

Enhancing Care Delivery for the Homeless: A Collaborative Needs Assessment Initiative

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Introduction

- Recent, multi-state secret shopper audits of community pharmacies have found that 48.3% and 57.9% of pharmacies were able to dispense buprenorphine (BUP) in response to requests to patients and providers, respectively.
- Our aim was to provide an accurate predictive model with readily understandable rules that determine where BUP may be located within a community.

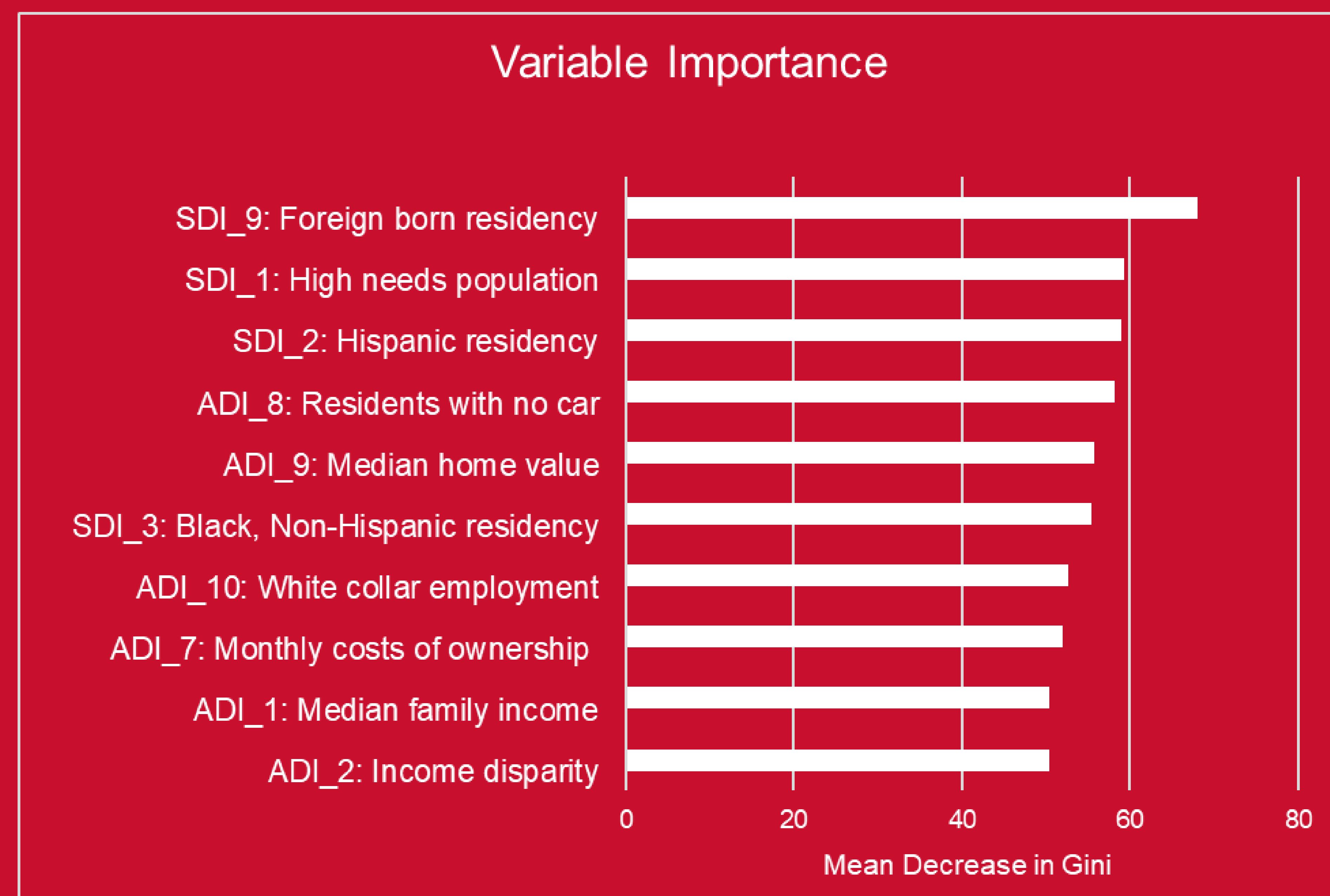
Methods

- Results of a telephone audit of BUP availability in 4,984 community pharmacies in 11 states (Hill, et al.) were used to define the dependent variable in this analysis, a binary indicator for whether a pharmacy was willing to dispense 14 BUP/naloxone films in response to a telephonic patient request.
- Pharmacies were geocoded to the census block group level.
- Twenty-three unique features of the Area Deprivation Index and Social Deprivation Index were extracted from the 2022 American Community Survey at the census block-group level to characterize the demographic, employment, income, and transportation characteristics of the pharmacy-surrounding area.
- Rural urban commuting area code and pharmacy type (chain or independent) were also included as features.
- Random forest modeling was used to predict BUP availability.
- Model tuning prioritized parsimony and interpretability by requiring a maximum depth of eight levels and a minimum node size of 50 observations.
- After assessing model fit, accuracy, and variable importance (Mean Decrease in Gini), Shapley Additive Explanation (ShAP) Values were used to identify the contribution of each predictor to the model.

