

# New River Remedies

Prescribers Redux



# Tools & Workflow

Connected PostgreSQL to Python using SQLAlchemy inside Jupyter Notebooks.

Queried data directly from multiple tables (prescription, drug, overdose\_deaths, population).

Used **pandas** for cleaning, joining, and reshaping large datasets.

Applied **Python visualization libraries** (*matplotlib*, *seaborn*) to reveal trends.

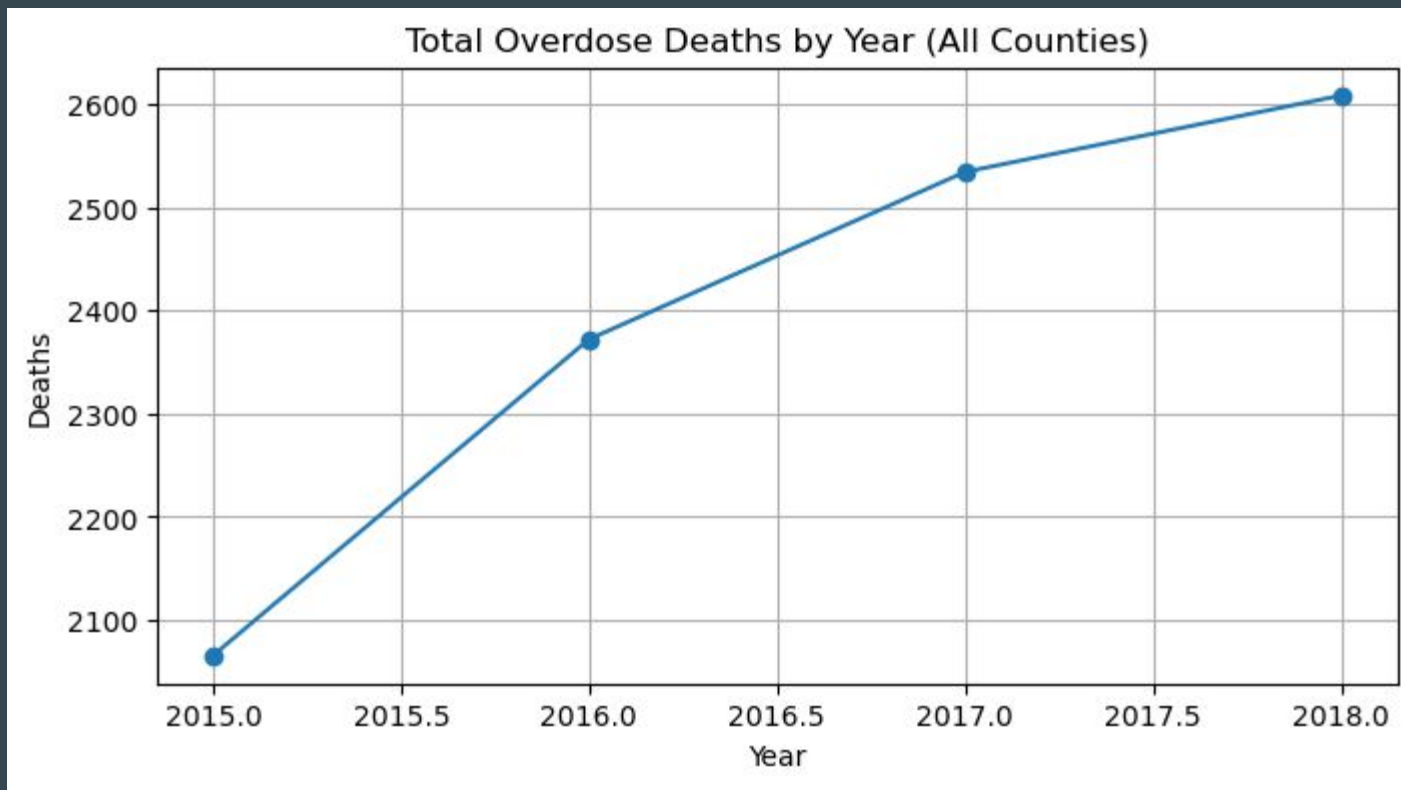
Translated raw SQL results into **clear tables, metrics, and graphs**.

Combined technical tools with analytical reasoning to answer:

- How spending on opioids relates to overdose deaths.
- County-level differences (Davidson, Shelby, etc.).
- Links between unemployment and opioid use.

