

# Impact of Adult Behaviors On Juvenile Outcomes

SURE 2024

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# How are juvenile healthcare outcomes impacted by adult health-related practices?

- Examine how adult behaviors impact quality and length of life in children under age 20
  - Intergenerational health impacts
  - Early intervention and prevention
  - Healthcare policy and education

# County Health Rankings Data

## Adult Behaviors

- Excessive Drinking
- Smoking
- Diet
- Physical inactivity
- Insufficient sleep
- Food Insecurity
- Uninsured
- STIs

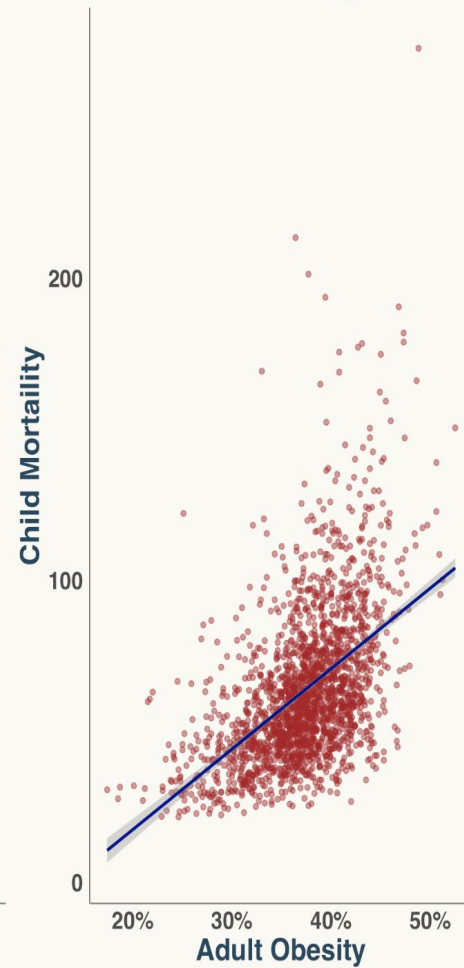
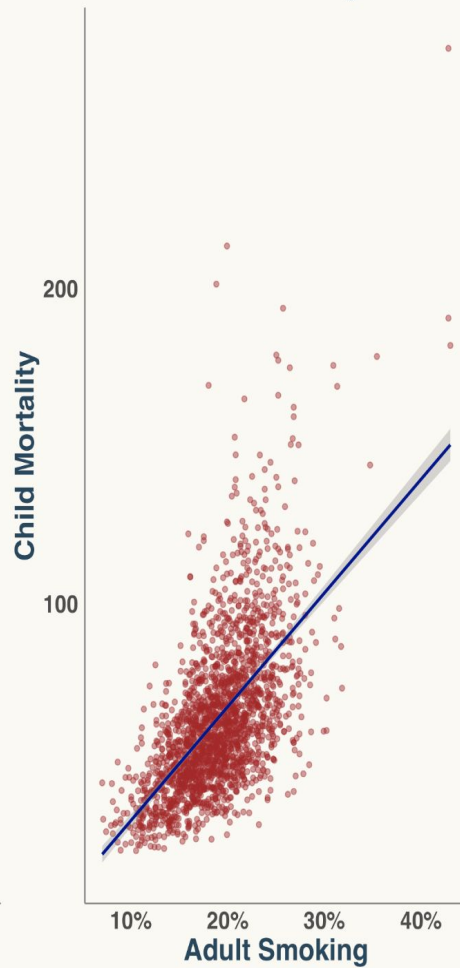
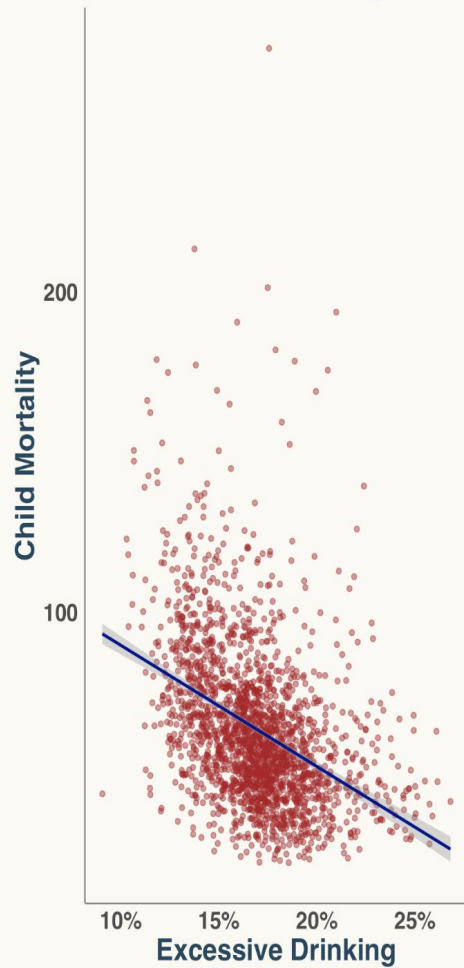
## Juvenile Outcomes

