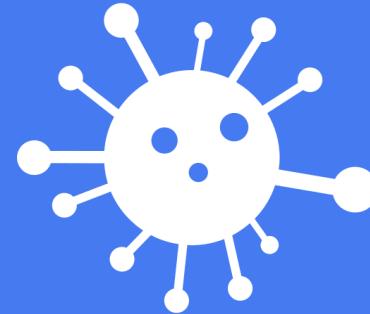


# **COVID-19: Impact on Vaccination**

Team: 4Horsemen



# OUR TEAM



**ASHISH  
SAXENA**

MSBA  
Grad Student  
LCOB, UC



**LOHIT  
BORAH**

MSBA  
Grad Student  
LCOB, UC



**LAVANYA  
THARANIPATHY**

MSBA  
Grad Student  
LCOB, UC



**TANMAY  
SHRIVASTAVA**

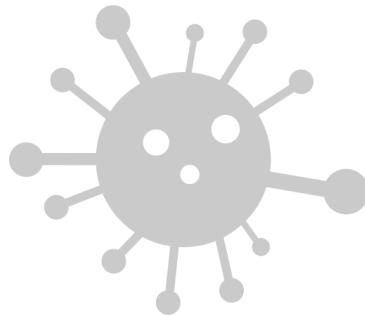
MSIS  
Grad Student  
LCOB, UC

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    - i. Social Vulnerability Index (SVI)
    - ii. CVAC
  - c. Identify potential areas of inhibition
    - i. Hesitancy of vaccination
  - d. Recommend solutions

