Seasonal Variation in Marriage License Applications*

An Exploratory Analysis with Open Data Toronto

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IN PROGRESS What was done:Marriage License data from Toronto between 2011 and 2024 was analysed to determine weather holidays influence the number of applications. What was found: Months associated with popular holidays like February (Valentine's day) and December(Christmas), show an increase in marriage license applications. Why this matters:Understanding these patterns can help city officials anticipate changes in demand for marriage-related services and allocate resources accordingly, ensuring that civil centers are prepaered for these seasonal shifts. It also gives us an insight into how emotional and culturl influences during holidays can drive personal descisions.

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*Code and data are available at: https://github.com/fatimahsy/Pandemic-Marriages-.git.

1 Introduction

The Data Section 2 of this paper explores the `opendatatoronto` data and outlines tools and methods used to analyze the data and some preliminary observations observed. The Results Section 3 introduces more observations found from the data analysis. The Discussion Section 4 ties back the findings to its real world relevance. Lastly, the Conclusion Section 5 summarizes key findings and outlines future areas of study.

2 Data

2.1 Tools

We use R Core Team (2024) and Gelfand (2022) * `ggplot2` (Wickham 2016) * `dplyr` (Wickham et al. 2023) * `readr` (Wickham, Hester, and Bryan 2024) * `tibble` (Müller and Wickham 2023)

2.2 Variable Descriptions

Variable	Description	Data Type
CIVIC_CENTRE	Code representing the civic center where the marriage license was issued	Character
MARRIAGE_LICENSES	Number of marriage licenses issued in that month	Numeric
YEAR	Year when the marriage licenses were issued	Integer
MONTH	Month when the marriage licenses were issued	Integer
DATE	Date constructed from year and month for easier time series analysis	Date

Table 1: Variable Overview

2.3 Dataset Overview

Some of our data is of Marriage licences (Figure 3) from Gelfand (2022).

Civic Centre	Number of Marriages	Year	Month	Date
ET	80	2011	01	2011-01-01
NY	136	2011	01	2011-01-01
SC	159	2011	01	2011-01-01
TO	367	2011	01	2011-01-01
ET	109	2011	02	2011-02-01
NY	150	2011	02	2011-02-01

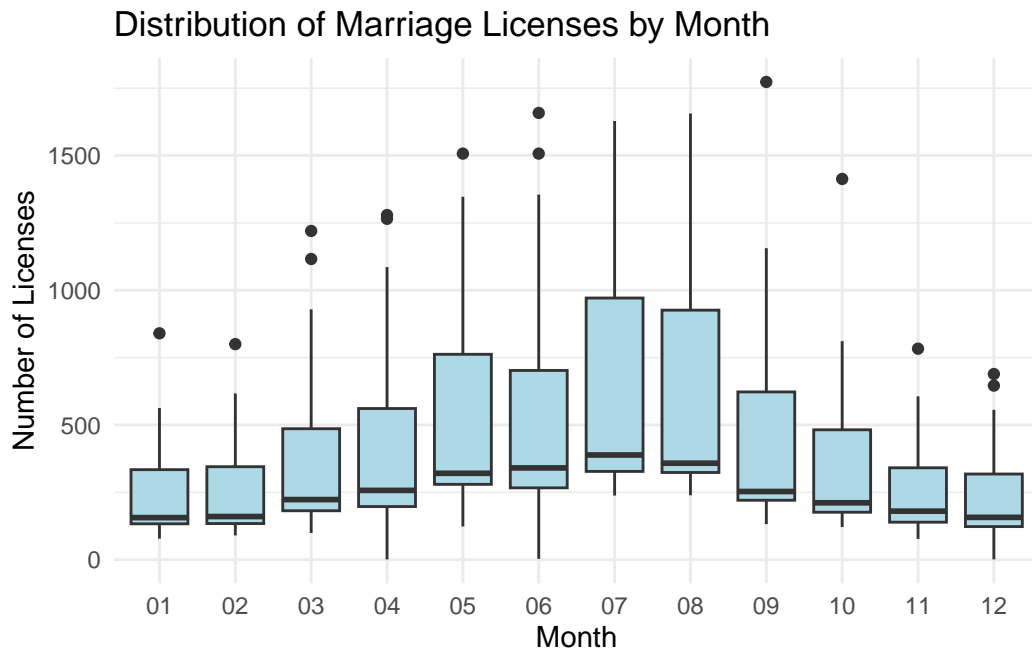Table 2: Sample of Toronto Mariage Liciences

