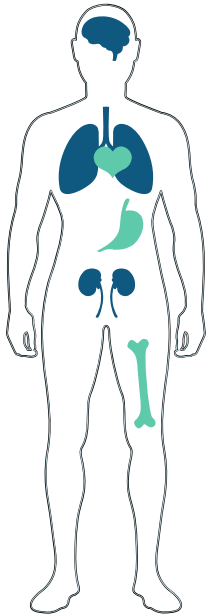
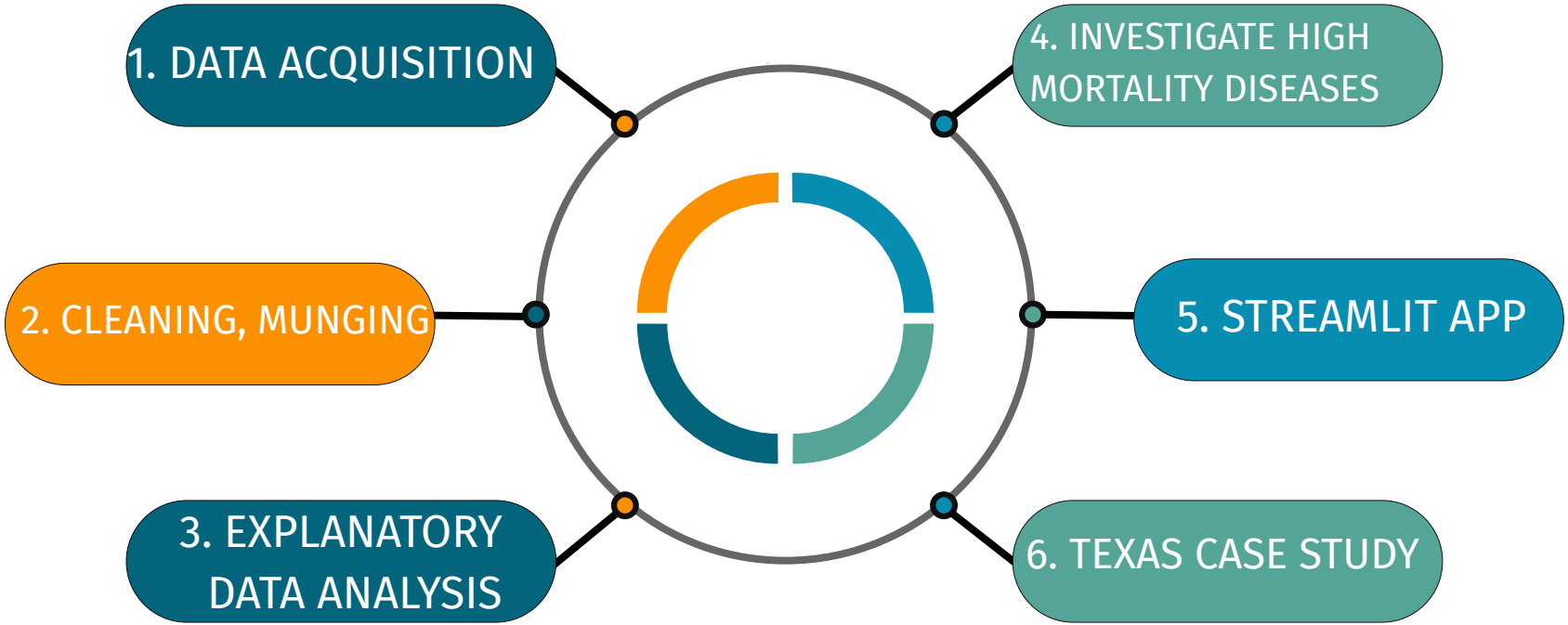
Diseases, Climate and Demographics

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)

