Predicting H1N1 Vaccine Uptake

Introduction

The National 2009 H1N1 Flu Survey investigated vaccination uptake and factors influencing individual decisions. This presentation explores how backgrounds, opinions, and health behaviors affect H1N1 vaccination choices, vital for effective public health strategies.

Business understanding

- Vaccine uptake is crucial for public health.
- By analyzing acceptance factors, we can tailor strategies to boost vaccination rates and enhance community immunity.

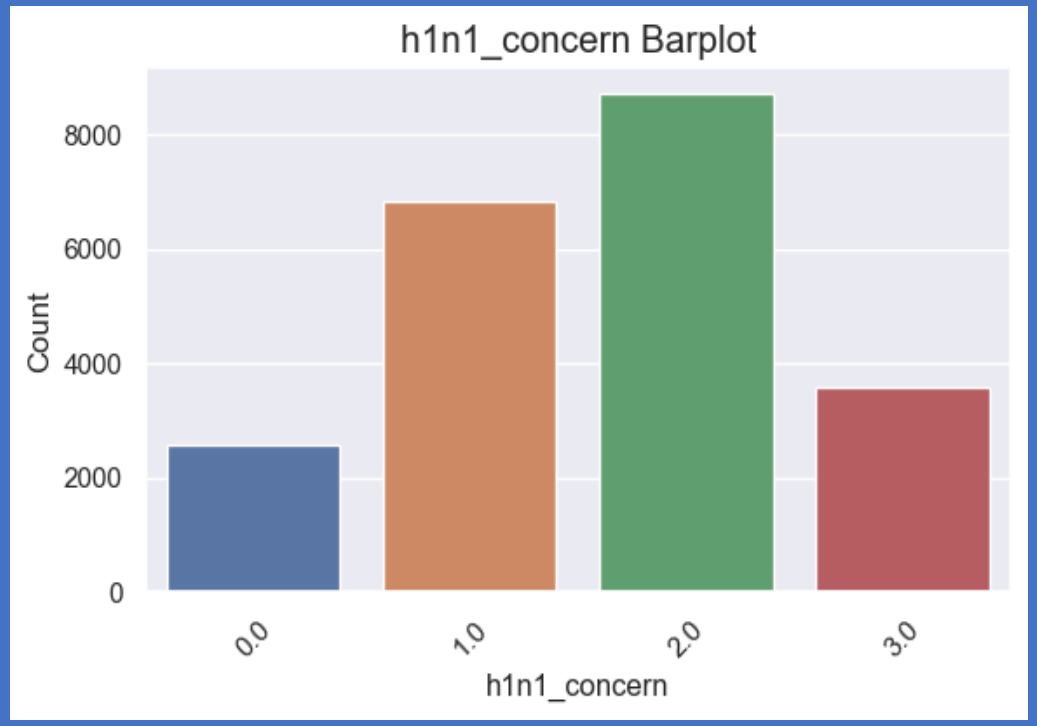
Problem statement

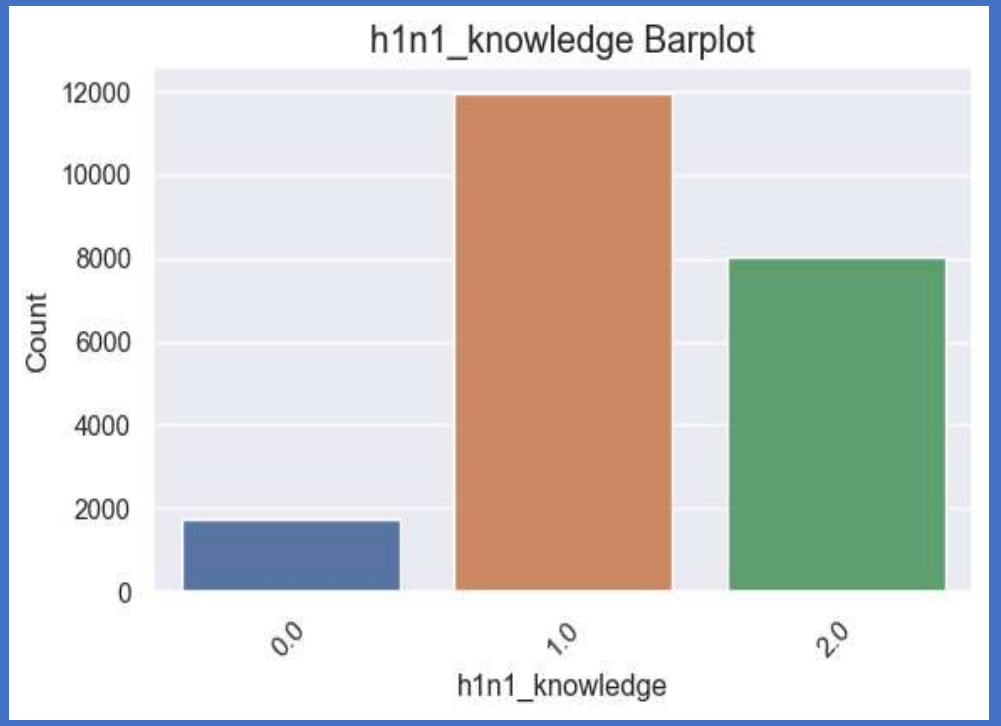
