PREDICTING H1N1 FLU Vaccination Status

USING MACHINE LEARNING

Phase-3 Final Project

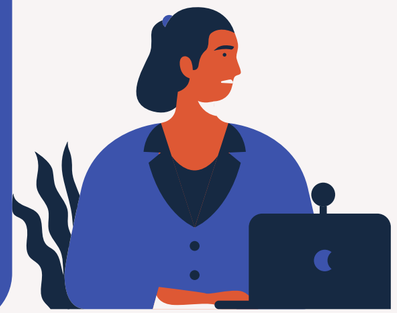
By LAARIA CHRIS

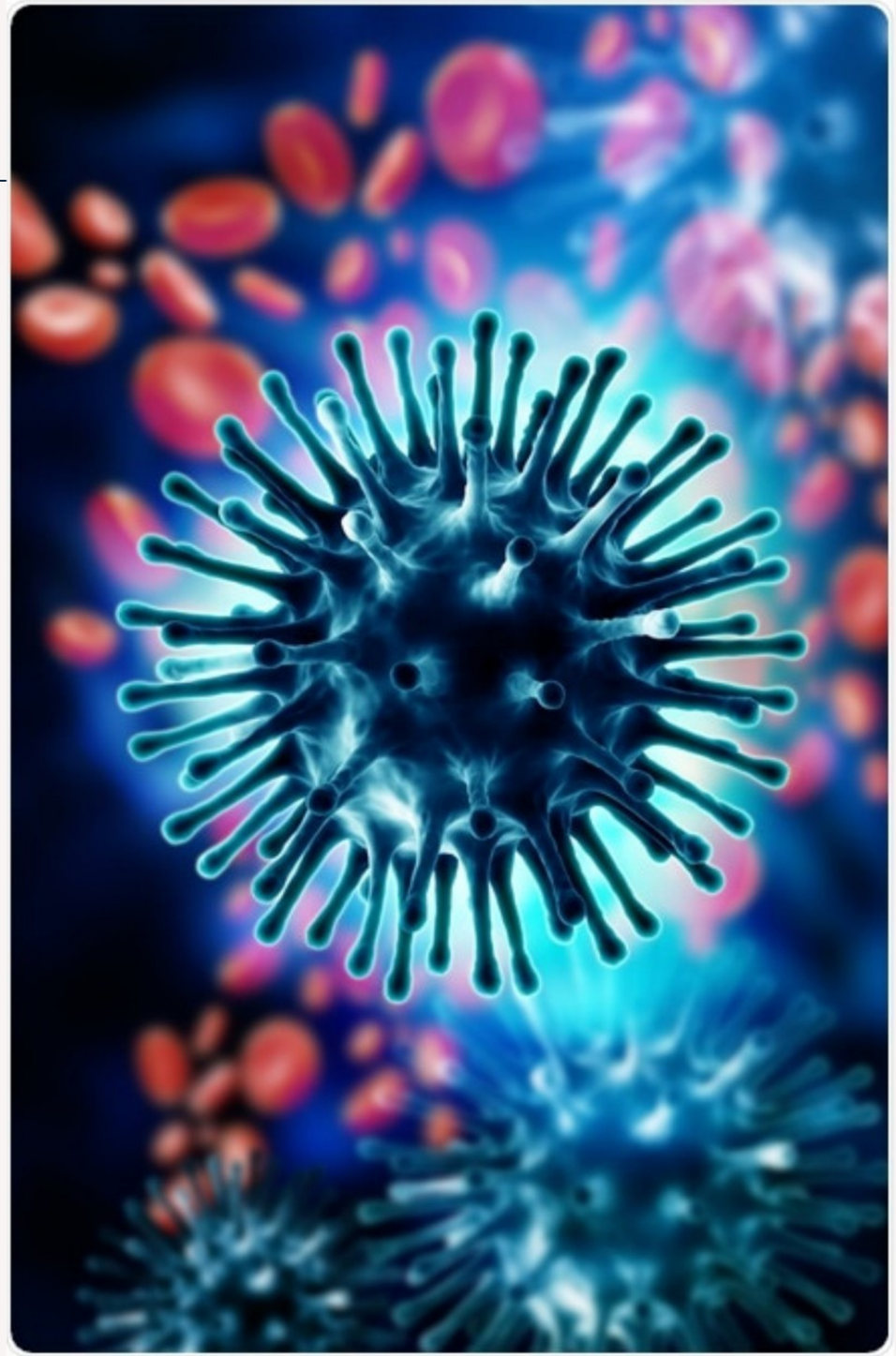
Outline

Public Health Perspective
Objectives
Data
Methods
Results
Recommendations
Future Works