57.8%

White alone, not Hispanic or Latino

18.7%

Hispanic or Latino

12.1%

Black or African American alone, not Hispanic or Latino

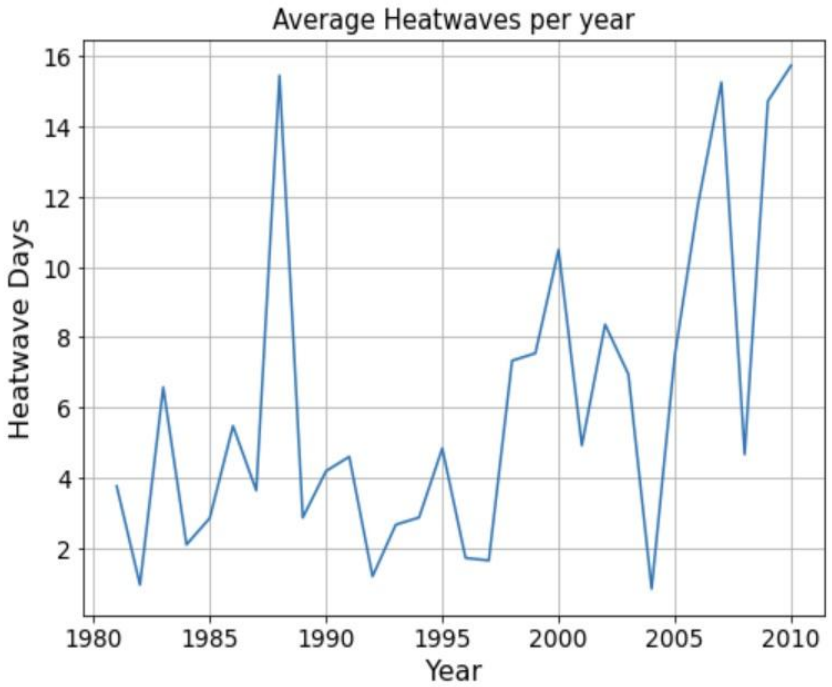
15.7%

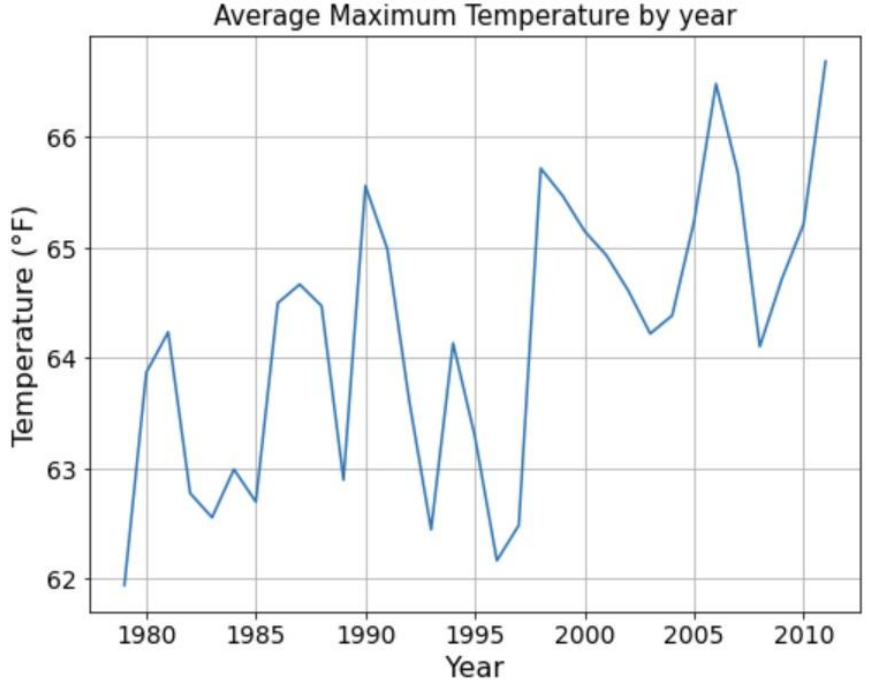
Asian (6%), American Indian or Alaska Native (1%), Native Hawaiian, Pacific Islander (0.1%), and other (8%)

Background on Climate Change

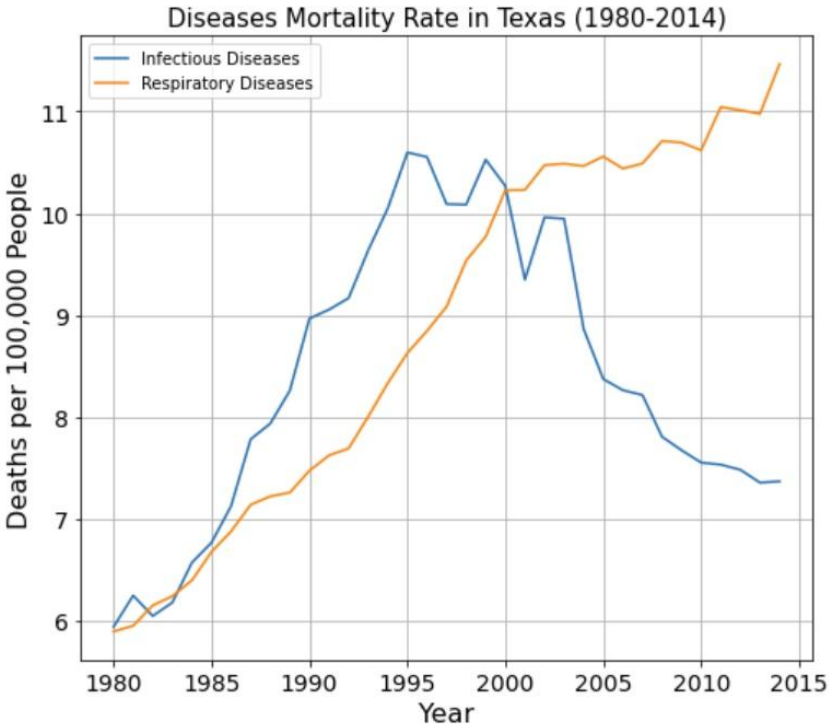
The heat-trapping effects of Carbon-dioxide and other gases have been demonstrated and show current climate change is man-made.