- The goal of this project is to develop a predictive model assessing the probability of individuals opting for the H1N1 vaccine.
- Factors considered include demographics, socio-economic status, and attitudes.
- The model aims for accuracy in predicting vaccine uptake to inform public health strategies effectively.

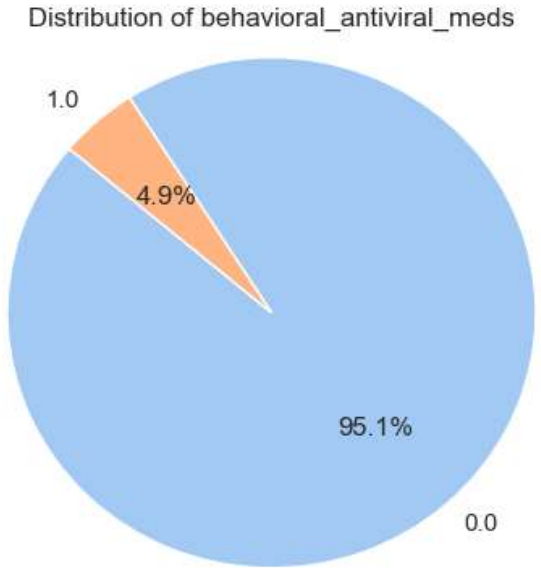
Objectives

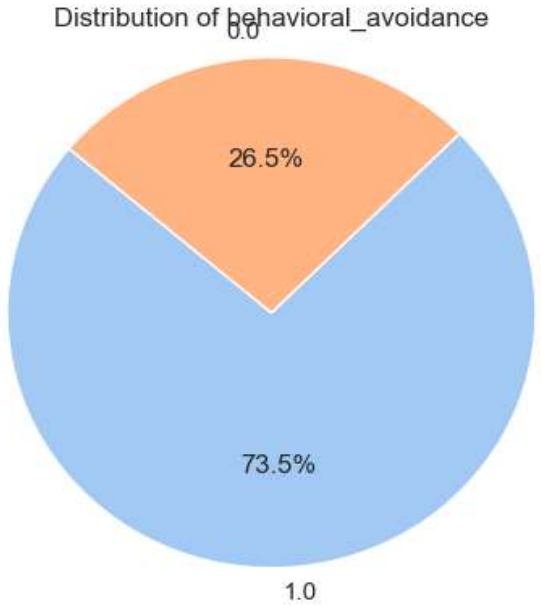
1. Develop a Robust Predictive Model for estimating H1N1 vaccine uptake likelihood.
2. Identify Key Predictors of H1N1 Vaccine Acceptance.
3. Generate insights and recommendations

