Frequent Inspections Fail to Curb Violations in Toronto's Good-Standing Food Establishments*

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1 Introduction

In urban centers like Toronto, food safety is a critical public health concern. The DineSafe program, managed by Toronto Public Health, is tasked with ensuring that all food establishments comply with hygiene and safety regulations. Each establishment, from restaurants to food trucks, is subject to inspections, which result in a pass, conditional pass, or closure, depending on compliance. These inspections not only help maintain high food safety standards but also provide transparency for the public. However, the frequency of inspections and the severity

*Code and data are available at: https://github.com/Jerryx2020/toronto_dinesafe_analysis

of infractions can vary significantly across different types of establishments, raising questions about how regulatory attention is distributed and whether certain types of food establishments require closer scrutiny.

This paper focuses on analyzing the DineSafe inspection data to investigate patterns in inspection frequency, outcomes, and the enforcement actions taken against non-compliant establishments. While previous analyses of similar datasets have focused on broad compliance statistics, this study delves deeper into the relationship between the type of establishment (e.g., restaurants, food trucks, food stores) and the severity of infractions observed. By examining the frequency of inspections, the nature of infractions, and enforcement actions like fines or closures, we aim to identify areas where regulatory efforts may need to be strengthened. Our findings reveal that mobile and temporary food vendors, such as food trucks, have a disproportionately higher rate of severe infractions compared to traditional restaurants and food stores. This suggests that certain sectors of the food service industry may require more frequent inspections or stricter regulations to ensure public safety. Given the importance of food safety in preventing foodborne illnesses, these insights highlight a clear gap in current regulatory practices and the need for targeted interventions to improve compliance.

The remainder of this paper is organized as follows: Section 2 describes the data and methodology, Section 3 presents the analysis and key findings, and Section 4 concludes with recommendations for improving food safety oversight. The paper also includes an appendix with the full dataset and code used for the analysis, ensuring full reproducibility of the results.

2 Data

2.1 Overview

This study uses the DineSafe dataset from Toronto's Open Data platform, accessed using the 'opendatatoronto' package (Gelfand 2022). This dataset provides detailed information on health inspections for food establishments, including restaurants and takeout locations. The dataset includes critical fields such as inspection dates, types of infractions, and establishment compliance statuses. According to the CDC, regular inspections and public posting of results, such as letter grades, play a crucial role in reducing foodborne illnesses by encouraging compliance in food service establishments (Centers for Disease Control and Prevention 2024). However, as revealed by a 2023 report from Hazel Analytics, issues such as inadequate handwashing and improper sanitization remain significant, particularly in the post-pandemic environment (Analytics 2023).

For the purposes of this analysis, the data was cleaned using the 'tidyverse' package (Hadley Wickham et al. 2019), which allowed for efficient filtering of relevant columns. Only data for "Restaurant" and "Food Take Out" establishments that had passed their most recent inspection were retained. This focus narrows the analysis to establishments in compliance,

allowing us to explore how frequent inspections correlate with violations. We then used the 'ggplot2' package for visualizing these patterns (H. Wickham 2016).

