Modeling and Visualization of the COVID-19 Outbreak in Ontario

Statistics Canada

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Introduction

- Client
  - Statistics Canada
    - Bruno St-Aubin, Team Lead and GIS Developer
    - Marian Radulescu, Unit Head and Analyst
- Requirements
  - Assess the quality and possibly improve upon StatCan open data sources
  - Build a product that shows that StatCan open source data are useable in complex analytical cases

Purpose

- Analyze the COVID-19 Outbreak in Ontario
  - Spread in long term care (LTC) homes
    - In the media
  - Association between disease activity in different (Public Health Unit) PHU regions and StatCan proximity measures

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THE STAR

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FEDERAL POLITICS

82% of Canada's COVID-19 deaths have been in long-term care, new data reveals

HEALTH

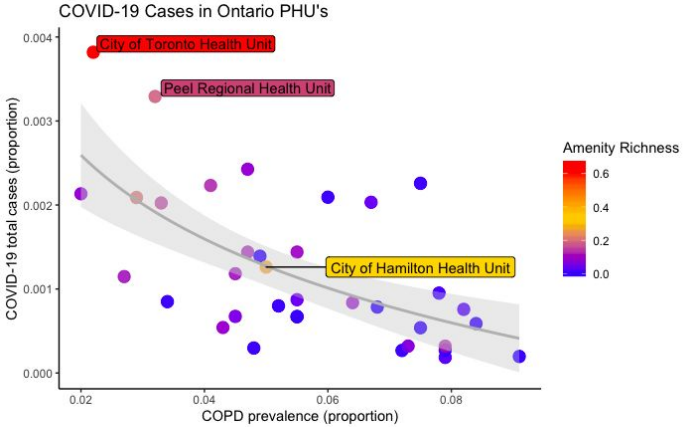
Coronavirus: Canadian military arrives at 5 Ontario long-term care homes struggling with COVID-19

