Understanding Homelessness-Related Deaths in Toronto: A descriptive analysis

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Abstract

This paper examines the dataset on Deaths of People Experiencing Homelessness in Toronto, reported by Toronto Public Health from January 2017 onwards. Our analysis uncovers crucial insights into the quantity and causes of deaths among the homeless. Despite data limitations, including unknown causes and missing information, our exploration highlights the severity of the issue. Key findings emphasize the pressing need for improved reporting mechanisms and targeted interventions to address homelessness-related fatalities. By navigating the dataset's complexities, this study contributes to a deeper understanding of the challenges faced by those without stable housing, underscoring the societal significance of addressing homelessness-related deaths.

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2 Introduction

Homelessness is a growing concern in urban landscapes, and Toronto has experienced a troubling surge in recent years. The visible presence of individuals lacking stable housing permeates city streets, reflecting a complex societal issue that demands urgent attention. As the number of people experiencing homelessness continues to rise, the consequences extend far beyond immediate challenges, impacting public health, safety, and overall community well-being.

This multifaceted challenge to the city's social fabric stems from factors such as economic disparities, housing affordability, mental health issues, and insufficient support systems. Against this backdrop, Toronto Public Health initiated a comprehensive tracking system in January 2017 to document and analyze deaths among individuals experiencing homelessness. This paper aims to unravel the intricacies of the dataset on Deaths of People Experiencing Homelessness in Toronto, offering insights into the gravity of the issue and contributing to a broader understanding of the societal implications of homelessness-related deaths.

The causes of death among individuals experiencing homelessness encompass a range of challenges, including cancer, accidents, cardiovascular diseases, pneumonia, suicide, homicide, COVID-19 disease, and the enigmatic realm of unknown causes. Among these, a stark pattern emerges, with a disproportionate number of cases attributed to drug toxicity. The prevalence of deaths due to drug toxicity not only underscores the vulnerability of the homeless population to substance abuse but also signals a pressing need for targeted interventions and harm reduction strategies.

3 Data

3.1 Data Source

This report relies on data tracked by Toronto Public Health (TPH) since January 2017, aiming for a more accurate understanding of deaths among individuals experiencing homelessness. TPH takes the lead in data collection, analysis, and reporting, collaborating with Shelter, Support and Housing Administration (SSHA), health agencies, and the Office of the Chief Coroner of Ontario (OCCO) for data verification.The data used in this paper was gathered from OpenDataToronto (Gelfand 2022), and statistical investigation R was used (R core Team 2022), along with the R packages Tidyverse (Wichham et al. 2019), Janitor (Firke 2023) and Knitr (Xie 2021).

3.2 Data Collection

The data contains information from January 2017 to June 2023, providing a comprehensive view of trends in homelessness-related deaths over time. It encompasses details such as age

groups, gender, causes of death, and monthly counts, offering a holistic understanding of the issue.

- Demographic Details:
  - Age Groups: Categories include <20, 20-39, 40-59, 60+, and Unknown.
  - Gender: Includes Female, Male, Transgender, and Unknown.
- Causes of Death:
  - Various causes are documented, including Accident, Cancer, Cardiovascular Disease, Drug Toxicity, Homicide, Other, Pneumonia, Suicide, and Unknown/Pending.
- Monthly Counts:
  - Monthly breakdowns provide insights into seasonal variations and potential patterns.

Similar Datasets: While no mention of similar datasets is provided, the unique focus on homelessness-related deaths in Toronto distinguishes this dataset. Comparable datasets may lack the specificity required for targeted interventions in addressing this societal issue.

Data Presentation: Visual representation includes graphs and tables illustrating the distribution of deaths across different variables. Summary statistics, such as total counts and averages, offer a high-level overview.

Highlights:

A disproportionate number of deaths due to drug toxicity, emphasizing the vulnerability of the homeless population to substance abuse. Notable variations in monthly counts, warranting further exploration. Conclusion: This data analysis provides a comprehensive understanding of homelessness-related deaths in Toronto, shedding light on key demographic details, causes of death, and temporal trends. The insights gained lay the foundation for informed interventions and policy decisions. Detailed graphs, tables, and statistics are available in the appendices for a more in-depth exploration of the dataset.

