

# My title\*

My subtitle if needed

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September 27, 2024

First sentence. Second sentence. Third sentence. Fourth sentence.

## 1 Introduction

You can and should cross-reference sections and sub-sections. We use R Core Team (2023).

The remainder of this paper is structured as follows.

## 2 Data

The data used to produce this paper was made available by Open Data Toronto through their R library ‘opendatatoronto’ (Gelfand (2022)). All actions to the data for the sake of this paper was used on the open source programming language R (R Core Team (2023)). Specifically the data cleaning, simulation, and testing was made possible by the libraries ‘tidyverse’ (Wickham et al. (2019)), ‘janitor’ (Firke (2023)), ‘dplyr’ (Wickham et al. (2023)), ‘lubridate’ for dates (Grolemund and Wickham (2011)), and ‘testthat’ for the tests of the simulation and real data sets (Wickham (2011)). All graphs and tables throughout this paper were produced using the library ‘ggplot2’ (Wickham (2016)).

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\*Code and data are available at: [LINK](#).

### **3 Results**

### **4 Discussion**

#### **4.1 Limitations**

Weaknesses and next steps should also be included.

## References

- Firke, Sam. 2023. *Janitor: Simple Tools for Examining and Cleaning Dirty Data*. <https://CRAN.R-project.org/package=janitor>.
- Gelfand, Sharla. 2022. *Opendatatoronto: Access the City of Toronto Open Data Portal*. <https://CRAN.R-project.org/package=opendatatoronto>.
- Grolemund, Garrett, and Hadley Wickham. 2011. “Dates and Times Made Easy with lubridate.” *Journal of Statistical Software* 40 (3): 1–25. <https://www.jstatsoft.org/v40/i03/>.
- 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. 2011. “Testthat: Get Started with Testing.” *The R Journal* 3: 5–10. [https://journal.r-project.org/archive/2011-1/RJournal\\_2011-1\\_Wickham.pdf](https://journal.r-project.org/archive/2011-1/RJournal_2011-1_Wickham.pdf).
- . 2016. *Ggplot2: Elegant Graphics for Data Analysis*. Springer-Verlag New York. <https://ggplot2.tidyverse.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>.
- Wickham, Hadley, Romain François, Lionel Henry, Kirill Müller, and Davis Vaughan. 2023. *Dplyr: A Grammar of Data Manipulation*. <https://CRAN.R-project.org/package=dplyr>.