Establishing Localized Safe Zones to Mitigate Against the Spread of a Pandemic

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Introduction

Background

The global coronavirus pandemic of 2020 has caused widespread infection of people, along with many deaths. One strategy that appears to have been at least partially effective in combatting the spread of the virus has been to issue 'stay at home' orders. While these are effective, the toll on businesses and the people that own or work at them has been great. Businesses have been forced to close, resulting in record unemployment levels in the United States, along with the resulting effects on people's incomes and their mental health.

On April 4, 2020, President Trump said in a press conference that it was imperative to get to a point where life can get back to normal. He highlighted restaurants, sports venues and other social gathering locations in particular as being desirable to reopen as soon as possible.

This study will look into the feasibility of establishing 'safe zones' – parts of the country that are - and can be kept - free of the virus. People who have tested negative for the virus could be moved from nearby hot zones into the safe zones, and in the event that someone in the safe zone test positive, they can be moved out of the safe zone.

Obviously, such a proposal has implications beyond the data, not least the ethical and legal aspects, but I leave such issues to the philosophers and lawmakers.

Problem

While the idea may sound simple, there are many factors that need to be taken into account in deciding where a safe zone can be established. It should be a location currently free of the virus where the

population numbers and density, availability of housing for people coming into the safe zone, availability of businesses to support the population, recreational facilities and healthcare services will all play a factor.

Within a safe zone, it would be desirable for life to go on as normal, as much as possible. Ideally, a safe zone would allow people to go to work and enjoy social and recreational activities as they would normally. It will include healthcare facilities such as hospitals, and other essential businesses including grocery stores.

Interest

The results of this study will be of interest to state and federal governments and may help to design a template for dealing with future pandemics, or at least a talking point to help design plans for the future.

The Data

Data Sources

Studying and modelling such a proposition would be impossible without data to draw insights from, and the current COVID-19 pandemic allows us to access real pandemic data. In this study, I will be utilizing the following data:

For the numbers of confirmed cases and deaths by US county, I have chosen the COVID-19 US Counties dataset published by the New York Times at https://raw.githubusercontent.com/nytimes/covid-19-data/master/us-counties.csv.

Social and economic data is available from the US Census Bureau at https://www.census.gov/data/ in both downloadable datasets and via API access. This will provide data on population numbers, population density and other economic factors.

Official US health, local government and public safety datasets are available at https://www.data.gov/. These will give insights on the availability and capabilities of hospitals, other healthcare services and public safety services such as emergency services.

Local venue and neighborhood data will be accessed via the Foursquare API to allow exploration of potential safe zones for the number of venues such as stores, cinemas, restaurants and coffee shops, and recreational venues.