Georgia's COVID-19 Story and Response

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Introduction to Georgia

Georgia is a southern state bordered by Florida to the south, Alabama to the West, South Carolina to the East and North Carolina and Tennessee covering the northern border of the state.

Georgia's population is currently around 10,500,000

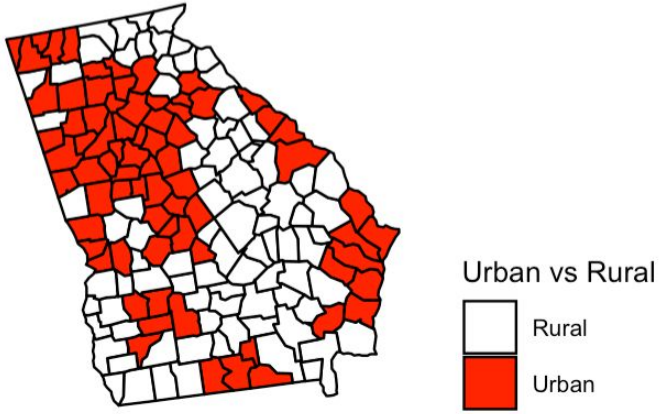
Georgia has a total of 159 counties, (second most in the United States). Largest county by population is Fulton county with 1,085,061 people and the least populous is Taliaferro county with 1,565 people.

Georgia has an almost equal amount of Rural and Urban counties; 85 Rural, 74 Urban (From Urban-Rural Continuum codes). almost evenly split

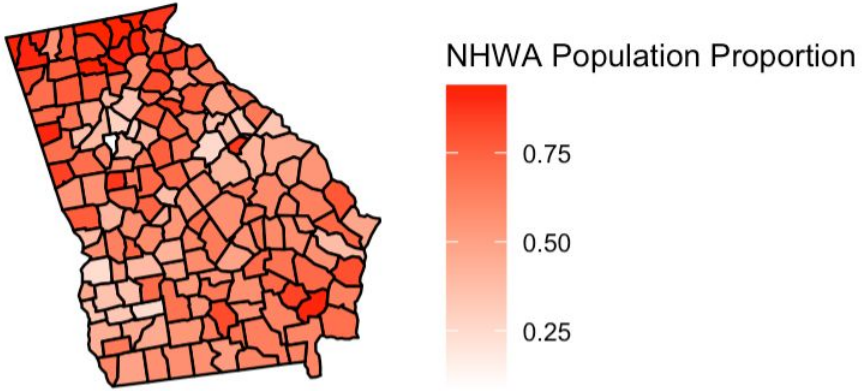
Georgia's population is 52.2% White, 31.2% Black or Africain American. 6.% Hispanic. With 10.6% belonging to other smaller groups.

Map of Georgia Demographics

Georgia Urban vs Rural



Georgia Non-Hispanic White American Proportion

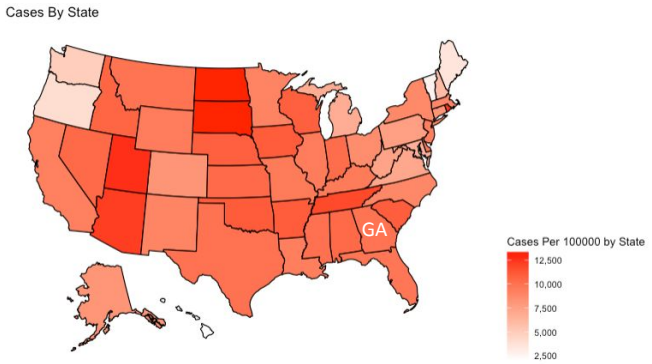


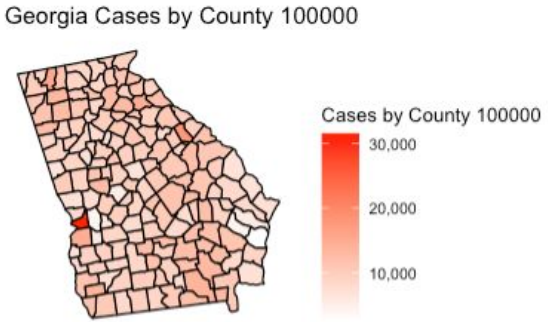
Additional Covid Information

- Georgia is one of the states that did not impose a national mask mandate (ironic; CDC HQ is in GA)
- July 2020 - Georgia Governor Brian Kemp issued an order preventing local governments from issuing mask requirements.
- Aug. 2020 - Gov. Kemp allows local governments to create mask mandates for their counties
- Major metropolitan areas such as Atlanta and Savannah mayors chose to issue mask mandates. While majority of counties did not
    - There were no travel restrictions implemented in GA

Exploratory Analyses

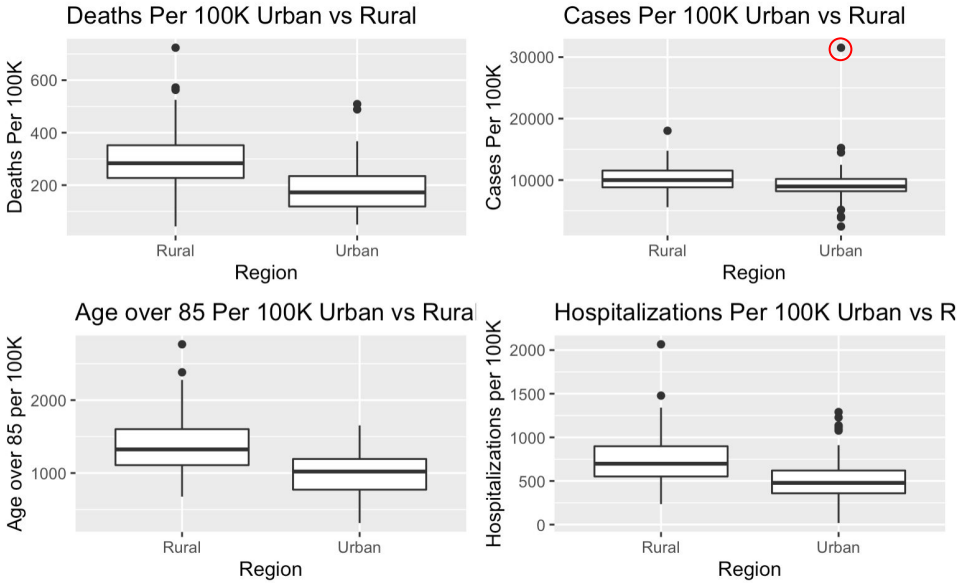
- As of March 13, Georgia ranked 6th in the United States for Covid-19 cases
    - 20th ranked once we normalized per 100,000 people
- Cases by 100,000 in GA
- One outlier county - Chattahoochee (We will explore later)



