



PRESENTERS: CZARINA LUNA, JUSTIN SOHN, & WESTON SHUKEN

JANUARY 2022

PREDICTING H1N1 VACCINATION STATUS

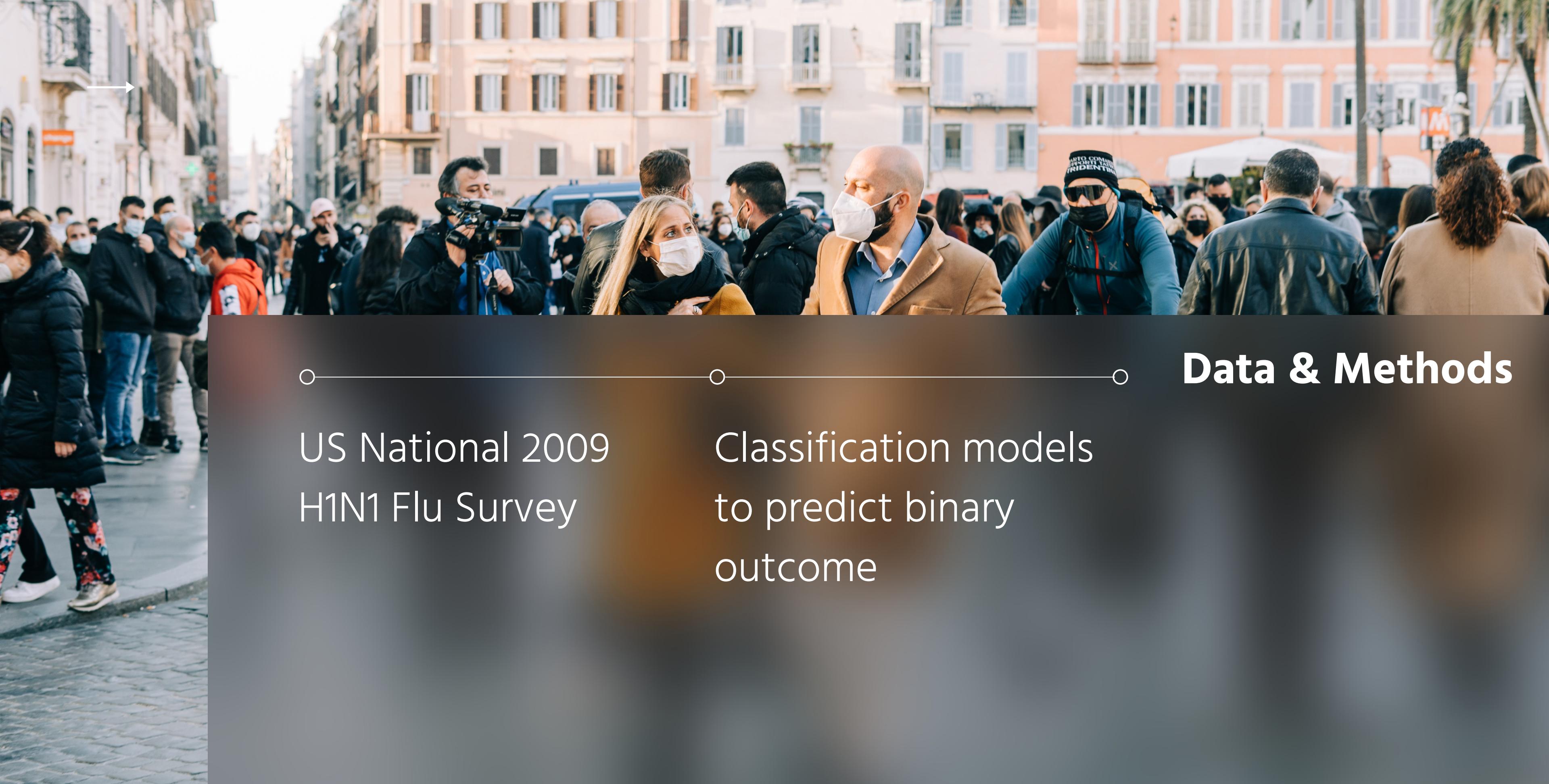


Understanding
factors related to
vaccination patterns

Overview

- Data from past pandemic
- Use characteristics to predict status
- Improve vaccination outreach
- Recommendation from doctor
- Education on effectiveness