Public Health Perspective

- The personal factors that underlie vaccination behavior
- Understanding vaccination patterns from past pandemics can improve future vaccination
- Decrease outbreaks



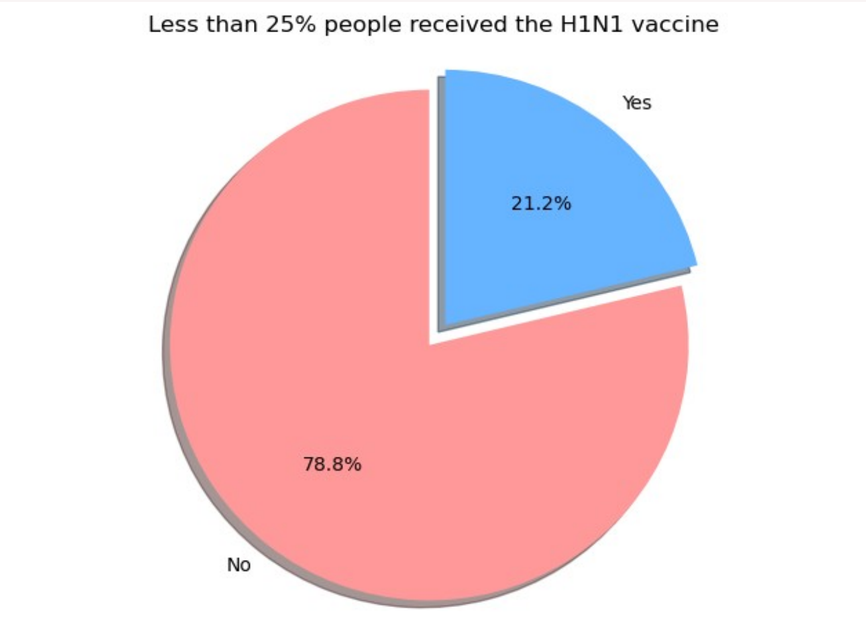


OBJECTIVES

- **Build an accurate H1N1 vaccination prediction model**
- **Find most important demographic, behavioral, and health features affecting vaccination status**

The Data

The National Flu Survey (NHFS, 2009)

