Predicting H1N1 Vaccination Status:

A Machine Learning Approach

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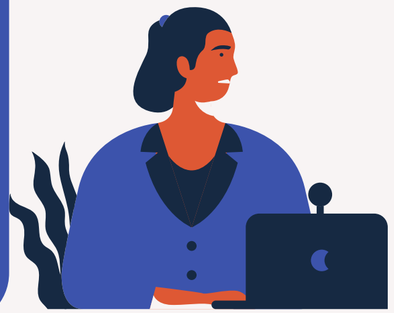
Outline

Public Health Perspective
Goals
Data
Methods
Results
Recommendations
Next Steps

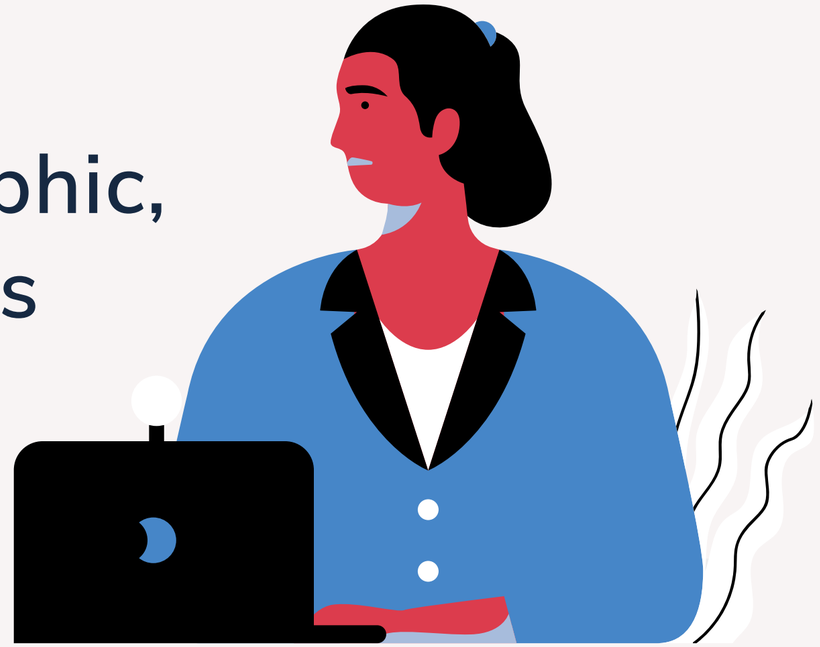
Public Health Perspective

- 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

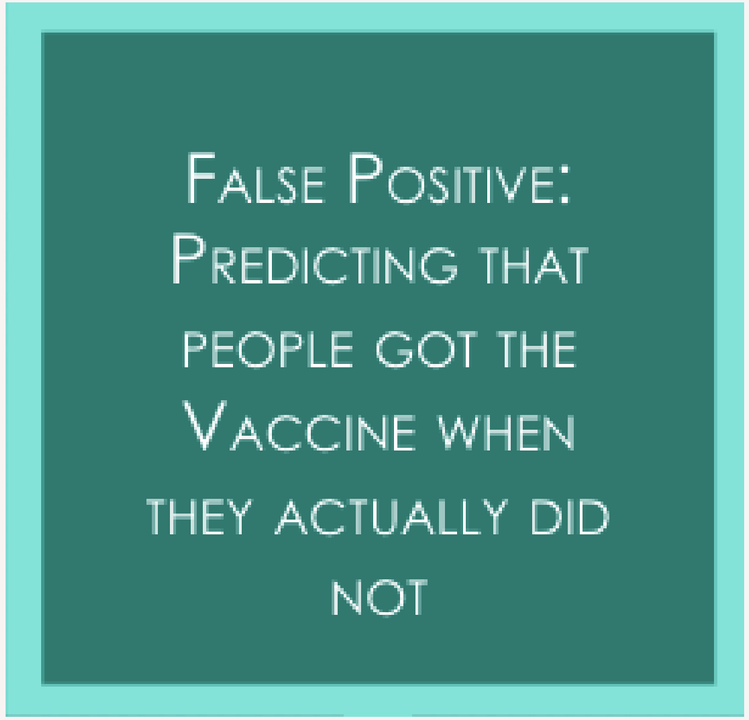
The National Flu Survey (NHFS, 2009)