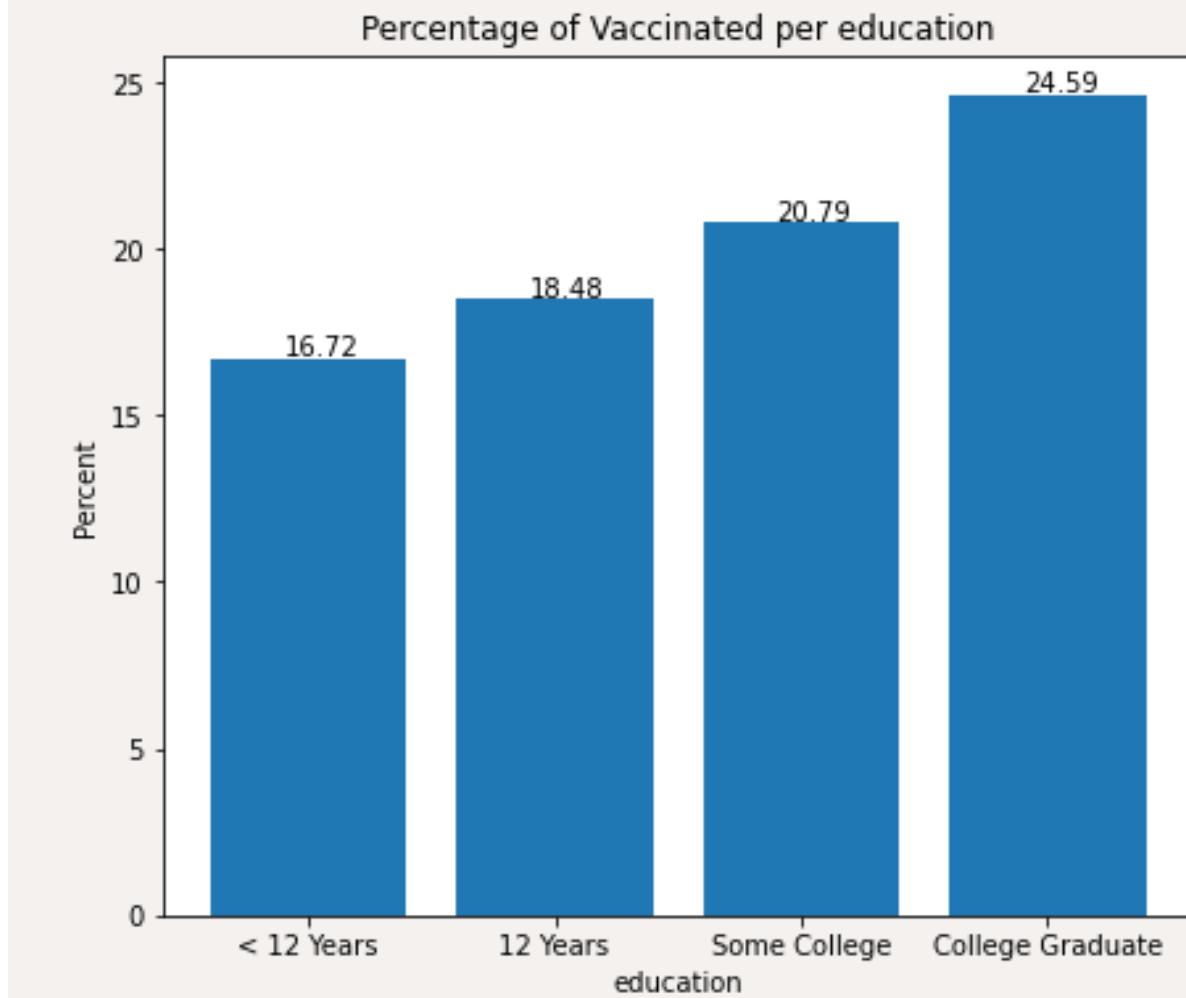
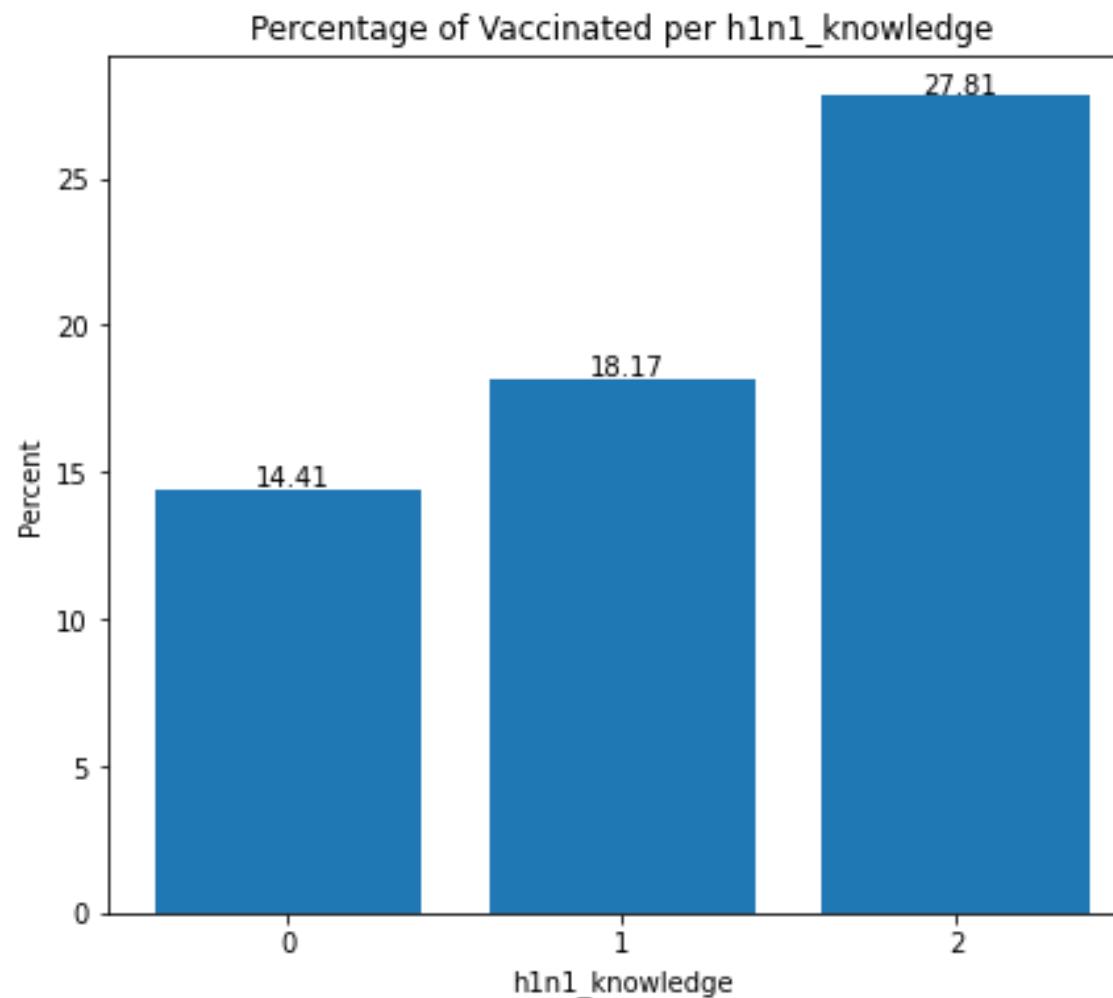
