

COVID-19 Impact and the Hospital Capacity:
Story of Mainland United States

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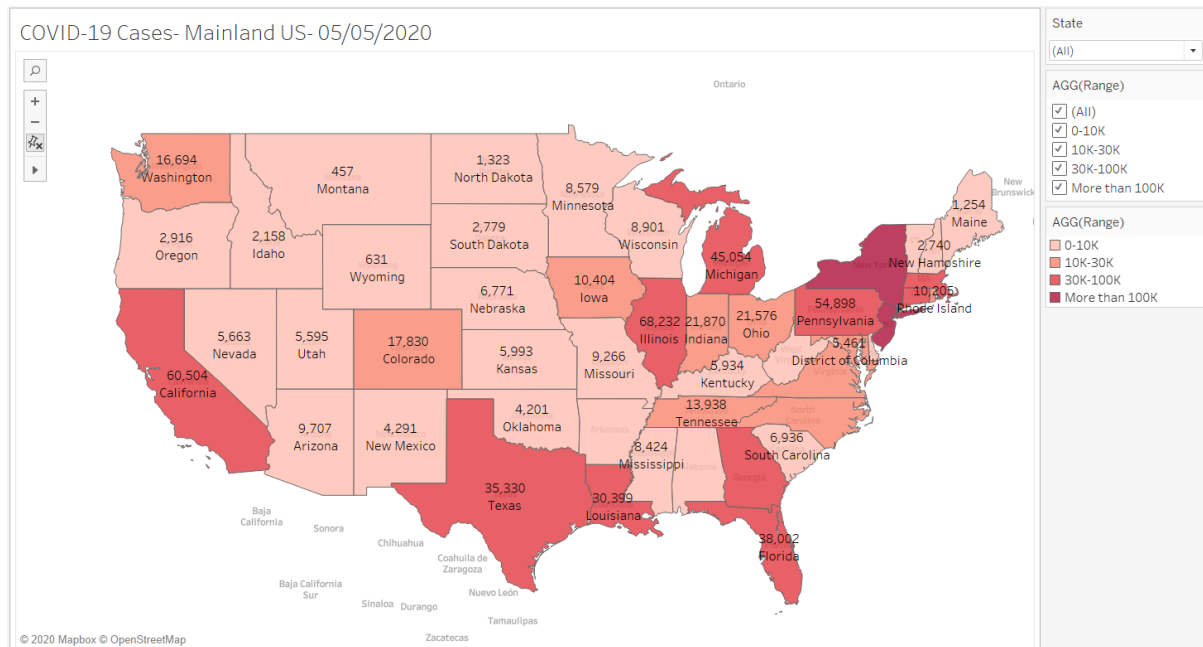
Ending of the beautiful year of 2019 was never expected to mark the beginning of the long-lasting crisis, the World was not at all prepared for. On 31st December 2019, the city of Wuhan in the Hubei province of China had reported a cluster of pneumonia cases and no one had the slightest idea of what would it turn out to be.

With more cases occurring in Mainland China and later the cases being reported outside China too, based on its genetic sequence released by China around 12th January, the seemingly pneumonia virus was now identified as the novel coronavirus or the COVID-19.