Conclusion

- BUP availability in community pharmacy can be accurately predicted by the socioeconomic and demographic characteristics of the residents of the census block group containing that pharmacy.
- Residents of predominantly non-white and immigrant neighborhoods are less likely to have access to medication for opioid use disorder within community pharmacies.
- Limited access within these areas represents a threat to the health and wellbeing of those attempting to access treatment.
- Our findings are suggestive of a disparity in access but more work is needed to be able to adequately measure treatment demand at the neighborhood level.

Neighborhood-level characteristics accurately predict availability of buprenorphine in community pharmacies. Buprenorphine is less available in diverse neighborhoods with lower home values.



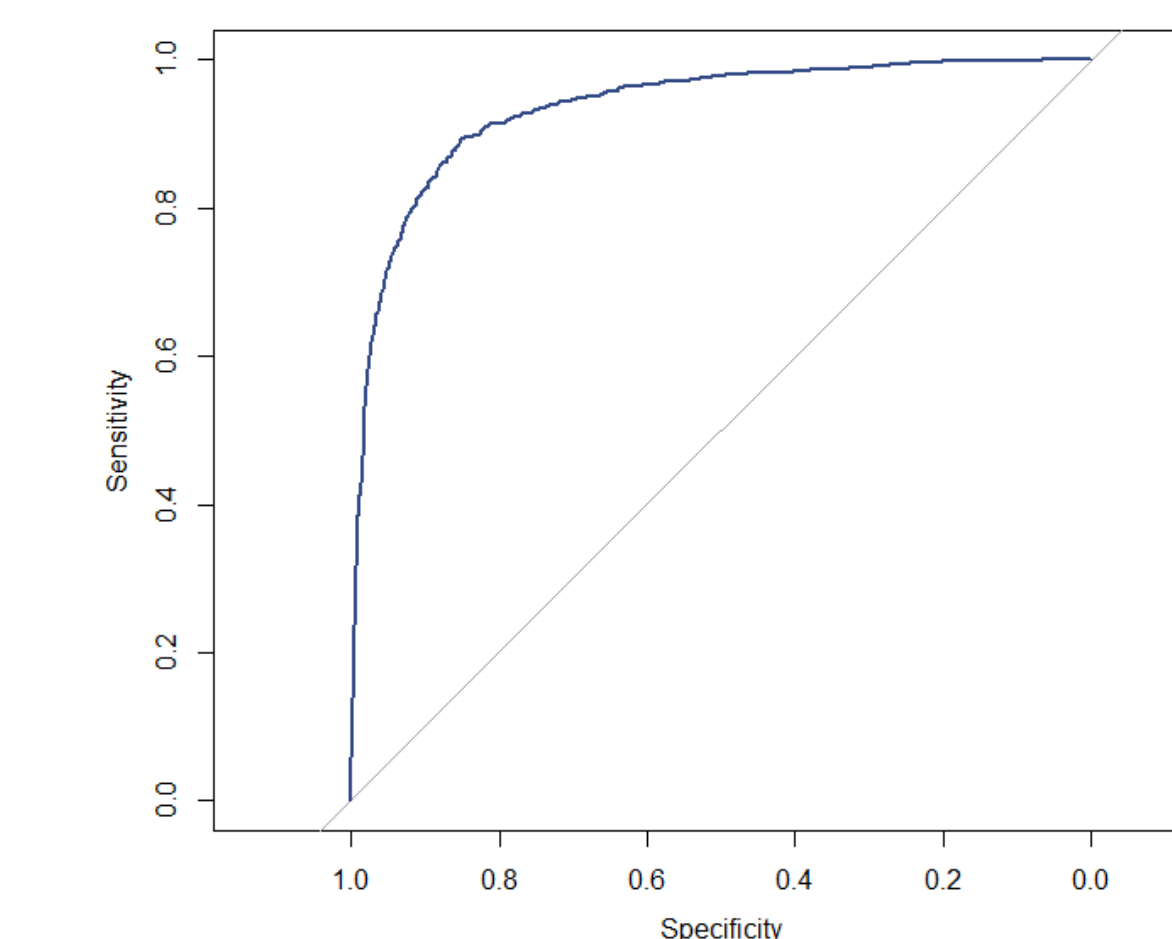
Figures and Tables

Confusion Matrix and Measures of Model Fit

Reference	Prediction	
	Not in Stock	In Stock
Not in Stock	1,917	107
In Stock	298	709

Indicator:	Value:
Accuracy:	0.87
Sensitivity:	0.87
Specificity:	0.87
Positive Predictive Value:	0.95
Negative Predictive Value:	0.74

Receiver Operating Curve (AUC: 0.94)



Shapley Additive Explanation Values for Selected Features



Key References

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