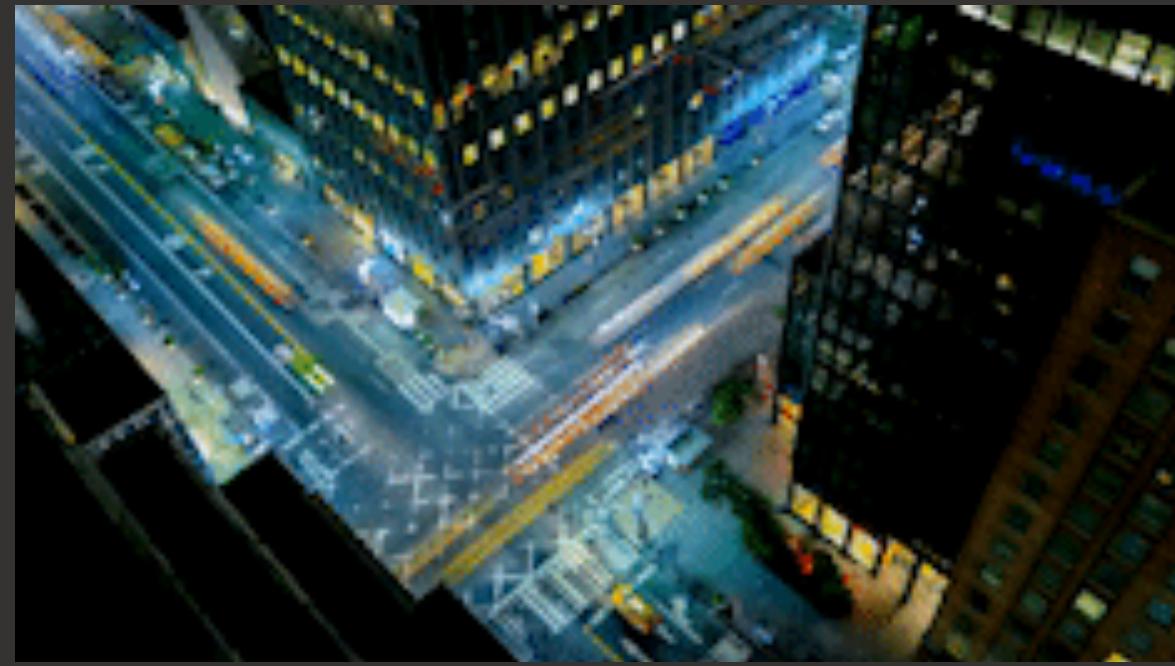


# **IDENTIFYING AREAS AT RISK FOR COVID- 19 AND OTHER DISASTERS**

- Emiko Sano
- Minoo Taghavi
- Cameron Vann

**General Assembly, Washington- DC**



- 1- Natural disasters can aggravate the impact of the COVID-19 pandemic.
- 2- Lack of tools for visualizing the combined risk.

# **PROBLEM STATEMENT**



# SOLUTION

---

1

Data  
Gathering/  
Cleaning

2

Combine data  
by County

3

Identify CA  
counties with a  
combined risk  
(Clustering)

4

Map combined  
risks for easy  
identification.

5

Make  
recommendations.



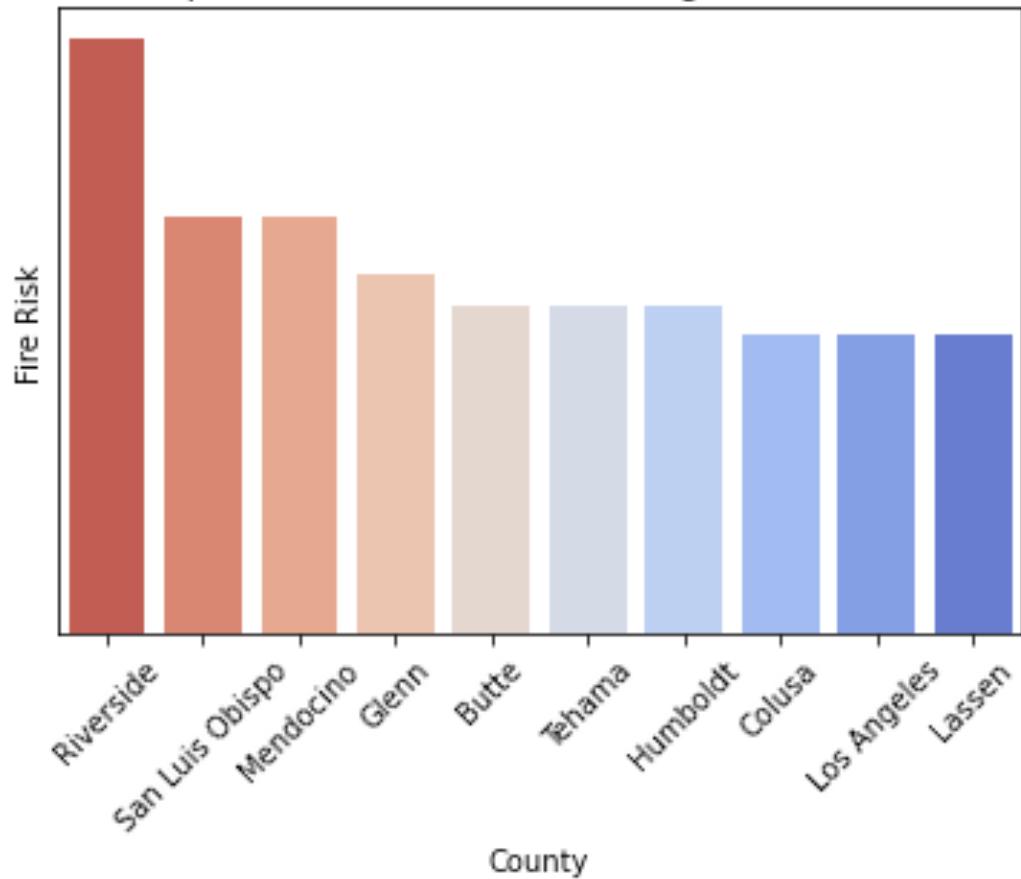
## Wildfires Has Devastated California in 2020.