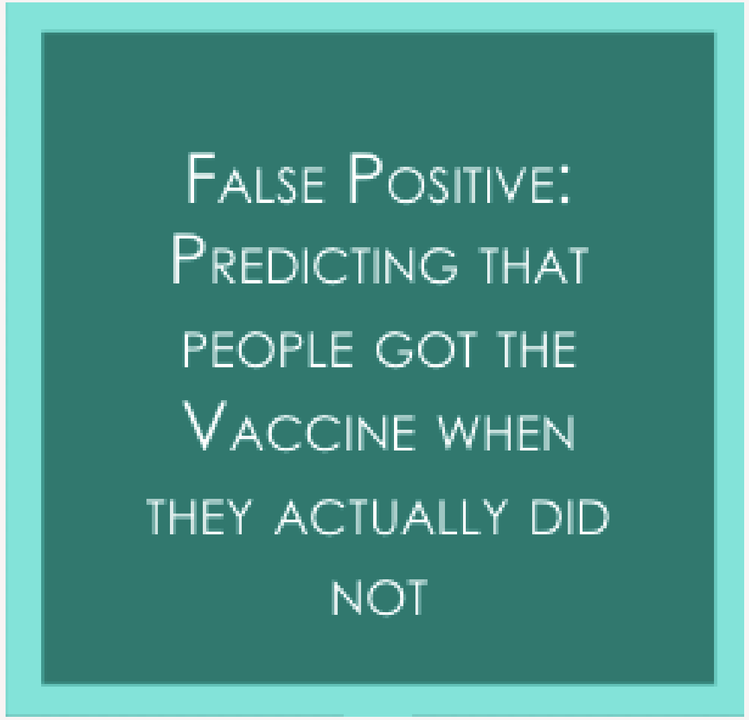


79%
Did not Get the Vaccine

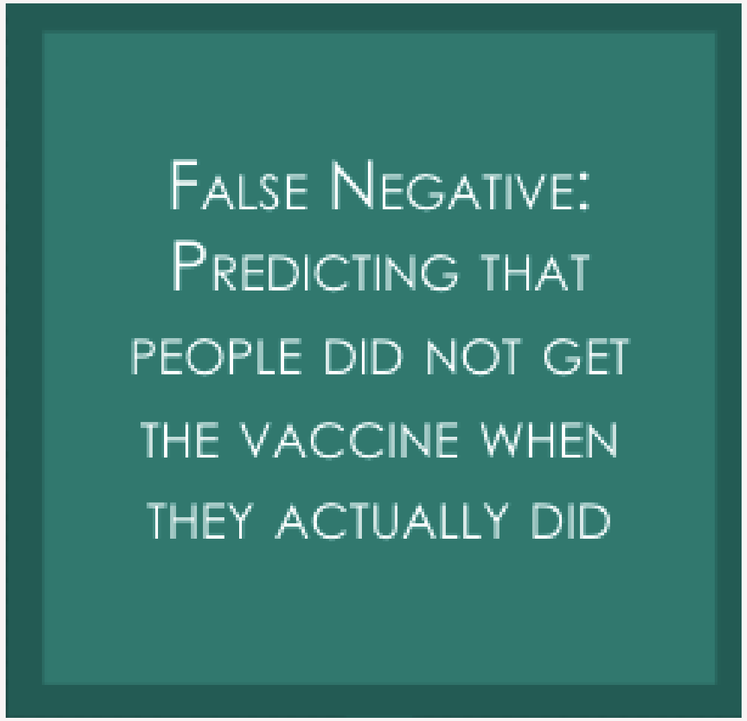
26,000
Respondents

36
Unique Factors

