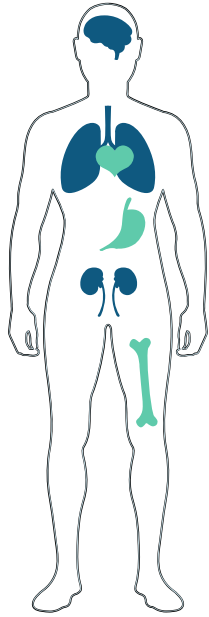




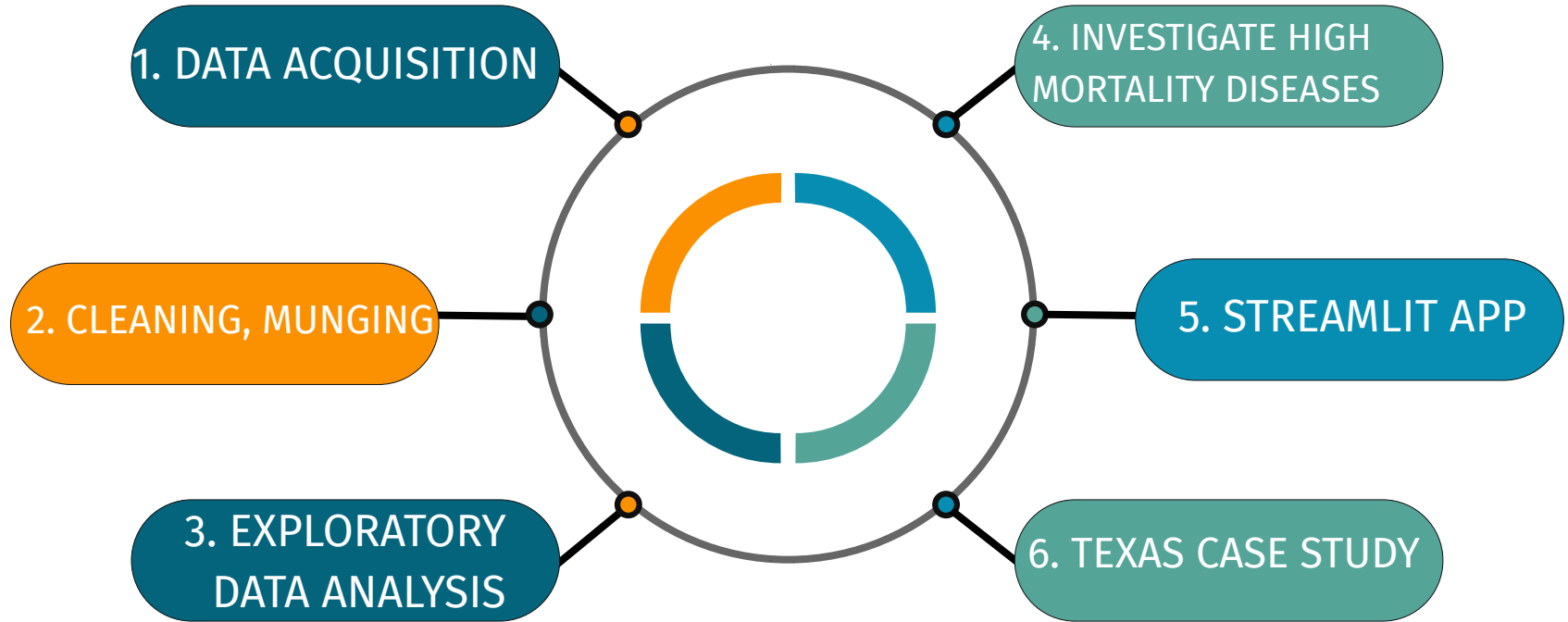
Diseases, Climate and Demographics

Investigating Trends of
Mortality and Broader
Demographics



**Using aggregated climate,
demographic & health data,
investigate meaningful trends in
mortality and create an interactive
visualization of the data.**

METHODOLOGY



DATA TYPES, SOURCES

DEMOGRAPHIC

Census: American Community Survey (**ACS**) 2019 5-year estimates

USDA: Economic Research Service (OpenIntro.org)