Investigating trends in climate

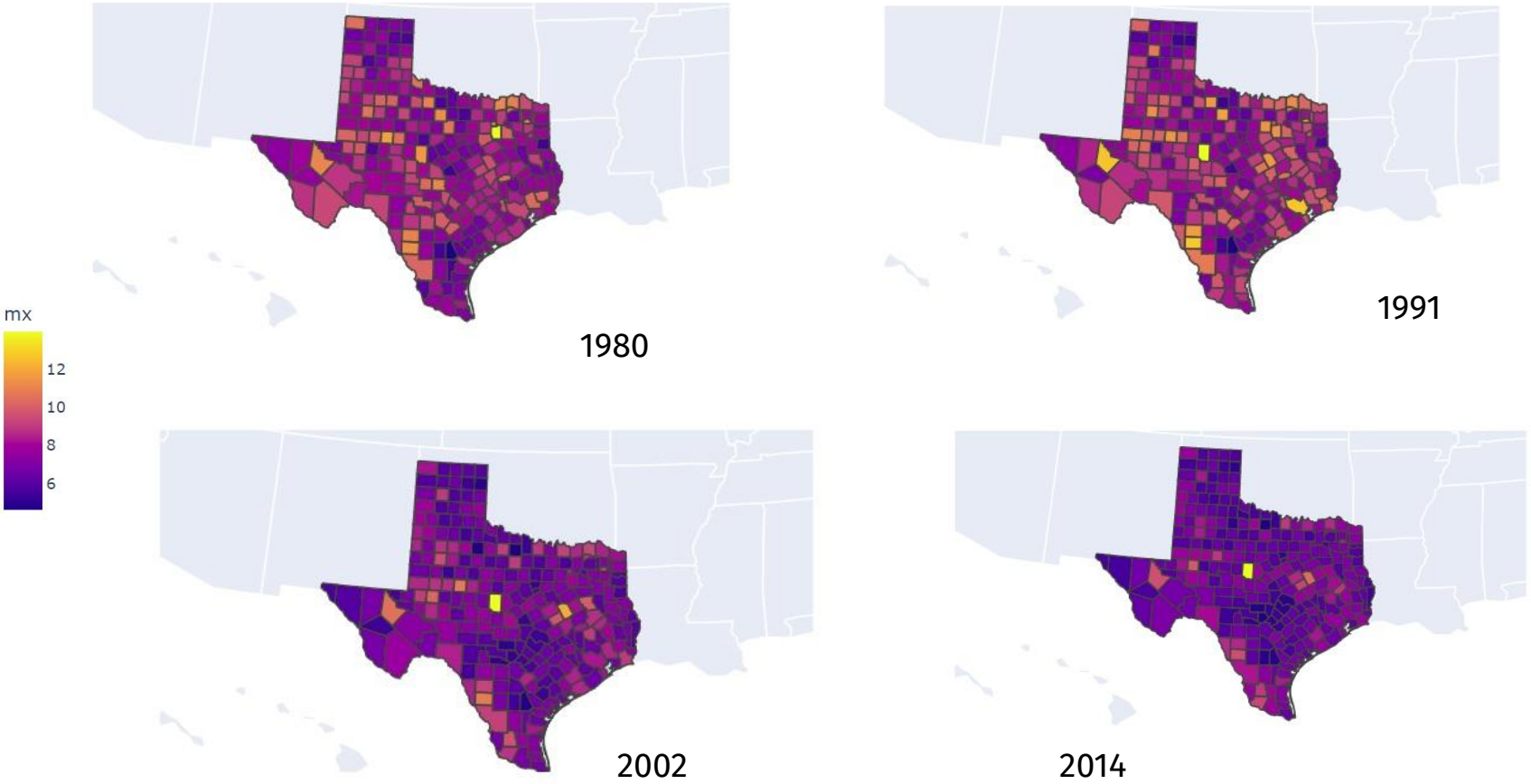




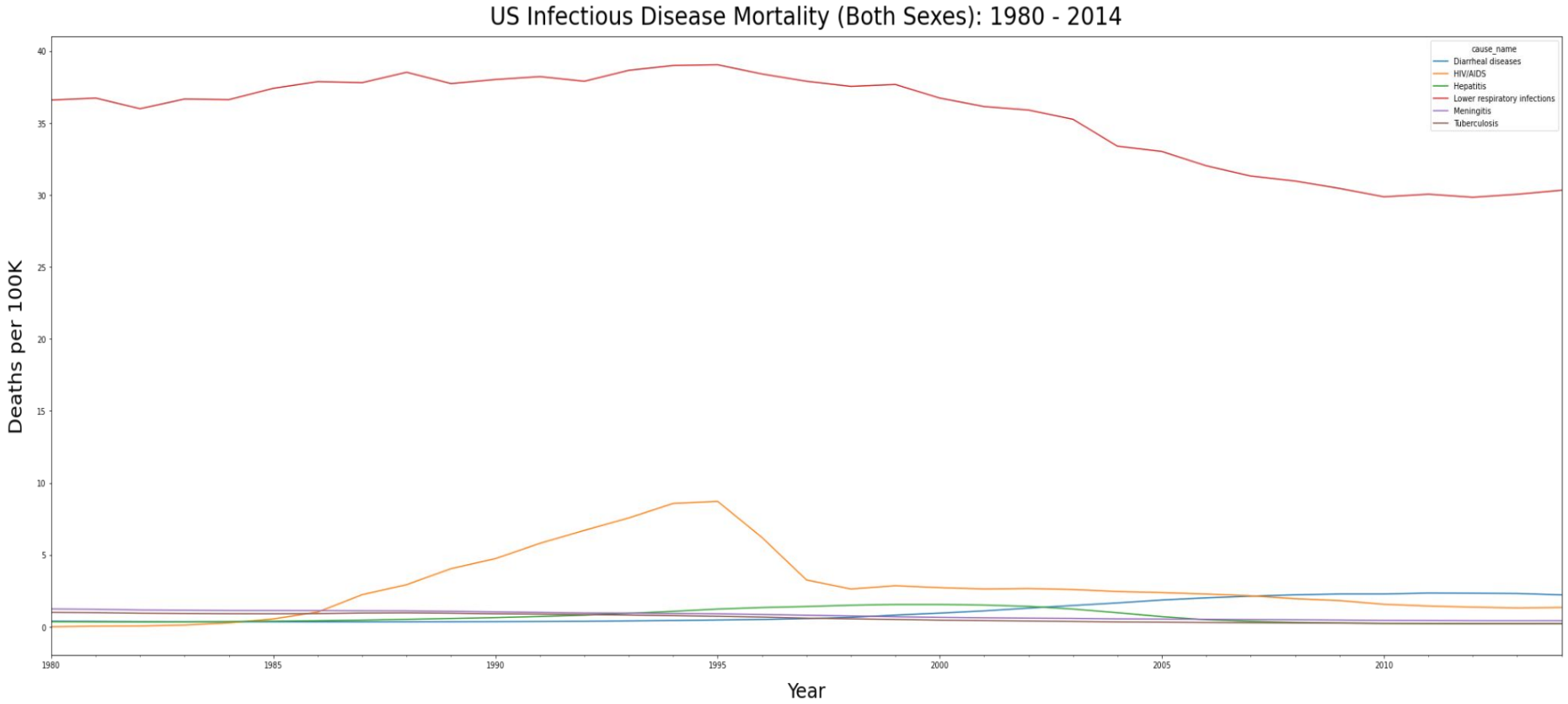
Disease Mortality Rates in Texas