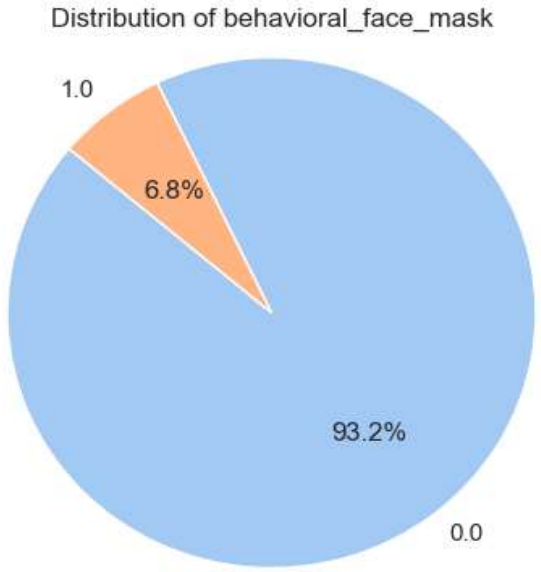
Data features

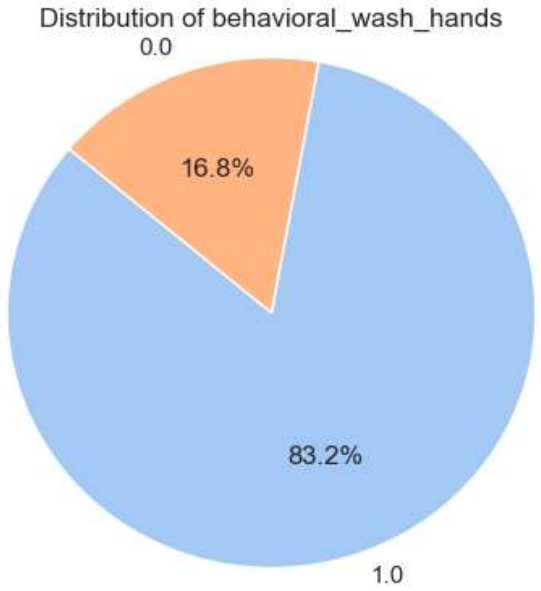

h1n1_concern Barplot
Count
8000
6000
4000
2000
0
0.0
1.0
2.0
3.0
h1n1_concern


h1n1_knowledge Barplot
Count
12000
10000
8000
6000
4000
2000
0
0.0
1.0
2.0
h1n1_knowledge