CLIMATE and WEATHER

NOAA and CDC:
Precipitation, air temps,
heat waves



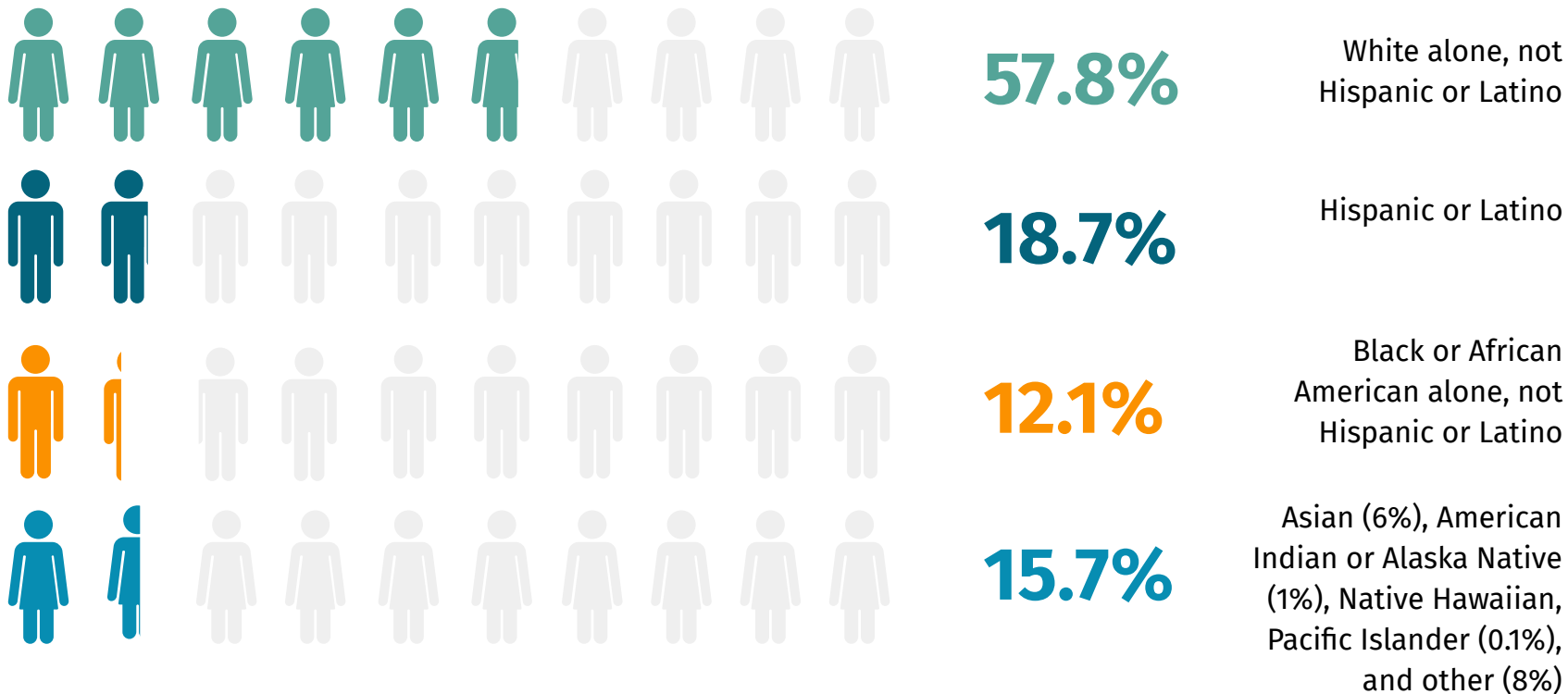
HEALTH

Institute for Health Metrics and Evaluation (IMHE): Mortality statistics (pre-COVID) from cardiovascular, respiratory, and infectious diseases.

COUNTY CLASSIFICATIONS

Office of Management and Budget (OMB): Urban/rural continuum, metro area indicator, smoking ban as of 2010

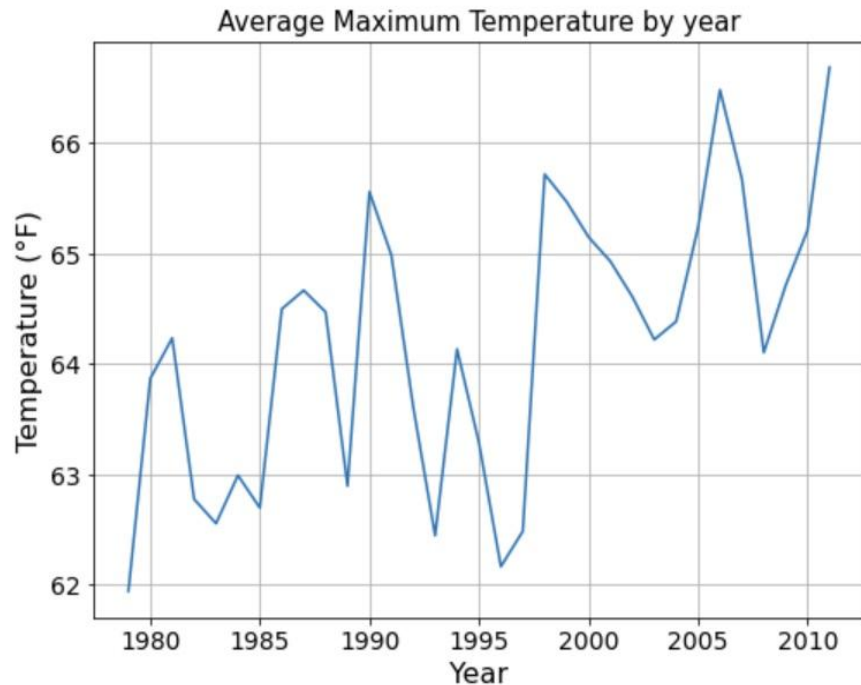
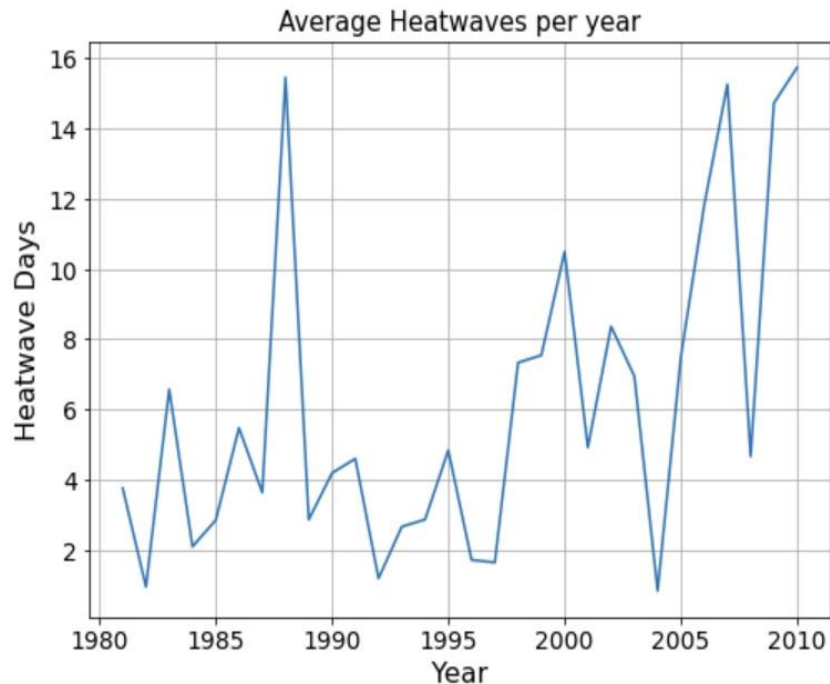
RACE AND ETHNICITY (2020 CENSUS)