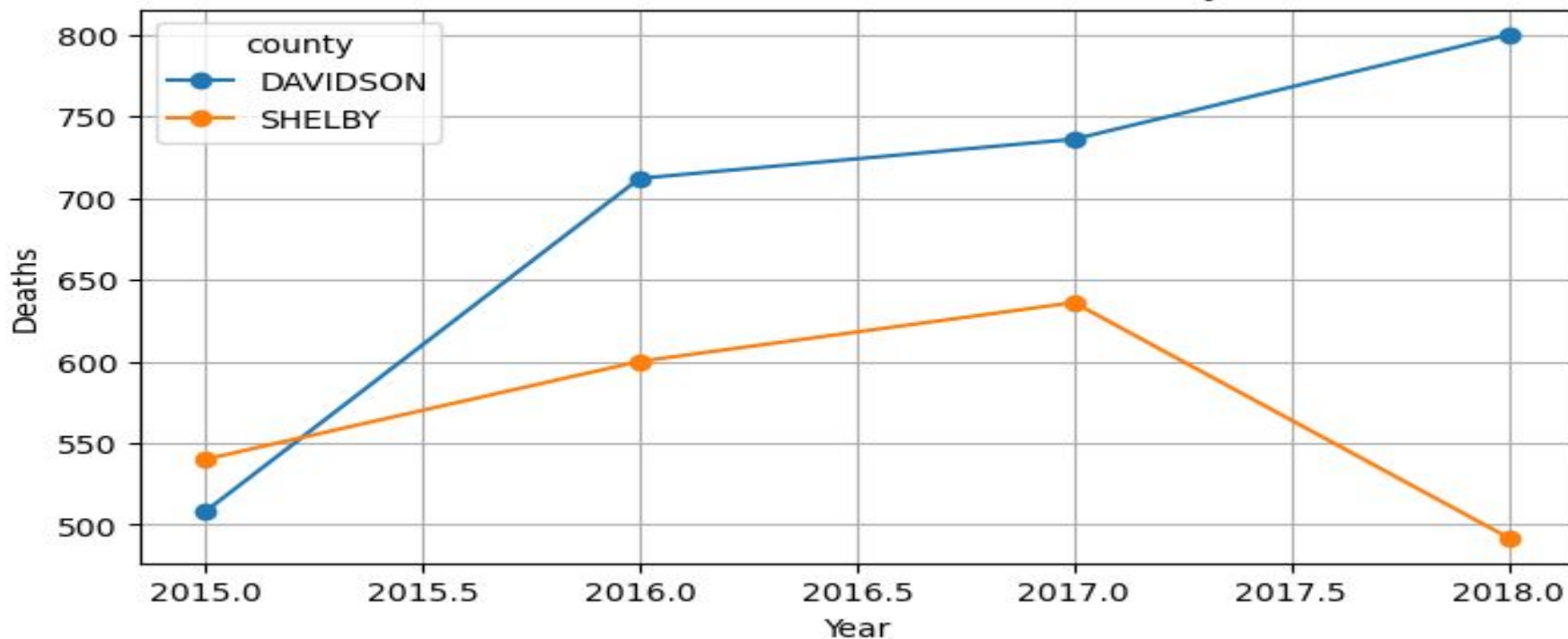


# Trends in Total Overdose Deaths Over Time



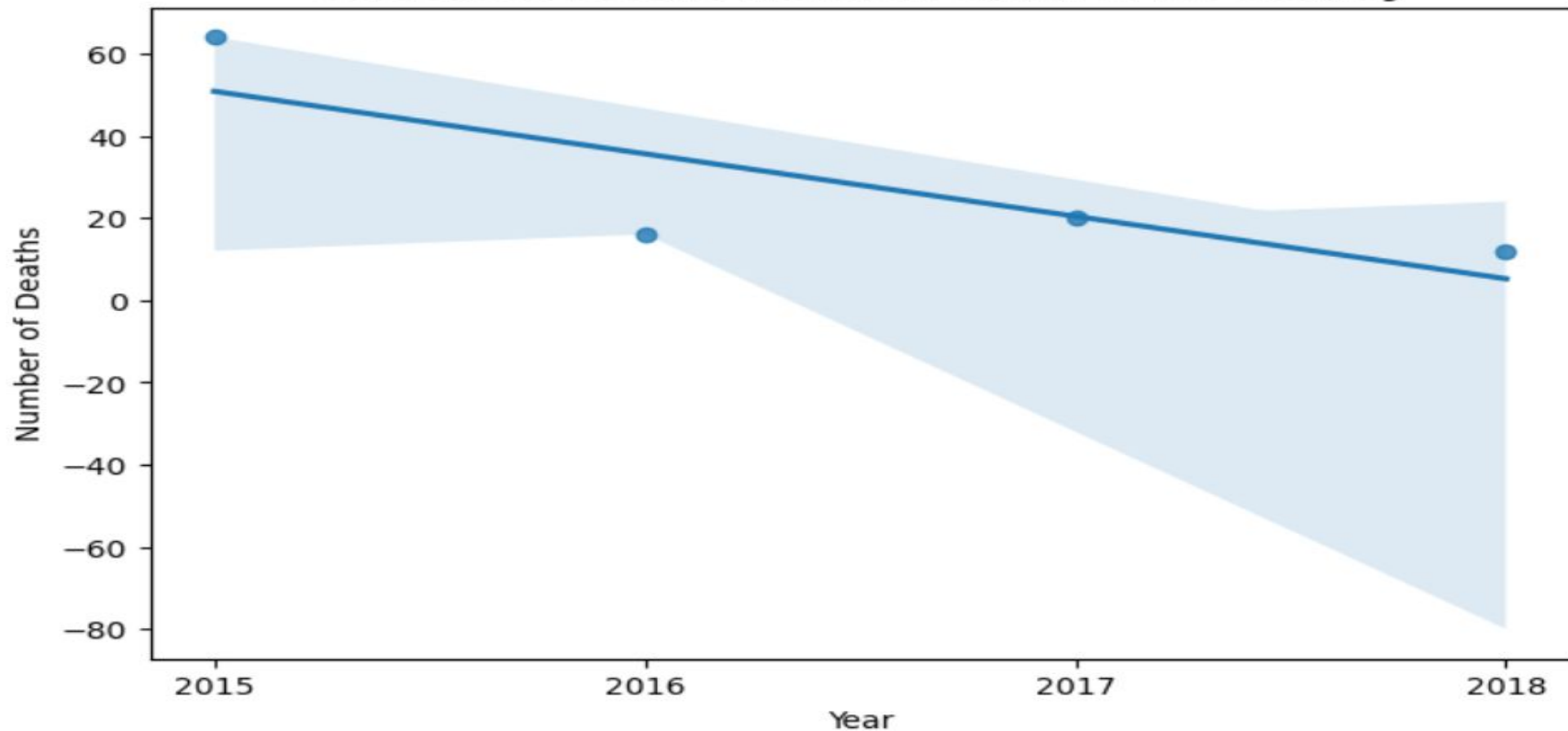
# Trends in Overdose Deaths: Davidson vs. Shelby Counties