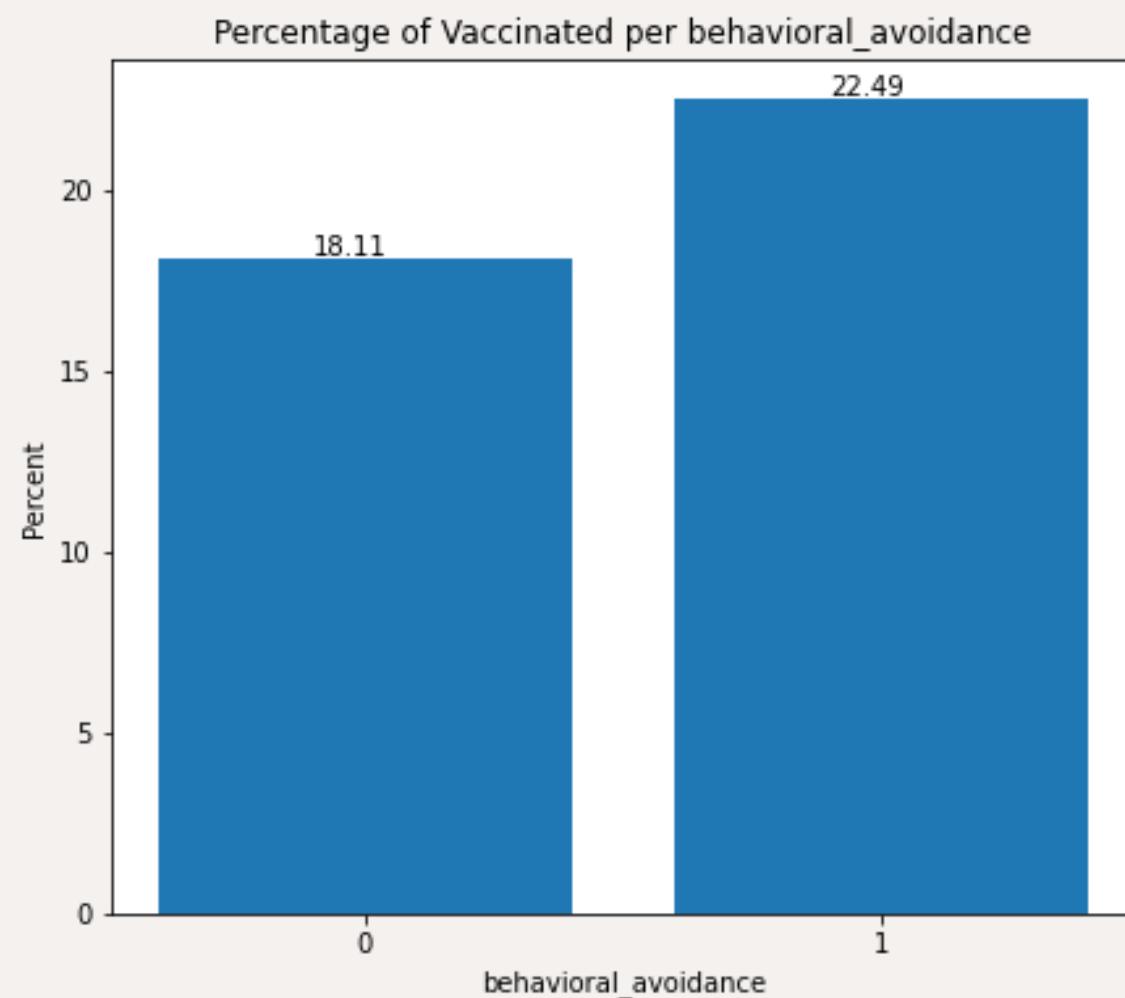
Data & Methods