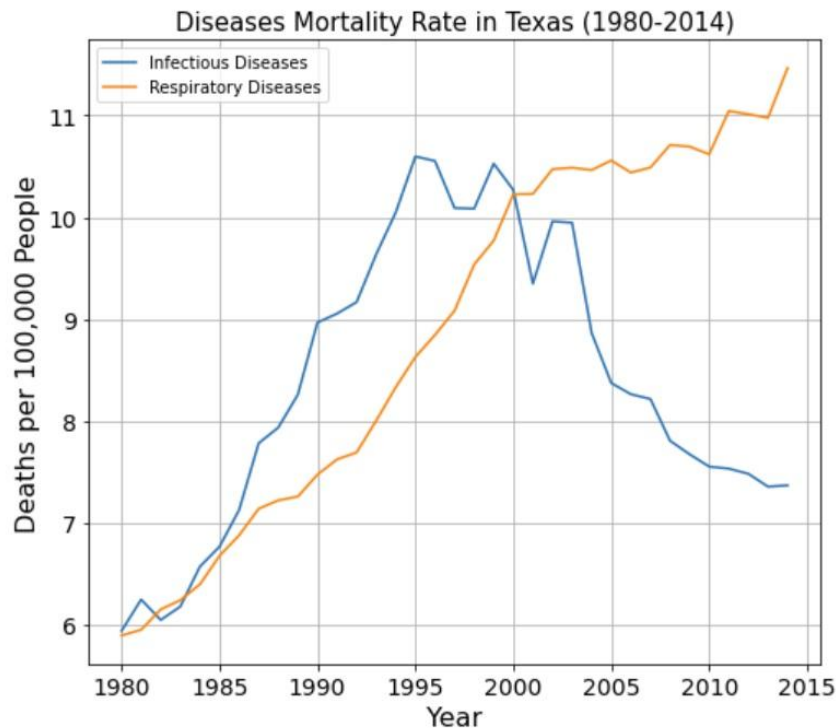
Background on Climate Change

The heat-trapping effects of Carbon-dioxide and other gases have been demonstrated and show current climate change is man-made.

Investigating trends in climate



Disease Mortality Rates in Texas



Infectious Disease Mortality Rate in Texas (per 100K)