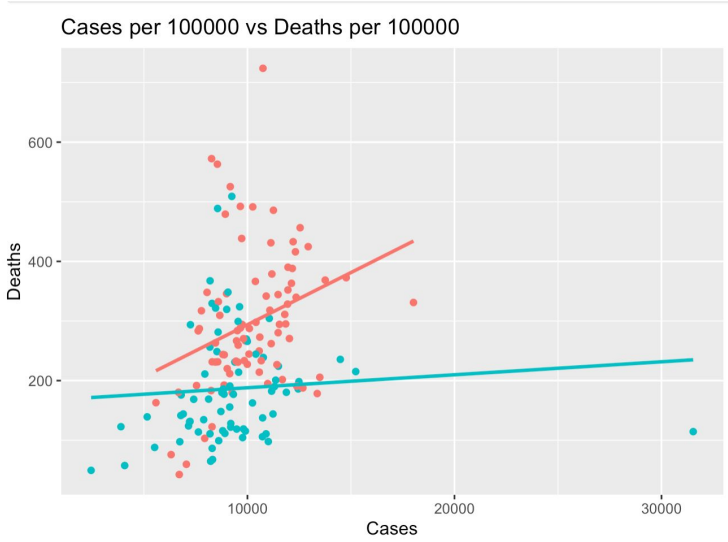


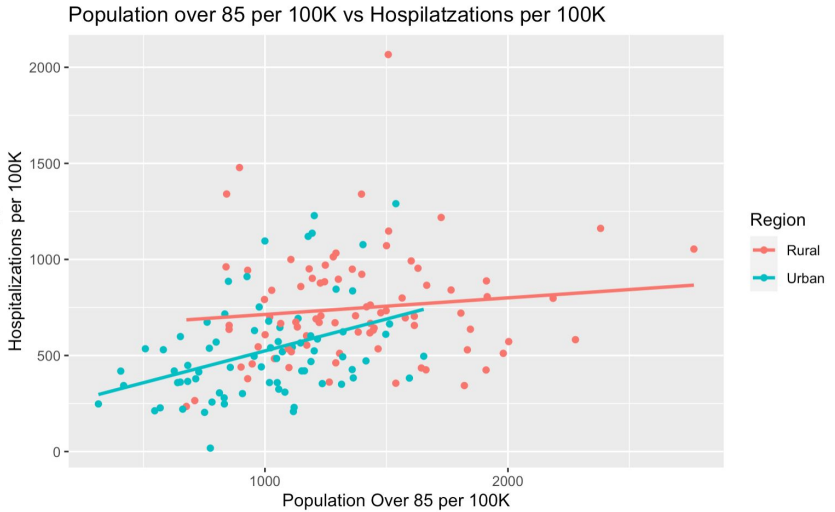
Exploratory Analysis : Urban and Rural

- Urban and Rural plots give us a way to analyze COVID-19 spread
  - Test to observe significance of differences
- Cases per capita appear similar among regions



Exploratory Analysis : Urban and Rural



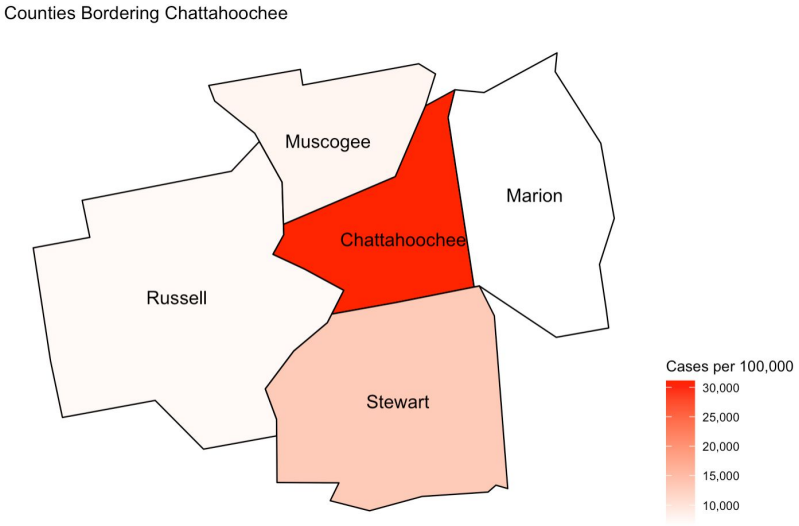


Exploratory Analysis : Urban and Rural

- Rural population is more afflicted in COVID-19 deaths
- Older population highly correlated
  - Test the significance of older population

Outlier County

- Chattahoochee county has one of the highest case rates in the nation
  - 37584.596 cases per 100K
- Very small town with a large military base
  - 20th Lowest deaths per capita in GA out of 159 counties
  - Young population from military