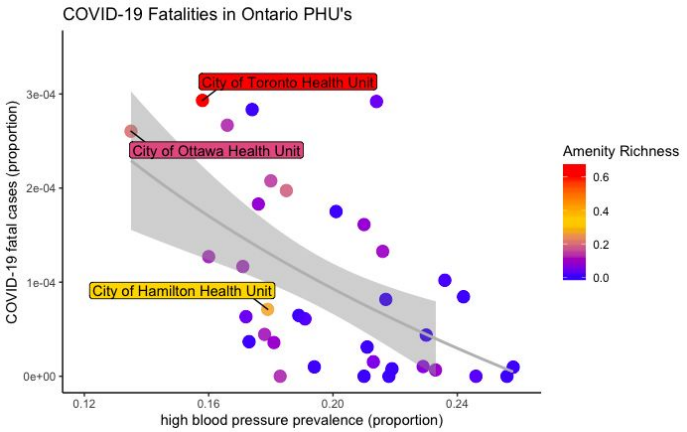
BY JESSICA PATTON - GLOBAL NEWS

Posted April 24, 2020 9:15 am
Updated April 24, 2020 4:51 pm

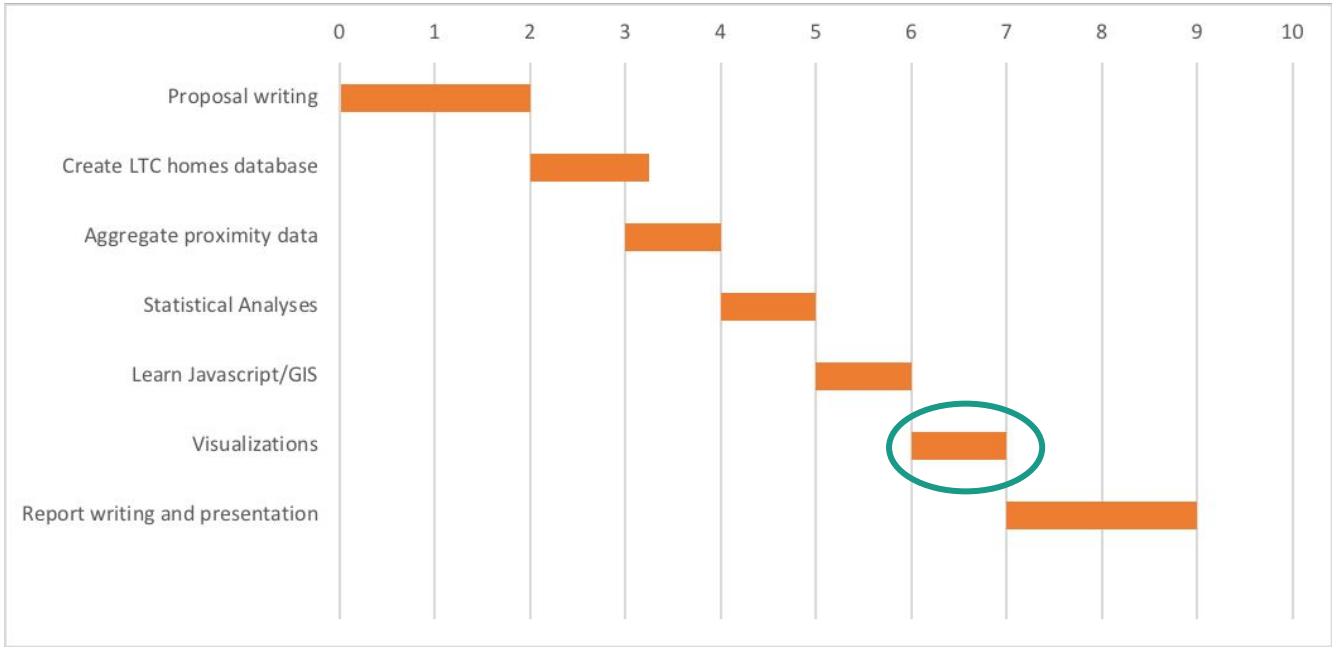
Summary of Week 6

- Midterm presentation
- Wrapped up statistical analysis
    - Adjusted response variable to reflect PHU proportion
    - Analyzed proportion of fatalities as response
- D3 tutorials and implementation





Schedule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Proposal writing
Create LTC homes database
Aggregate proximity data
Statistical Analyses
Learn Javascript/GIS
Visualizations
Report writing and presentation

Week 7 - Agenda

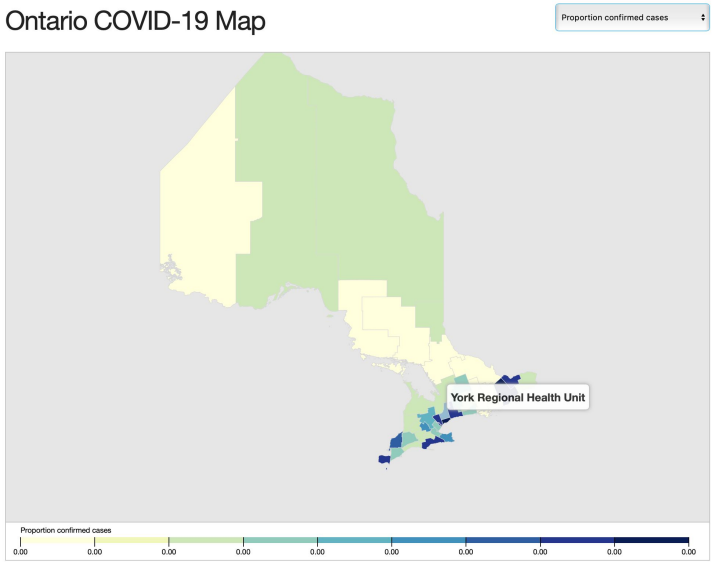
1. Produce an inferential statistical model of factors that may be associated with the COVID-19 outbreak in long-term care (LTC) homes in Ontario
2. **Produce an inferential statistical model of proximity and comorbidity factors that may be associated with COVID-19 outbreaks at the level of Public Health Units (PHU) regions in Ontario**
3. **Produce an interactive dashboard using QGIS and D3 (JavaScript) to visualize COVID-19 outbreak in combination with proximity and co-morbidity factors in Ontario.**

