**Final Observations**

**What Regions of the US Show Hotspots of Deaths?**

Heatmaps for each year between and including 2015 and 2019 were created. We observed the Eastern Midwest region including Illinois, Indiana, Michigan, Ohio, and West Virginia - and Florida experienced a large increase in overdose deaths between 2015 and 2019. Overdose deaths appeared to increase across the United States, but the change in the number of deaths in the eastern Midwest region and Florida is most obviously seen in the heatmaps. Additionally, the heatmaps demonstrated that California has had a consistently large number of overdose deaths relative to the rest of the country.

**How do Medicare and Medicaid Prescription Rates Compare?**

Comparing the prescription rates of opioids between Medicare and Medicaid, our analysis revealed that for Medicare, Nevada had the highest prescribing rate in 2015, Utah in 2016 and 2017, Alabama in 2018 and 2019. New York had the lowest prescribing rate for all five years tracked. For Medicaid, Colorado had the highest prescribing rate for 2015, 2016, and 2017. Montana had the highest in 2018 and Virginia in 2019. Once again, New York had the lowest rate for all five years. Nationally, the prescribing rates were higher with Medicaid than Medicare, but both declined consistently over the five years. Further analysis compared Colorado and Virginia's rate of change for the prescribing rates. Colorado had the highest rate for the first three years (Medicaid), but ultimately didn't change very much. Virginia, however, had a drastic increase in that time, rising about 5% over just two years, to take the highest rate in 2019.

**Does the Prescribing Doctor Ratio have an effect on Overdose Death Rates?**

Analyzing the drug death ratio by state, and comparing it to the ratio of doctors prescribing drugs for both Medicare and Medicaid we hoped to find a correlation between these two datasets. There was no correlation found between the two datasets, likely due to the effect of illicit drug overdose deaths found in the CDC Dataset. We do note a trend downward in the overall Prescribing ratio, which likely has an effect on prescribed drug overdose deaths, but that cannot be proven with this dataset alone.

**Are Prescription Rates & State Death Rates Correlated?**

Our initial question sought to find a potential link between Opioid Death Rates and Medicaid Opioid Prescription Rates. A scatter plot looking at Opioid Death Rates and Prescription rates showed no strong correlation between them. An r-value, 0.006, confirmed this.

Looking at Long-Acting Opioids revealed a similar conclusion. An r-value, 0.003 suggests Long-Acting Opioids, and State Death rates aren’t strongly correlated.

**Final Conclusions**

There is not a strong correlation between Medicare/Medicaid Prescription Rates and Overall Death Rates. State and federal regulations on opioid prescriptions do not seem to have an effect on death rates overall. There is the suggestion that regulations have had an effect in controlling prescription rates. However overall death rates are continuing to rise and the suggestion is that there is a growing drug trade providing people with drugs.