Explaining the COVID-19 cases in Montreal

Introduction

- What are the most affected boroughs?
- Why are they harder hit than the rest of the island?
- Which borough is likely to be the least prepared for the next outbreak?

Data Acquisition

- Santé Montréal website

  https://santemontreal.qc.ca/en/public/coronavirus-covid-19/situation-of-the-coronavirus-covid-19-in-montreal

- Ville de Montréal website

  http://donnees.ville.montreal.qc.ca/dataset/polygones-arrondissements

- Foursquare API

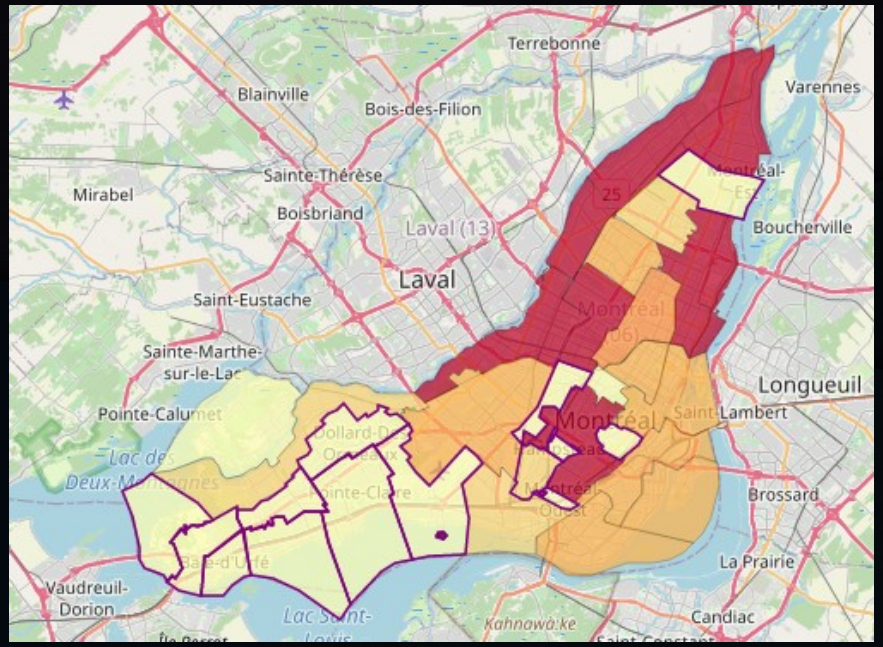
  https://developer.foursquare.com/docs/build-with-foursquare/categories

Data Cleaning / Wrangling

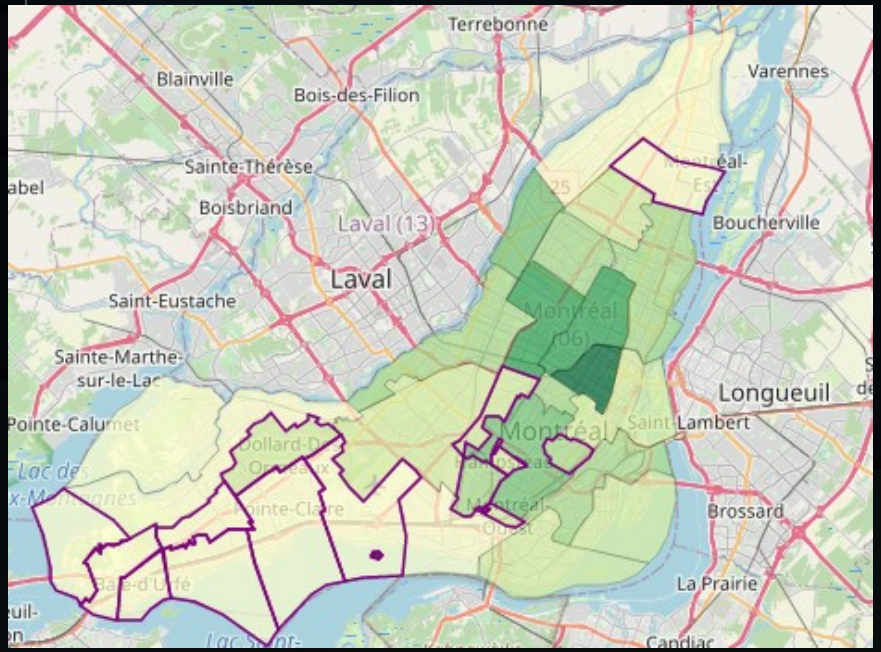
	Arrondissement ou ville liée	Nombre de cas confirmés	Répartition des cas (%)	Taux de cas pour 100 000 personnes	Nombre de décès	Taux de mortalité pour 100 000 personnes
0	Ahuntsic-Cartierville	2460	8,6	1832,5	358	266,7
1	Anjou	729	2,5	1703,4	51	119,2
2	Baie D'urfé	31	0,1	*810,9	< 5	n.p.
3	Beaconsfield	62	0,2	320,8	9	n.p.
4	Côte-des-Neiges-Notre-Dame-de-Grâce	2336	8,1	1402,8	259	155,5

