COVID-19 Analysis Across US States

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Agenda

Objective of the Analysis

Analyze the evolution of the pandemic in the United States through the course of 2020 by addressing these 6 questions:

1. What are the mortality trends across all the US states during this health crisis?
2. Is state-level policy action effective in slowing down the infections?
3. What is the relationship between mortality rate, infection rate and the percentage of seniors and children living in the same household?
4. How does health insurance coverage correlate with mortality rate and infection rate?
5. How are hospital provider capacities related to mortality rates?
6. Are socio-economic factors correlated with higher infection rate?

Data and Limitations

Data Period & Source

- Time Period: Jan 22 - July 17, 2020
- Frequency attributes: Daily or Point in time
- Sources: Johns Hopkins, KFF (Kaiser Family Foundation)

Data Elements

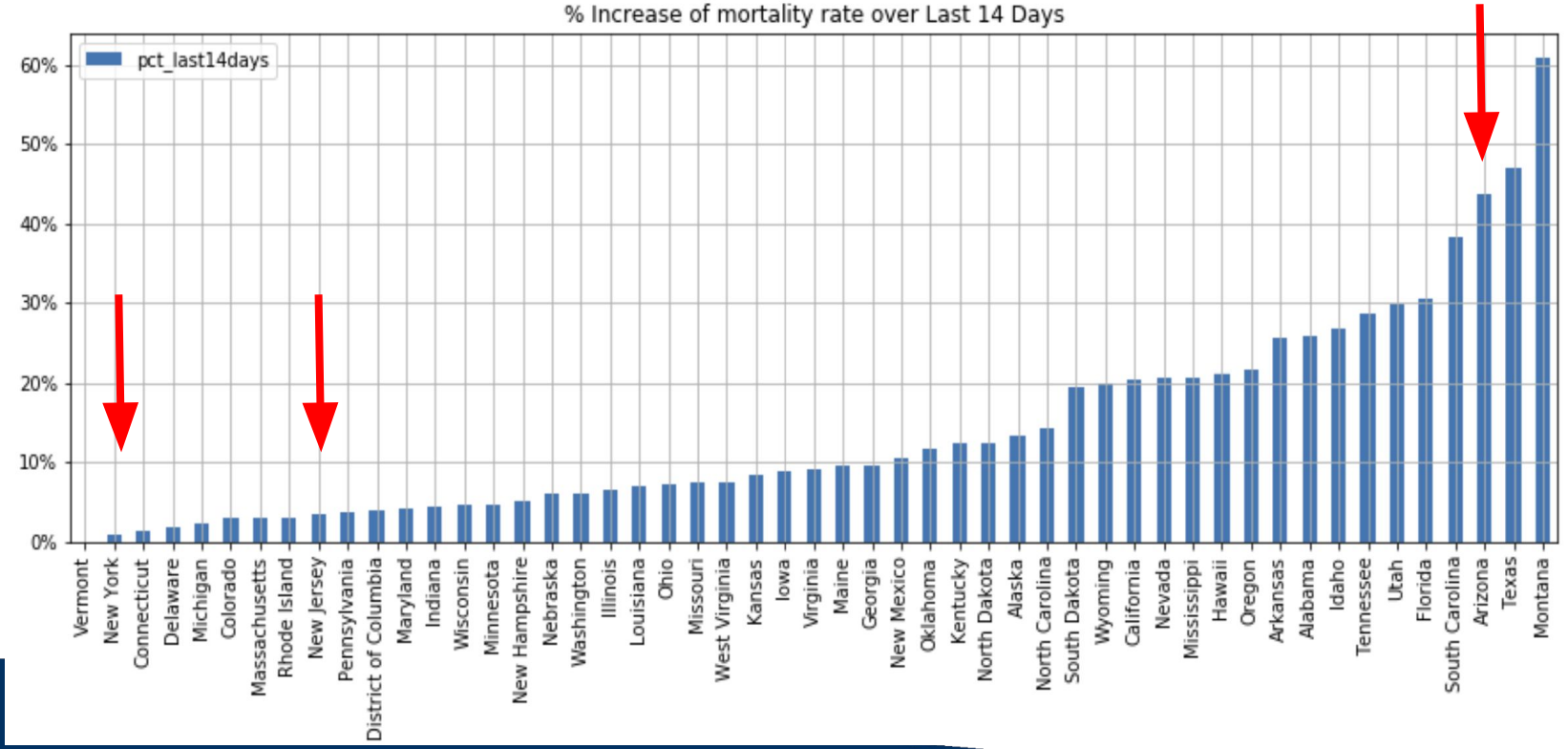
- Number of confirmed cases
- Mortality and Transmission Rate
- State Reopening Date
- Seniors living with School-Age Children
- Uninsured and Unemployed Population
- Hospital Admissions and Beds

