COVID-19 Healthcare Capacity in Monterrey, MEX

1. INTRODUCTION

When the COVID-19 pandemic led to a mandatory shelter, many countries weren't prepare for what was coming. With the first weeks, the response to the contingency was coming late, the president of Mexico were ambiguous and with out the public health care needed for what's coming. How is the healthcare Capacity in the City of Monterrey and surroundings .

2. Data Acquisition and cleaning

2.1 Data Source

For the analysis above I used the following data. Until 7/26/2020 this was the current data of covid in Mexico(All the 32 states). Also I used the second link to extract the # of towns/cities in Nuevo Leon Mexito

https://coronavirus.gob.mx/datos/#DownZCSV
https://es.wikipedia.org/wiki/Anexo:Municipios_de_Nuevo_Le%C3%B3n

Using above said data I will obtain the nearest hospital and also its latitude and longitude using Foursquare API

2.1 Data Cleaning

OFICIAL GOVERNMENT DATA: This cvs contains the info daily for each city in the 32 states in Mexico, and we only needed the NL. We only need the column: "nombre=", "poblacion" and we need to sum the daily data to know the current covid infected.

Wikipedia Data :-In the table it consists of 7 columns which are ' Clave Inegi' , "Municipio " so
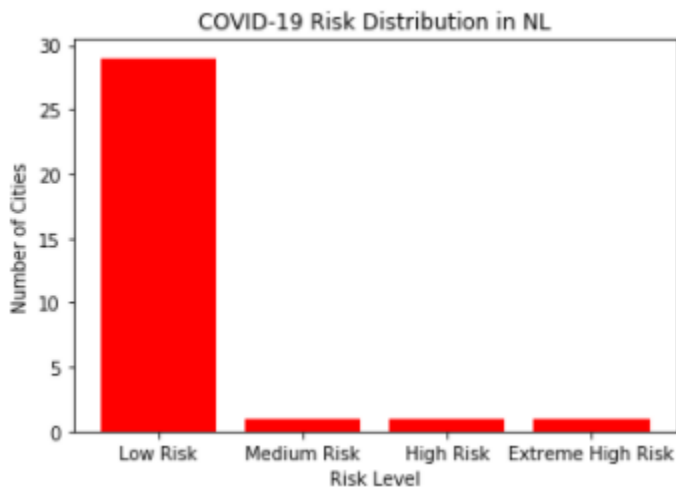
3. Analyze

Cluster and Visualize the Healthcare Hardship¶ According to Hardship Index, we now can cluster cities into different catagories. We use K-means clustering to divide this categories

3. Result

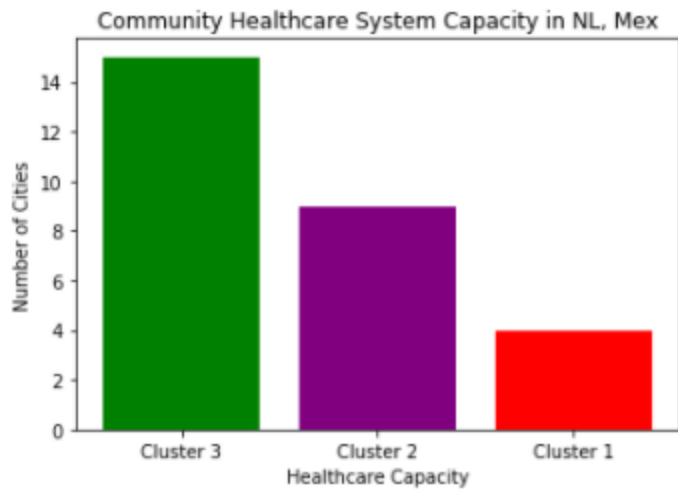With the following table we use the KNN clusters based on Hospitals reach near each of the cities

	City	poblacion	Total	City Latitude	City Longitude	Risk Level	Number of Hospitals
0	Abasolo,Nuevo Leon, Mexico	112397	113	25.700329	-100.355472	Low Risk	28
1	Aramberri,Nuevo Leon, Mexico	17800	17	25.644610	-100.295850	Low Risk	27
2	Bustamante,Nuevo Leon, Mexico	12830	8	25.737521	-100.333534	Low Risk	24
3	Carmen,Nuevo Leon, Mexico	275478	1456	25.670000	-100.357590	Medium Risk	34
4	China,Nuevo Leon, Mexico	11962	43	25.644610	-100.295850	Low Risk	27
5	Doctor Arroyo,Nuevo Leon, Mexico	37859	59	25.730665	-100.330205	Low Risk	31
6	Doctor Coss,Nuevo Leon, Mexico	1845	3	25.709449	-100.302903	Low Risk	38
7	Galeana,Nuevo Leon, Mexico	52045	86	25.731355	-100.331755	Low Risk	29
8	General Bravo,Nuevo Leon, Mexico	6127	46	25.665535	-100.335940	Low Risk	35
9	General Treviño,Nuevo Leon, Mexico	1194	5	25.688640	-100.307930	Low Risk	37
10	General Zaragoza,Nuevo Leon, Mexico	6604	3	25.738271	-100.336300	Low Risk	22

Using K/means clustering on the Total Cases for the 32 cities/Towns we can see that there is only 3 cities that fell in Extreme ,High, Medium Risk; Monterrey,Guadalupe and Carmen
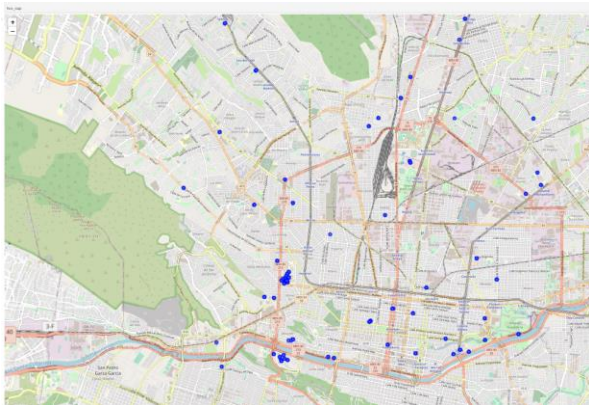

Low Risk	29
Extreme High Risk	1
High Risk	1
Medium Risk	1

Bar chart to visualize the overall healthcare system capacity in Monterrey Surroundings . The following graph shows the clusters in the area.

We can visualize all the hospitals in the Area

Conclusion

We can see that there is a deficient system, with the current hospitals/cases covid, not even we still don't have the capacity of each of this hospitals and not all the hospital accept patients with covid-19, with this data missing we could be more accurate on how each of the cities will be available to manage the cases.