- Child Mortality Rate
- Low Birthweight

## Data Cleaning

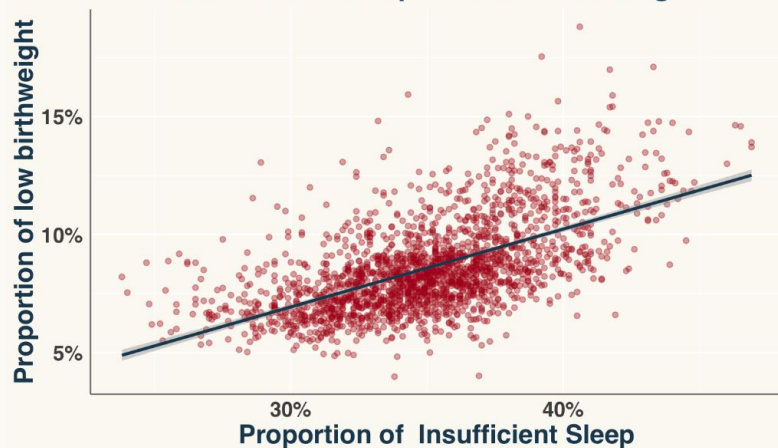
- Creation of binary response variable for insufficient sleep (high/low proportion of population)

# Excessive drinking, smoking, and obesity are associated with increased child mortality rates

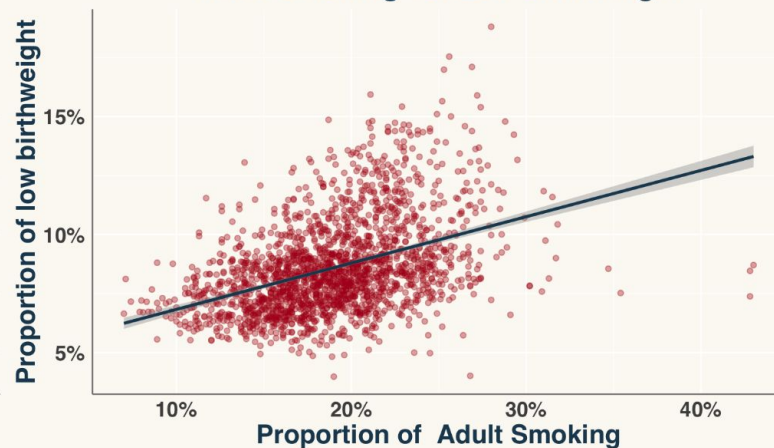


# Insufficient sleep, smoking, obesity, and food insecurity are associated with increased low birthweight births

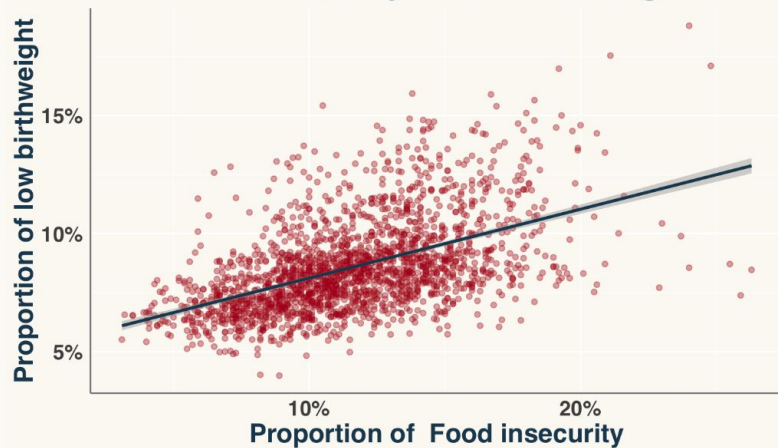
## Insufficient Sleep vs. Low Birthweight



