Mental Health & Incarceration

MCRT3
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Agenda

01 Problem Statement

02 Data Exploration & Machine Learning

03 Limitations

04 Policy Recommendations & Future Work

Problem Statement

More than 60% of inmates suffer from mental health conditions

Goal

- Improve quality of life
- Positively impact community health
- Reduce rate of re-incarceration

Policy Impact

- Identify 100 people who are most “at-risk” for re-incarceration
- Proactively provide mental health treatment

Effectiveness

Reduce the reincarceration rate among former inmates who are at risk of being reincarcerated due to untreated mental health conditions.

Efficiency

Due to constrained resources, we want to ensure that the 100 individuals are actually highest-risk of reincarcerated.

Equity

Those 100 individuals identified monthly for proactive mental health outreach belong to communities most negatively affected by reincarceration.

Data Exploration & Machine Learning

Data Sources

01	Justice Information Management System Department (JIMS)	• Inmate Demographic and Background Information • Case Information • Pre-trial Risk Assessment Results
02	Johnson County Mental Health Center (JCMHC)	• Financial Status Information • Mental Health Assessment Information • Crisis and Emergency Call Information
03	Johnson County Police Department	• Arrest Information • Charge Information
04	Medical Emergencies Department (MEDACT)	• Patient Encounter Information

On the first of every month, of all the individuals who were released from Johnson County Jail in the last 2 years and are not currently in jail, we aim to identify **100 individuals** who are most likely to return to jail in the next year to prioritize proactive mental health interventions to prevent re-incarceration

Modelling Plan

Rows
A person on a certain date

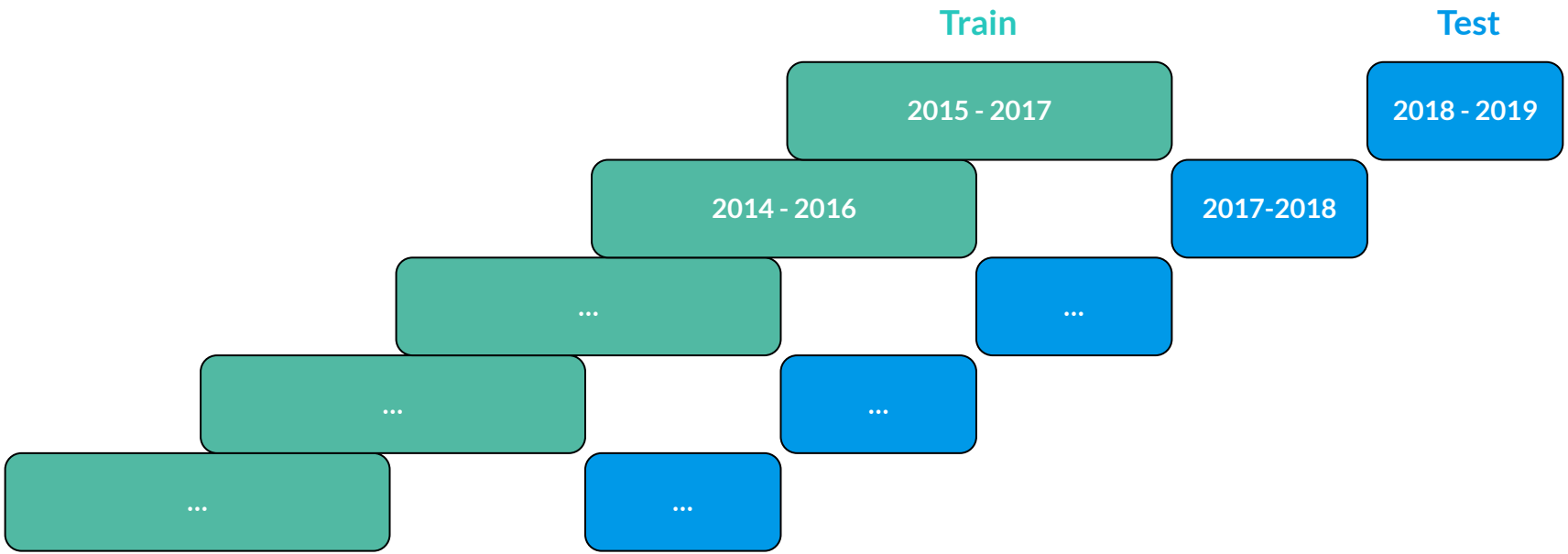
Labels
Whether or not this person will be re-incarcerated within the next year of this date.
The value is 1 if True, and 0 if False.

Features
Demographics | Criminal Justice History | Mental Health History | Risk Evaluation

Model Types
Decision Tree | Random Forest | Scaled Logistic Regression | Gradient Boosting | Neural Network

