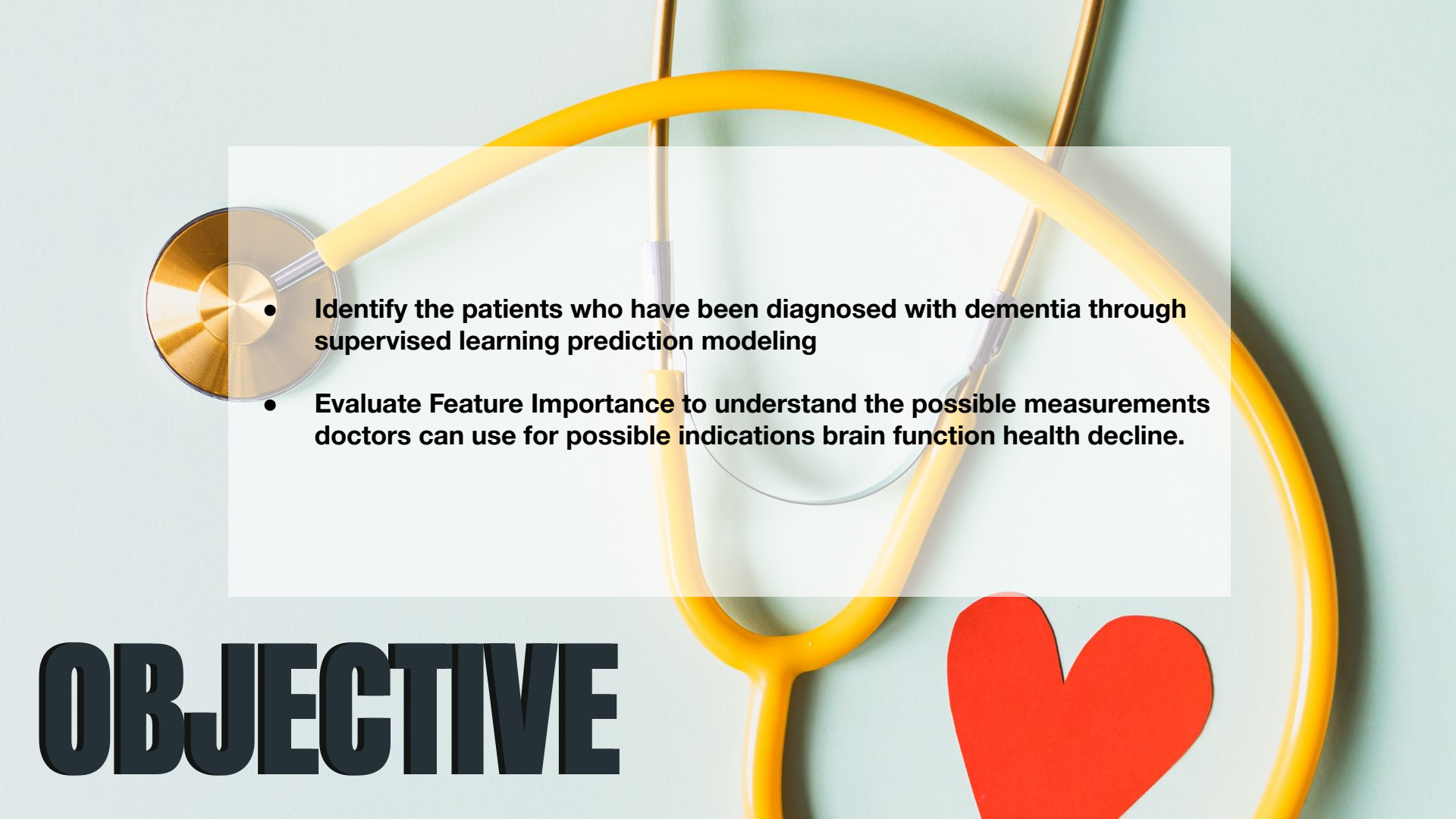
