COVID-19 ICU Admissions

Agenda

Problem Overview

Data Trends

Predictive Modeling

Model Justification

Problem Overview

Predicting COVID-19 ICU Admissions

Tasks At Hand

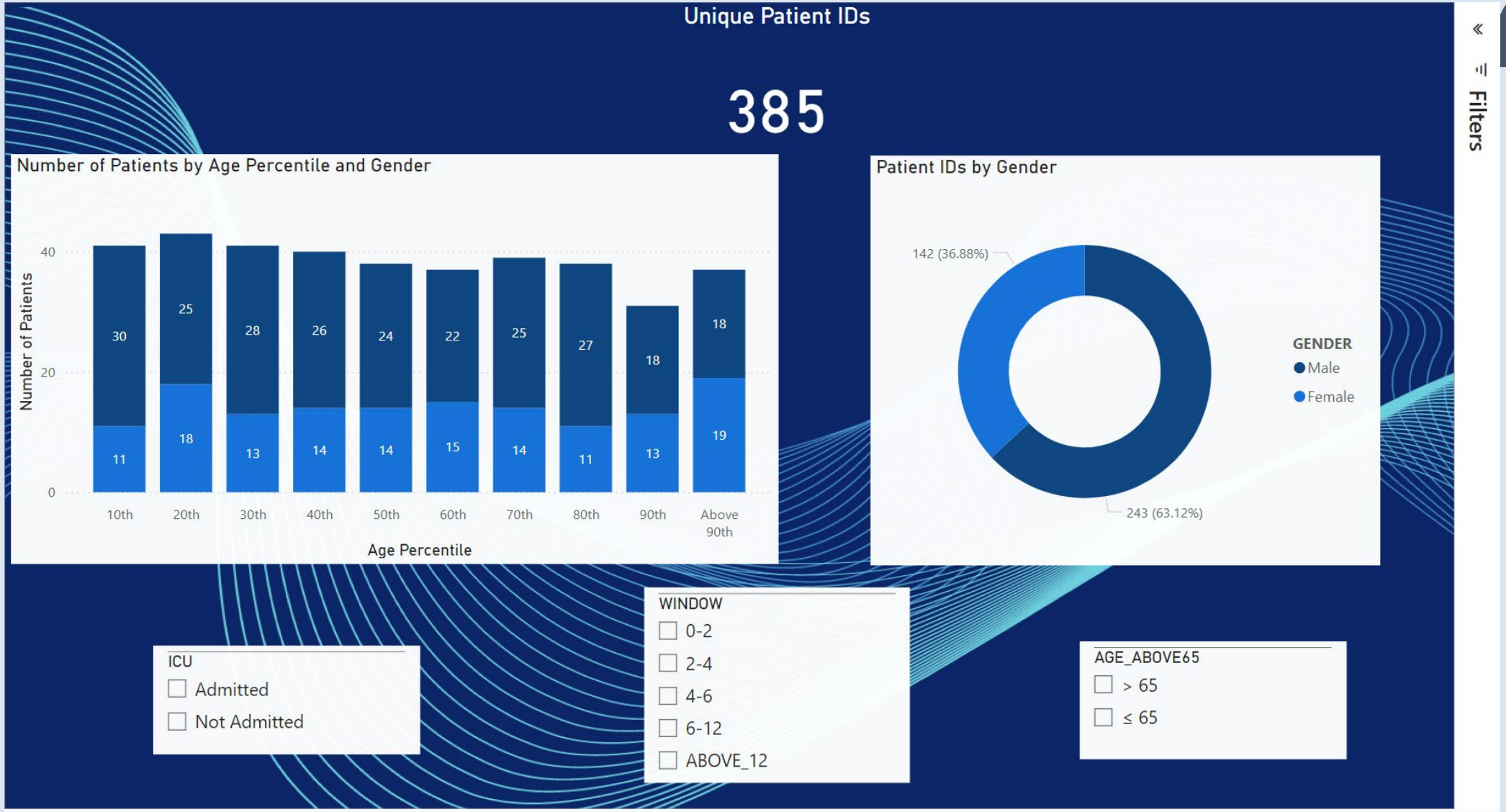
- 1. Predict **admission** to ICU of confirmed COVID-19 Cases
  - Is it feasible to predict which patients will need ICU support? Why?
  - The goal is to provide tertiary & quarternary hospitals with the most accurate answer so ICU resources can be arranged or patient transfer can be scheduled.
- 2. Predict **NOT admission** to the ICU of confirmed COVID-19 cases
  - Is it feasible to predict which patients will NOT need ICU support? Why?
  - To provide local & temporary hospitals a good enough answer so frontline physicians can safely discharge and remotely follow up with these patients.

