

Impact of mental health care on mental health outcomes: A county-level analysis focusing on socioeconomic factors and the implementation of the Affordable Care Act

Olivia Egede^{*} Julius Jones^{*} Alayna Prince^{*} Jasmine Philibert [TA Advisor: YJ Choe]

^{*}Equal contribution. Author names listed alphabetically.

Introduction

- Since 2020, there has been a significant global surge in **mental health awareness**, with a growing emphasis on understanding and addressing psychological and emotional well-being.
- This heightened awareness led to an increased demand for **mental health professionals**, fueled by the reduced stigma surrounding seeking care.
- To effectively tackle these issues, it becomes crucial to **improve the access to mental health care**, as doing so can help lower the number of untreated mental health cases while simultaneously promoting greater access to mental health treatments.

Motivation & Goals

In this report, we analyze the relationship between **access to mental health care**, measured by the number of available mental health professionals (per 100K population), and an individual's **mental health status**, measured via the number of self-reported poor mental health days (per 30 days). In doing so, we also focus on two additional factors that may impact the relationship.

- Impact of Socioeconomic Factors:** Numerous studies have established a significant association between lower socioeconomic status and a higher occurrence of negative mental health events. We specifically focus on two socioeconomic factors: **median household income** and the **percentage of college graduates**.
- Impact of the Affordable Care Act (ACA):** In 2010, the ACA was legislated in the U.S. to expand healthcare coverage. As of 2023, **a total of 12 states have not implemented the ACA**. Our focus is on examining the effects of ACA implementation on the mental health variables.

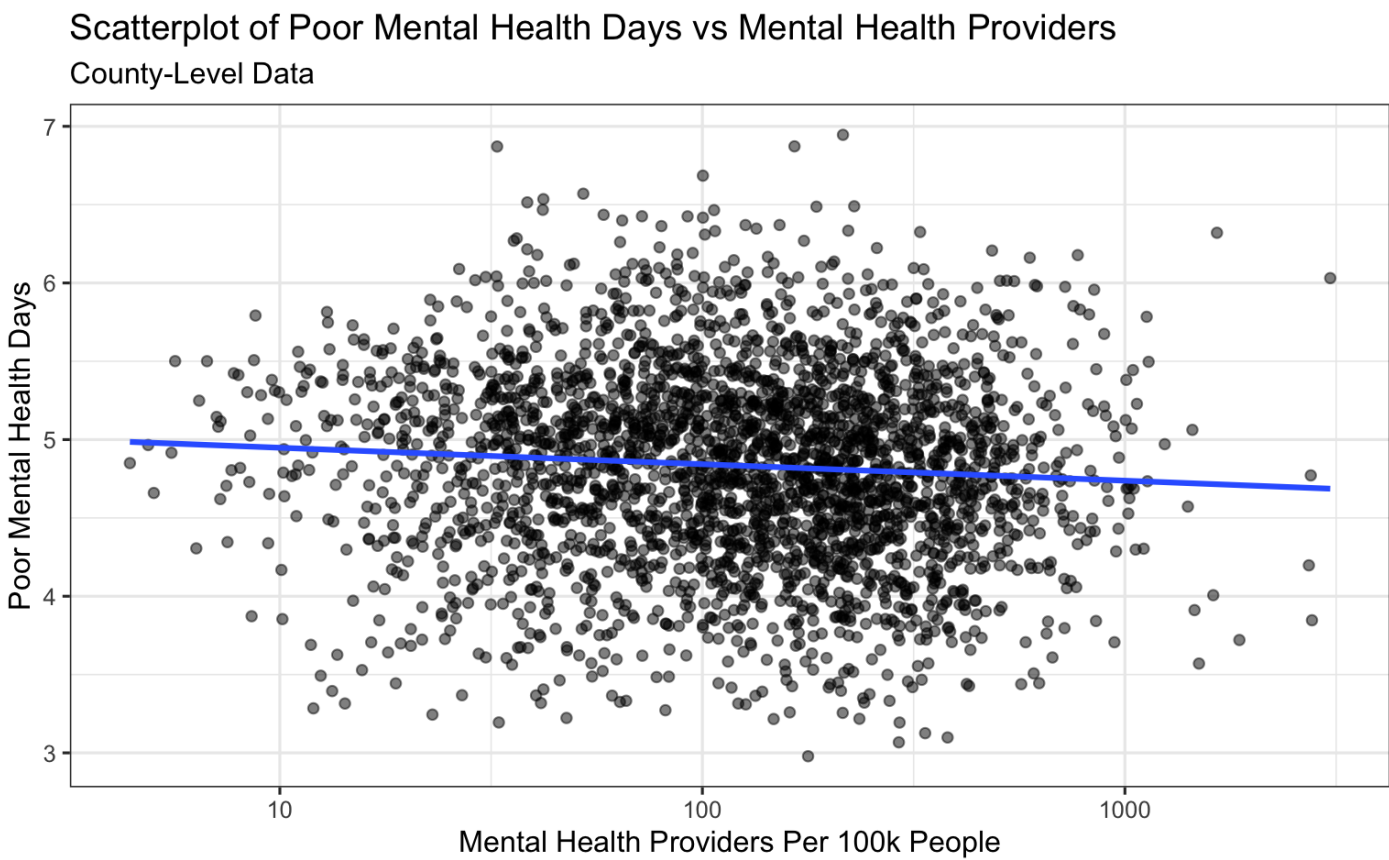
We use the U.S. *county health rankings data*; all analyses are conducted at the **county** level.