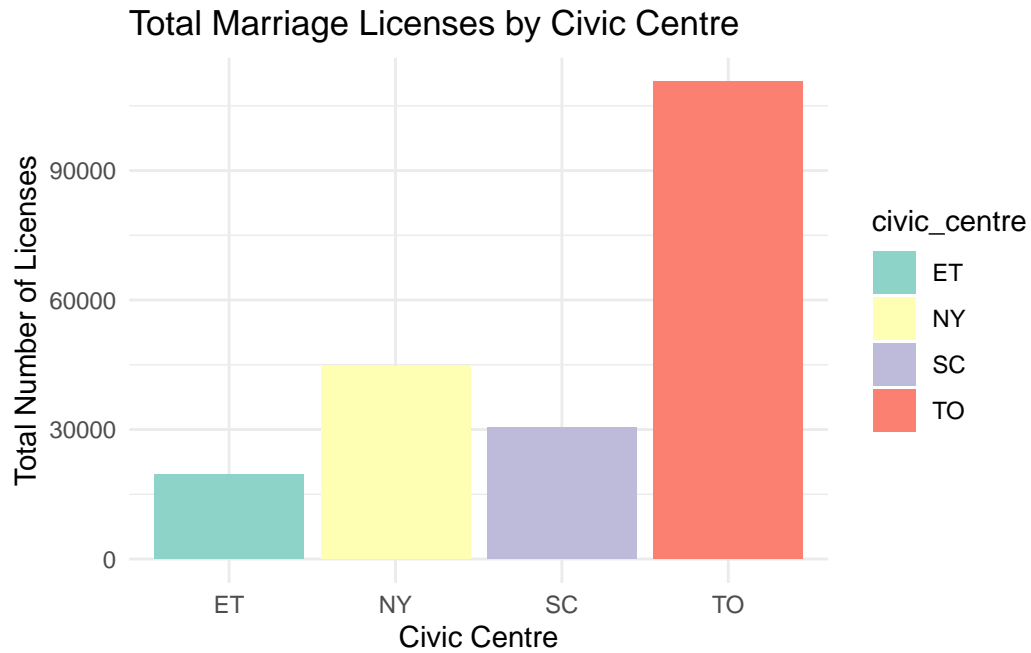Figure 1: Figure 1: Distribution of Marriage Licenses by Month

Figure 2: Figure 2: Total Marriage Licenses by Civic Centre

The scatter plot (Figure 3) displays the number of marriage licenses issued in Toronto over time, spanning from before 2015 to approximately 2025.
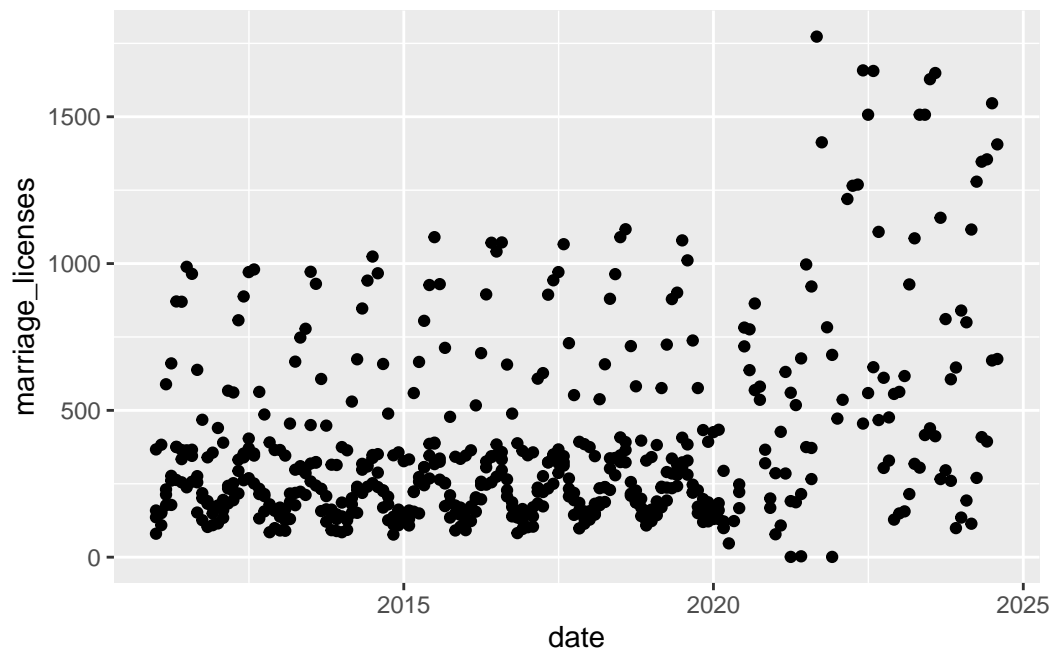
Figure 3: Marriage Licinces By Date
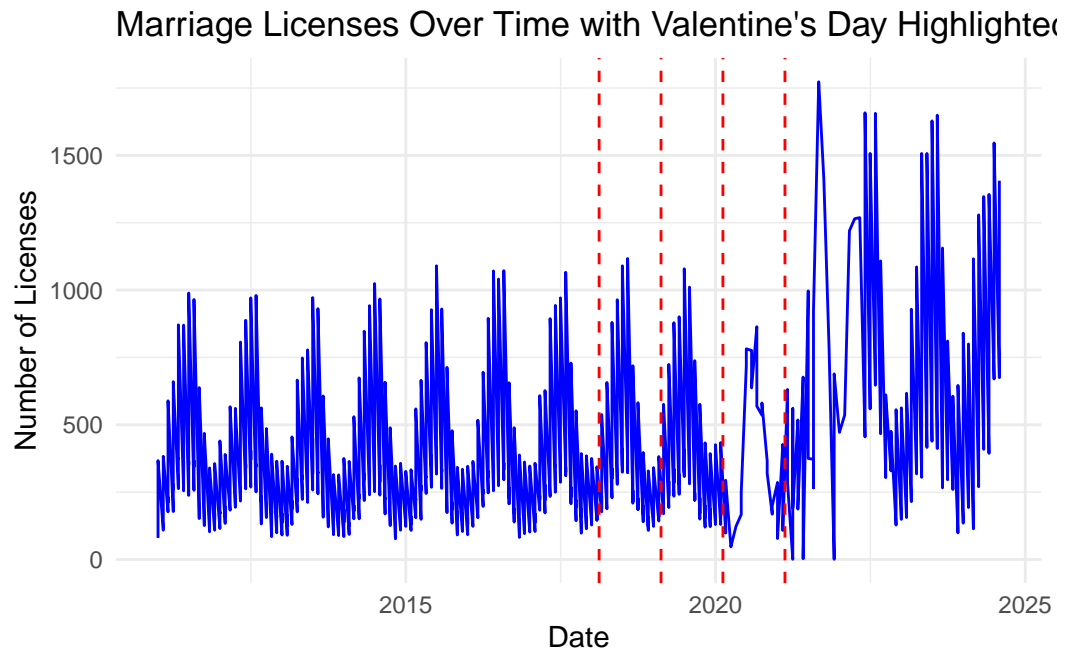
3 Results

