

Predicting H1N1 Vaccination Status:

A Machine Learning Approach

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Outline

Public Health

Perspective Goals

Data

Methods

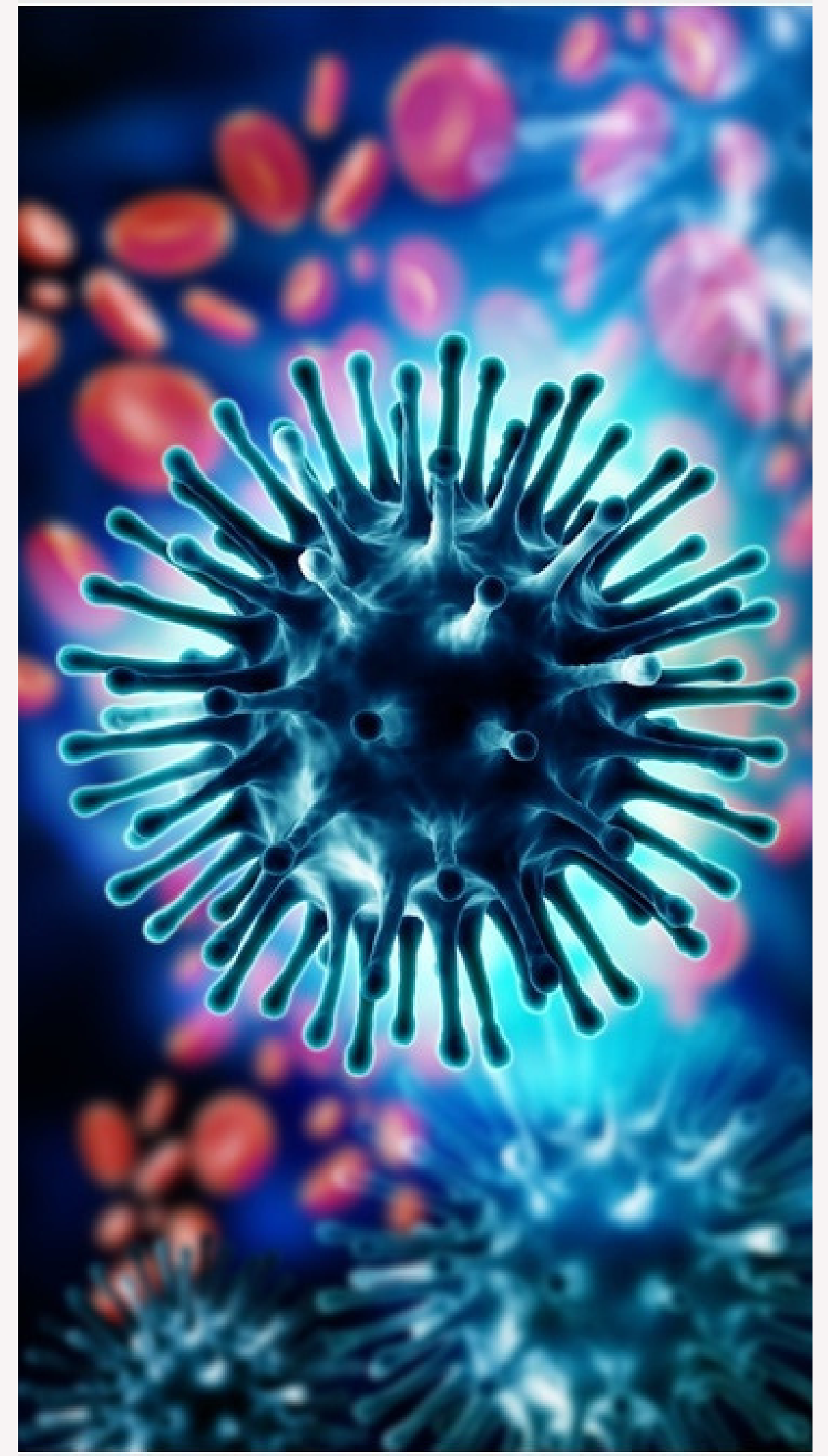
Results

Recommendations

Next Steps

Public Health Perspective

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



GOALS