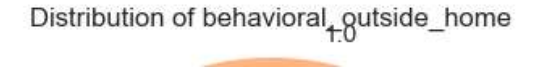

Distribution of behavioral_antiviral_meds
1.0
4.9%
95.1%
0.0

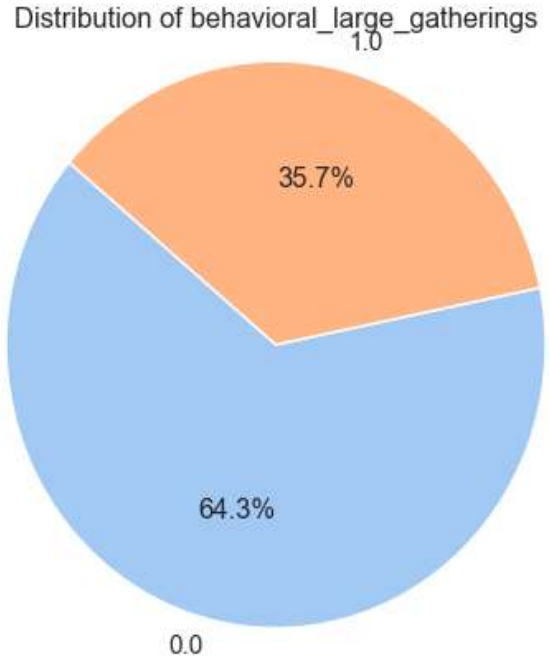

Distribution of behavioral_avoidance
0.0
26.5%
73.5%
1.0

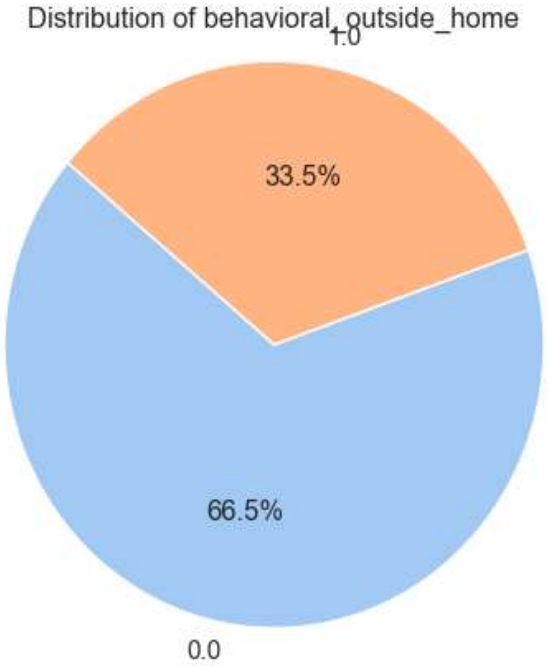

Distribution of behavioral_face_mask
1.0
6.8%
93.2%
0.0

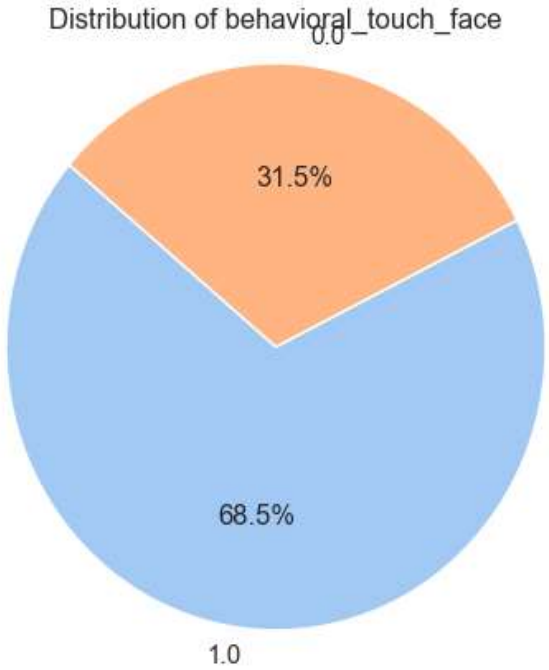

Distribution of behavioral_wash_hands
0.0
16.8%
83.2%
1.0

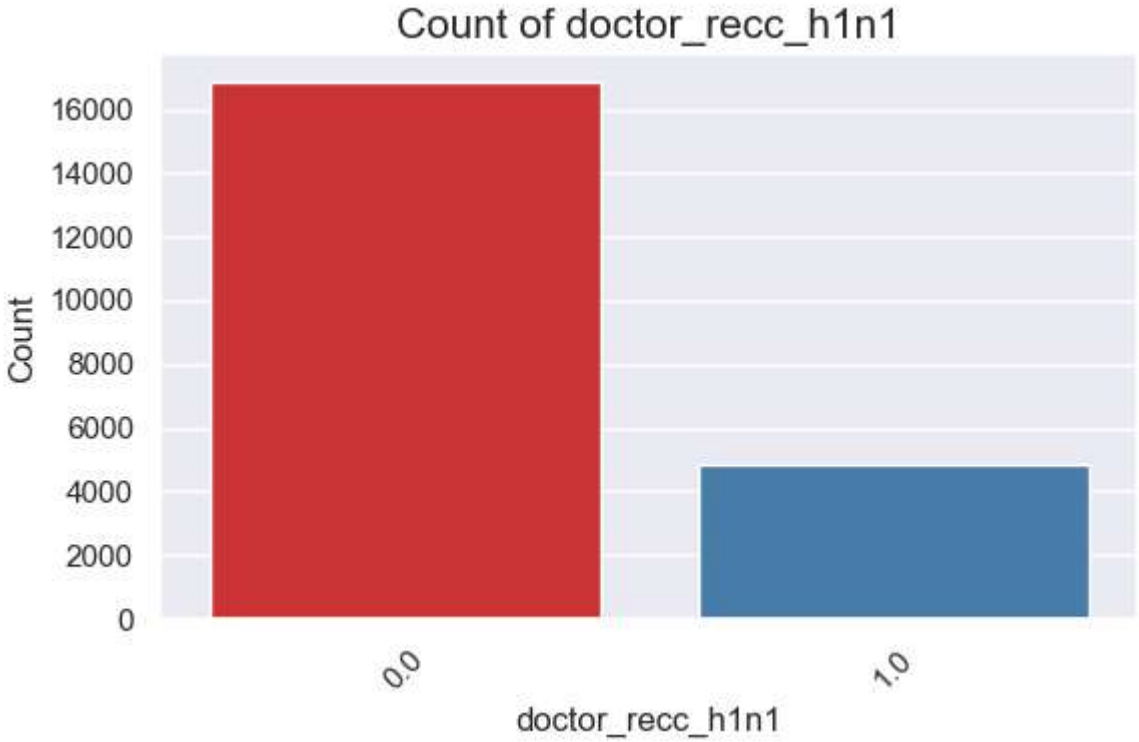
Distribution of behavioral_large_gatherings
1.0