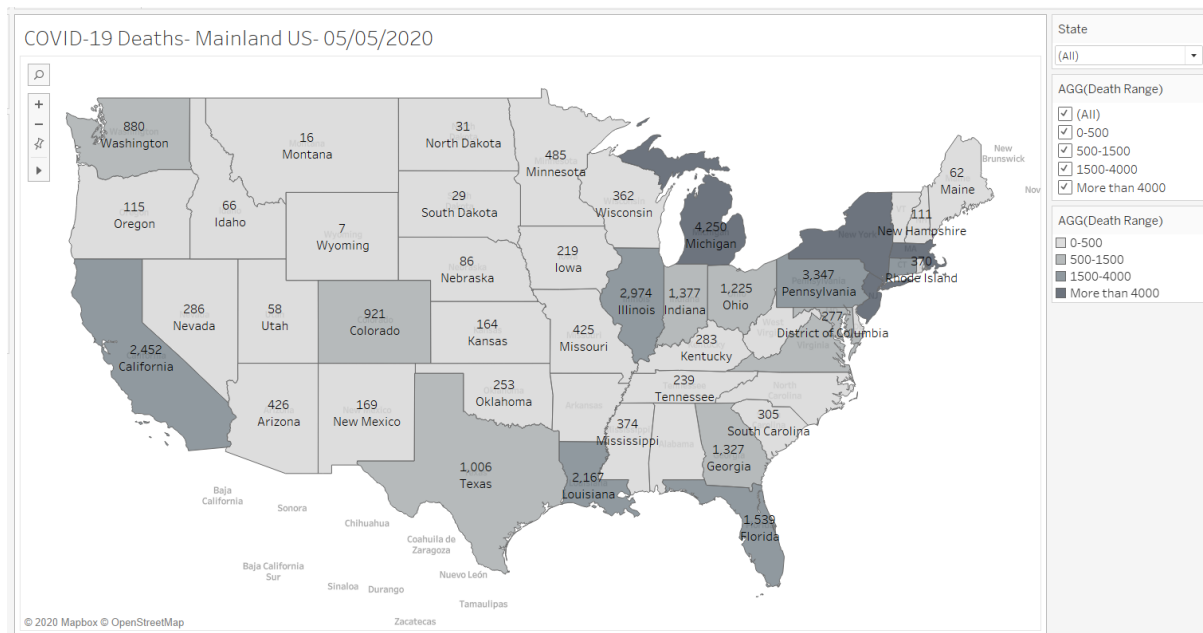
The COVID-19 virus devastated mainland China and especially the province of Hubei and created a sense of panic in every other country in the World. Despite all countries closing their borders and releasing travel advisory for China, the response, as per my point of view, was late and the virus, however had already started spreading outside mainland China to the neighbouring Asian countries.

By the first week of March, the virus had created a different level of havoc and panic in most of the European nations including Italy, Spain, and Germany. By the first week of March a few hundred cases were noted in Mainland US and it was the beginning of the devastation, one never thought of for the United States.

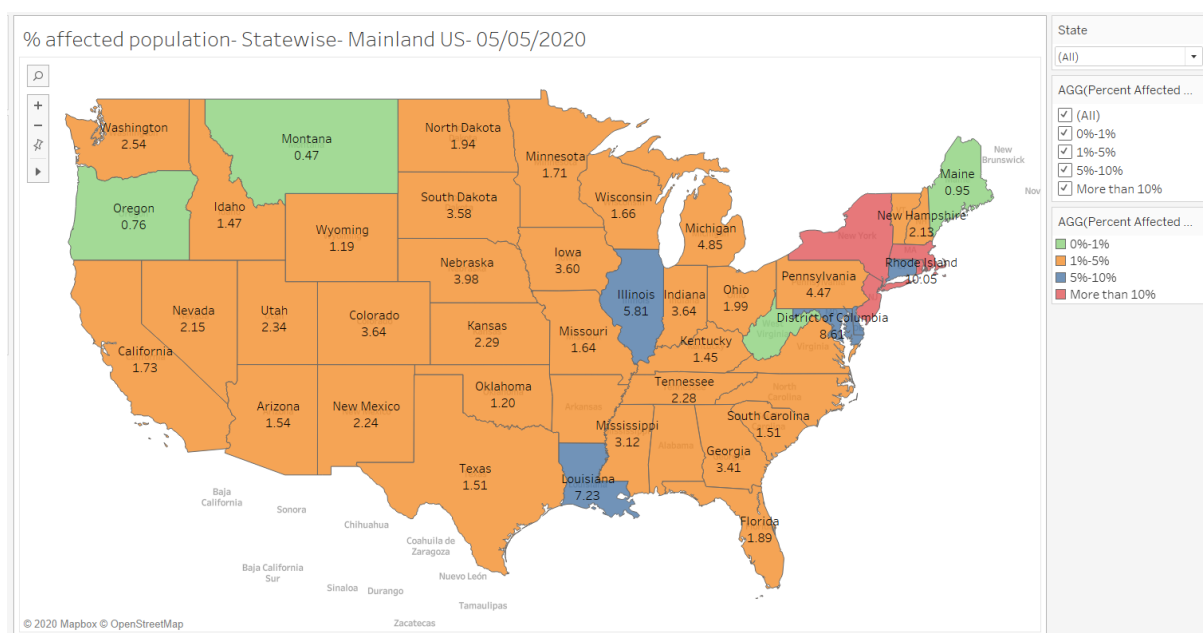
Below shown are some of the visualizations that show the havoc created by the COVID-19 virus in the United States. **The visualizations have been created in Tableau using the data obtained from John Hopkins University.**



Map-1: COVID-19 positive cases registered as of 5th May 2020 in The United States of America



Map-2: COVID-19 deaths registered as of 5th May 2020 in The United States of America



Map-3: Percentage of Population Affected by COVID-19 (Per State)

A great nation like The United States saw the impact of virus on most of its sectors including aviation, education, health, finance, labour and so on.