4 Model and Results

This dataset was processed and analyzed using the R programming language (R Core Team (2023)), as well as tidyverse (Wickham et al. (2019)), tidyr (Wickham, Vaughan, and Girlich (2023)) and dplyr (Wickham et al. (2022)) programming packages. The package janitor (Firke (2023)) was used to clean column names, and knitr (Xie (2021)) was used to generate the final R Markdown report. ggplot2 (Wickham (2016)) was used to make the graphs featured throughout the paper. Finally, knitr (Xie (2021)) was used to generate the final R Markdown report.

The first aspect of the data I investigated is an analysis of the trend in total deaths among homeless individuals per year. This figure provides a clear view of the data distributed on an annual basis and may be useful for understanding the trend. There was a slight decrease in the number of deaths from the beginning of 2017 to 2018. However, starting in 2019, the numbers began to rise and reached their peak level in 2021. From 2022 onwards, the numbers began to decrease again. The peak was attributed to the COVID-19 pandemic, which led to a substantial increase in both non-fatal and fatal overdoses in the shelter system and the broader community. In response, the Integrated Prevention and Harm Reduction Initiative (iPHARE) was established in December 2020 as a multi-pronged effort by the City and community agencies to address opioid-related deaths in Toronto's shelter system (Toronto Public Health, 2022). For the graph, The x axis represents the passage of time, specifically the years for which data on the total deaths of homeless people is being presented. Each point on the x-axis corresponds to a specific year, allowing you to track changes and trends over time. The y-axis represents the total number of deaths of homeless individuals. This is a measure of the cumulative or aggregate number of deaths in a given year. The higher the point on the y-axis, the greater the total number of deaths among the homeless population for the corresponding year.

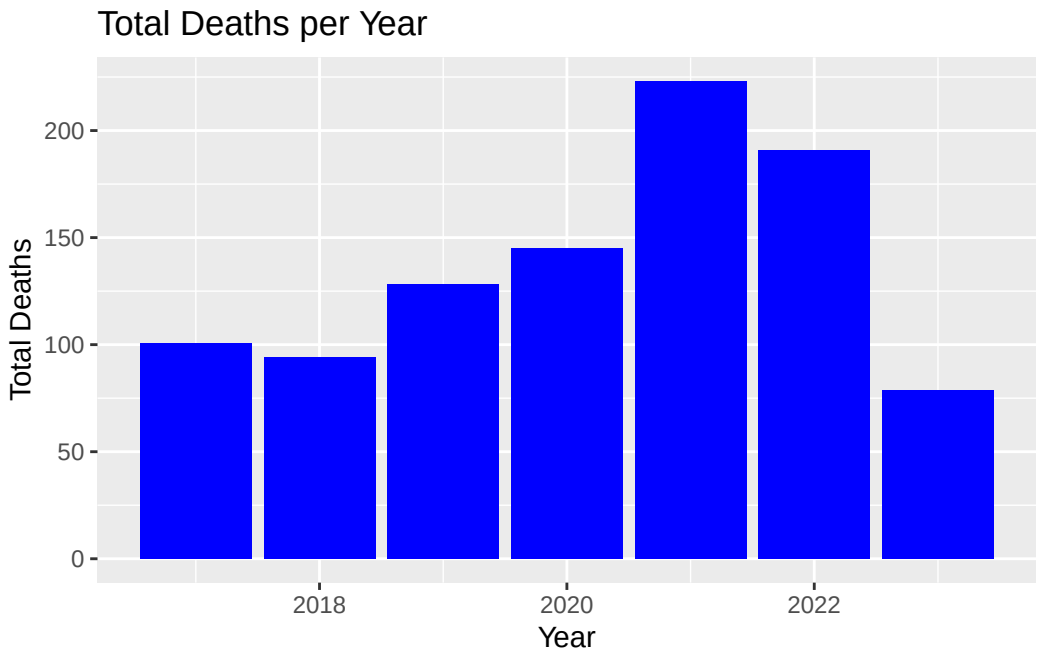

Figure 1: Total Deaths for People Experiencing Homelessness by year

The next aspect of the data that I analyzed was the trend in the age of death among people experiencing homelessness, broken down by gender for each year. I categorized the gender into male and female, where on the left side of the graph, you can observe the trend of the age of death for females experiencing homelessness, while the right side represents the trend for

males. Each bar represents the total deaths for each age group (age below 20, age between 20 - 39,age between 40 - 59, and age above 65 or more). Therefore, this graph provides insight into the age trends of death for homeless individuals.

