

PREDICTING H1N1 FLU Vaccination Status

USING MACHINE LEARNING

Phase-3 Final Project

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Outline

Public Health Perspective

Objectives

Data

Methods

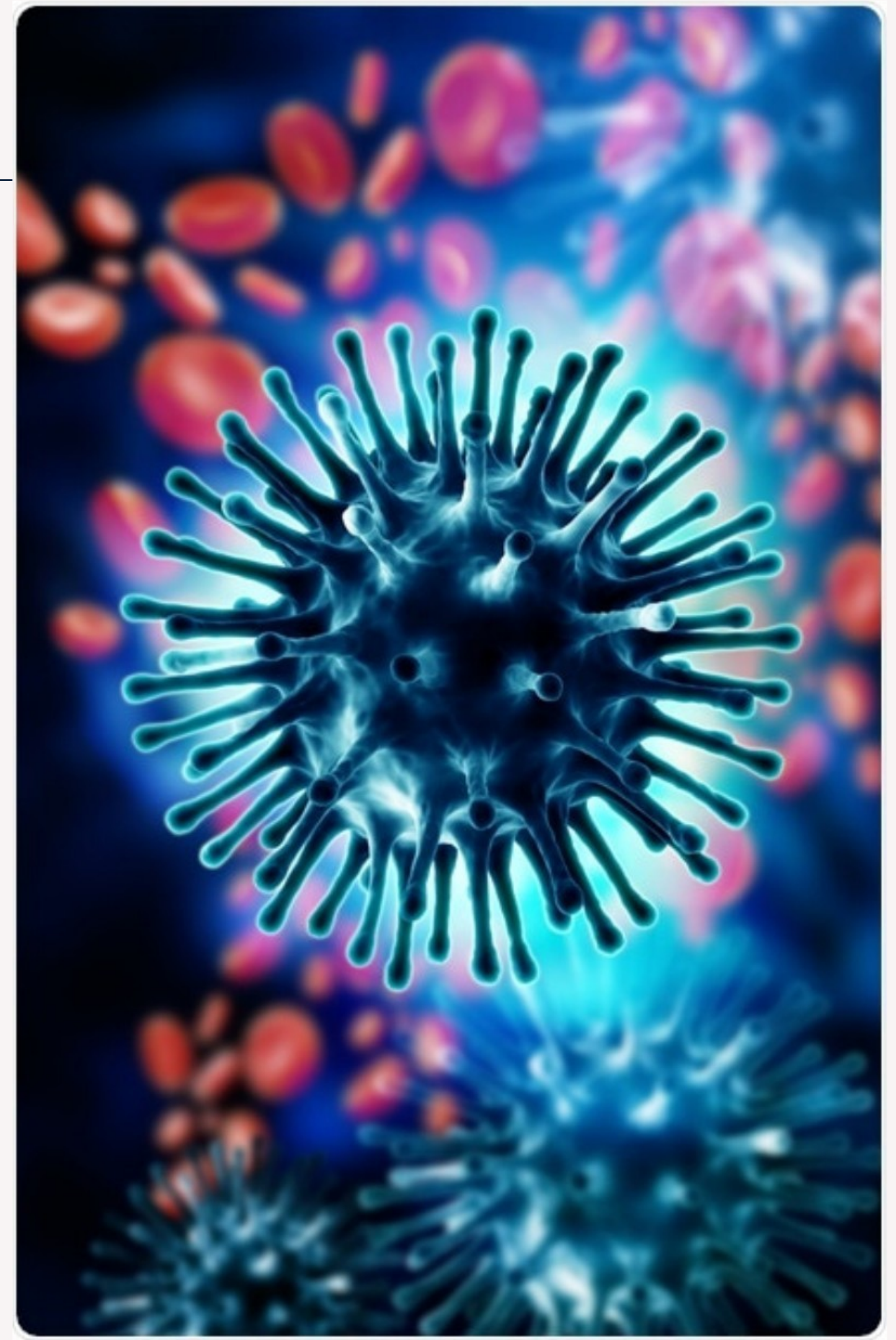
