

JOHN MOLSON SCHOOL OF BUSINESS

Department of Supply Chain and Business Technology Management (SCBTM)

BSTA 445 Section AA

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Project Proposal:

Montreal crime study from January 2015 to May 2021

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Introduction

Montreal's police department has witnessed changes due to the current pandemic and the closing and merging of stations over the last few years. A dataset of criminal acts¹ became available on the open data portal² of the city. For each act we have its category, the date and time, the geographic location and the police division assigned with it. The dataset covers the time from 01 January 2015 until today and is updated regularly. We wish to analyze the effects of the covid situation on crime trends.

About the Dataset³

A supplementary cleaning code file is provided⁴

Although the dataset contains all registered acts from the following categories:

Fatal Crimes • Break and Enter • Mischiefs • Auto Burglaries • Auto thefts • Armed Robberies

it lacks some of other important categories like frauds and simple robberies. By comparing our data with the census we find that the given dataset counts for approximately 35% of the total number of crimes.⁵ The dataset contains 191,611 registered crimes over the period ending on May, 31 2021. Extra columns were added to identify the neighbourhoods where the crimes took place and the neighbourhoods being supervised by the associated police division.

Existing analyses of the dataset

In 2018, Analysts at CBC have created an animated map of the city and the evolution of crime from 2015 to and throughout 2017. They also studied pattern changes in the categories over the period of the three years.⁶ The city of Montreal offers an up-to-date interactive visualization of the data.⁷

Questions

Has the covid situation affected the rate of crimes? During these 7 years, what are the most remarkable changes in crimes? Which neighbourhoods have the highest/lowest rates of crime per category? And how has that changed over time?

Methodology

To test for changes due to covid, we will study a correlation relation rather than a causation one. We will fit an ARMA model to the data and then apply paired-t-test to the residuals. For the rest of the analysis we will use visualization tools to explore, find answers, and present our outcomes.

Expected results

We believe that the results of our analyses will aid the SPVM by calling attention to patterns, trends, and problems related to criminal activity that can be easily observed through the methods applied to our dataset. With this information, they can then allocate their limited resources in a way that is most effective in creating change for the city of Montreal.

¹ [Actes criminels - Dataset \(montreal.ca\)](#)

² [Open Data | Laboratoire d'innovation urbaine de Montréal \(montreal.ca\)](#)

³ [Crimes-in-Montreal/Police_Interventions_cleaned.csv · khaledfouda/Crimes-in-Montreal \(github.com\)](#)

⁴ [Crimes-in-Montreal/Data_Cleaning.R · khaledfouda/Crimes-in-Montreal \(github.com\)](#)

⁵ Based on selected divisions for the year 2019.

⁶ [What 3 years of detailed crime data tells us about how safe a city Montreal is | CBC News](#)

⁷ [Vue sur la sécurité publique - Ville de Montréal \(montreal.qc.ca\)](#)