KEY QUESTIONS

- Main Question:** Does the **number of mental health providers per population** affect the number of self-reported **poor mental health days**?
- Socioeconomic Status:** How does socioeconomic status impact poor mental health days?
- ACA:** How does ACA implementation affect the relationship between the number of mental health providers per population and the number of poor mental health days?

Does access to mental health providers affect mental health status?

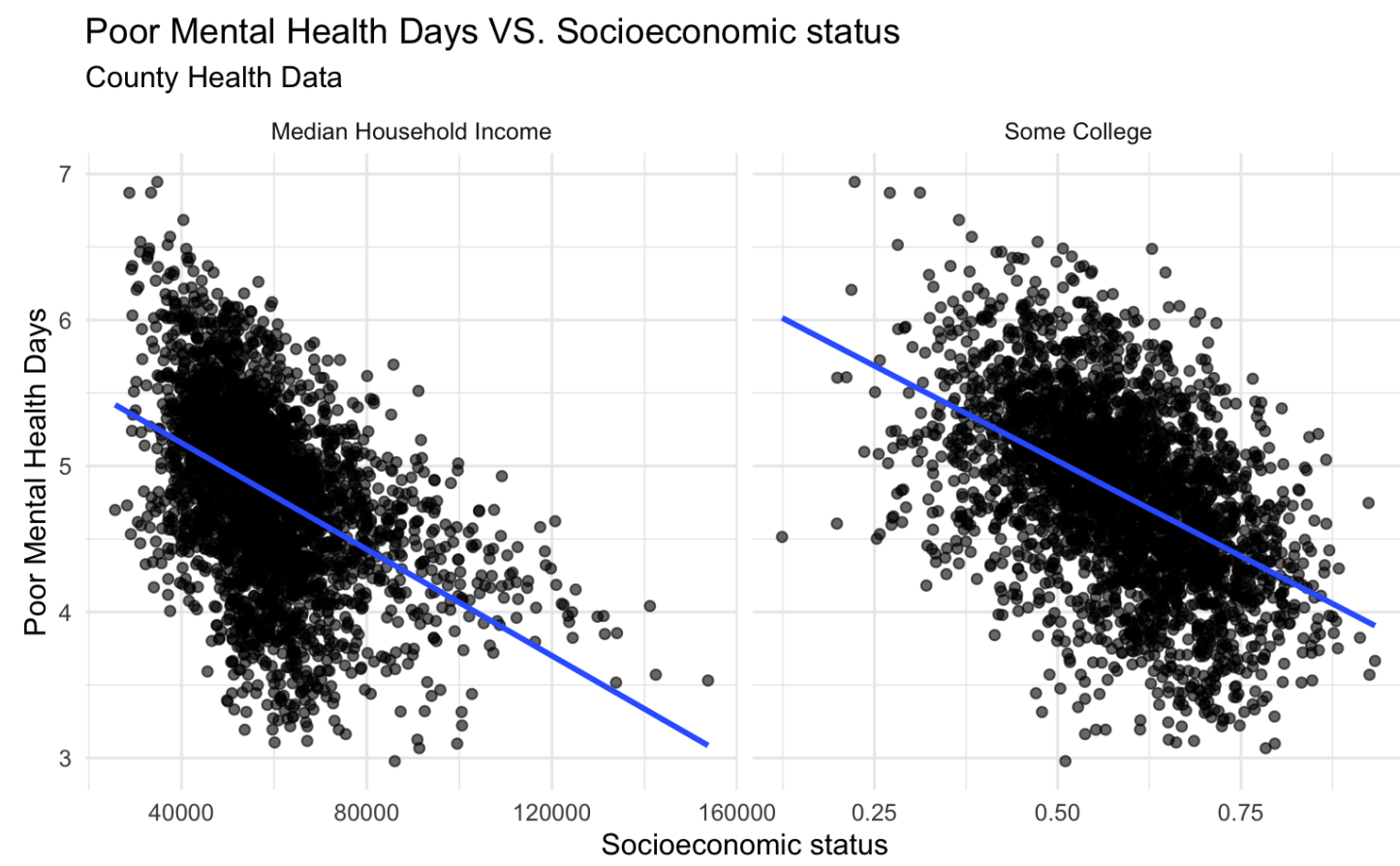
We expect to see a strongly negative association between the two variables.



