Battling COVID-19 in Post-Vaccination Era

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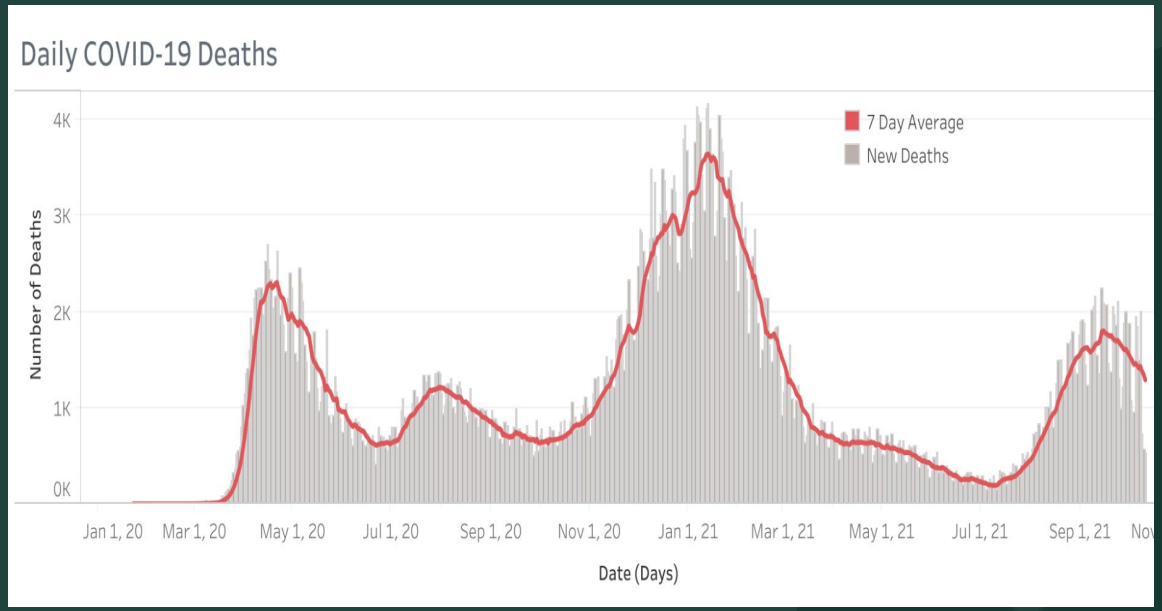
October 2021