Results

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

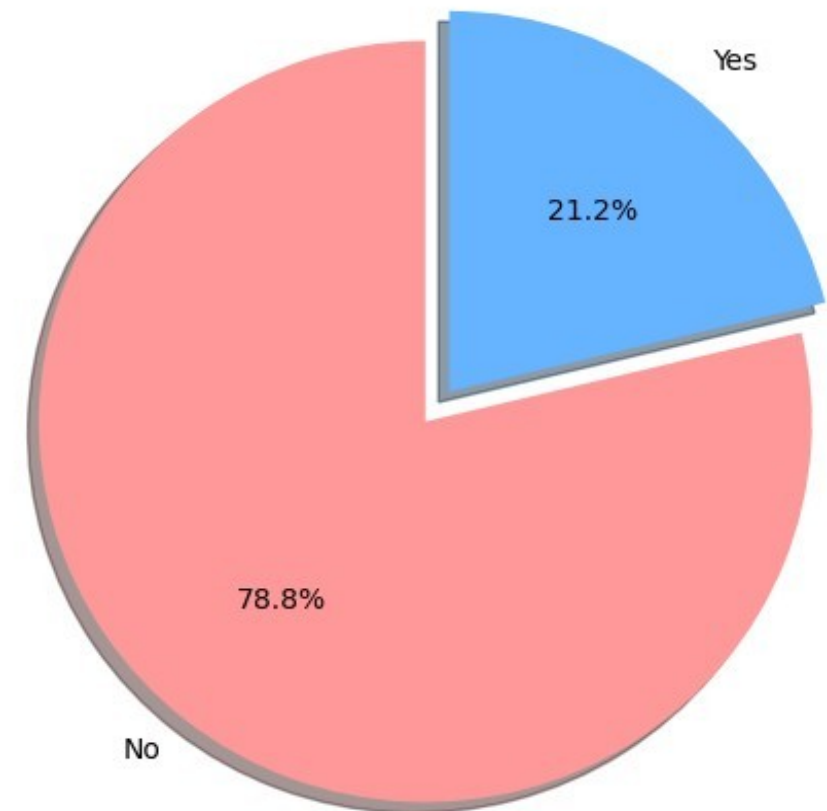
- **Build an accurate H1N1 vaccination prediction model**
- **Analyse the factors that influence people to get H1N1 vaccine or not**