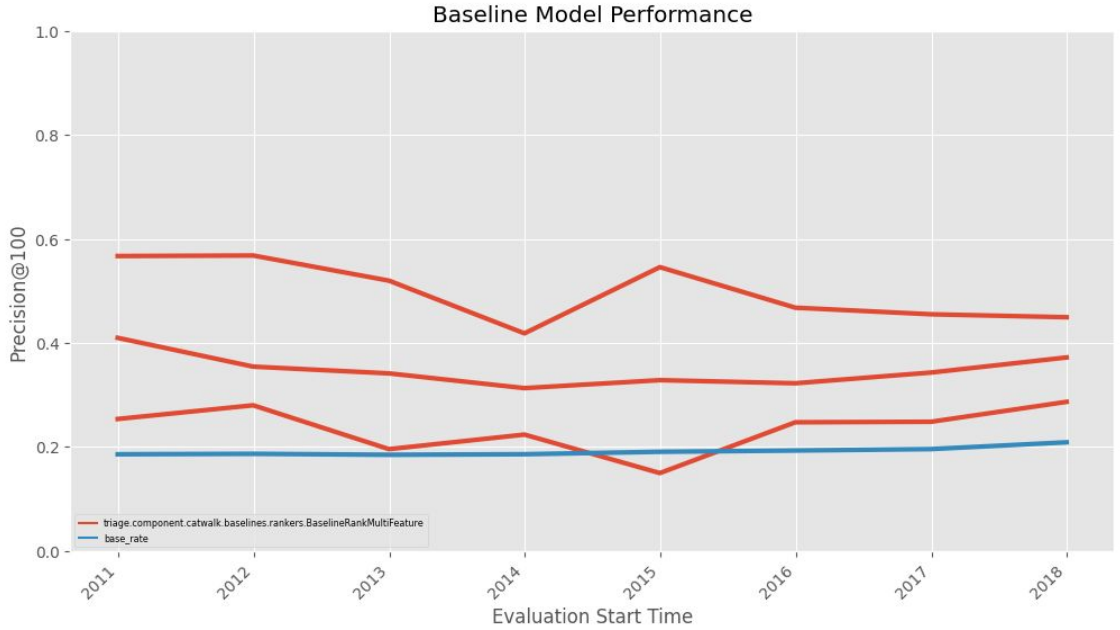
Model Selection Metrics
Out of the 100 people that the model assigned top risk scores, how many of them actually end up being reincarcerated.

Temporal Validation

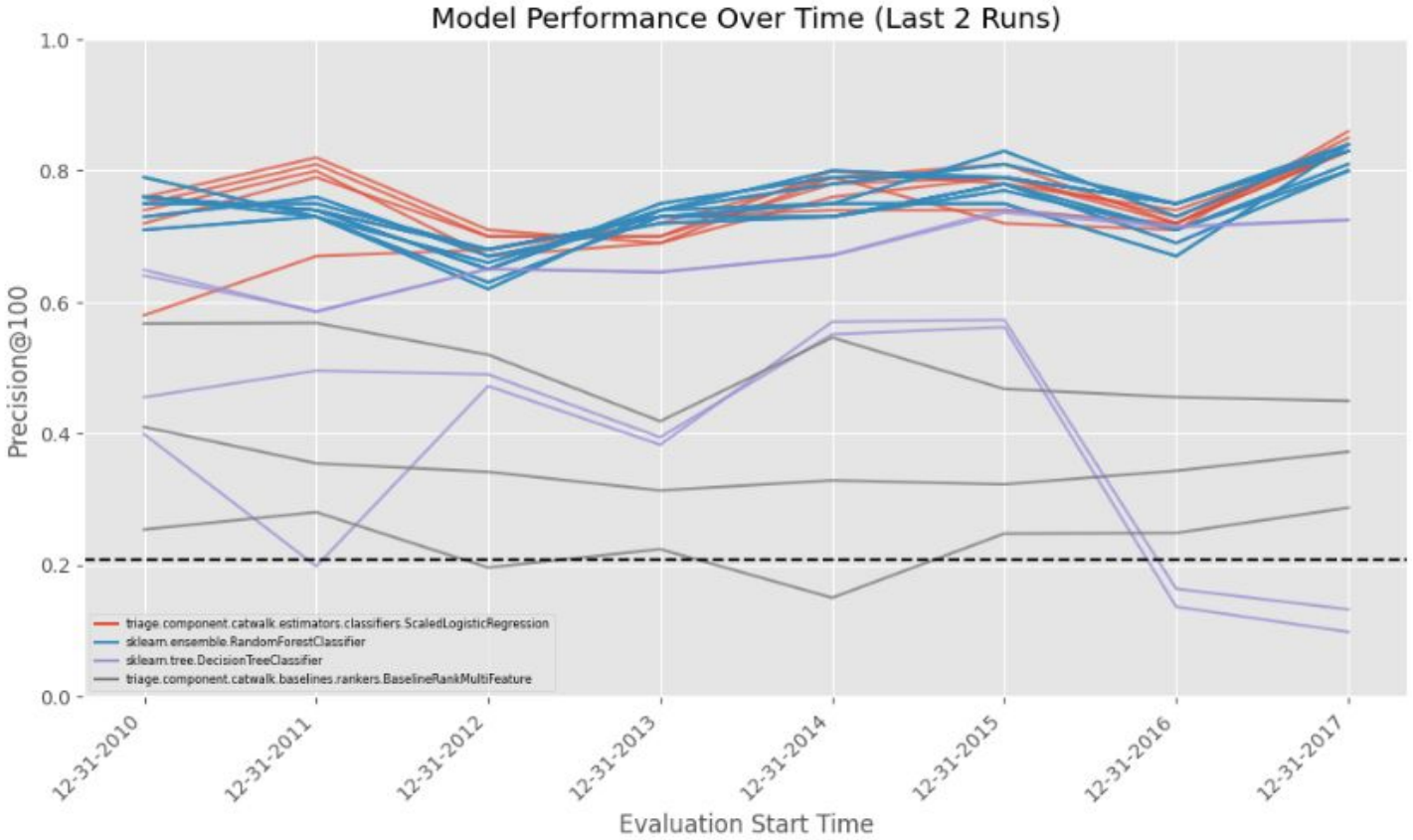


Baselines

1. People who have visited JCMHC the most since the feature start time
2. Number of bookings since the feature start time
3. Average time between current release and next booking

