The Impact of Seasonal Changes on Mortality Rates in Toronto*

Death Registry Statistics in Toronto

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September 27, 2024

This study analyzes death toll data across four civic centers (ET, NY, SC, and TO) from 2011 to 2023, with the goal of identifying seasonal patterns and regional differences in mortality. Utilizing death registry data, we categorized the deaths by season—Winter, Spring, Summer, and Fall—and aggregated the death tolls across the years for each region. The analysis revealed notable variations in mortality trends across both seasons and civic centers. The results show that Winter consistently reported higher death tolls compared to other seasons across most regions, with the NY and ET civic centers experiencing the highest tolls during this period. In contrast, SC and TO exhibited more balanced seasonal distributions, with Summer showing a slightly elevated death toll. Using visual representations generated through ggplot2, the findings highlight significant regional disparities, which suggest possible influences of environmental, socio-economic, or health system factors contributing to seasonal mortality trends.

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1 Introduction

You can and should cross-reference sections and sub-sections. We use R Core Team (2023), Wickham et al. (2019) and Gelfand (2022).

The remainder of this paper is structured as follows. Section 2....

2 Data

Some of our data is of deaths (Figure 1), from City of Toronto Open Data Team (2024).

2.1 Overview Data

Table 1: Sample Data

_id	CIVIC_CENTRE	DEATH_LICENSES	PLACE_OF_DEATH	TIME_PERIOD
27767	ET	69	Outside City Limits	2011-01
27768	ET	341	Toronto	2011-01
27769	NY	141	Outside City Limits	2011-01
27770	NY	540	Toronto	2011-01
27771	SC	129	Outside City Limits	2011-01
27772	SC	545	Toronto	2011-01

2.2 Cleaned Data

Table 2: Sample Data

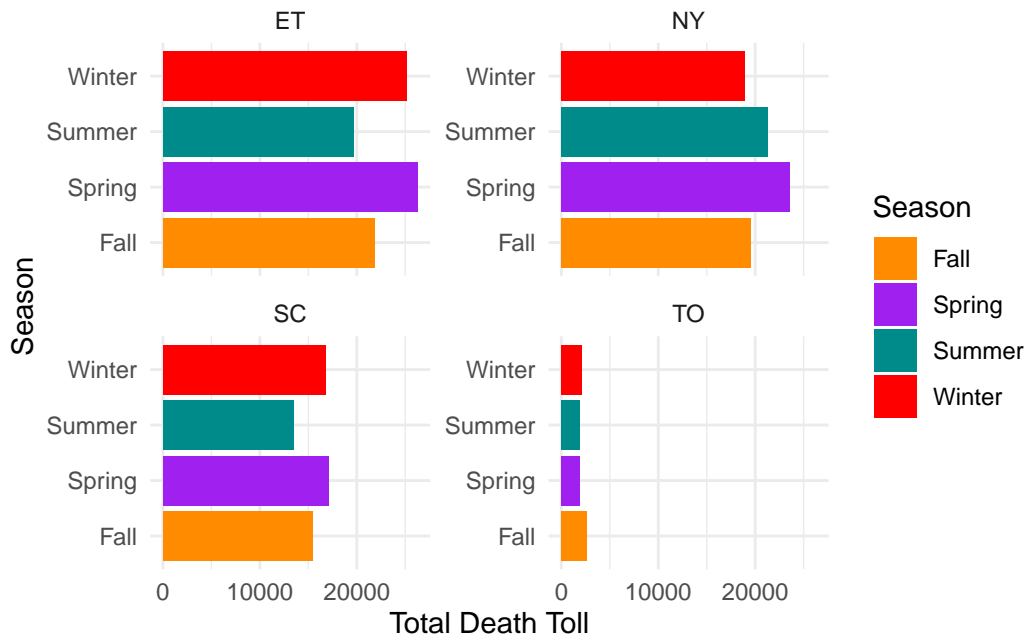| ID	Civic Centre	Death Toll	Place of Death	Year	Month	Season
27767	ET	69	Outside City Limits	2011	Jan	Winter
27768	ET	341	Toronto	2011	Jan	Winter
27769	NY	141	Outside City Limits	2011	Jan	Winter
27770	NY	540	Toronto	2011	Jan	Winter
27771	SC	129	Outside City Limits	2011	Jan	Winter

The

Figure 1: Total Death Toll by Season and Region (2011-2023)

And also planes (**?@fig-planes**). (You can change the height and width, but don't worry about doing that until you have finished every other aspect of the paper - Quarto will try to make it look nice and the defaults usually work well once you have enough text.)