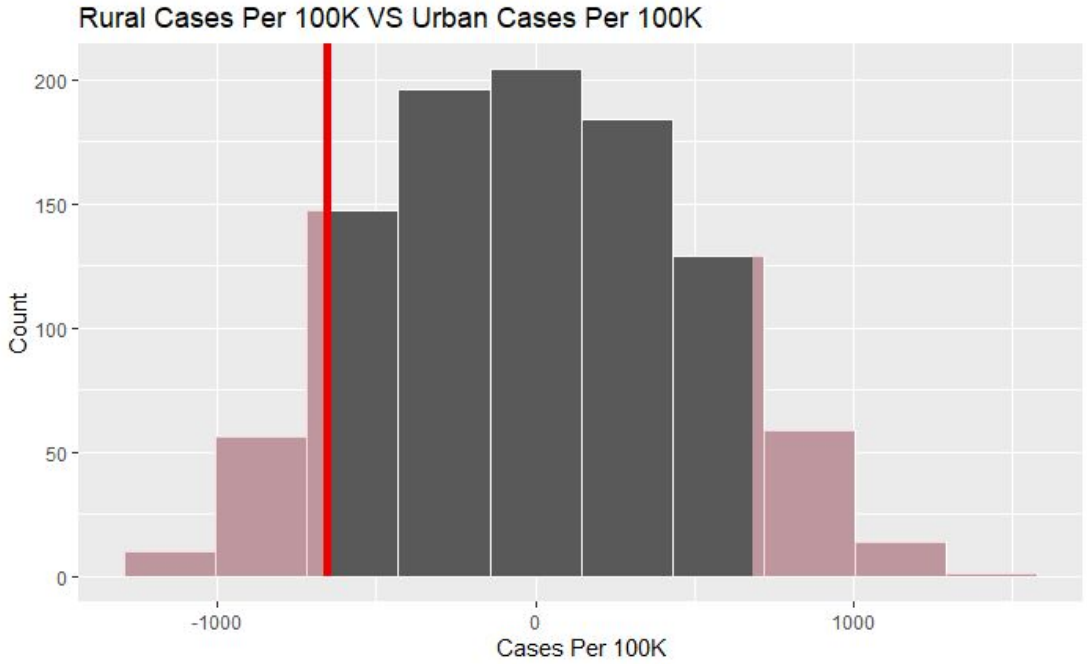


Hypothesis Testing

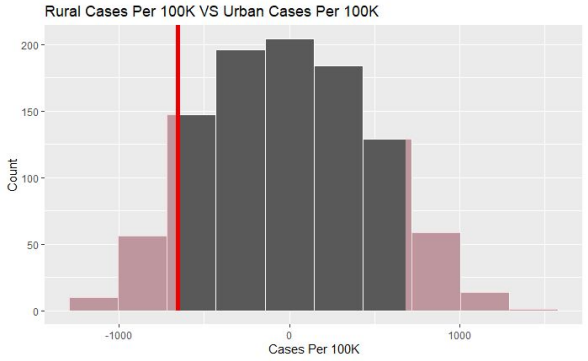
Hypothesis: Urban vs Rural Cases

Null Hypothesis: There is no difference between the cases per 100 thousand in Rural areas and cases per 100 thousand in Urban areas

Alternate Hypothesis: There is a difference between the cases per 100 thousand in Rural areas and cases per 100 thousand in Urban areas



Hypothesis Cases cont...



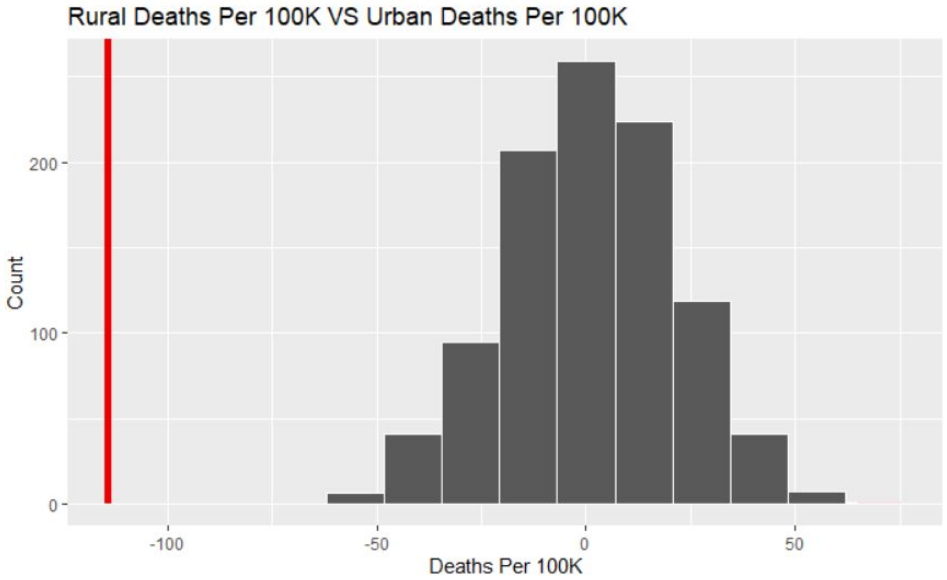
- α = 0.05
- p-value = 0.17
- **Do not reject** the null hypothesis

We could not claim that there is a difference between the cases per 100 thousand in Rural areas and cases per 100 thousand in Urban areas

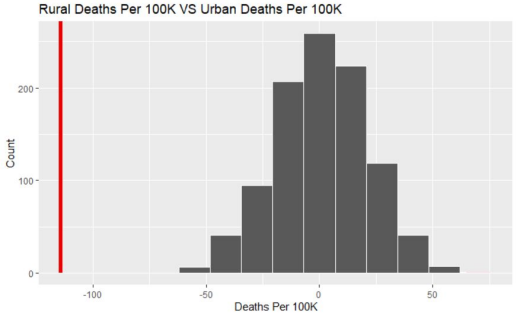
Hypothesis: Urban vs Rural Deaths

Null Hypothesis: There is no difference between the deaths per 100 thousand in Rural areas and deaths per 100 thousand in Urban areas

Alternate Hypothesis: There is a difference between the deaths per 100 thousand in Rural areas and deaths per 100 thousand in Urban areas



Hypothesis Deaths cont...