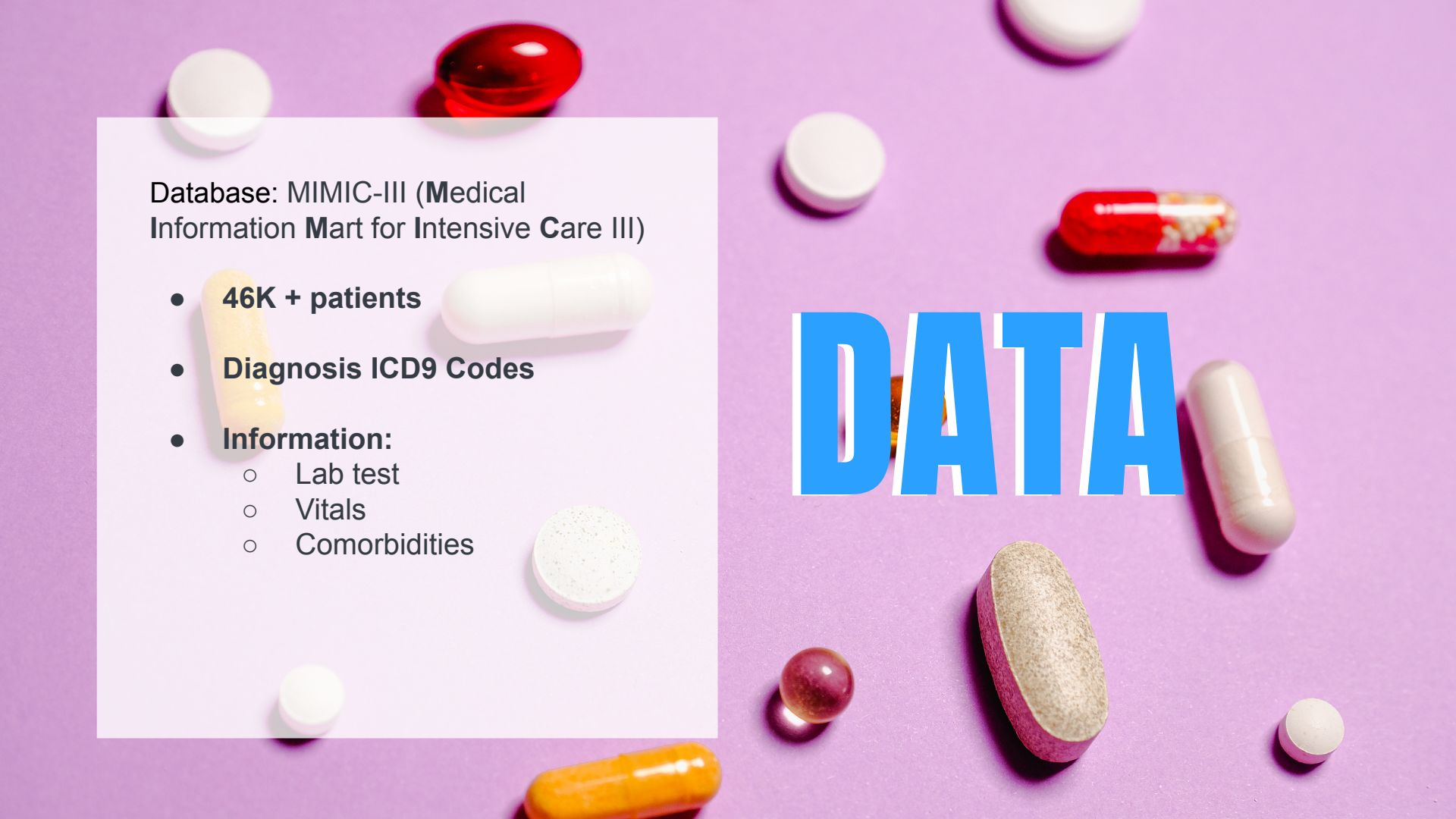


