"How Can You Mend a Broken Heart?"
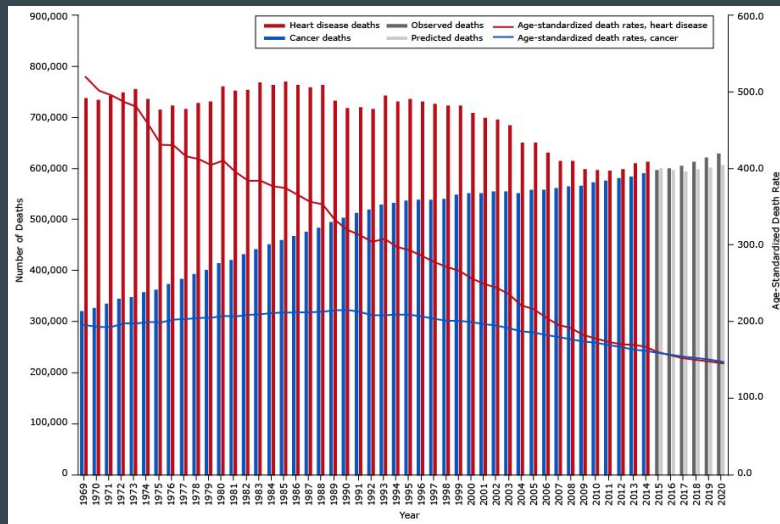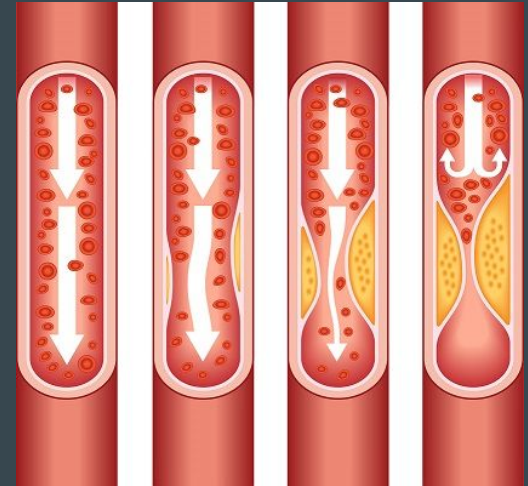
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Matthew Bollinger

Background

- 610,000 Americans die of heart disease each year, making up 1 in every 4 deaths
- Heart disease is the single largest killer in America, narrowly beating out cancer
- Heart disease deaths have practically stopped dropping since around 2007

Causes of Heart Disease

- According to the CDC, the most type of fatal heart disease is coronary artery disease, in which plaque gradually builds up in the arteries, leading to chest pain and eventually a heart attack
- Contributing factors leading to coronary artery disease in individuals include smoking, physical inactivity, obesity, diabetes, and stress
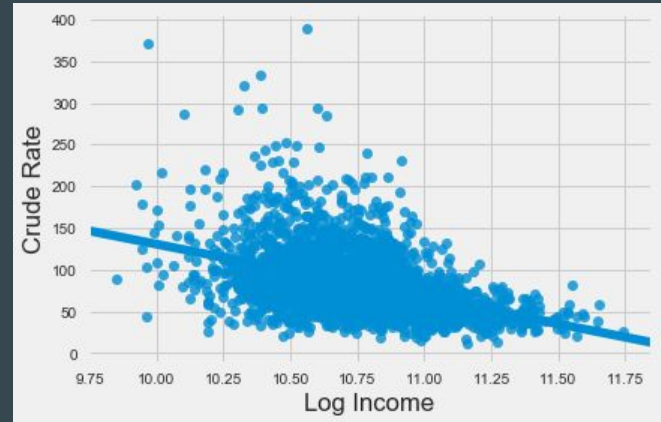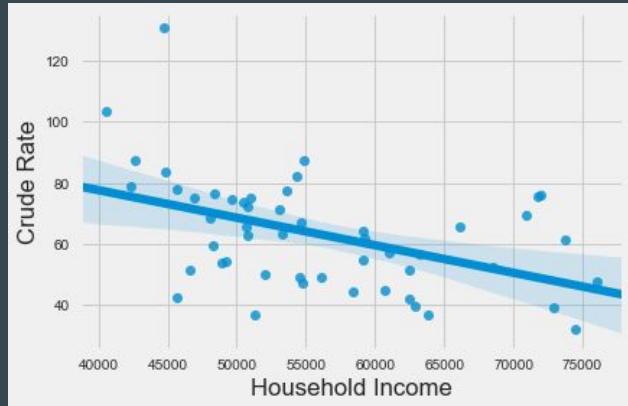
Study