3.1 Seasonal and Holiday Trends

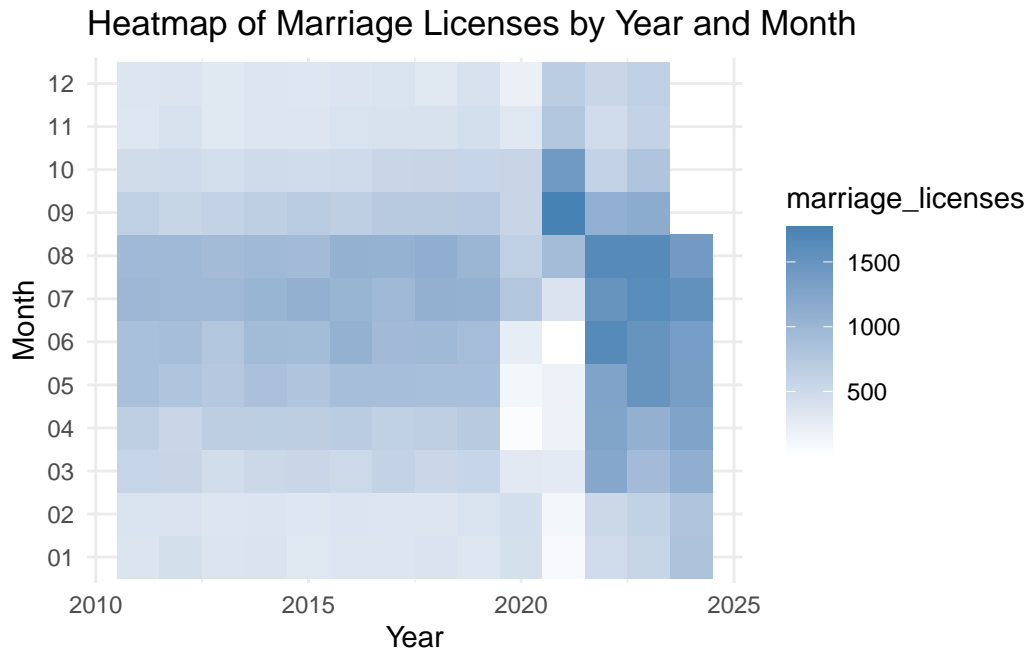Figure 4: Figure 3: Marriage Licenses Over Time with Valentine's Day Highlighted