3 Results
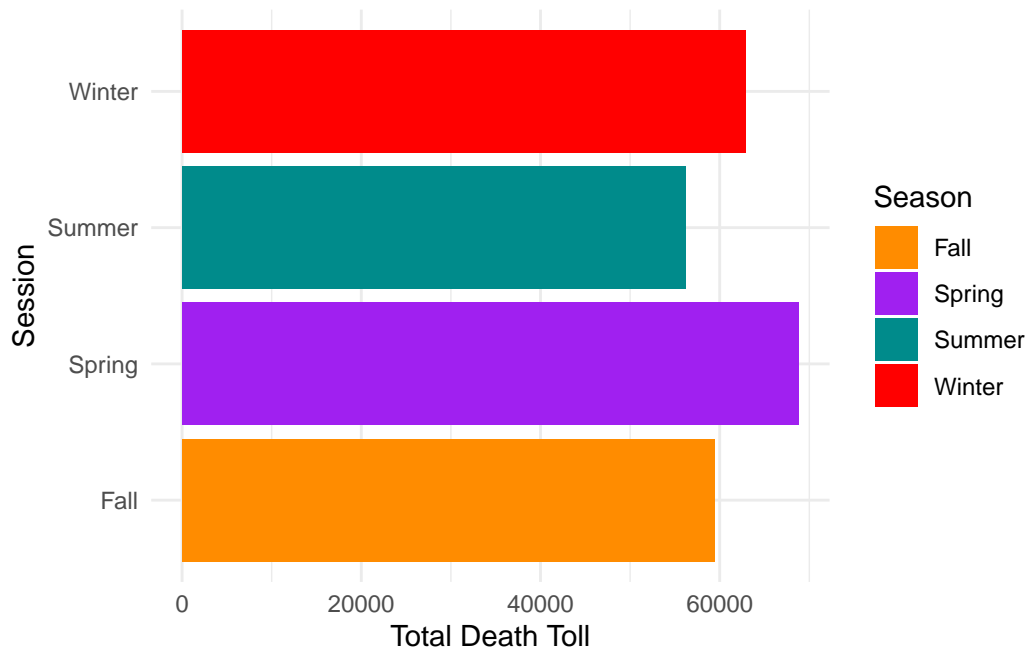
Our results are summarized in **?@tbl-modelresults**.

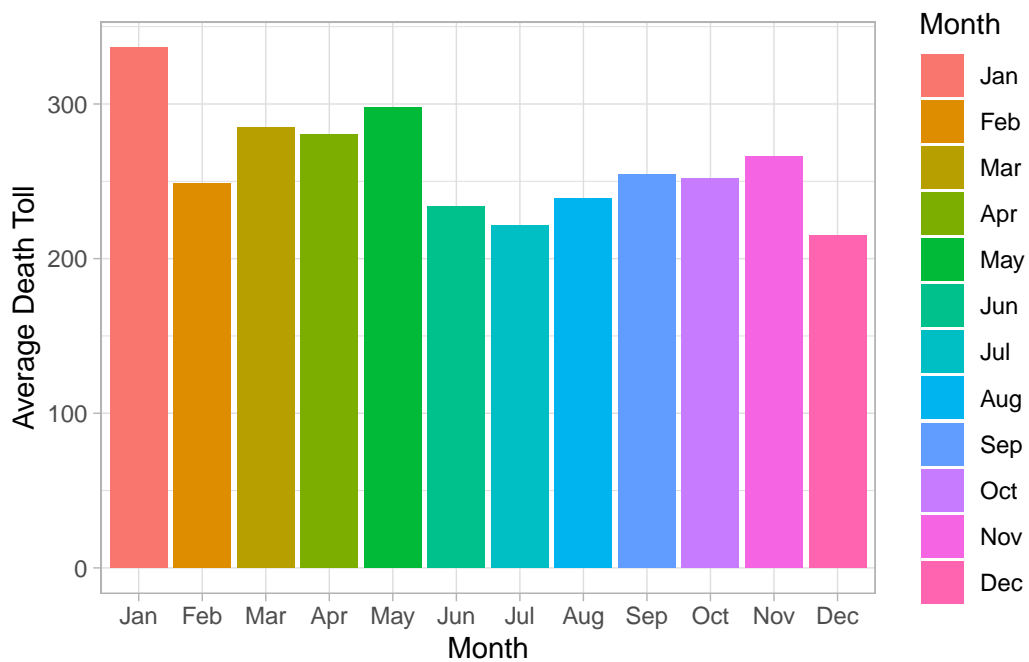Figure 2: Total Death toll by Season (2011-2023)

Figure 3: Average Death Toll by Month (2011-2023)

4 Discussion

4.1 First discussion point

If my paper were 10 pages, then should be be at least 2.5 pages. The discussion is a chance to show off what you know and what you learnt from all this.

4.2 Second discussion point

4.3 Third discussion point

4.4 Weaknesses and next steps

Weaknesses and next steps should also be included.

Appendix

A Additional data details

B Model details

B.1 Posterior predictive check

In **?@fig-ppcheckandposteriorvsprior-1** we implement a posterior predictive check. This shows...

In **?@fig-ppcheckandposteriorvsprior-2** we compare the posterior with the prior. This shows...

B.2 Diagnostics

?@fig-stanareyouokay-1 is a trace plot. It shows... This suggests...

?@fig-stanareyouokay-2 is a Rhat plot. It shows... This suggests...

References

City of Toronto Open Data Team. 2024. *Death Registry Statistics Dataset.* City of Toronto. https://open.toronto.ca/dataset/death-registry-statistics/.

Gelfand, Sharla. 2022. *Opendatatoronto: Access the City of Toronto Open Data Portal.* https://CRAN.R-project.org/package=opendatatoronto.

R Core Team. 2023. *R: A Language and Environment for Statistical Computing.* Vienna, Austria: R Foundation for Statistical Computing. https://www.R-project.org/.

Wickham, Hadley, Mara Averick, Jennifer Bryan, Winston Chang, Lucy D'Agostino McGowan, Romain François, Garrett Grolemund, et al. 2019. "Welcome to the tidyverse." *Journal of Open Source Software* 4 (43): 1686. https://doi.org/10.21105/joss.01686.