PREDICTING DEMENTIA



- 
- Identify the patients who have been diagnosed with dementia through supervised learning prediction modeling
 - Evaluate Feature Importance to understand the possible measurements doctors can use for possible indications brain function health decline.

OBJECTIVE



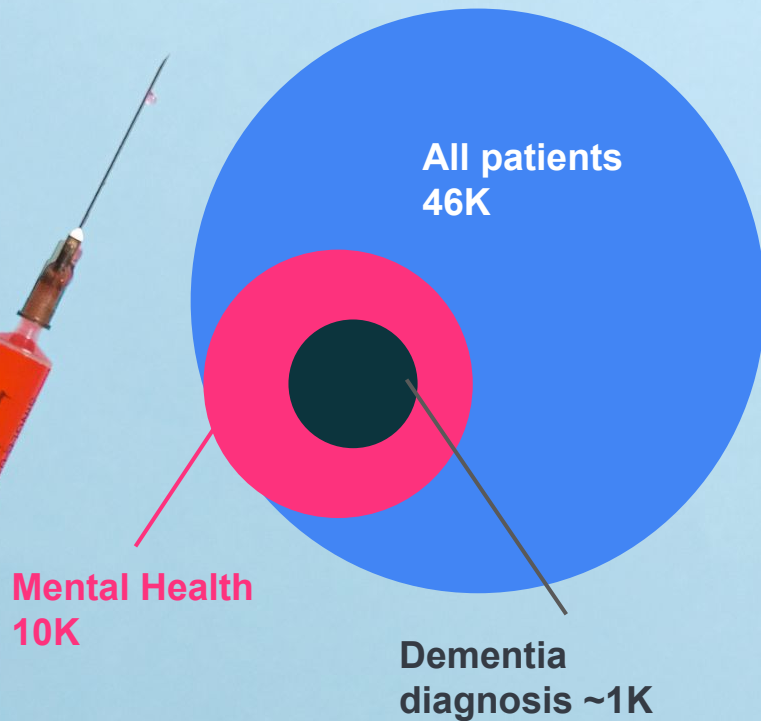
Database: MIMIC-III (**M**edical
Information **M**art for **I**ntensive **C**are **I**II)

- **46K + patients**
- **Diagnosis ICD9 Codes**
- **Information:**
 - Lab test
 - Vitals
 - Comorbidities

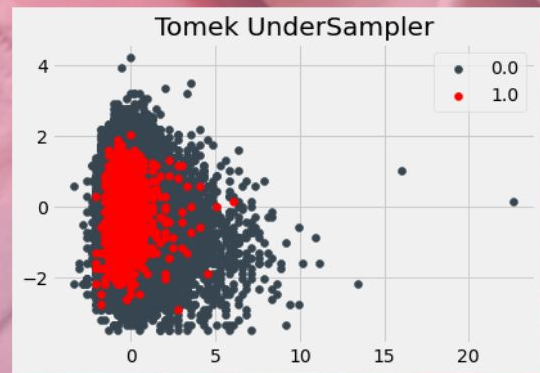
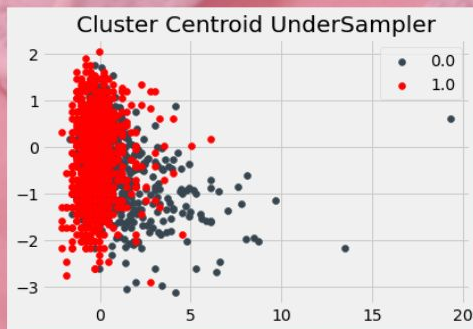
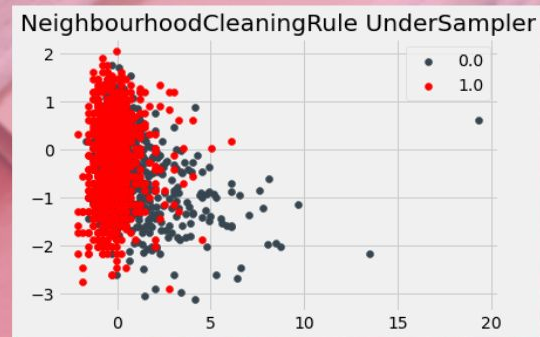
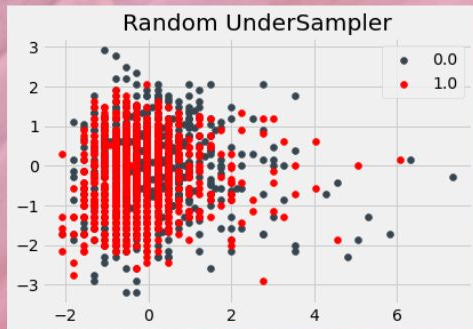
DATA