26,000 Respondents

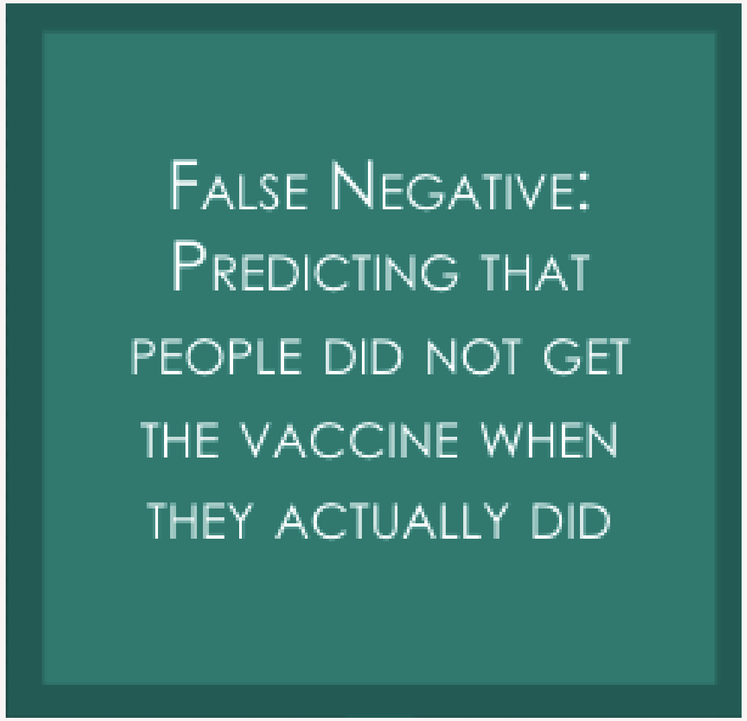
79% Did not Get the Vaccine

35 Unique Factors

Modeling Context



Big Problem