- Used data from Medicare, the CDC, and the US census to find factors that most impacted rate of death from heart disease, per 100,000 citizens, on the county level
- Applied DBScan to find anomalous regions where heart disease was most prevalent
- Built linear regression model to quantify how much changes in certain factors would reduce the prevalence of heart disease in each county
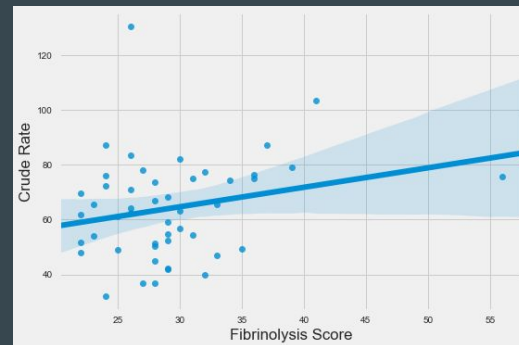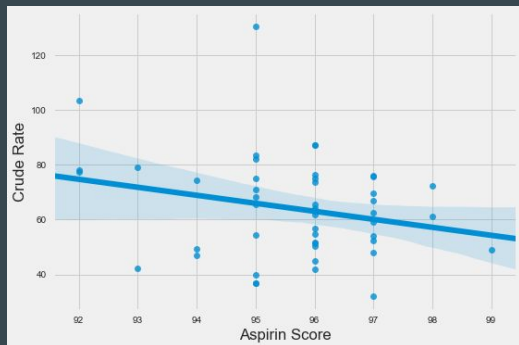
Demographic and Economic Data Insights

- Factors with a significant impact on heart disease prevalence: poverty, mean income, % of county that is Latino
- Factors that were not significant in predicting heart disease prevalence: unemployment rate, % of black citizens in a county, insurance rates
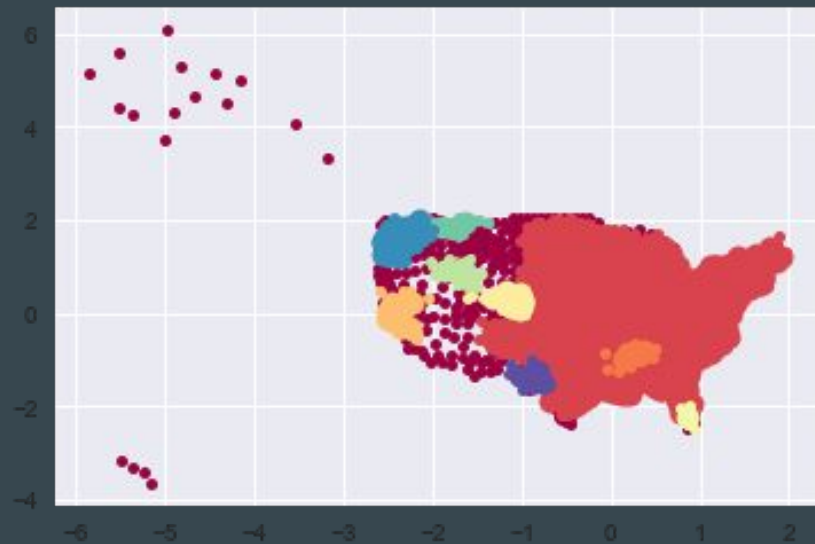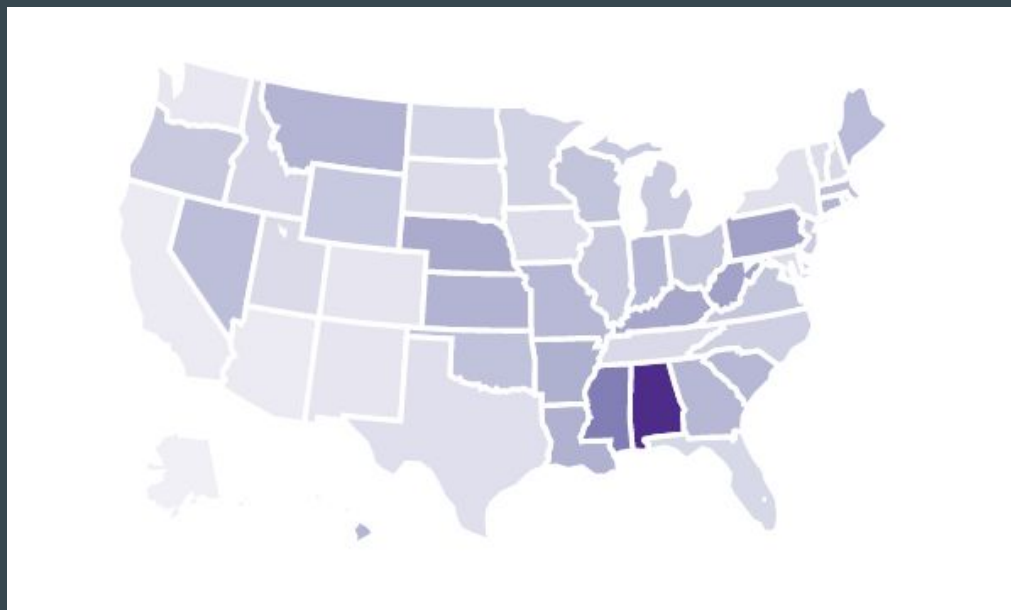
Medicare Hospital Compare Data

