

# Epidemic Analysis of Covid\_19

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## 1. Introduction

### 1.1 Background

At the close of 2019, a pneumonia of unknown cause was detected in the city of Wuhan in Hubei province, China. At the end of Jan 2020, the virus outbreak in Wuhan which named covid 19 by WHO. It seems this virus spread very fast, it outbreak in Italy and Spain in March then it swept US. As far as today, the totally confirmed case increased to more than two million. Many countries are falling into the crisis of lack of medical resources and hundreds people died every day. There is no specific medicine to treat this virus, ventilators are the key part to save lives, but its output is limited. Prevent virus is the most important thing for the whole world. Also the epidemic hit the world economic heavily, many industries are forced to stop business in order to prevent various spread, unanimous people lose their job and trapped into financial problems.

### 1.2 Problem

The whole world is concerned about epidemic, an intuitive epidemic map will help people better understand the global situation. Each country has different medical condition and capacity, this is the biggest element that influenced the country mortality rate. According to the big difference of infection rate by country, anti-epidemic measures definitely played a crucial role. So we need to use this data to decide what's the best useful way to prevent and control the spread of this virus and which country's medical system is worth for others to learn from.

## Data acquisition

### 1.3 Data Resources

Recently, covid 19 is the most concerned issue around the world, WHO updates relevant data everyday and Johns Hopkins have designed a wonderful website with various of epidemic map and chart based on countries and areas. I got data from Enigma include the number of confirmed cases, deaths, recoveries by location and global, it also include geographic locations which could be used to draw maps, these csv files will be update daily in github, so I can retrieve the data easily thanks to their wonderful jobs. As for the population of countries and regions I use, these data are retrieved from Wiki.

### 1.4 Data Usage

There are three point I want to figure out, the first and also the most important part is Global Epidemic Map. As for this part, I need to get the number of confirmed cases by country and specific state or city and their longitude and latitude in order to generate map.

Sample Feature Selection

| Province/State | Country/Region | Lat     | Long     | Total Confirmed |
|----------------|----------------|---------|----------|-----------------|
| Beijing        | China          | 40.1824 | 116.4142 | 593             |

| Country/Region | Daily Confirmed Case | To Current Day |
|----------------|----------------------|----------------|
| China          | From 1/22/20         | /              |

The secondary aspect I want to do research is Diagnosis Rate by Country and the most serious state in each country. I also need the data that used in before step and population of these countries and areas are necessary. The conclusion based on analysis will be helpful to provide some recommendations about what measures are effective to prevent virus.

Sample Feature Selection

| Country/Region | Confirmed Cases | Population    |
|----------------|-----------------|---------------|
| China          | 83968           | 1.393 billion |

At the last, Comprehensive Medical Level and Ability by Country is the topic that I'll seeking the conclusion by data. This analysis need to combine many elements, for example countries population, the percentage of confirmed case by countries population, the mortality rate by countries and by confirmed cases. Those data are key partial that could get some conclusions.

Sample Feature Selection

| Country/Region | Diagnosis Rate | Mortality Rate By Country | Mortality Rate By Confirmed Case | Population |
|----------------|----------------|---------------------------|----------------------------------|------------|
| ***            | ***            | ***                       | ***                              | ***        |