Overdose Deaths: Davidson vs Shelby

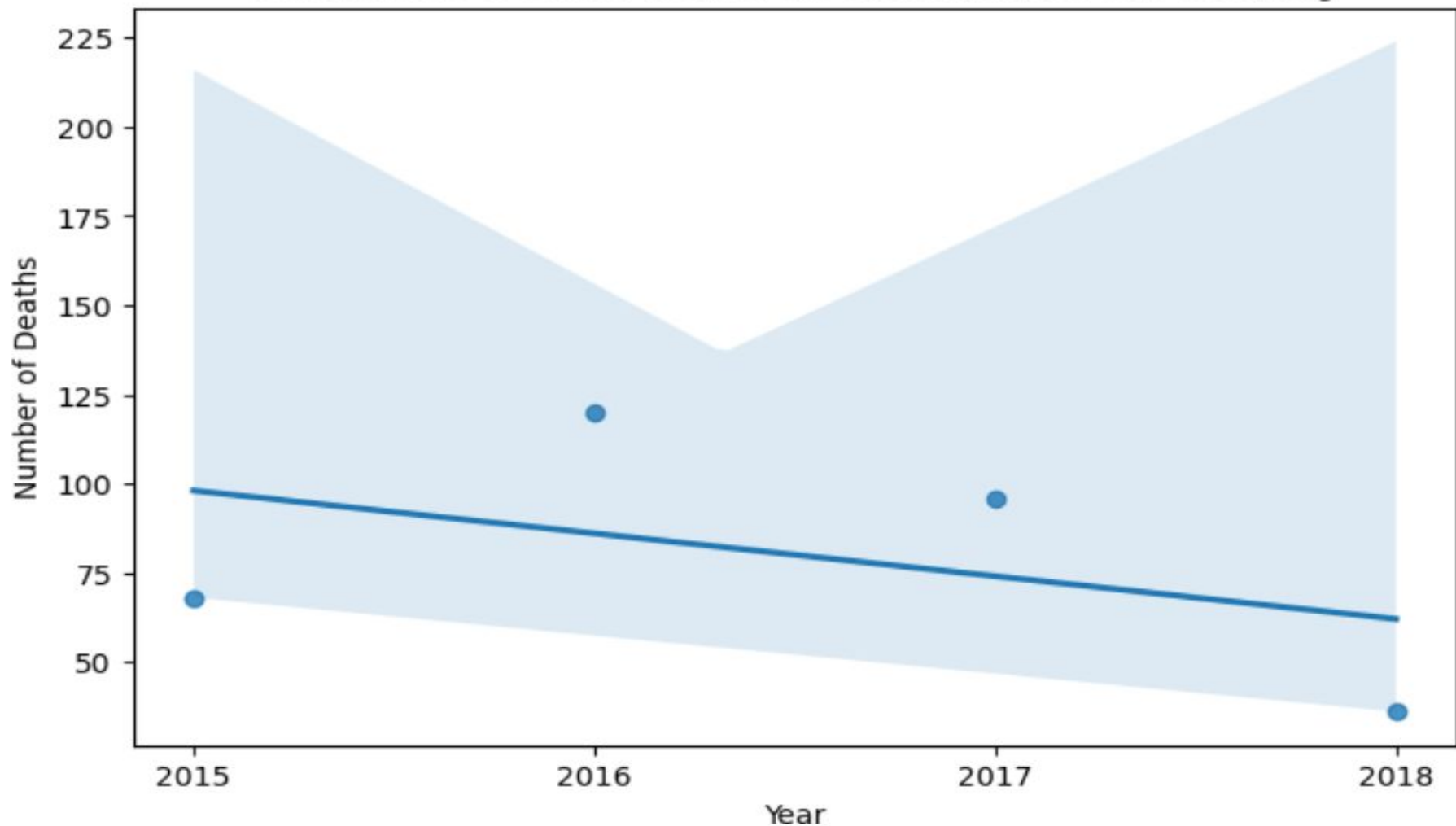


# The 3 Most Downward Trending Counties

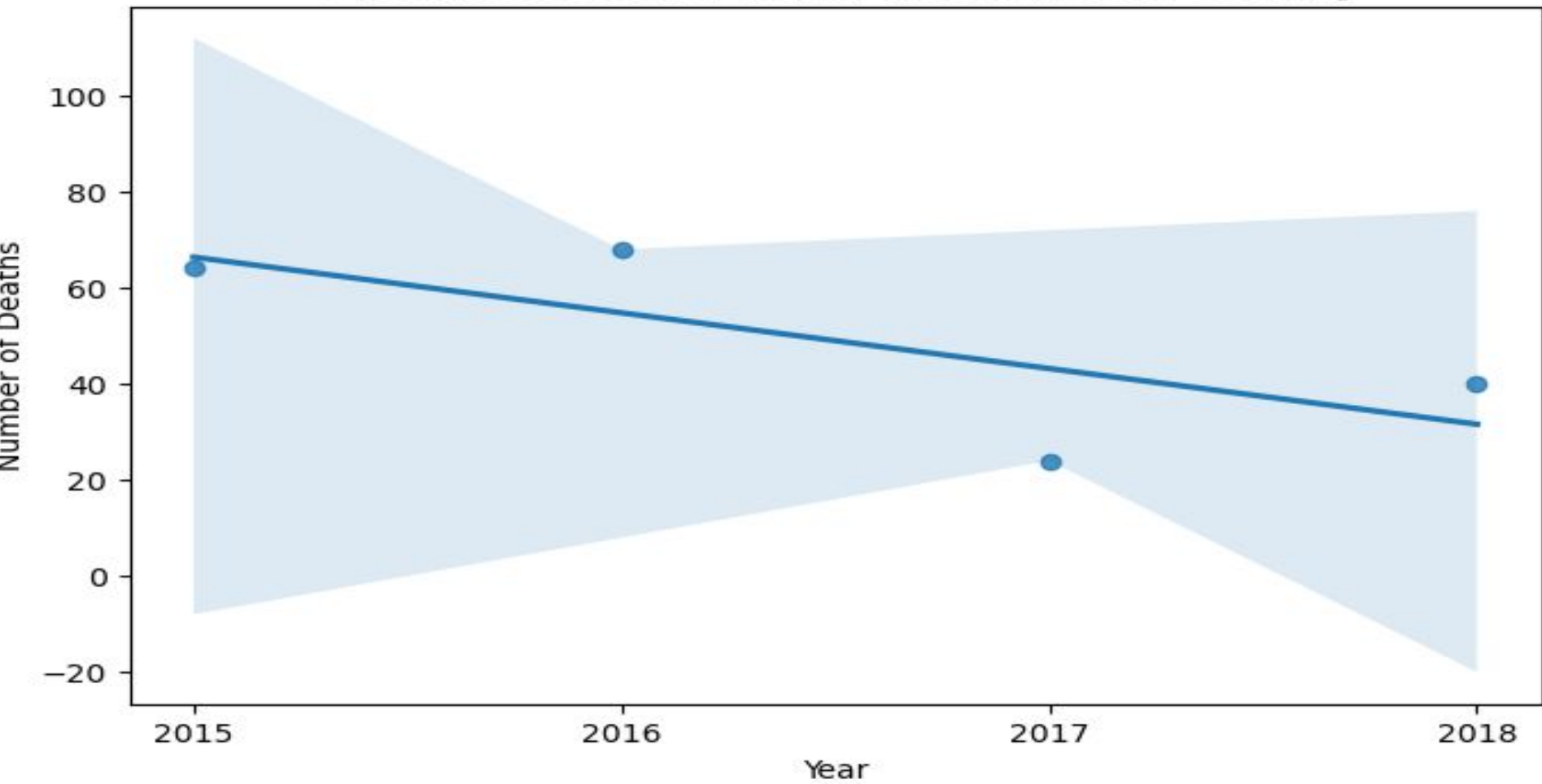
**Overdose Death Trend in CAMPBELL County**



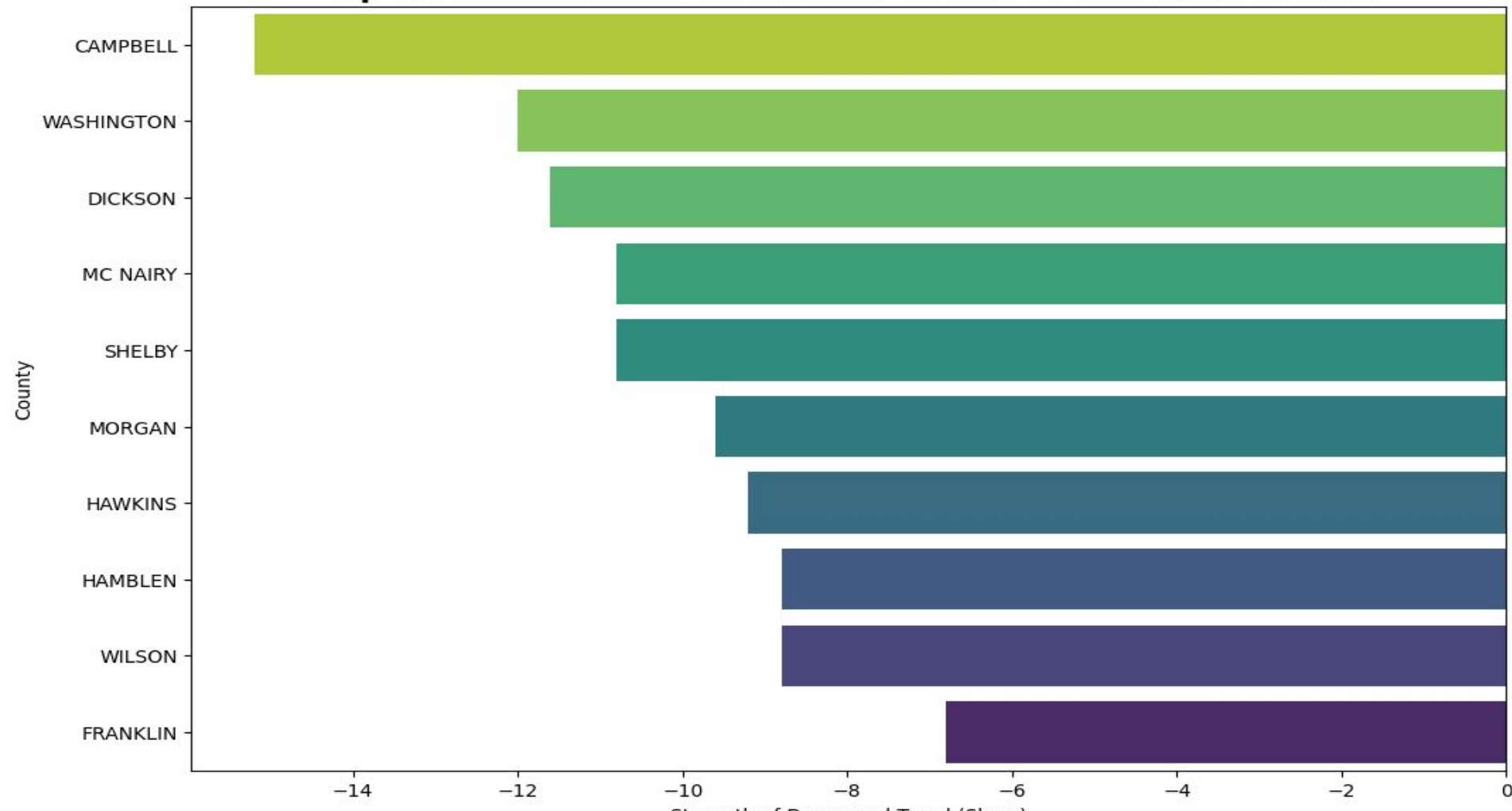
## Overdose Death Trend in WASHINGTON County