CHALLENGES

- Health Data
- Missing values
- Class imbalance
- Evaluation



CLASS IMBALANCE



STRATEGY

Strategy 1

Random undersampling of the majority class to = minority class

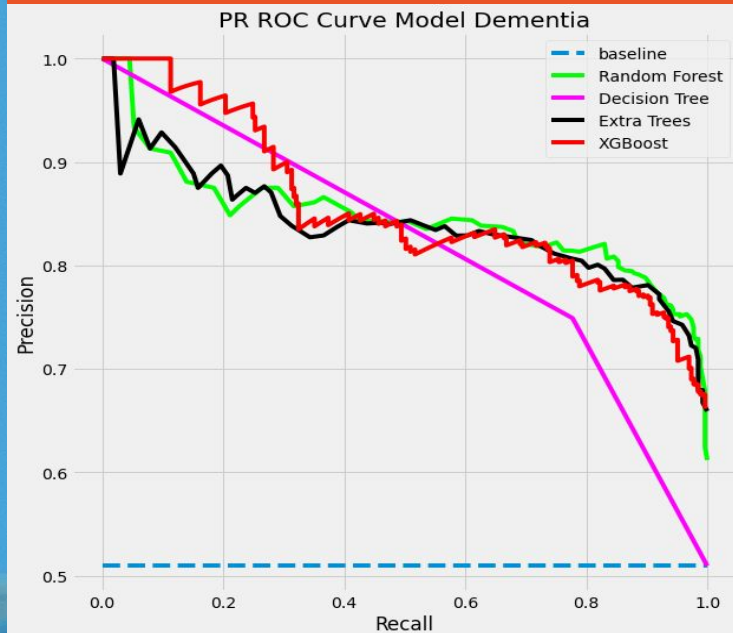