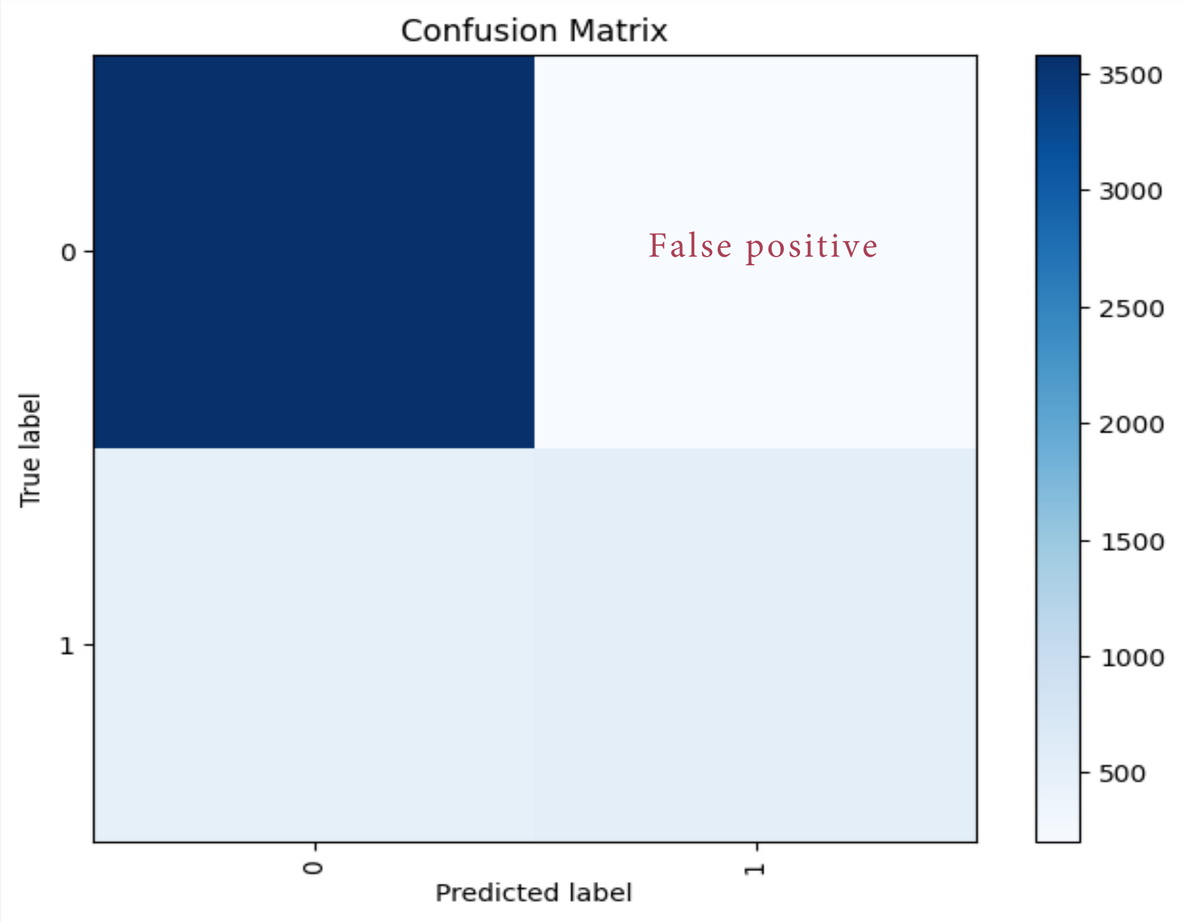


Not a Big Problem

Model & Results

Gradient Boosting Score

84% Accuracy



Top 4 Important Features