Some Numbers

Fully Vaccinated — 56%

~1500 — Daily Deaths in Summer/Fall 2021

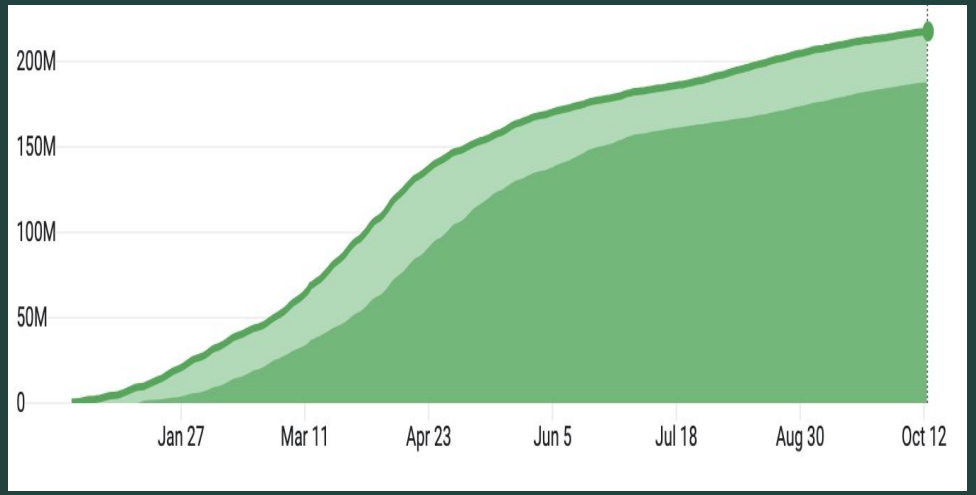
Unvaccinated — >90%



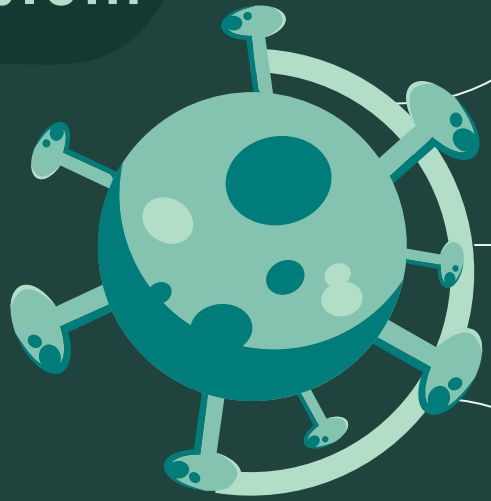
Vaccination Dilemma

Vaccine Surplus

Vaccination Rate Plateaued



The Problem



1. High Mortality
2. Uninterested population
3. Legal Obstacles

A New Strategy?

The Beneficiaries

01

Center for Disease Control and prevention (CDC)

02

Federal Government

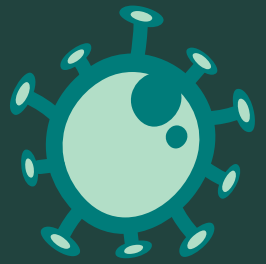
03

State Governments

Impact

1) Prioritize Focus
   (e.g. metro areas, non metro areas)

2) Identify Higher Risk Locations



Then resources can be better reallocated...