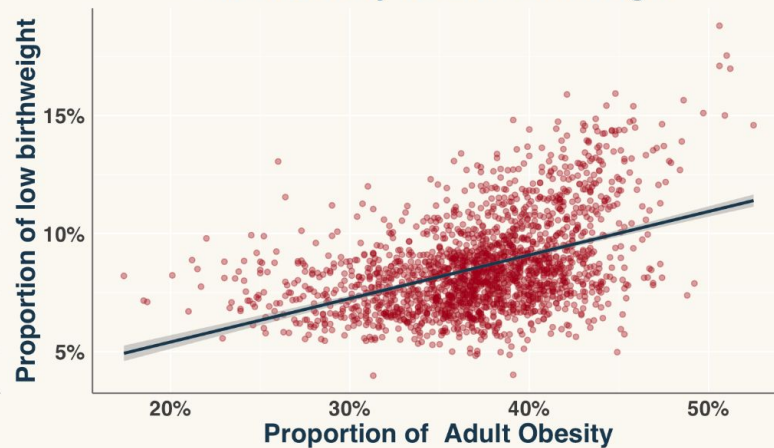
## Adult Smoking vs. Low Birthweight



## Food insecurity vs. Low Birthweight



## Adult Obesity vs. Low Birthweight

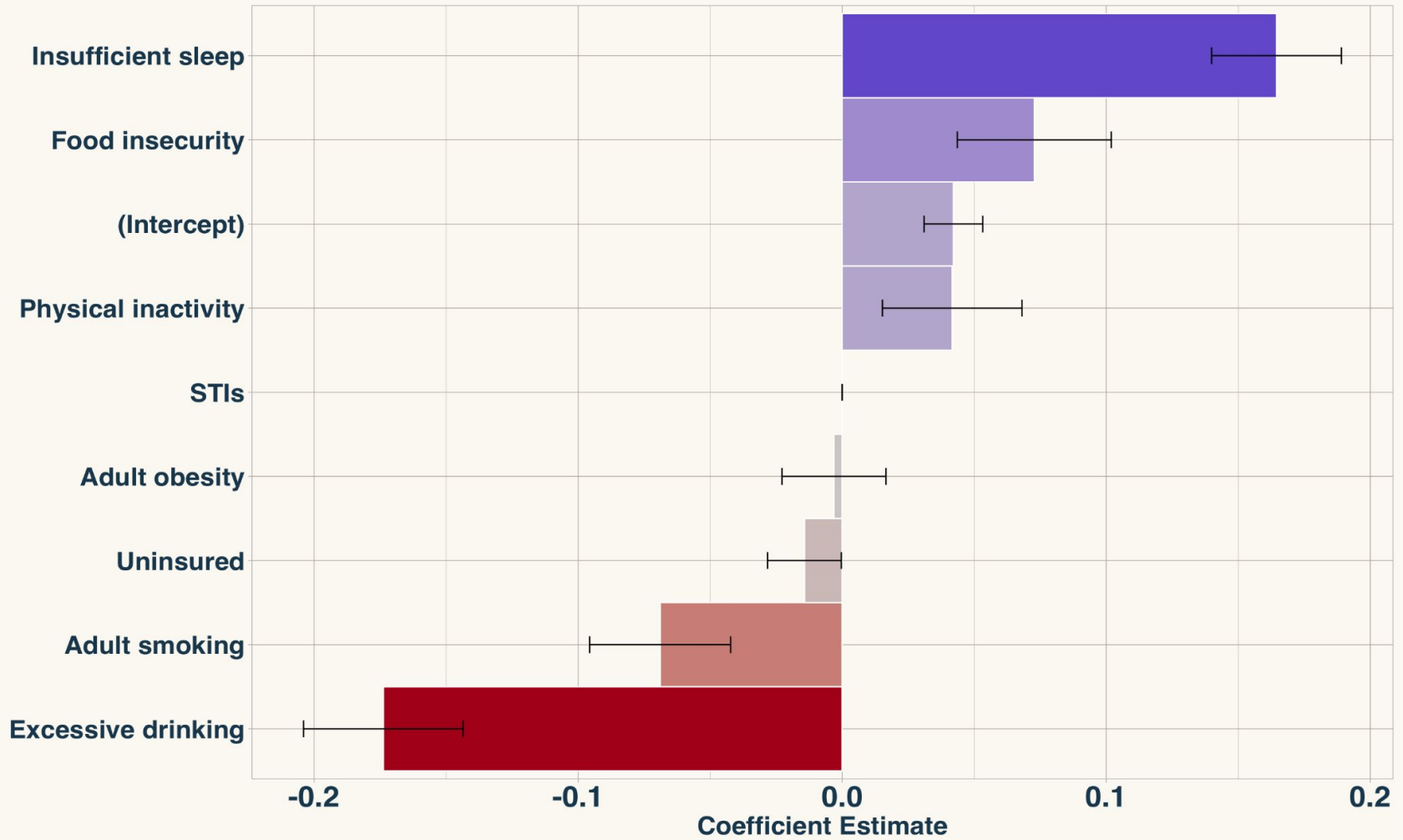


