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The Opioid Crisis: What Factors are to Blame?

Introduction

The Opioid Crisis has been a topic of great controversy due to the sudden and lasting effects it has had on communities across the country. There are several factors that contribute to the crisis and in order to determine which variables play the biggest role, the relationship between **unemployment and opioid overdose rates, opioid prescription rates and opioid overdoses, and educational attainment and overdoses** will be analyzed.

The common narrative is that opioid prescriptions have fueled the crisis because they have put these drugs into the hands of Americans. Additionally, the addictive properties of opioids were not fully disclosed to doctors and patients while they were being marketed by pharmaceutical companies (Keyes et al. 2014, p. 52). While this undoubtedly has played an important role in making opioids accessible and able to be abused, just how much of overdose rates can be explained by prescription rates? It must be noted that there are several intervening variables, meaning unemployment, prescription rates, and educational attainment alone cannot provide causality for overdose rates, they are just part of the story.

Data

- Opioid overdose rates at the state level were downloaded from the Kaiser Family Foundation dataset which gathers data from the CDC NCHS, MCOD, WONDER databases and measures this rate as an age-adjusted rate per 100,000 people.
- Opioid prescription rates at the state level were downloaded from the CDC which gathers this data from the IQVIA Xponent dataset and reports this measure as a rate per 100 people.
- Unemployment rates were downloaded from the US Bureau of Labor Statistics.
- Educational Attainment rates (Less than High School) were downloaded from Social Explorer which gathers data using the Census' American Community Survey.
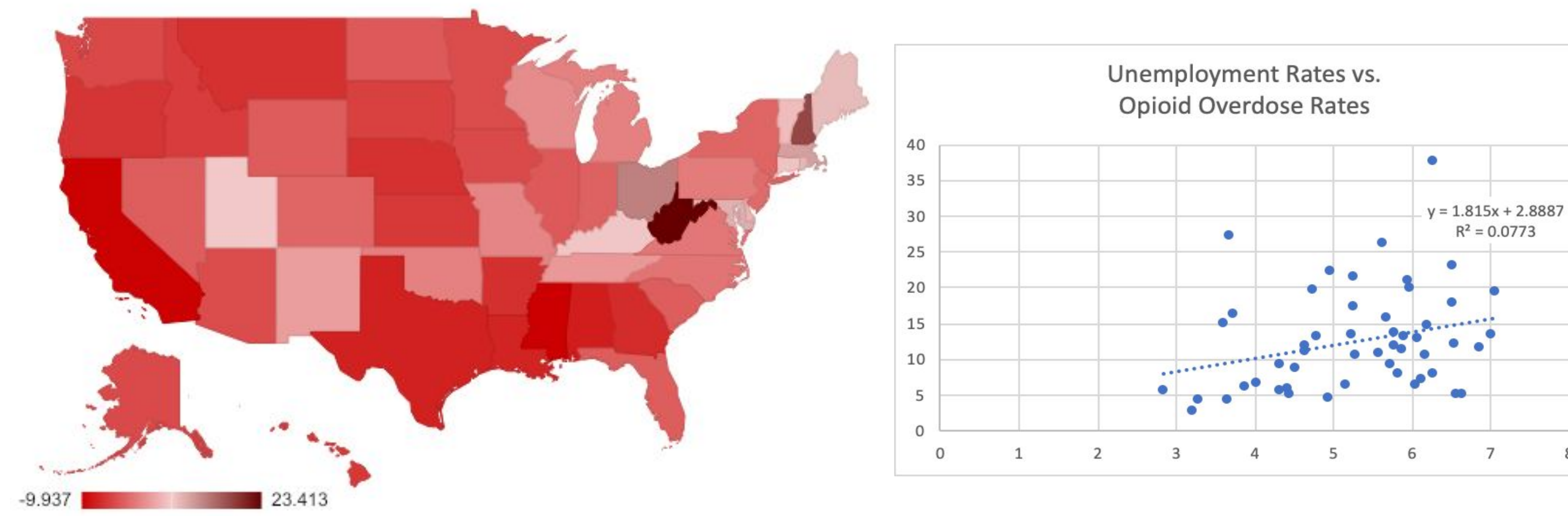

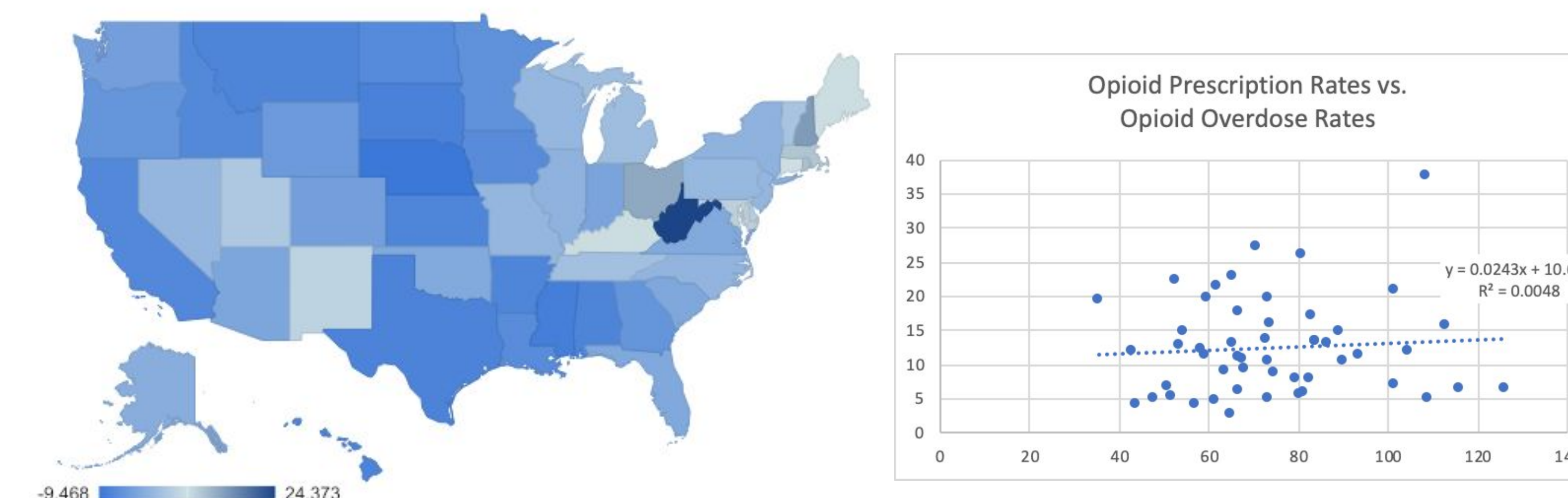**Figure 1:** Map of error and scatterplot for unemployment rates and overdose rates