Data Science Solution

01 CDC Vaccination Data

02 CDC COVID Related Data

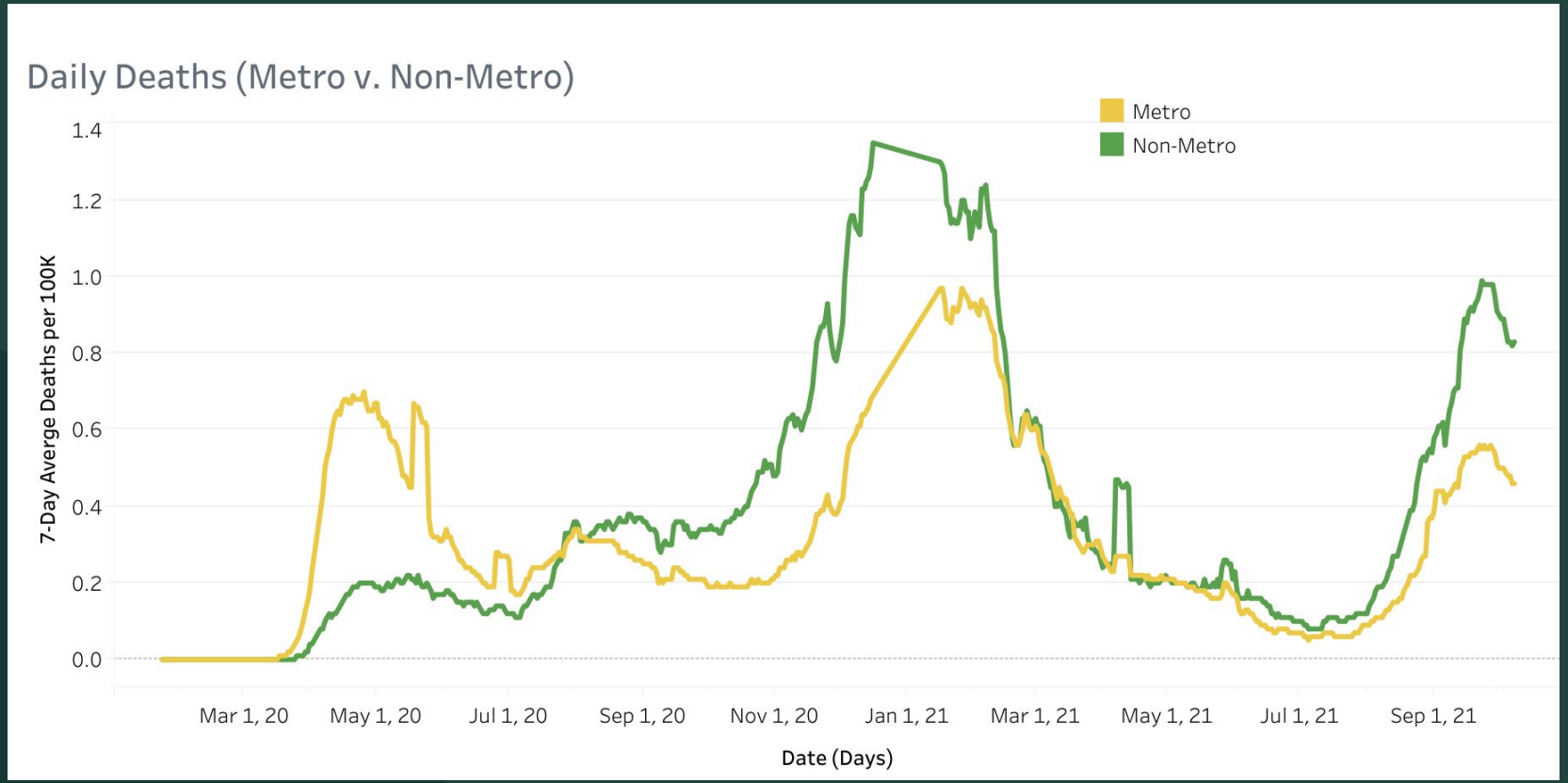
03 Census Bureau Demographic Data

Demographic data such as age, income, race ,etc., can be accurate predictors of COVID-19 mortality

Critical Assumption

Initial Analysis → Future Modelling

Initial Analysis (Focus):