	Borough	ConfirmedCount	DistributionRate	ConfirmedPer100K	DeathCount	DeathPer100K	Population	Area	BoroughType	Density	Latitude	Longitude
0	Ahuntsic-Cartierville	2460.0	8.6	1832.5	358.0	266.7	134243	25.571187	0	5249.775752	45.545058	-73.692788
1	Anjou	729.0	2.5	1703.4	51.0	119.2	42797	13.878194	0	3083.758656	45.612252	-73.569294
2	Baie-d'Urfé	31.0	0.1	810.9	5.0	100000.0	3823	8.025921	1	476.331652	45.416696	-73.914343
3	Beaconsfield	62.0	0.2	320.8	9.0	100000.0	19327	24.922506	1	775.483821	45.415412	-73.857932
4	Côte-des-Neiges-Notre-Dame-de-Grâce	2336.0	8.1	1402.8	259.0	155.5	166524	21.483755	0	7751.159068	45.483677	-73.635721

Exploratory Analysis



Confirmed cases

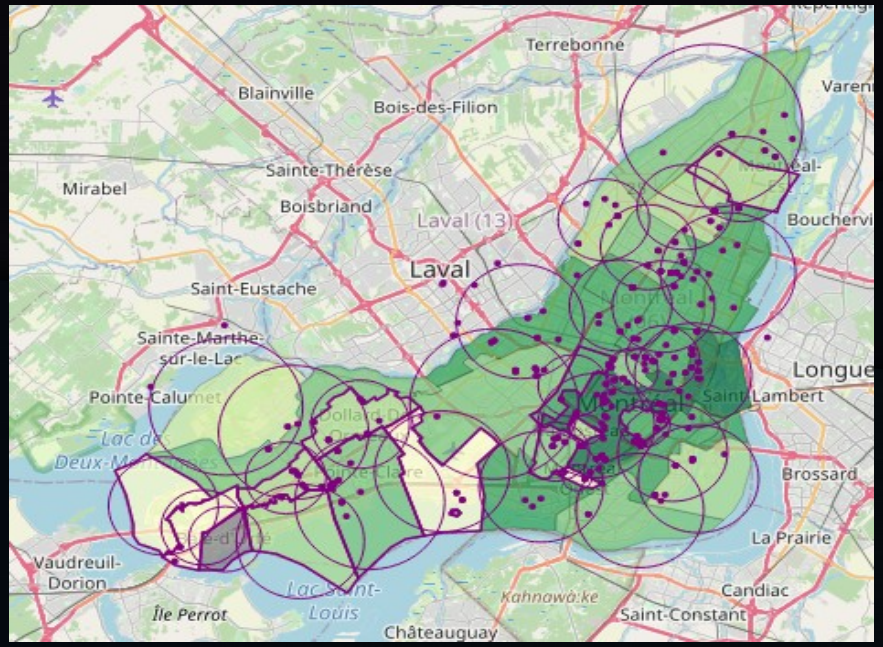


Population density

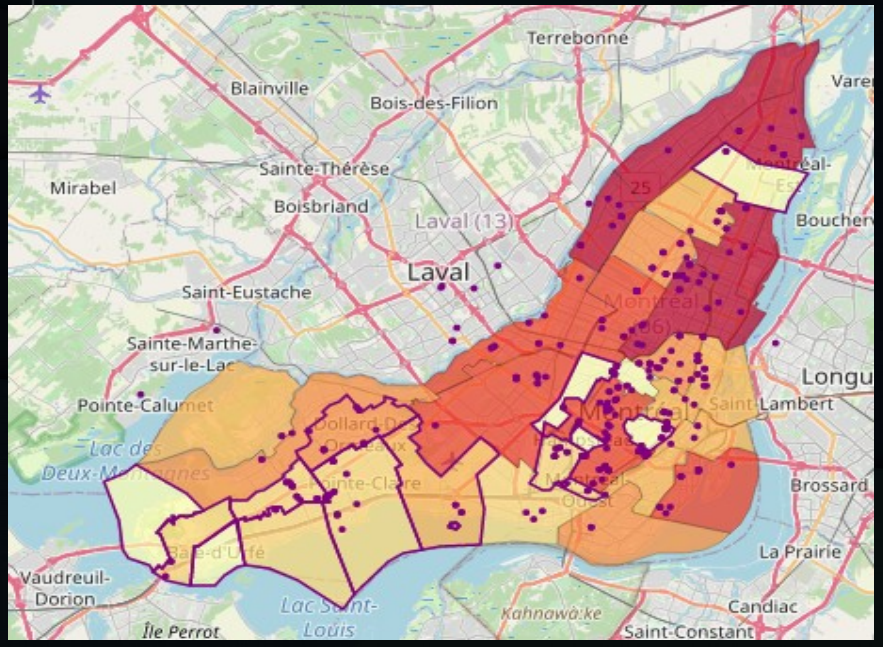
Exploratory Analysis

- Are linked cities doing better?
- Is it due to population density?
- How many clinics does each borough have?