# Overdose Death Trend in DICKSON County

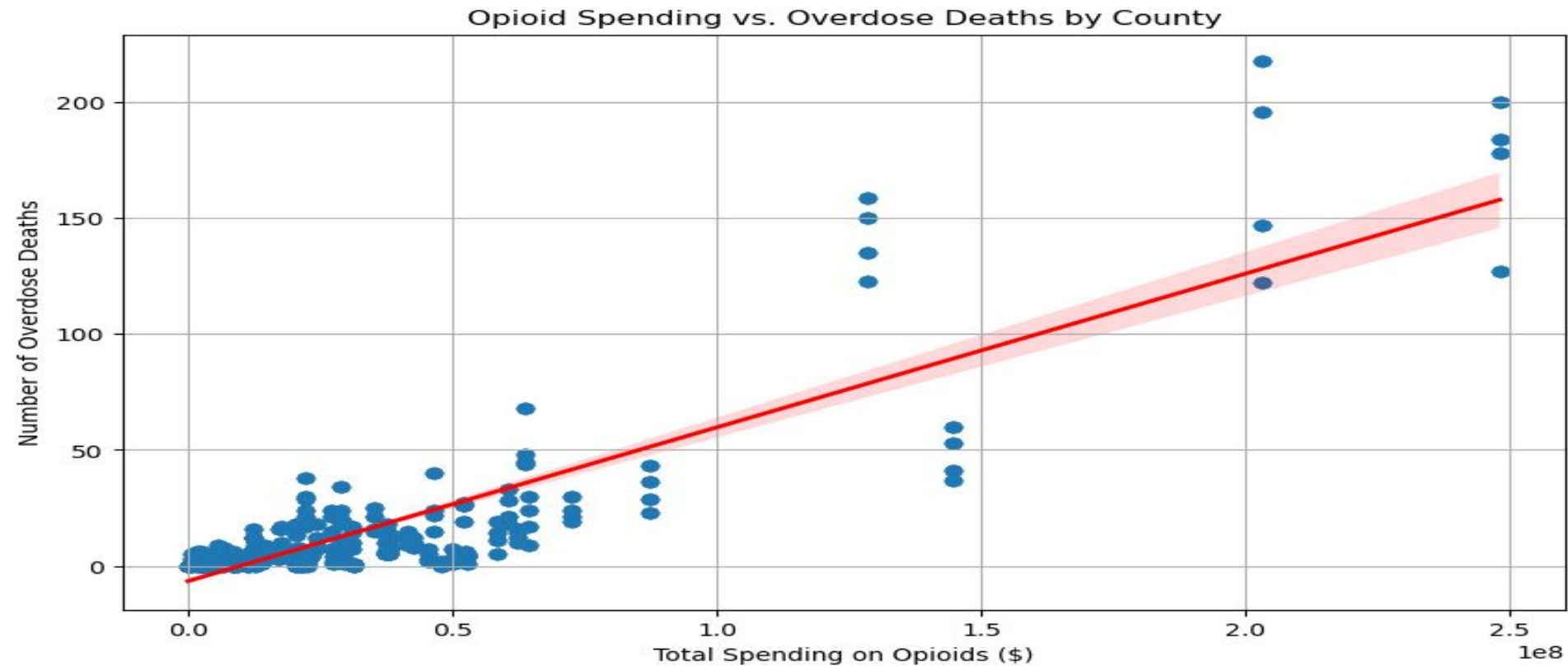


**Top 10 Counties with Downward Trends in Overdose Deaths**

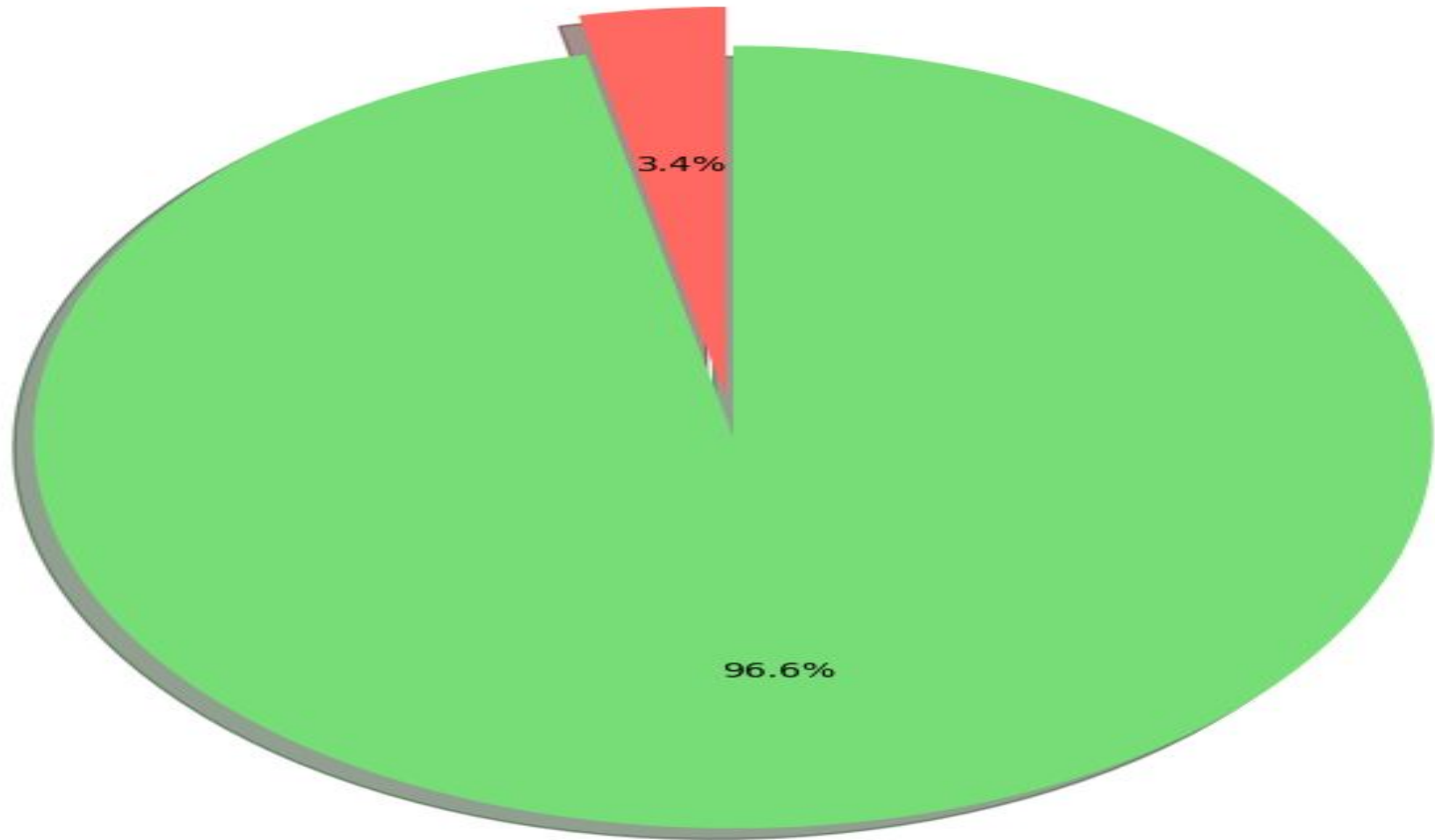




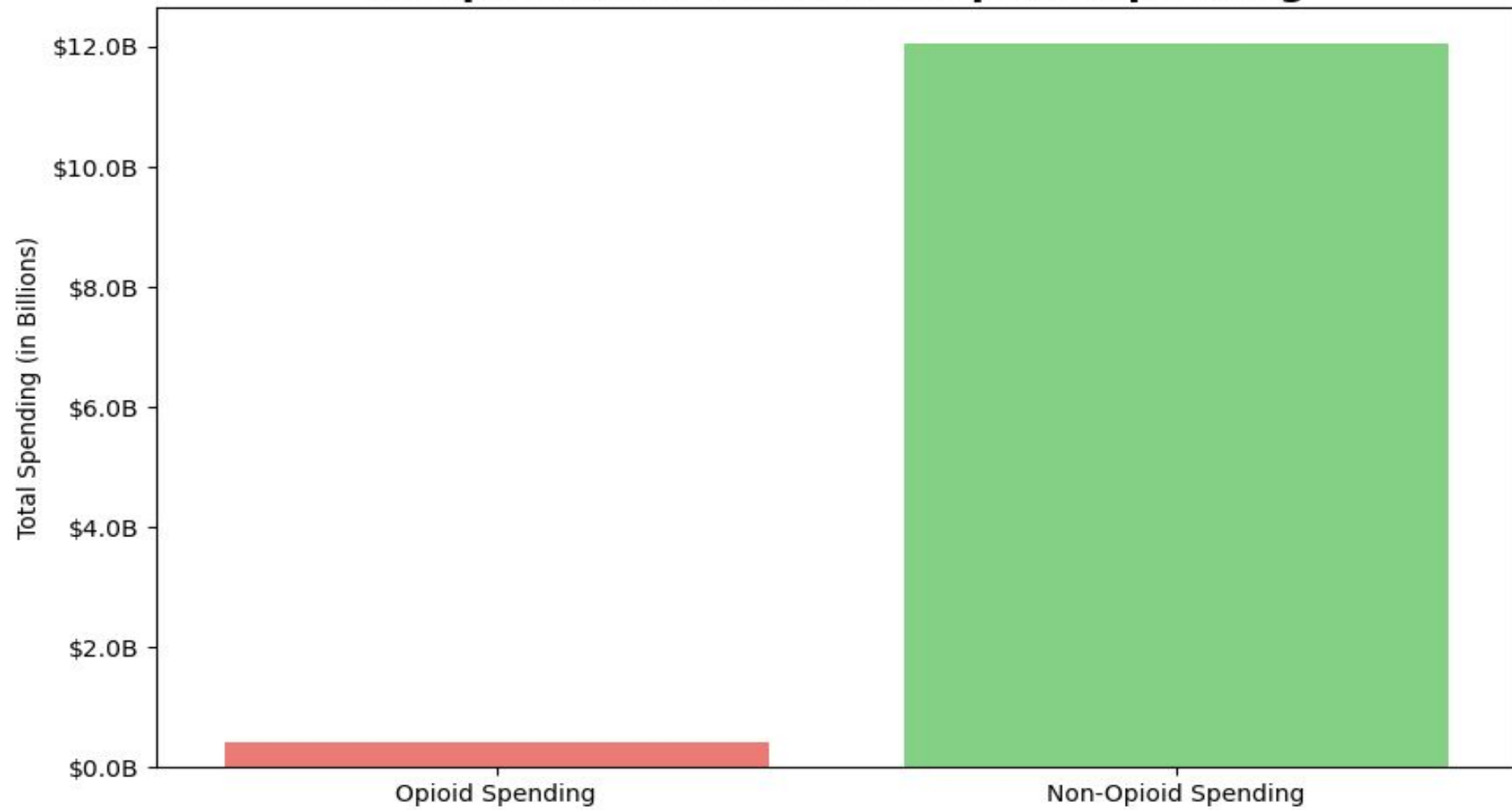
# Opioid Spending and Overdose Deaths: What's the Connection?