Age

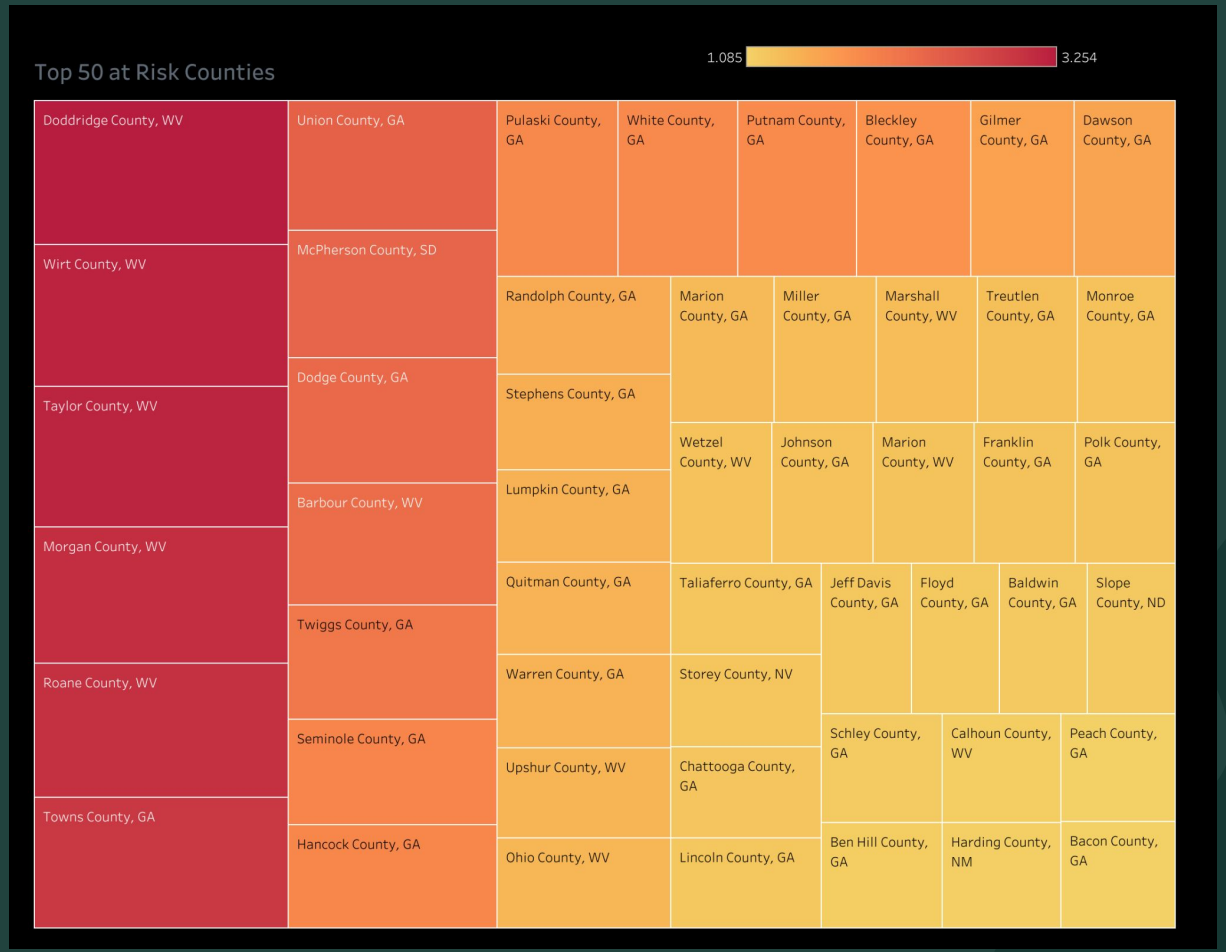
More than 82% of the total COVID-19 victims were above 55 years old!

$$\text{Risk Index} = \frac{\text{+65 Population (\%)}}{\text{+65 Vaccination Rate (\%)}}$$