As of October 17<sup>th</sup> :

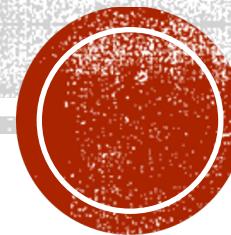
- ❖ 202 Total Fires.
- ❖ 19 Currently Active Fires.
- ❖ 32 People Killed.
- ❖ 3,549,923 Acres Burned (3% of all California)



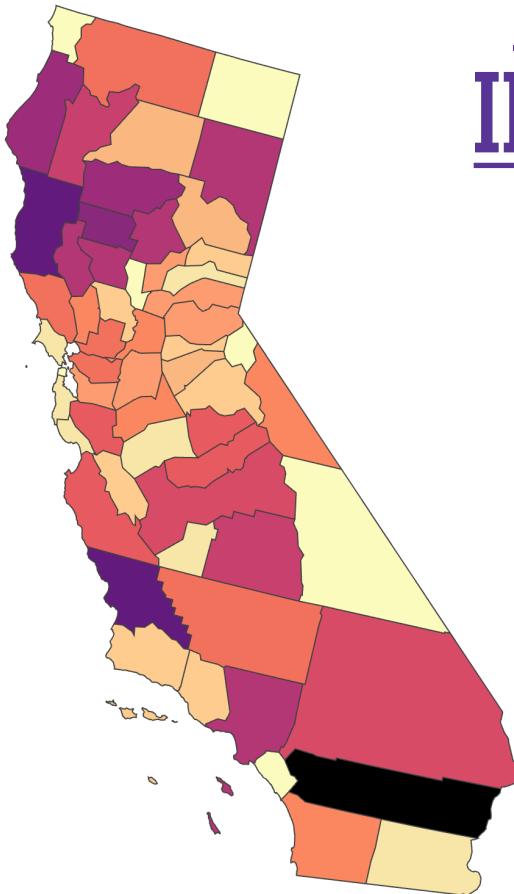
Top 10 CA counties with the Highest Fire Risk



