

Capstone Checkpoint Two

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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 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
- STI's

Juvenile Outcomes

- Child Mortality Rate
- Low Birthweight

Data Cleaning Process

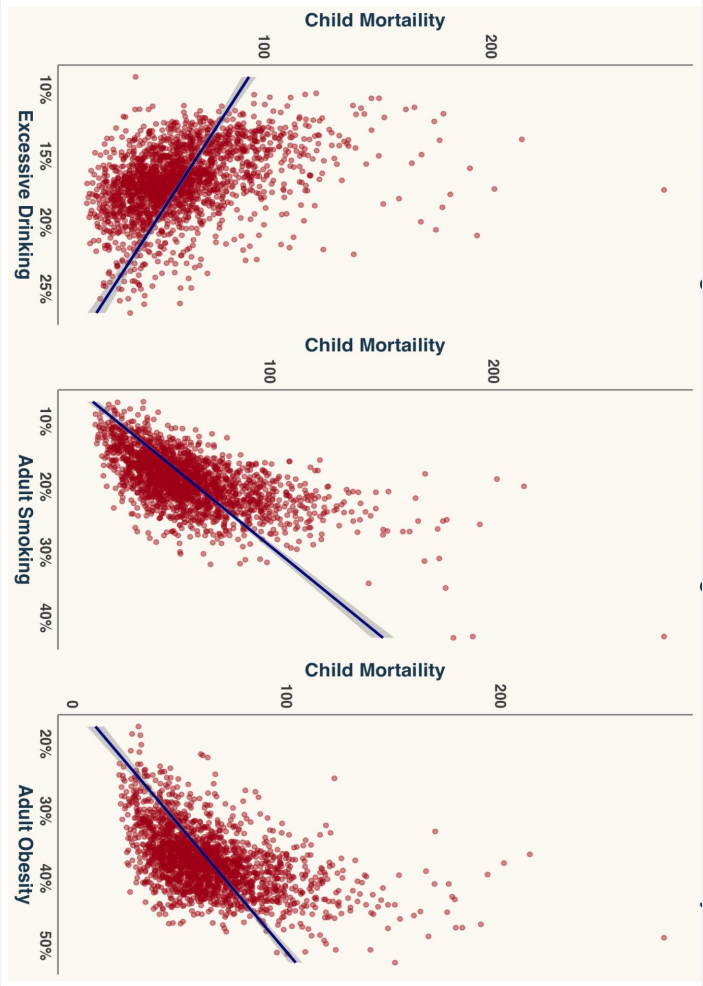
- Remove first row of variable description
- Remove “na” values
- Remove states mistakenly listed as counties
- Creation of binary response variable for insufficient sleep (high/low proportion of population)

Plan of Action (Completed Steps)

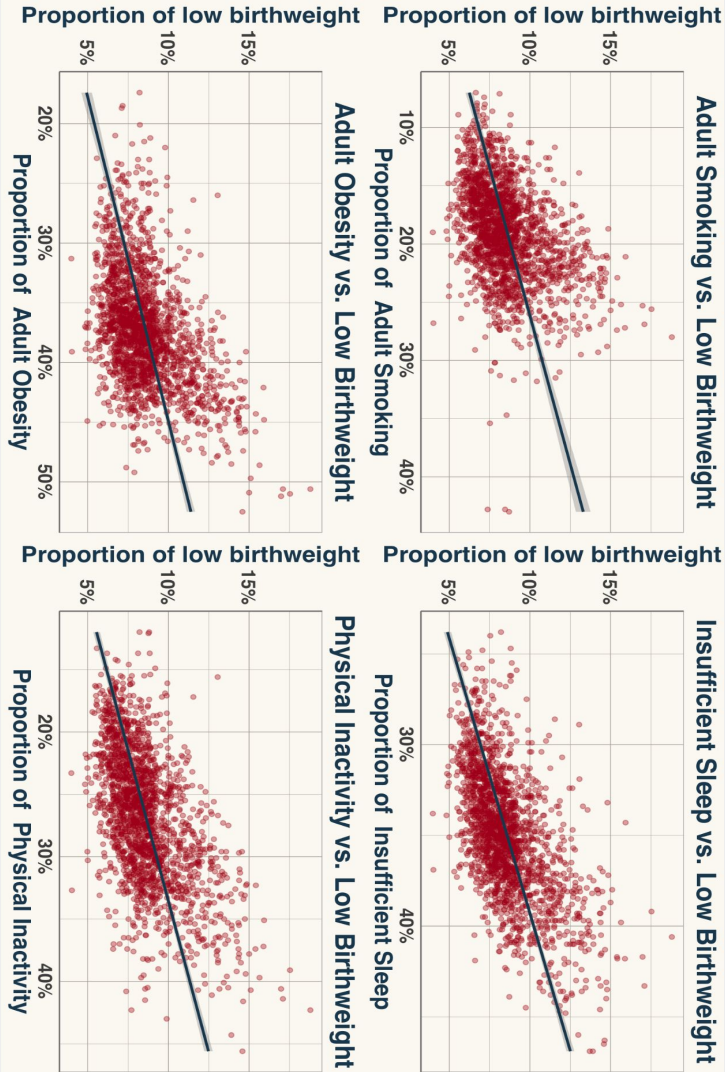
- Data wrangling/cleaning
- Choice of variables for analysis
- FEA
- Use lasso regression to determine which factors best predict low birthweight and child mortality
- Model using decision trees
- Creation of binary response variable for insufficient sleep