- US National 2009 H1N1 Flu Survey

- Classification models to predict binary outcome

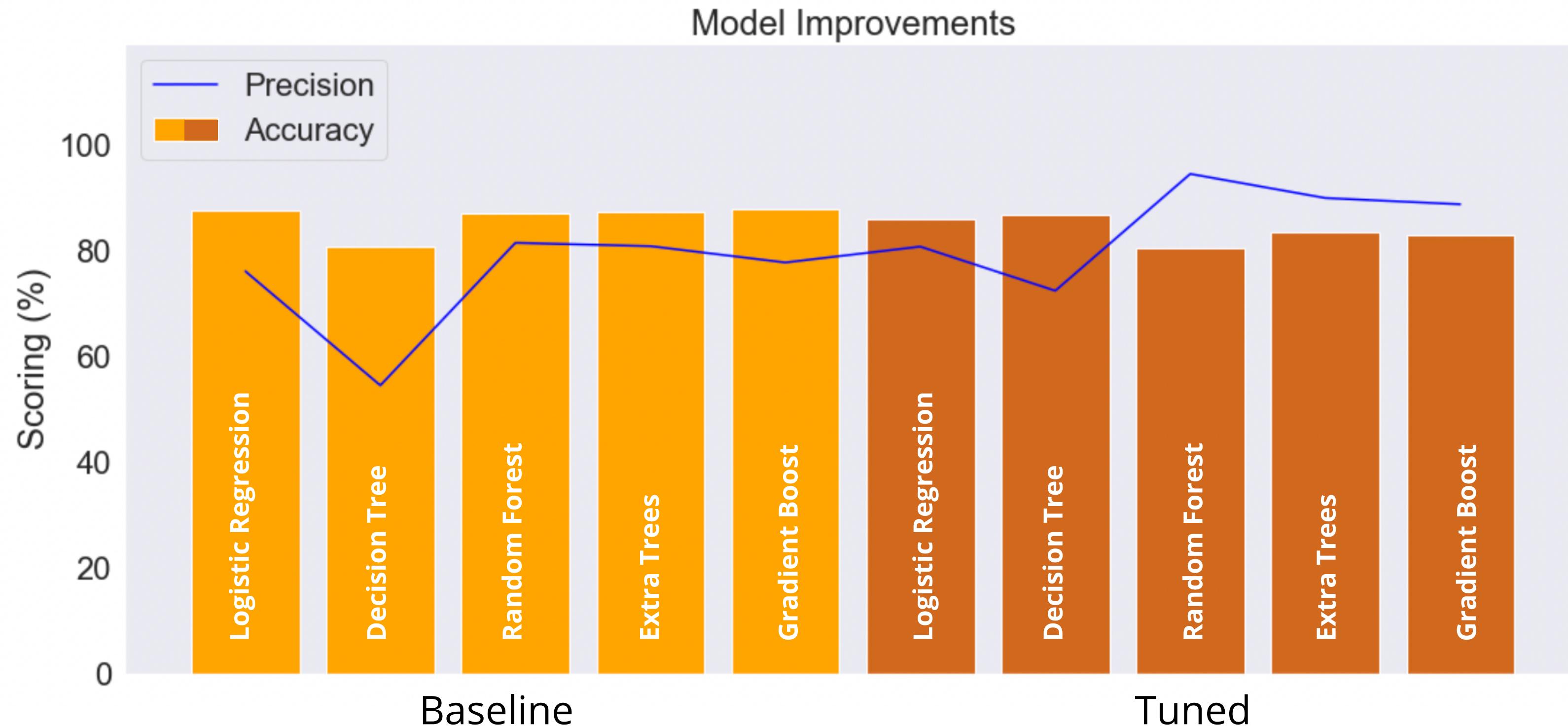
Data Analysis

Percentage of Vaccinated



Model Performance