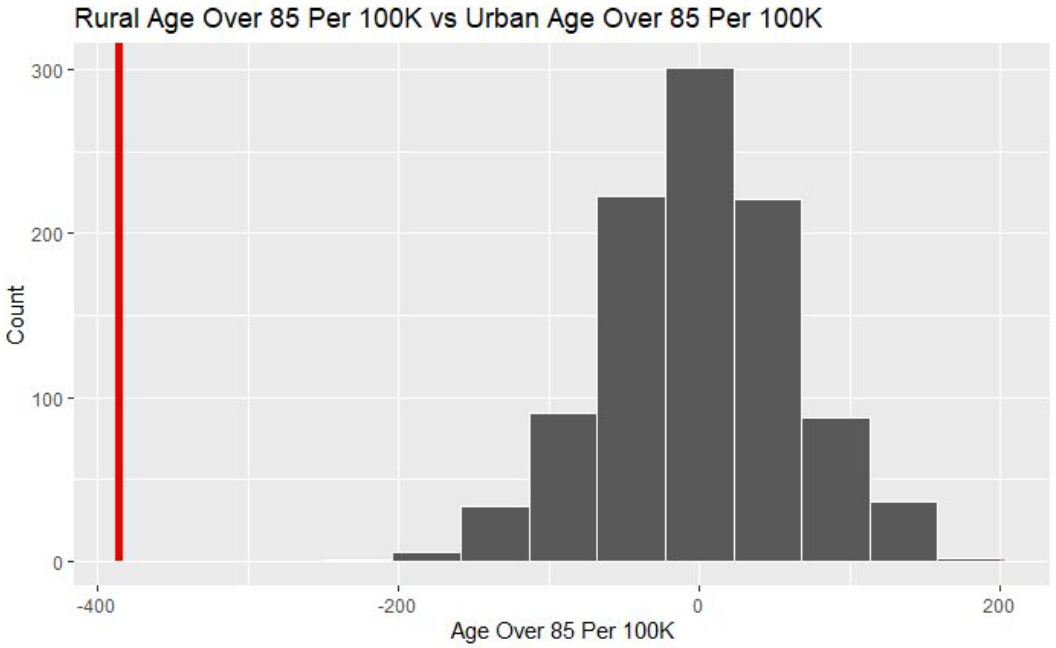
- α = 0.05
- p-value = 0.00
- **Reject** the null hypothesis

We could claim that there is a difference between the deaths per 100 thousand in Rural areas and deaths per 100 thousand in Urban areas

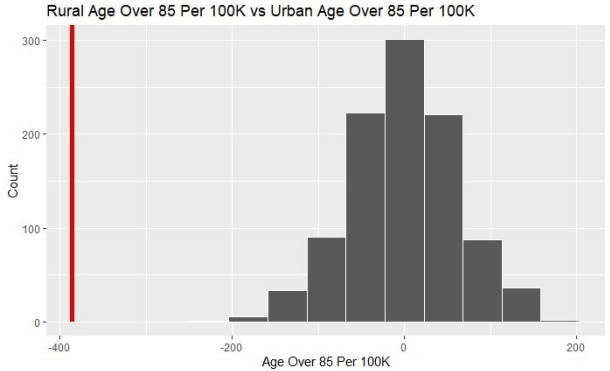
Hypothesis: Urban vs Rural Age Over 85 Per 100K

Null Hypothesis: There is no difference between the age over 85 per 100K in rural areas and age over 85 per 100K in urban areas

Alternate Hypothesis: There is a difference between the age over 85 per 100K in rural areas and age over 85 per 100K in urban areas



Hypothesis Age over 85 cont...



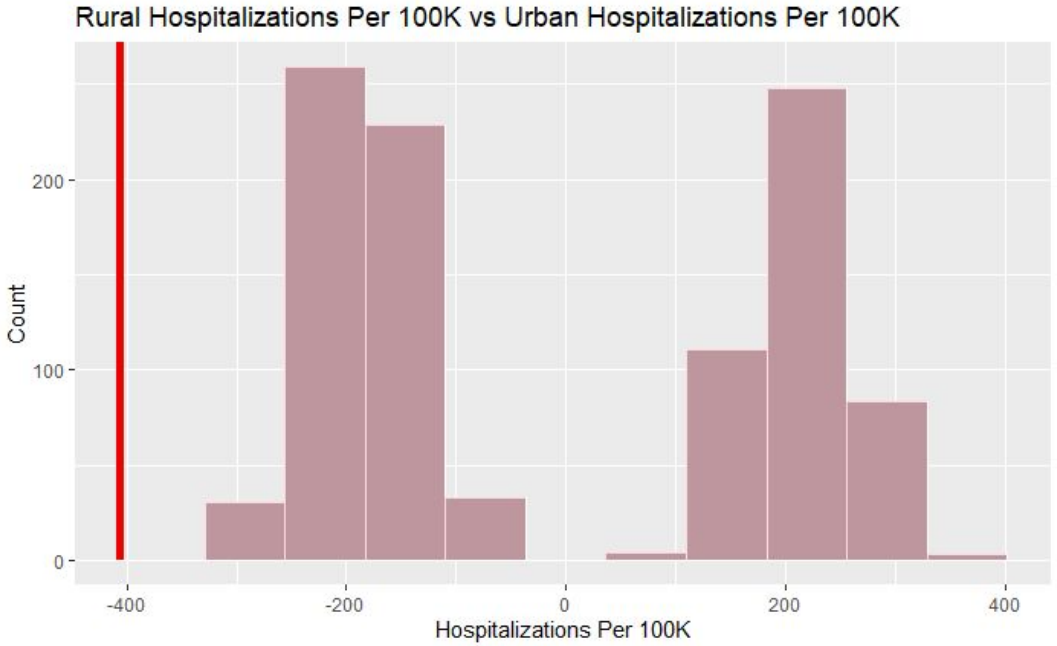
- α = 0.05
- p-value = 0.00
- **Reject** the null hypothesis