mx

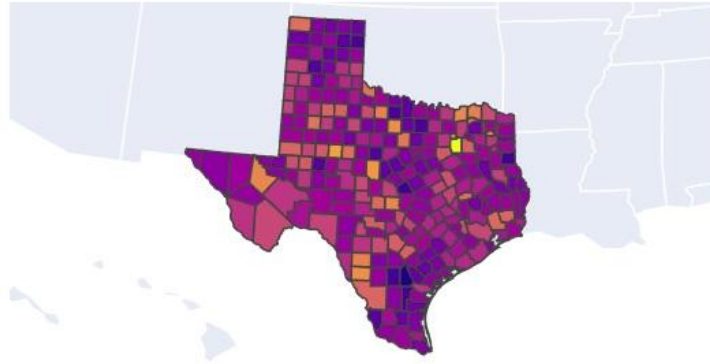


12

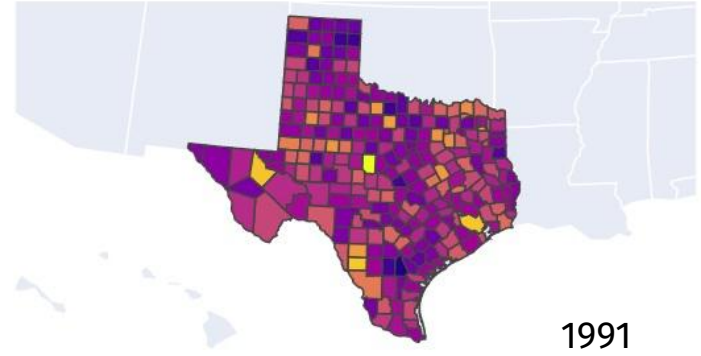
10

8

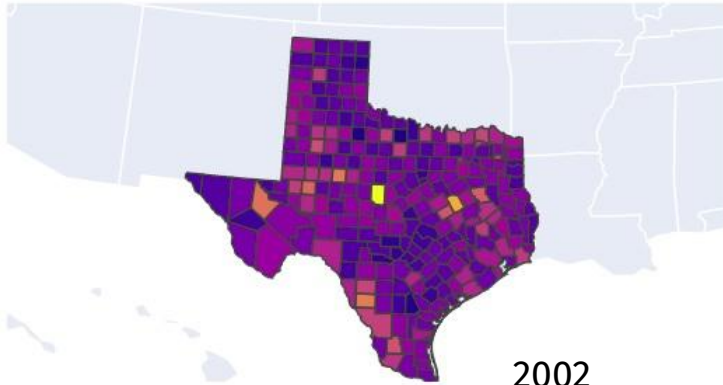
6



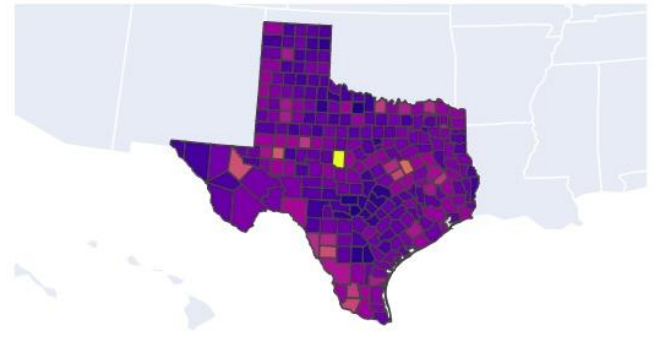
1980



1991



