

The Decedents of Shelter Residents in Toronto by Year*

The Decedents significantly increased during the pandemic

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Study of the number of decedents of shelter residents in Toronto by year.

1 Introduction

Most people don't have a clear picture of what life is like for the homeless and those living in shelters Krajewska-Kulak et al. (2016). It is often known that the homeless population has higher incidence of sickness and early mortality. The City is dedicated to recognizing new and developing problems in the shelter system and acting quickly to address them Toronto (2024). This paper aims to analyse the average age of all decedents and the trend and level of deaths numbers in shelter in a yearly basis from 2007 to 2024.

This paper uses R R Core Team (2023) to analyse involved data. In the process of analyzing and visualizing the data set, the following R packages are used: tidyverse Wickham et al. (2019), janitor Firke (2021), ggplot2 R Core Team (2024), dplyr Wickham et al. (2023) opendatatoronto Gelfand (2022) and knitr Xie (2024)

In Data section (Section 2.1), the study explains the significance of the data, and how the data was collected by the City government. In the Data visualizing sections, the study investigate the Total decedents(Section 2.2) and the Average age of decedents(Section 2.3) each year from 2007 to 2024. The conclusion section(Section 3) summarise the study.

*Code and data are available at: https://github.com/HaoboRrrr/The_total_decedents_of_shelter_residents_in_Toronto

2 Data

2.1 Overview

The Toronto Shelter and Support Services Division has collected the information of shelter deaths and the average age of decedents Toronto (2024) since 2007 and conducts an annual review of the data. Operators of Toronto shelters are required to provide a written report PDF to the City within 30 days following the death of a resident or recent resident within 24 hours of the shelter's closure. The death of shelter residents data is a subset of data shared by Toronto Public Health (TPH) on its Deaths of People Experiencing Homelessness dashboard. The initial data set has features like years, total decedents, average age of decedents, male and female decedents and so on. This study used select select function Wickham et al. (2023), to select the interested features: years, total decedents, and average age of all decedents. The data type of year column in the original data was string, and in this study it was changed to integer. The cleaned data shown below(Figure 1). The data shows the year from 2007 to 2024ytd and its corresponding total decedents and average age.

year	total_decedents	average_age_of_death_all_decedents
2007	24	52
2008	26	50
2009	16	56
2010	21	54
2011	21	54
2012	18	53
2013	16	52
2014	30	57
2015	45	58
2016	33	57
2017	35	56
2018	26	57
2019	48	54
2020	74	51
2021	132	47
2022	110	51
2023	91	51
2024	47	50

Figure 1: Data of total decedents each year

This data shows that there were many decedents in the shelter each year from 2007 to 2024ytd. This means that people living in shelters are at greater risk than the general public.They may

experience the threat of drug abuse, violence, illegal guns Brown (2011).

2.2 visualizing data: Total Decedents each year

After viewing the actual data, visualizing the data can provide us with a different perspective. The study used ggplot to plot the relationship between total decedents and years R Core Team (2024), the type of graph used was bar plot, with x-axis represent the year, and y-axis represent the total decedents. The fig-width was set to 10 in order to show the x-axis clearly. (Figure 2)