- 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)**

**26,000
Respondents**

**79%
Did not Get the Vaccine**

**35
Unique Factors**

Modeling Context

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

Big Problem

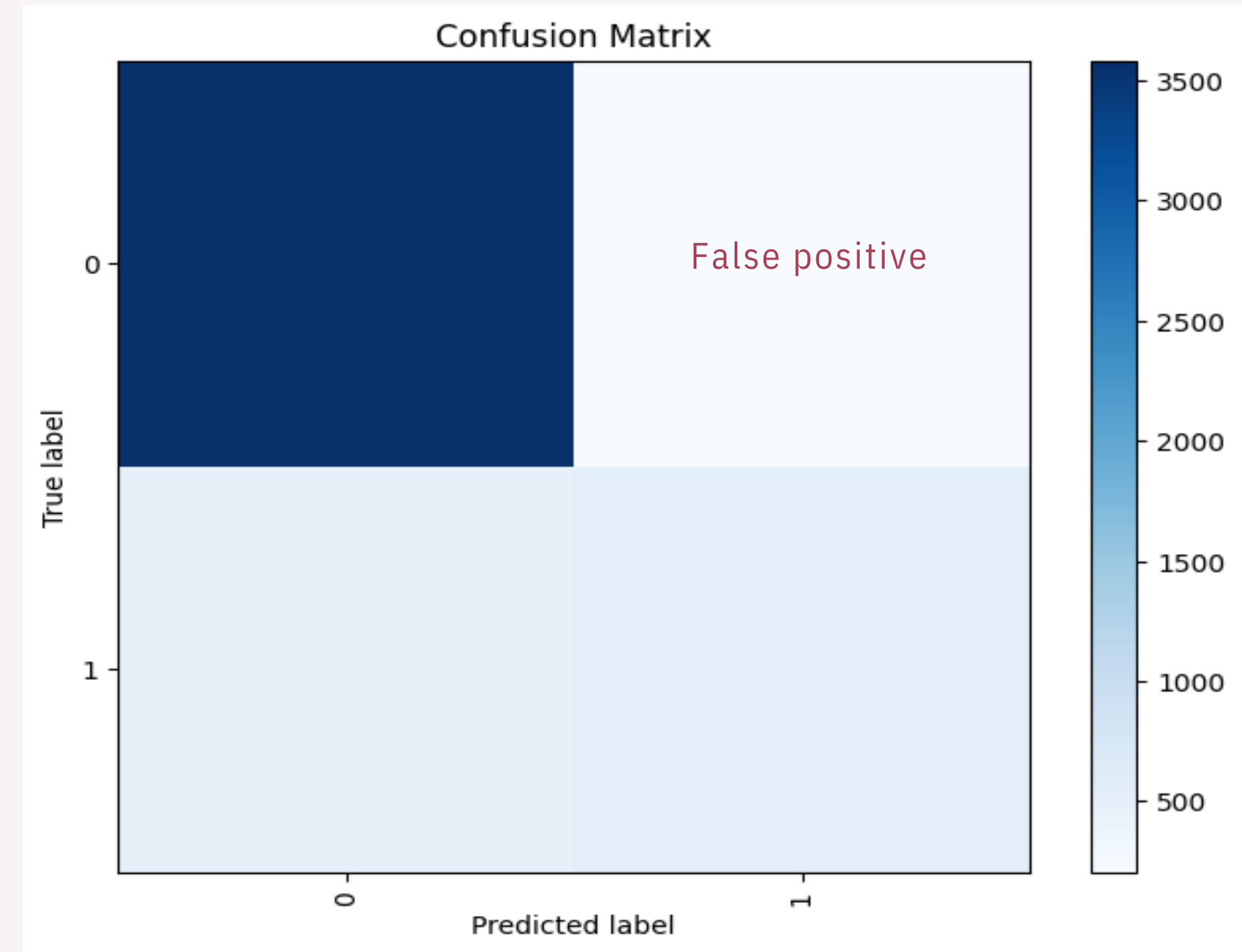
FALSE NEGATIVE:
PREDICTING THAT
PEOPLE DID NOT GET
THE VACCINE WHEN
THEY ACTUALLY DID