# 30,462,210

Confirmed  
Cases\*



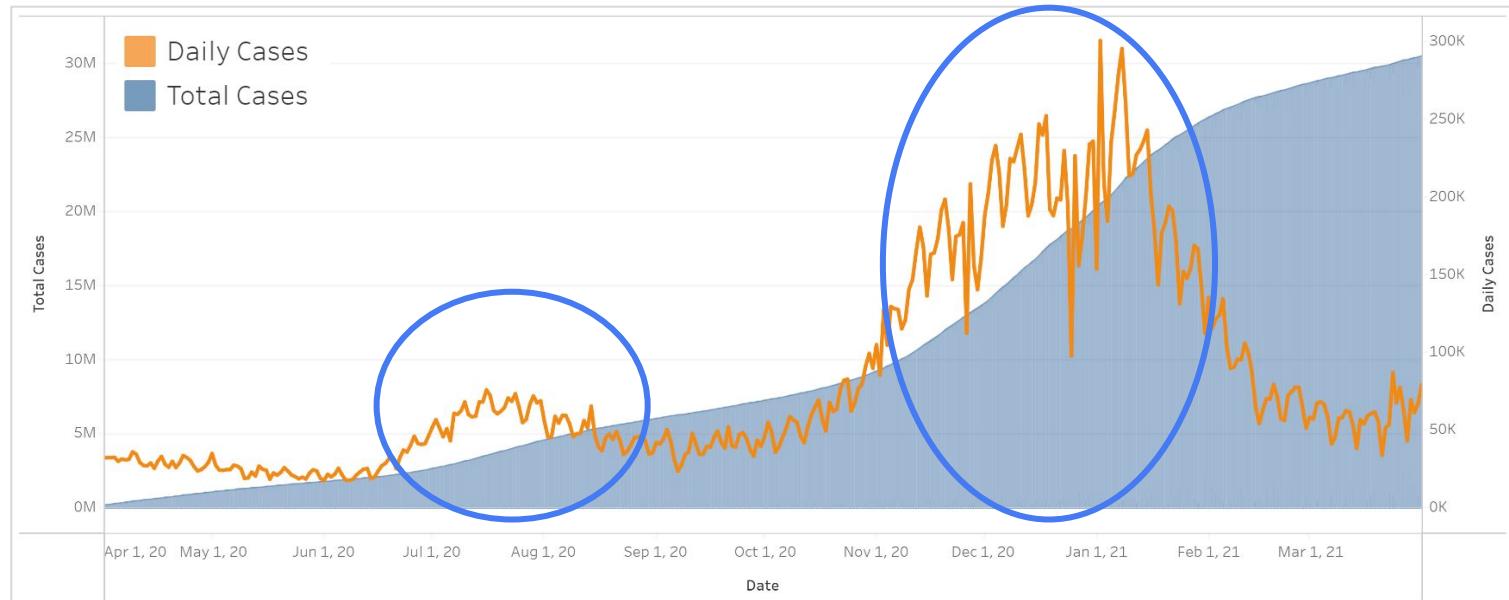
Confirmed  
Deaths\*

# 552,352

01

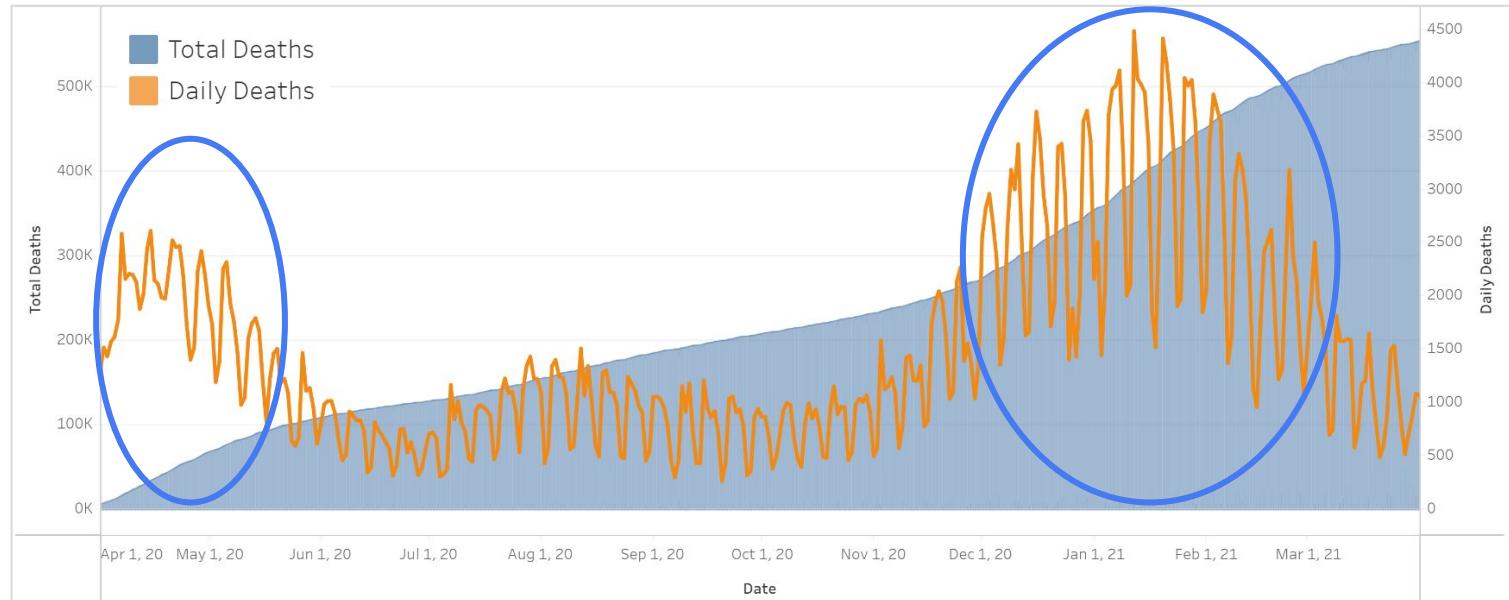
## **COVID-19 in US: An Overview**

# Daily and Total Cases in US



- The highest number of daily cases were recorded in US in the month of January 2021
- The first wave of COVID 19 cases was observed in July - August 2020 followed by a much larger second wave in December 2020 - January 2021

# Daily and Total Deaths in US

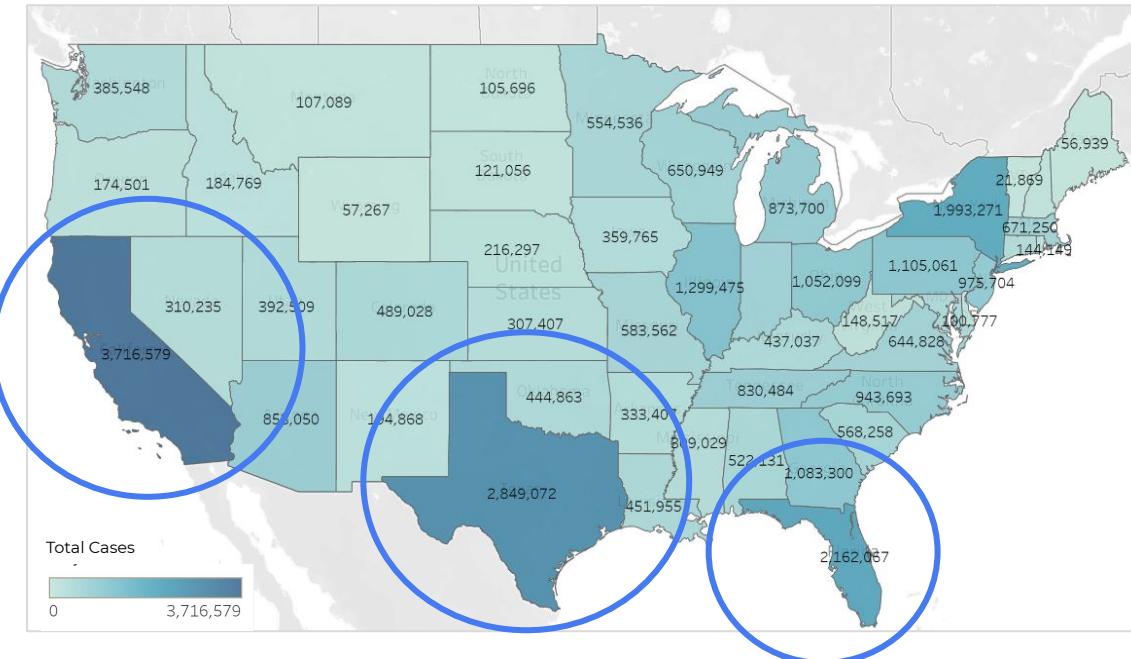


- The highest number of daily deaths were recorded in US in the month of January 2021
- The first wave of COVID 19 deaths was observed in April - May 2020 followed by a much larger second wave in December 2020 - February 2021

