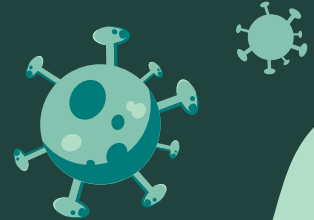


Battling COVID-19 in Post-Vaccination Era

Milad Afrasiabi
October 2021





Fully Vaccinated

56%

~1500

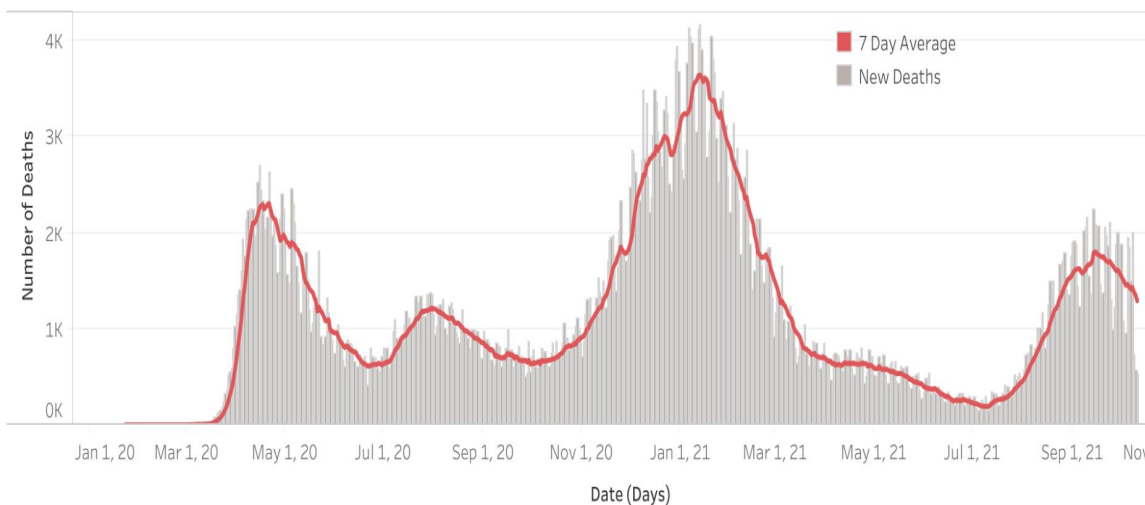
Daily Deaths
in Summer/Fall 2021

Unvaccinated

>90%

Some Numbers

Daily COVID-19 Deaths



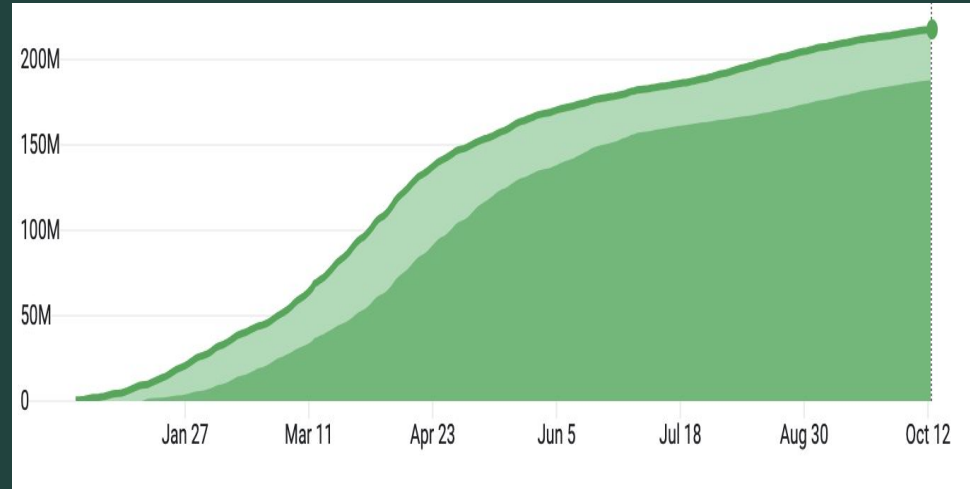