The Data

**The National Flu Survey
(NHFS, 2009)**

Less than 25% people received the H1N1 vaccine



79%

Did not Get the Vaccine

26,000

Respondents

36

Unique Factors

Modeling Context

FALSE POSITIVE:
PREDICTING THAT
PEOPLE GOT THE
VACCINE WHEN
THEY ACTUALLY DID
NOT

Big Problem

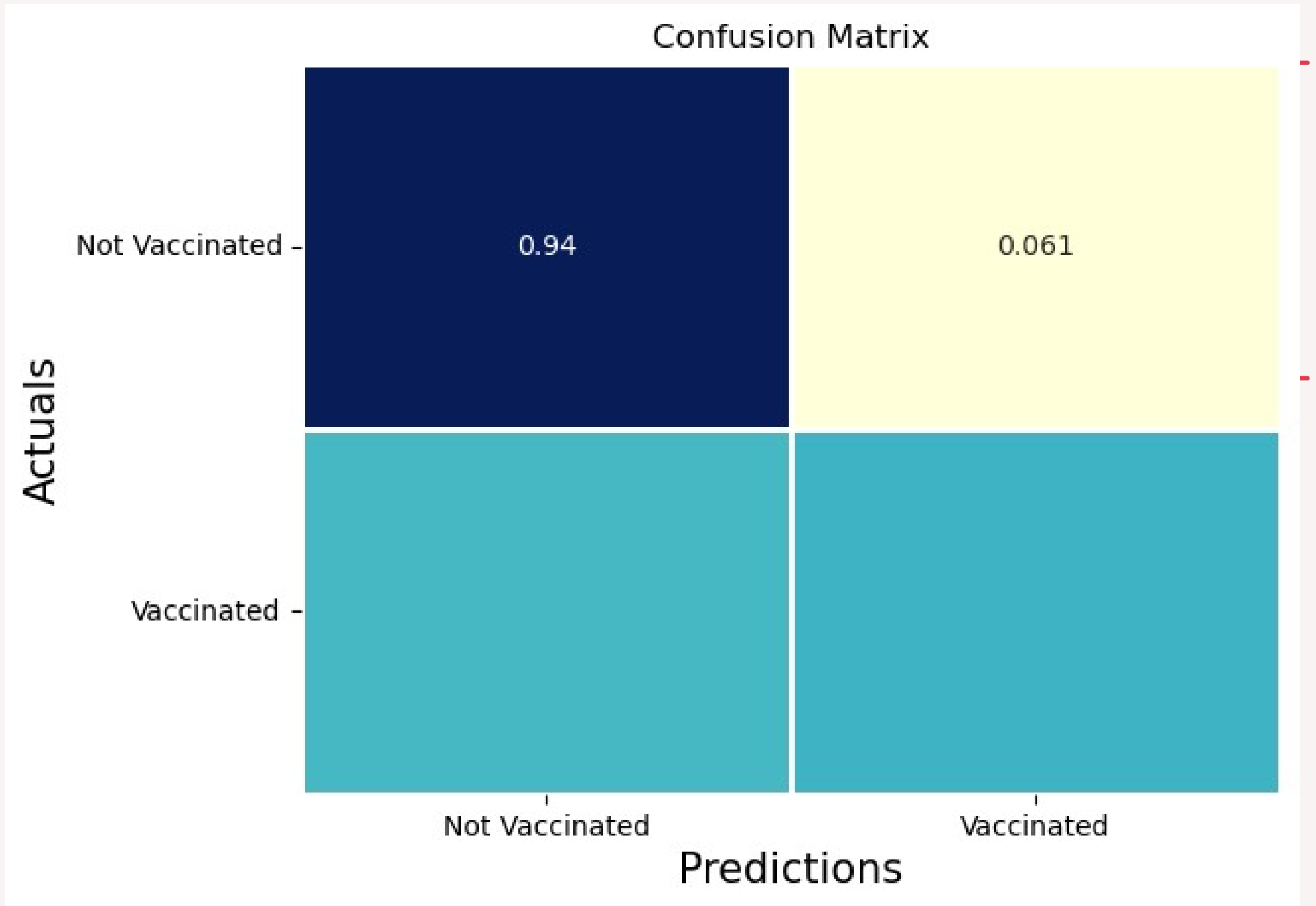
FALSE NEGATIVE:
PREDICTING THAT
PEOPLE DID NOT GET
THE VACCINE WHEN
THEY ACTUALLY DID