# **02-a**

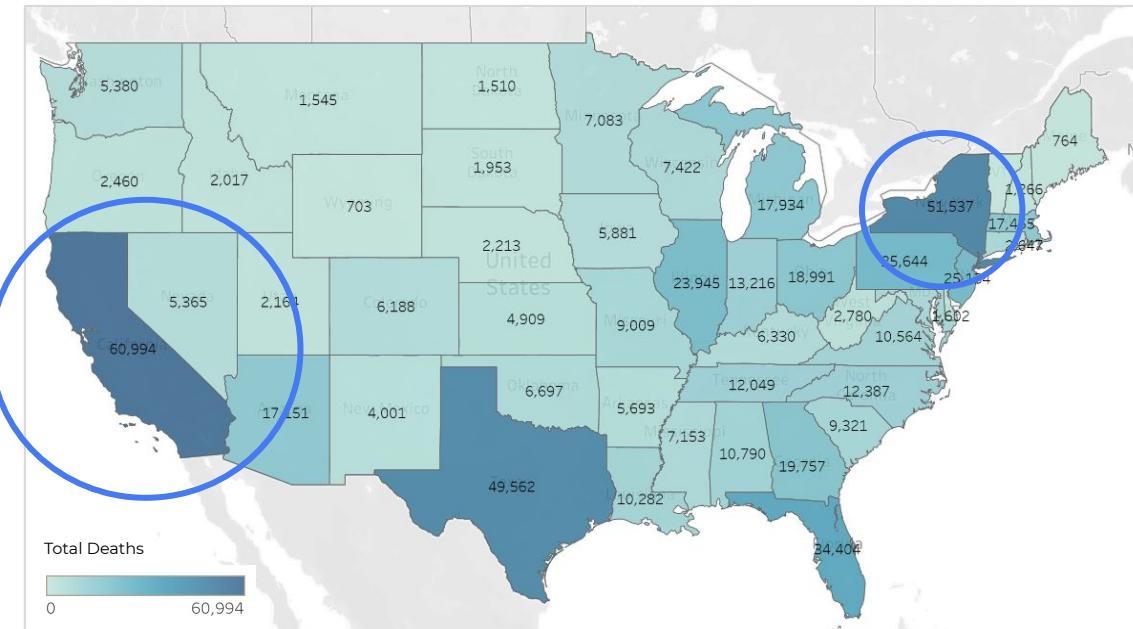
## **Identifying problem areas**

# COVID Impact - Total Number of Cases



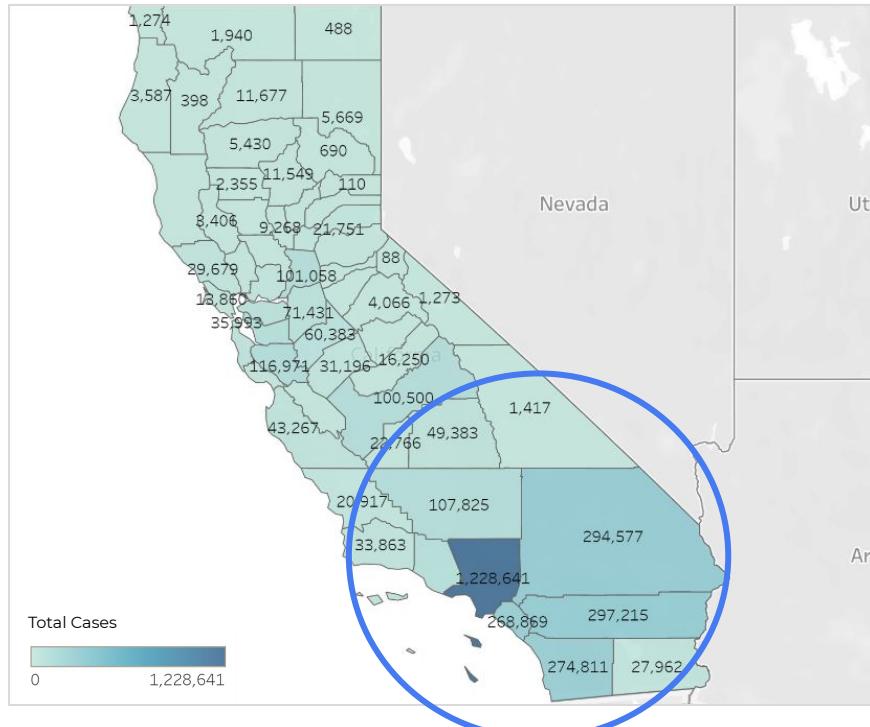
- Among all states in the US, highest number of cases were recorded in California to date
  - The states which recorded the second and third highest cases to date were Texas and Florida respectively

# **COVID Impact - Total Number of Deaths**



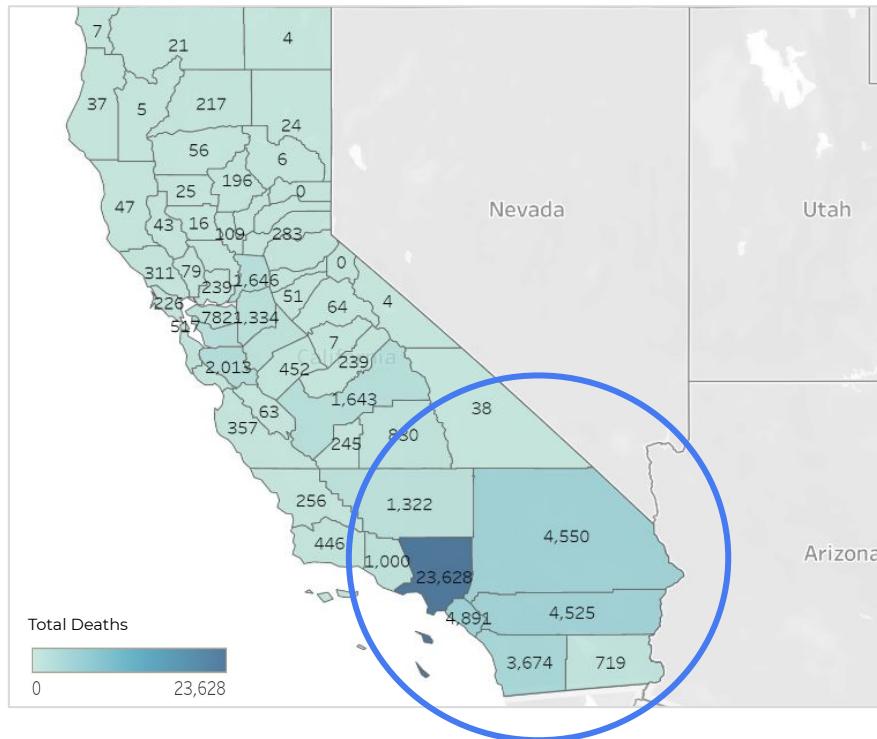
- Among all states in the US a high number of deaths was also recorded in California
  - Even though New York recorded the fourth-highest number of total cases, in terms of total deaths it was second