Not a Big Problem

Model & Results

Gradient
Boostin
g Score

84% Accuracy



Top 4 Important Features

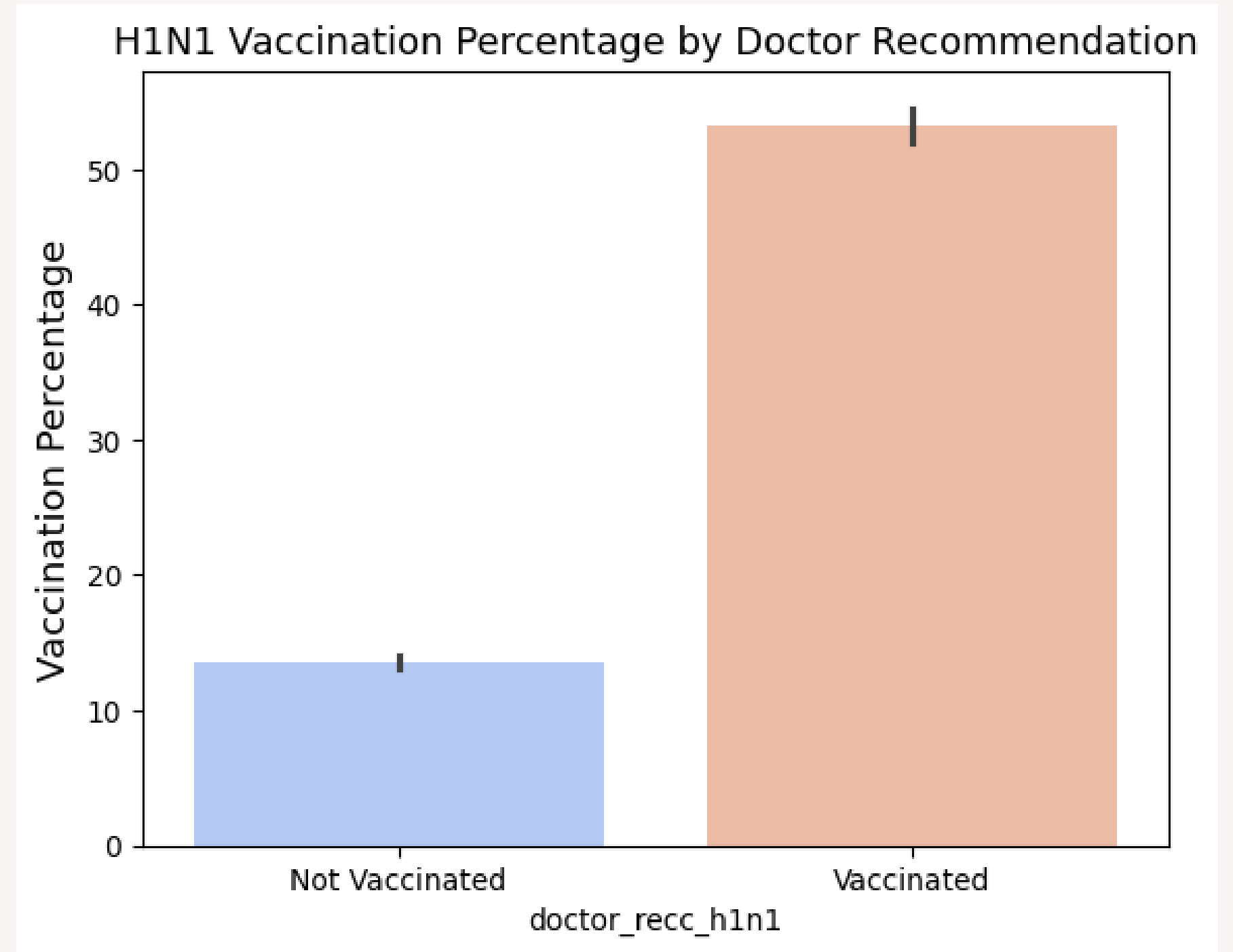
**Doctor Recommendation
of H1N1 Vaccine**