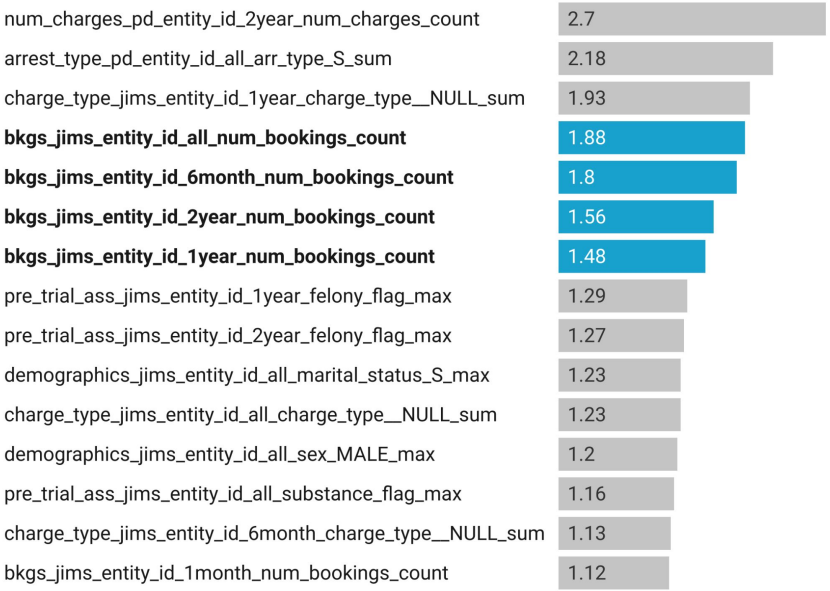


Model Performance

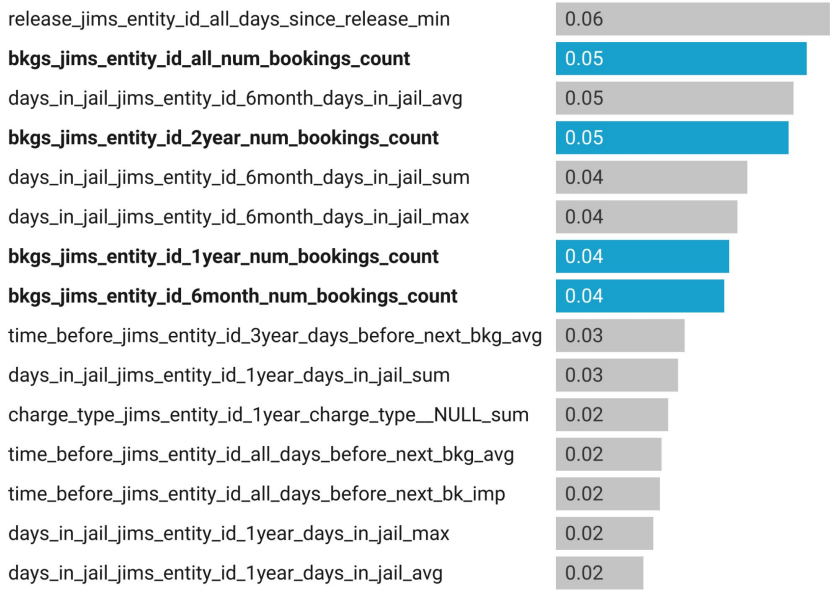


Feature Importances

Scaled Logistic Regression

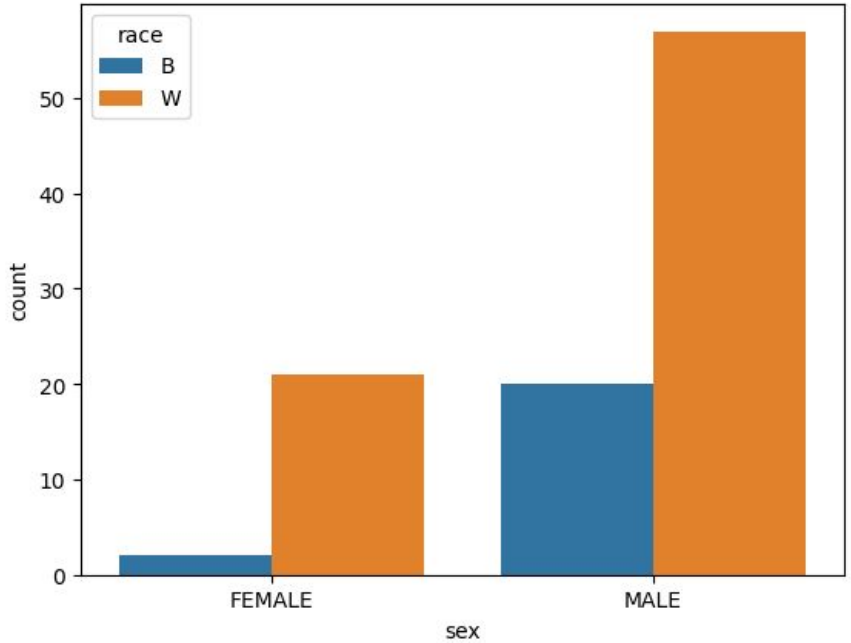


Random Forest

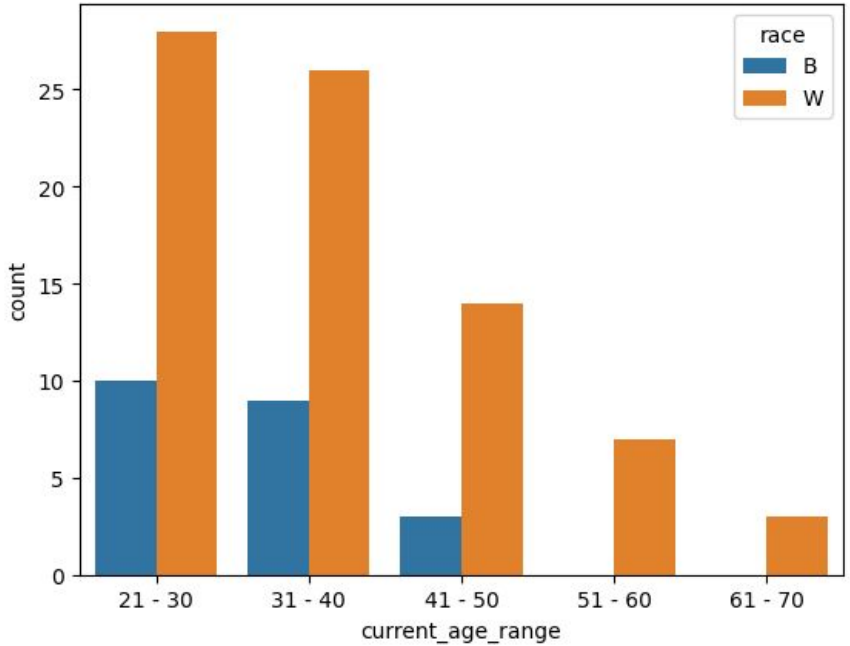