# Total Number of Cases - A Closer view of California



- Los Angeles County recorded the highest number of cases to date in California, almost one-third of total cases in California
- Most of the cases in California state were recorded in southern counties

# Total Number of Deaths - A Closer view of California

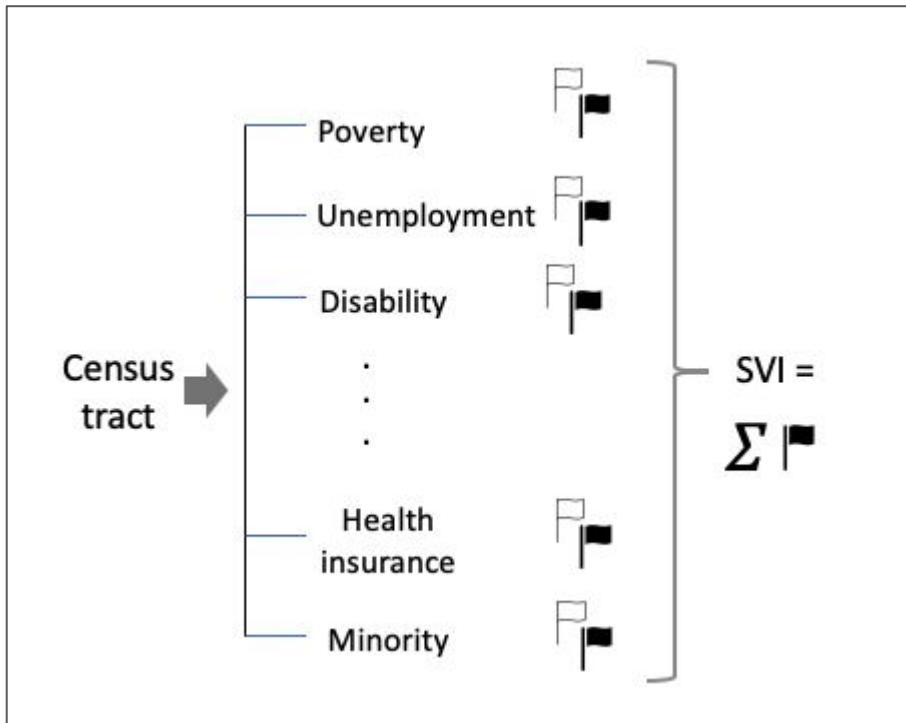


- Los Angeles County also recorded the highest number of deaths to date in California, almost one-third of total deaths in California
- A similar trend was observed in deaths as well with most cases being observed for southern counties only in California state

**02-b**

**Identifying areas of high  
potential risk**

# High Risk Indicators - SVI



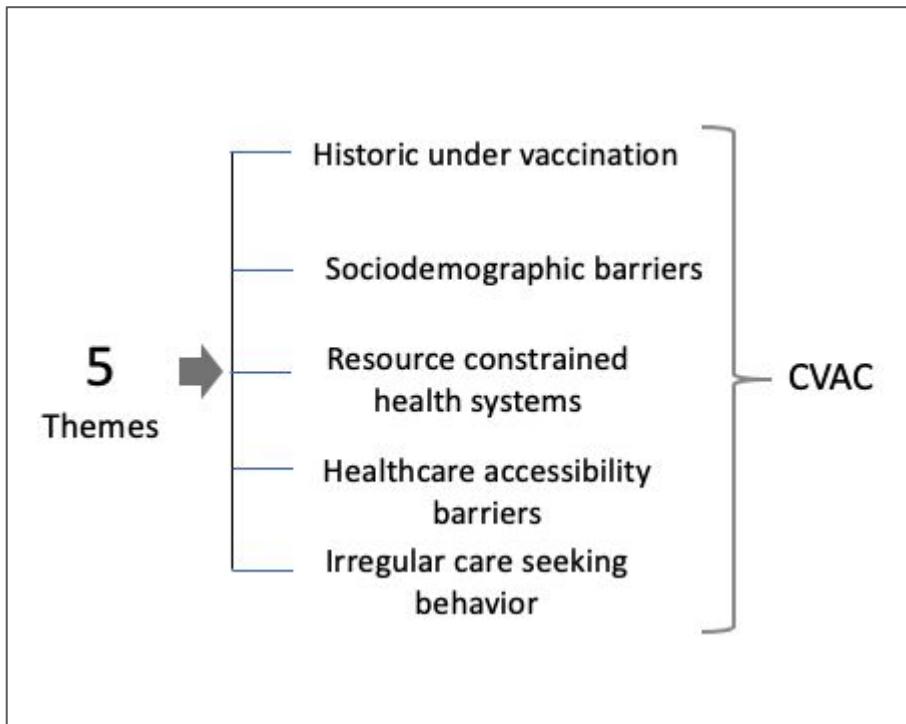
## Social vulnerability

Measures the resilience of communities when responding to or recovering from threats to public health