Not a Big Problem

Model & Results

XGBoost
Classifier
Score

87 % Accuracy



Top 4 Important Features

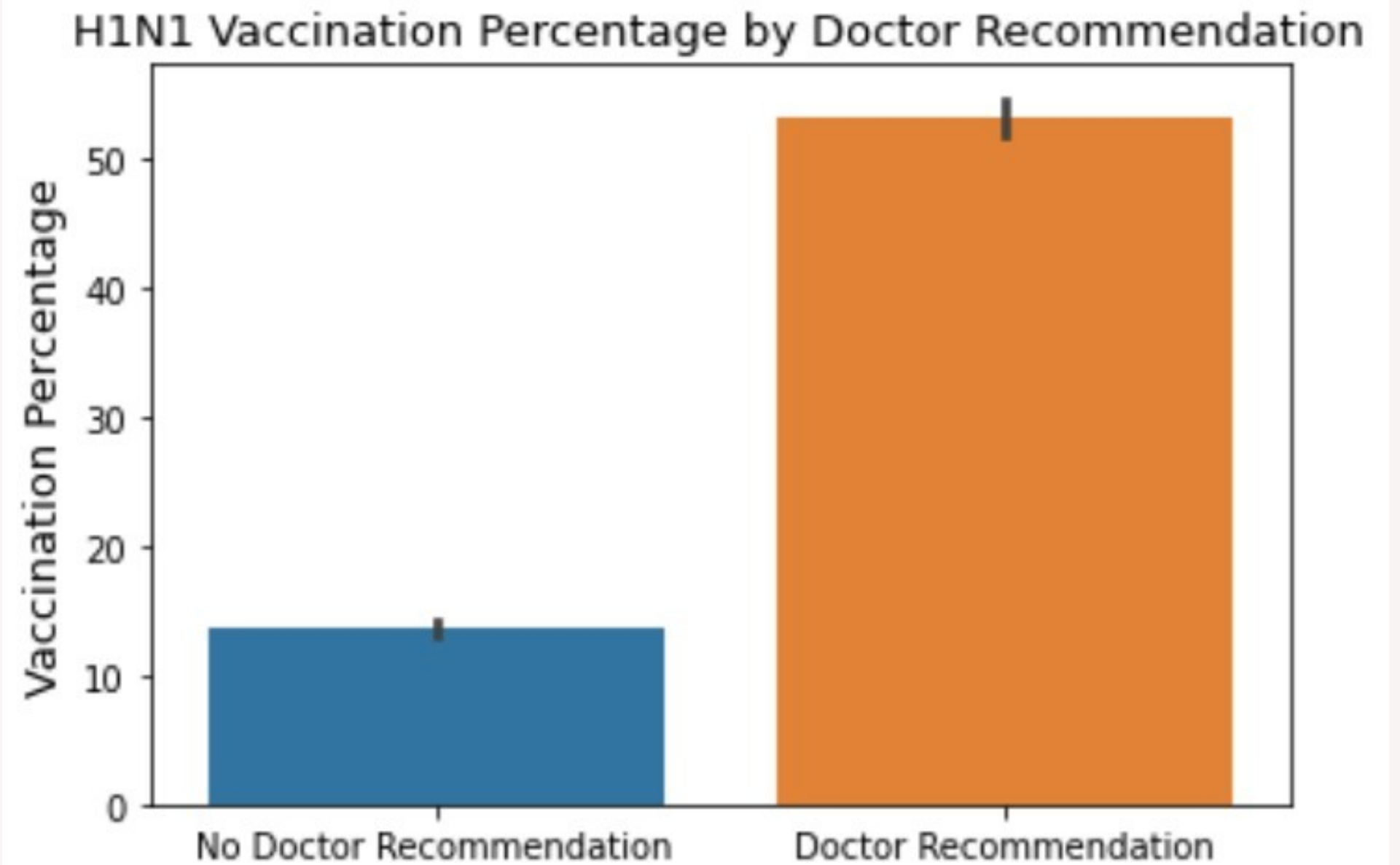
**Doctor Recommendation
of H1N1 Vaccine**