2.2 Results

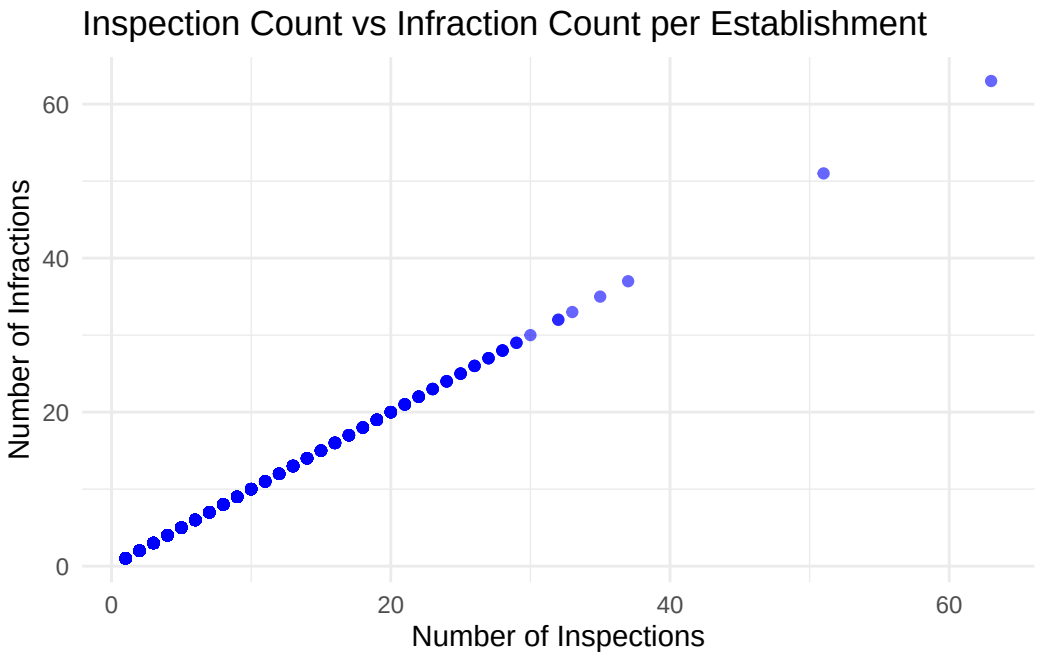

Figure 1: Inspection Count vs Infraction Count per Establishment

As shown in Figure 1, establishments inspected more frequently tend to have higher counts of infractions. This positive correlation reflects findings from literature that increased inspection frequency does not necessarily reduce violations but instead highlights pre-existing issues (Public Health 2023; Centers for Disease Control and Prevention 2024). The data was handled using the 'tidyverse' package for summarization and visualization (Hadley Wickham et al. 2019), while the plots were generated using 'ggplot2' (H. Wickham 2016).

Inspection Trends Over Time {#fig-inspections-over-time}

As shown in Figure 2, the number of inspections fluctuated across the years. These variations are likely driven by external factors, such as regulatory changes or public health crises, including the COVID-19 pandemic (Analytics 2023). The visualization was created using 'ggplot2' (H. Wickham 2016) and time-based grouping was managed via 'lubridate' (Grolemund and Wickham 2011).

Figure 3 compares the infractions between restaurants and takeout establishments, indicating that restaurants tend to have slightly more violations. This finding reflects the complexity of