- 16 measures across 3 themes\*
- Flags assigned for every measure exceeding 90th percentile in a census tract
- Sum of flags per census tract gives SVI

\*Socioeconomic, Population, Housing

# High Risk Indicators - CVAC

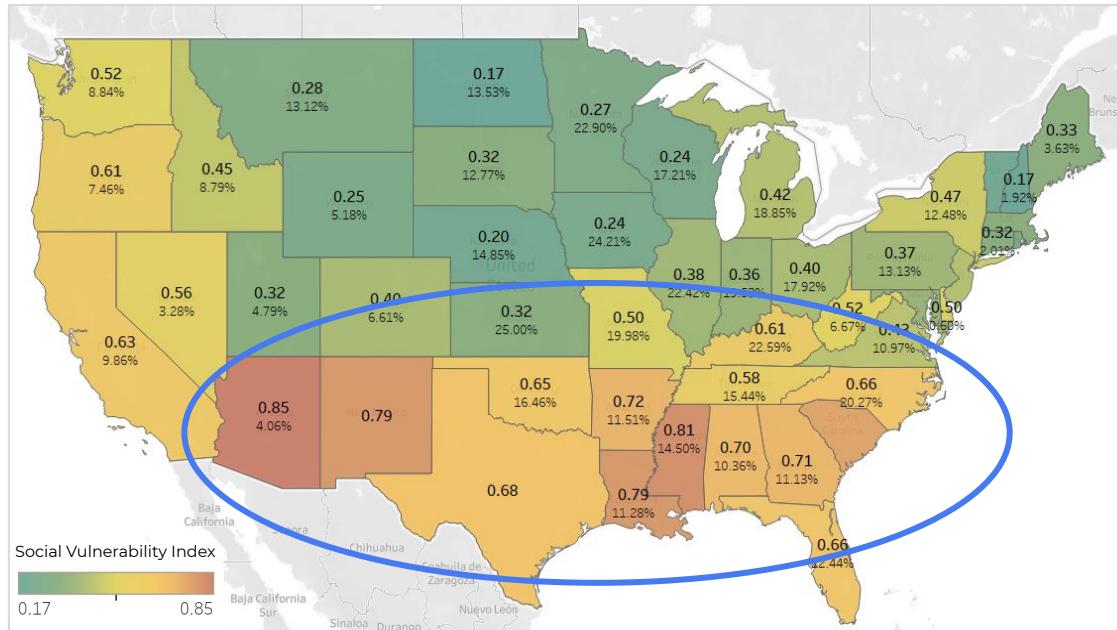


## COVID-19 Vaccine Coverage index (CVAC)

Measure of the expected difficulty a community may face in achieving rapid, widespread COVID-19 vaccine coverage

- A higher score indicates a higher level of concern for COVID-19 vaccine rollout
- 
- Modular score broken down to 5 themes
  - Each theme constructed from sub themes with multiple indicators
  - Equally weighted theme level combined to get CVAC index

# Risk Assessment - SVI vs. Vaccinations Received

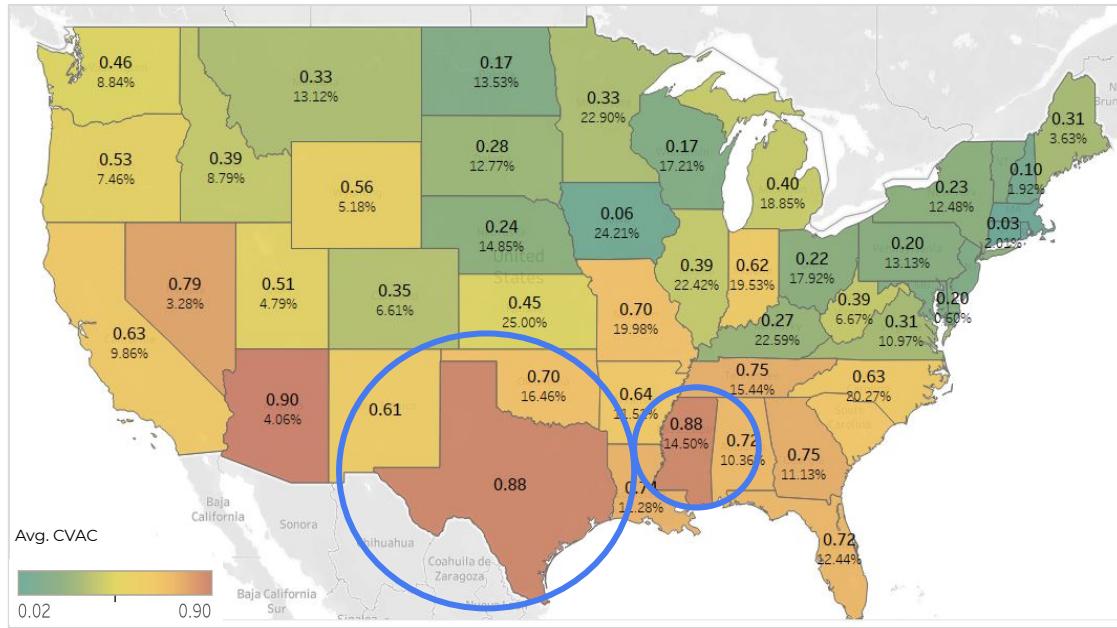


- Southern and western states which have very high avg. social vulnerability index (SVI) also observed a higher number of cases and deaths due to COVID 19
- Despite high SVI, states like Arizona only 4.06% of its adult population was fully vaccinated