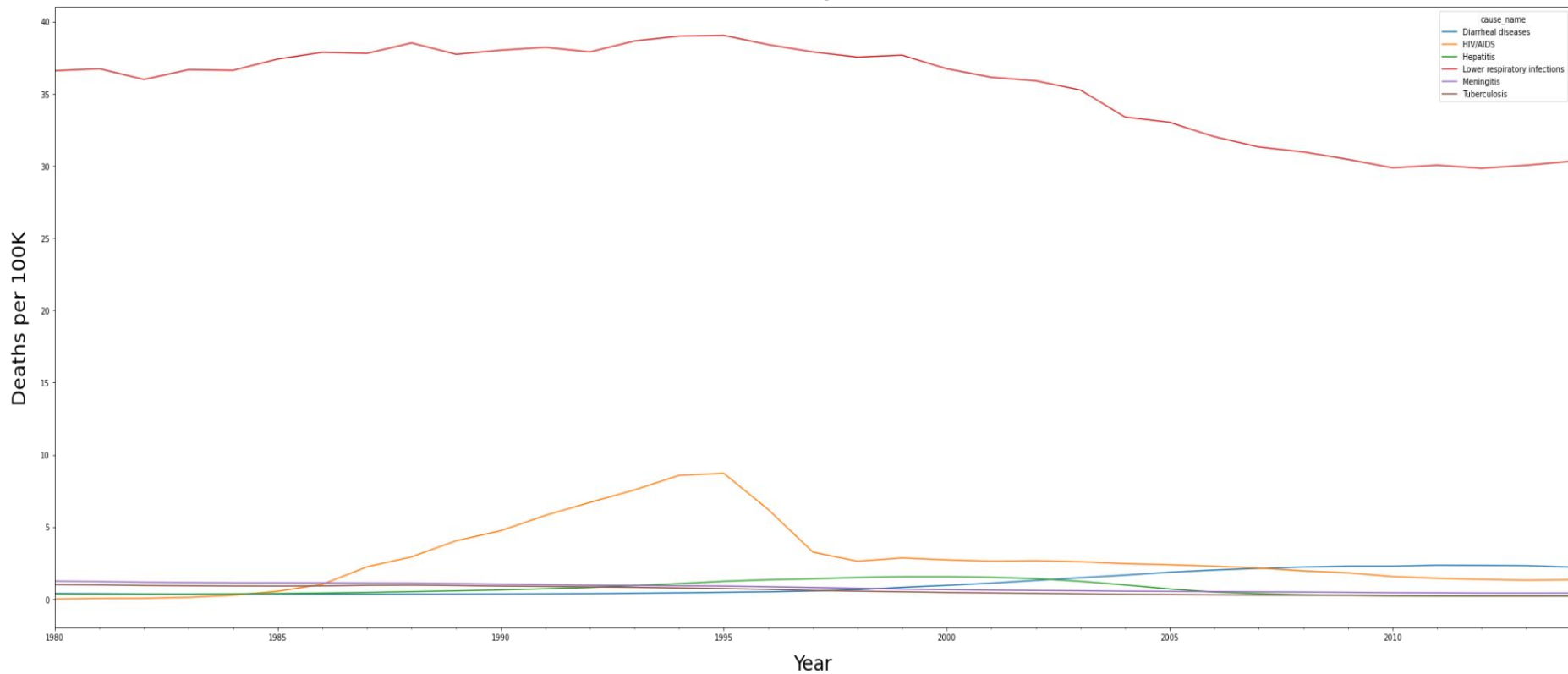
2002



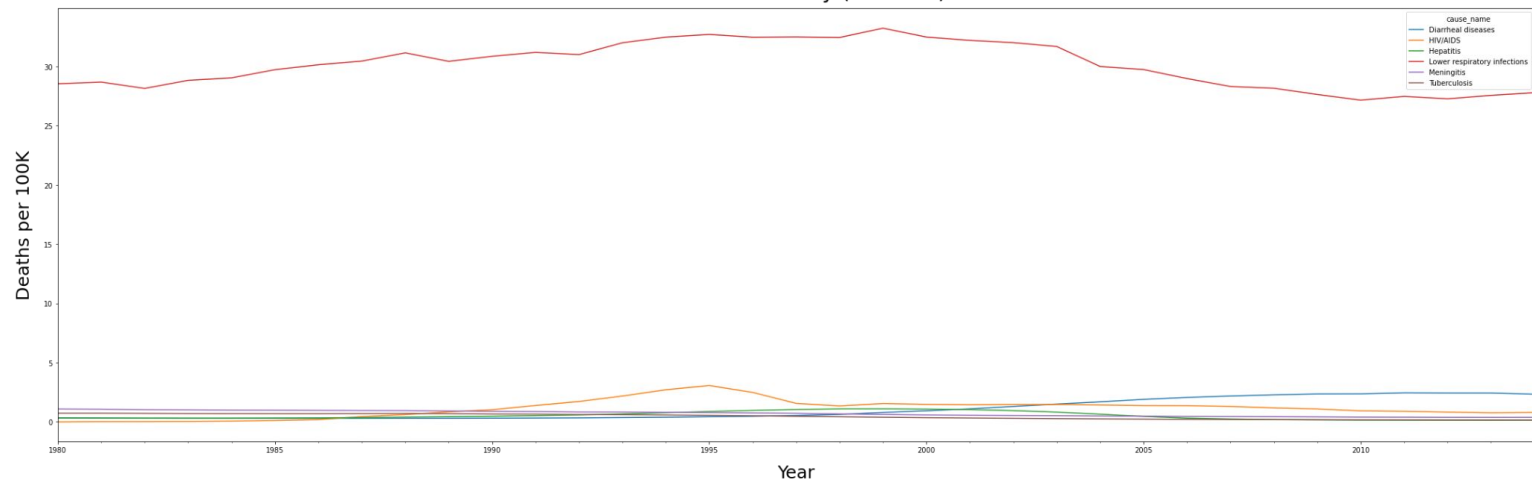
2014

Data Analysis

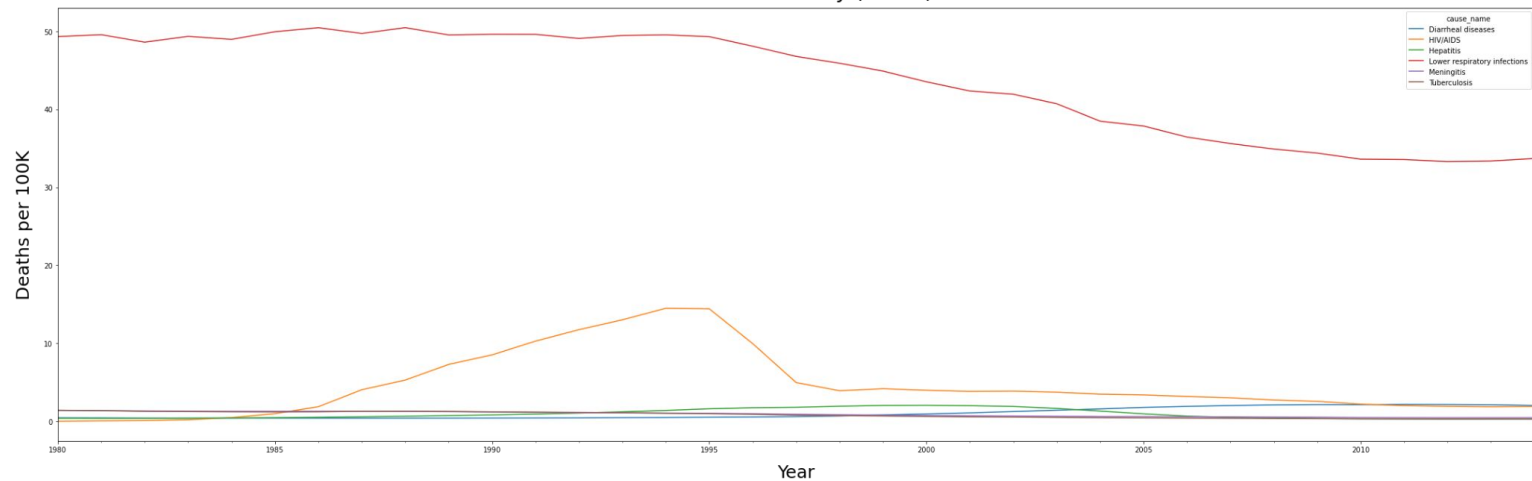
US Infectious Disease Mortality (Both Sexes): 1980 - 2014