**FIRES HAS  
DEVASTATED  
RIVERSIDE  
COUNTY IN  
2020 !**



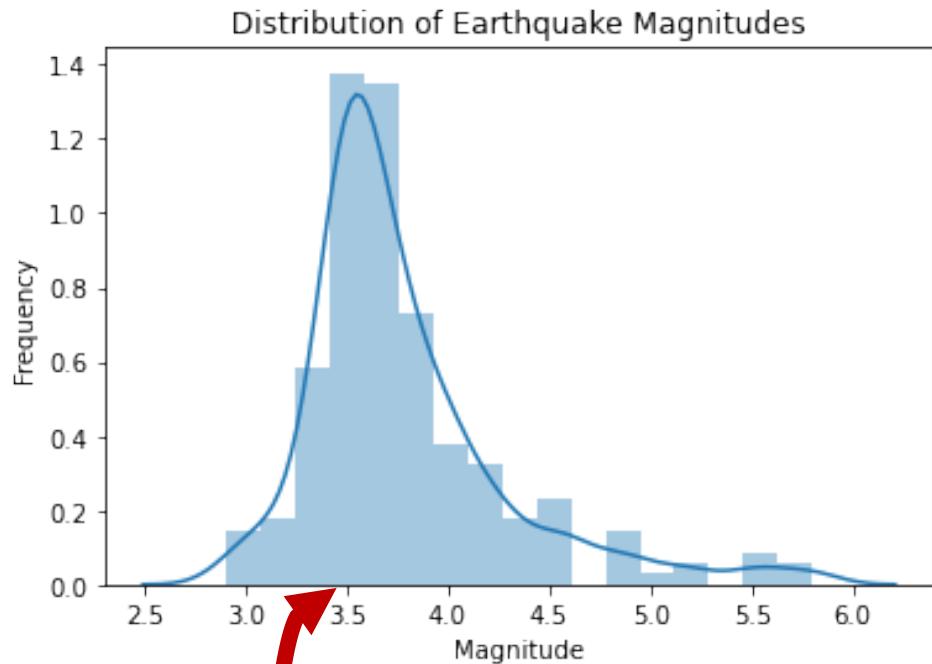
# FIRE SCORE PER COUNTY IN CALIFORNIA



Fire Score per County  
20



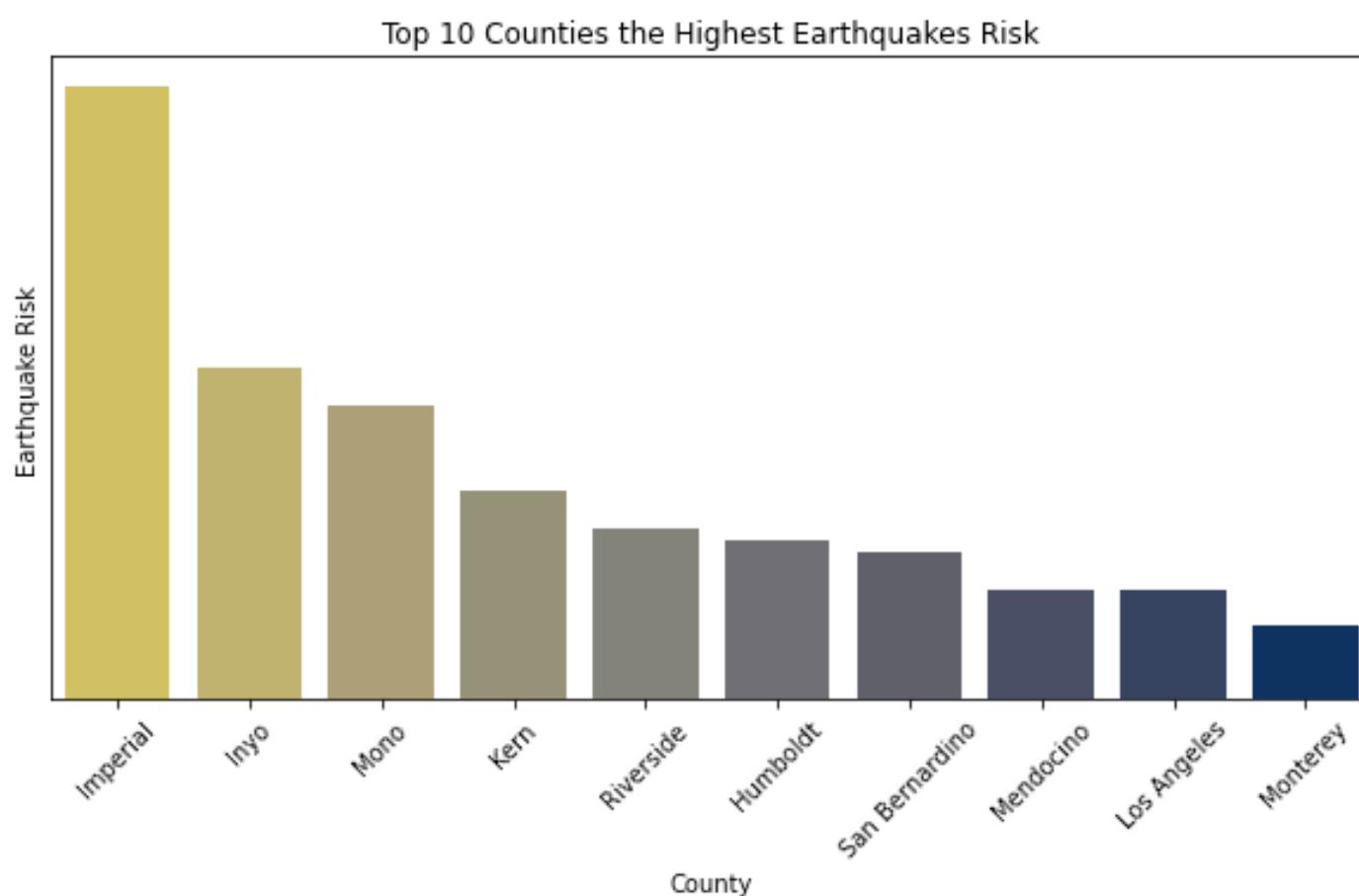
➤ California Is Shaking A Lot ...  
But “Lightly”  
200 Earthquakes Recorded as of October 17.



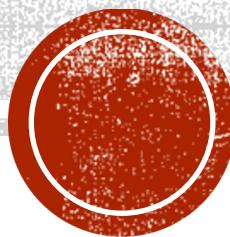
Class	Magnitude
Great	8 or more
Strong	7 - 7.9
Moderate	6 - 6.9
Light	5 - 5.9
Minor	4 - 4.9
	3 - 3.9