Strategy 2

Predict patients in Mental Health
~ 10K

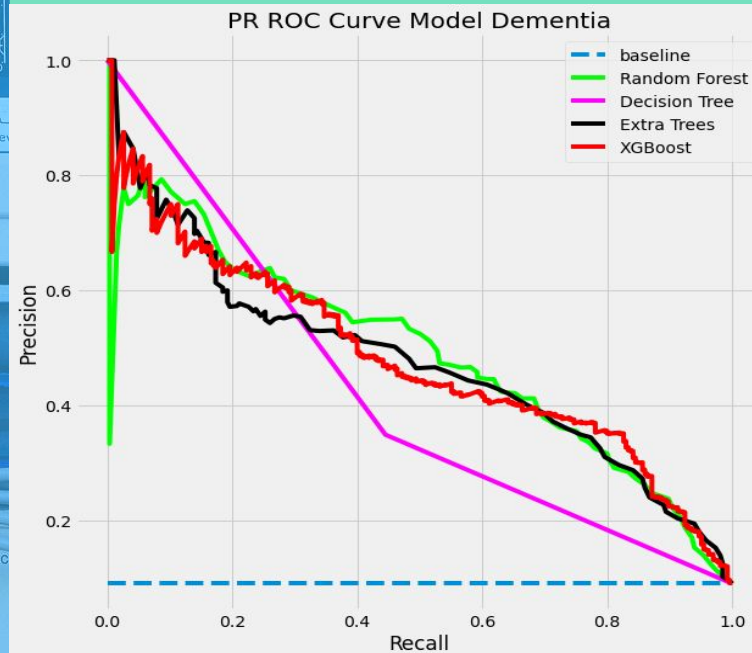
Predict dementia Diagnosis
~1000

MODELING

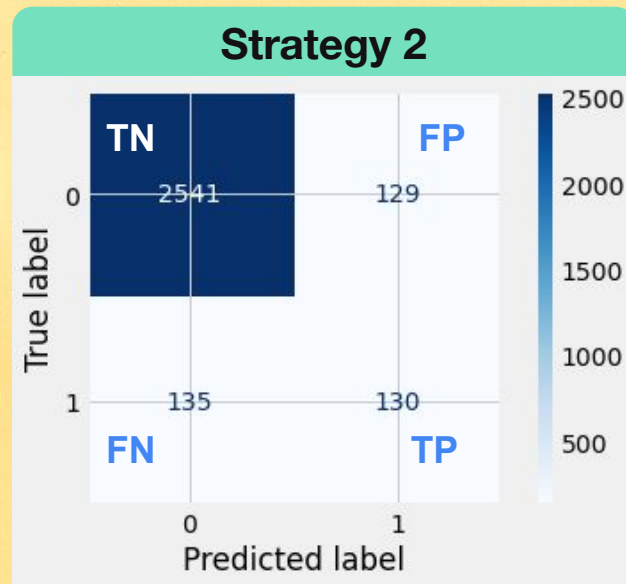
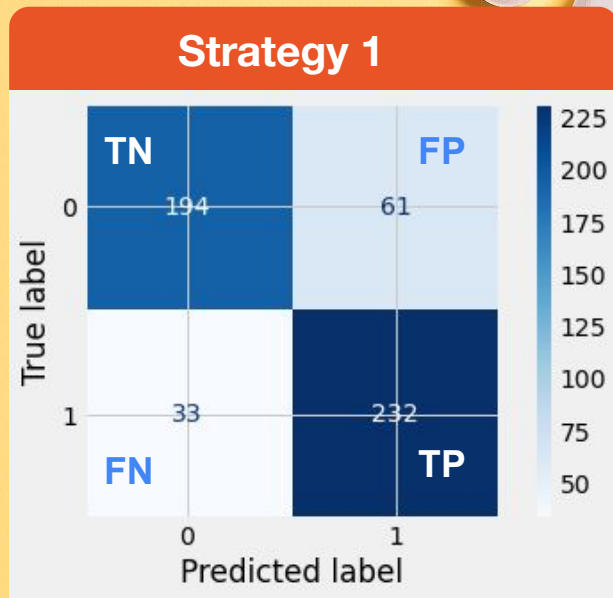
Strategy 1