Data Limitations

- Lack of data on elderly who are uninsured
- Confounding factors like health conditions and age.

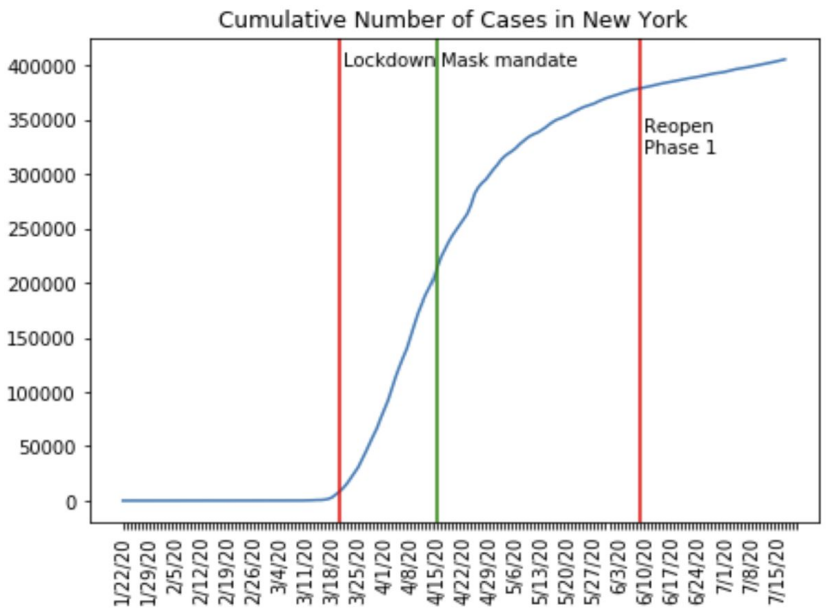
Recent evolution in mortality rates

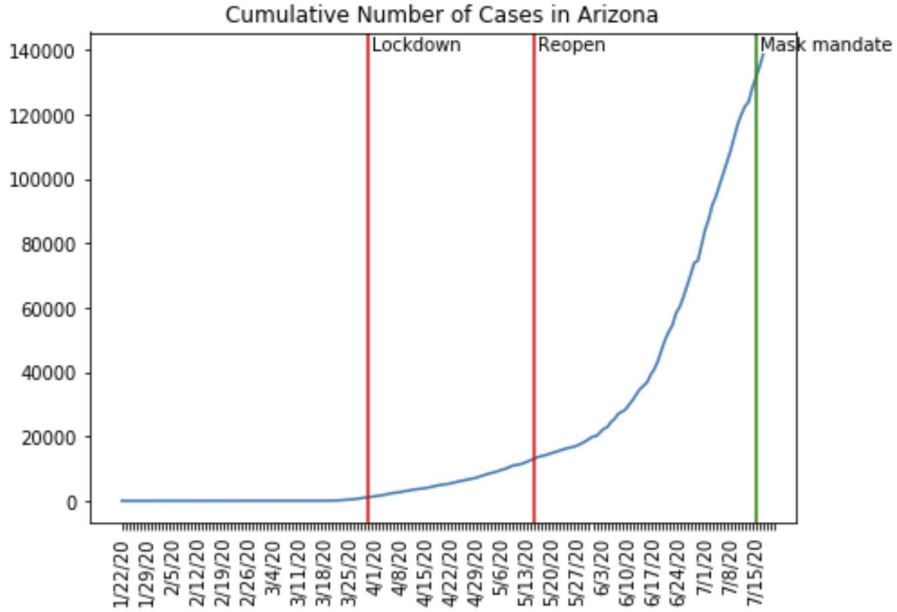
- Rate of increase is relatively low in New York and New Jersey– states with the highest number of COVID cases and deaths
- Rate of increase is highest in Montana, Texas, Arizona