\* Percentages represent Vaccinated adults as percentage of population

COVID-19

# Risk Assessment - CVAC vs. Vaccinations Received



\* Percentages represent Vaccinated adults as percentage of population

- The CVAC score was highest for Texas that had one of the highest numbers of cases and deaths to date due to COVID 19
- States like Mississippi and Texas depicted high vulnerability with CVAC of 0.88 thus requiring immediate attention of vaccinations

**02-c**

**Identifying areas of inhibition**

# Vaccine Hesitancy

## Vaccine Hesitancy

Estimated using the Census Bureau's Household Pulse Survey (HPS) data

## Hesitancy

Percentage of survey responses indicating that they would "probably not" or "definitely not" receive a COVID-19 vaccine when available

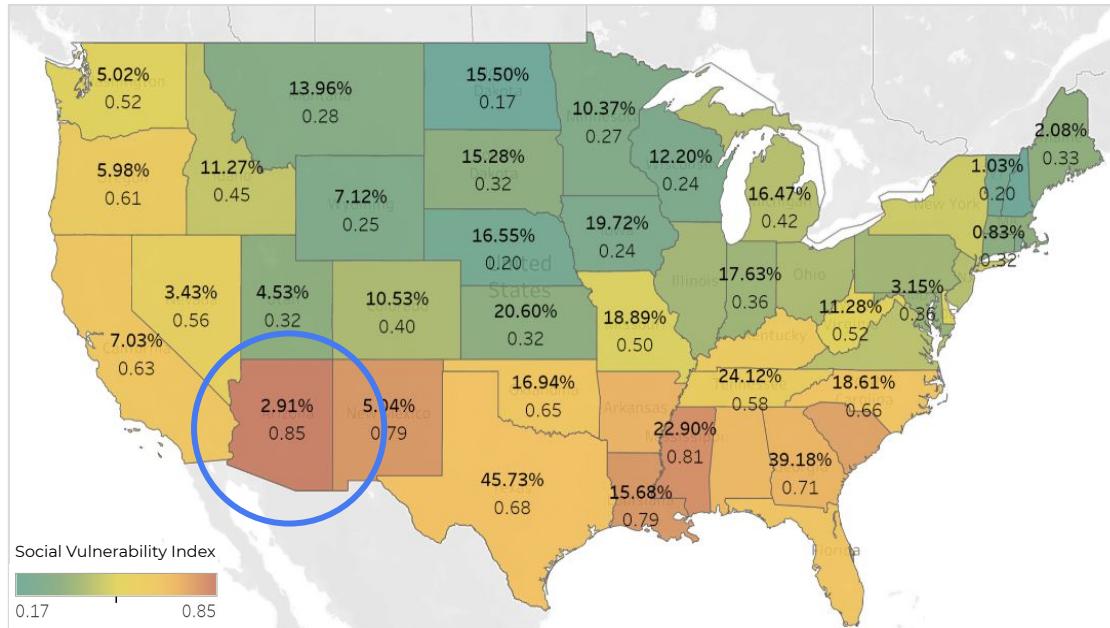
Question used for calculating hesitancy:

Once a vaccine to prevent COVID-19 is available to you, would you get a vaccine?

- 1) Definitely get a vaccine
- 2) Probably get a vaccine
- 3) Probably not get a vaccine
- 4) Definitely not get a vaccine



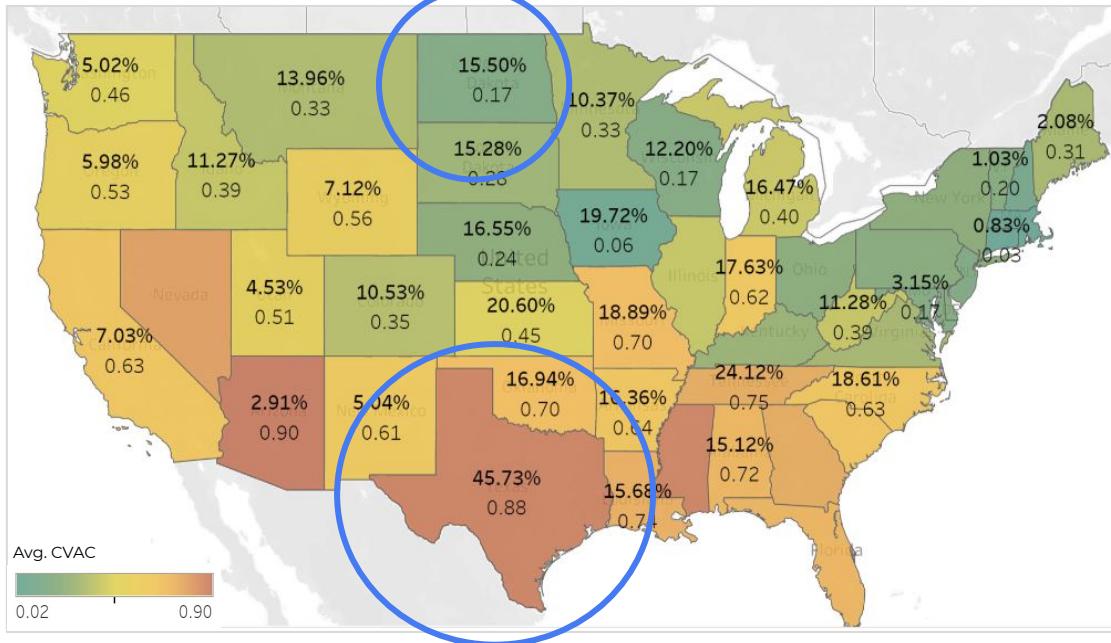
# Social Vulnerability Index vs. Vaccine Hesitancy