Excessive drinking, adult smoking, and other adult health behaviors are associated with child mortality and low birthweight

Child Mortality



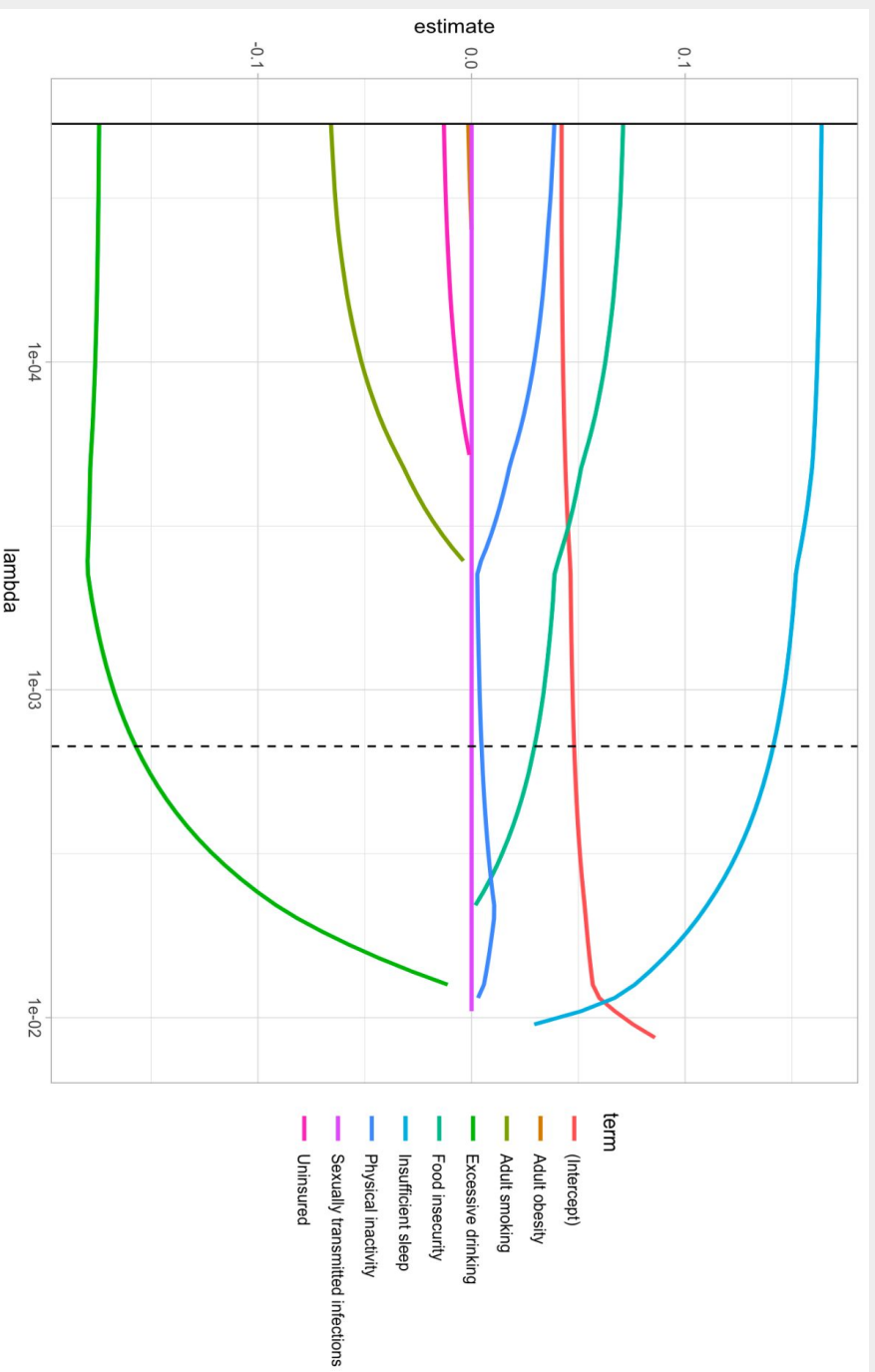
Low birthweight



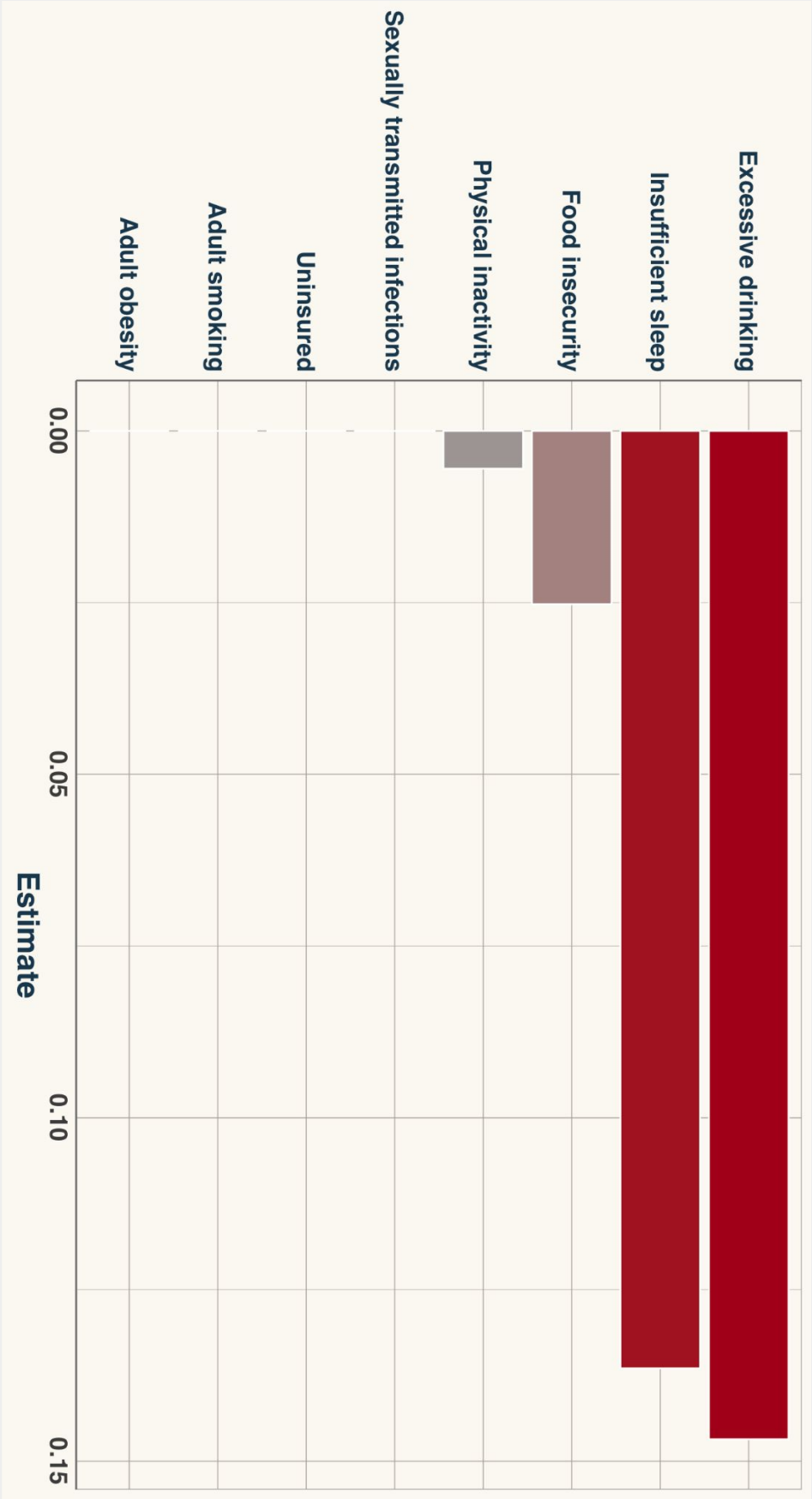
Lasso Regression for predicting low birthweight