EARTHQUAKE

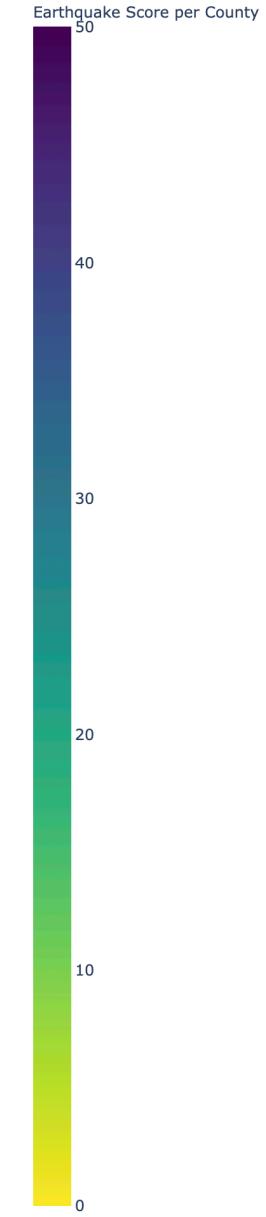
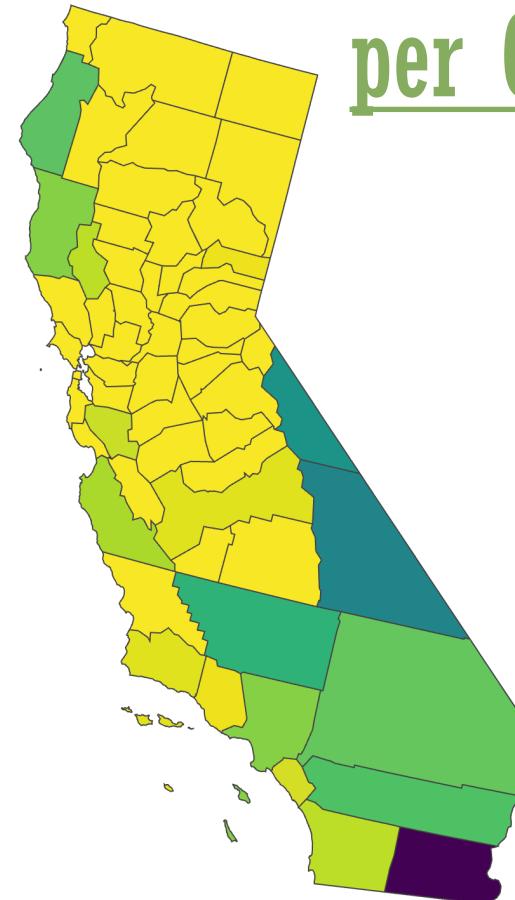
A large, stylized red arrow points downwards, overlaid on a background image of a city skyline at night. The word "EARTHQUAKE" is written in bold, black, sans-serif capital letters across the middle of the arrow.



EARTHQUAKES  
HAVE BEEN  
SHAKING MAINLY  
IMPERIAL COUNTY  
IN 2020.