Characteristics of Those Classified as *At Risk*

Breakdown of Sex and Race



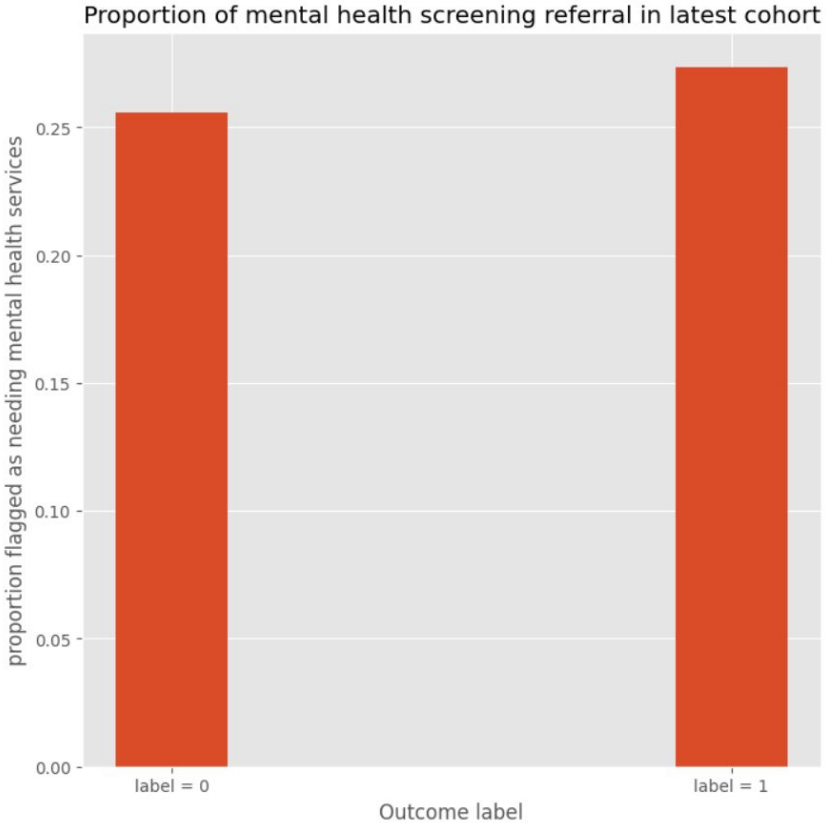
Breakdown of Age and Race



Limitations

Our analytical formulation **does not** explicitly incorporate mental health into the cohort or label structure