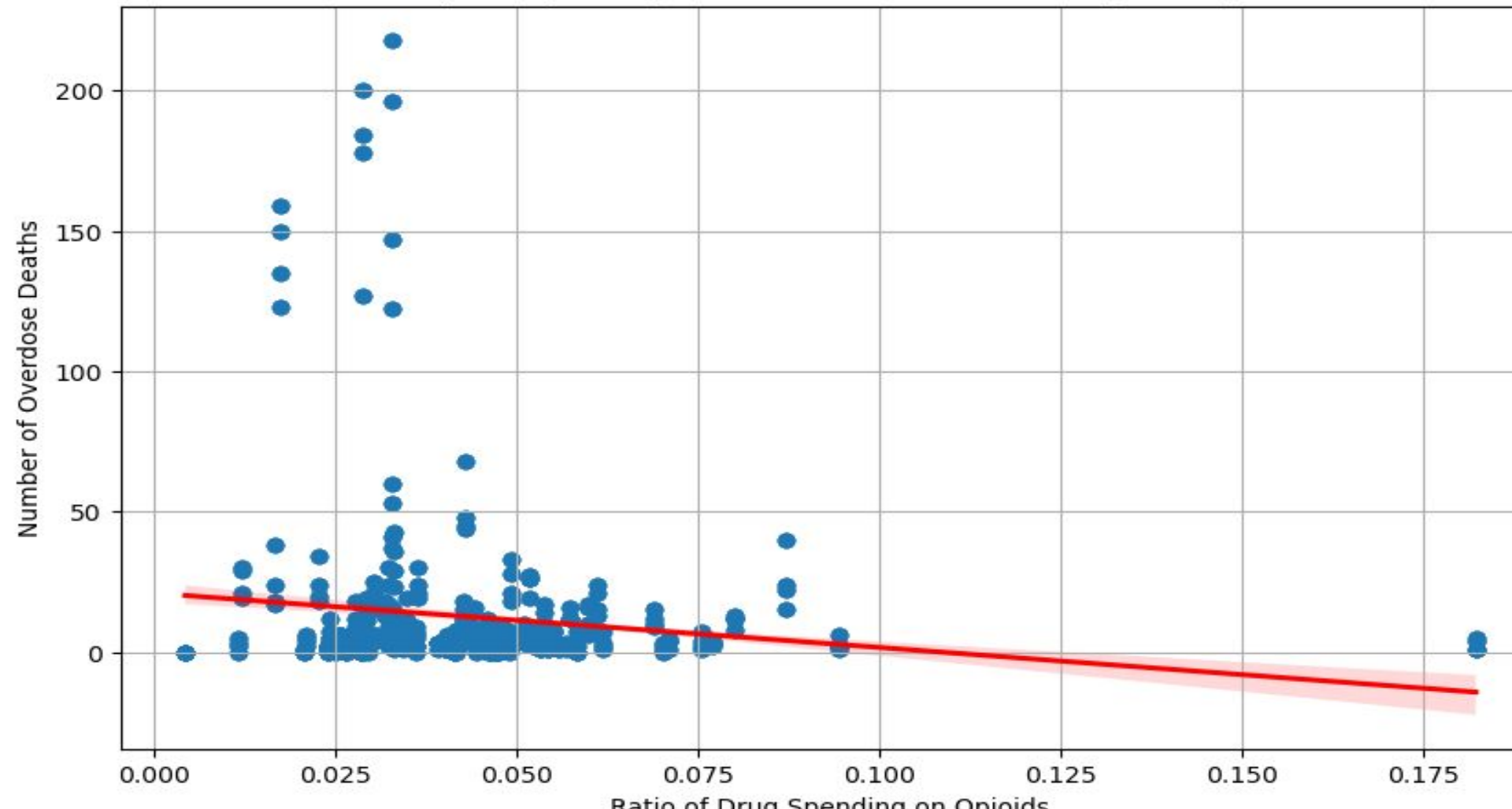
# Fraction of Total Prescription Spending



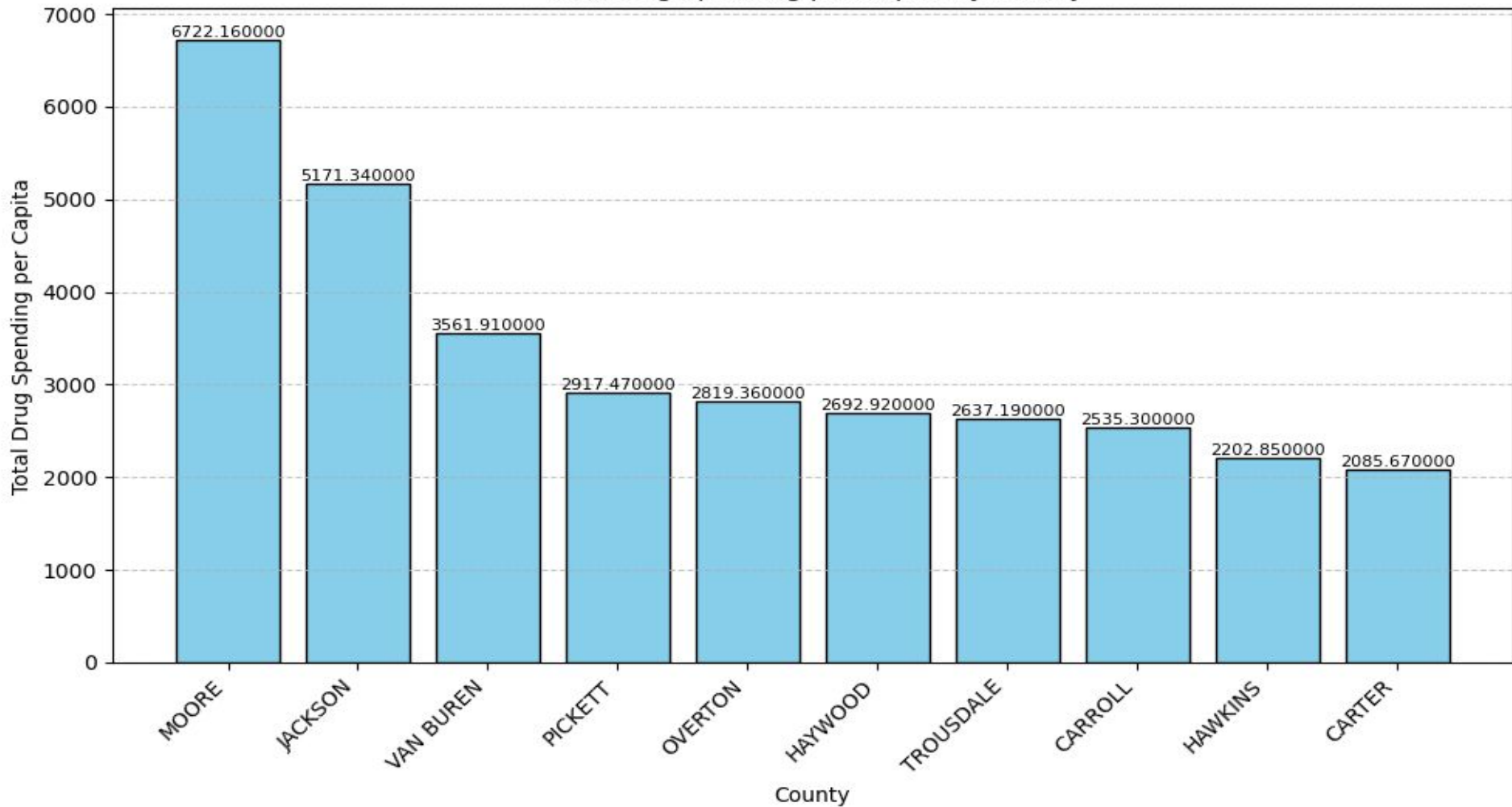
# Comparison of Total Prescription Spending