Takeaway: The linear trend is surprisingly flat, which leads us to explore different variables, like policy and socioeconomic factors.

What about the impact of socioeconomic factors?

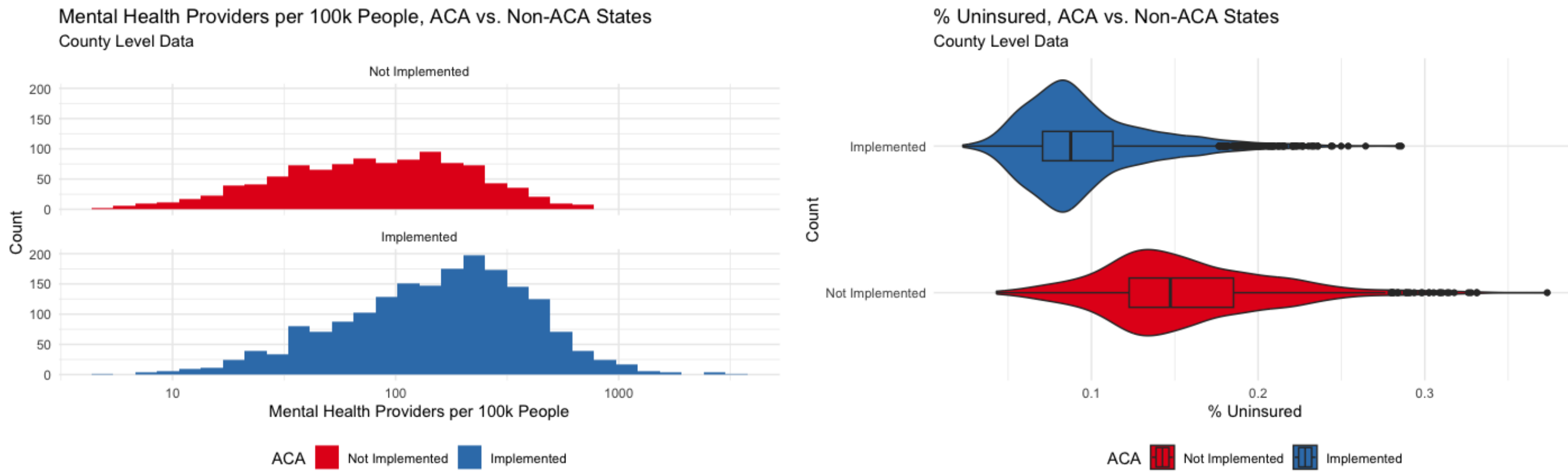
We expect that the number of poor mental health days would have a negative association with socioeconomic factors, namely median household income (left) and % of college graduates (right).