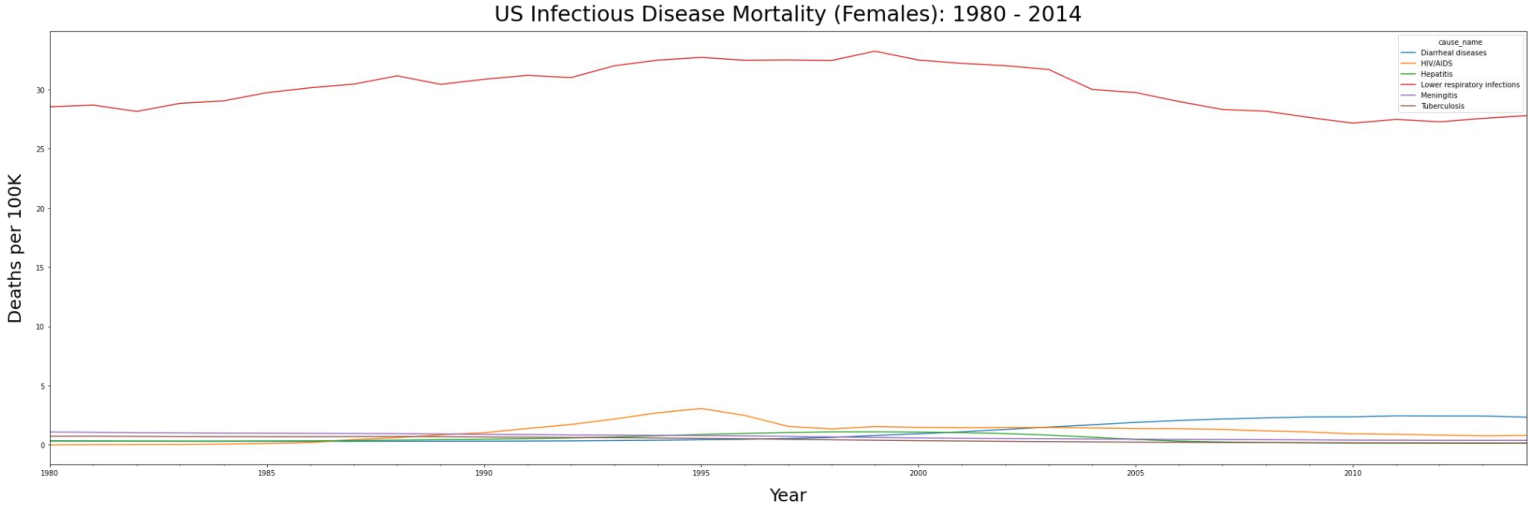


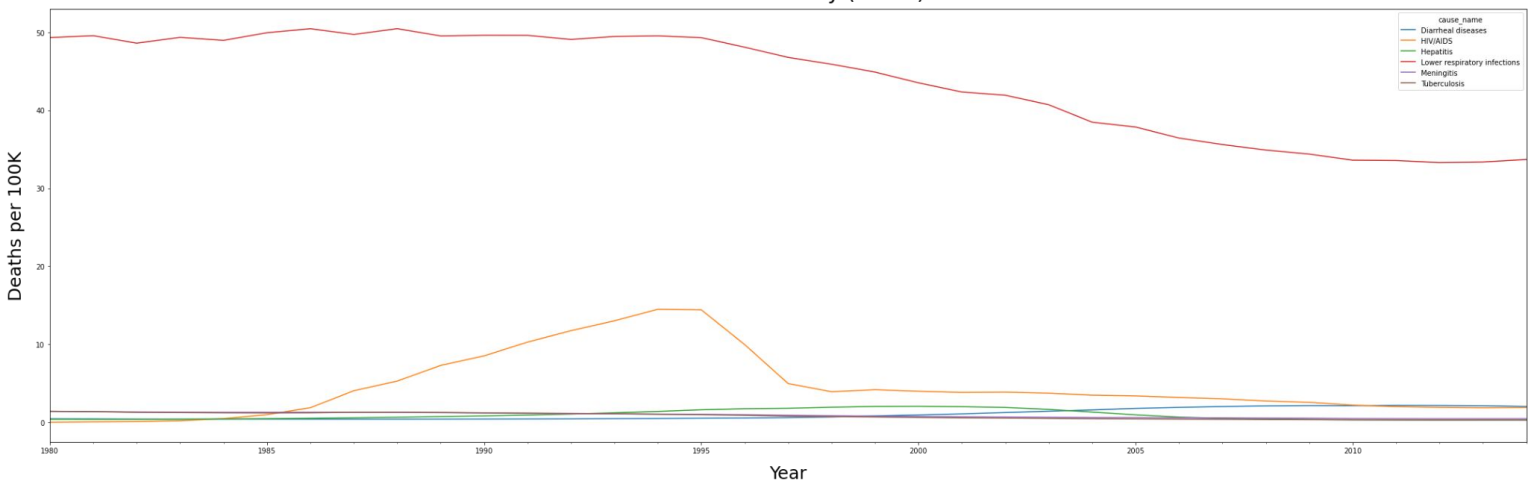
Infectious Disease Mortality Rate in Texas *(per 100K)*