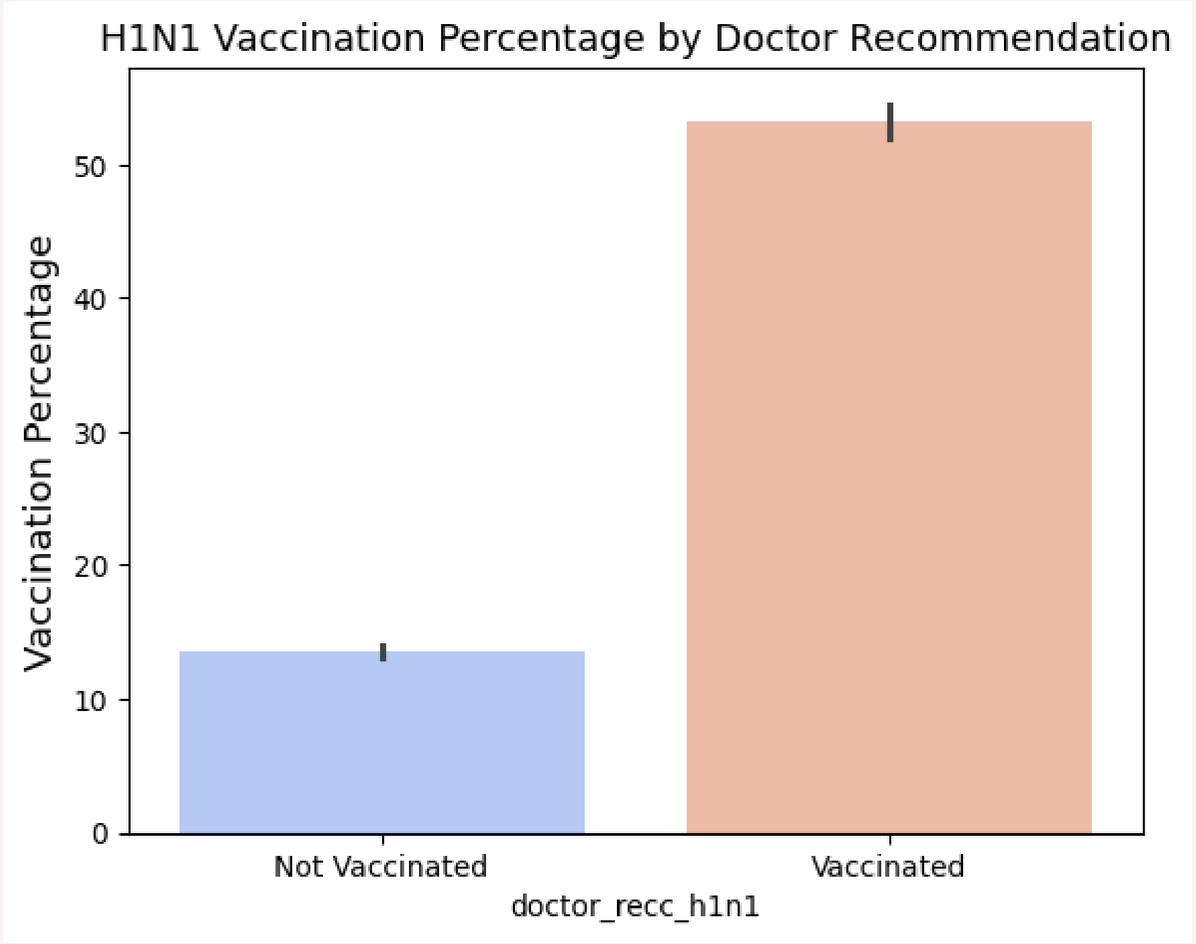
Doctor Recommendation of H1N1 Vaccine

Health Insurance

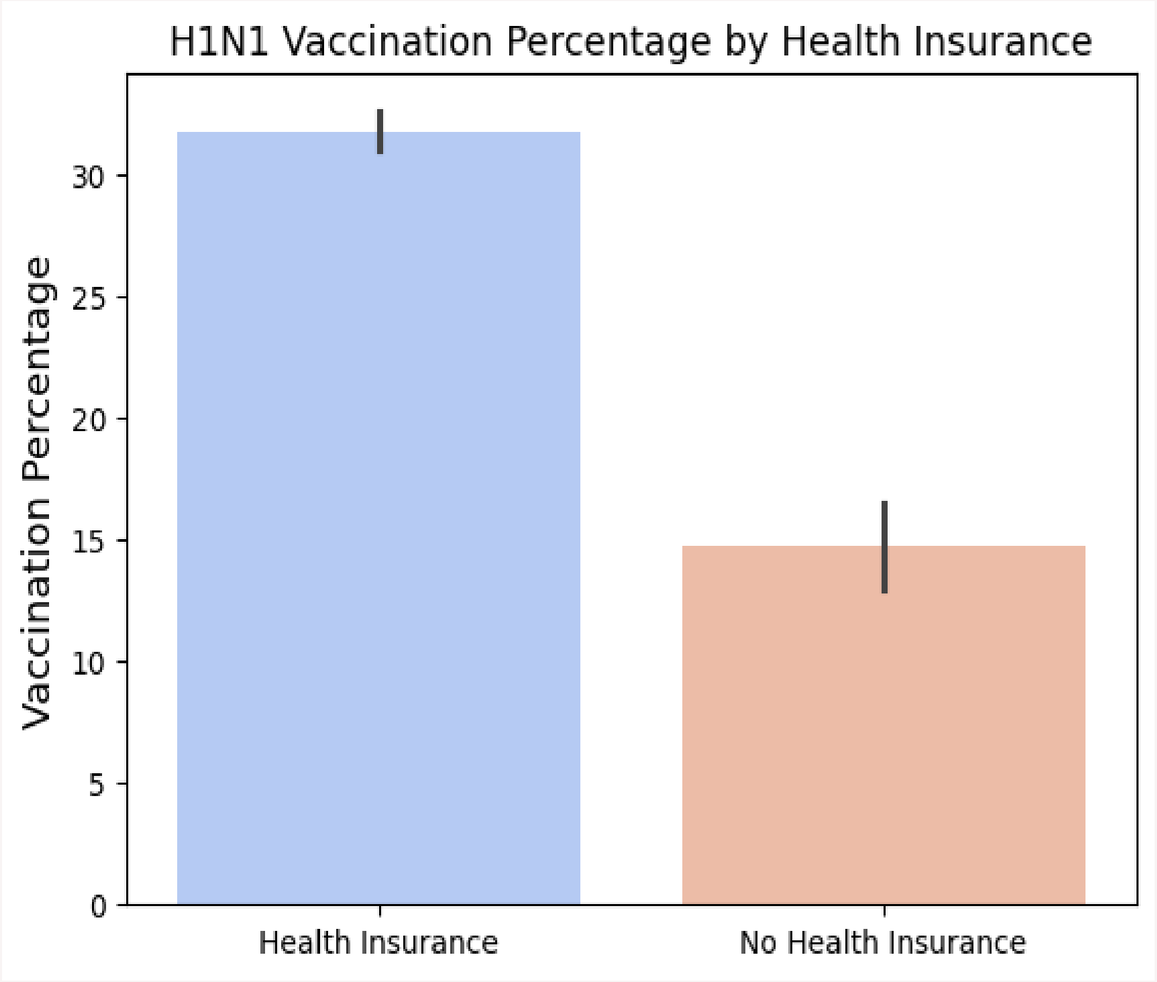