# Earthquake Score per County in California



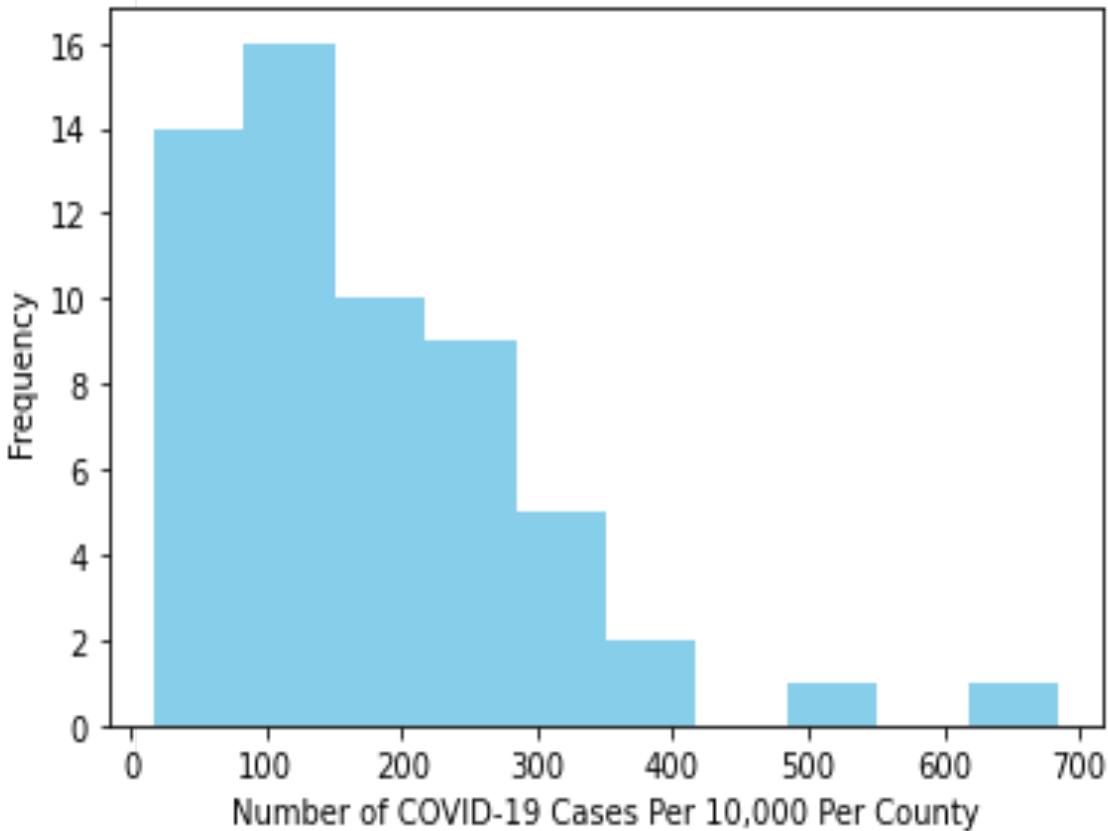


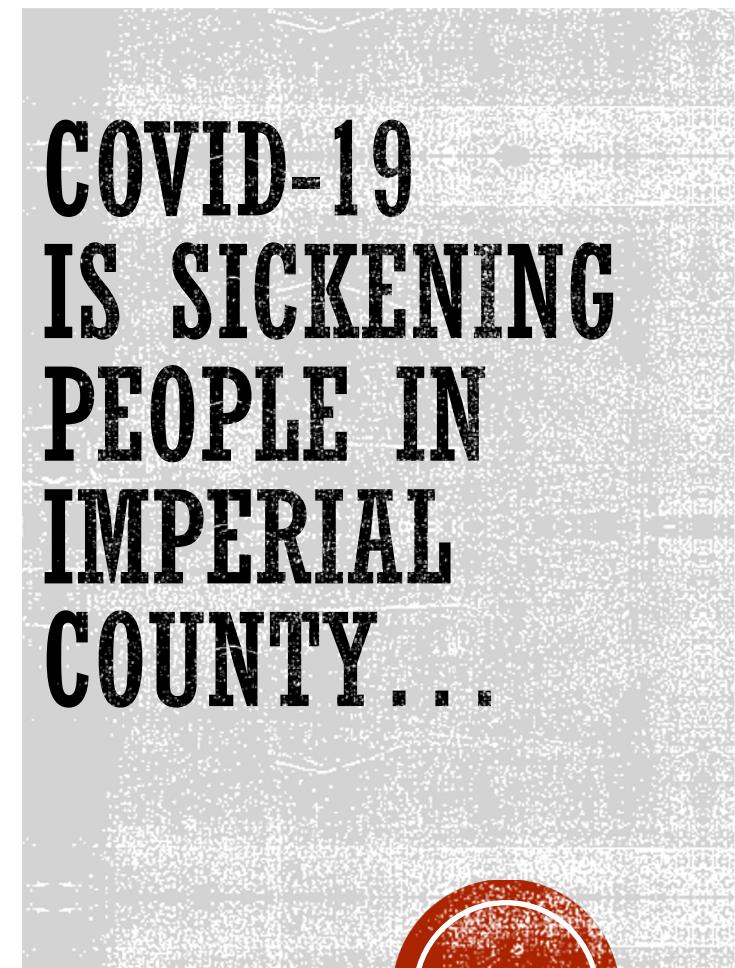
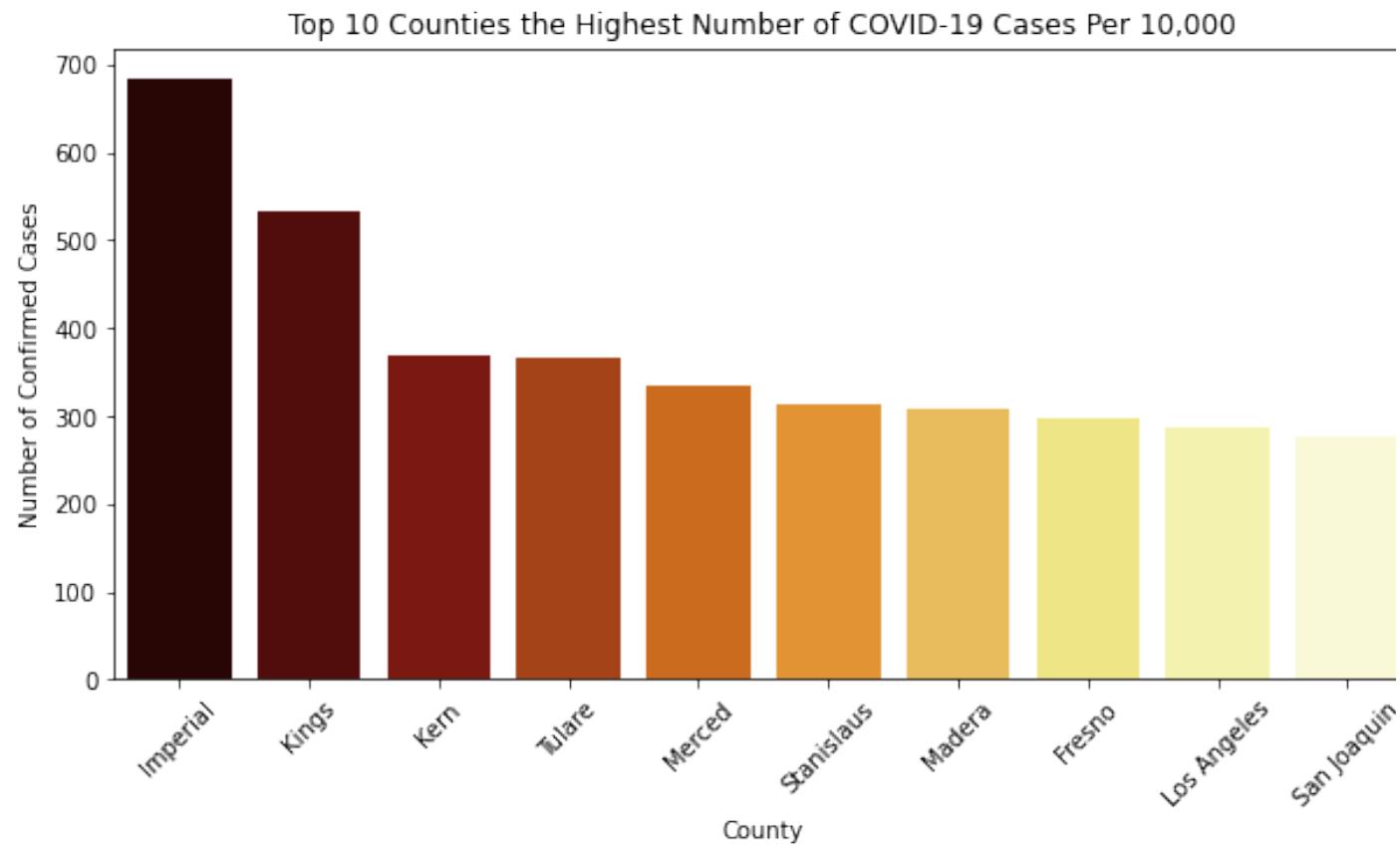
# COVID-19