Exploratory Analysis



Clinics nearby



Patients per clinic

Results

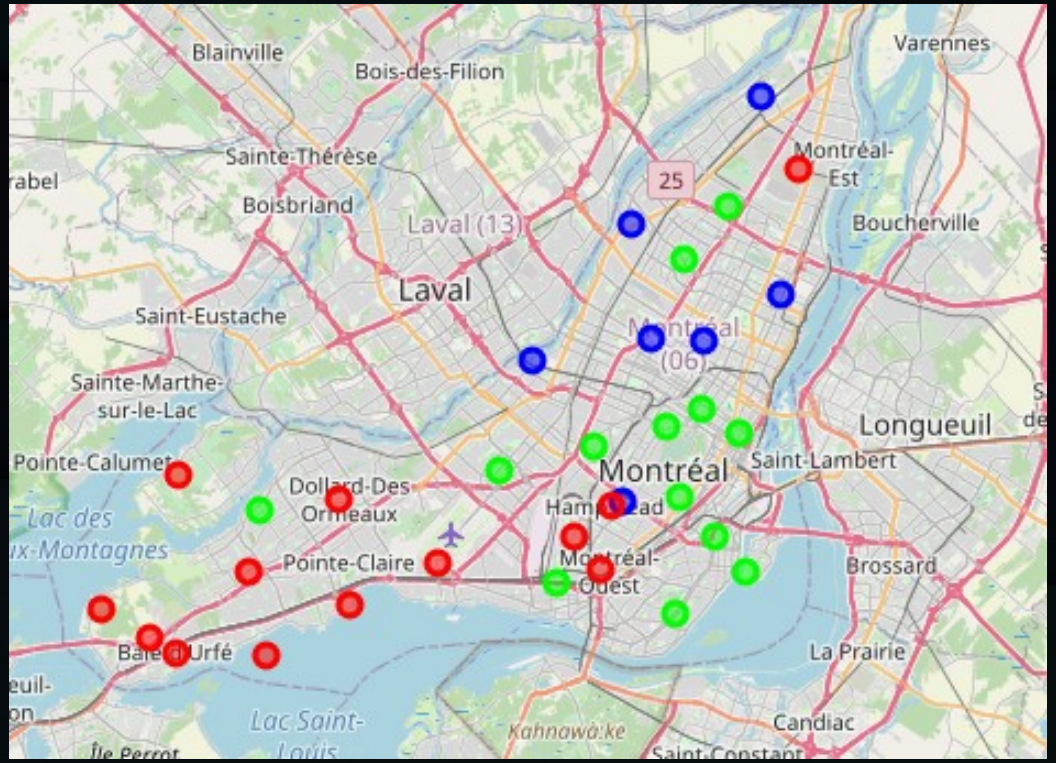
- **Cluster 1**: Boroughs to watch out for. These boroughs seem to be under control but exhibit a moderate-to-relatively-high patient per clinic ratio. This could become a bottleneck for testing and patient care if cases start going up all of the sudden.
- **Cluster 2**: Very affected boroughs. High confirmed cases, likely due to population density and high patient per clinic ratio.
- **Cluster 3**: Safe zones, low confirmed cases and deaths. Usually, high ratio of number of patients to clinic availability.

Results

Cluster 1: GREEN

Cluster 2: BLUE

Cluster 3: RED



Conclusion

- Additional demographics data is required.
- Linked cities (less densely populated areas) are managing it better.
- More testing and intensive care clinics are needed in highly populated areas.