Assessing 2023 Disease Outbreaks by Location Type in Toronto

Benny Rochwerg

GitHub Repository Link

https://github.com/bennyrochwerg/toronto-disease-outbreaks-2023.git

This GitHub Repository includes the R code and Figures involved in creating this report.

Dataset Sketch

A sketch of the required dataset (Figure 1) is available on the GitHub Repository and is labelled as `Figure 1.JPG`.

Graph Sketch

A sketch of the graph to be developed in this analysis (Figure 2) is available on the GitHub Repository and is labelled as `Figure 2.JPG`.

Preamble Documentation

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#### Preamble ####

# Purpose: Employ data pertaining to 2023 disease outbreaks in Toronto
# in order to create a graph of the number of outbreaks in each type
# of location.
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```

```
# Date: January 16, 2024
# Prerequisites: Ability to acquire data regarding 2023 disease outbreaks
# in Toronto.
```

Data Simulation

Table 1: Simulated 2023 Toronto Outbreak Data

ID	Location Type
1	School
2	Other
3	Hospital
4	School
5	Long-Term Care Home
6	Long-Term Care Home

Results

Table 2: Number of Outbreaks by Location Type in Toronto from 2023

Location type	Number of outbreaks in 2023
Hospital (Acute Care)	107
Hospital (Chronic Care)	131
Hospital (Psychiatric)	19
Long-Term Care Home	602
Retirement Home	195
Transitional Care	13

Figure 3: 2023 Toronto Outbreak Data
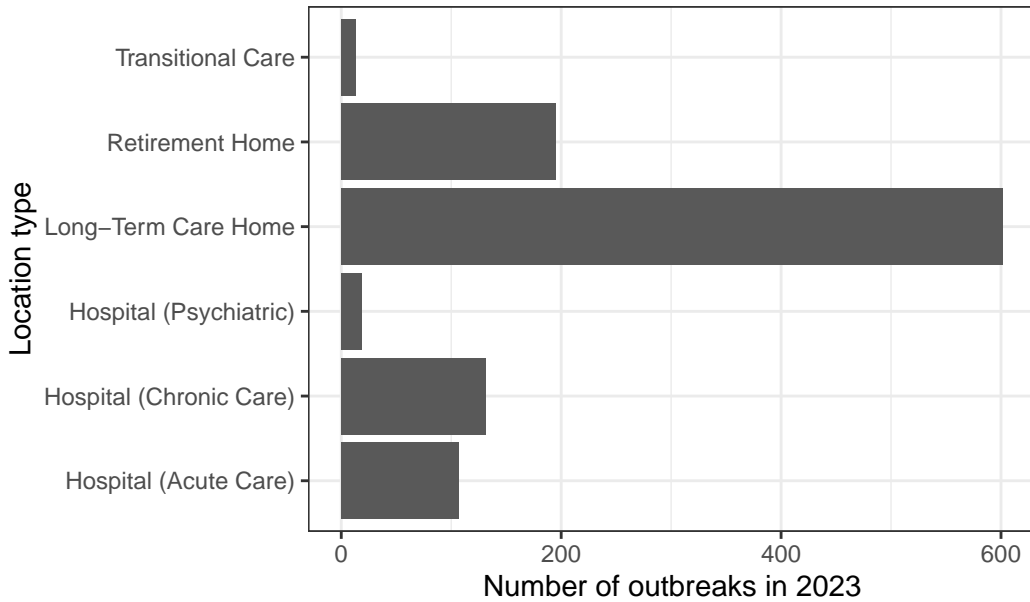
Discussion

Toronto Public Health maintains data on health care facilities' disease outbreaks (Toronto Public Health 2024). These outbreaks are characterized as a greater-than-anticipated rise in disease at a particular location (Toronto Public Health 2024). The purpose of this investigation was to assess the number of outbreaks by location type in Toronto from 2023.

To do this, outbreak data was collected from Toronto Public Health through the `opendatatoronto` package (Gelfand 2022) for the R programming language (R Core Team 2023). This data was then cleaned with the R programming language (R Core Team 2023) as well as the `janitor` (Firke 2023), `tidyverse` (Wickham et al. 2019), and `knitr` (Xie 2023) packages.

Table 2 and Figure 3 illustrate the number of outbreaks by location type in Toronto from 2023. Long-term care homes had 602 outbreaks, followed by retirement homes (195 outbreaks), hospitals with respect to chronic care (131 outbreaks), hospitals with respect to acute care (107 outbreaks), hospitals with respect to psychiatric care (19 outbreaks), and transitional care facilities (13 outbreaks).

These results show that long-term care homes had substantially more outbreaks than other health care facilities in Toronto in 2023. The vast majority of Ontario long-term care home residents are 65 years of age or older (Ontario Centres for Learning, Research and Innovation in Long-Term Care 2018). Also, older individuals are more susceptible to becoming ill due to a poorer immune system (Brodkey 2022). Consequently, it appears that enhanced infection

control protocols should be enacted in long-term care homes to reduce the number of outbreaks in these vulnerable settings. Future research should examine the impacts of different infection control techniques in long-term care homes to help alleviate this issue.

Acknowledgements

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