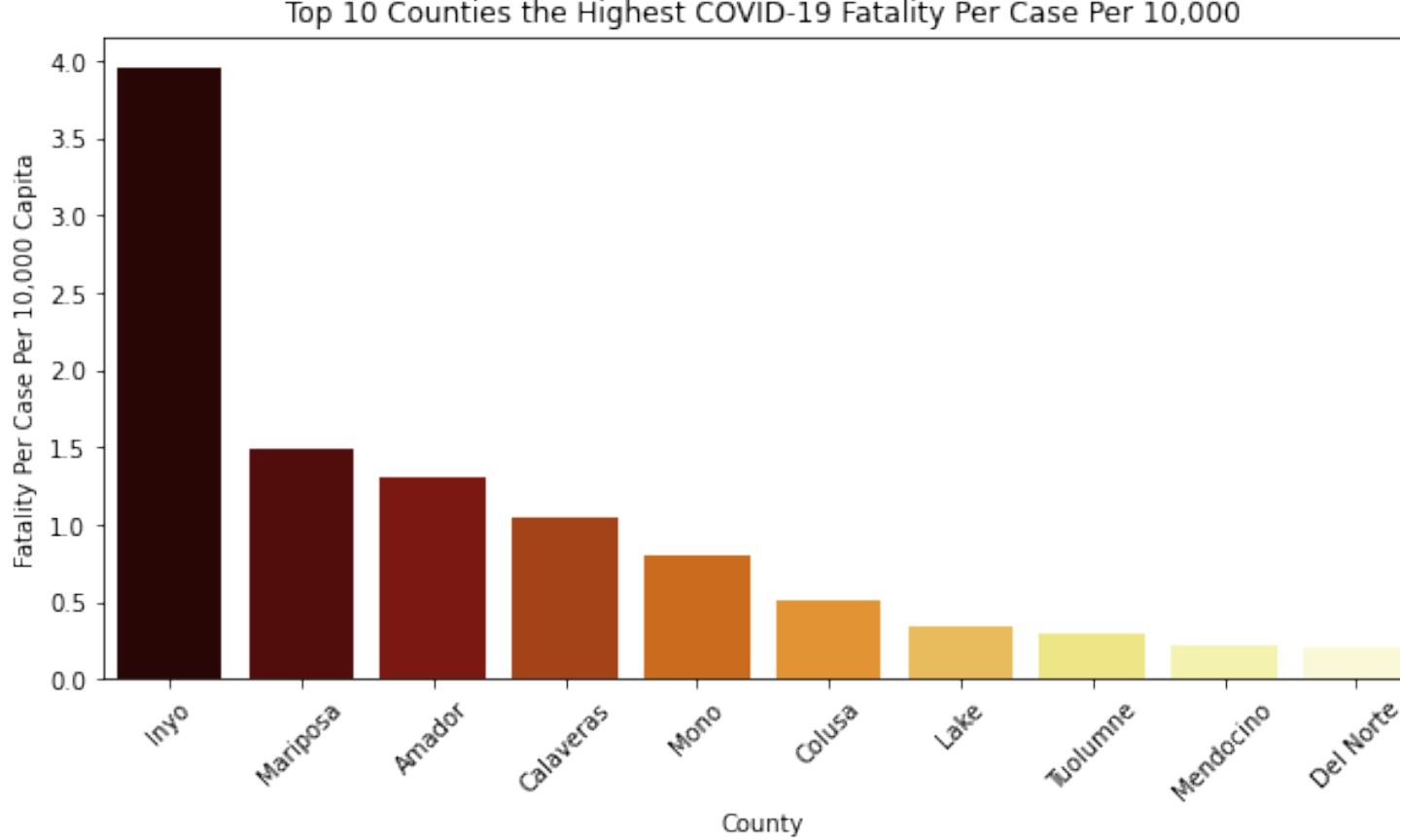
## Is Affecting Some Counties More Than Others...

\* 220 People per 10,000 have COVID-10 in CA.

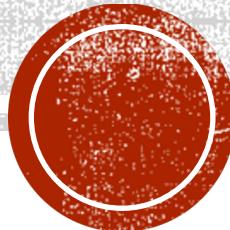
Distribution of the Number of COVID-19 Cases Per 10,000 Due to COVID-10