# Model Selection & Methods

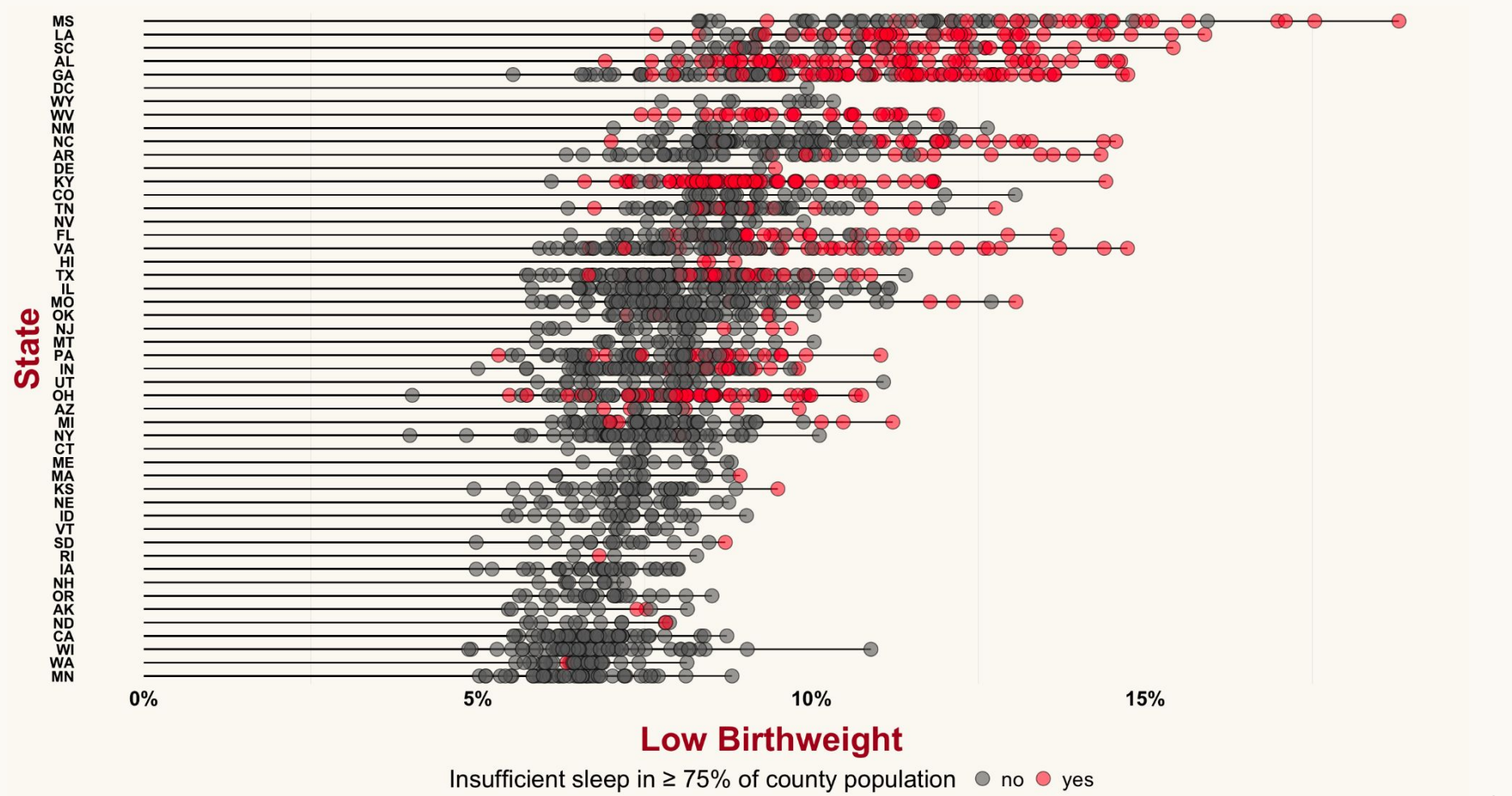
- Objective: Determine the strongest adult-behavior predictors of low birthweight