We could claim that there is a difference between the age over 85 per 100K in rural areas and age over 85 per 100K in urban areas

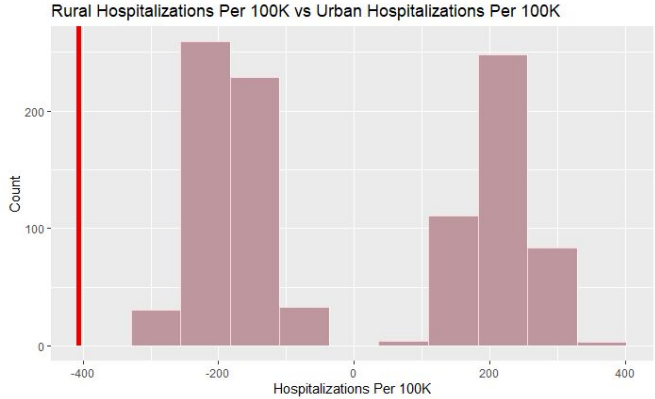
Hypothesis: Urban vs Rural Hospitalizations 100K

Null Hypothesis: There is no difference between hospitalization per 100K in urban areas and hospitalization per 100K in rural areas

Alternate Hypothesis: Hospitalization per 100K of rural areas is greater than hospitalizations per 100K of urban areas



Hypothesis Hospitalizations cont...

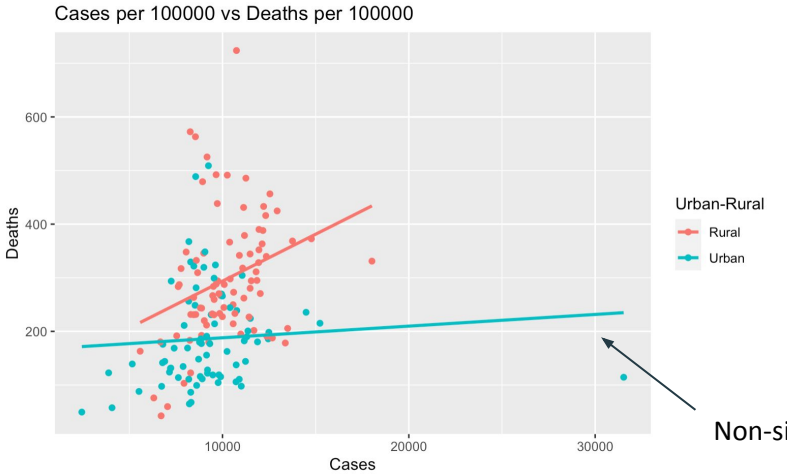


- α = 0.05
- **Bi-Modal** -> p-value = 0.00
- **Reject** the null hypothesis

We could claim that Hospitalization per 100K of rural areas is greater than hospitalizations per 100K of urban areas