There is a small difference between mental health outcomes in the latest cohort



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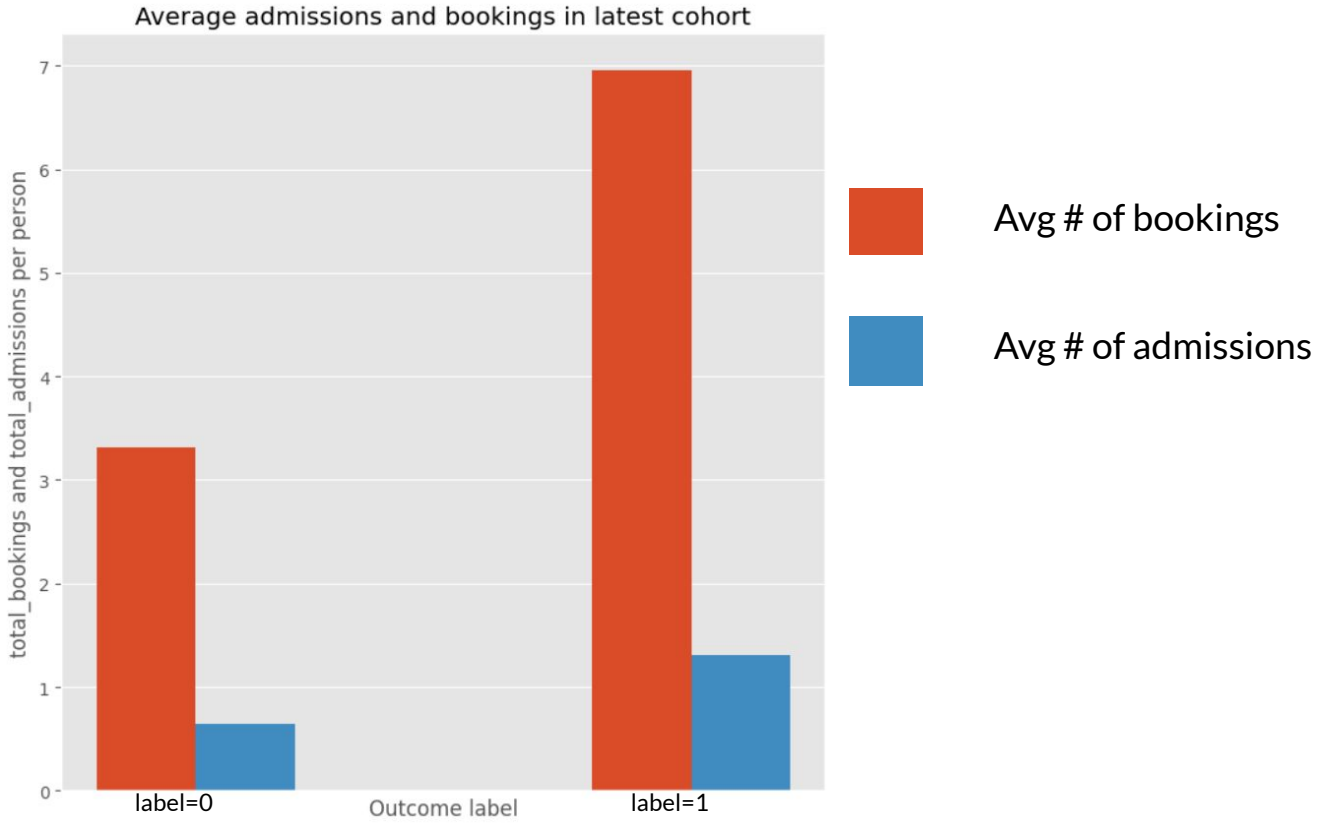
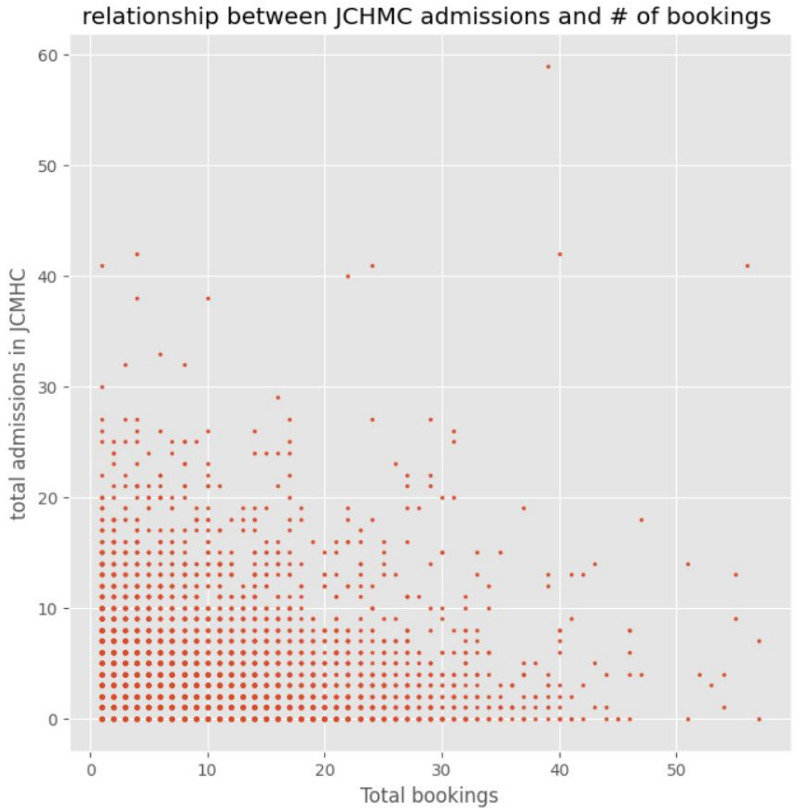
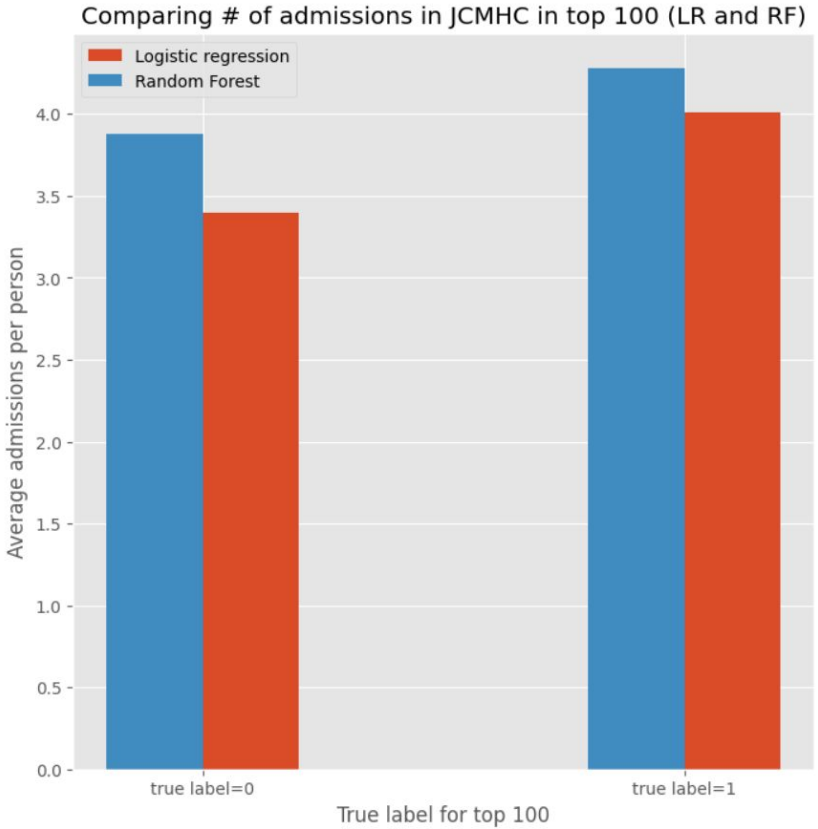