Data Analysis




US Infectious Disease Mortality (Females): 1980 - 2014
Deaths per 100K
Year
cause_name
Diarrheal diseases
HIV/AIDS
Hepatitis
Lower respiratory infections
Meningitis
Tuberculosis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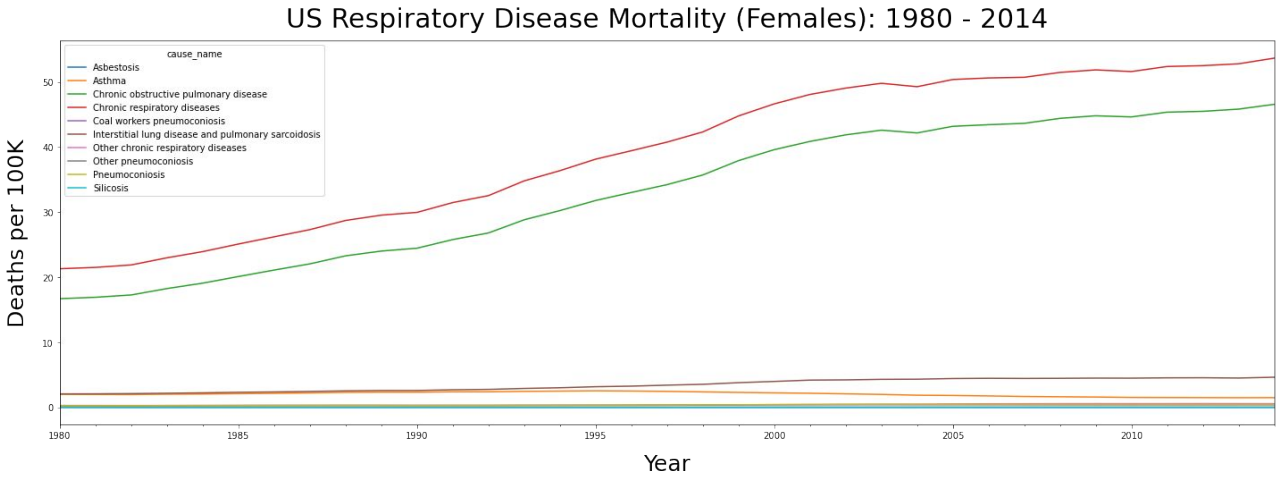
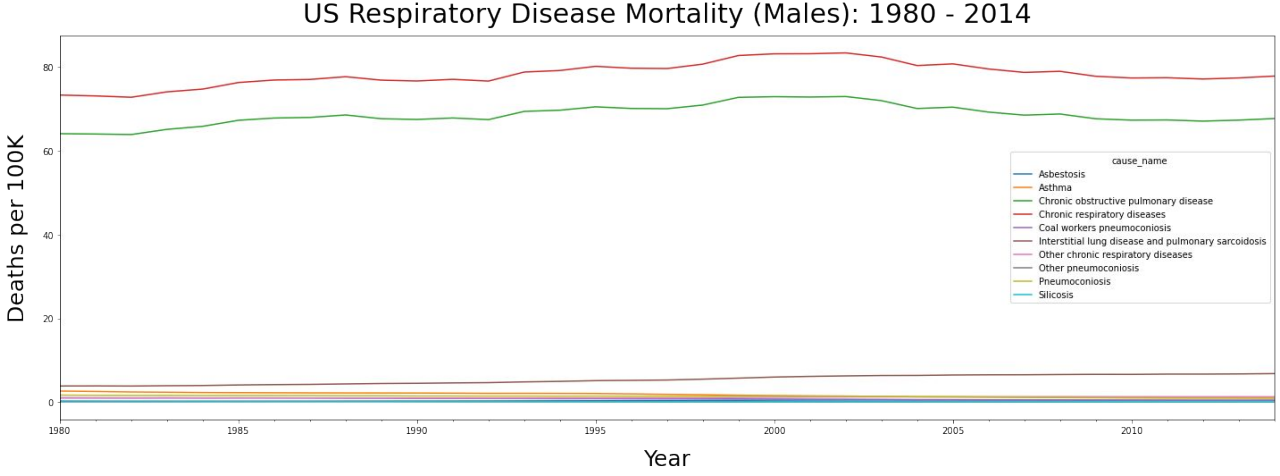