- For heart disease, Medicare collected five metrics:
  - How many outpatients with chest pain received aspirin within 24 hours;
  - How many outpatients received blood clots within 30 minutes of arrival;
  - Median # of minutes before outpatients with chest pain received an ECG;
  - Median time to fibrinolysis
- Of these, the most significant was the aspirin score followed by the fibrinolysis score
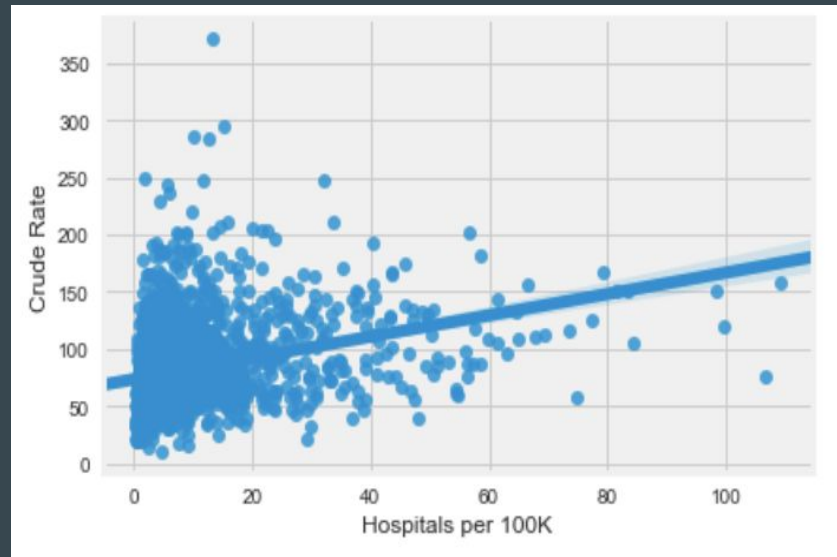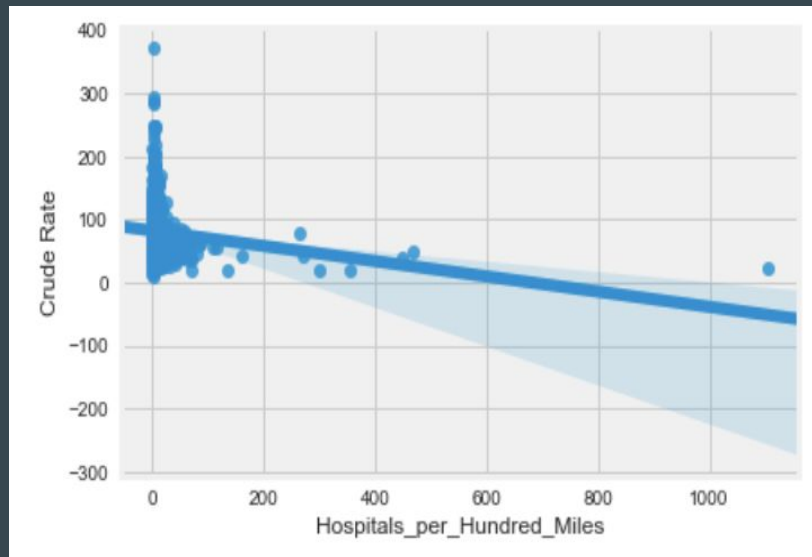
Geographic Distribution of Data

Deeper purples indicate a higher death rate per 100000 citizens; DBSCAN on the right

Hospital Density Didn't Really Matter...

Conclusion

- Focus on prevention: throwing more money into improving metrics for caring for heart attacks won't really reduce the problem
- Increase the availability, and publicize the utility, of aspirin
- Use cost of deaths from heart disease to buttress overarching arguments for expanding social insurance generally to alleviate poverty
- Use generous incentives to enable lower-income families to buy healthier food