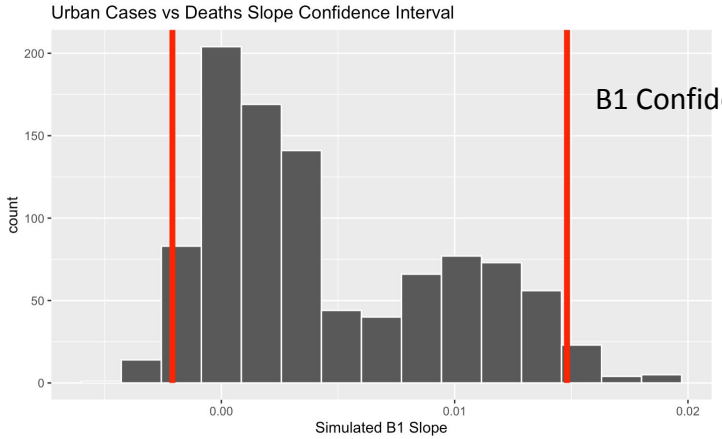
Regression Analysis

Regression Analysis

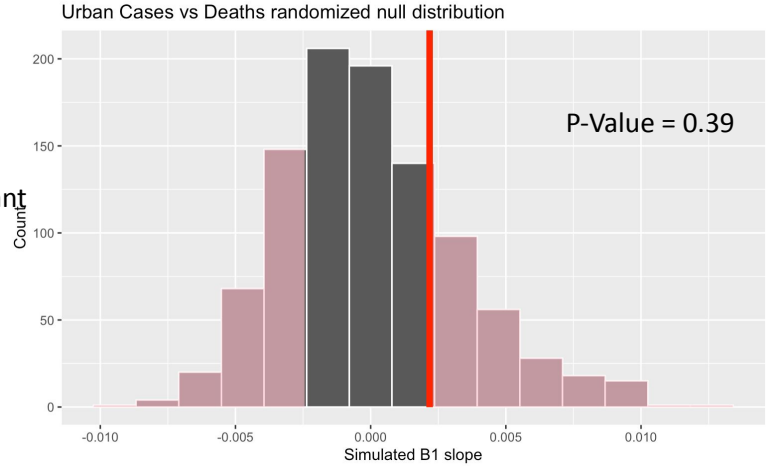


Non-significant

Urban Cases vs Deaths Analysis

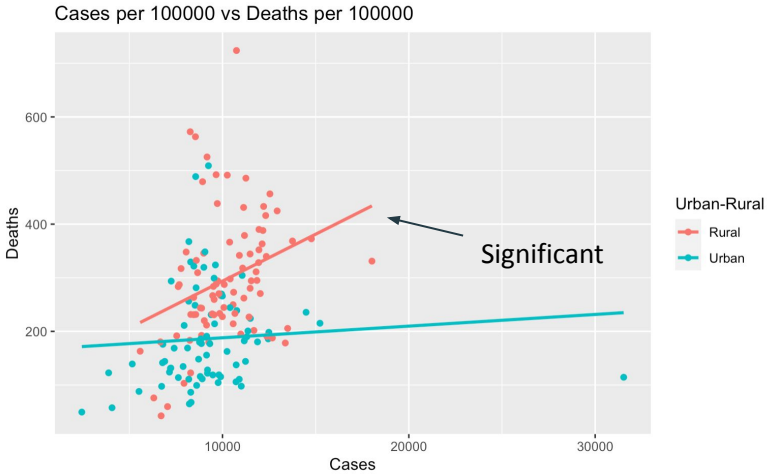


B1 Confidence

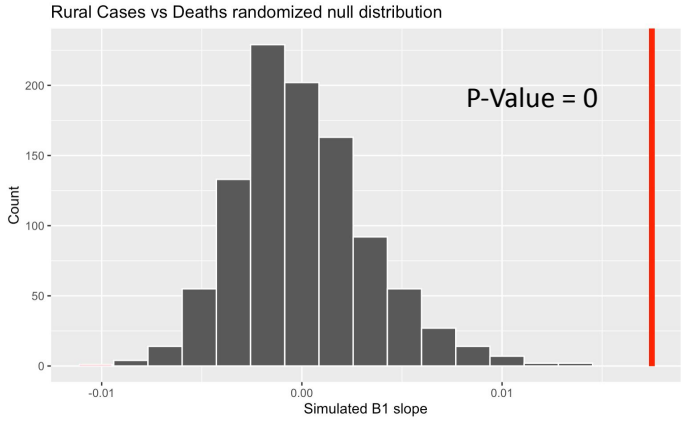


P-Value = 0.39

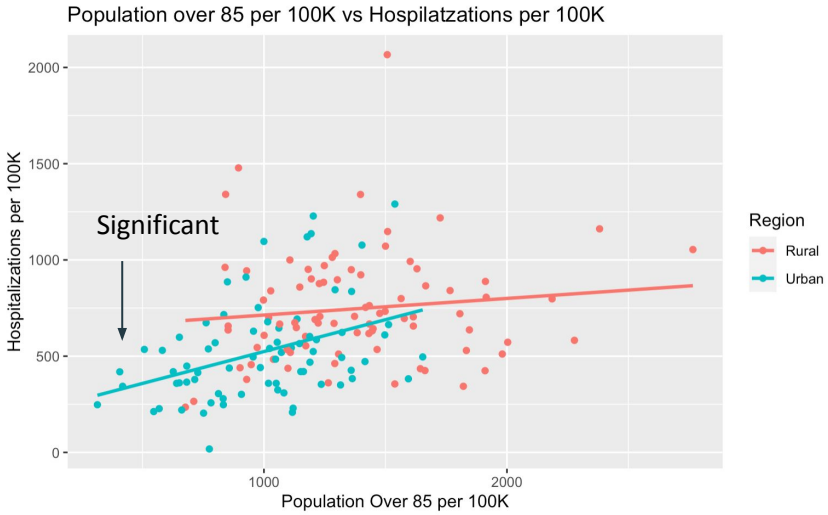
Regression Analysis



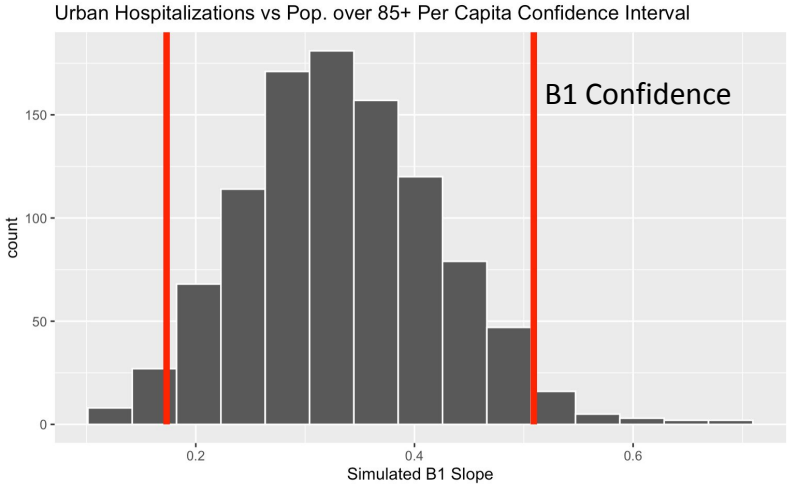