Modeling Context



Big Problem

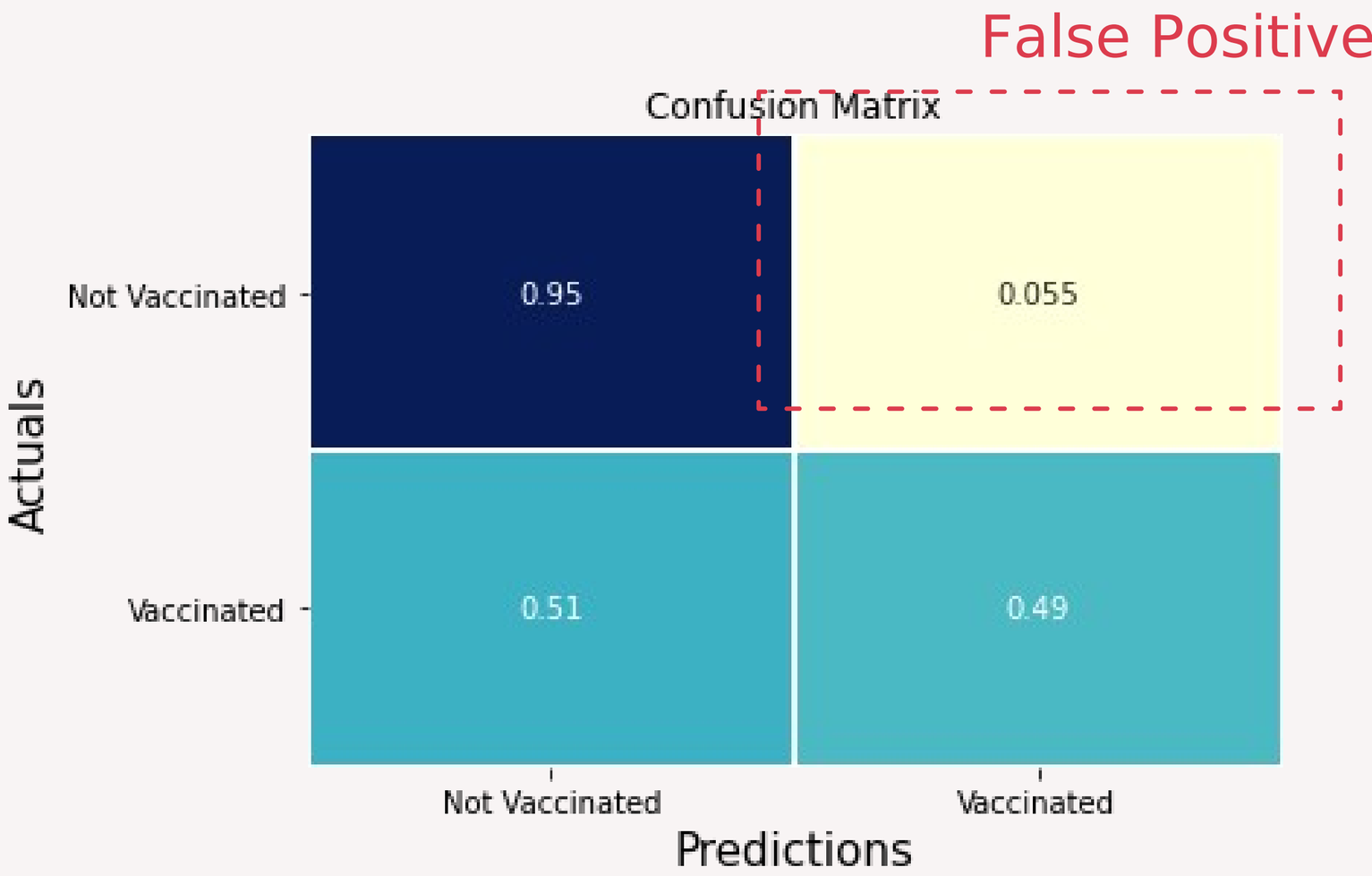


Not a Big Problem

Model & Results

Gradient Boosting Score

84% Accuracy