\* Vaccine Hesitancy in percentage of population

- Arizona, despite a high SVI of 0.85, showed only 2.91% vaccine hesitancy thereby indicating less apprehensions in the population about the vaccine
- Although northern states have low SVI, they exhibit high average hesitancy

# CVAC vs. Vaccine Hesitancy



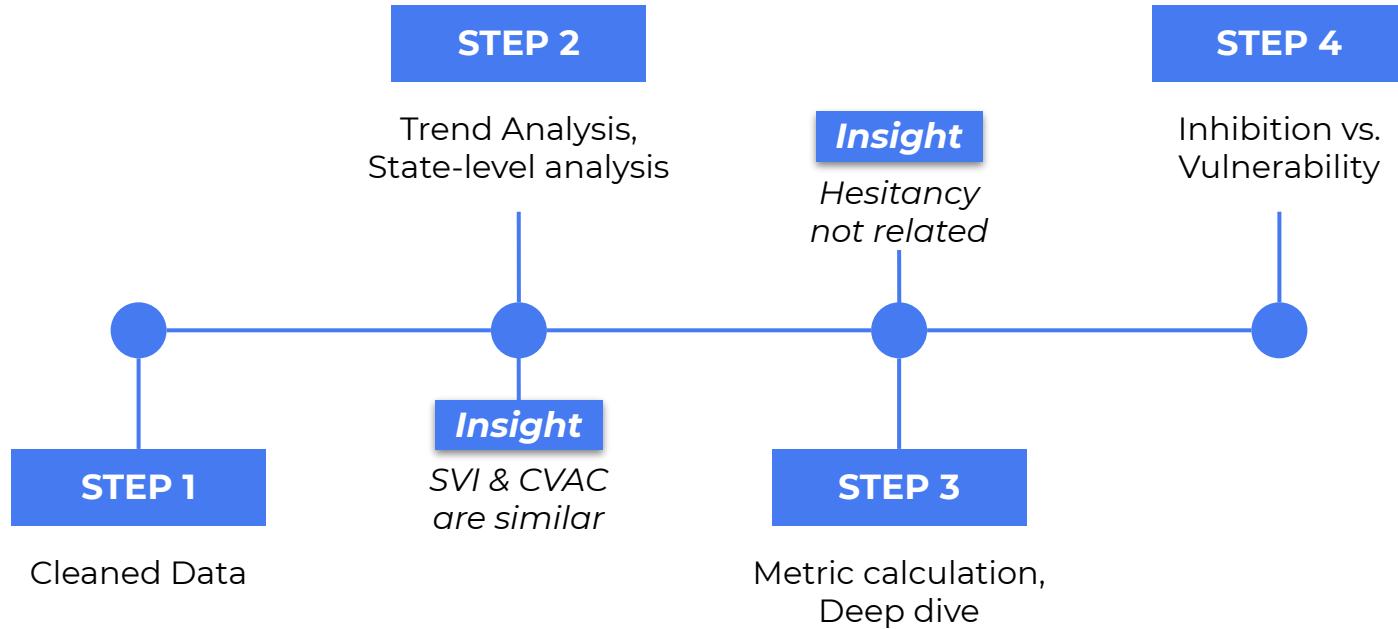
- States like Texas, with very high vulnerability (CVAC 0.88) and high hesitancy (45.73%), pose potential threat of COVID spread
- States, like North Dakota, with low vulnerability (CVAC 0.17) but low hesitancy (15.50%) gain lower priority compared to states with similar hesitancy but higher vulnerability

\* Vaccine Hesitancy in percentage of population

**02-d**

**Recommend solutions**

# Analysis Summary



# Vulnerability vs. Inhibition - Plan of Action

		Vulnerability				
		Very High	High	Moderate	Low	Very Low
Inhibition	Very High					
	High					
	Moderate					
	Low					
	Very Low					

## Concentration Points

State	Vulnerability	Inhibition
Mississippi	Very High	Very High
Arizona	Very High	High
Louisiana	High	Very High
Alabama	High	Very High
Georgia	High	Very High

Note: States in same category are ranked based on deaths per cases

## Recommendations

Healthcare facilities in areas of high vulnerability need to be strengthened.

Areas of high *Vulnerability* can be prioritized to enable strong vaccine distribution & administration systems



Apprehensions about the vaccine and its side-effects should be addressed via suitable awareness campaigns

Areas with high *Inhibition* can be targeted for informative broadcasts

# Impact

- Increased vaccination and improved health & immunity
- Informed population hence reduced misinformation
- Improved healthcare facilities and hence better preparedness against pandemics