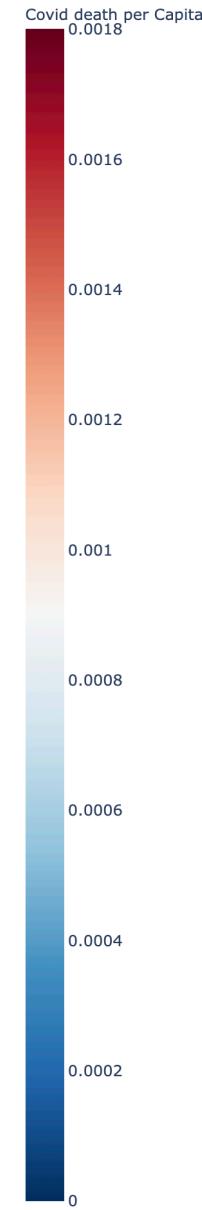
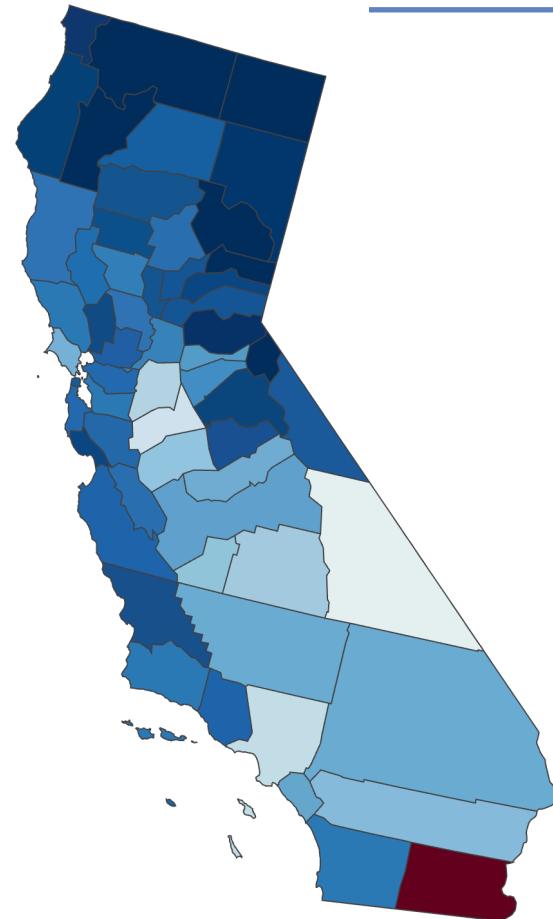


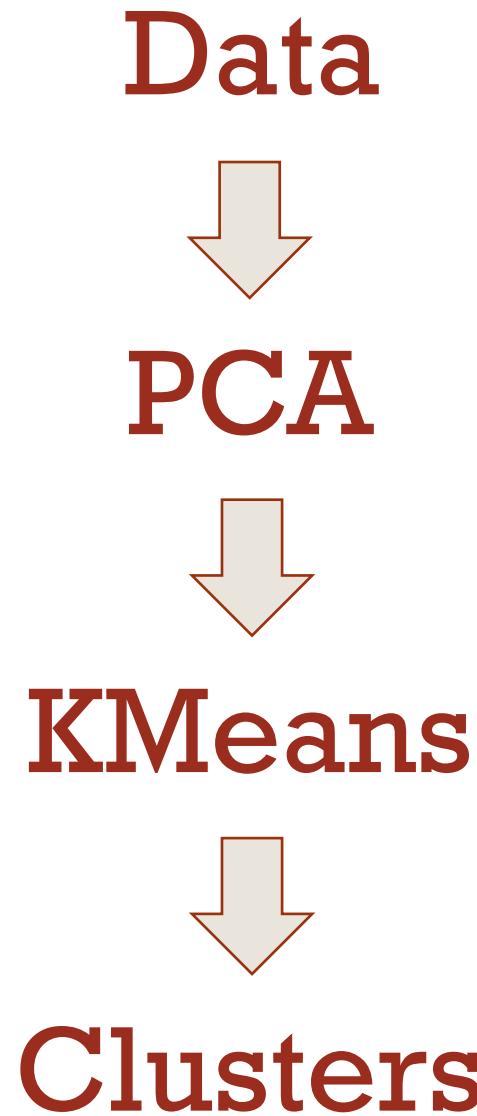


IS INYO COUNTY  
LAGGING IN  
EFFECTIVE  
COVID-19  
TREATMENTS?



# Covid Death per Capita in California





## MODELING FOR COMBINED RISK

- The Approach
  - Variable Engineering
  - Clustering Trial and Error
  - Algorithm Selection
    - PCA
    - Kmeans