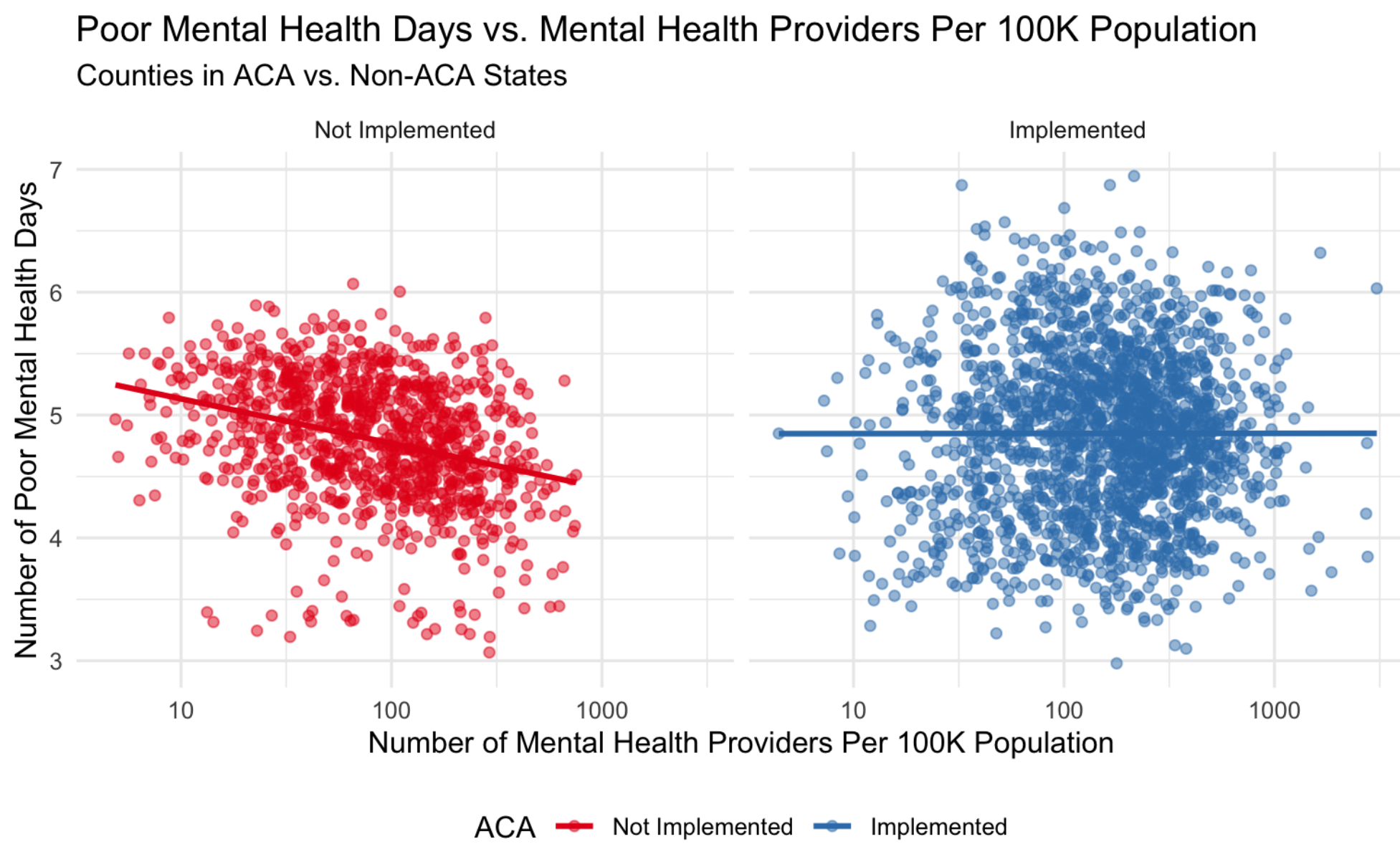
Takeaway: Socioeconomic status, in terms of education or income, is negatively correlated with poor mental health days.

How does the Affordable Care Act impact mental health outcomes?

We first look at the number of mental health providers and the percentage of uninsured people for **non-ACA** and **ACA** states.



We also look at the relationship between mental health providers per population and poor mental health days among **non-ACA** and **ACA** states.



In terms of the Affordable Care Act, what does this mean?

- For states *with* ACA implementation, we observe **more mental health providers** per population and **fewer uninsured people**.
 - Implication:** The implementation of the ACA may be beneficial for people needing access to mental health care.
- For states *without* ACA implementation, there is a clear negative correlation between mental health providers and poor mental health days.
 - Implication:** Having more mental health providers in non-ACA states may lead to an improved mental health status of the residents.

Which variables are predictive of mental health status?

We use a random forest regressor to assess the significance of variables impacting mental health. We include a total of 18 socioeconomic and healthcare-related variables as predictors, including all variables used earlier.