The impact of COVID-19 on the education sector as quoted by CNN, **“Officials in 48 US states, as well as Washington DC, have ordered or recommended school closures for the rest of the school year, according to a CNN tally. Schools in all five US territories -- American Samoa, Guam, Northern Mariana Islands, Puerto Rico and US Virgin Islands -- also are closed for the remainder of the school year.”**

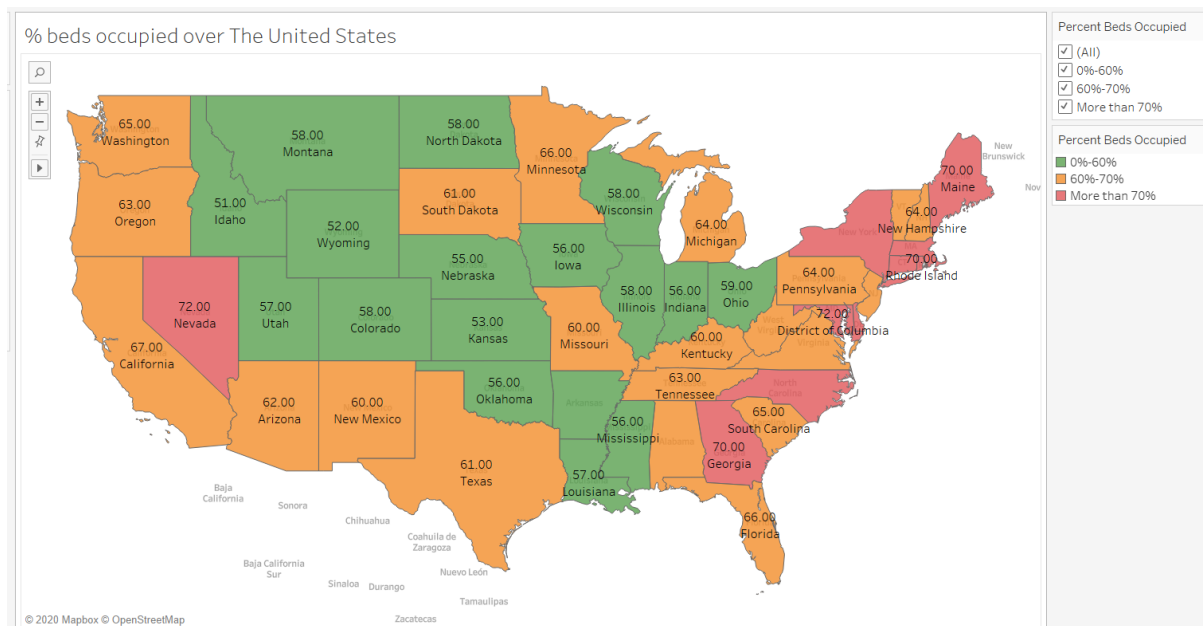
Similarly, the impact of COVID-19 on the airline sector can be understood as quoted by CNBC, **“To limit the spread of the coronavirus disease, a total of 217 countries and territories worldwide have imposed travel restrictions, according to a report by the United Nations’ World Tourism Organization. Such travel curbs have turned the travel and tourism industry into one of the largest casualties of the coronavirus pandemic. Airlines’ passenger revenue is estimated to plunge by \$314 billion in total — or 55% — from 2019 levels, according to the International Air Transport Association. Job losses in the travel industry could reach more than 100 million this year, according to an analysis by World Travel and Tourism Council.**

The COVID-19 pandemic adversely affected the employment across The United States and as quoted by USA Today, **“The U.S. economy lost 20.5 million jobs in April and the unemployment rate soared to 14.7% — both record highs — laying bare the starkest picture yet of the crippling gut-punch delivered by the coronavirus pandemic.”**

With COVID-19 infecting a huge number of people as shown above, the pandemic had almost entire hospital staff over the States on their toes. Below shown are some visualizations showing the devastating impact of the virus on people’s health.