Heatmap of Marriage Licenses by Year and Month

Figure 5: Figure 4: Heatmap of Marriage Licenses by Year and Month
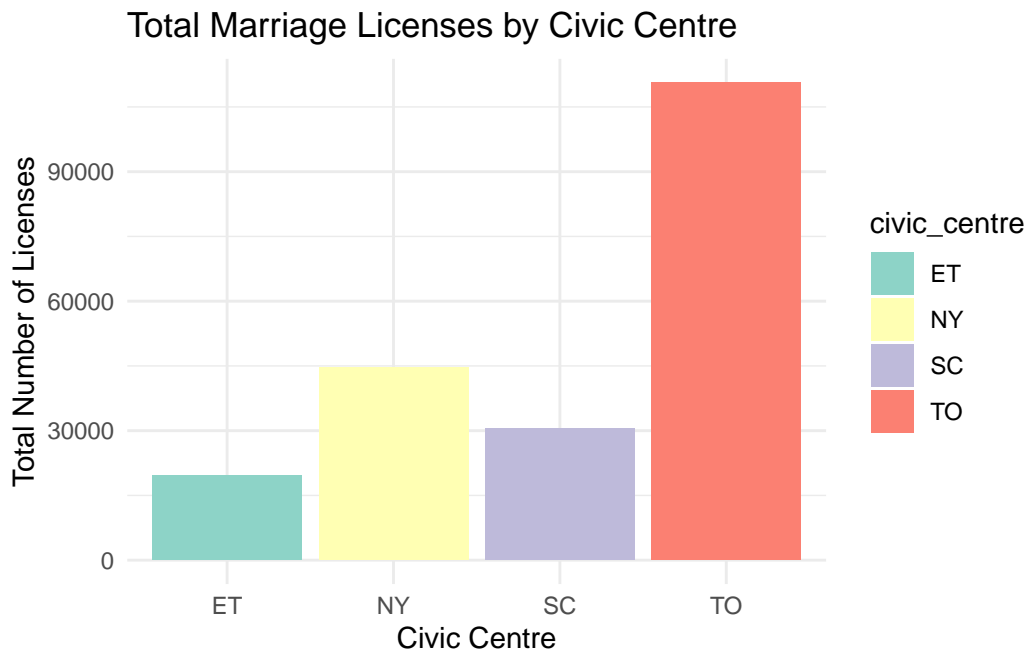
Total Marriage Licenses by Civic Centre

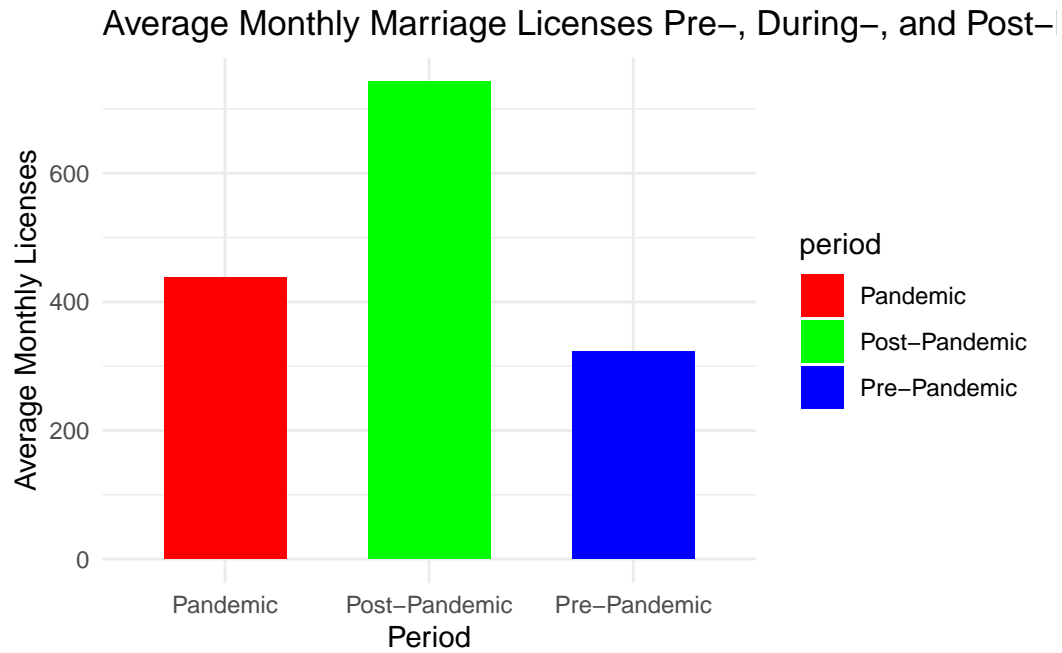Figure 6: Figure 5: Total Marriage Licenses by Civic Centre

Figure 7: Figure: Average Monthly Marriage Licenses Pre-, During-, and Post-Pandemic

3.2 Civil Center Comparison

3.3 Patterns

4 Discussion

5 Conclusion

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Appendix

References

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