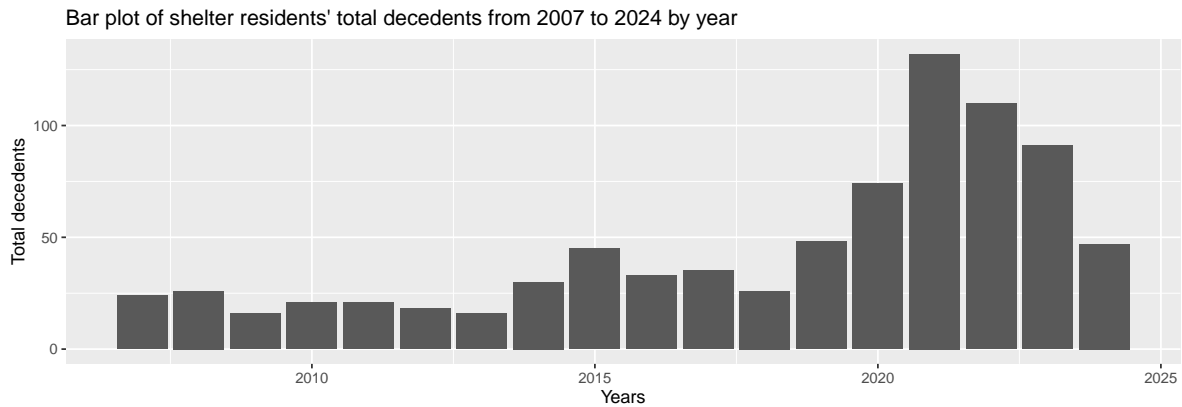


Figure 2: Barplot of Total decedents each year

The average deaths per year prior to 2019 was 25.9, this number spikes during 2020 to 2023. The graph is left skewed, most of deaths were recorded between 2020 and 2023. During the pandemic. The operation of the shelter has been greatly affected during the epidemic. Toronto's medical resources are so stretched that they are unable to give medical care for the people in the shelter Khandor et al. (2011).

2.3 Visualizing data: Average age of decedents

This study used plot function R Core Team (2023) to plot a scatter plot(Figure 3). Average age of decedents was on the y-axis and year was on the x-axis. A linear model of average age of death respect to year was added to the scatter plot, with a downward slope of -0.1651 Yao and Li (2014).

Call:

```
lm(formula = data$average_age_of_death_all_decedents ~ data$year)
```

Coefficients:

(Intercept)	data\$year
386.1300	-0.1651

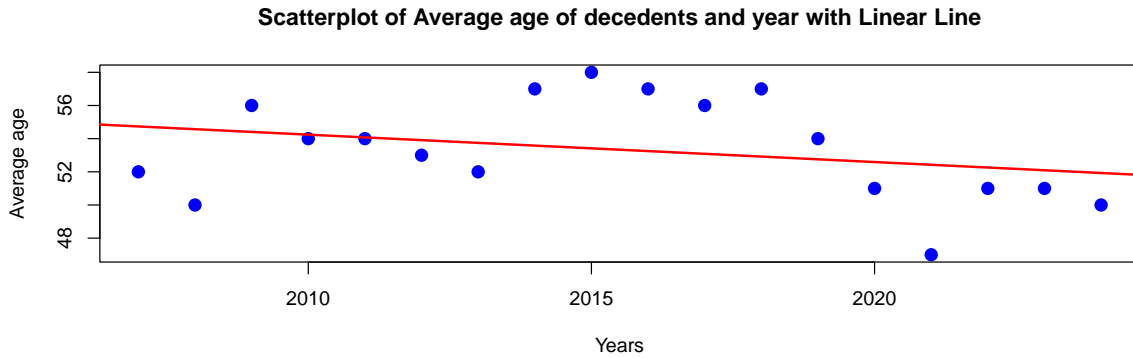


Figure 3: Scatter plot of average age of death and years

The study shows the average age of death in shelter has decreasing trend with downward sloping of -0.1651, which means that the expected change of average age of death in shelter next year will be 0.1651 years younger.

3 Conclusion

This study examines the number of total decedents in shelter from 2007 to 2024ytd, and the outcome is the number of decedents significantly increased during the Covid-19 pandemic Section 2.2. The study also investigate the average age of decedents each year and the linear regression model of average age and year, the linear model show the average age of people dying in shelters is declining.

From these data, we know that people living in shelters are always living in danger, their life expectancy is shorter than most people in society Cragg and O’Flaherty (1999). They are also the most likely to be forgotten when society is hit. Perhaps what the government needs to do is to guide such people to reintegrate into society and get back to work, rather than indulge them and think that they have fulfilled their obligations by just providing food.

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