Health Insurance

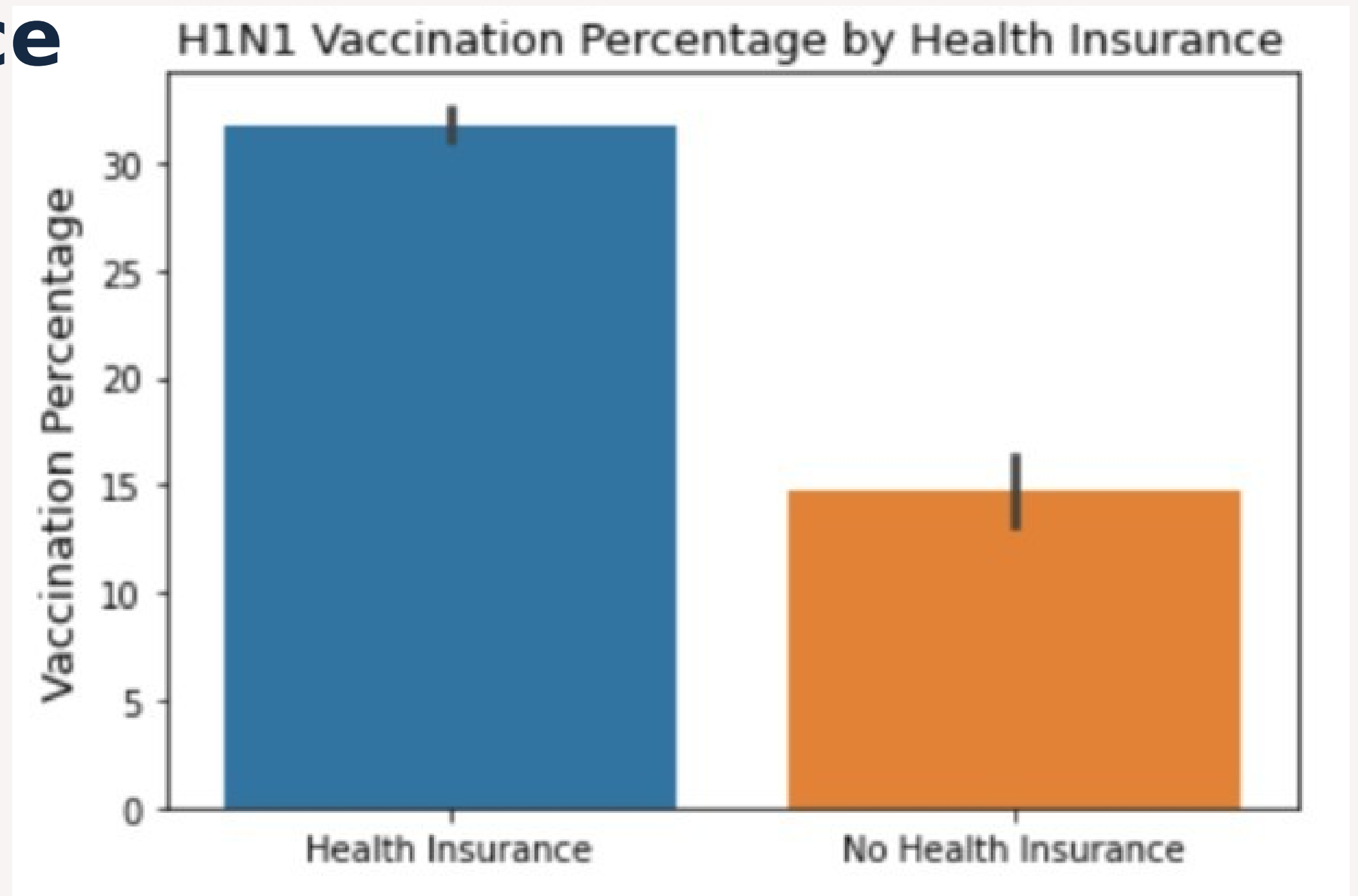
**Opinion on H1N1 Vaccine
Effectiveness**