Top 4 Important Features

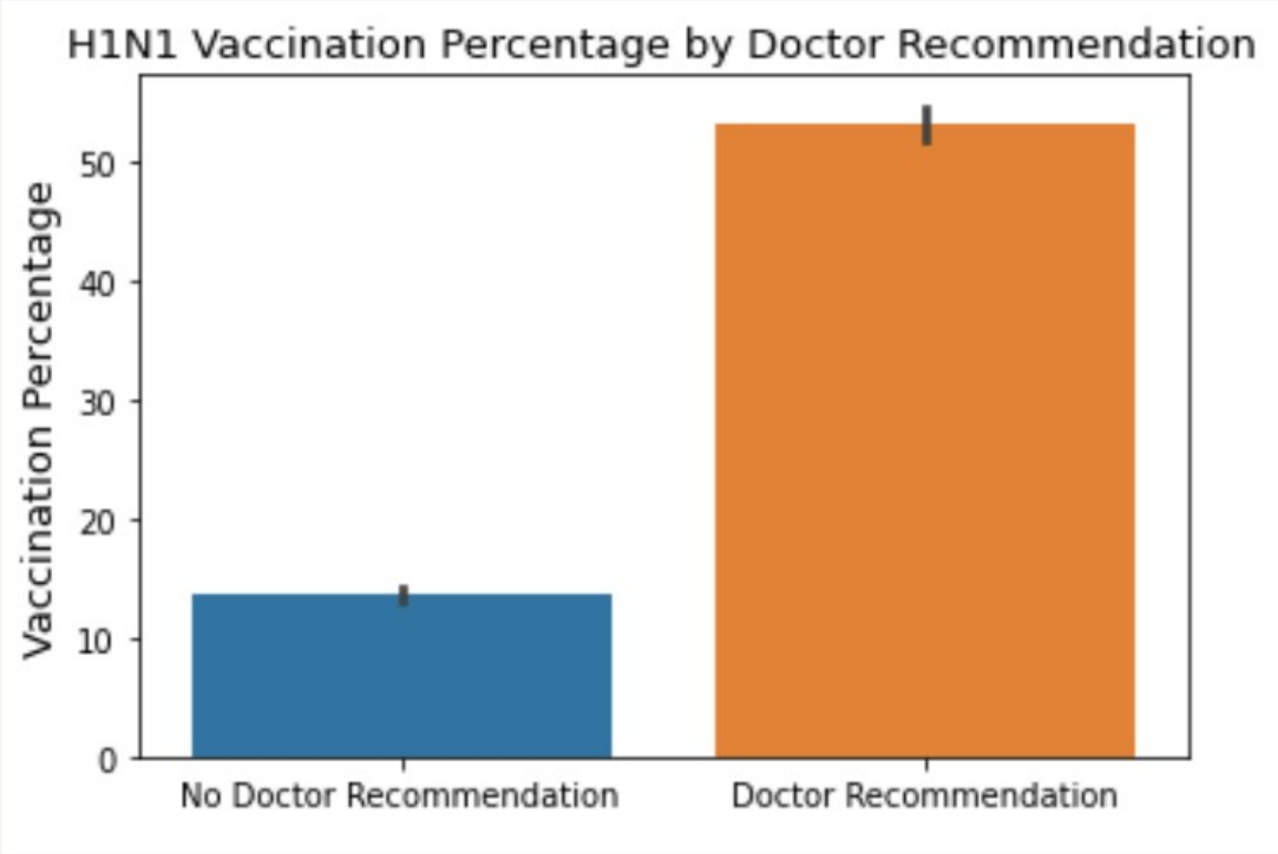
Doctor Recommendation of H1N1 Vaccine

Health Insurance

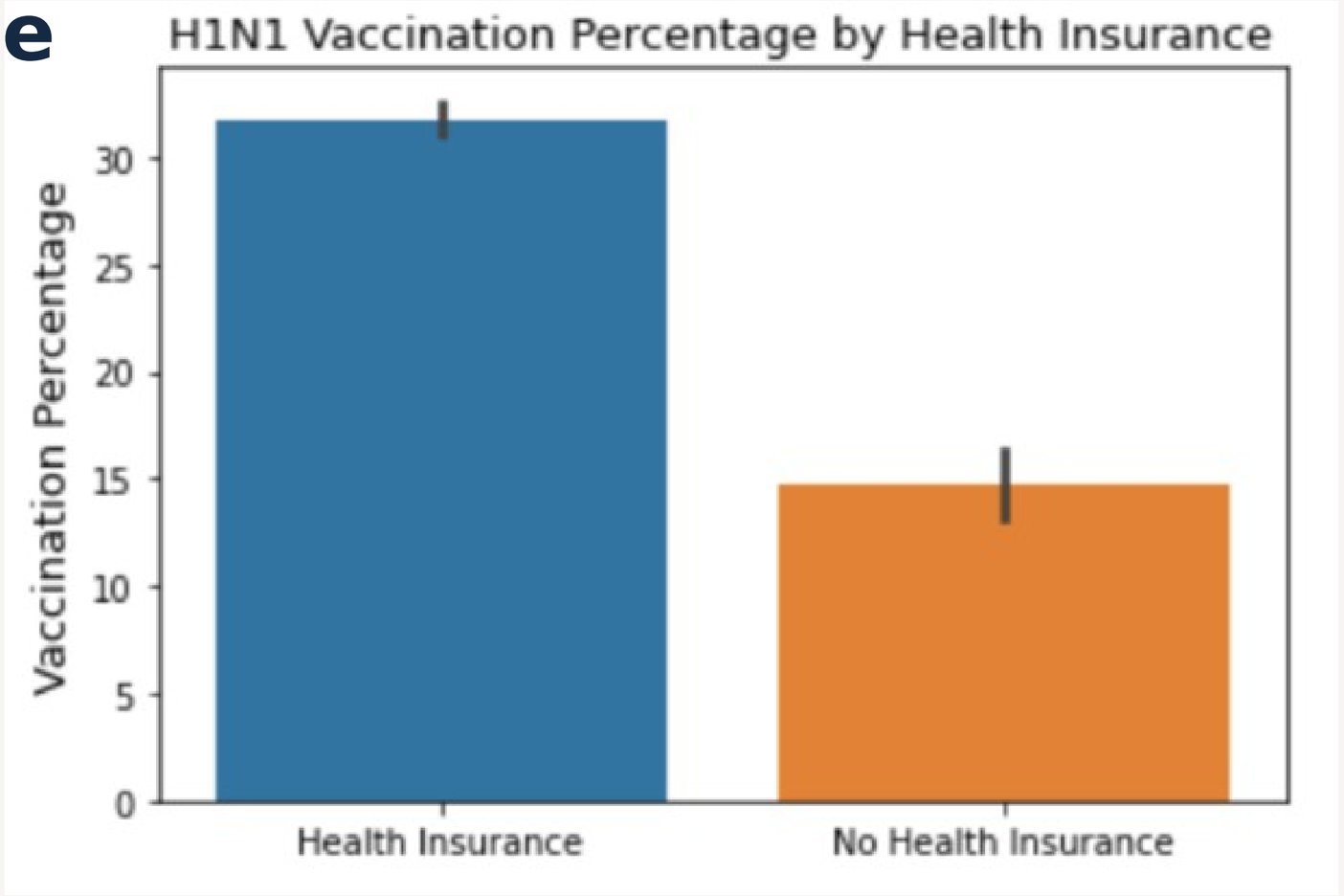