Health Insurance

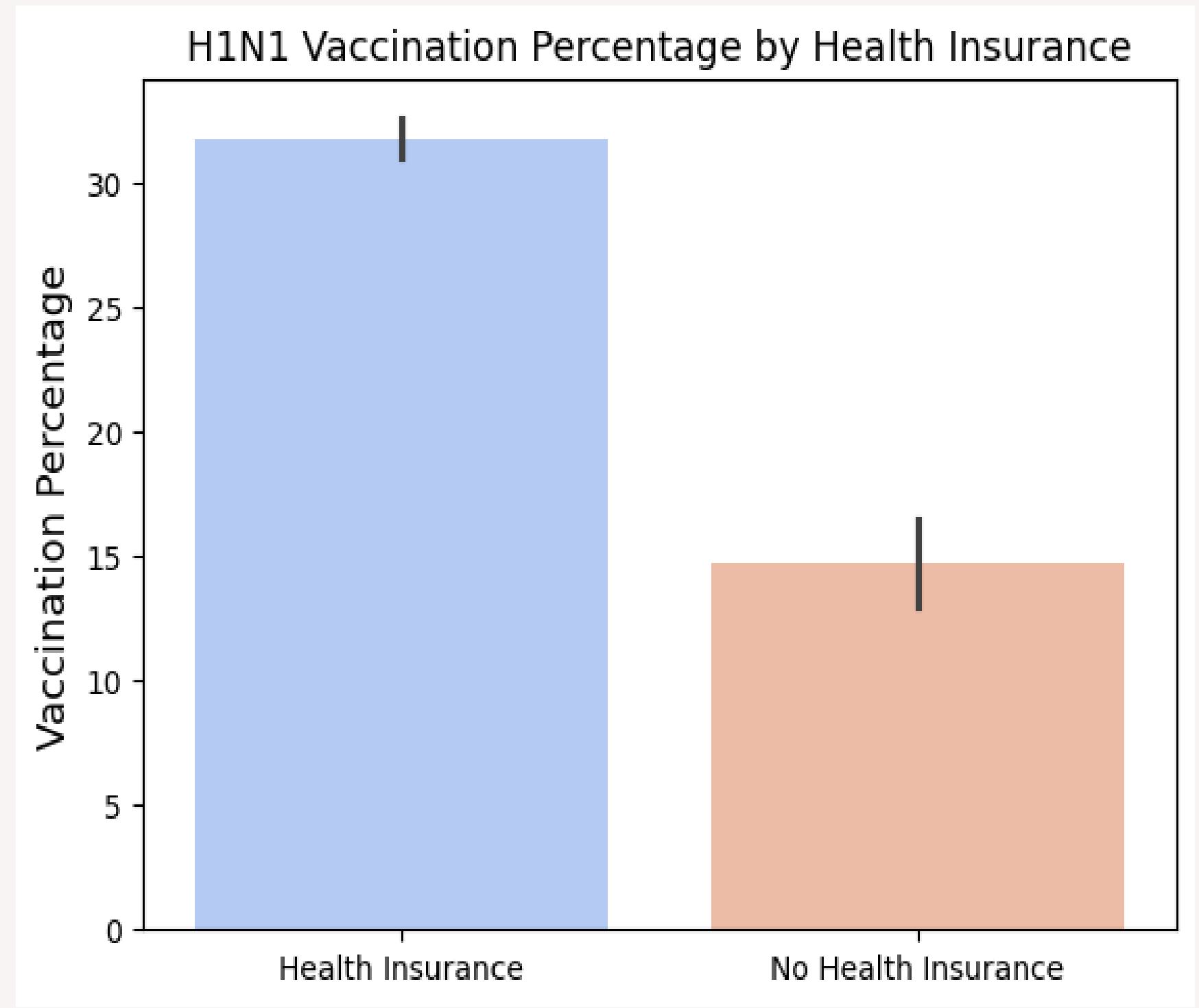
**Opinion on H1N1 Vaccine
Effectiveness**