Opinion on H1N1 Risk

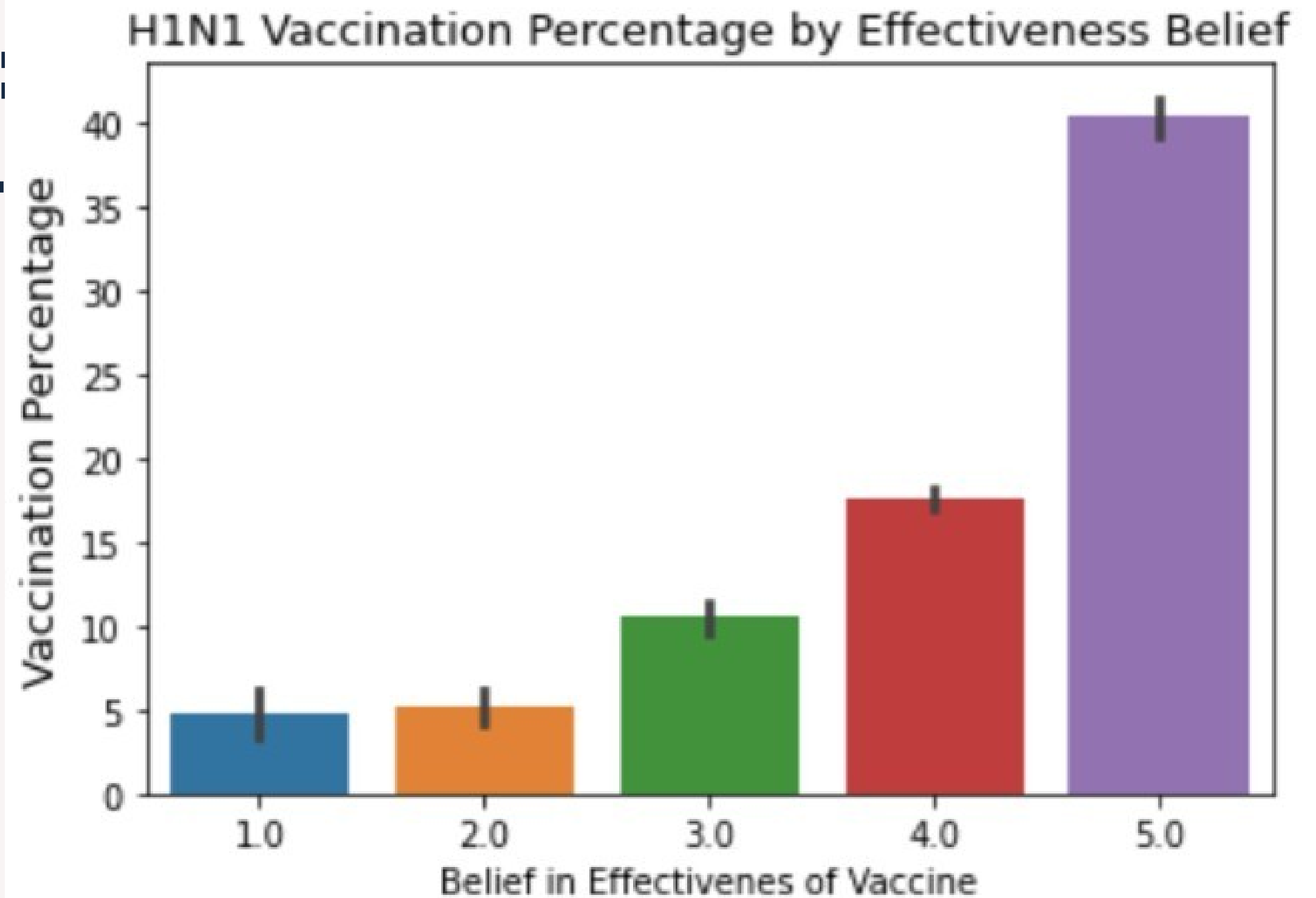
Data Visualizations: Doctor Recommendation