US Respiratory Disease Mortality (Females): 1980 - 2014
Deaths per 100K
Year
cause_name
Asbestosis
Asthma
Chronic obstructive pulmonary disease
Chronic respiratory diseases
Coal workers pneumoconiosis
Interstitial lung disease and pulmonary sarcoidosis
Other chronic respiratory diseases
Other pneumoconiosis
Pneumoconiosis
Silicosis
0
10
20
30
40
50
1980
1985
1990
1995
2000
2005
2010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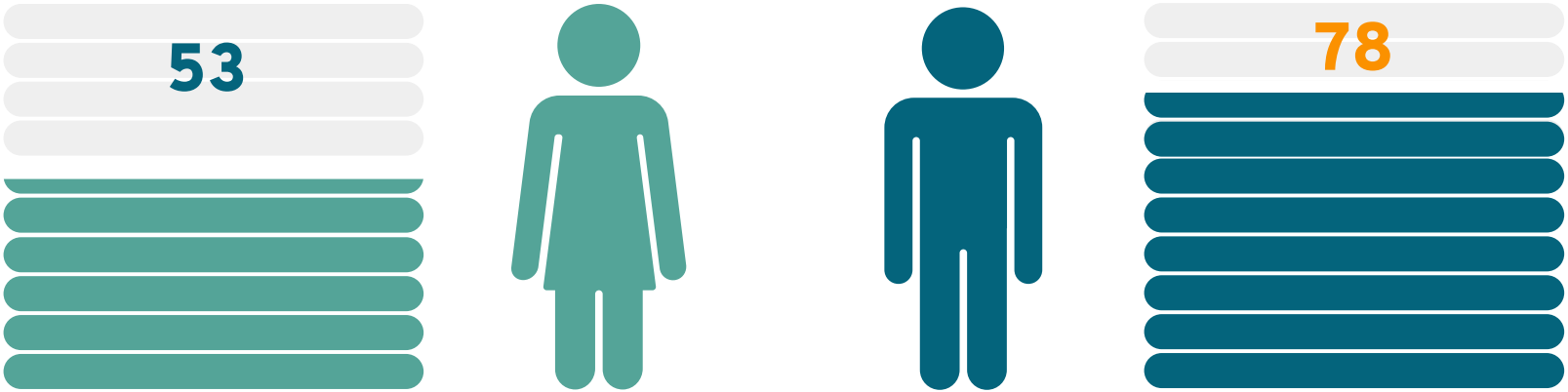
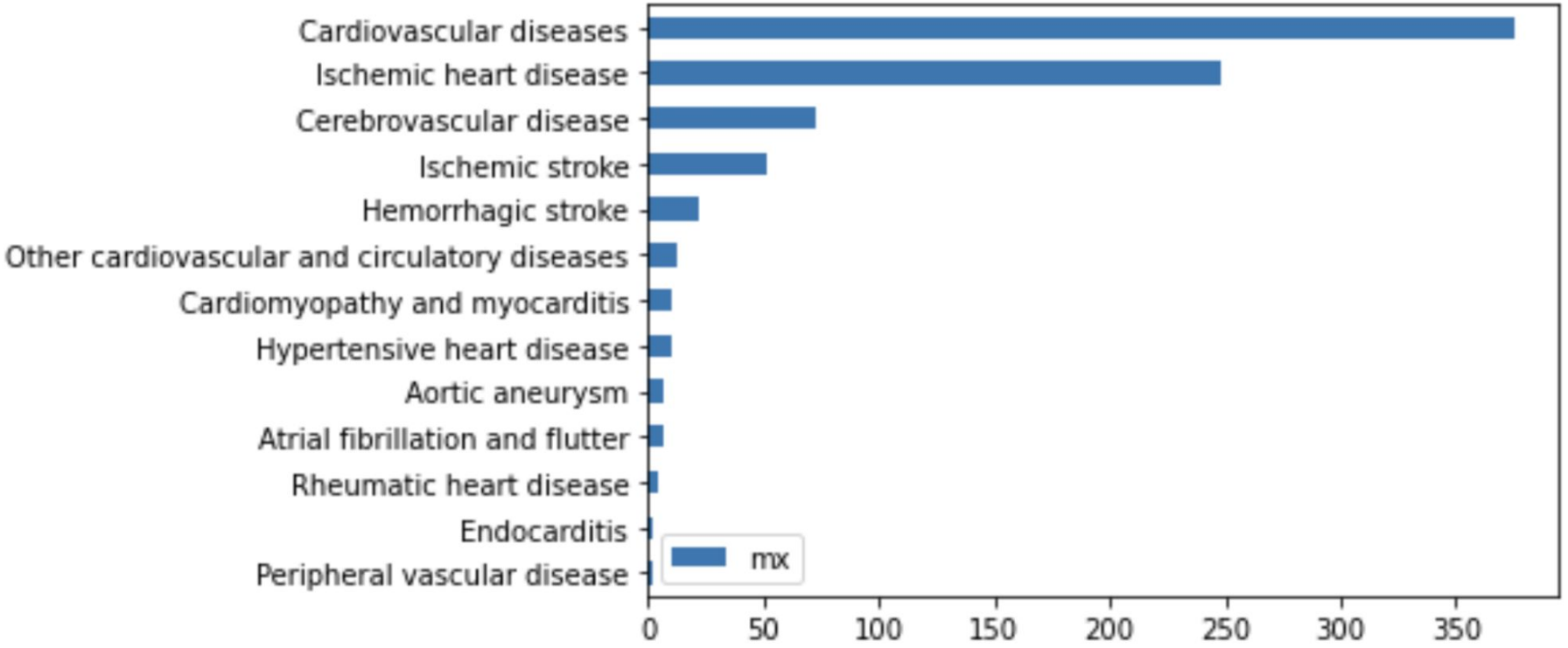
0
20
40
60
80
1980
1985
1990
1995
2000
2005
2010

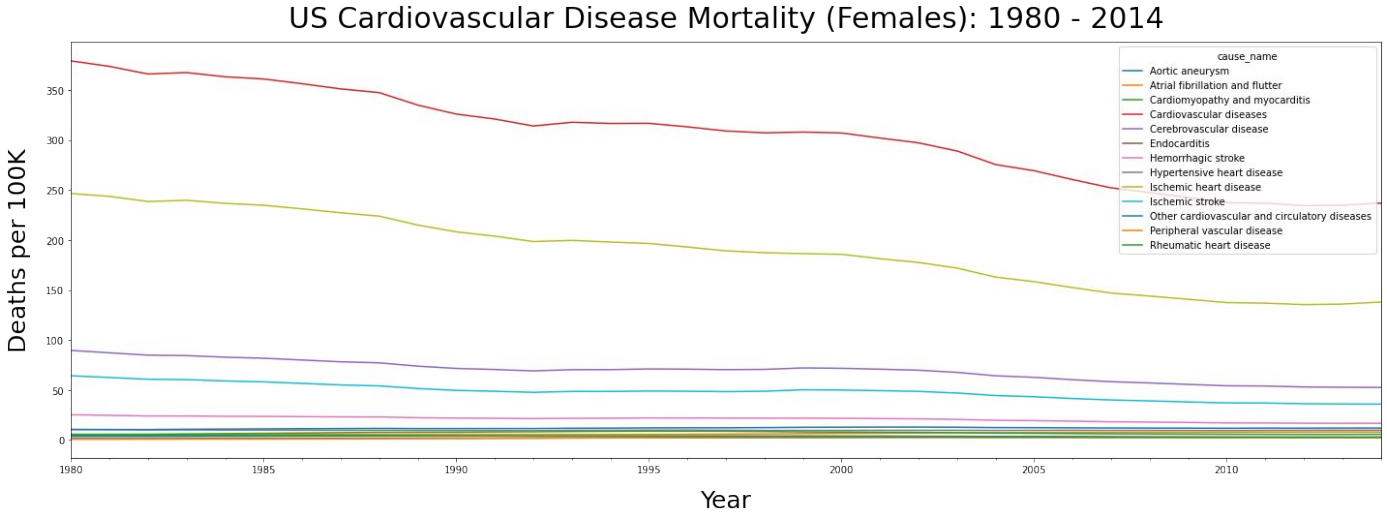
MORTALITY INCIDENCE FROM CARDIOVASCULAR DISEASE *(PER 100K)*