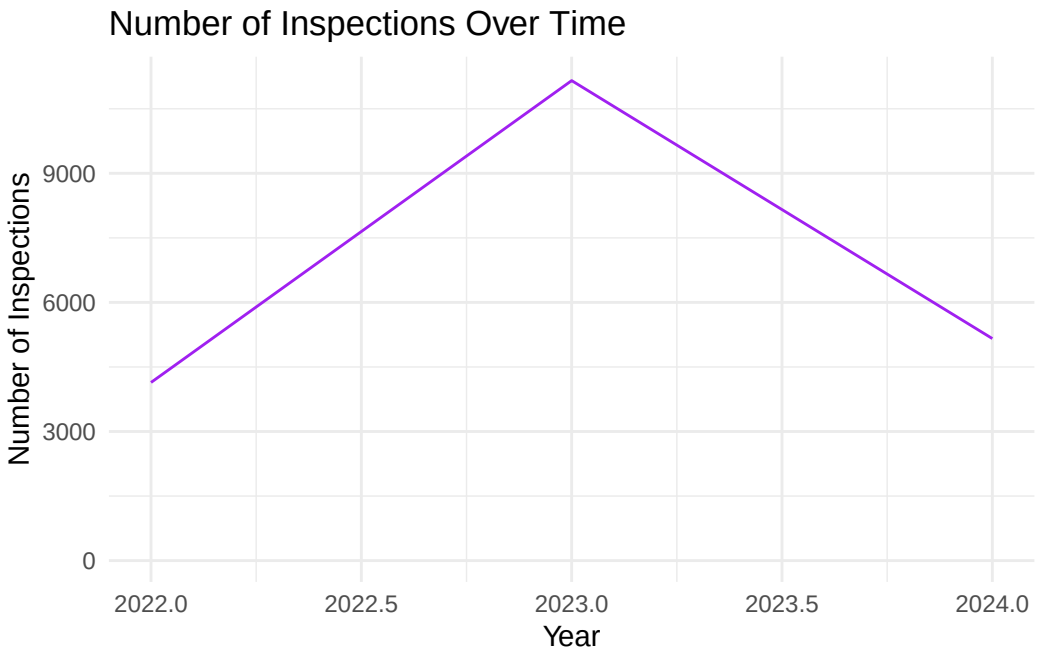

Figure 2: Number of Inspections Conducted Over Time

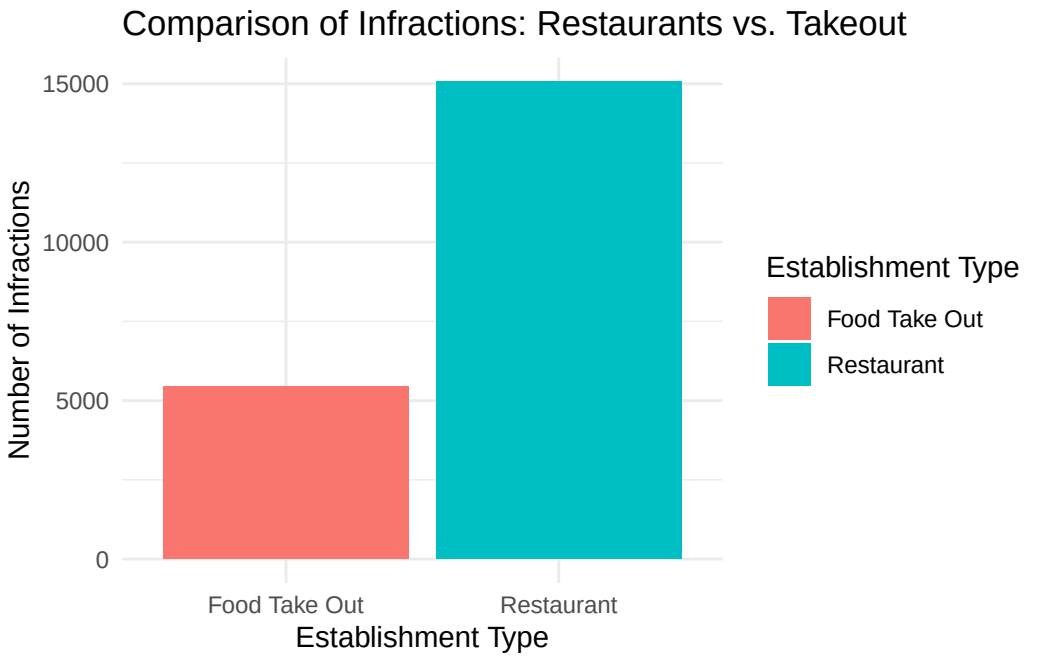

Figure 3: Comparison of Infractions Between Restaurants and Takeout Establishments

full-service food operations, which often lead to higher violation rates, as noted in previous studies (Analytics 2023; Agency 2023).

3 Discussion

The results indicate that frequent inspections tend to uncover more infractions, reflecting findings from studies that emphasize the role of inspections in identifying rather than reducing violations (Centers for Disease Control and Prevention 2024; Public Health 2023). The variability in inspection frequency over time further highlights the impact of external events, such as the pandemic, on inspection activities (Analytics 2023). Lastly, the comparison between restaurants and takeout establishments reveals that full-service restaurants face more infractions, possibly due to their operational complexity (Agency 2023).

A Appendix

A.1 Dataset and Graph Sketches

A.2 Data Cleaning

A.3 Attribution Statement

References

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