Below shown map depicts the hospital occupancy of 5th May because of COVID-19.

Please Note: The occupancy shown is based only the reported occupied beds by COVID-19 patients and the actual percent can be more than shown below but in no circumstances can it be less than shown.



Map-4: Hospital Occupancy (in %) due to COVID-19 across The United States

States with more than 70% hospital beds occupied are Nevada (72%), Maine(70%), New York(78%), Rhode Island(70%), Massachusetts(74%), Delaware(72%), North Carolina(70%), Georgia(70%), Connecticut(76%), District of Columbia(72%) and Maryland(71%).

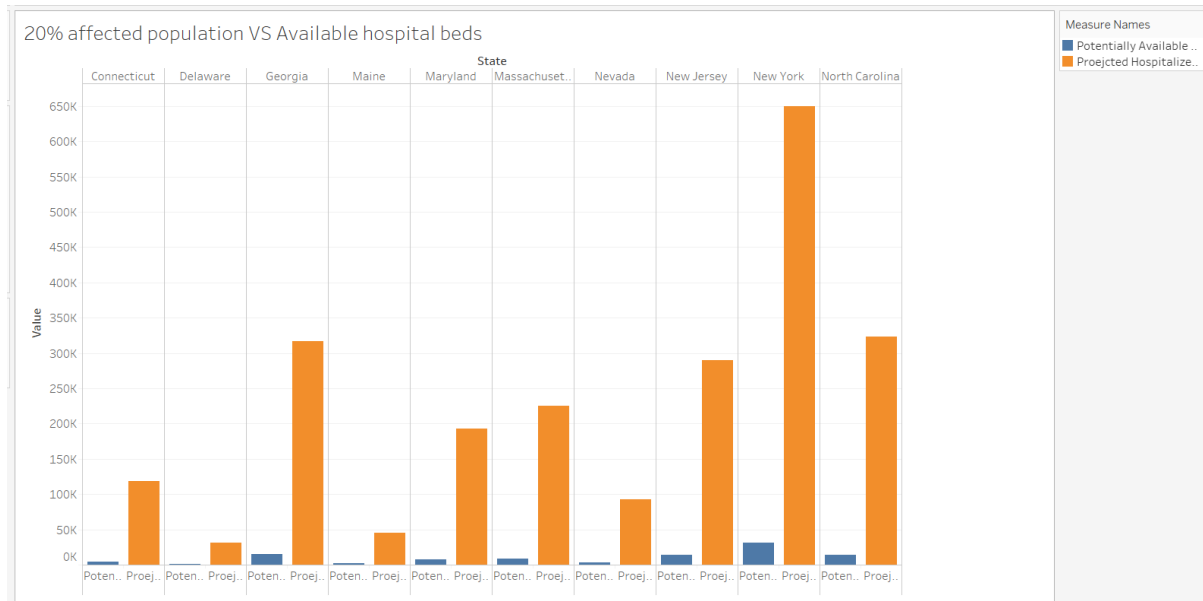
In depth analysis- Hospital Capacity VS Projected COVID-19 Cases as per the dataset provided by HGI (Harvard Global Health Institute)

As shown in the above visualizations American states like New York and New Jersey have almost 20% of its population affected and to quote global pandemics, **“Our original infection rate scenarios are based on estimates by leading epidemiologists such as Harvard’s Mark Lipsitch, who predicts that 20 to 60 percent of the population will get infected with the novel coronavirus over the course of the pandemic. Our original time stamps – 6, 12 or 18 months – are based on the assumption that it will take about 18 months for a vaccine to be widely available (if there will be a vaccine.)”**.

Hence, assuming 20% population being infected in many states, we have created a visualization to compare the projected hospitalizations with the potentially available hospital beds.

Projected hospitalization- 20% population being infected and 20% of the infected population assumed to be hospitalized.

Potentially available hospital beds- Beds available with 50% increased capacity to visualize a flexible scenario where at any given time the number of beds available is based on patients admitted and patients discharged or moved due to some circumstances.