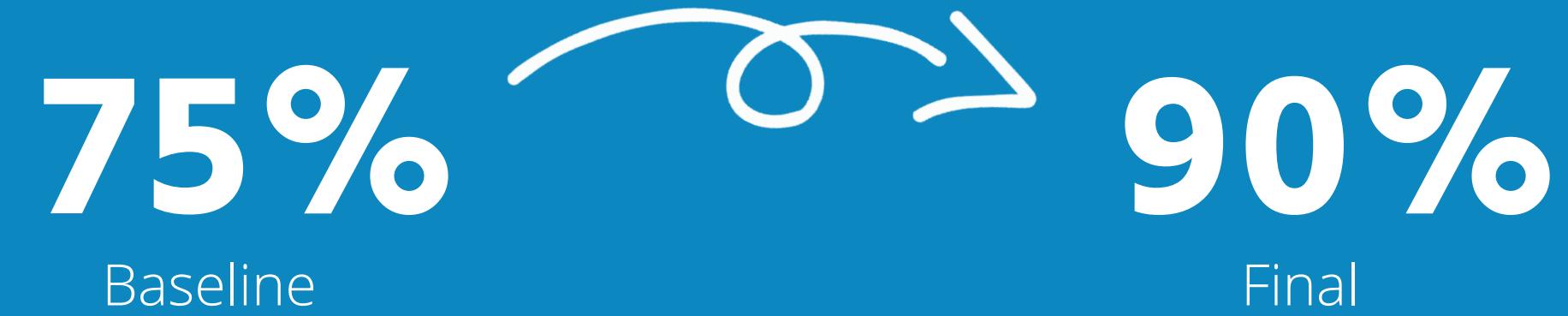
Model Improvements



Final Model

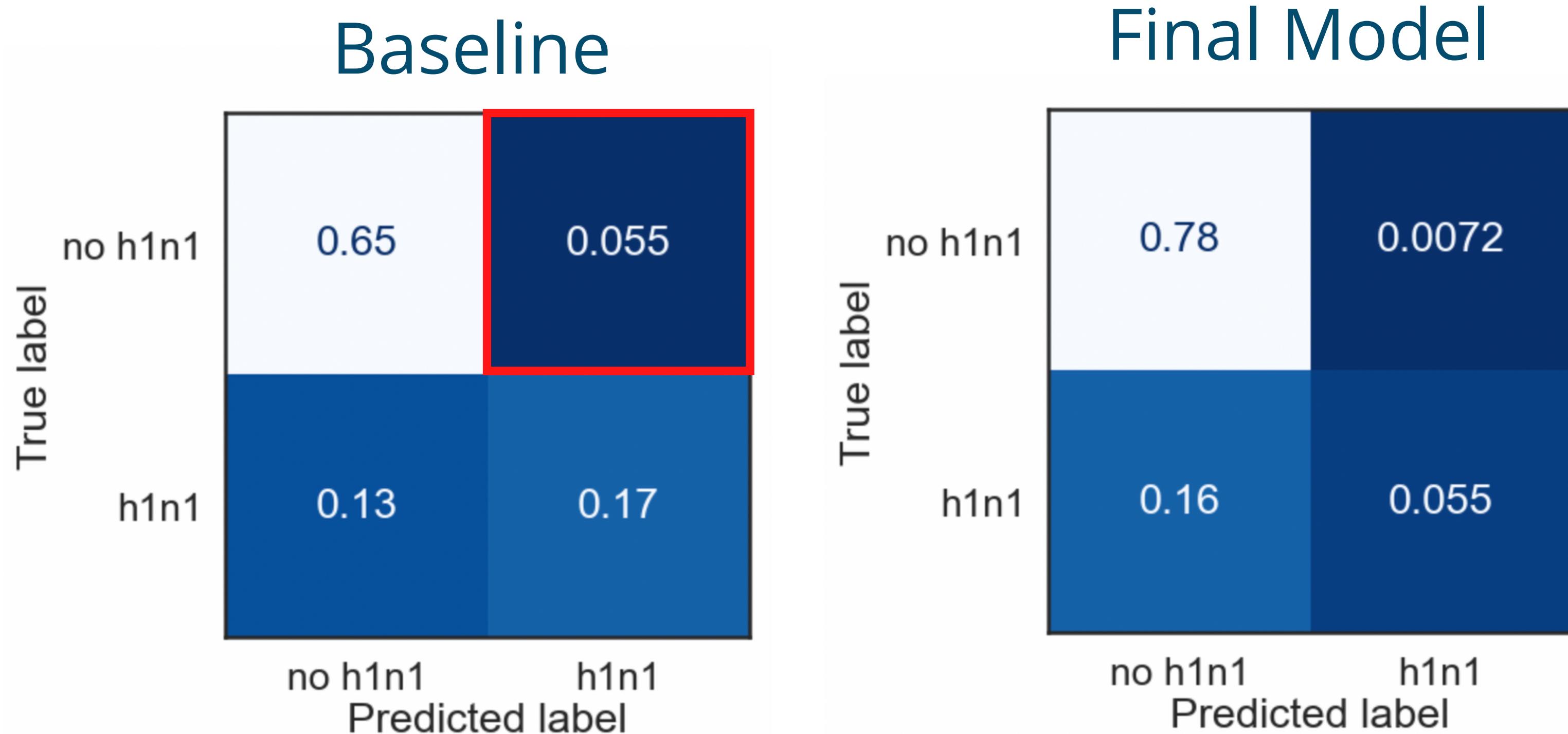
Precision

*Out of all the people we predicted who received the H1N1 vaccine,
how many of them actually did?*