Variable selection and shrinkage penalty for preventing overfitting and greater interpretability

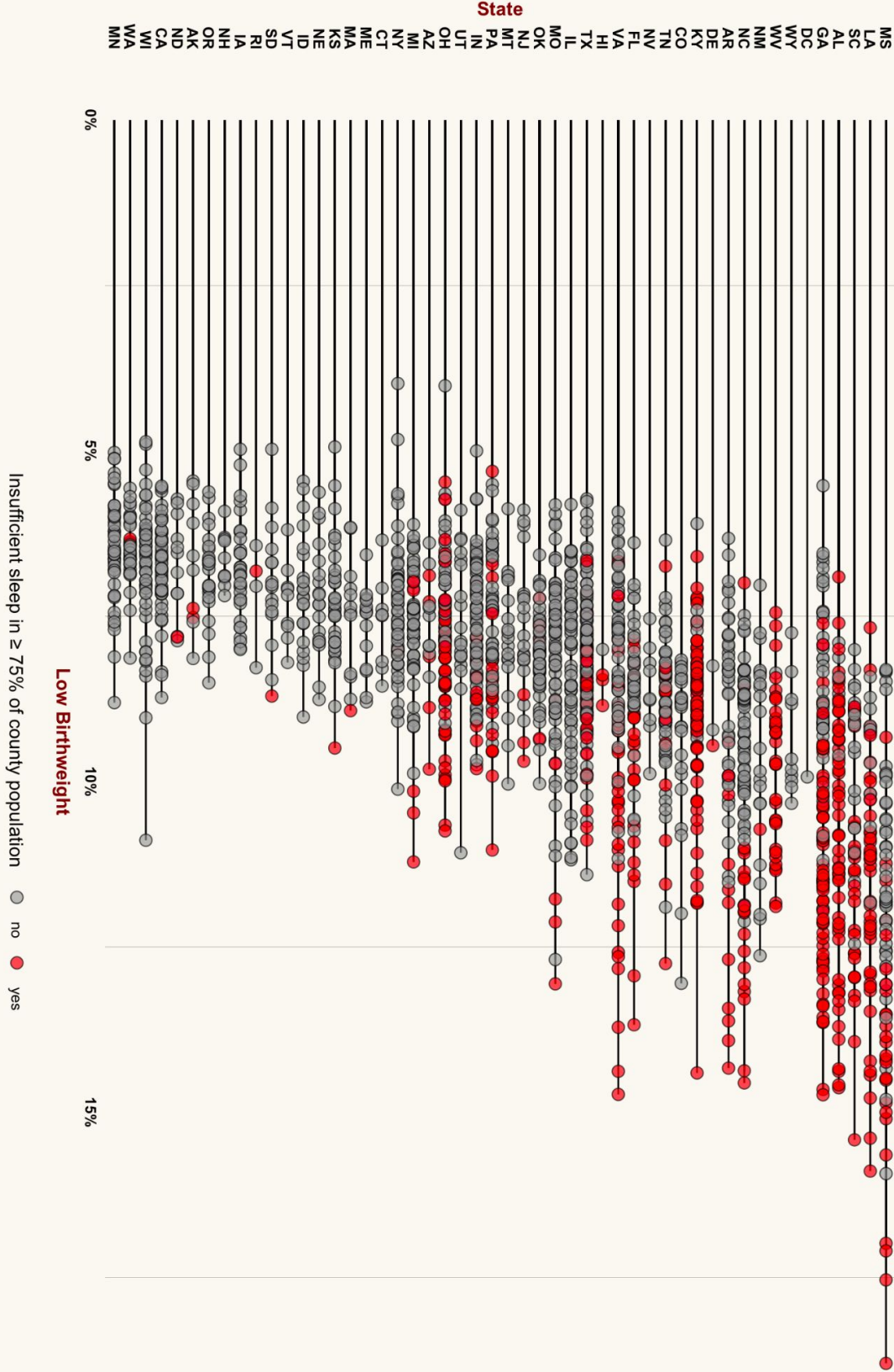
- λ was picked with 10-fold cross validation (cv.glmnet)
- Solid line on the left is the lambda.min that gives the minimum mean cross-validated error.
- Dashed line is the largest value of λ such that the cross-validated error is within one standard error of the minimum mean cross-validated error