# Excessive drinking and insufficient sleep are the strongest predictors of low birthweight

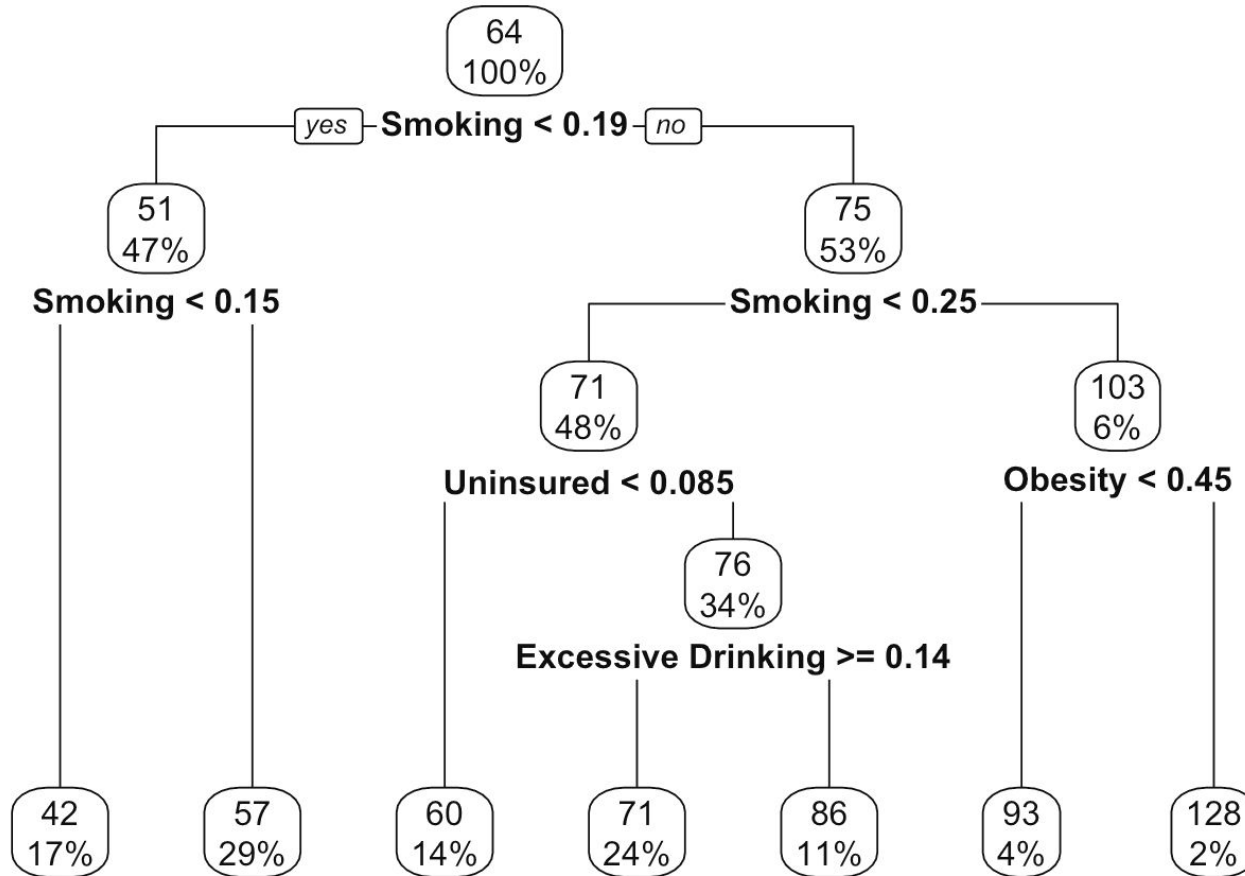


# Counties with a higher % of low birthweight births are also counties with higher % of insufficient sleep

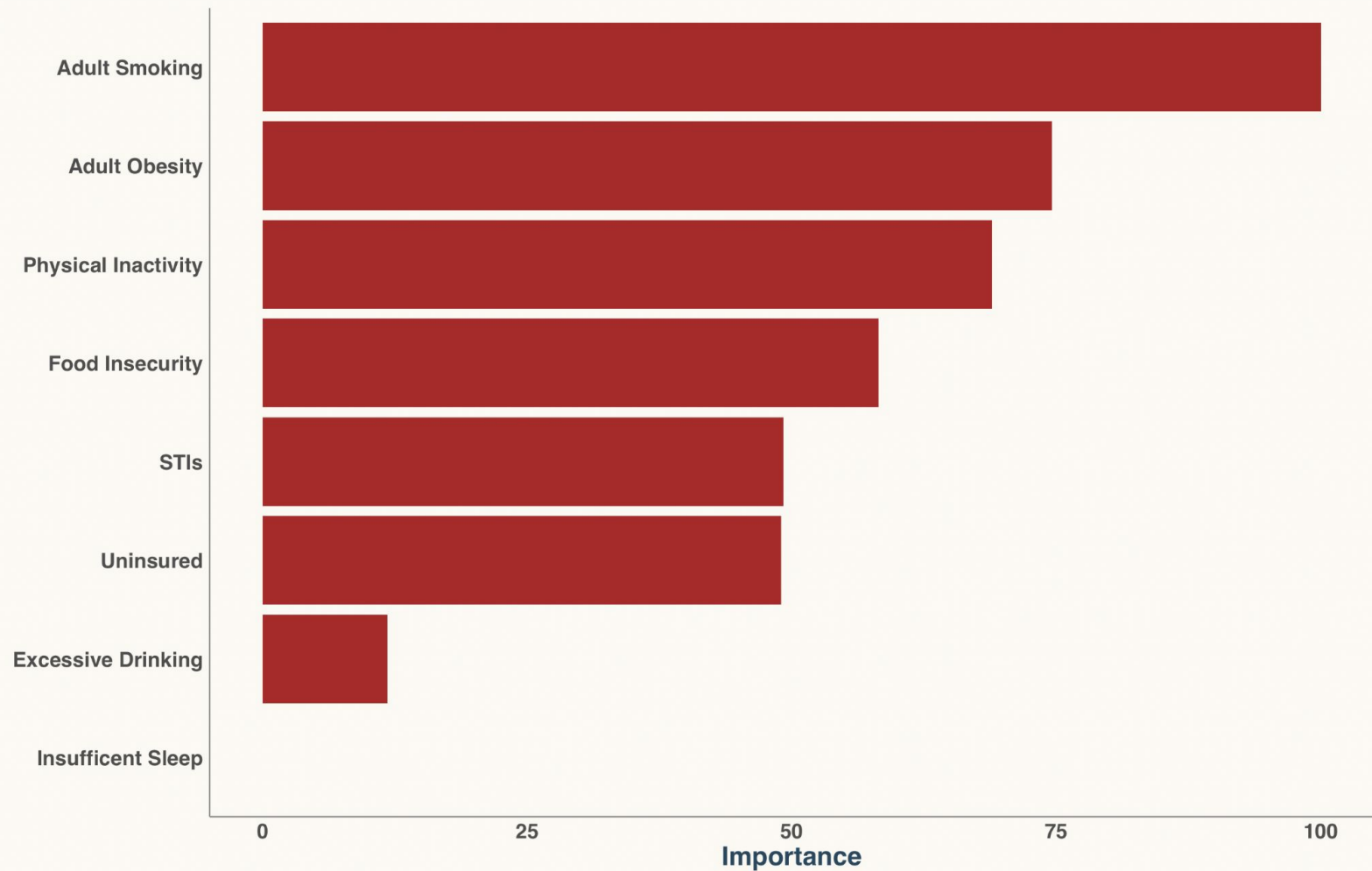




# Decision Tree for Predicting Child Mortality



# Variable Importance Plot for Predicting Child Mortality



## Discussion

- Healthcare costs
- Effective public health campaigns and preventive strategies
- Targeted interventions