Opinion on H1N1 Vaccine Effectiveness

Opinion on H1N1 Risk

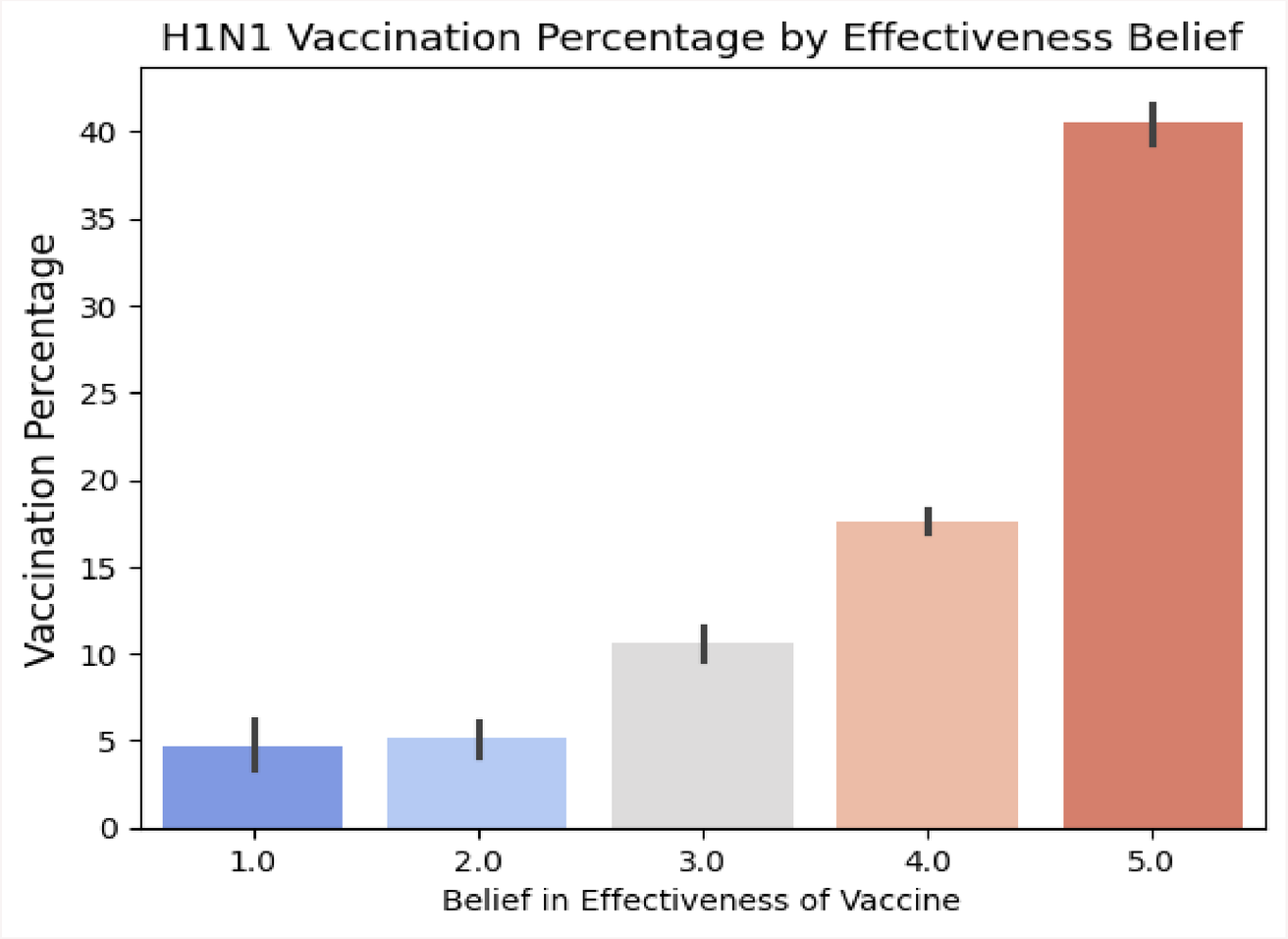
Data Visualizations: Doctor Recommendation