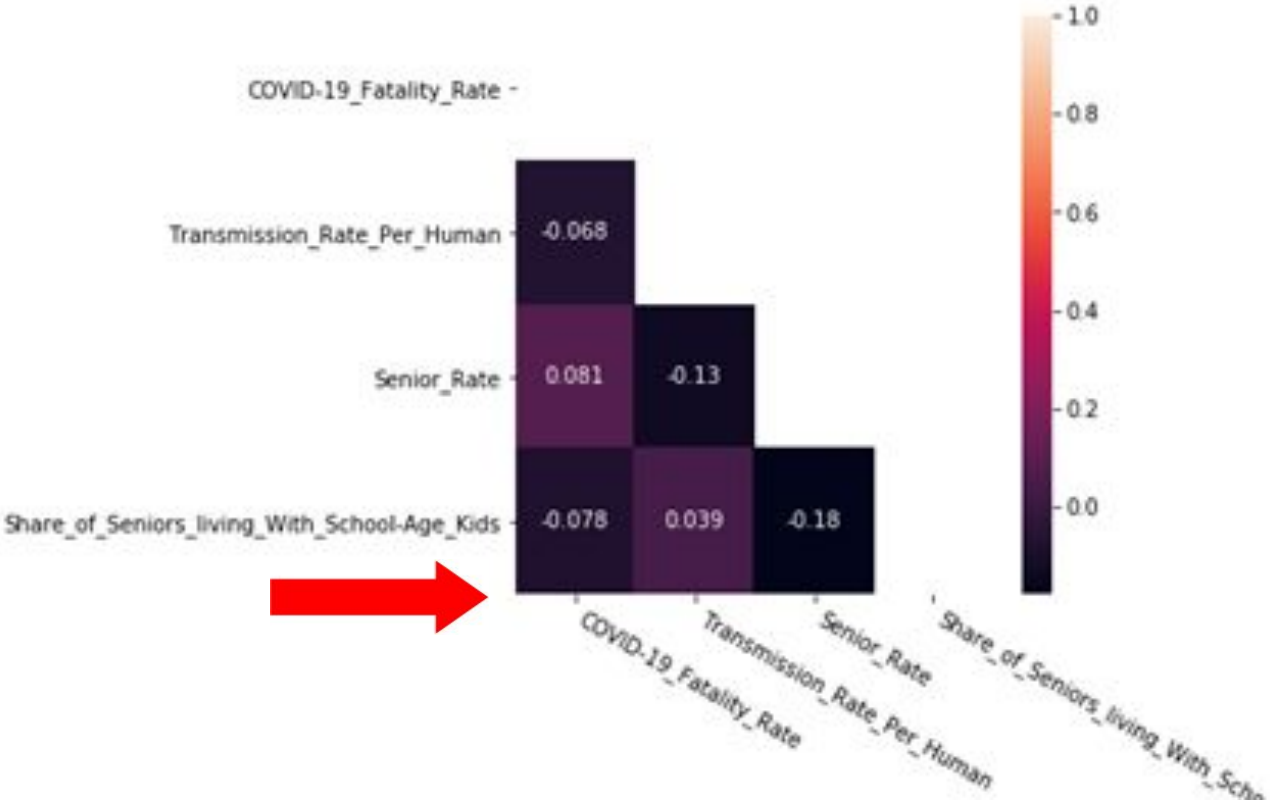
Effect of State Level Policy Actions

- New York reopened when increase in the number of cases slowed down (negative second derivative)
- Arizona reopened when the number of new cases was still increasing.
- Timing of reopening is likely to be a factor in the evolution of the epidemic