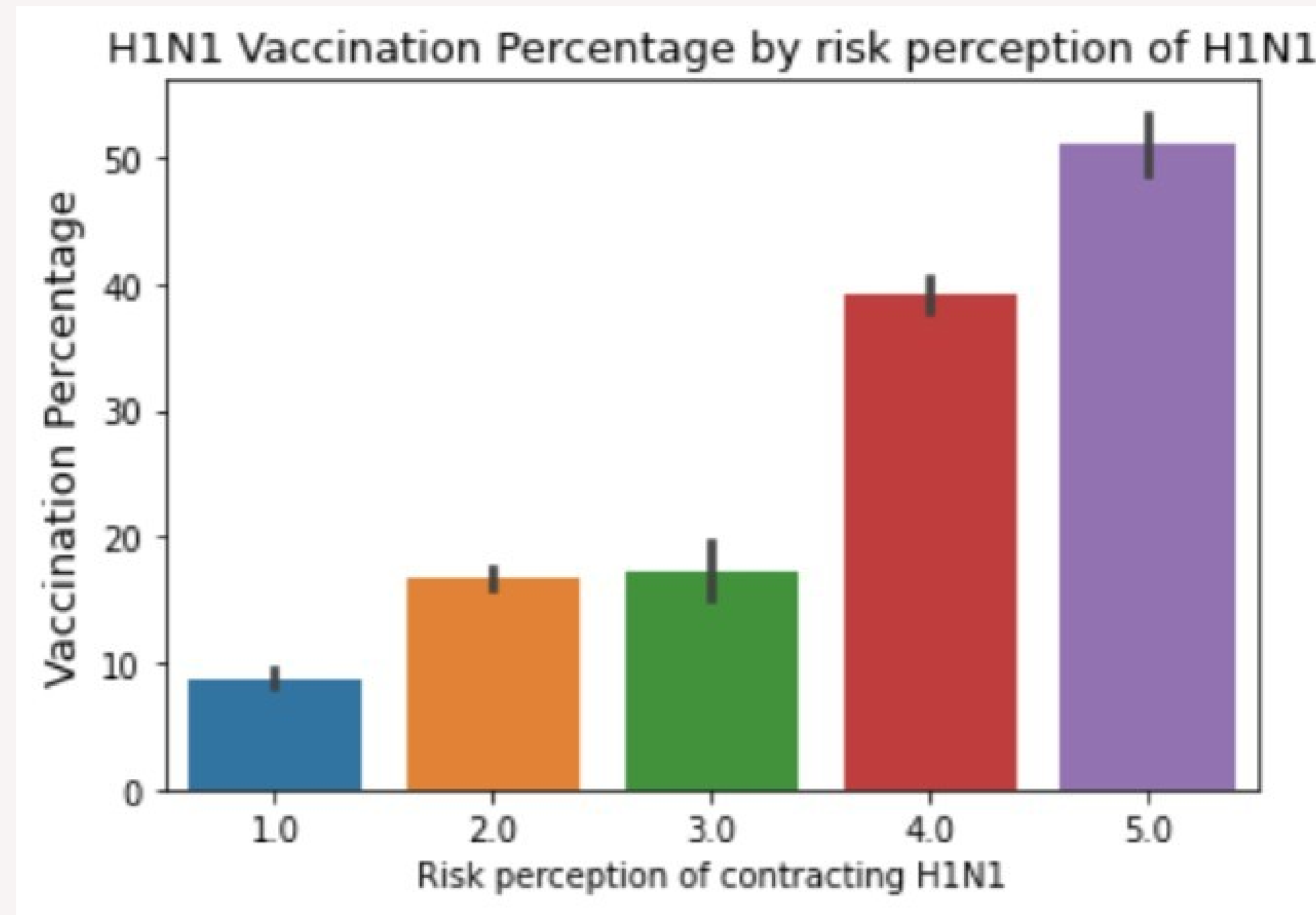
Data Visualizations: Health Insurance



Data Visualizations: Belief in H1N1 Vaccine Effectiveness



Data Visualizations: H1N1 Risk Perception





Recommendations

**Doctor
Recommendations**

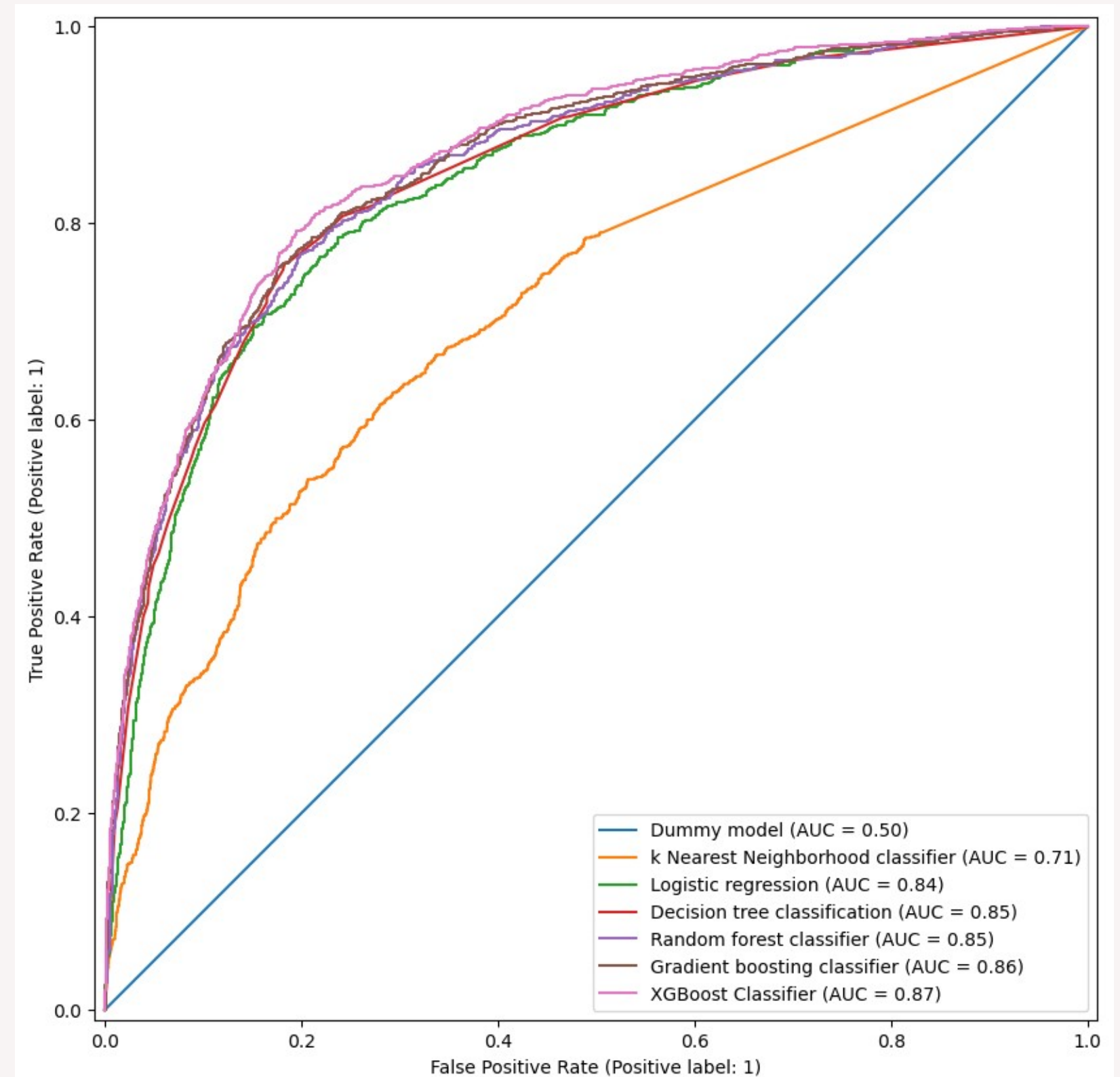
**Health
Insurance**

**Educational
Outreach**

Comparison of Multiple Model Results

XGBoost Classifier

BEST MODEL





FUTURE WORKS

Recent Survey Data

Pre/After Covid-19 Difference

More Feature Engineering

Improve Accuracy

Seasonal Vaccine Prediction

Enhance and Generalize Model



What to do



Thank you!