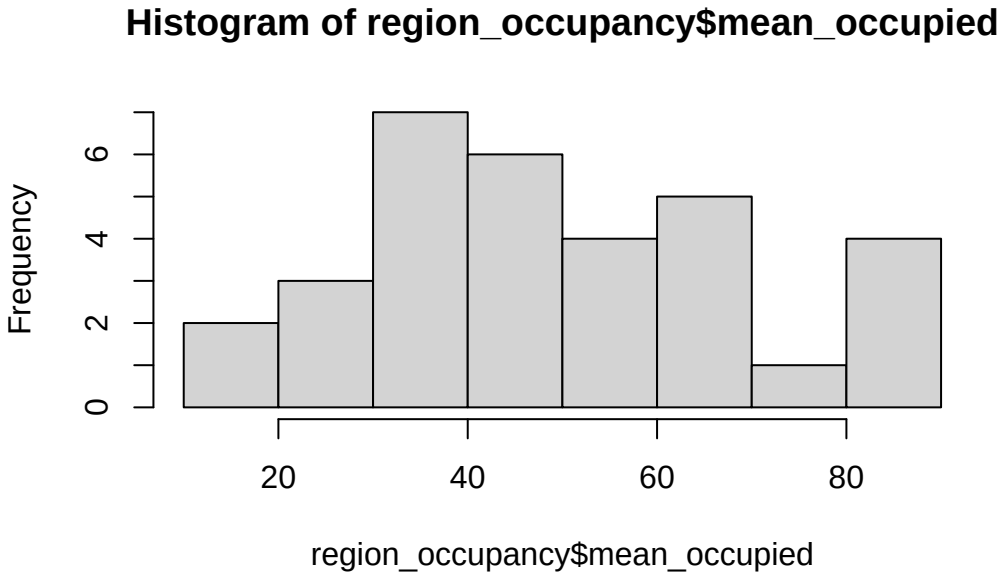

Figure 3: Average Bed Occupancy of Shelters Across Different FSA Regions

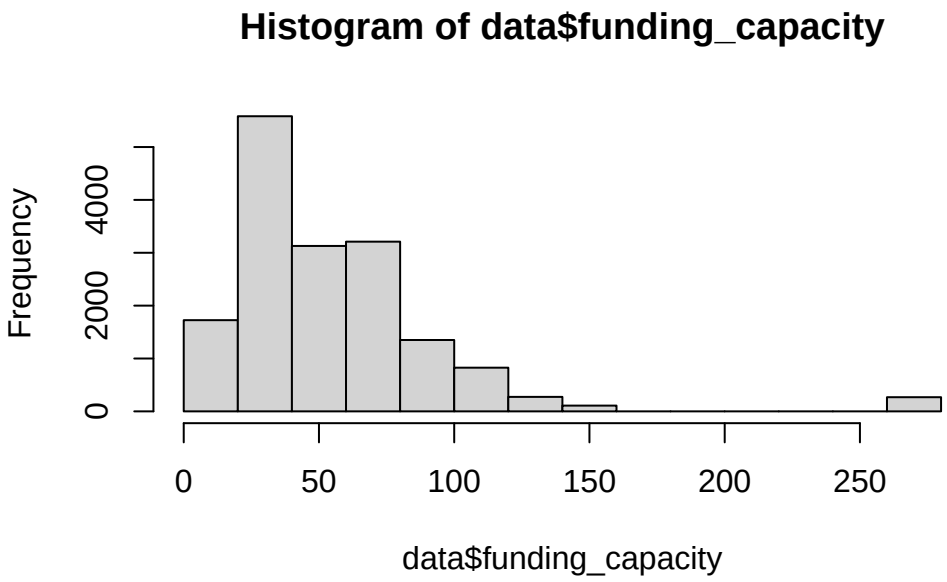

Figure 4: Funding Capacities of Toronto Emergency Shelters

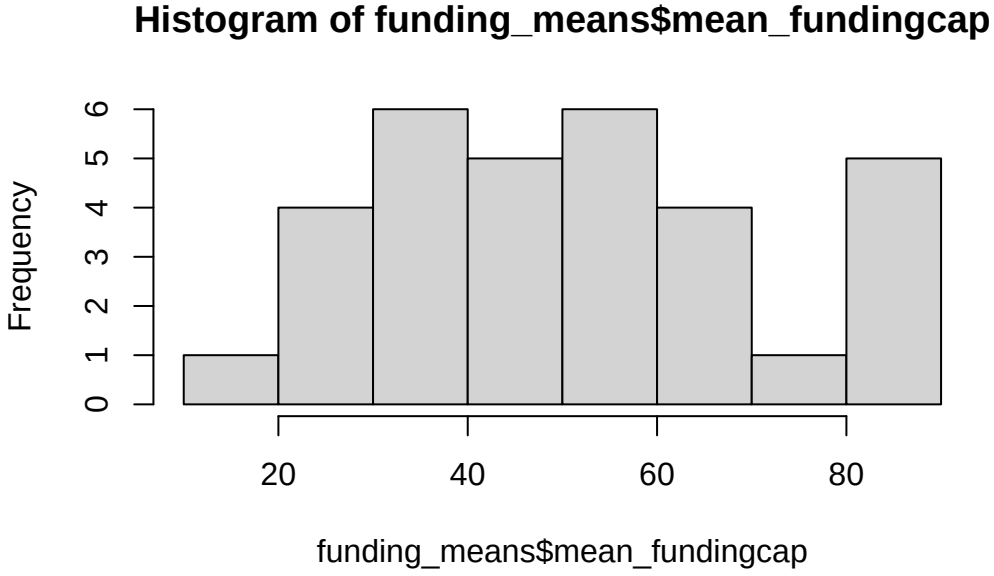

Figure 5: **?(caption)**

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)**

Appendix

.1 Data License Information

Contains information licensed under the Open Government Licence – Toronto. # Additional data details

References

City of Toronto. n.d. "Open Data License." https://open.toronto.ca/open-data-license/.

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