We don’t see a strong correlation between bookings and JCMHC admissions



There is a small difference in MH outcomes between correct and incorrect predictions



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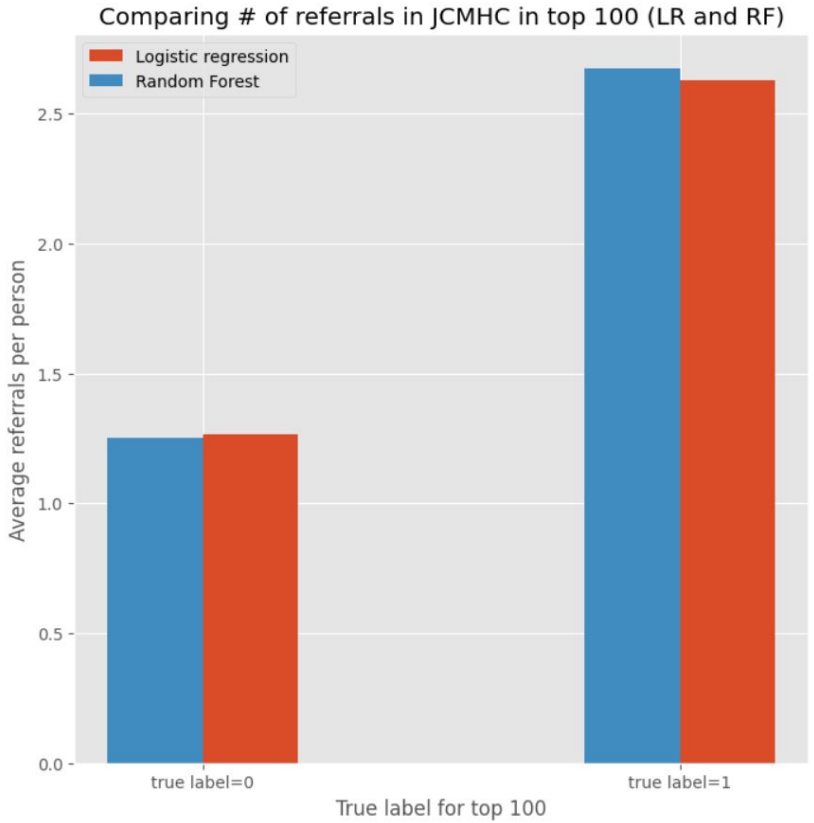
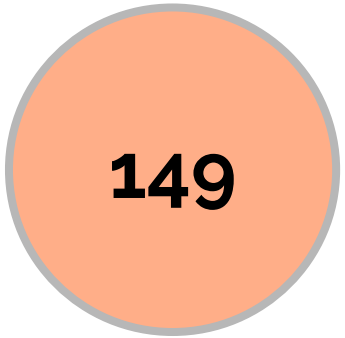
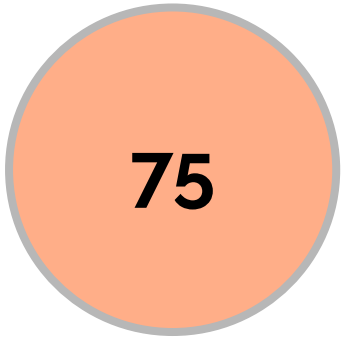


How important are the mental health features?