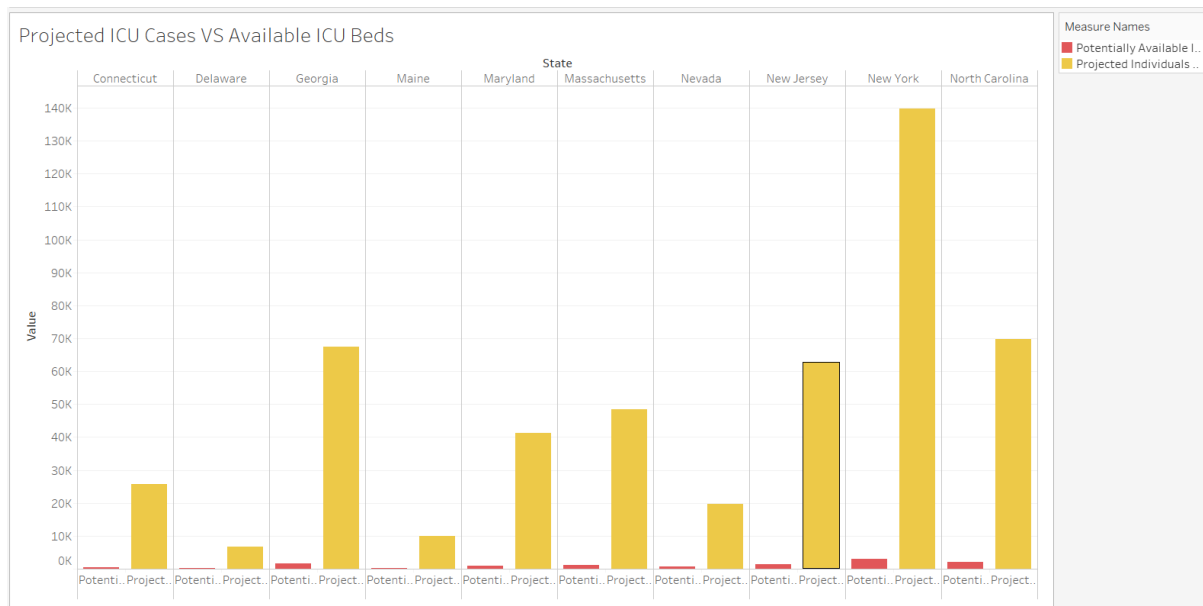


Graph-1: Projected Infections VS Available Hospital Beds

COVID-19 is a serious pandemic and leads to many critical cases that need to be admitted in ICU. Considering the fact, the below shown visualization comparing the number of people needing ICU care with potentially available ICU beds tells a lot about the severity of the disease.

Again, to quote Global Pandemics, **“From the overall infected population those under 65 had a 3.6 percent probability to end up needing ICU care, and those 65 and older had an 8.1 percent probability to need ICU care”**.

Based on these ICU admission projections and potentially available ICU beds, we can observe the severity of the pandemic.



Graph-2: Projected ICU Admissions VS Available ICU Beds

Hence, based on the maps showing the number of cases and deaths and the quotes suggesting the affect of the pandemic on various sectors and by the visualizations advocating the current and potential surge of patients occupying general and ICU beds it is evident that the pandemic is indeed severe and is creating havoc in the United States.

The purpose of this documentation is not to blame or show the lack of preparedness of any sector or the Government but only to prove the severity of the global pandemic based on various evidences.

Certain State Governments in the United States are in fact doing a great job in combating the invisible enemy. An example for the same is as shown below.

As of March 30, 2020, to quote npr.org,

“One such facility has been set up in Central Park, in the East Meadow. It's a grassy space normally populated by sunbathers, but as of Tuesday it will be a 68-bed respiratory care unit opened in partnership between the relief organization Samaritan's Purse and Mount Sinai Health System.”

“*The Wall Street Journal* reported Monday that the city will build a 350-bed space in Queens, at the Billie Jean King National Tennis Center located in Flushing Meadows-Corona Park, which is also the largest public tennis facility in the world.”

“On Monday morning, the city welcomed the arrival of the USNS Comfort, a Navy hospital ship. The ship, which has about 1,000 beds and a dozen

operating rooms, will treat patients who need urgent medical care, but who do not have COVID-19”

“Last Friday, New York Gov. Andrew Cuomo announced that the state had completed the construction of a 1,000-bed temporary hospital at the Jacob K. Javits Convention Center, on the far west side of Manhattan.”

The virus is indeed dangerous but with certain imposed restrictions and great efforts by the State and the Federal Government it can surely be combated, sooner or later.

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