Number of Seniors Living with School-Age Kids

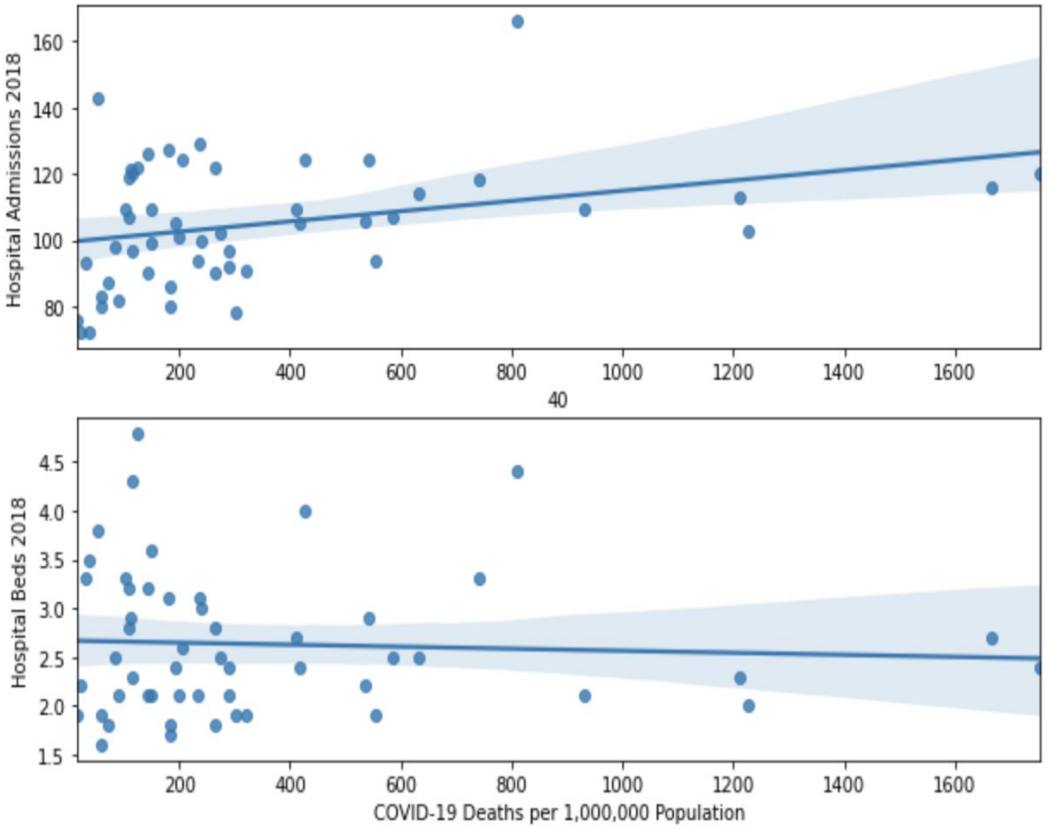


- Low correlation.
- Results are inconclusive since . Schools have not reopened.

Proportion of Uninsured in the Population

- Moderately Negative Correlation between Uninsured and Fatality Rate : **-0.56**
- Low correlation between Uninsured and Transmission Rate
- Age is a confounding factor
- Results are inconclusive. Study needs to be done to compare health outcomes amongst people of the same age group with or without health insurance.

