

# Seasonal Variations in Mortality Rates Among Shelter Residents in Toronto: Is Winter the Deadliest Season?\*

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This study explores Toronto winters' influence the mortality rates among sheltered residents, utilizing data from 2007-2023. I explore on how cold weather impacts those in shelters by drawing upon previous research that highlights increased risks for homeless populations during colder months. I show that mortality rates in spring, summer, and fall are similar, while winter shows a noticeable increase compared to the other seasons. The results reinforces the need for enhanced seasonal support and interventions to mitigate cold-weather risks for the homeless.

## 1 Introduction

Homelessness is a persistent issue in Canada, with Toronto fostering to the largest population of homeless individuals in the country Blair (2024). On any given night, an estimated 10,000 people in Toronto are without a permanent home, with many relying on Toronto shelters for safety and warmth Blair (2024). Despite the city of Toronto providing shelters for these homeless people, sheltered residents still face many health risks.

Previous research has shown that homeless populations are at an increased risk of mortality by cold temperatures Romaszko and Cymes (2017). Particularly during the winter months, cold weather conditions pose severe threats to their health. primarily due to exposure to extreme temperatures, increased vulnerability to illness, and other environmental factors. While many studies have examined the impact of cold weather on the broader homeless population, less attention has been given to sheltered residents specifically, who, despite being indoors, may still face significant risks during the winter.

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\*Code and data are available at: <https://github.com/kevica/toronto-sheltered-residents-deaths-analysis>

This paper aims to explore seasonal variations in mortality rates among shelter residents in Toronto between 2007 and 2023. By comparing mortality rates across winter, spring, summer, and fall, we seek to determine whether winter poses a disproportionately high risk for sheltered individuals. Our findings reveal a marked increase in mortality during the winter months, reinforcing the importance of targeted interventions and support systems to protect this vulnerable population from cold-weather-related harm.

The remainder of this paper is structured as follows: Section 2 presents the data used in the analysis, Section 3 outlines the methodology, Section 4 discusses the results, and Section 5 provides conclusions and recommendations for future policy interventions.

## 2 Data

## References

- Blair, Nicole. 2024. "Homelessness Statistics in Canada." *Made in CA*, March. <https://madeinca.ca/homelessness-statistics-canada/#:~:text=Toronto%20has%20the%20most%20homeless>.
- Romaszko, Jerzy, and Iwona Cymes. 2017. "Mortality Among the Homeless: Causes and Meteorological Relationships." *PLOS ONE* 12 (12): e0189938. <https://doi.org/10.1371/journal.pone.0189938>.