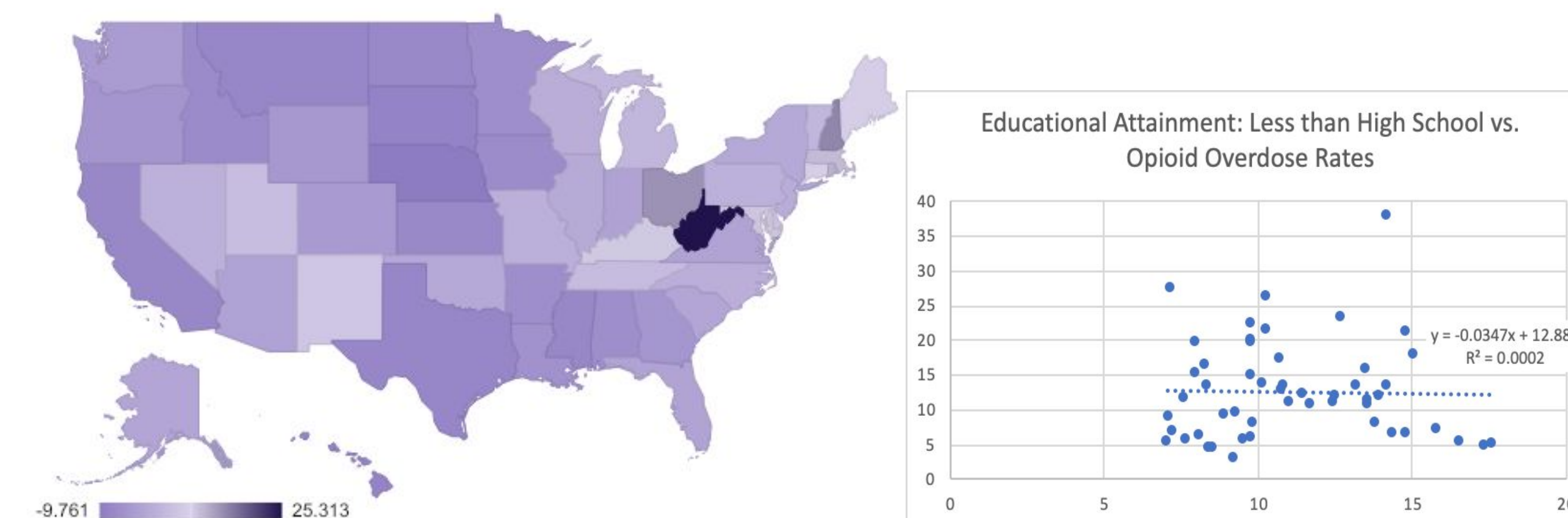**Figure 2:** Map of error and scatterplot for prescription rates and overdose rates

Figure 3: Map of error and scatterplot for educational attainment rates and overdose rates

Methods

In order to provide an accurate time series analysis, I averaged the data between 2013 and 2017 for each indicator. A bivariate regression analysis was conducted in Excel for each paring of variables in order to determine the strength of the correlation and how well the model predicts. In each model, opioid overdose rates is the dependent variable. The errors were then mapped using Google Sheets to show how well the model predicts these rates.

Results

Unemployment Rates & Opioid Overdose Rates:
Correlation Coefficient (R): 0.278
R-Squared: 0.077
Bivariate Equation: $y = 1.815x + 2.8887$
Best Predicted State: **Pennsylvania**
Worst Predicted State: **West Virginia**

Prescription Rates & Opioid Overdose Rates:
Correlation Coefficient (R): 0.069
R-Squared: 0.0048
Bivariate Equation: $y = 0.0243x + 10.681$
Best Predicted State: **New York**
Worst Predicted State: **West Virginia**

Educational Attainment & Opioid Overdose Rates:
Correlation Coefficient (R): -0.014
R-Squared: 0.0002
Bivariate Equation: $y = -0.0347x + 12.882$
Best Predicted State: **New Jersey**
Worst Predicted State: **West Virginia**

Conclusions

While none of the correlation coefficients are particularly strong, unemployment rates were the strongest. This is not to say that being unemployed leads to opioid misuse and death, however in this study, it is the factor that played the biggest role and times of economic recession have been shown to produce increased drug use as a form of a coping mechanism (Rigg et al. 2018, 124).

The correlation would likely be stronger if the overdose rates solely considered prescription opioids and not all opioids, however this is still a reasonable analysis.

West Virginia was the worst predicted state for all three tests due to it being an outlier with such high overdose rates.

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