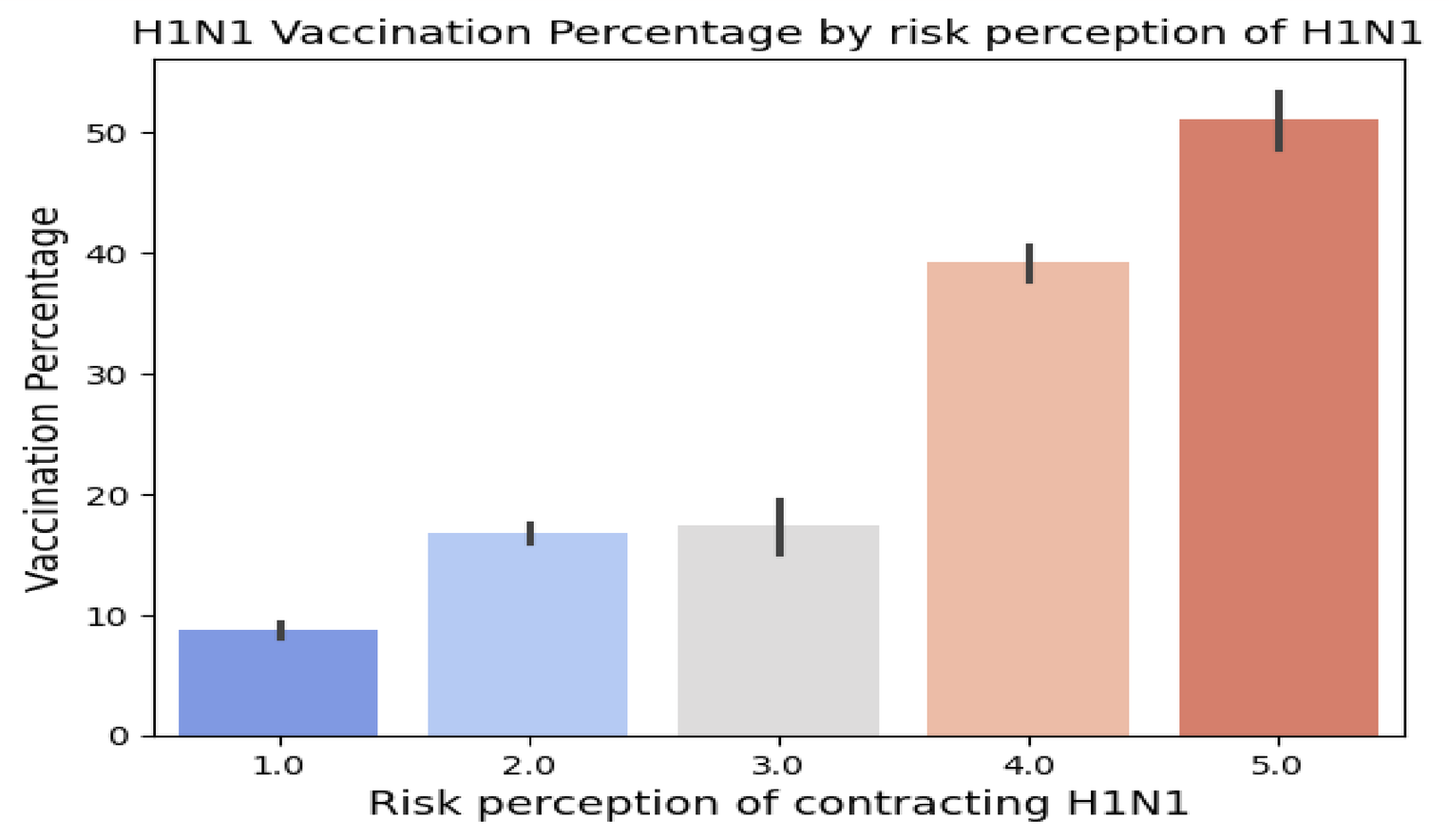
Data Visualizations: Health Insurance

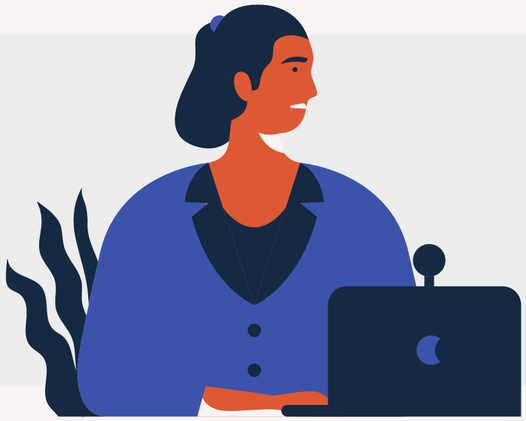


Data Visualizations: Belief in H1N1 Vaccine Effectiveness



Data Visualizations: H1N1 Risk Perception





Recommendations

Doctor Recommendations

Health Insurance

Educational Outreach

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!

Appendix

Comparison of Multiple Model Results