Capstone – The Battle Of neighborhood Report

## **Introduction: Business Problem**

Covid-19 has been a new viral disease that has impact the world in 2020. World has come to a standstill with travel restrictions in all countries, tens of thousands are infected every day and thousands being deceased. Even after ten months start of this pandemic, the number of cases is still on rise.

In this project we will try to find the Covid cases in Ontario. Specifically, in this report we will review few of the **health center regions in Ontario province** that have huge number of cases and we use geocoding to view the **availability of hospital distribution** in this area.

We will use our data science powers to generate a few most promising neighborhoods based on this criterion. And decide the possible location to establish temporary medical centers to handle emergency medical crisis.

## **Data**

Based on definition of our problem, factors that will influence our decision are:

* number of Covid cases in each of Health region by age groups
* number of hospitals and distance to Health region in the neighborhood
* distance of hospital from Health Center

We decided to use regularly spaced grid of locations, centered around Health Region.

Following data sources will be needed to extract/generate the required information:

* centers of candidate areas will be generated algorithmically and approximate addresses of centers of those areas will be obtained using **Google Maps API reverse geocoding**
* number of restaurants and their type and location in every neighborhood will be obtained using **Foursquare API**
* Latest Covid-19 cases from the **Toronto Health Region** official website.

## **Methodology**

In this project we will utilize our efforts on detecting number of hospitals in Health regions with major covid cases, particularly Toronto Health Region. We will take data with proximity of 5kms around the region.

In first step we will collect the COVID-19 cases data from the **Toronto Health Region**.

Second step in our analysis will be splitting data into two parts namely, first wave and second waves.

In third step, we will compare the number of cases for each health region in both waves and take the region with the greatest number of cases in the second wave.

In final step, we will create an impact circle marker with number of cases as marker. Each radius of the circle will be proportional to its number of cases. We will consider the circle with highest radius and search the hospitals near the health region within 5kms radius using foursquare api. Once we draw circle with the available data, we will conclude the area where there is more need of hospitals or emergency medical centers.

## **Analysis**

We will download the latest covid-19 cases data from Toronto Health official website and perform some basic explanatory data analysis.

## **Results and Discussion**

Our analysis shows that although there is a great number of hospitals in Toronto Health Region (~5000 raduis to the region) which being the biggest Health region of the Ontario province

Results of the report clearly showcase the distribution of hospitals around the health region are not uniformly distributed. As we can see, most of the hospitals are concentrated at north-west or north of health region, leaving no hospital coverage towards south and south-west.

## **Conclusion**

Aim of this project was to identify hospital distribution around the Toronto Health Region, which is having the highest number of COVID-19 cases now.

Finally, we can conclude that, there is great deal of establishing new or temporary hospitals around the south-west or south of this health region to allocate equal amount of health facilities and provide emergency services available to elderly and vulnerable group in the region.