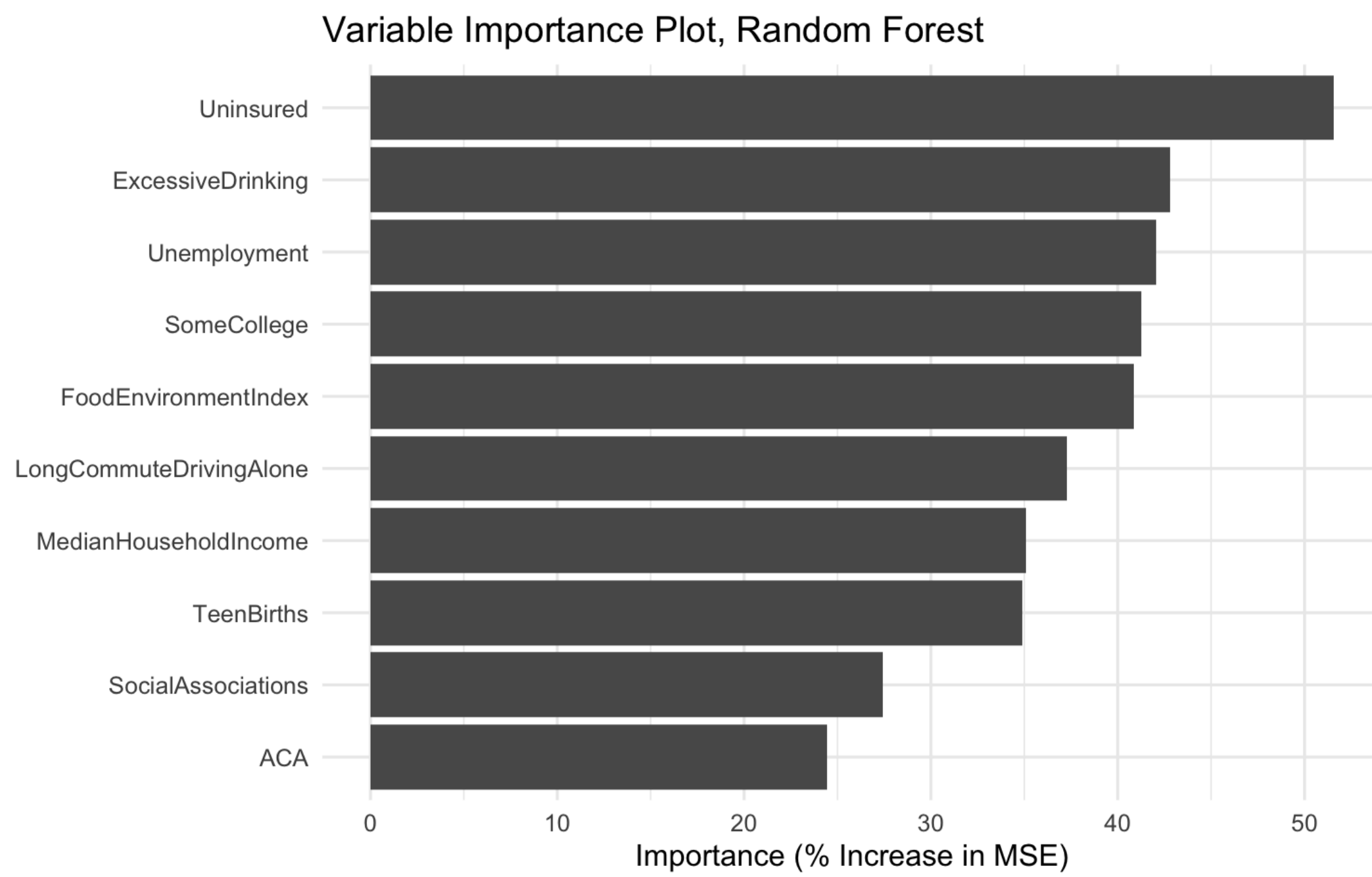


Figure 1. Variable importance of the random forest predictor.

Uninsured, Excessive Drinking, and Unemployment had the highest increase in the out-of-bag mean squared error (MSE). This aligns with the notion that there are more direct predictors of mental health problems than the availability of mental health providers.

Conclusions

- Our exploratory analysis (or our linear model analysis in the report) demonstrates that there is a significant relationship between the number of mental health providers and the average number of poor mental health days in counties.
- Counties in ACA states tend to have a higher number of mental health providers per 100K people and a lower percentage of uninsured people.
- For counties in non-ACA states, the number of poor mental health days decreases as the number of mental health providers per 100K people increases (even after controlling for socioeconomic variables).