Measuring the efficient number of pharmacies in Moscow during Covid-19

Discussion of the Background

Coronavirus Disease is a severe infectious disease that started in December 2019 and has been continuing to this day. More than 3.52 million cases of the disease and more than 248,000 deaths have been reported worldwide. The vaccine has not yet been invented, so there is still no effective way to fight the virus yet, except for self-isolation and following WHO recommendations. As a result, the number of active cases continues to grow, increasing the burden on hospitals and pharmacies around the world. Therefore, maintaining the same level or reducing the rate at which a population becomes infected would give hospitals more time to resolve the situation and would flatten the COVID-19 curve.

Description of the Problem

One way of the virus spread is between people during close contact, often through the small droplets that may occur during coughing, sneezing, and breathing. The use of disinfectants and face masks helps to curb the spread of the disease, but many countries have introduced restrictions on the sale of these items online to stop fraud and the manipulation of their sale. For example, in Moscow, the sale of masks is allowed only in pharmacies now. However, Moscow is the second most populated city in Europe with over 12.6 million residents, which means that not all areas of the city may have enough medicine for everyone. Thus, the goal of this project is to identify the neighbourhoods where people might experience the lack of the means of protection against the virus.

Description of the Data

The neighbourhoods of Moscow will be analysed in project. To do so, the following sources of information will be used:

- Wikipedia will provide the names, areas and populations of the neighbourhoods.
- GeoJSON file that contains the coordinates of the neighbourhoods' borders.
- OpenStreetMap for determining the centre of every neighbourhood and making maps.
- Foursquare will be used to search for pharmacies in the neighbourhoods.

The way to solve the problem

Providing information about pharmacies that should theoretically be in high demand could help authorities and suppliers in the distribution of medicines around the city. This project will provide data analysis and a choropleth map of Moscow neighbourhoods where the colours will show the neighbourhoods with the highest ratio of population to the number of pharmacies. To determine the latter, the Foursquare requests will be made with the coordinates of the centre of a neighbourhood and the radius, depending on its area.

Say, it takes 5 minutes to serve one client in a pharmacy (12 people per hour). The working day is 8 hours, therefore, around 100 people will be served per day and around 3000 per month. According to Pew Research Center, the average number of people in one Russian family is 3.2 and, say, every family will go to a pharmacy only once per month. Thus, the results of more than 10000 people per pharmacy would be considered as high and this will be reported as a potentially problem area.