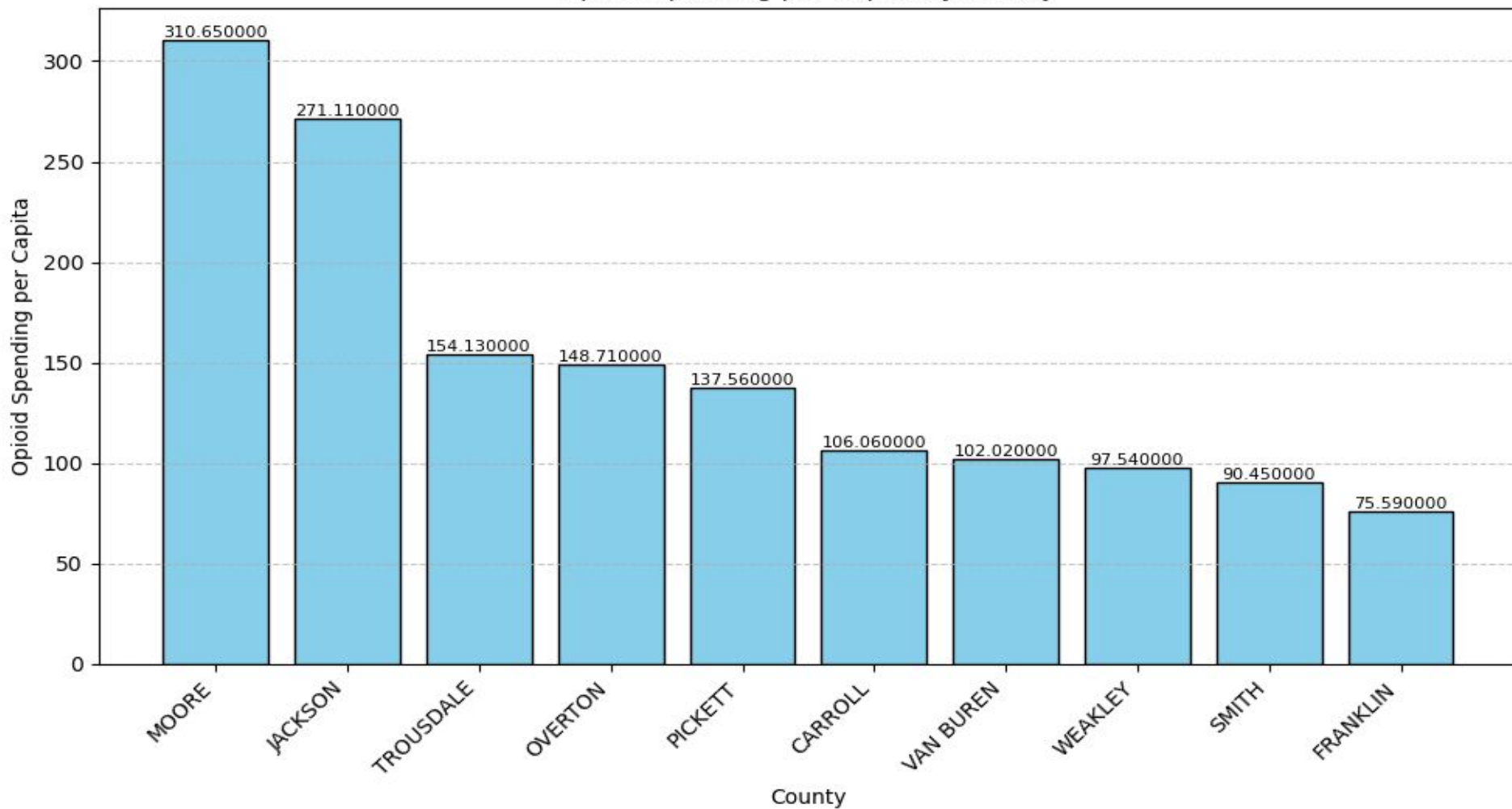
Opioid Spending Ratio vs. Overdose Deaths by County



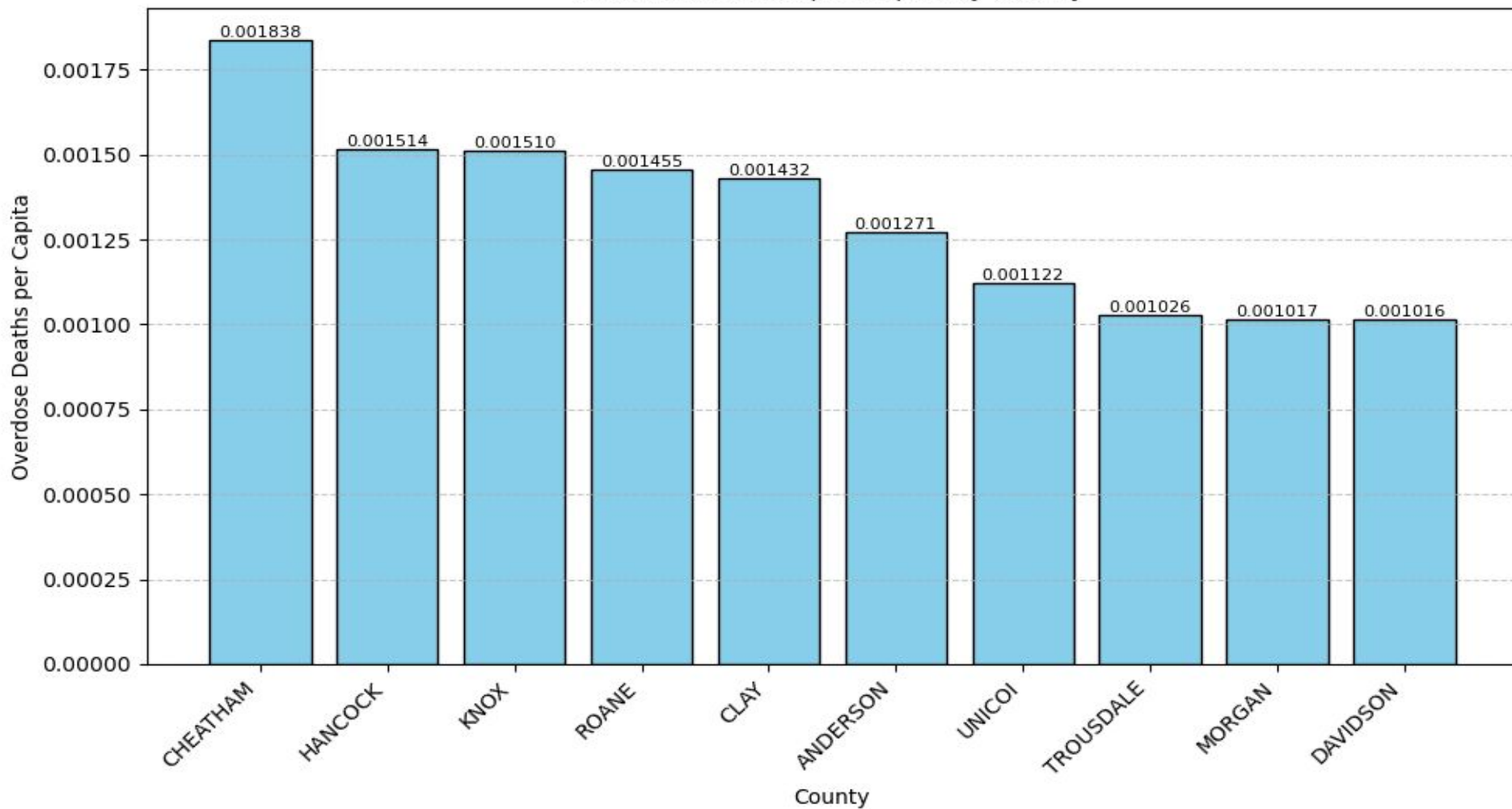
Total Drug Spending per Capita by County