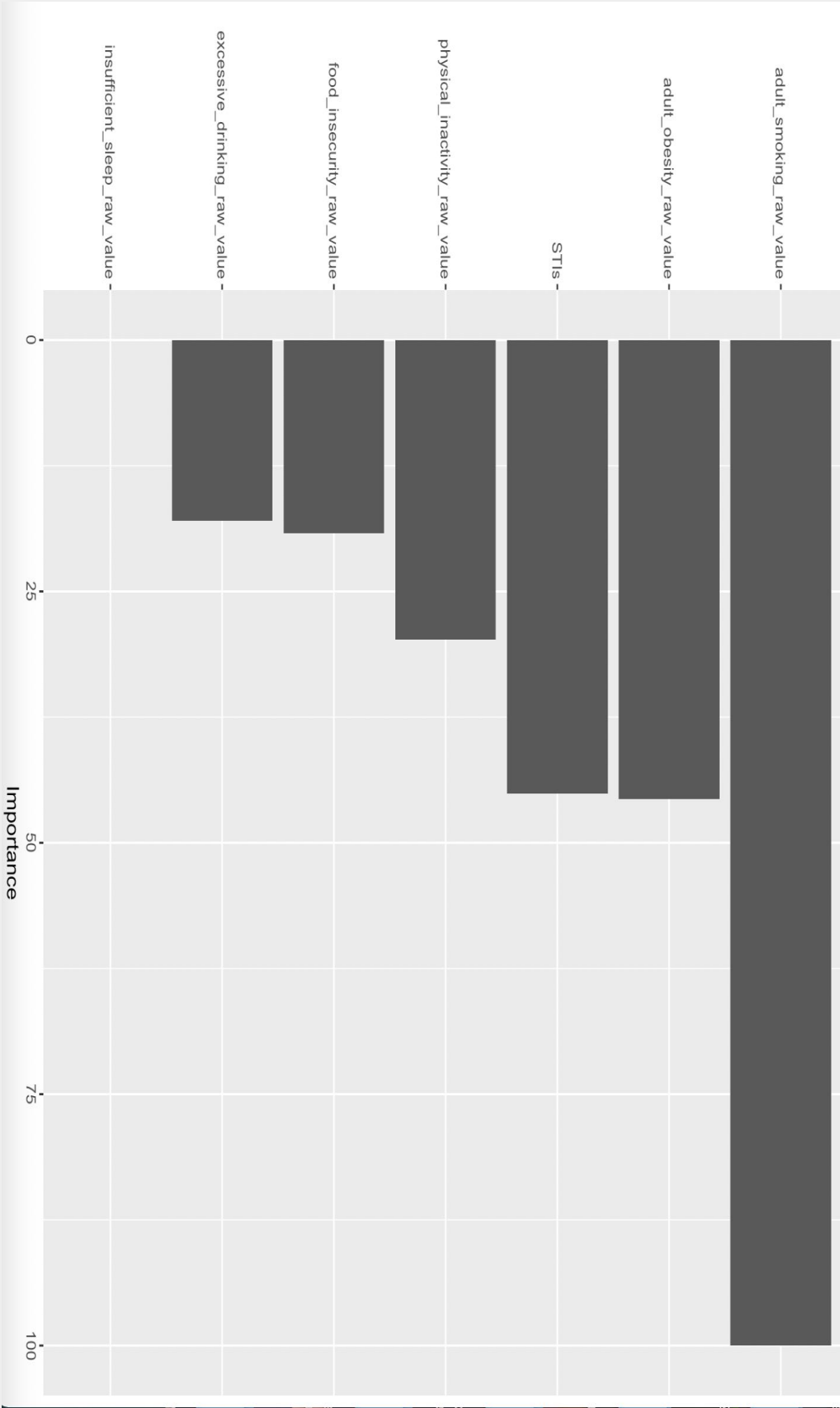
Excessive drinking and insufficient sleep are the strongest predictors of low birthweight



Across the United States



Variable Importance Graph



Future Steps

- Editing aesthetics of graphs
- Finalize inferences/takeaways from models
- Finish report and poster
- Investigating potential limitations
 - Gender with excessive drinking
 - Parent to child data
- Investigating future work
 - Intervention programs e.g. (where and who)