Opinion on H1N1 Vaccine Effectiveness

Opinion on H1N1 Risk

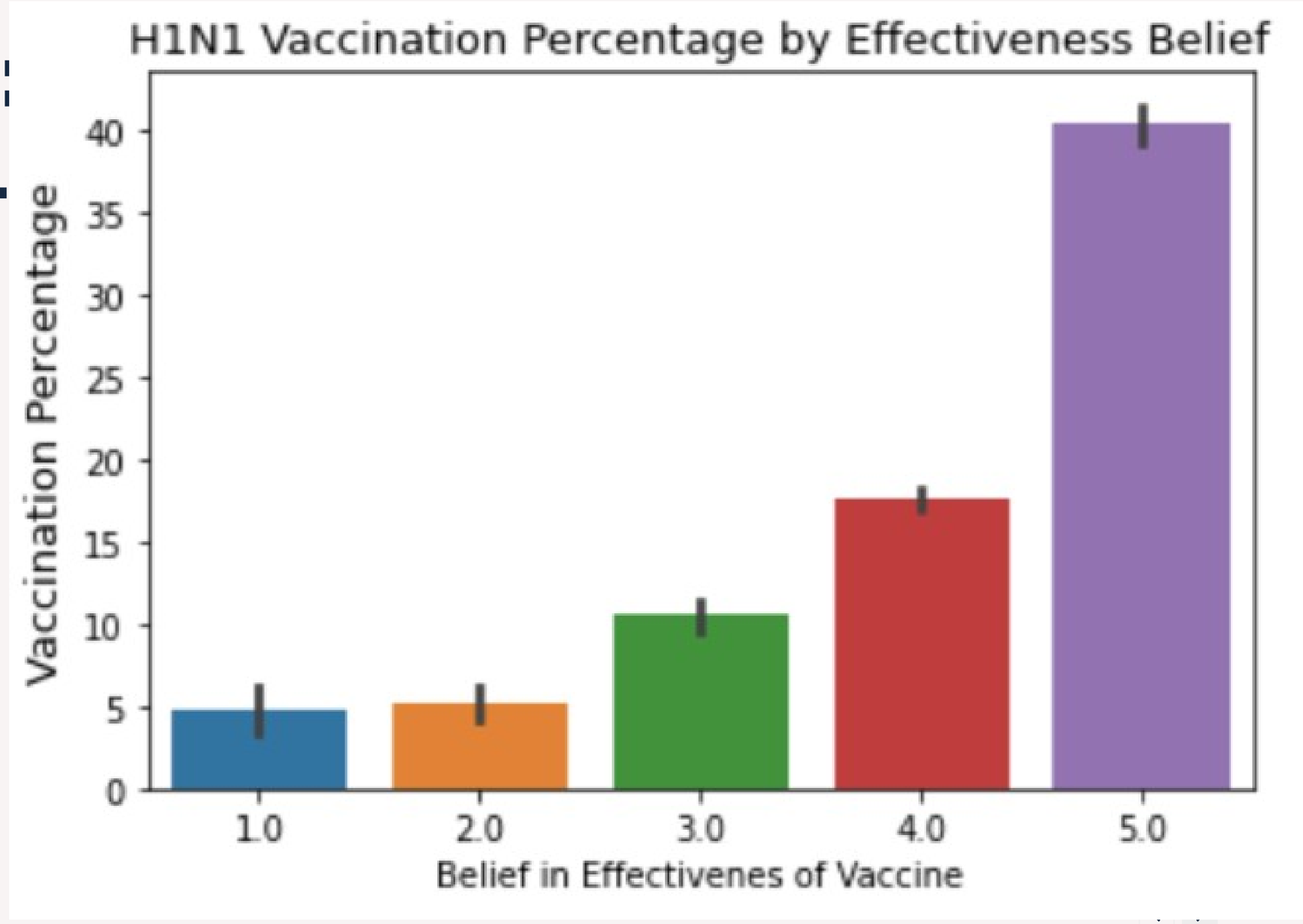
Data Visualizations: Doctor Recommendation