Vaccination Dilemma



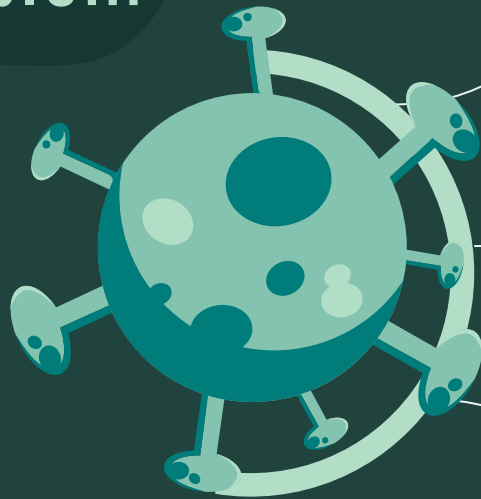
Vaccine Surplus



Vaccination Rate
Plateaued



The Problem



1

High Mortality

2

Uninterested population

3

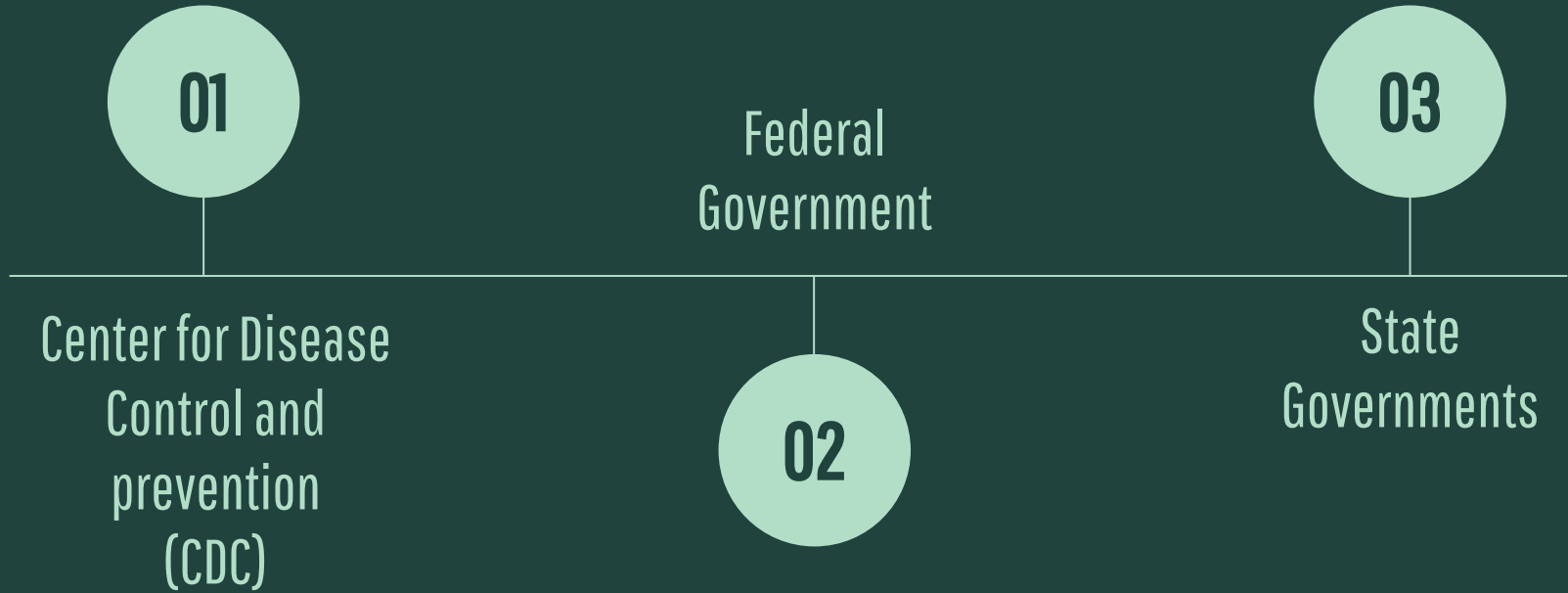
Legal Obstacles

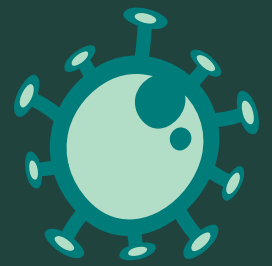


A New Strategy?