Strategy 2

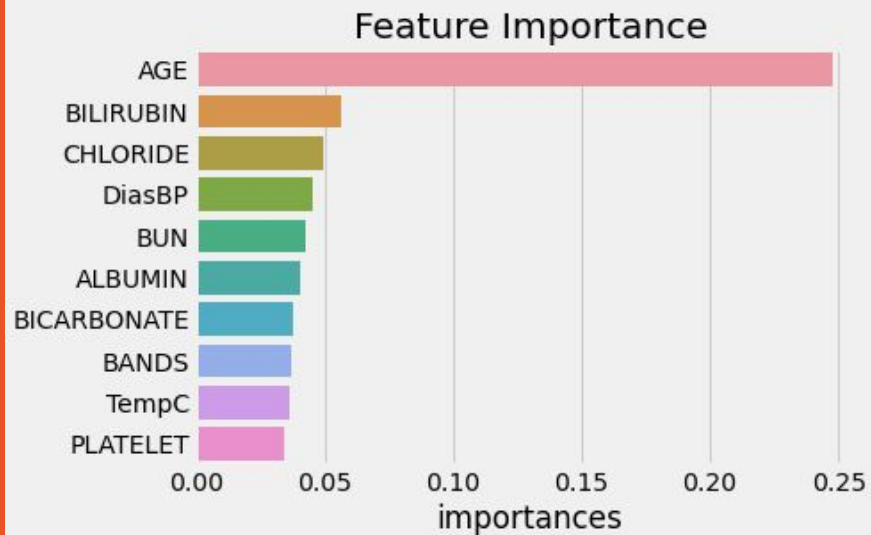


MODELING

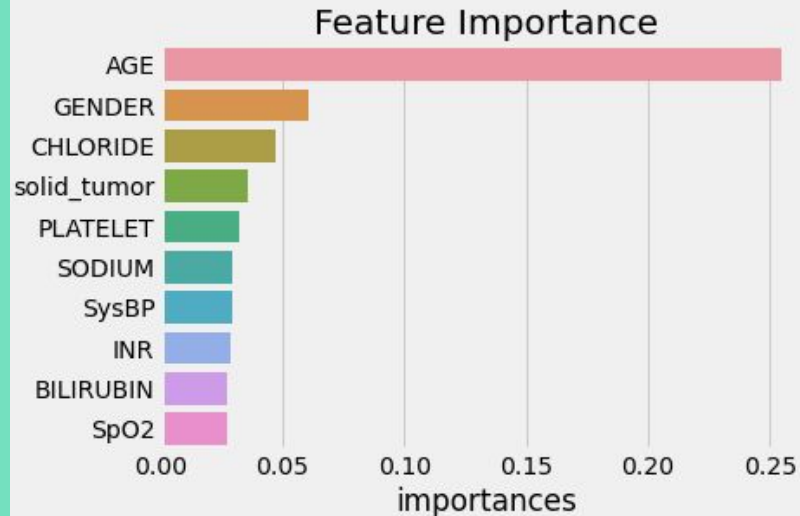


FEATURE EVALUATION

Strategy 1



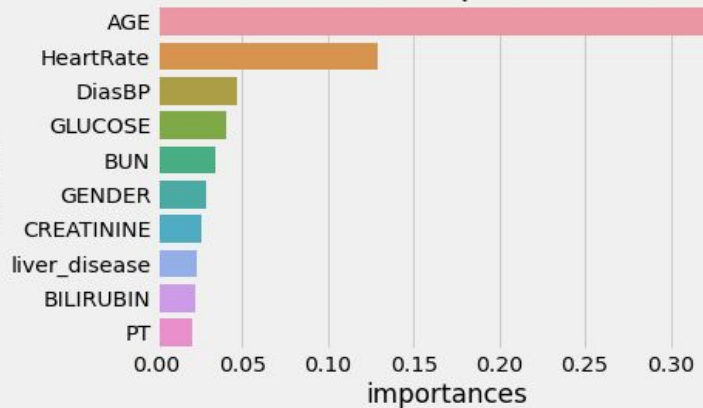
Strategy 2



MODELING

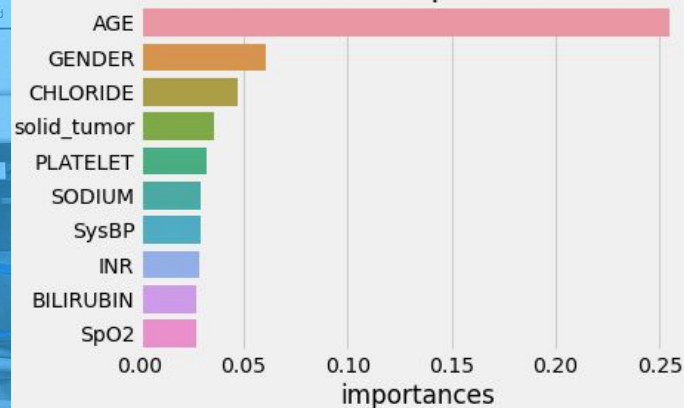
Strategy 2.1 - Mental health

Feature Importance

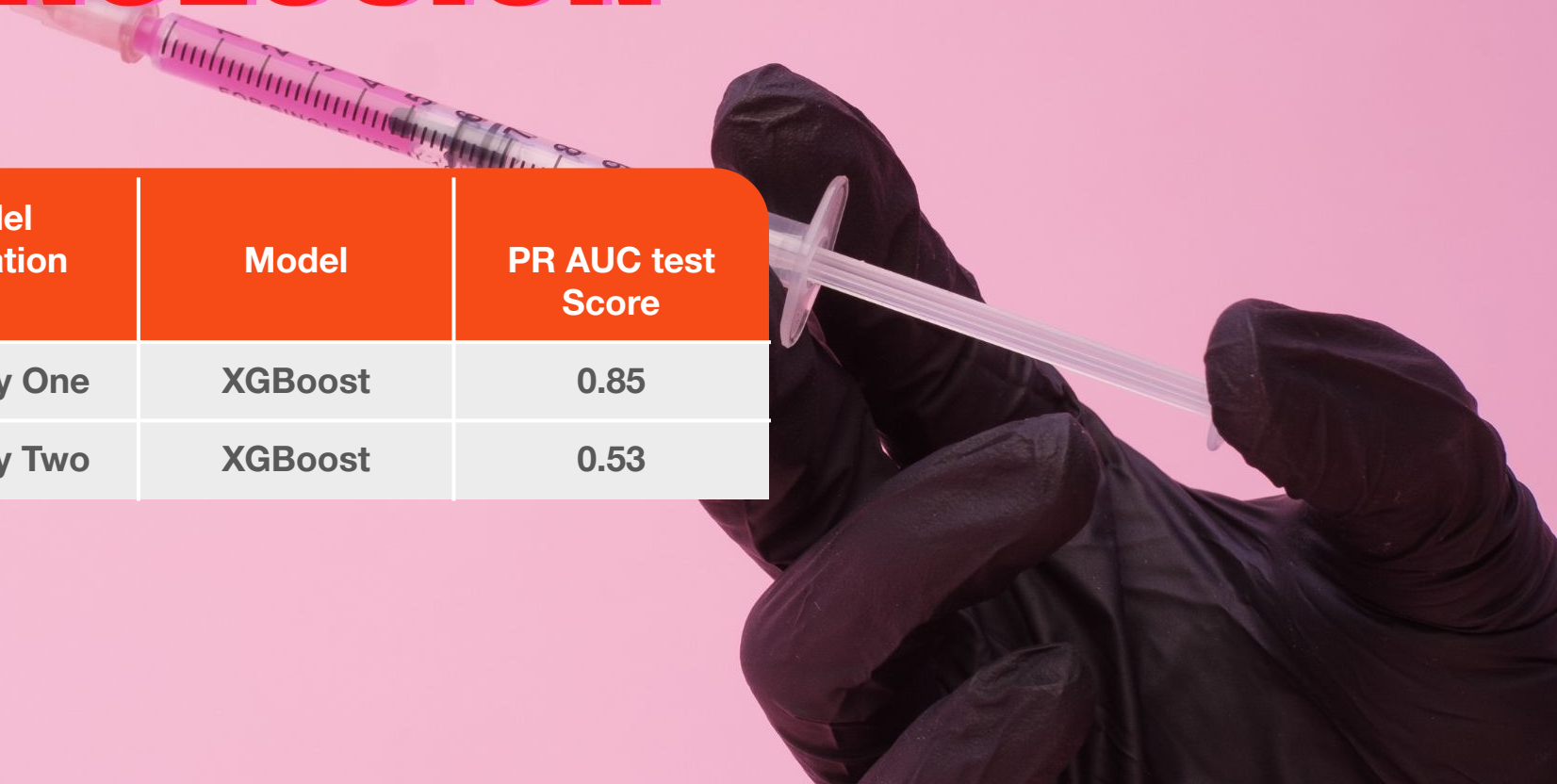


Strategy 2.2 - Dementia

Feature Importance



CONCLUSION



Model Evaluation	Model	PR AUC test Score
Strategy One	XGBoost	0.85
Strategy Two	XGBoost	0.53

CONCLUSION

Recommendation:

- Find a more balanced dataset
- More variability in features
- Further Model tuning

What indicators can be monitored for patients that could be at risk for developing dementia?

- Age
- Abnormal Serum Bilirubin/Albumin levels in lab results
- Chloride levels- helps to maintain the body's electrolyte balance It is important also for the normal function of nerves, muscles and blood clotting.



A top-down view of a silver laptop on a light-colored surface. A black stethoscope is draped over the left side of the laptop. Several pieces of crumpled white paper are scattered around the laptop: one on the keyboard, one to the left of the laptop, one to the right, and one below the laptop. A black computer mouse is positioned to the right of the laptop. The word "QUESTIONS" is overlaid in large, bold, blue capital letters across the center of the image.

QUESTIONS