## Future work

- Demographics, income, and gender
- Regional and environmental context

### Limitations:

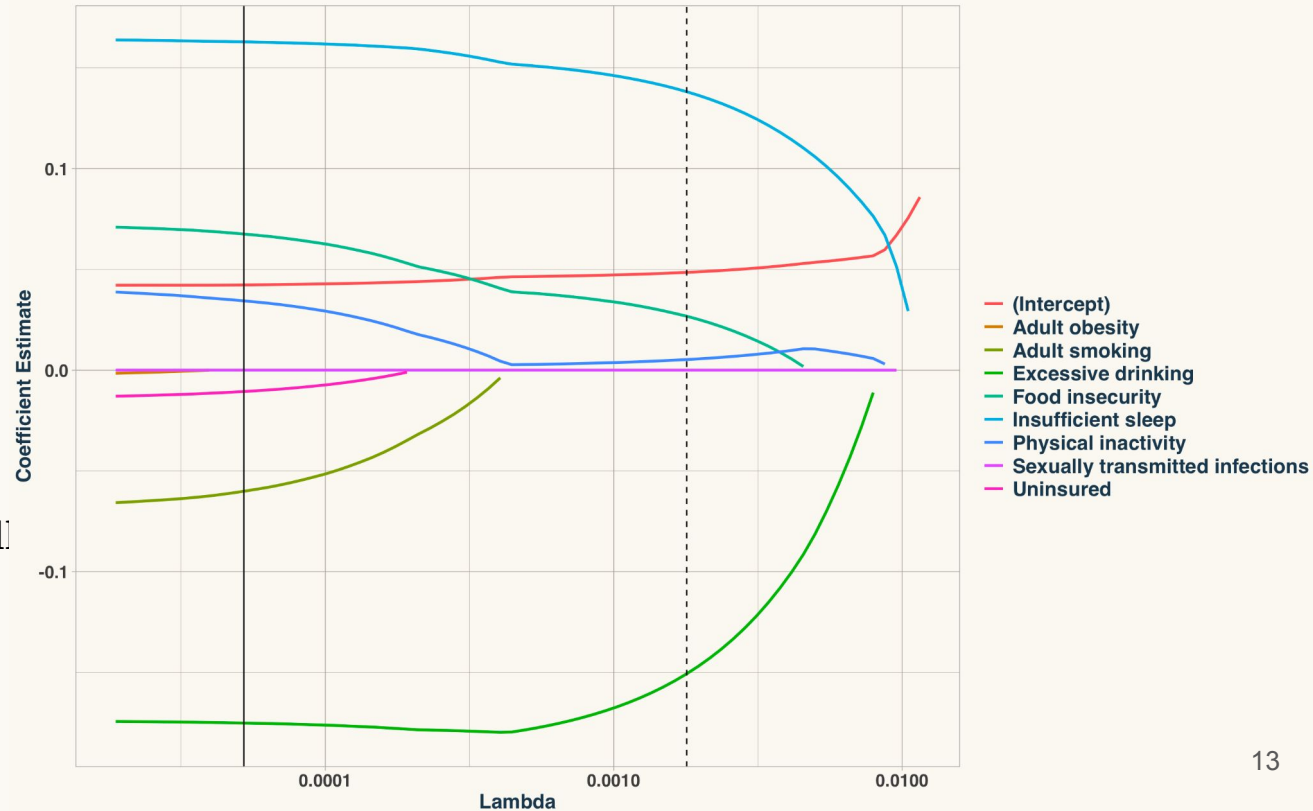
- Gender
  - Excessive drinking
- Parent to child data

# Appendix

# Lasso Regression for predicting low birthweight

Variable selection and shrinkage penalty for preventing overfitting, multicollinearity, reducing variance, and allowing for greater interpretability.

- $\lambda$  was picked with 10-fold cross validation (cv.glmnet)
- Solid line on the left is the lambda.min that gives the minimum mean cross-validated error.
- Dashed line is the largest value that  $\lambda$  can take while still falling within the one standard error interval of the minimum cross-validated error.



# Cross-validation results