Research suggests that the median age of death for people experiencing homelessness in 2022 was 55 years for males and 42 years for females. For comparison, the median age for the general population in Toronto is 79 years for males and 84 years for females (Toronto Public Health, 2022). Especially when you observe the graph, you'll notice that the age group between 40 and 59 years old old stands out.

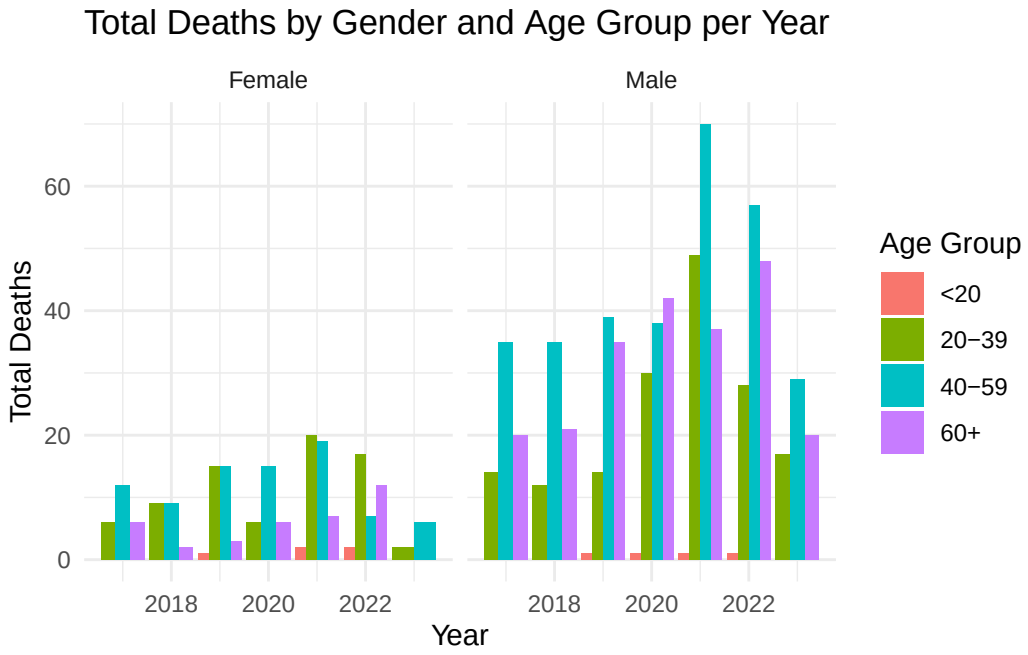

Figure 2: Trend of Age of Death for People Experiencing Homelessness

The "Cause of Death by Year" graph provides a visual representation of the total count of various causes of death among a specific population over the years. This analysis aims to uncover trends, patterns, and insights into mortality factors within this time frame.

Key Observations:

- Covid-19 Impact:
  - A noticeable spike in deaths due to Covid-19 is evident, particularly in the year(s) it affected the population.
  - The distinctive color assigned to Covid-19 allows for quick identification and analysis of its impact on overall mortality.
- Drug Toxicity Patterns:

  - The graph reveals patterns in deaths attributed to drug toxicity. Understanding these patterns can be crucial for public health initiatives and policies aimed at addressing substance abuse and overdose.
  - The graph prominently reveals "Drug Toxicity" as the most prevalent cause of death across multiple years.

- Comparative Analysis:
  - The bar plot enables a direct comparison of causes of death within each year.
  - Observing the relative heights of each segment provides insights into the leading causes of mortality and their fluctuations over time.

- Seasonal Variations:
  - By examining the graph across different years, any potential seasonal variations in causes of death can be discerned.
  - This information can guide healthcare planning and resource allocation during specific times of the year.