Opioid Spending per Capita by County



Overdose Deaths per Capita by County

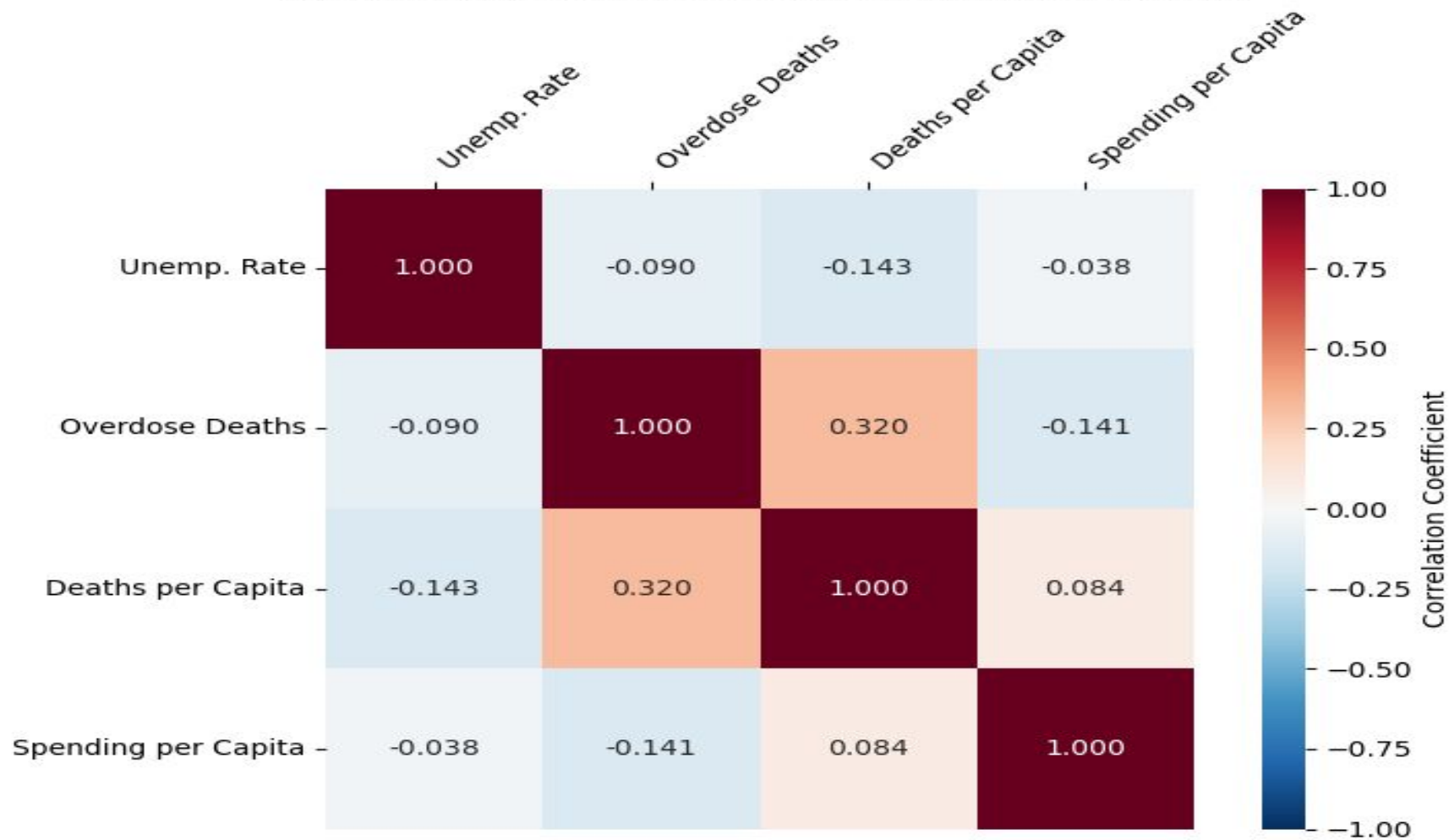


# Does the Unemployment Rate Affect Overdose Deaths and Spending on Opioids?

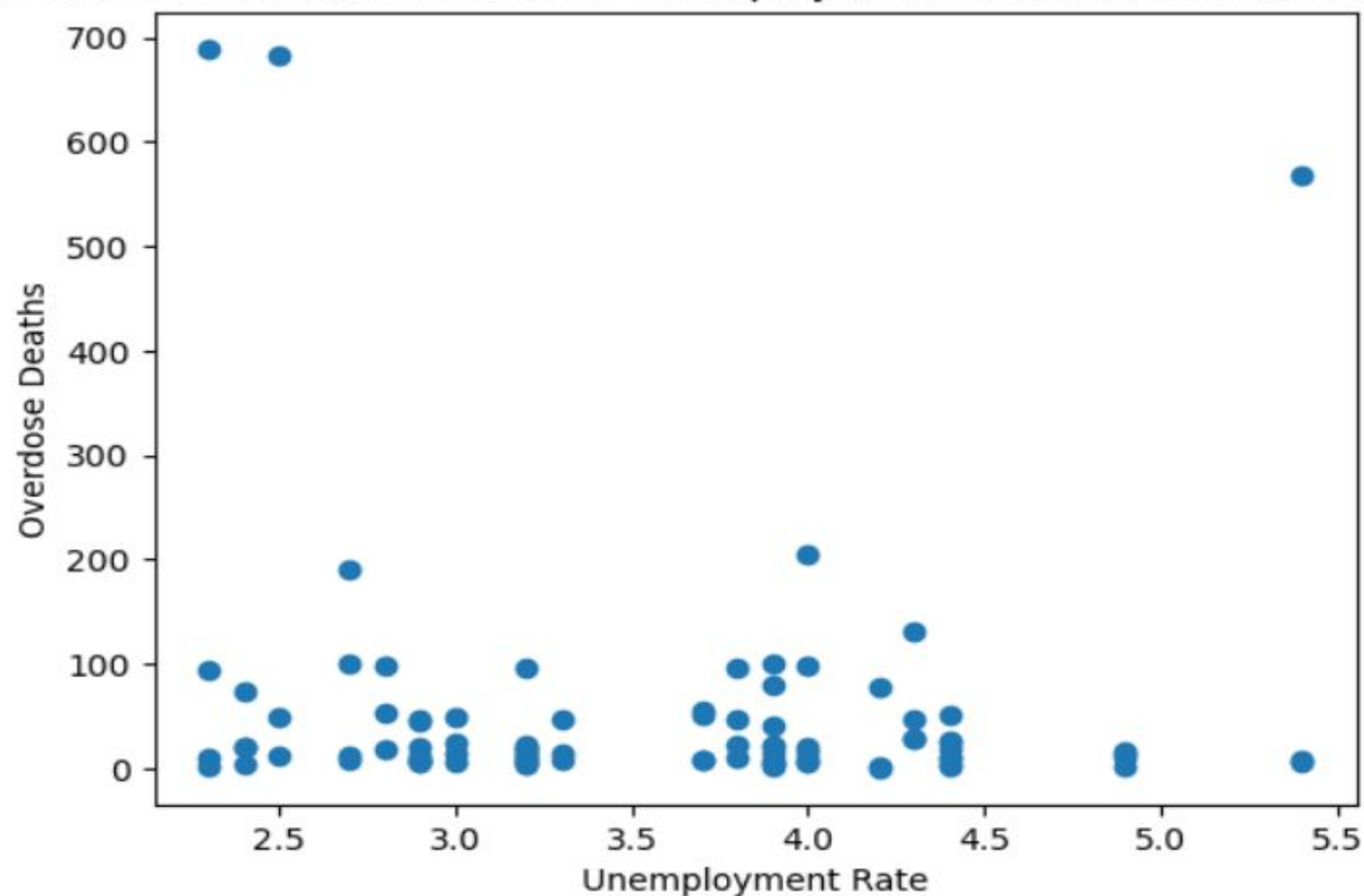




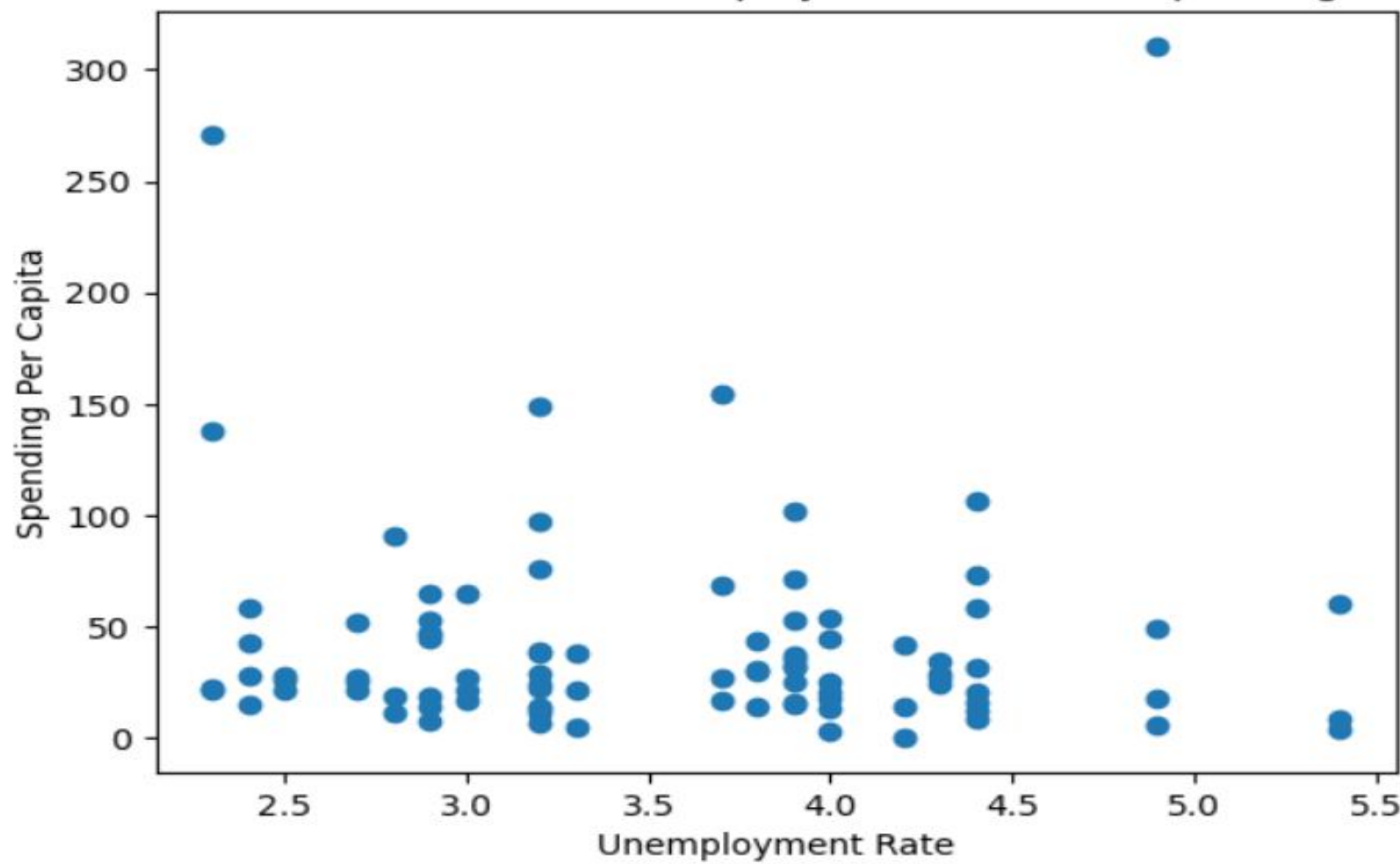
Unemployment Rate vs Opioid Spending and Overdoses



Is There a Correlation Between Unemployment Rate and Overdose Deaths?



Is There a Correlation Between Unemployment Rate and Spending on Opioids?



## Top Opioid Prescriber Locations in Tennessee



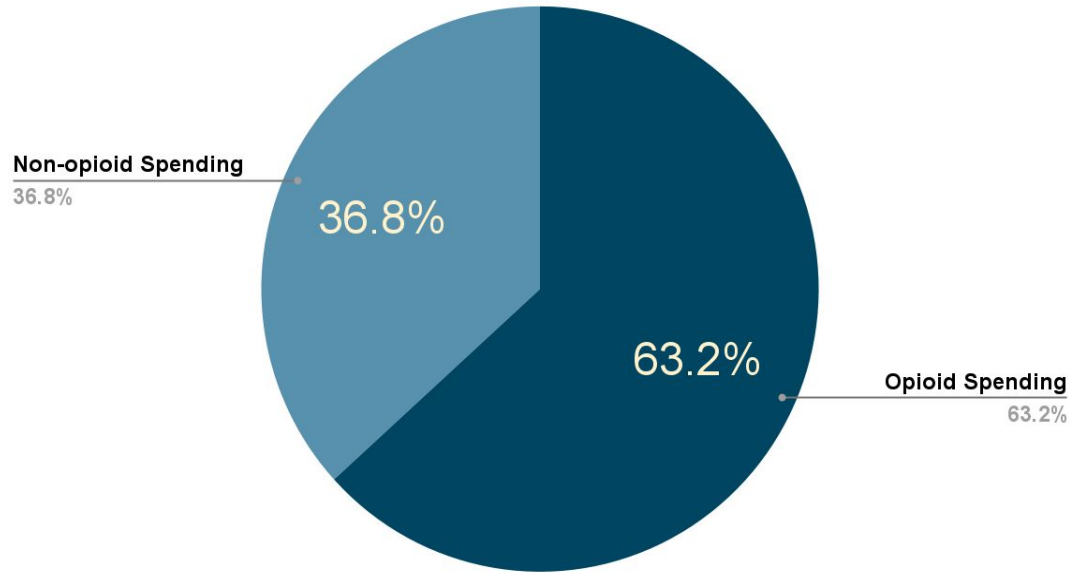
- Top prescriber locations are in central TN and eastward
- Davidson and Shelby counties are not included
- Counties surrounding Davidson contain top prescribers
- Majority in less populated or rural areas
- Knoxville and Bristol suggest that it is not necessarily a rural trend
- NE Tennessee should be identified as an area of interest

# Prescriber Identifier by County Tool

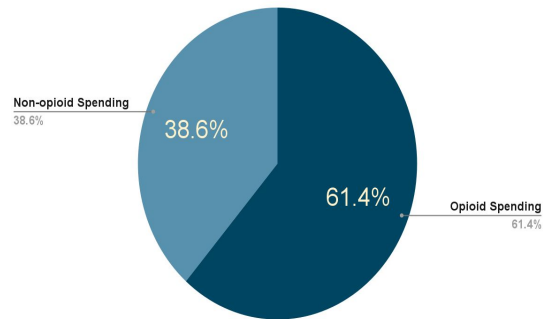
- Active opioid prescribers in every county
- The further east you travel in TN, the higher the average prescription rate
- The counties between Nashville and Memphis contain the lowest prescription rates
- Perry, Decatur, Henderson, Madison counties



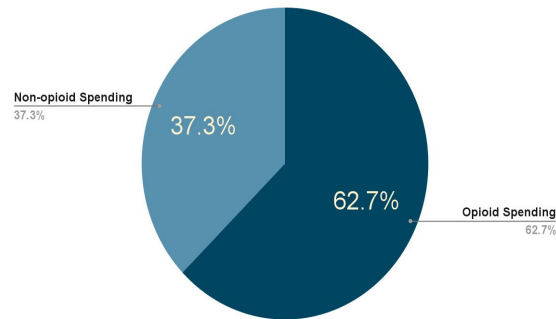
## Top 10 Opioid Prescriber Spending Ratio



## Top 50 Opioid Prescriber Spending Ratio

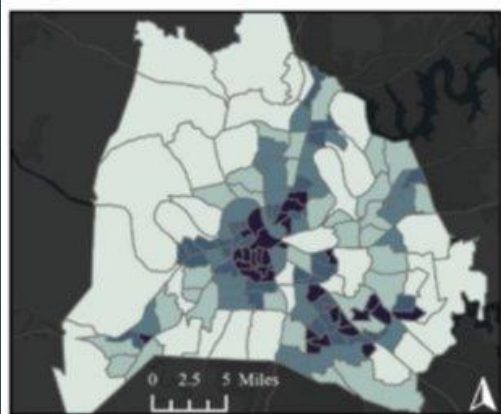