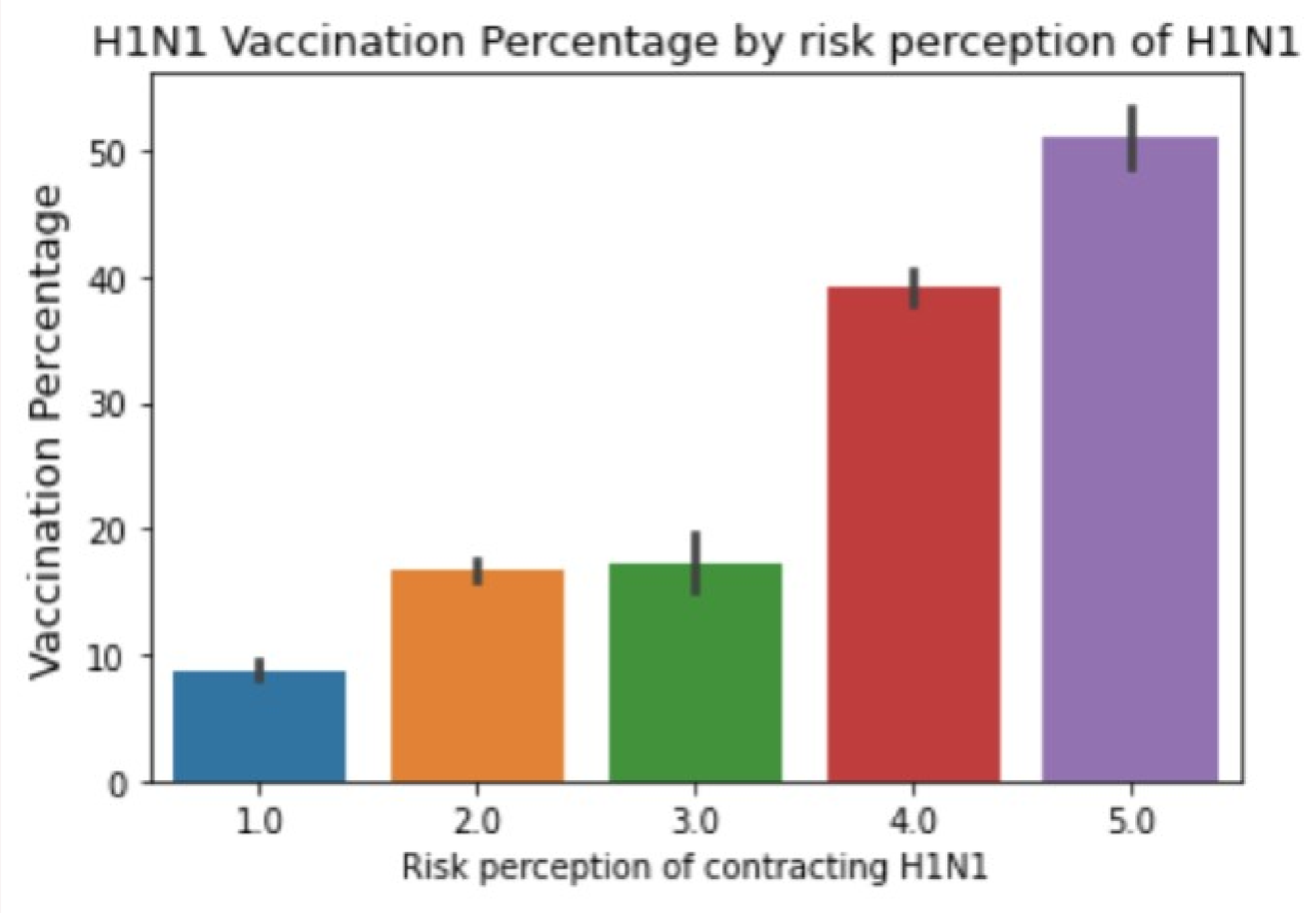
Data Visualizations: Health Insurance

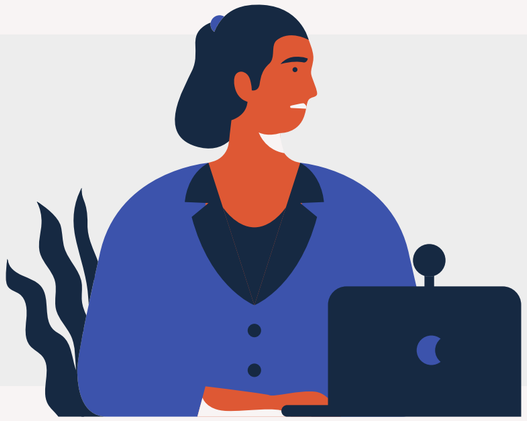


Data Visualizations: Belief in H1N1 Vaccine Effectiveness



Data Visualizations: H1N1 Risk Perception





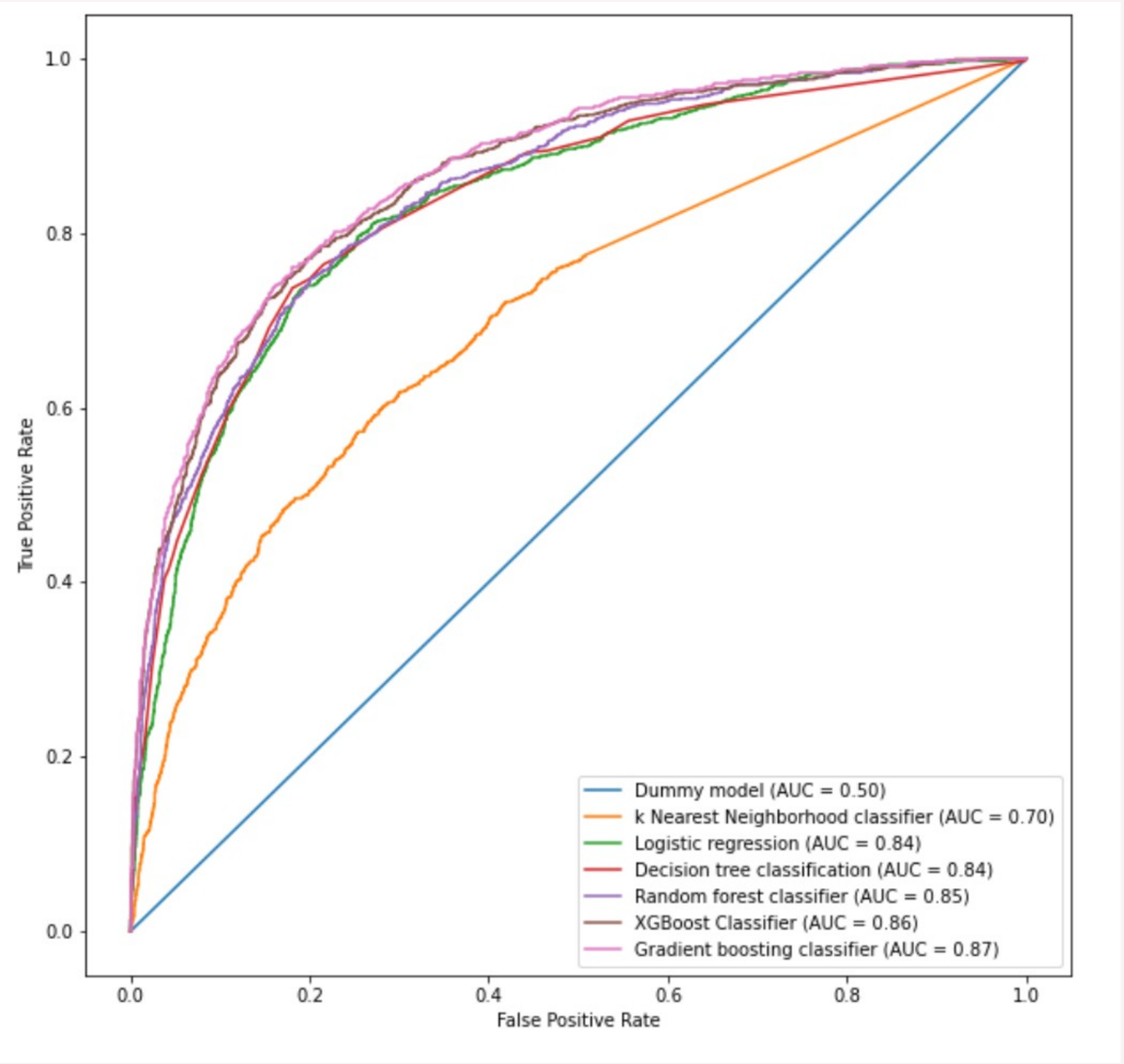
Recommendations

Doctor Recommendations

Health Insurance

Educational Outreach

Comparison of Multiple Model Results



BEST MODEL

Data Source

FUTURE WORKS

What to do

Recent Survey Data

Pre/After Covid-19 Difference

More Feature Engineering

Improve Accuracy

Seasonal Vaccine Prediction

Enhance and Generalize Model

Thank you!