Problem Description and Background Discussion

On March 21, 2020, the City of Chicago came under the stay-at-home gubernatorial order in the aftermath of the outbreak of Coronavirus Disease in the last quarter of 2019 (COVID-19). In the fight against COVID-19, the administration of the City of Chicago is on the lookout for data analysis and insight that would provide the foundation to contain the spread of the virus.

Effective data analysis and insight is the tool that would enable the mayoral administration of the City of Chicago to enact orders, rules, regulations, guidelines, measures, activities and operations aiming at enabling the city-wide response that is specific and appropriate to each zip code area.

On what has to be designed as the target variables, the first criterion upon which the response would be determined is the overall level of severity of COVID-19 infection in a given zip code area. The second criterion is the singular prediction score of each of the factors; namely, state of emergency, effectiveness of healthcare facilities, access to the services necessary to maintain good health, COVID-related mortality rate, health-conscious culture, rate of health insurance coverage, percentage of positive cases, safety and security, and contamination risk.

Both criteria - the overall severity level and factors score- will feed into the recommendation engine to determine the state of response the authority of the City of Chicago should take. In fact, the task consists of two components, which are the unsupervised prediction and the recommendation engine.