

COVID-19 Progression in the US

Project Link:

<https://github.com/karlwhite247/Data-Visualization-with-Tableau/blob/b5ebb7aa3b32c39865c47b7146a33c4a2a9b3a4e/Course%205%20Data%20Visualization%20with%20Tableau%20Project/Assignment%206%20-%20Final%20Presentation.twbx>

Design Choices:

The design choices took into account the 3 personas listed below: 1) an epidemiologist, 2) hospital administrator, and 3) a businessperson. The first two would have a medical background and familiar with COVID-19 progression in the US, but the businessperson is unlikely to have that background. Therefore, one design choice was a **data story** that included an introduction which included some background and walking through the issues involved with spread of disease; otherwise, the businessperson would not understand the presentation.

Because of the need to show data across the US, utilized a map of the US summarizing the Key Performance Indicators (KPI) of Number of Positive Cases, the Case Fatality Rate, Deaths per 1000 population, and Positive Test Ratio utilizing **size of circle** over each state and county as well **color** coding to highlight differences between states and counties. Given different persons may be interested in various regions, states, and counties allowed them to **filter** by those fields. In addition, the progression of the disease varied over time, so a date **filter** was also provided. To help show a potential correlation between the positive test ratio and case fatality ratio a scatter-plot graph was chosen. A line graph with start and end date and state filters was chosen to best show a trend of positive cases and deaths over time. These visualizations were also chosen to reduce cognitive load and clutter and provide an step by step explanation vice a single visualization which might be overwhelming.

Comparing Final Project with Original Project

The original proposal included more predicting potential positive cases which may be important but as I was pulling data and gaining more understanding another important KPI surfaced which was the Positive Test Ratio. I learned that if the positive test ratio is greater than 10% then it is likely cases are being missed and it is impossible to do contact tracing and contain the outbreak. So instead of working on prediction finding the data and developing the positive test ratio KPI became more important. (see data story for more explanation).

COVID-19 Project Proposal

Executive Summary

Because of the lack of COVID-19 testing and contact tracing in some locations in the US, it has been difficult to assess the number of actual COVID-19 cases and therefore the economic and health implications of the outbreak. Up to 80% of symptomatic patients were not tested and virtually none of the asymptomatic cases even though they are likely contagious. [1] Asymptomatic cases likely make up about 20% of total cases.[2-10] Several recent studies provide a case fatality and case – ICU / hospitalizations that would help potentially predict a more realistic number of total COVID-19 cases and therefore help predict future cases.[11-15] Given governors' plan to relax social distancing restrictions it will be important to compare the positive cases of COVID-19 through testing and those predicted from recent hospitalizations and deaths.[16, 17]

Why: Because of the lack of testing and contact tracing, there is a general under reporting of COVID-19 cases in the US. This under reporting causes errors in predictive models which are needed to predict future cases, hospital and ICU staffing and equipment needs, as well as future fatalities.

Who: The stakeholders are civic and hospital leaders in the community. In addition, business leaders and workers have an interest in the information. See persona documents below.

What: In order to estimate symptomatic and asymptomatic cases by state and county, will pull currently COVID-19 hospitalizations, ICU admissions, and deaths from these two web sites: [Covid Cases by County](#) and [Hospitalizations, ICU Admissions, and Deaths by State](#). County and State [Demographic data from the US Census](#) will also be utilized. All of these sources are publicly available. There will need to be some data clean-up / data quality efforts as well as joining the sources together by time.

How: US map will the ability to drill down by county show discrepancies between positive test cases and the likely number of cases based on hospitalizations, ICU admissions, and deaths. The future number of cases will also be predicted.

Challenges: Syncing several data sources together will likely be challenging. Devising a predictive model will also be challenging. For the latter will review the literature to see the best methodology. In order to appeal to a large audience needs to be simple and straightforward but also with the ability to inform multiple stakeholders.

Persona 1 COVID-19 State Epidemiologist: Janet



Role: Janet is a state epidemiologist who is interested in a better predictive model for COVID-19, and is concerned that her state is not capturing all of the cases of the disease.

Age: 40

Gender: Female

Education: Master of Public Health (MPH)

Goals:

- Improved reporting of cases of COVID-19 in her state
- With improved reporting, Janet's office can help ensure local health departments do proper contact tracing / quarantine of patients
- Reduce the morbidity and mortality from COVID -19

Context:

- "I feel like I am "driving blind" in regard to making policy recommendations to the governor."

Persona 2 COVID-19 Hospital Administrator: John



Role: John is a hospital administrator who is interested in a method to better predict staffing and supplies needed for his facility. The number of COVID-19 hospital cases has started to decline but he is worried that they may be another surge when the governor changes social isolation restrictions over the next few weeks.

Age: 45

Gender: Male

Education: Master of Business Administration in Health Care (MBA)

Goals:

- Need at least a 4 week heads up if a surge in COVID-19 patients is anticipated
- Obtain needed supplies to best care for his patients
- Keep his staff informed and supplied with the equipment they need to care for patients
- Be able to start caring for more elective and routine health care needs.
- Reduce the morbidity and mortality from COVID -19

Context:

- "I don't ever want to go through what we did over the last few weeks. We really need a better information regarding this disease."

Persona 3 COVID-19 Businessperson: Susan



Role: Susan is a businessperson who owns a consulting business that employs 5 employees. The last 2 months has been very difficult since she has had work from home and only have virtual meetings with her employees. Her staff are concerned about meeting clients face to face. She is glad the governor wants to “open up” the state but doesn’t want to endanger her staff or her loyal customers.

Age: 35

Gender: Female

Education: Bachelor of Arts (BA)

Goals:

- Need a better understanding of the risks involved to her staff and customers
- Reduce the risks to her staff and customers to a reasonable level
- What strategies and actions should she and her staff take?

Context:

- “I’ll be glad to get back to normal, but I understand we will need to make some changes.”

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