Models with precision > 85%
on latest evaluation set

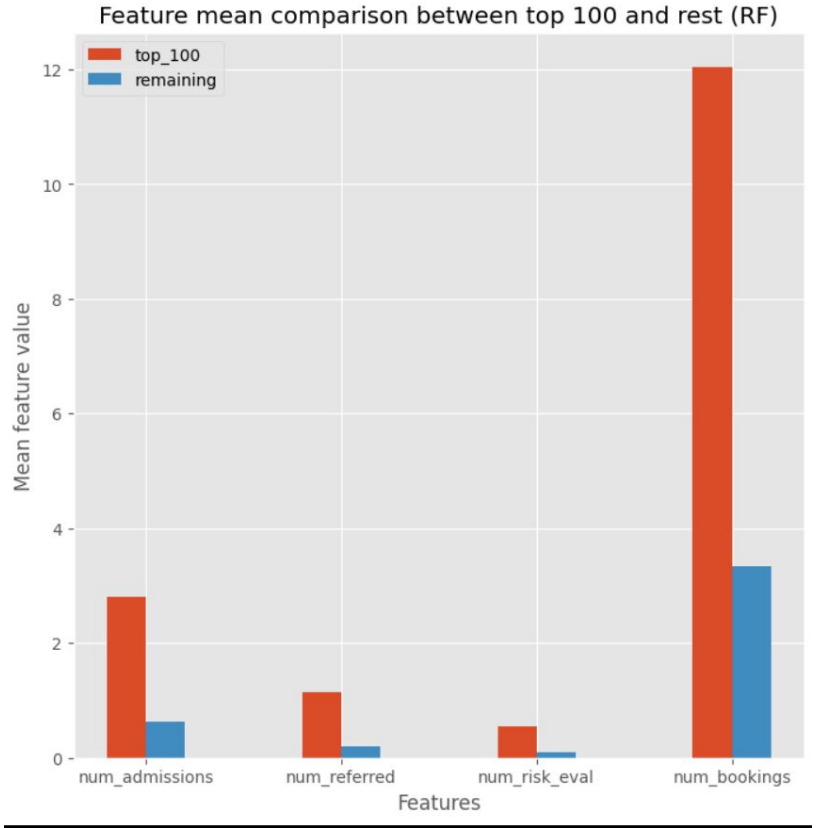


Models having a MH
feature in top 20

Best rank any feature gets in any mode → 8

Best ranked MH feature → # of admissions in JCMHC

Criminal justice features have a higher difference between top 100 and the rest



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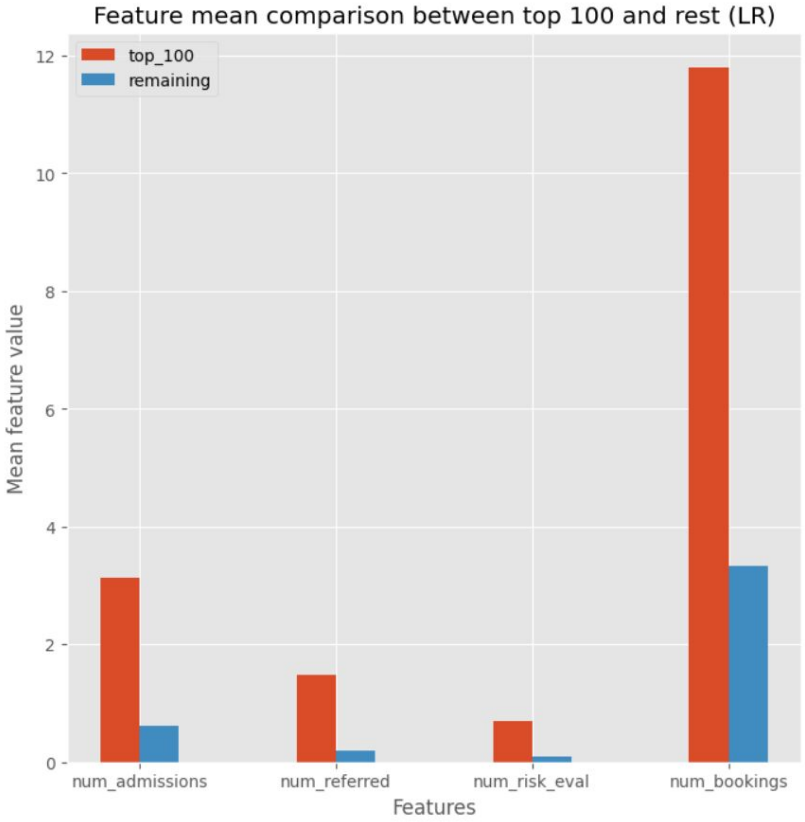


Policy Recommendations & Future Work

Targeting interventions

- GAO: Importance of early screening
  - Expansion of BJMHS
  - Follow-up surveying
  - Assess survey for potential bias
- Proactivity is key
- Personalized care plans, during and after incarceration

"Individuals should be screened **as early** in the booking process as possible and **throughout their involvement** in the criminal justice system to detect substance abuse and mental health disorders."

-GAO

Future Work

Incorporating mental health conditions in cohort definition

- Not currently accounted for in our definition
- May impact usefulness of treatment
- Expansion of BJMHS helpful in this