Opinion on H1N1 Risk

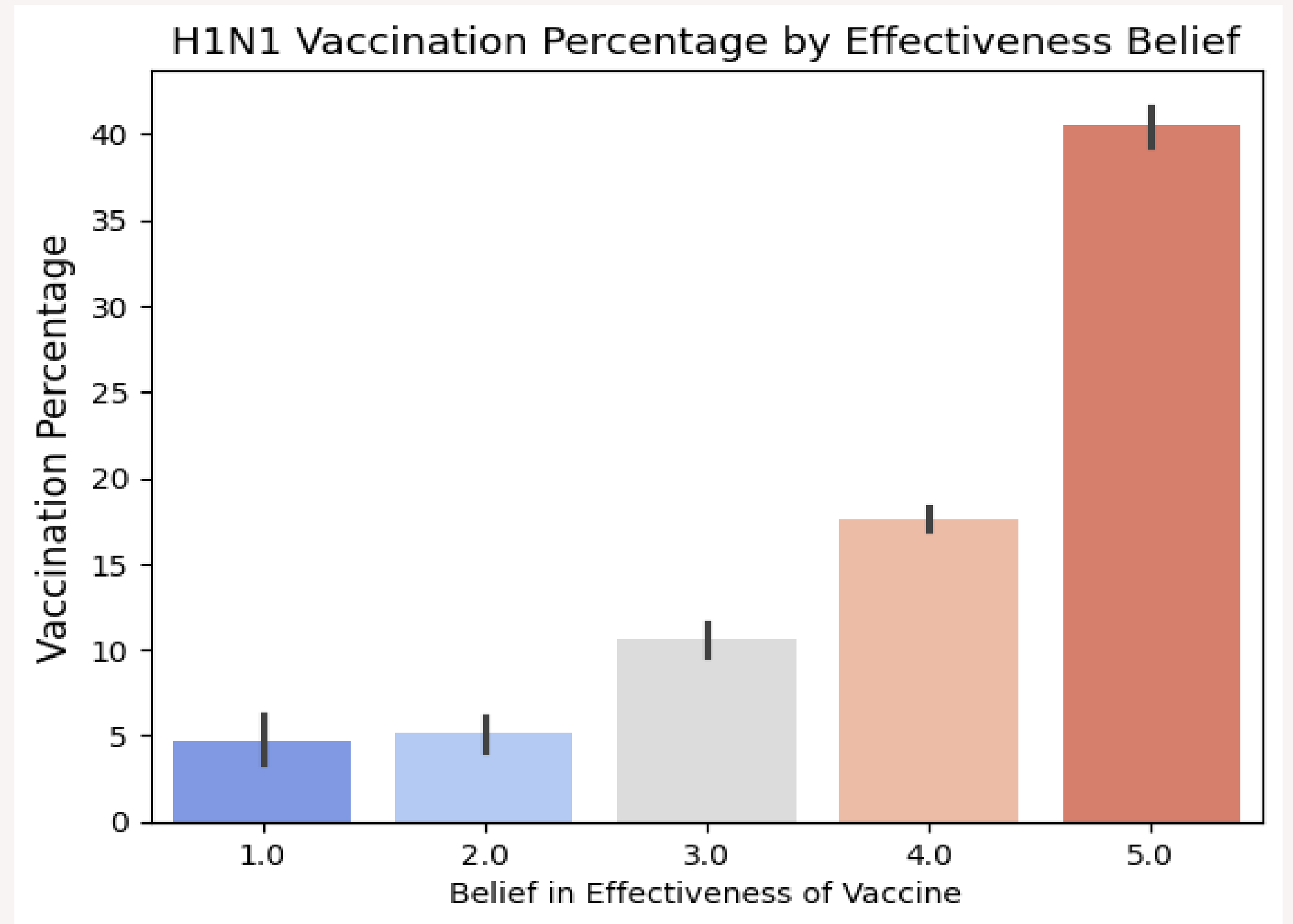
Data Visualizations: Doctor Recommendation