Rural Cases vs Deaths Analysis

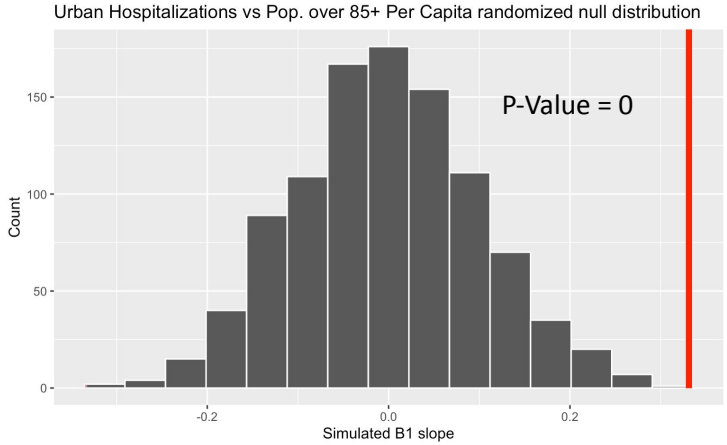


Regression Analysis 2



Urban Hospitalization vs
Population Over 85 per Capita





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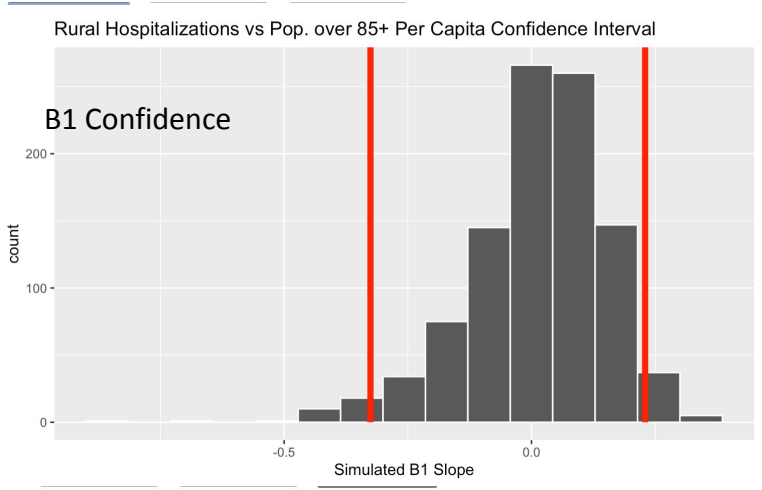
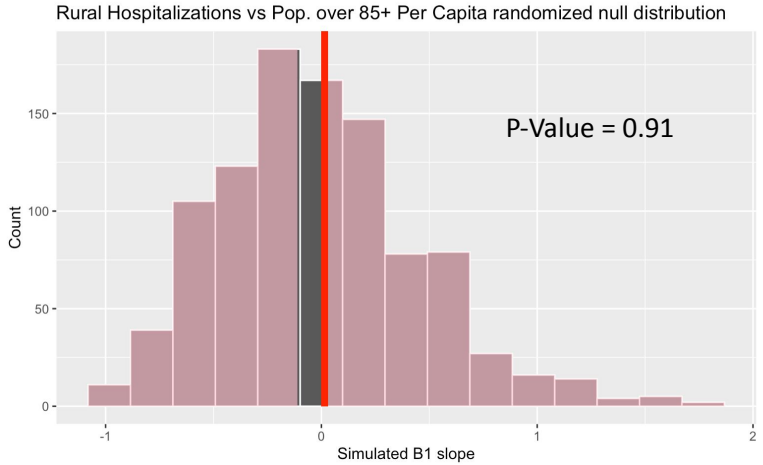
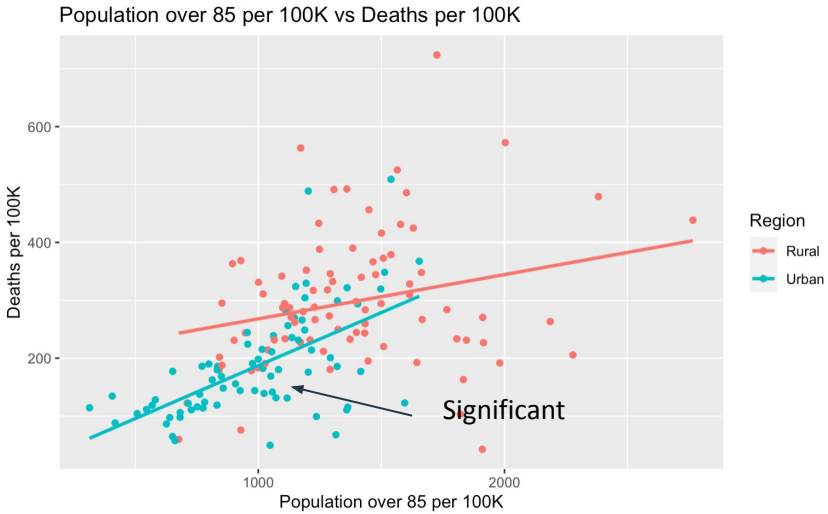
Rural Hospitalization vs Population Over 85 per Capita