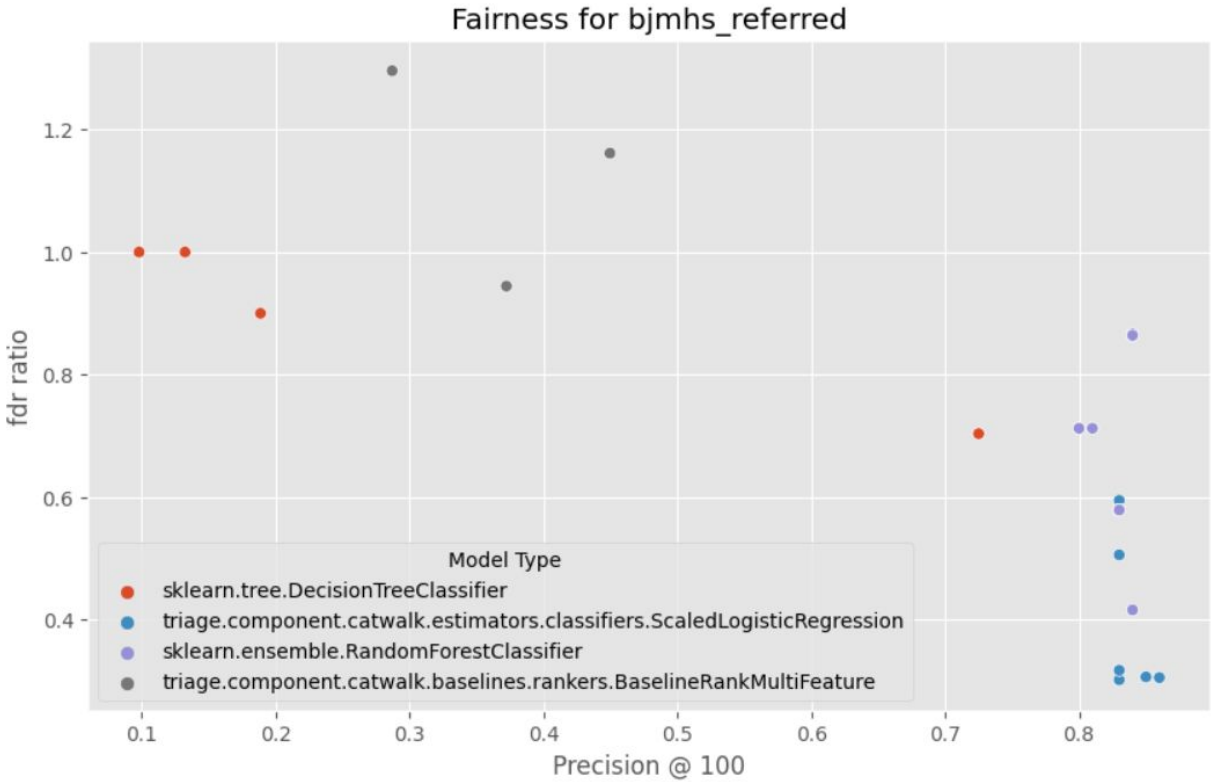
Field trial deployment

- Measuring efficacy of outreach
- Measuring potentially deleterious effects of outreach
- Regression discontinuity at 100 people served
- Iteration

Questions?

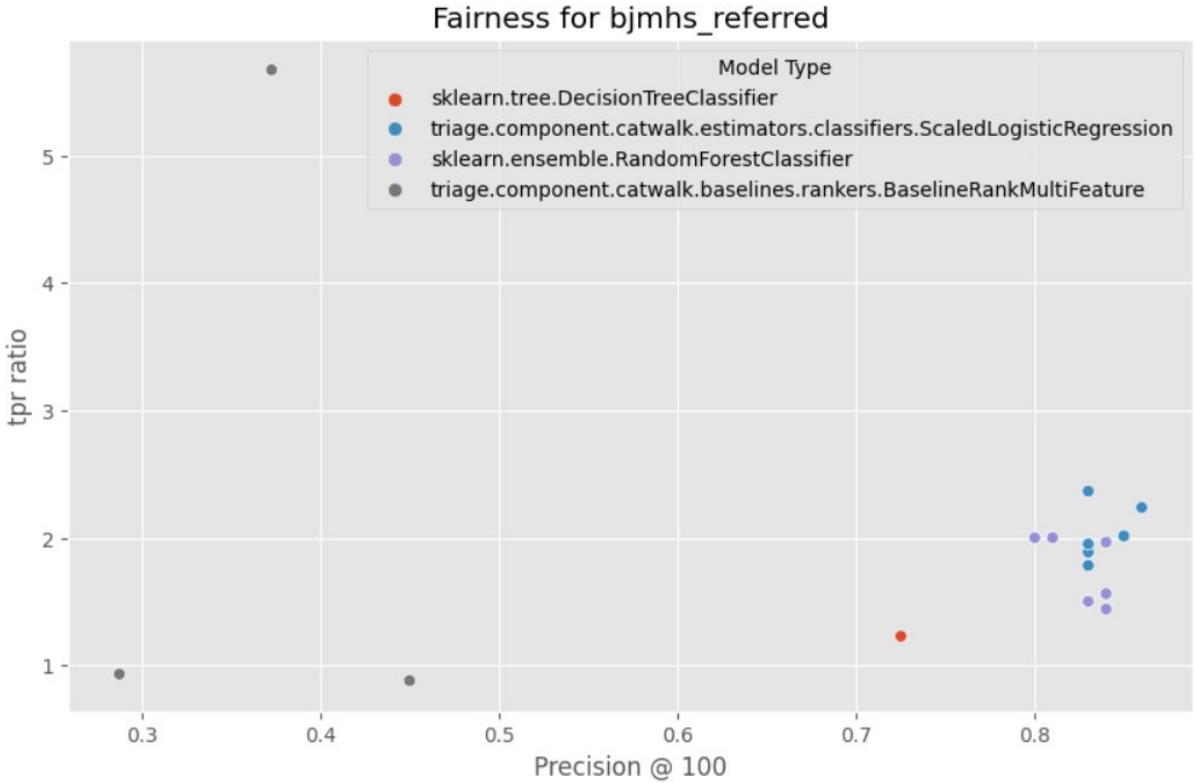
Appendix

Quick note on fairness performance on MH feature



Base group:
bjmhs_referred = 0

Quick note on fairness performance on MH feature



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