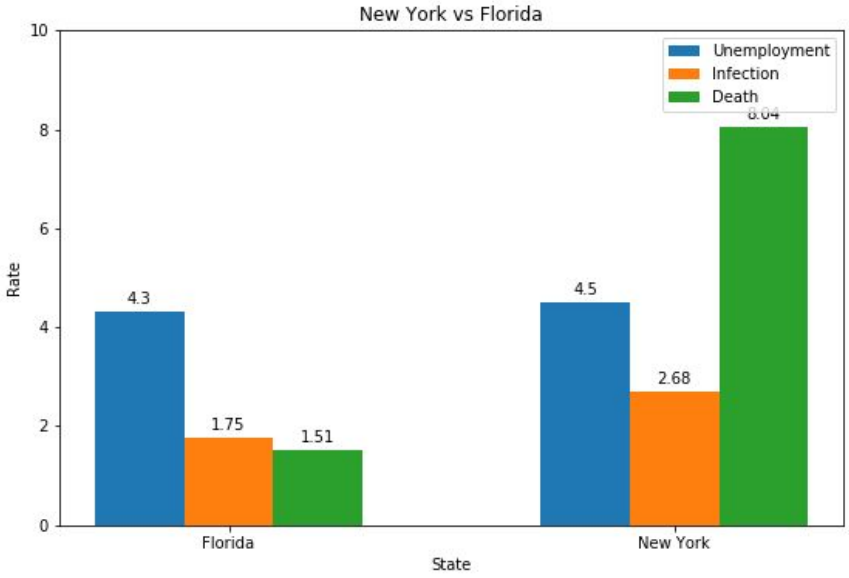
Hospital infrastructure and mortality rates

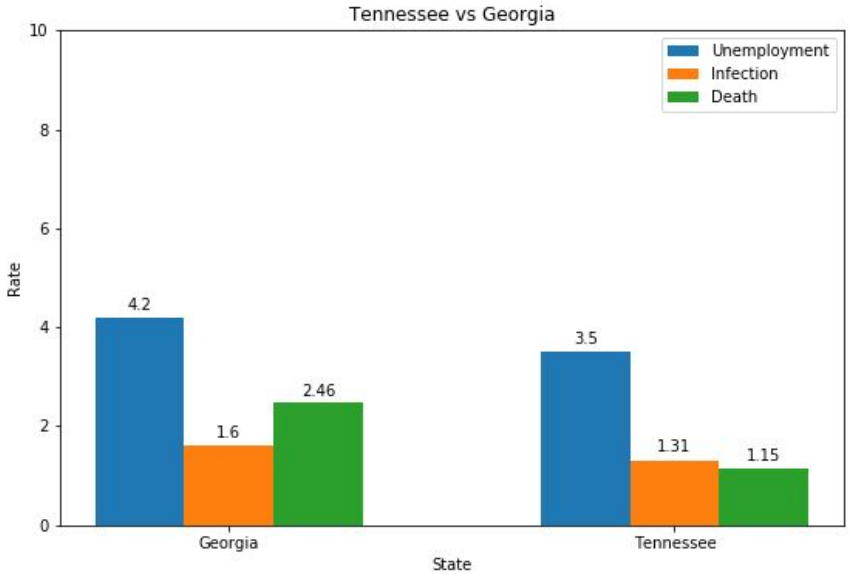


- Hospital admissions is positively related to the COVID-19 deaths.
- Points to the fact that most critical patients are admitted to hospitals

- Minimal correlation between hospital beds and COVID-19 deaths.
- Points to the fact that beyond a certain point, hospital infrastructure doesn't play a role in preventing COVID deaths

Controlling for population density, unemployment rate prior to the pandemic correlates positively with infection and death rate





Recommendation: it is important for the government to provide extra support to low income household.

Takeaways from our analysis

01	Mortality rates are slowing down in Northeast; accelerating elsewhere
02	Timing of policy actions is important. Stay at home mandates are effective if they are in place long enough
03	Unemployment rate prior to the pandemic correlates positively with infection and death rate
04	Differences in hospital capacities across US states hasn't affected adverse health outcomes in this pandemic
05	Unable to prove increased infection rate or mortality amongst the elderly living with school children because schools have not reopened
06	Unable to prove that lack of health insurance increases infection or mortality rate. Age is a confounding factor