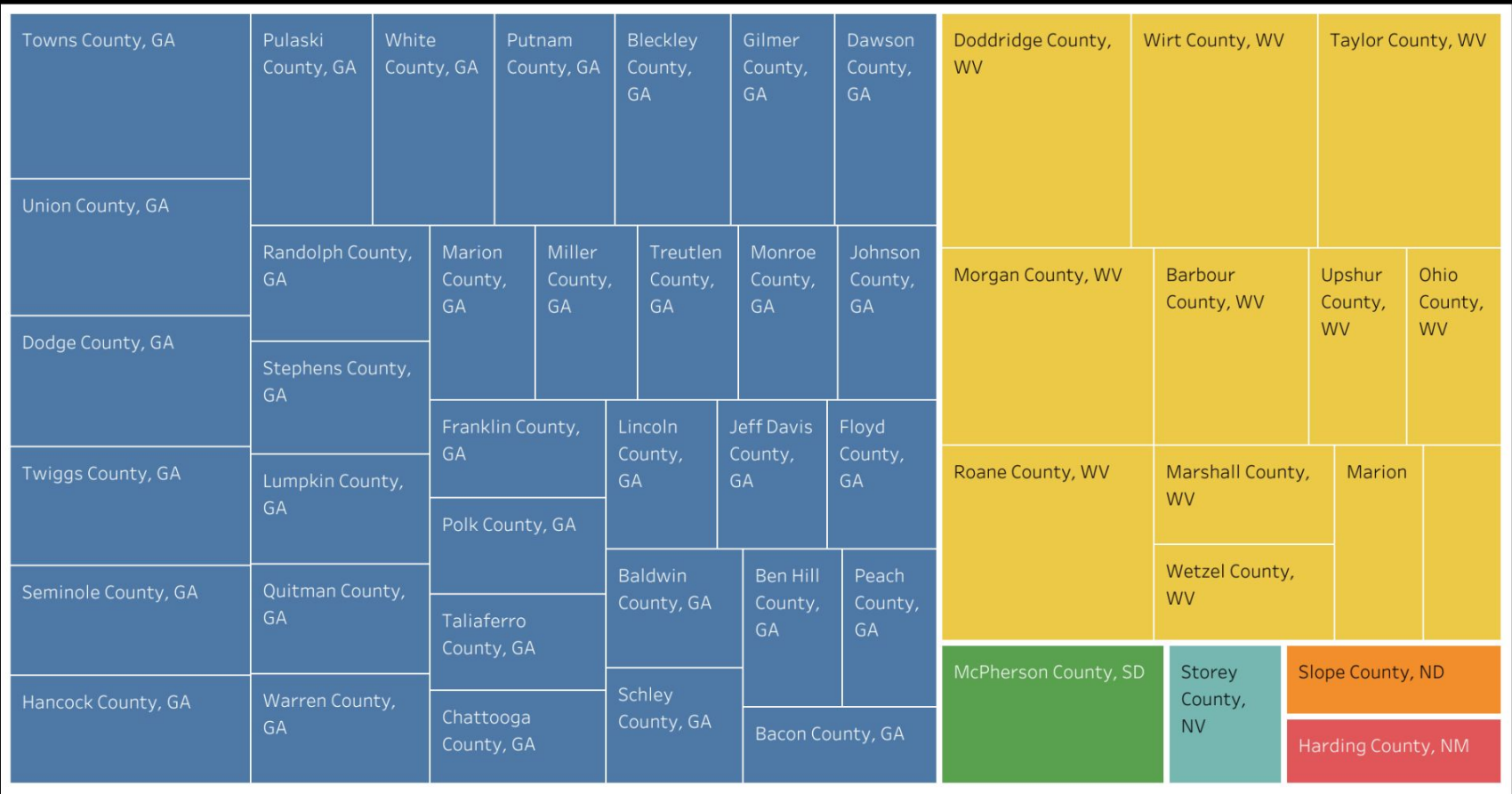
Initial Analysis (Higher Risk):