## Top 100 Opioid Prescriber Spending Ratio

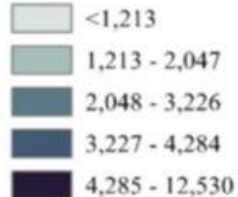


- Nearly  $\frac{2}{3}$  of drugs prescribed by the top prescribers are opioids
- This trend remains virtually the same for the top 50 and top 100
- This shows a very consistent tendency for prescribers
- Those who prescribe opioids at a higher rate are likely to continue prescribing

# Map of Opioid Prescriptions in the Nashville Area



A. Population Density (2020)  
Number of People per Square Mile



- As of 2018, overdose deaths were trending upwards
- The most opioids prescribed are in central Nashville
- Population density plays a role
- SE Nashville has a large volume of opioid prescriptions
- ZIP code 37205 also has a large volume
- Does economic status play a role?

# Summary

- Population plays a large role in opioid prescription rates and deaths, but it's not the determining factor
- Rural areas may have similar overdose rates to metropolitan areas
- There is a precedent of reduced opioid deaths in major cities
  - Memphis, Shelby County TN. Deaths are trending downward



# Conclusion

- More oversight of opioid prescriptions in Tennessee is essential to reducing overdose death rates
- Top opioid prescribers can be identified, and steps taken to reduce prescription rates
- The rural counties of TN should be scrutinized more closely for prescription abuse