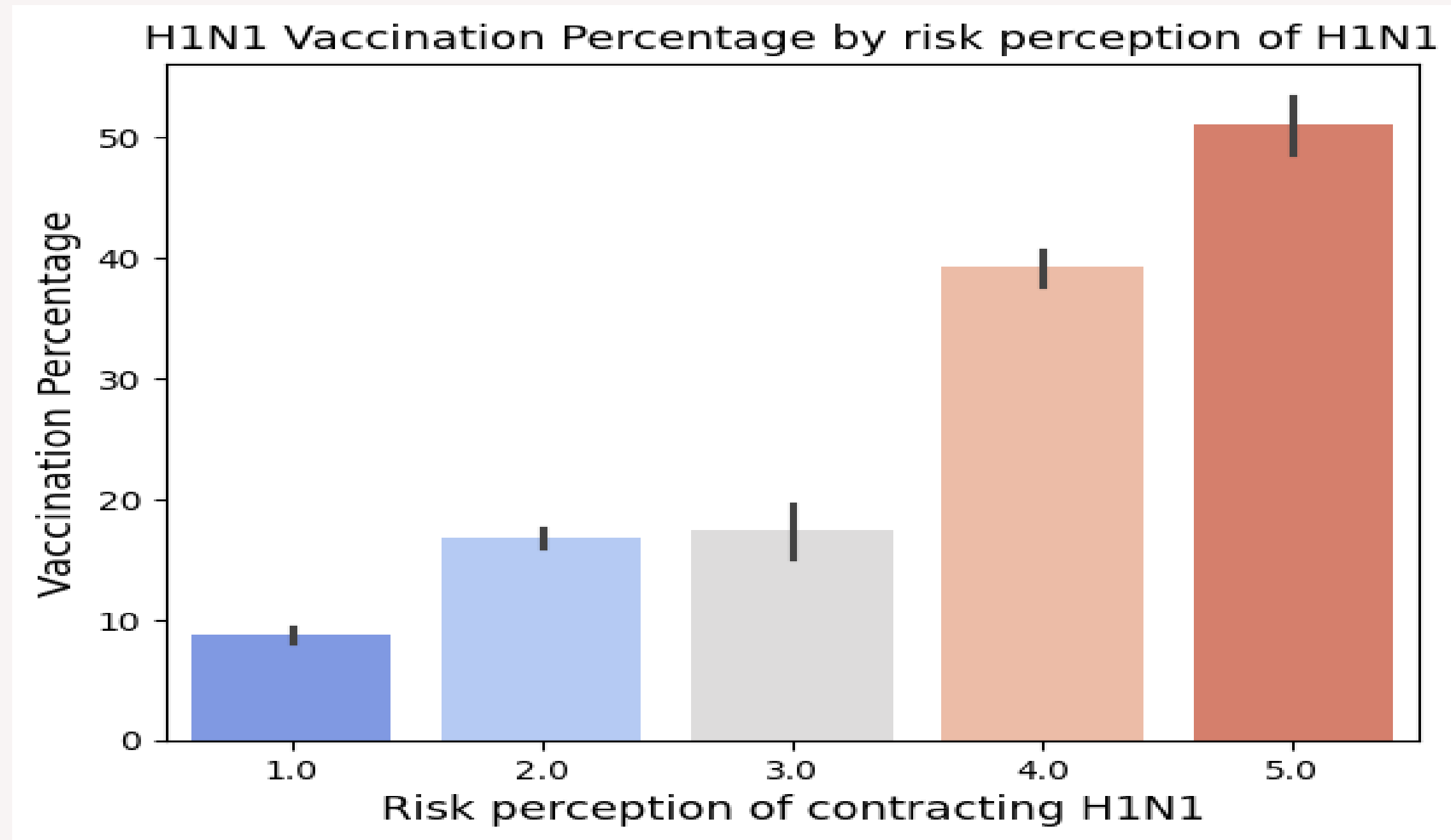
Data Visualizations: Health Insurance



Data Visualizations: Belief in H1N1 Vaccine Effectiveness



Data Visualizations: H1N1 Risk Perception





Recommendations

Doctor
Recommendations

Health
Insurance

Educational
Outreach



Connecting with Stakeholder Needs:

My findings directly address the needs of public health stakeholders by providing actionable recommendations to improve vaccination strategies. By leveraging my predictive models, stakeholders can tailor interventions to target specific demographic groups and address vaccine hesitancy effectively.



Next Steps



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 AND STAY
HEALTHY