Georgia

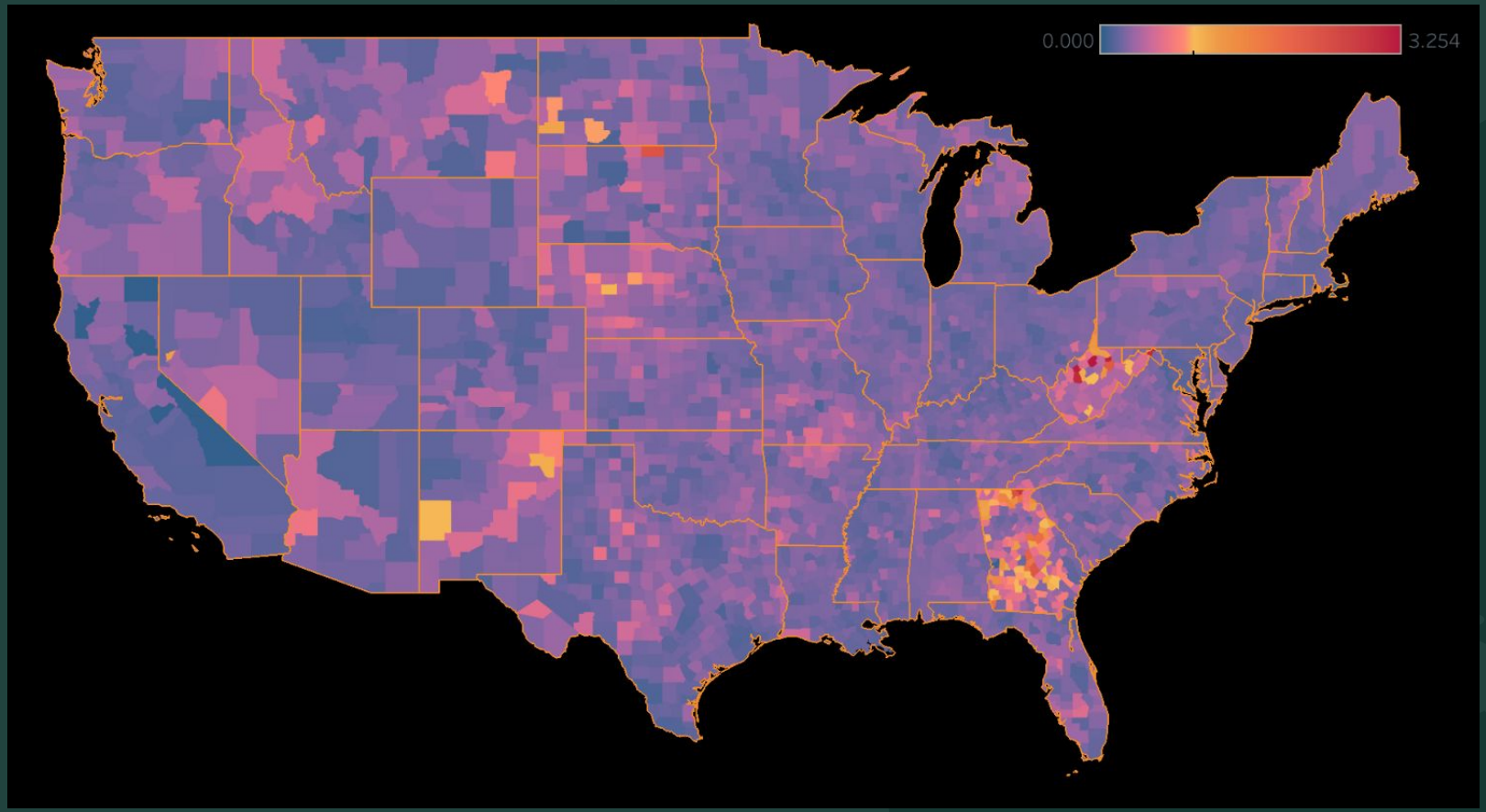
West Virginia



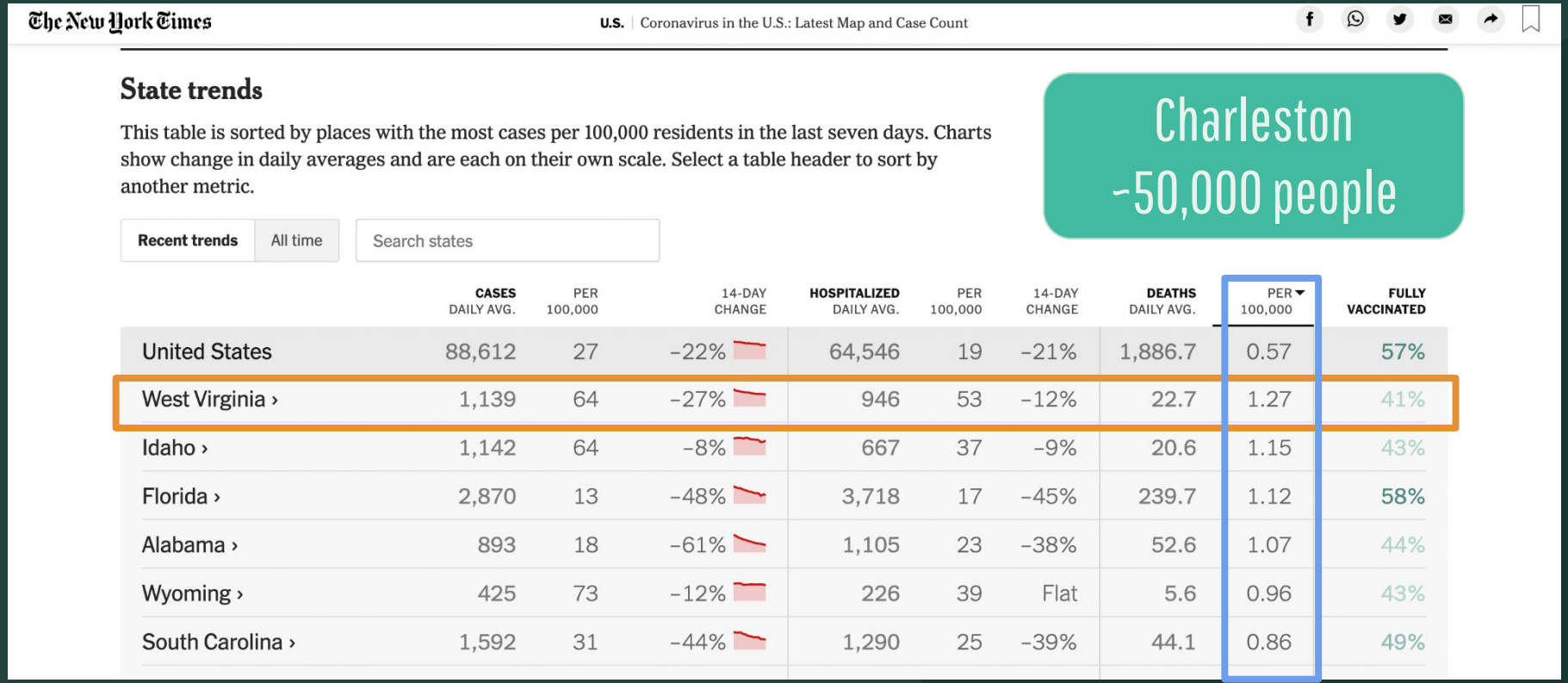
Top 50 at Risk Counties by State



County Level Risk Index



West Virginia (A less urbanized state)



The New York Times | U.S. | Coronavirus in the U.S.: Latest Map and Case Count

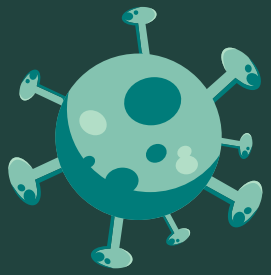
State trends

This table is sorted by places with the most cases per 100,000 residents in the last seven days. Charts show change in daily averages and are each on their own scale. Select a table header to sort by another metric.

Charleston
~50,000 people

Recent trends | All time | Search states

	CASES DAILY AVG.	PER 100,000	14-DAY CHANGE	HOSPITALIZED DAILY AVG.	PER 100,000	14-DAY CHANGE	DEATHS DAILY AVG.	PER 100,000	FULLY VACCINATED
United States	88,612	27	-22%	64,546	19	-21%	1,886.7	0.57	57%
West Virginia ›	1,139	64	-27%	946	53	-12%	22.7	1.27	41%
Idaho ›	1,142	64	-8%	667	37	-9%	20.6	1.15	43%
Florida ›	2,870	13	-48%	3,718	17	-45%	239.7	1.12	58%
Alabama ›	893	18	-61%	1,105	23	-38%	52.6	1.07	44%
Wyoming ›	425	73	-12%	226	39	Flat	5.6	0.96	43%
South Carolina ›	1,592	31	-44%	1,290	25	-39%	44.1	0.86	49%



Main Takeaway:

Rural areas with older population and lower vaccination rates among them, can be identified as high risk areas. Resources can be better allocated to those places (more ICU beds, better testing facilities and procedures, stricter social distancing measures, etc.)

Future Directions:

- Considering risk factors other than age
- Building predictive models and find the relationship between the risk factors and actual death rates