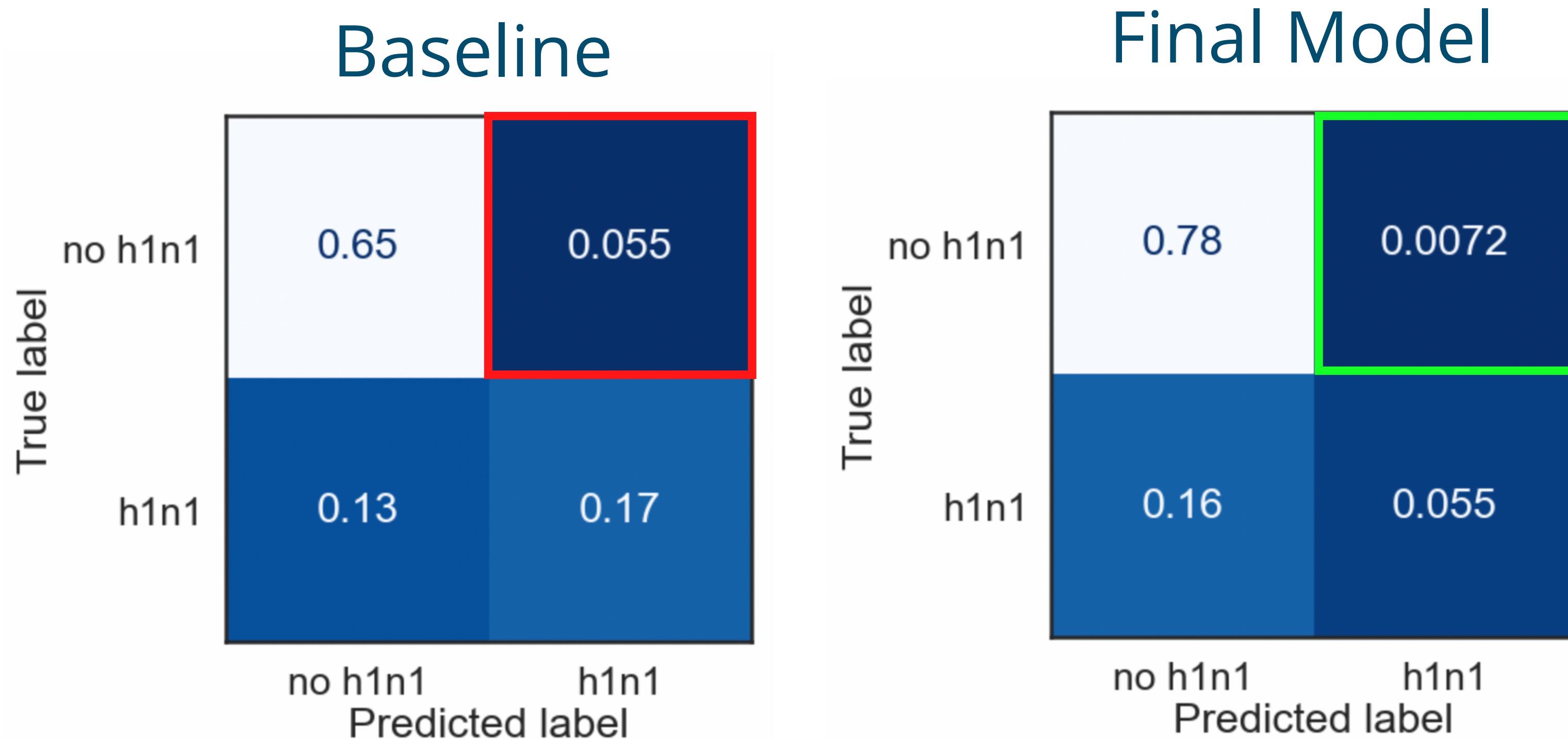
Final Model

Confusion Matrix



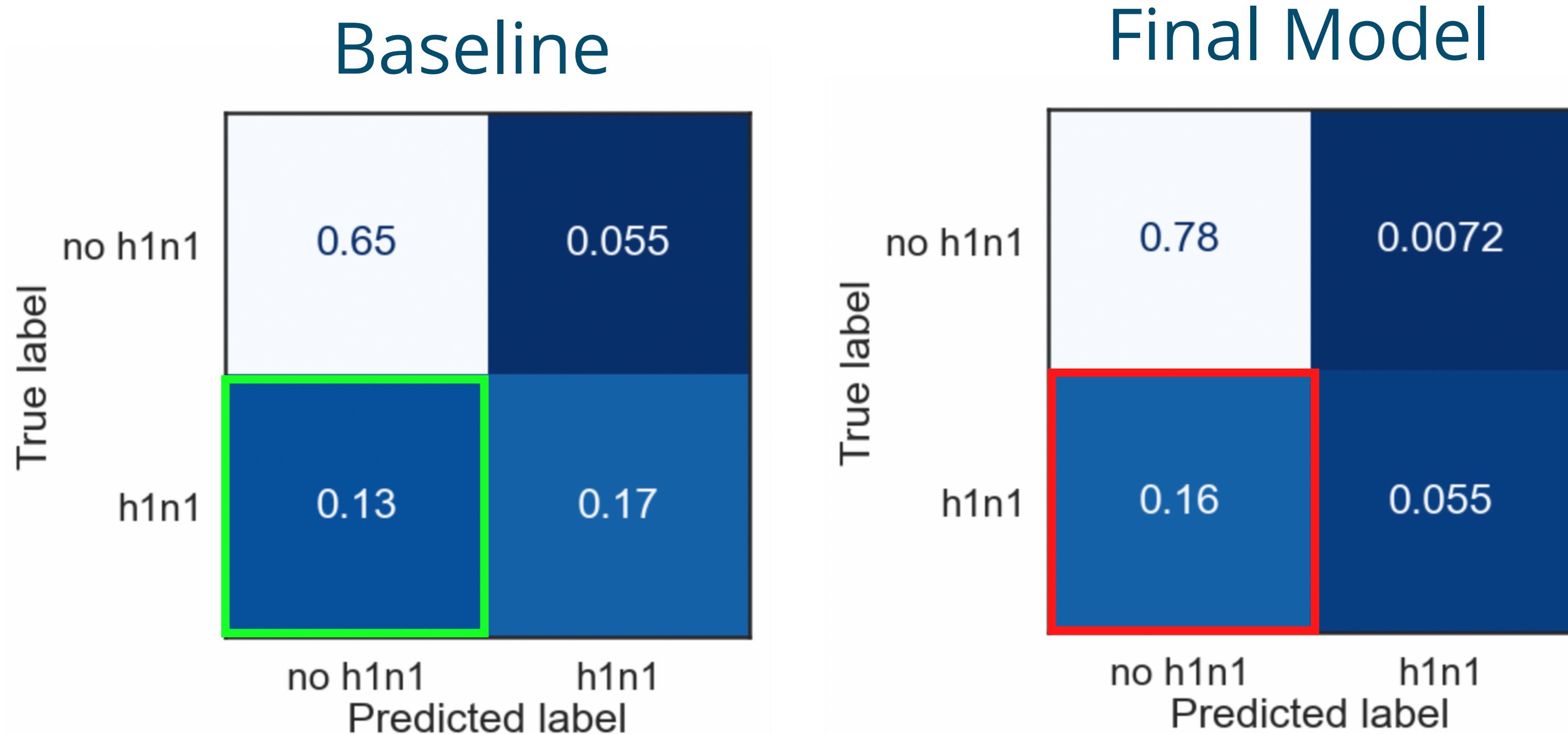
Final Model

Confusion Matrix



Final Model

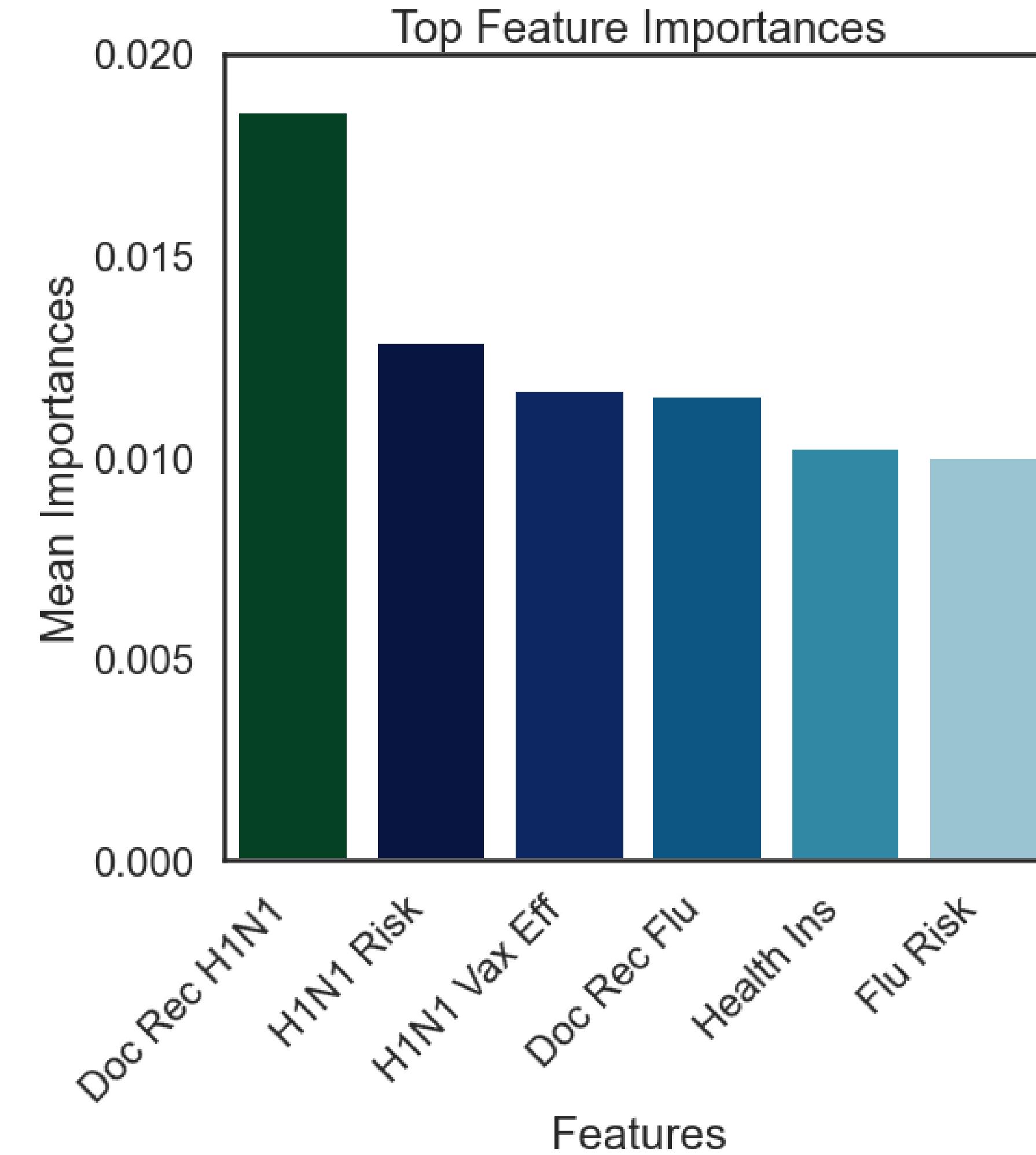
Confusion Matrix



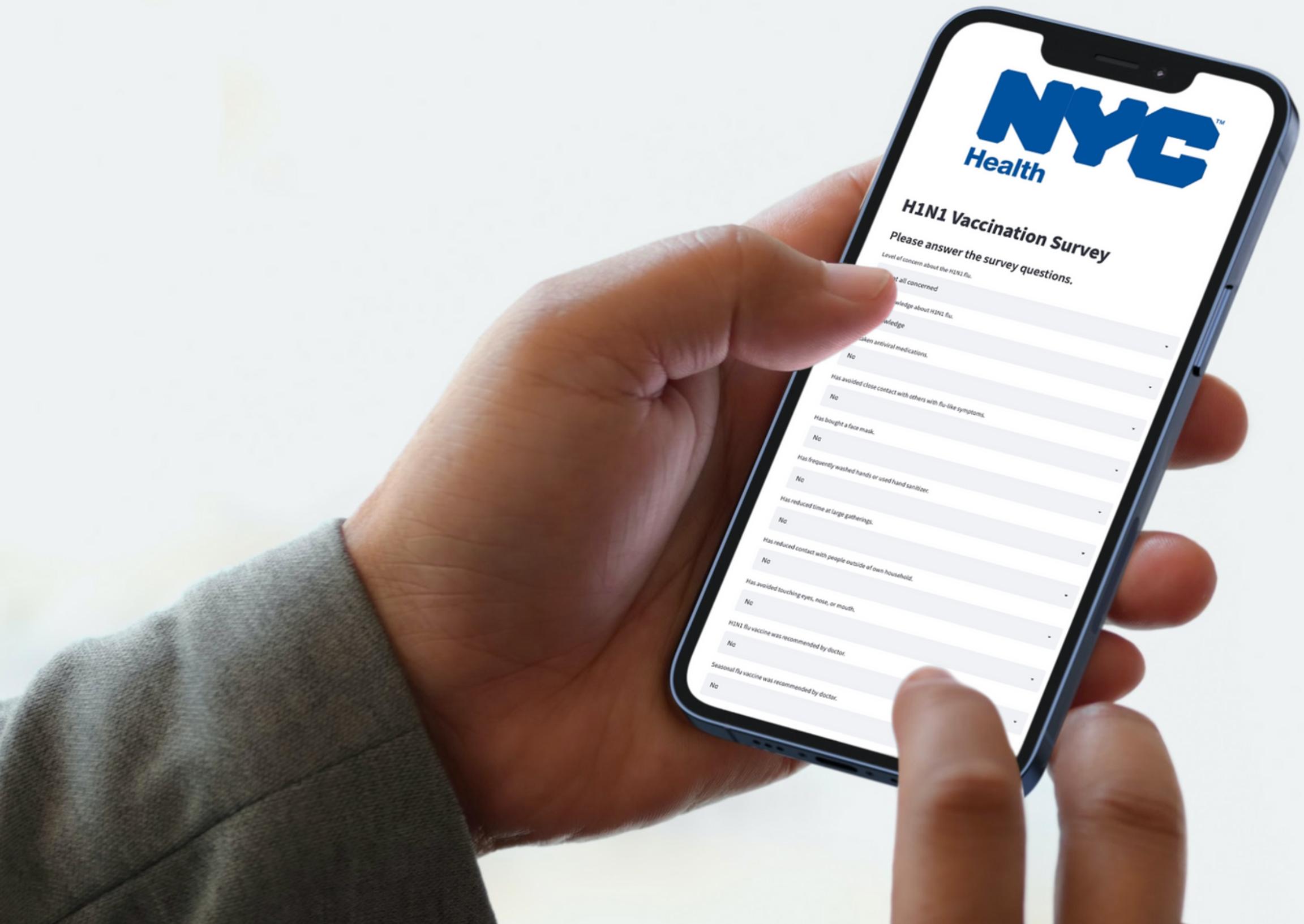
Final Model

Permutation
Importances

PREDICTING H1N1 VACCINATION STATUS



Model Deployment



Employment Status:

Employed

Number of other adults in household (highest is 3 and above).

0 1 2 3

Number of children in household (highest is 3 and above).

0 1 2 3

Complete.

Vaccination Prediction: ['Refuse Vaccine']

A screenshot of a web-based form or dashboard. It features a dark blue header bar. Below the header, there are two input fields: one for employment status set to "Employed" and another for the number of other adults in the household, which has a slider from 0 to 3 with the value set to 1. There is also a field for the number of children in the household, with a similar slider from 0 to 3 set to 1. At the bottom left is a "Complete." button, and at the bottom right is a prediction message: "Vaccination Prediction: ['Refuse Vaccine']".

Results

- Improved ability to predict vaccination status
- Precision increased 75% → 90%
- Discovered features related to vaccination status





Recommendations

- PCP Recommend H1N1 and seasonal flu vaccine
- Increase awareness regarding the risks of the flu and H1N1 virus, and effectiveness of the vaccine
- Consider incentivizing to uninsured



Next Steps

Collect more recent data

Ask more questions in the survey

Deploy Model



Any questions?