- Conclusion:

The "Cause of Death by Year" graph provides a comprehensive overview of mortality trends, enabling a deeper understanding of the health dynamics within a specific population. Its utility lies in guiding targeted interventions, resource allocation, policy development, and public awareness efforts to improve overall community health and well-being.

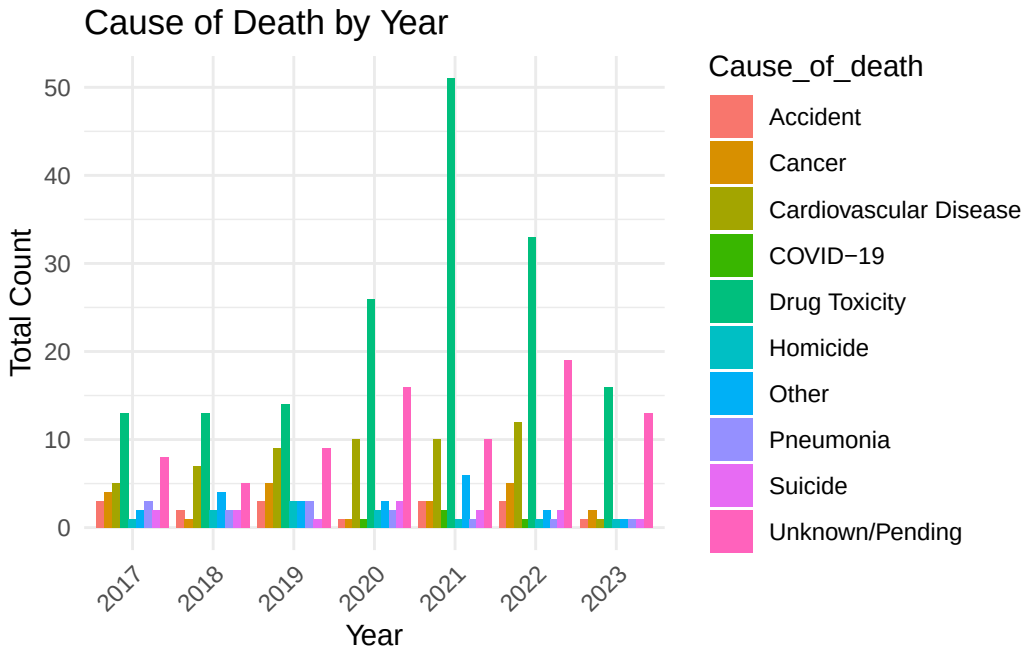

Figure 3: Cause of Death by Year

5 Discussion

In conclusion, this analysis of the dataset on Deaths of People Experiencing Homelessness in Toronto offers valuable insights into the multifaceted challenges faced by individuals without stable housing. Despite limitations, such as unknown causes and missing information, our exploration of homelessness-related deaths and emphasizes the urgent need for improved reporting mechanisms.

The results reveal a disturbing trend, revealing a disproportionate number of deaths linked to drug toxicity, emphasizing that people experiencing homelessness are more likely to struggle with drug problems. This shows how crucial it is to use specific plans and ways to make things safer, for example, reducing harm, to deal with why these deaths happen. Also, the ups and downs in the number of deaths each month need more checking and understanding. It suggests that officials should think about how things change with the seasons when they're making plans to support people who are experiencing homelessness.

The demographic details, causes of death, and temporal trends presented in this report contribute to a deeper understanding of the societal implications of homelessness-related deaths. The data-driven approach, utilizing visual representations and statistical analysis, lays the foundation for informed interventions, policy decisions, and community awareness efforts.

Moving forward, addressing homelessness-related deaths in Toronto requires a collaborative effort involving Toronto Public Health, Shelter, Support and Housing Administration, health agencies, and the Office of the Chief Coroner of Ontario. The implementation of targeted strategies, informed by the insights gained from this analysis, is crucial for mitigating the impact of economic disparities, housing affordability issues, mental health challenges, and insufficient support systems contributing to homelessness.

In conclusion, this study serves as a call to action, urging policymakers, healthcare professionals, and the community at large to recognize and address the urgent need for comprehensive solutions. By doing so, we can collectively work towards a society where the most vulnerable members receive the support and care they need, ultimately reducing the tragic toll of homelessness-related deaths in Toronto.

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