Trends in the Data

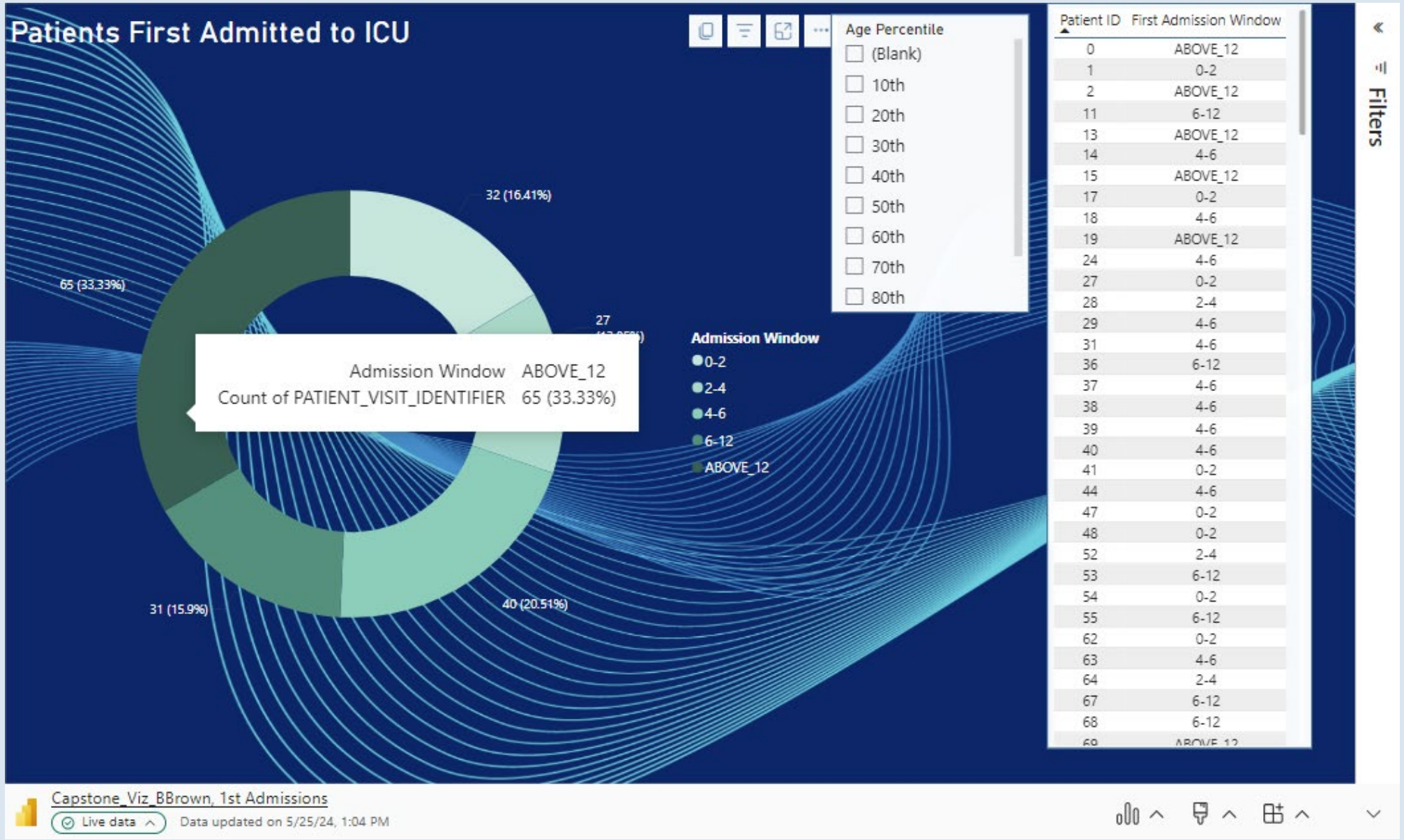
- Dataset from Hospital Sao Paulo and Brasilia
- All anonymized
- All scaled between -1 and 1
- Breakdown of Data:
    - Patient Demographic Info (3)
    - Patient Previous Grouped Diseases (6)
    - Blood results (36)*
    - Vital Signs (6)*