US Infectious Disease Mortality (Females): 1980 - 2014



US Infectious Disease Mortality (Males): 1980 - 2014

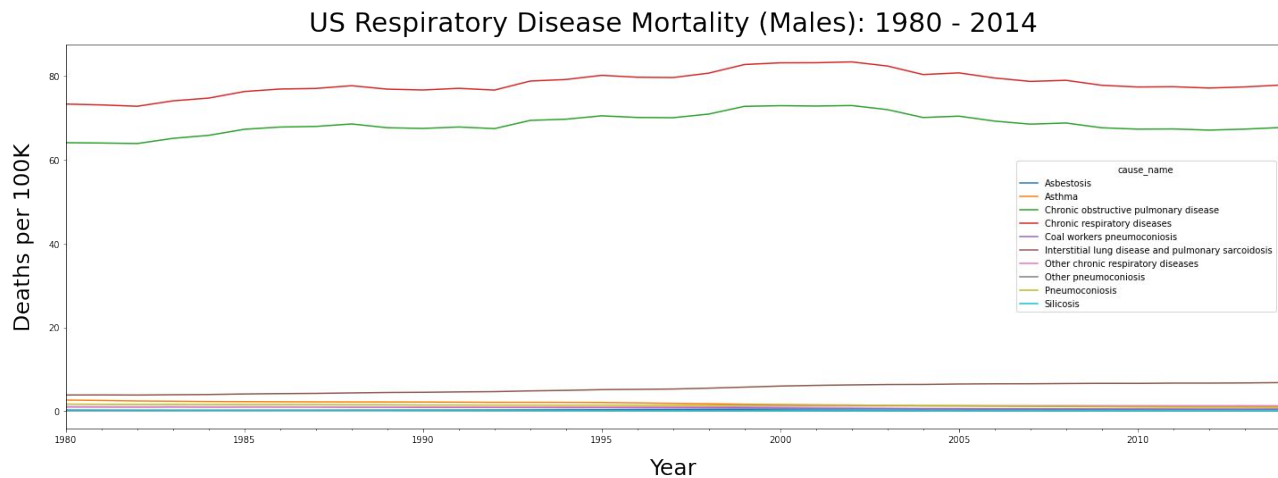


Deaths per 100k

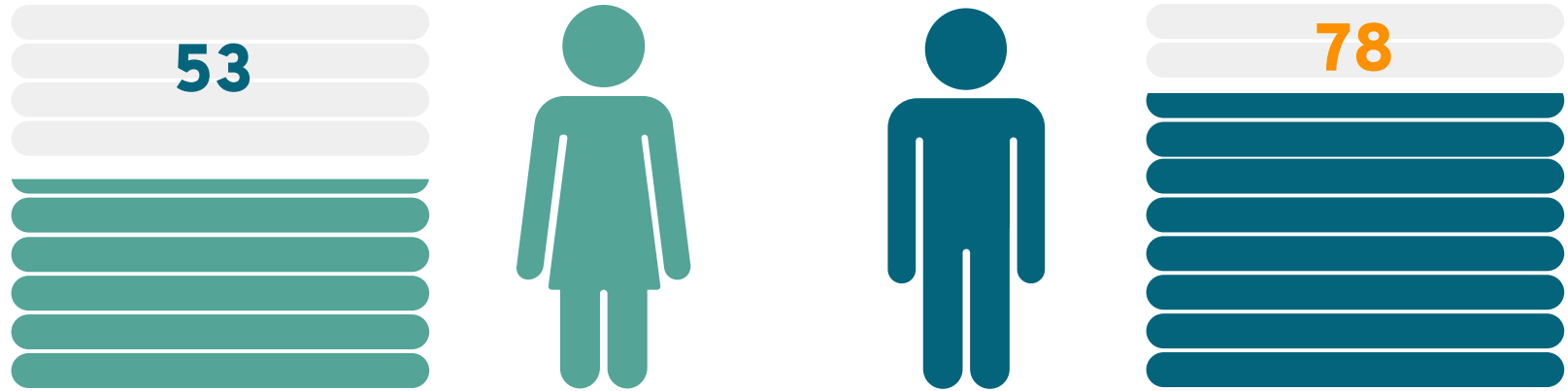
Year

cause_name

- Asbestosis
- Asthma
- Chronic obstructive pulmonary disease
- Chronic respiratory diseases
- Coal workers pneumoconiosis
- Interstitial lung disease and pulmonary sarcoidosis
- Other chronic respiratory diseases
- Other pneumoconiosis
- Pneumoconiosis
- Silicosis

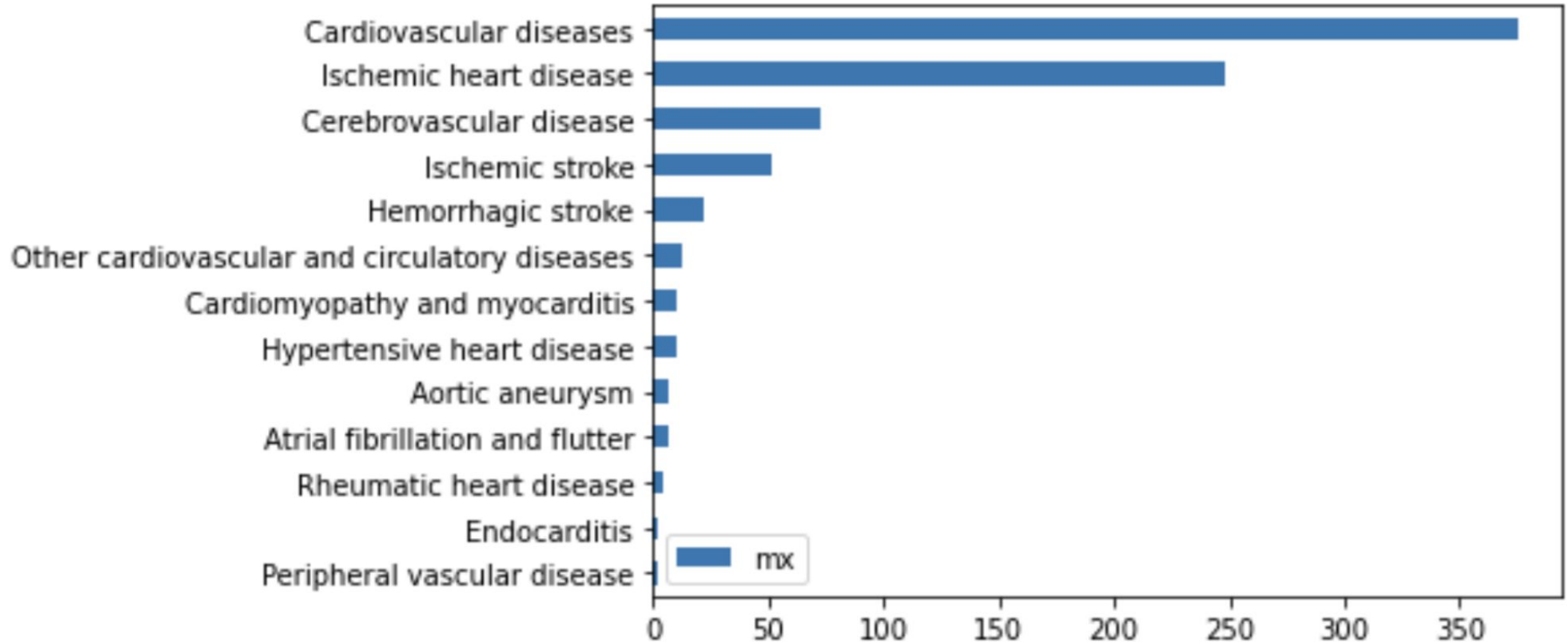


MORTALITY INCIDENCE FROM CARDIOVASCULAR DISEASE (*PER 100K*)