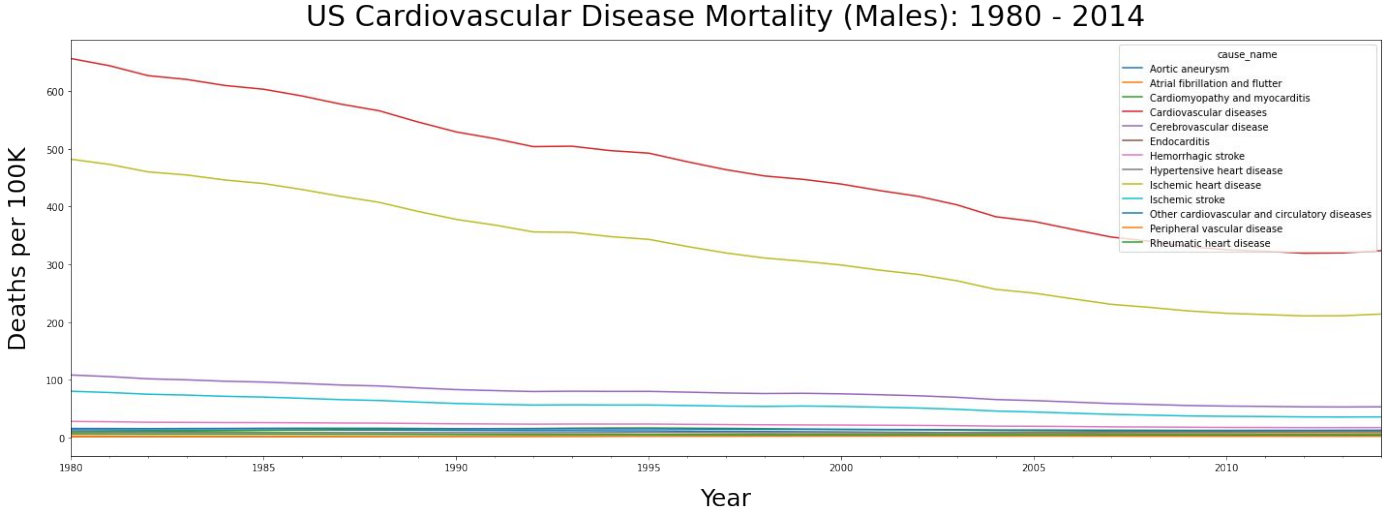


Disease of: cardiovascular, rheumatic heart, ischemic, cerebrovascular, hemorrhagic stroke, hypertensive heart, cardiomyopathy and myocarditis, atrial fibrillation, aortic aneurysm, peripheral vascular, endocarditis, other

LEADING CAUSES OF DEATH FROM CARDIOVASCULAR DISEASE




US Cardiovascular Disease Mortality (Females): 1980 - 2014
Deaths per 100K
Year
cause_name
Aortic aneurysm
Atrial fibrillation and flutter
Cardiomyopathy and myocarditis
Cardiovascular diseases
Cerebrovascular disease
Endocarditis
Hemorrhagic stroke
Hypertensive heart disease
Ischemic heart disease
Ischemic stroke
Other cardiovascular and circulatory diseases
Peripheral vascular disease
Rheumatic heart disease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Cardiomyopathy and myocarditis
Cardiovascular diseases
Cerebrovascular disease
Endocarditis
Hemorrhagic stroke
Hypertensive heart disease
Ischemic heart disease
Ischemic stroke
Other cardiovascular and circulatory diseases
Peripheral vascular disease
Rheumatic heart disease

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.