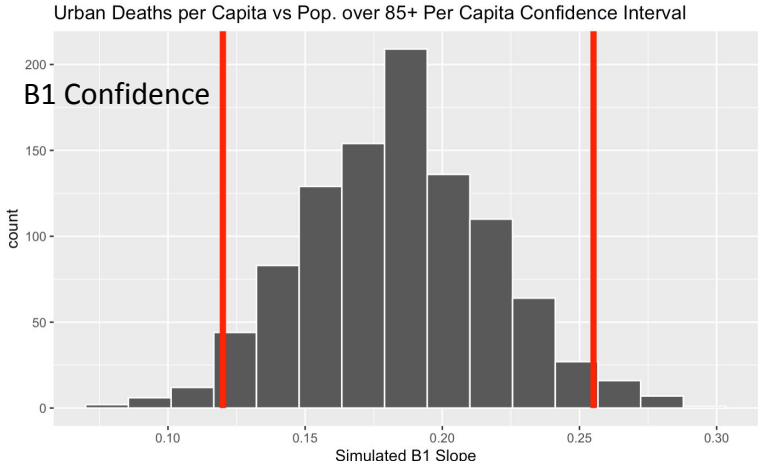


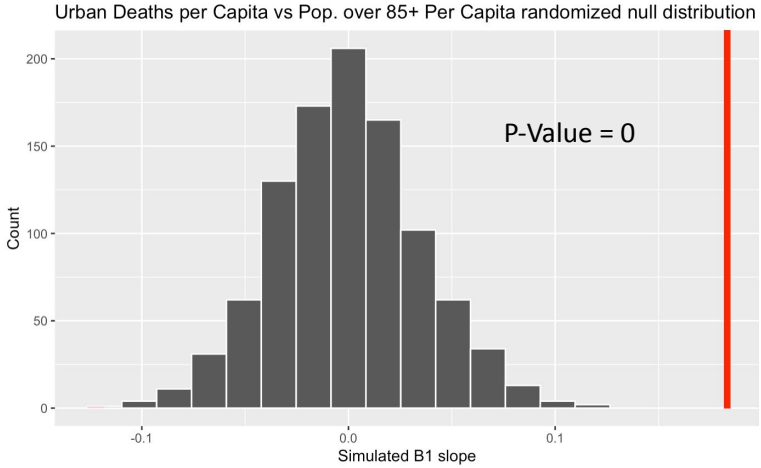


Regression Analysis 3



Urban Deaths vs Population Over 85 per Capita





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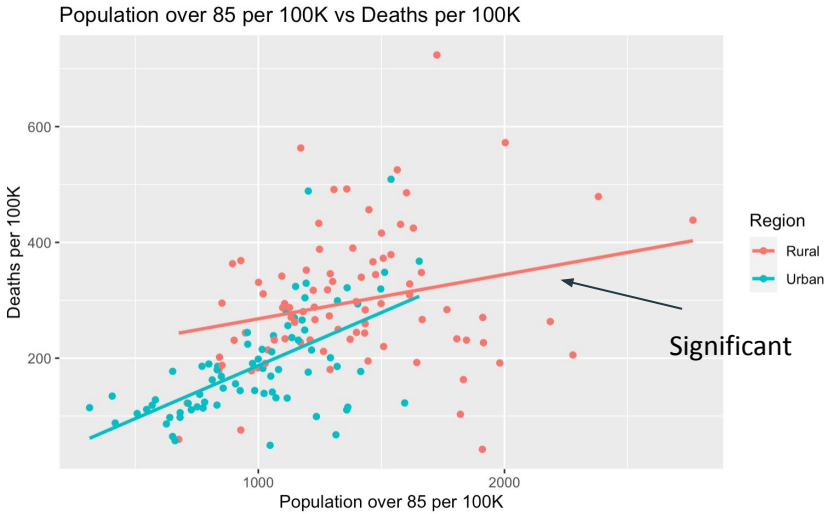
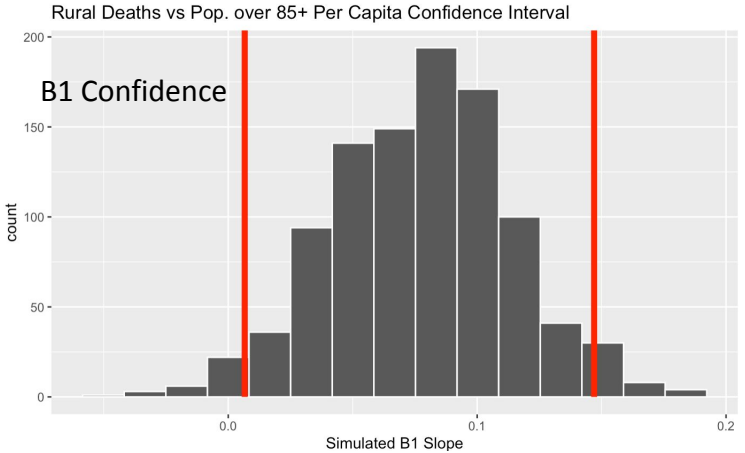
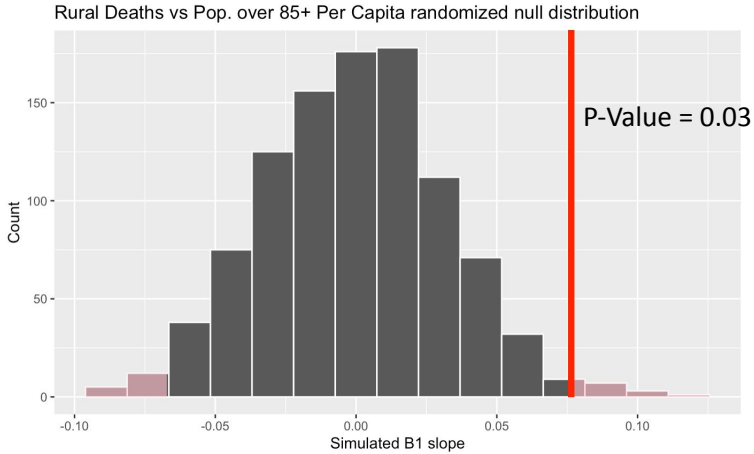


Rural Deaths vs Population Over 85 per Capita





Conclusion

Due to Georgia’s diverse population, many counties, and differing political views, we see that the state had a difficult time putting together a proper response to COVID-19.

The deaths in Georgia’s rural counties are higher than deaths in Georgia’s Urban counties.

The deaths in Georgia’s rural counties are highly correlated with the over 85 years old population.

In urban counties more cases does not lead to more deaths. Even though there were more hospitalizations, which could have been a logical explanation as to why there wasn't a significant increase in deaths, our analysis shows that the more hospitalizations still led to more deaths. Thus hospitalizations does not explain a low rate of deaths in Urban population. It is very plausible the younger population which explains the low death rate in Urban counties.

Sources

https://www.aarp.org/health/healthy-living/info-2020/states-mask-mandates-coronavirus.html#Georgia

https://www.nytimes.com/interactive/2021/us/covid-cases.html

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