Week 7 - Tasks

1. **D3 Dashboard**
    a. Interactive map of Ontario
        i. Public Health Unit (PHU) polygon borders
        ii. Long Term Care homes (longitude, latitude) as points
        iii. Relevant metadata
    b. Additional chart for proximity measures (if necessary)
        i. Content and style TBA
2. **Cleaning and organization of documentation**
3. **Writing final paper**
4. **Updating data analysis with recent web scrape**

D3 Dashboard - Interactive Map

Proportion of confirmed cases



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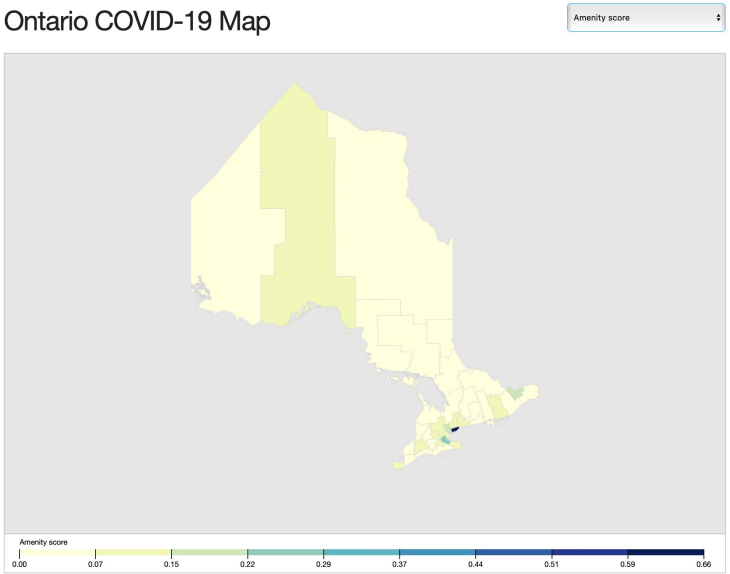
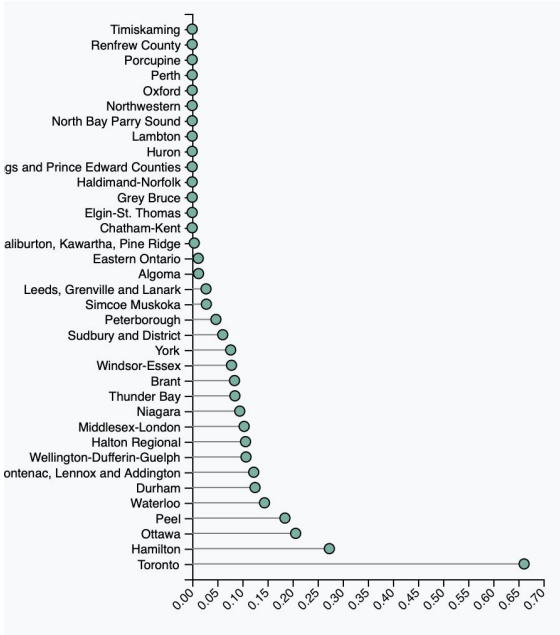
Total population:	1131052
No. confirmed cases:	1523
Proportion confirmed cases:	0.0013
Amenity score:	0.0767
No. fatalities:	101

D3 Dashboard - Interactive Map Barrier

Amenity Score



D3 Dashboard - Additional Proximity Chart



Potential Limitations

1. Barriers with D3 language - *Bruno from Statistics Canada has offered his help.*

Thanks!