COVID-19

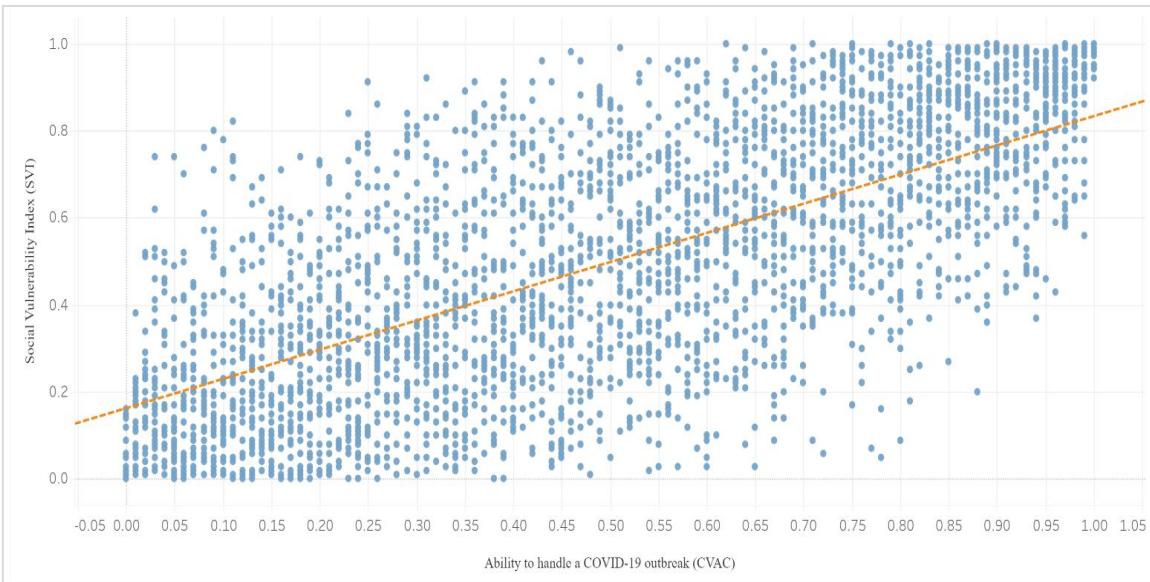
**Thanks!**



COVID-19

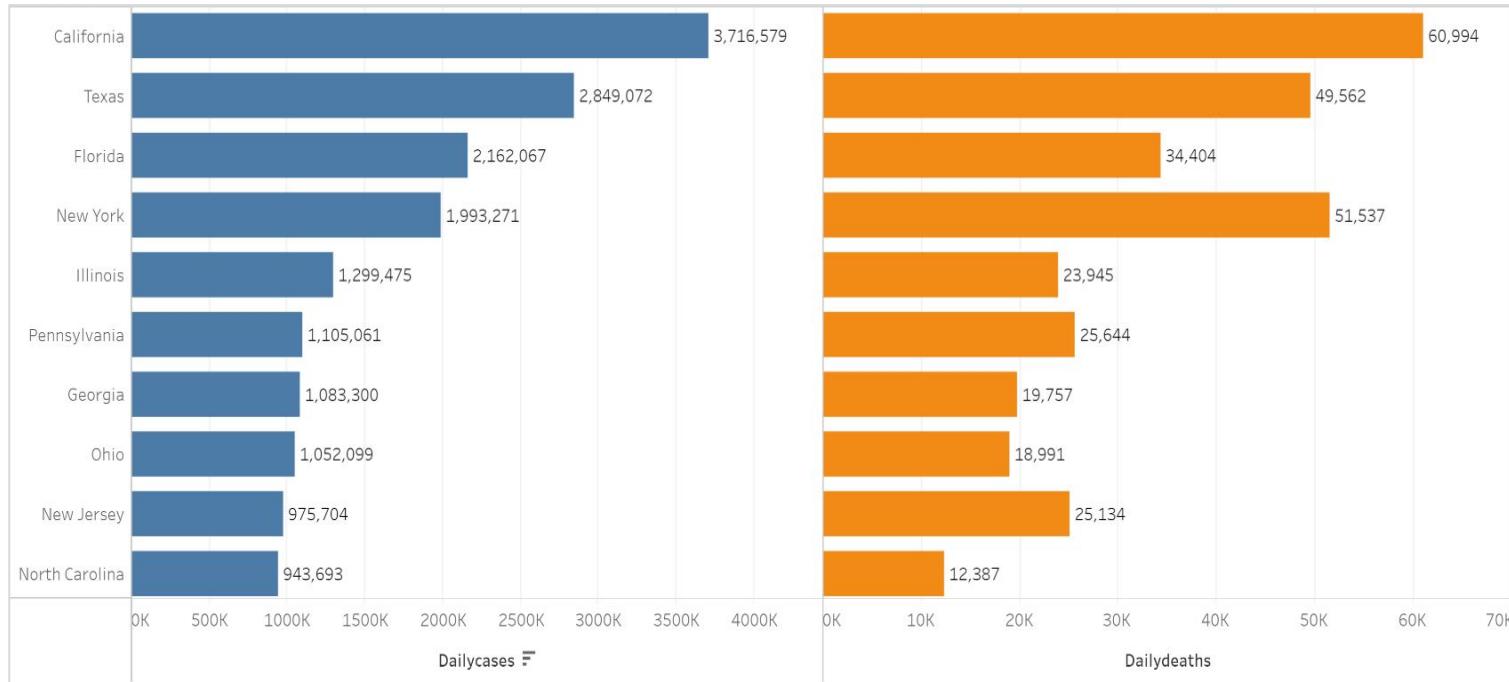
# APPENDIX

## SVI vs. CVAC



- Social Vulnerability Index (SVI) and ability to handle a COVID-19 outbreak (CVAC) have a high positive correlation (0.72)
- States with high SVI in-turn indicate low preparedness against COVID-19 implying high overall vulnerability

# Top 10 US states by total cases and deaths



# Resources

- Data Sources
  - [Cases & Deaths, John-Hopkins University, Kaggle](#)
  - [Hesitancy & Demographics, CDC](#)
- References
  - [Reporting County Level Vaccination](#)
  - [Estimates of vaccine hesitancy for COVID-19](#)

# CREDITS

CREDITS: This presentation template was created by Slidesgo, including icons by Flaticon, and infographics & images by Freepik.