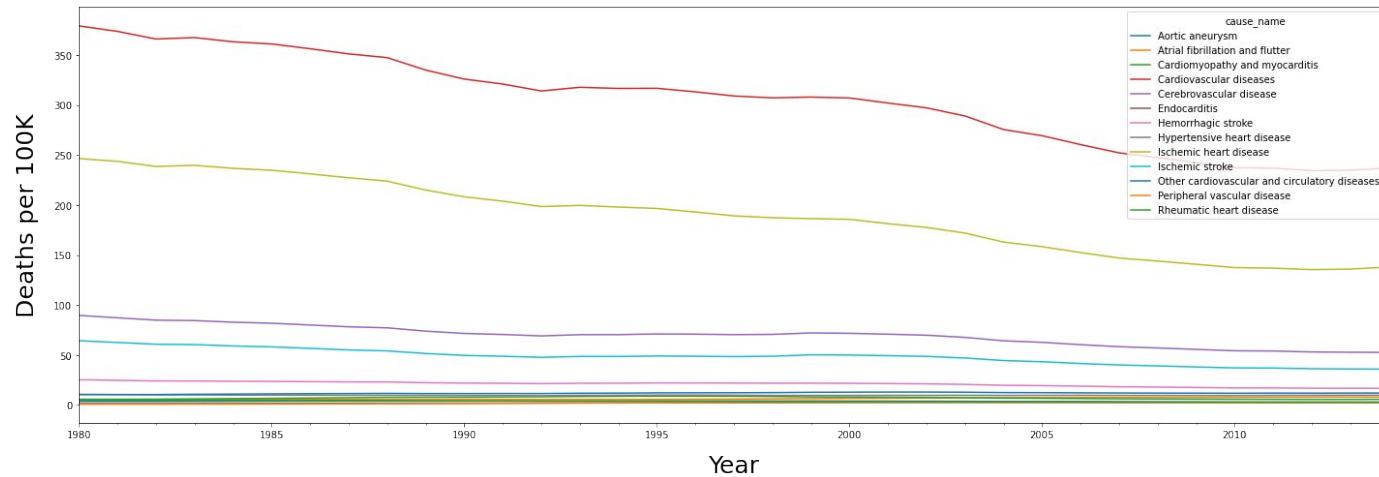


Disease of: cardiovascular, rheumatic heart, ischemic, cerebrovascular, hemorrhagic stroke, hypertensive heart, cardiomyopathy and myocarditis, atrial fibrillation, aortic aneurysm, peripheral vascular, endocarditis, other

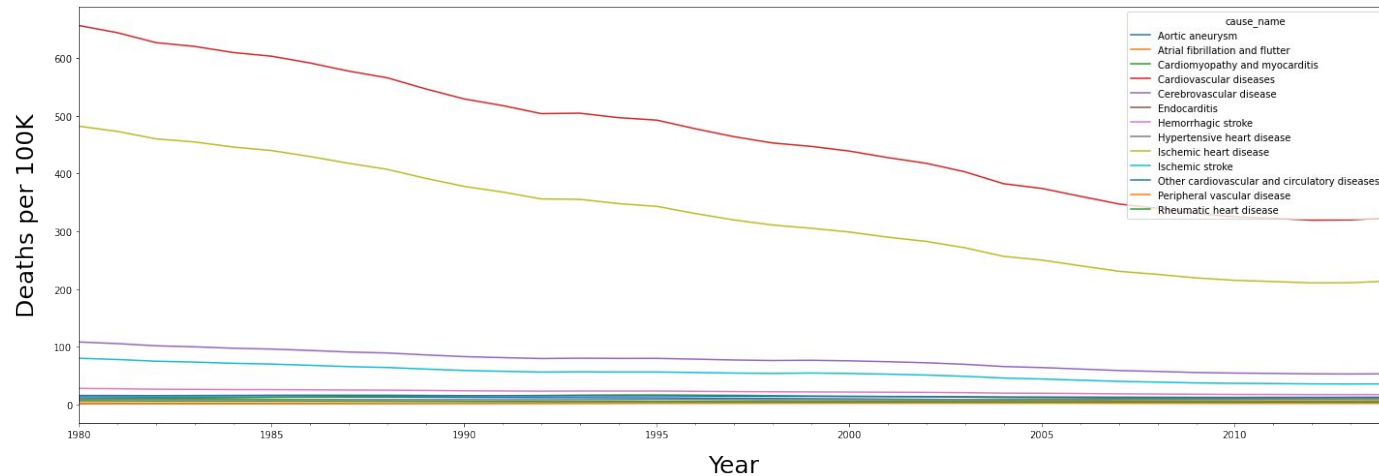
LEADING CAUSES OF DEATH FROM CARDIOVASCULAR DISEASE



US Cardiovascular Disease Mortality (Females): 1980 - 2014



US Cardiovascular Disease Mortality (Males): 1980 - 2014



k-Means Clustering

Cluster 1:

Australia, **Austria**, Bahrain, Belgium, **Canada**, Czech Republic, Denmark, Finland, **France**, **Germany**, Greece, Hong Kong (China), Iceland, **Ireland**, Israel, **Italy**, Japan, Korea, Rep., Kuwait, Netherlands, New Zealand, Norway, Oman, **Portugal**, Puerto Rico, Saudi Arabia, Singapore, Slovenia, **Spain**, Sweden, Switzerland, Taiwan, **United Kingdom**, and **United States**.

Cluster 2:

Afghanistan, Angola, Benin, Botswana, Burkina Faso, Burundi, Cambodia, Cameroon, Central African Republic, Chad, Congo, Dem. Rep., Congo, Rep., Cote d'Ivoire, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Haiti, Iraq, **Kenya**, Lesotho, Liberia, Madagascar, Malawi, Mali, Mozambique, Myanmar, Namibia, Niger, **Nigeria**, Rwanda, Sierra Leone, Somalia, **South Africa**, Sudan, Swaziland, Tanzania, Togo, Uganda, **Zambia**, and Zimbabwe.

Cluster 3:

Albania, Algeria, **Argentina**, Bangladesh, Bolivia, Bosnia and Herzegovina, **Brazil**, Bulgaria, **Chile**, **Colombia**, Comoros, Costa Rica, Croatia, Cuba, Dominican Republic, Ecuador, Egypt, El Salvador, Guatemala, Honduras, Hungary, Indonesia, **Iran**, Jamaica, Jordan, Korea, Dem. Rep., Lebanon, **Libya**, Malaysia, Mauritania, Mauritius, **Mexico**, Mongolia, Montenegro, Morocco, Nepal, Nicaragua, **Pakistan**, **Panama**, Paraguay, **Peru**, Philippines, Poland, Reunion, Romania, Sao Tome and Principe, Senegal, Serbia, Slovak Republic, Sri Lanka, **Syria**, Thailand, Trinidad and Tobago, Tunisia, **Turkey**, Uruguay, **Venezuela**, Vietnam, West Bank and Gaza, and **Yemen, Rep.**