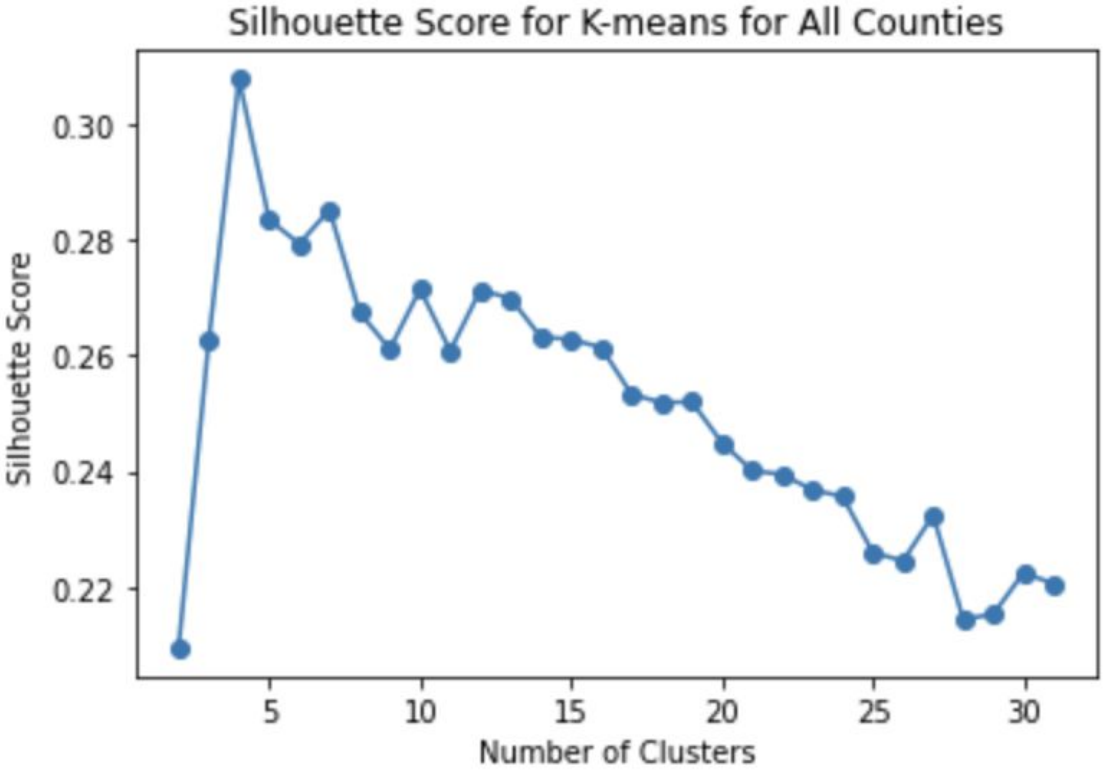
Cluster 3:
Albania, Algeria, **Argentina**, Bangladesh, Bolivia, Bosnia and Herzegovina, **Brazil**, Bulgaria, **Chile**, **Colombia**, Comoros, Costa Rica, Croatia, Cuba, Dominican Republic, Ecuador, Egypt, El Salvador, Guatemala, Honduras, Hungary, Indonesia, Iran, Jamaica, Jordan, Korea, Dem. Rep., 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.

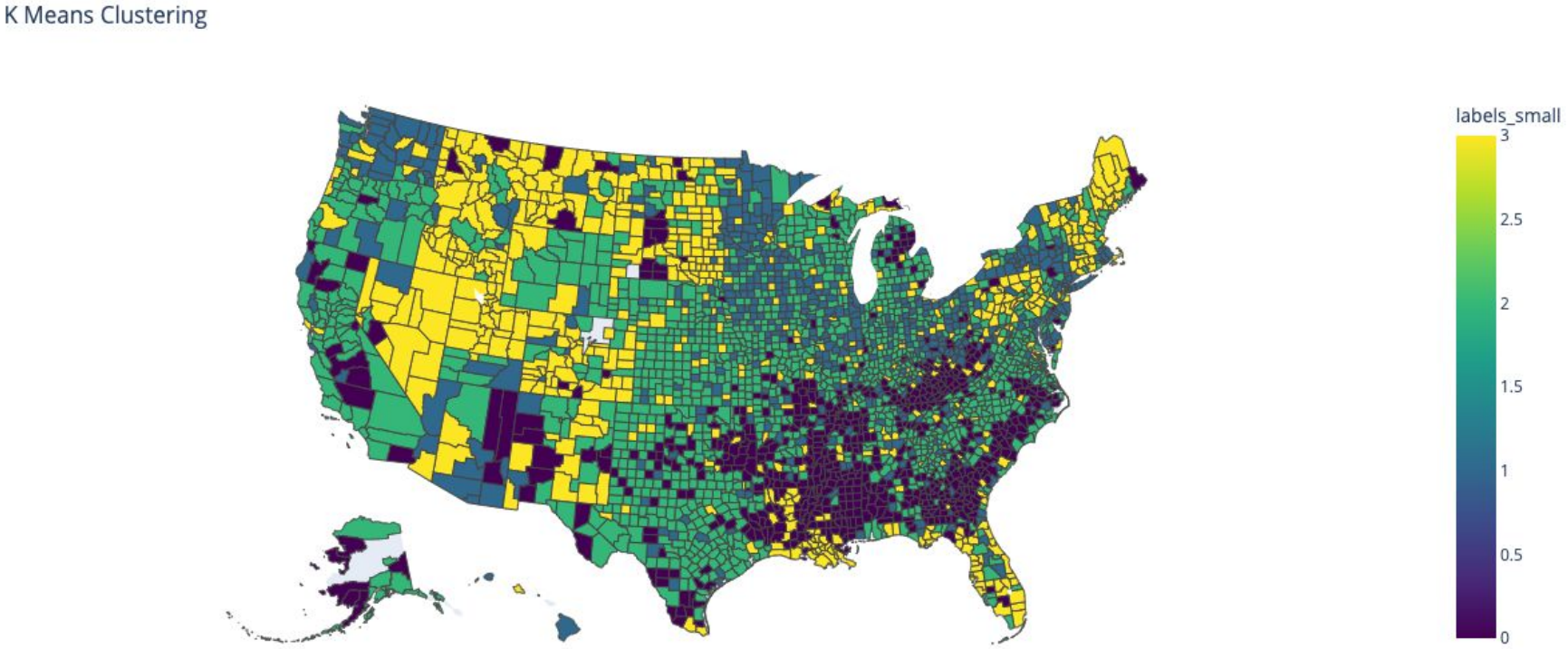
k-means Clustering, Continued

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



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.