** Each of these is expanded to show minimum, maximum, mean, median, difference, and relative difference calculations.*

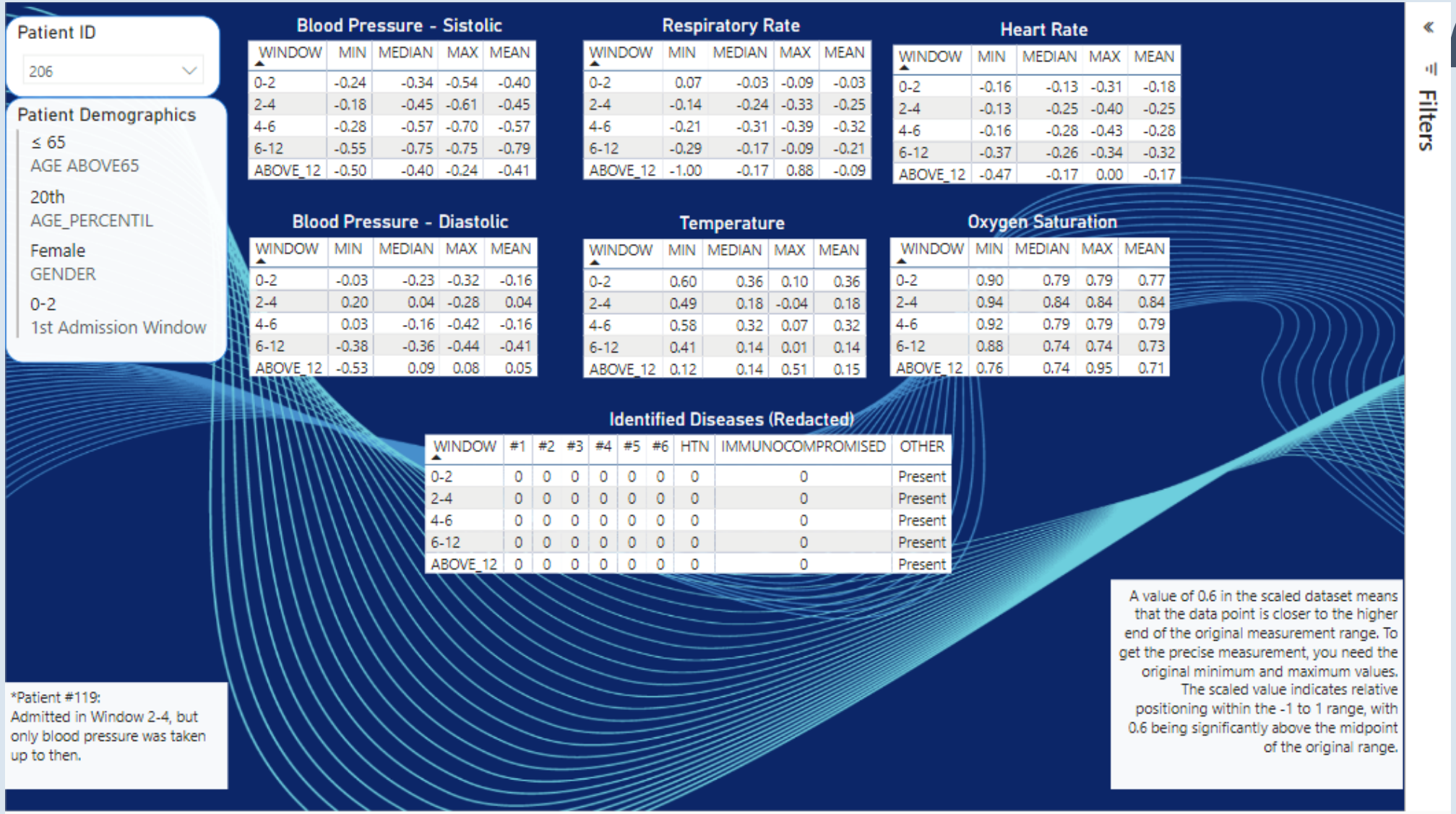
Patient Demographics



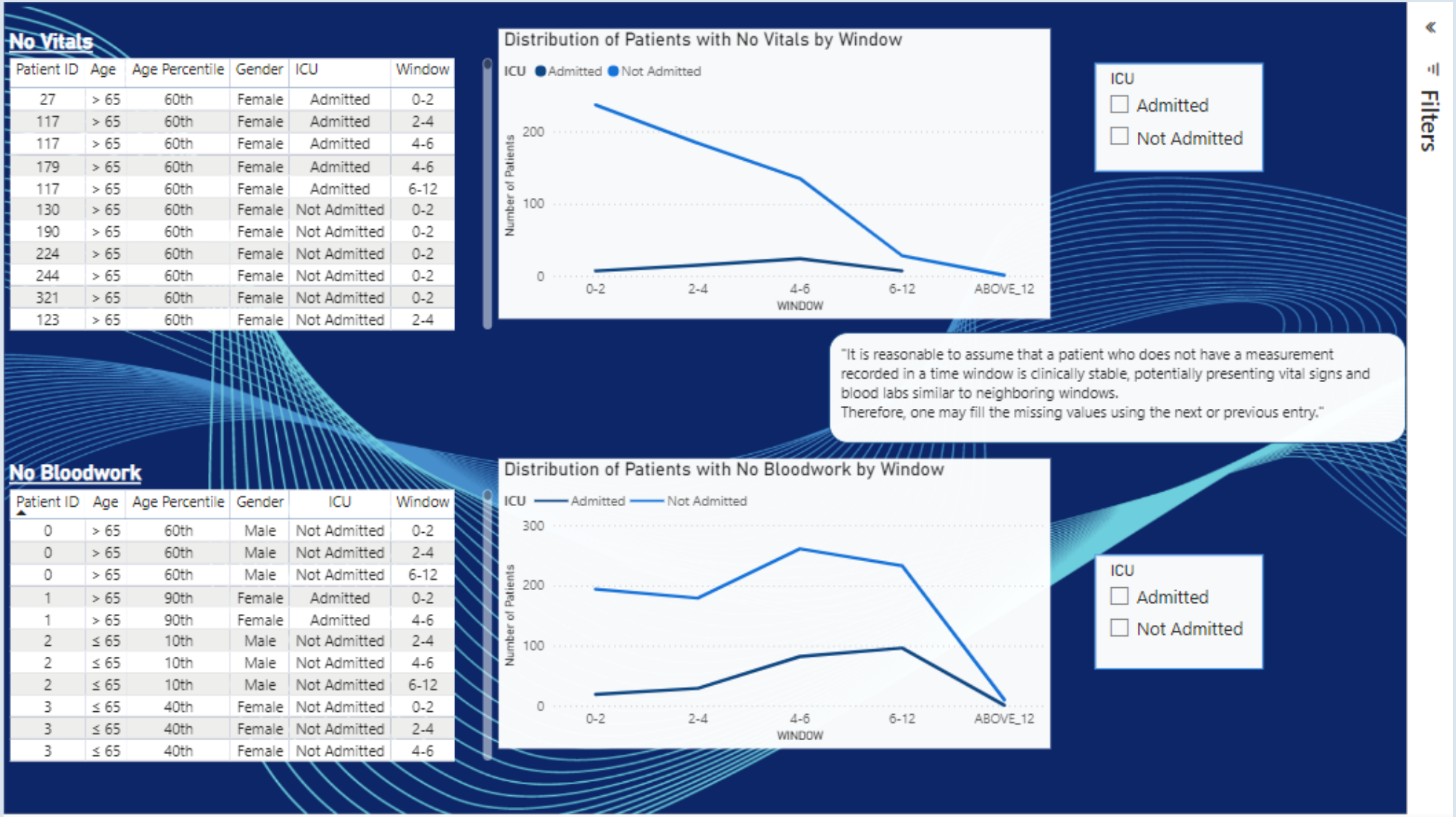
First ICU Admissions



Explore a Patient Profile

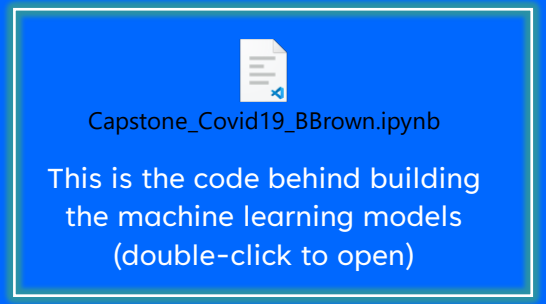


No Vitals or Bloodwork Taken