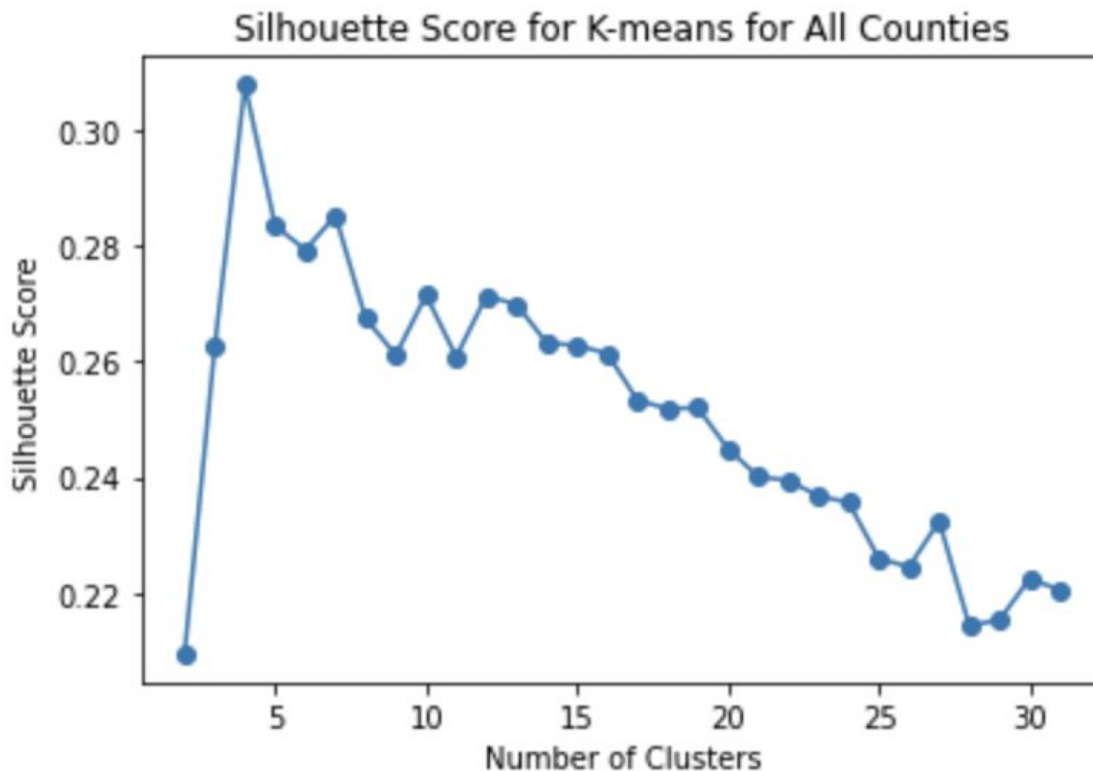
Cluster 4:

China and India.

k-means Clustering, Continued

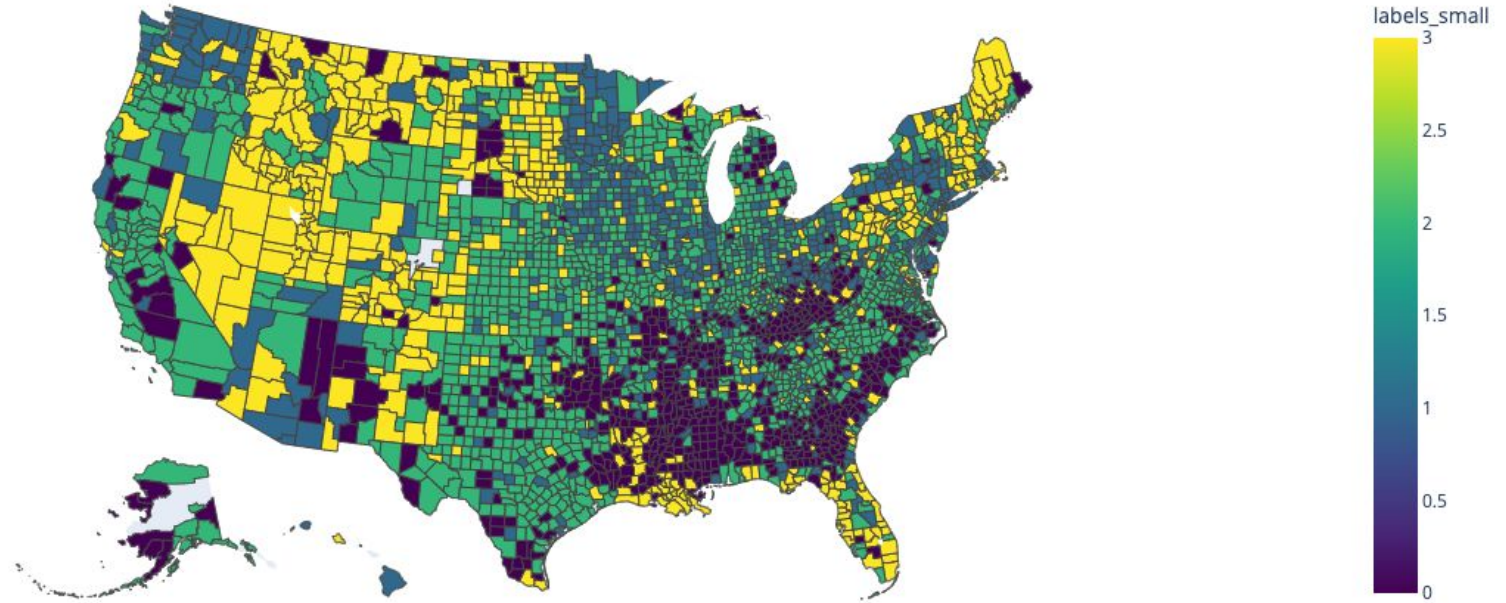
INCLUDED FEATURES

- Percent below poverty
- Smoking ban as of 2010
- Unemployment rate in 2019
- Obesity prevalence per 100K
- Rural-urban continuum as of 2013.



k-means Clustering Choropleth

K Means Clustering



CONCLUSION and PATH FORWARD

- Be prepared to do lots of work cleaning and munging!
- You can do this, too!
- Predictive models to predict income, mortality, disease, and climate metrics.