The Beneficiaries





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):

Daily Deaths (Metro v. Non-Metro)





Age

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

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

Initial Analysis (Higher Risk):

Georgia



West Virginia

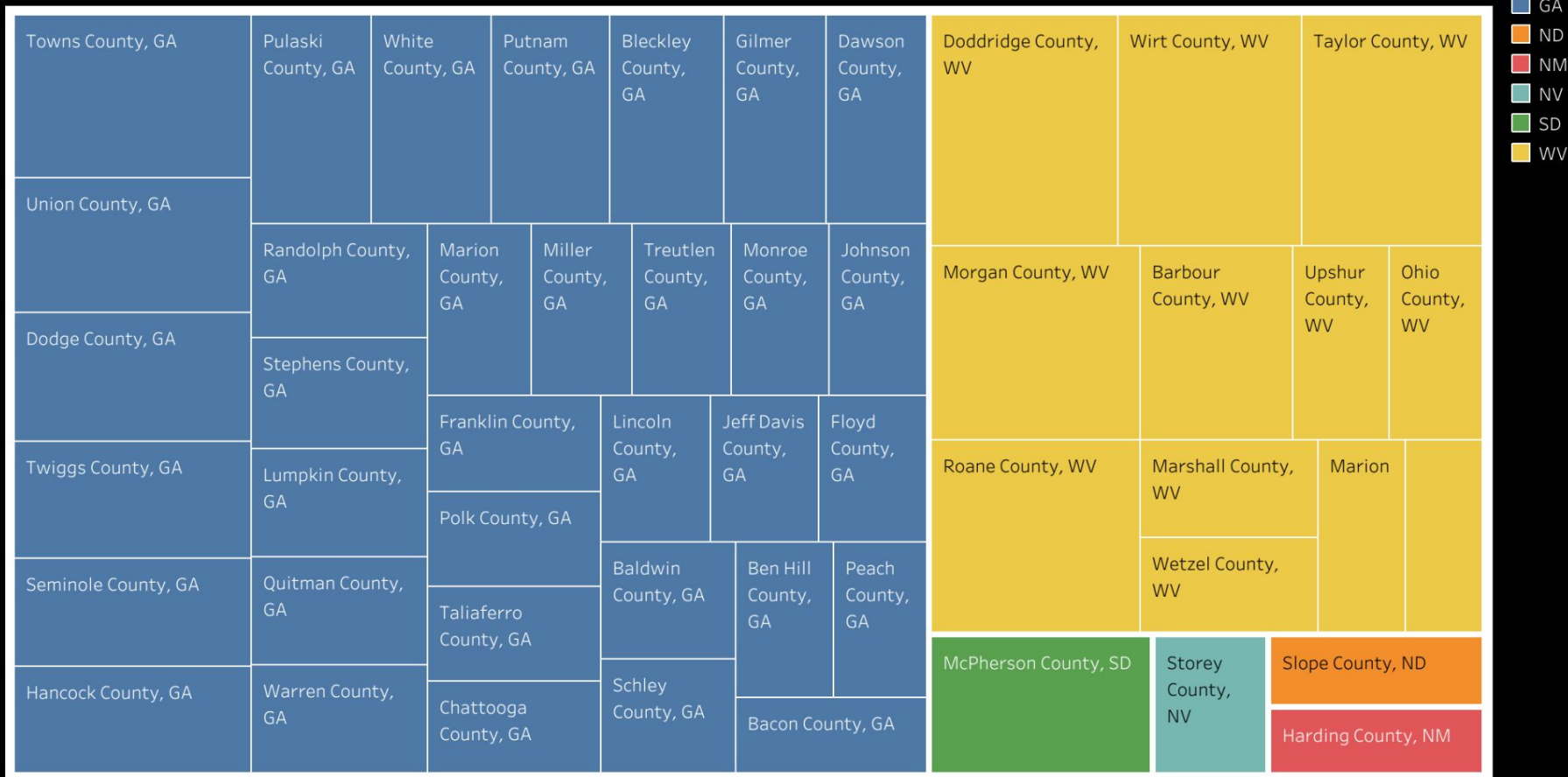


Top 50 at Risk Counties

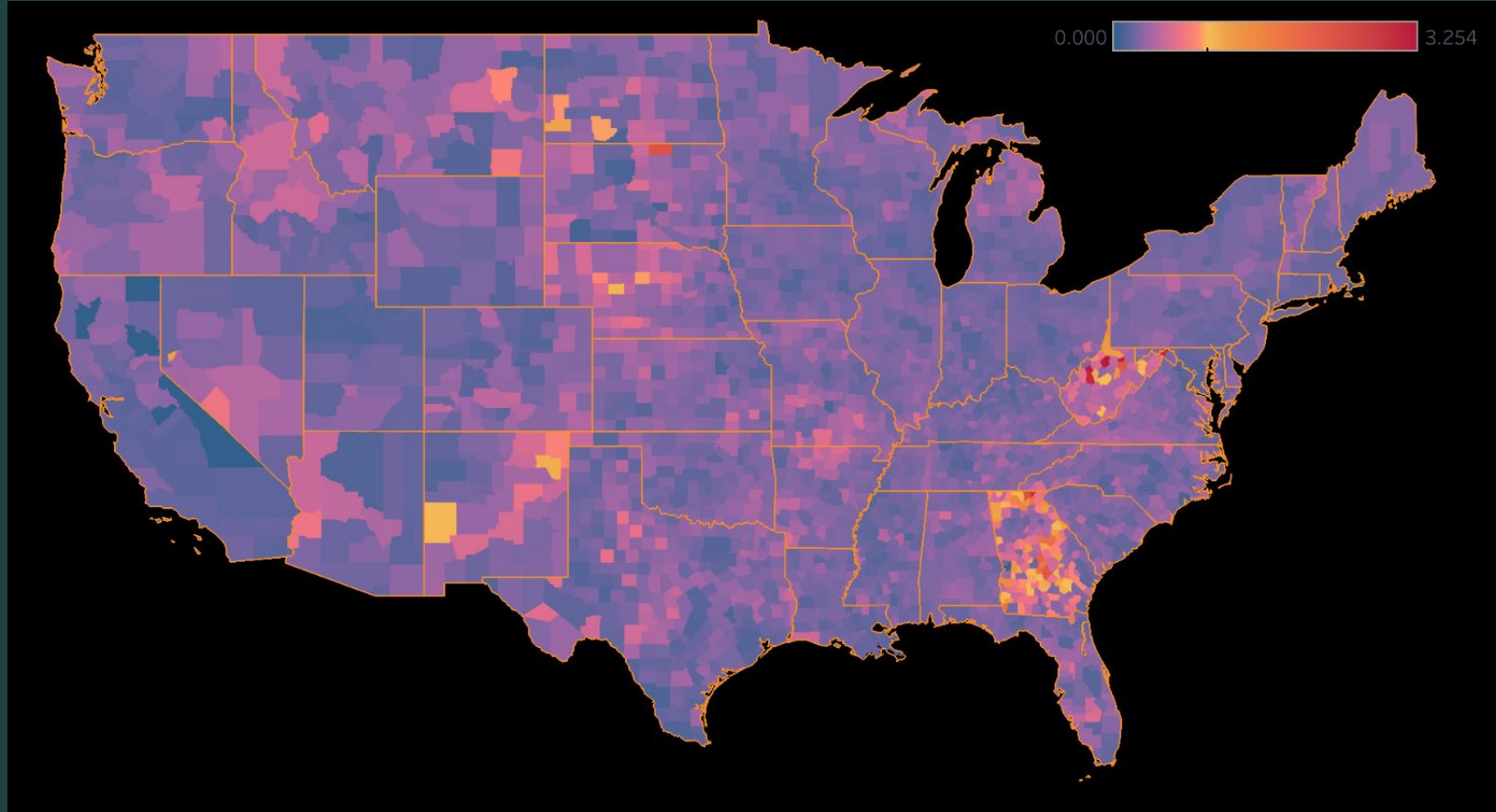
1.085  3.254

Doddridge County, WV	Union County, GA	Pulaski County, GA	White County, GA	Putnam County, GA	Bleckley County, GA	Gilmer County, GA	Dawson County, GA
Wirt County, WV	McPherson County, SD	Randolph County, GA	Marion County, GA	Miller County, GA	Marshall County, WV	Treutlen County, GA	Monroe County, GA
Taylor County, WV	Dodge County, GA	Stephens County, GA	Wetzel County, WV	Johnson County, GA	Marion County, WV	Franklin County, GA	Polk County, GA
Morgan County, WV	Barbour County, WV	Lumpkin County, GA	Quitman County, GA	Taliaferro County, GA	Jeff Davis County, GA	Floyd County, GA	Baldwin County, GA
Roane County, WV	Twiggs County, GA	Warren County, GA	Storey County, NV	Schley County, GA	Calhoun County, WV	Peach County, GA	
Towns County, GA	Seminole County, GA	Upshur County, WV	Chattooga County, GA	Ben Hill County, GA	Harding County, NM	Bacon County, GA	
	Hancock County, GA	Ohio County, WV	Lincoln County, GA				

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.

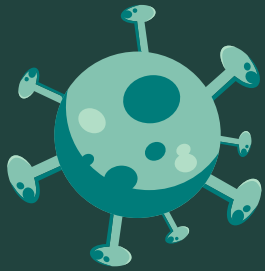
Recent trends

All time

Search states

Charleston
~50,000 people

	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