# FINDING THE CLUSTERS

## Principle Component Analysis (PCA)

Dimension Reduction

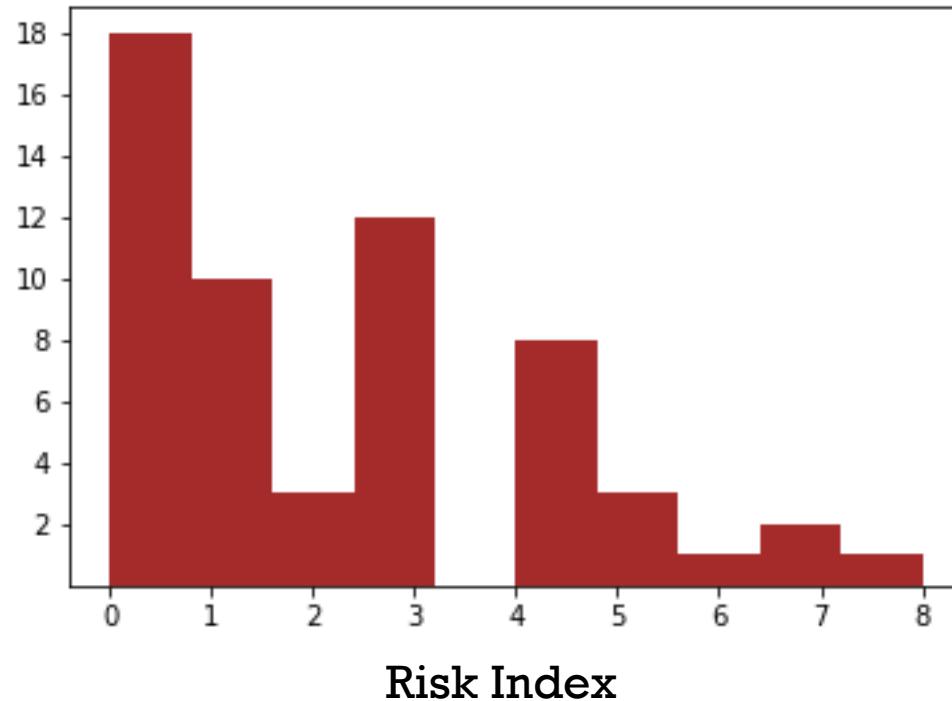
26 Variables → 2

Variability Explained

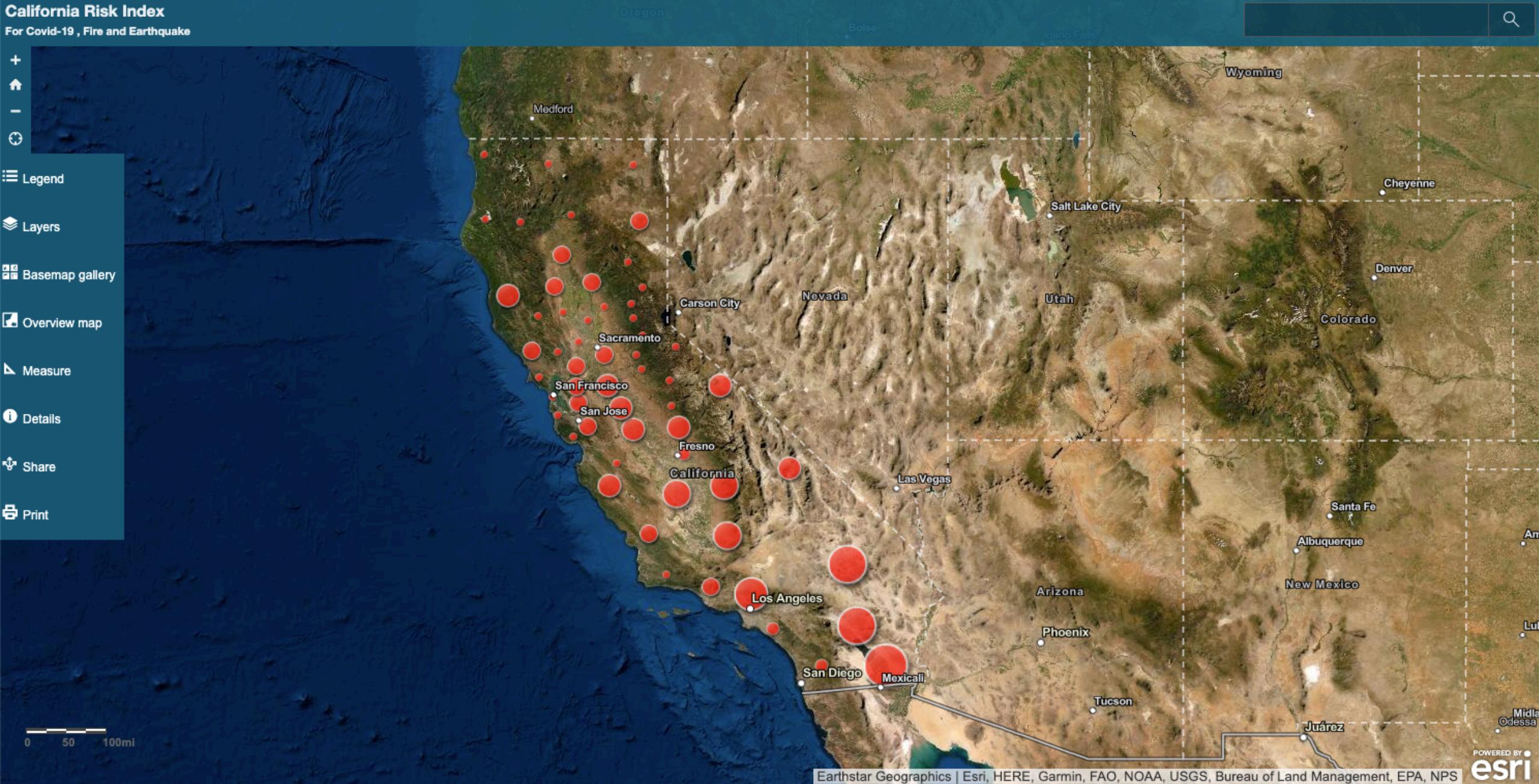
62%

## K-Means

Distribution of Risk (Zero = Safest)



# California Risk Index for Covid-19, Fire and Earthquake



# SUMMARY/ CONCLUSION

- We made a series of maps that can identify :
  - Fire risk alone
  - Earthquake risk alone
  - COVID-19 risk alone
  - Combined risk
- We recommend that Imperial county considers a preparedness plan.