Predictive Models

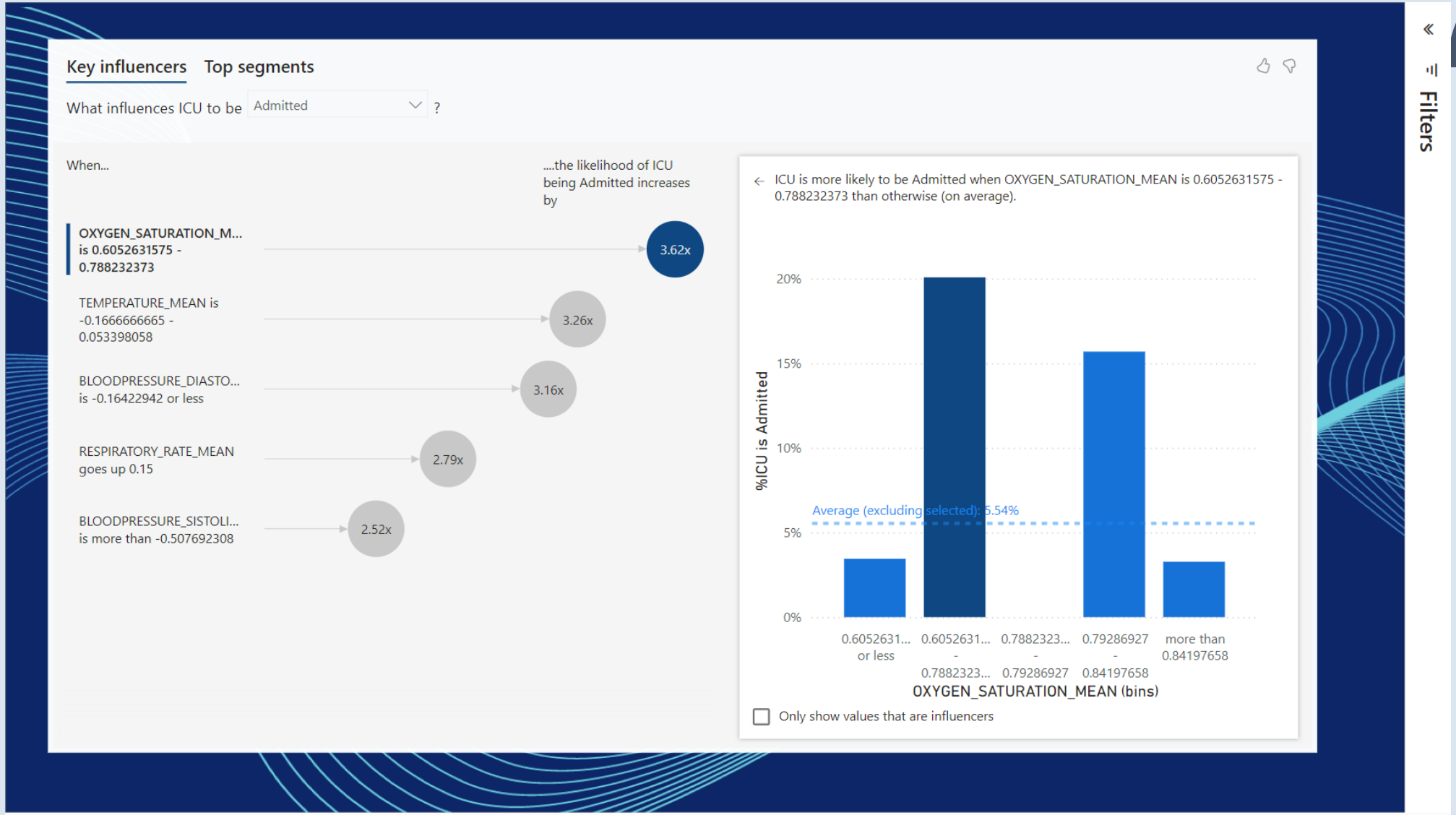
(Let’s get to the gist of the techy stuff)



Model Evaluation

Model	Accuracy
Logistic Regression	97.2%
Decision Tree Classifier	94.1%
Random Forest	96.5%
Support Vector Machines	86.8%
Naïve Bayes	94.1%

Key Influencers



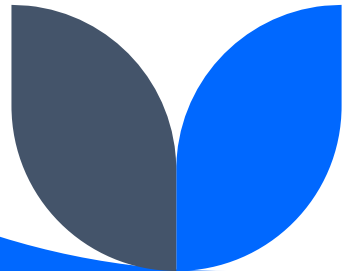
Capstone_Viz_BBrown, ML Visuals - 2

Live data | Data updated on 5/25/24, 1:04 PM

Final Takeaways

Why use this model?

- Strong precision, recall, and f1-scores = high predictive capabilities
- Can provide data points as markers for likelihood of ICU admittance (or non-admittance)
- Load & analyze data specific to your city/region/hospital
- Keep up with changes in patient vital signs



Thank you