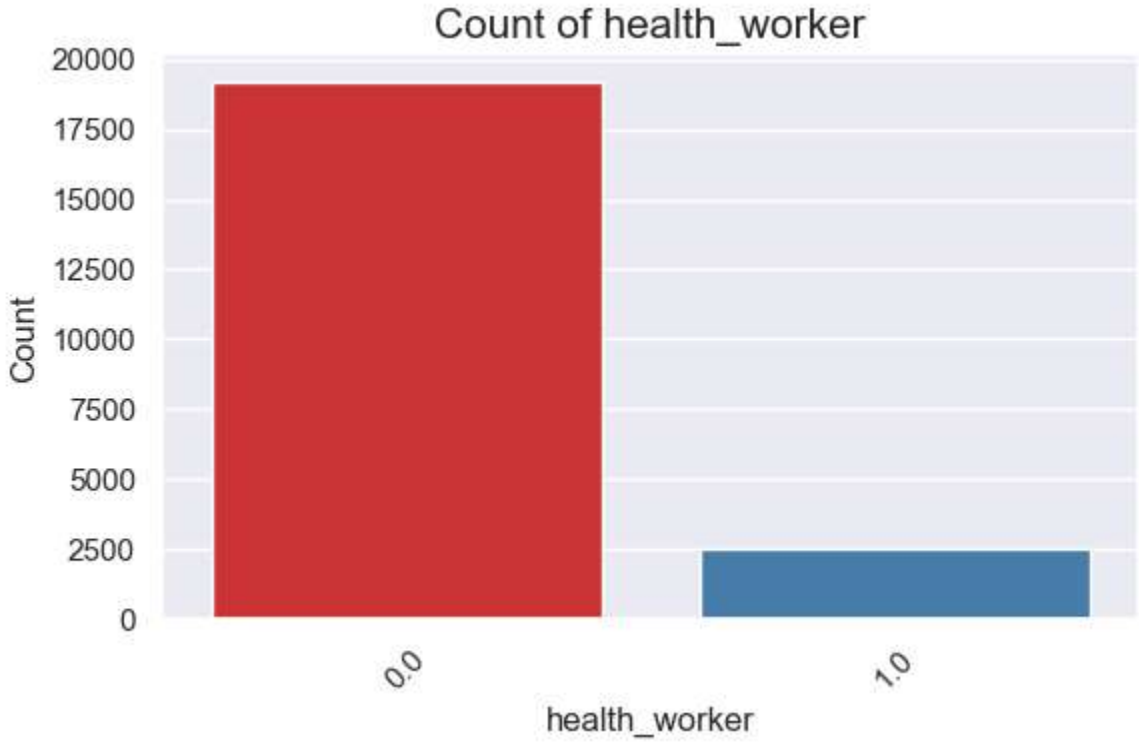

Distribution of behavioral_outside_home
1.0

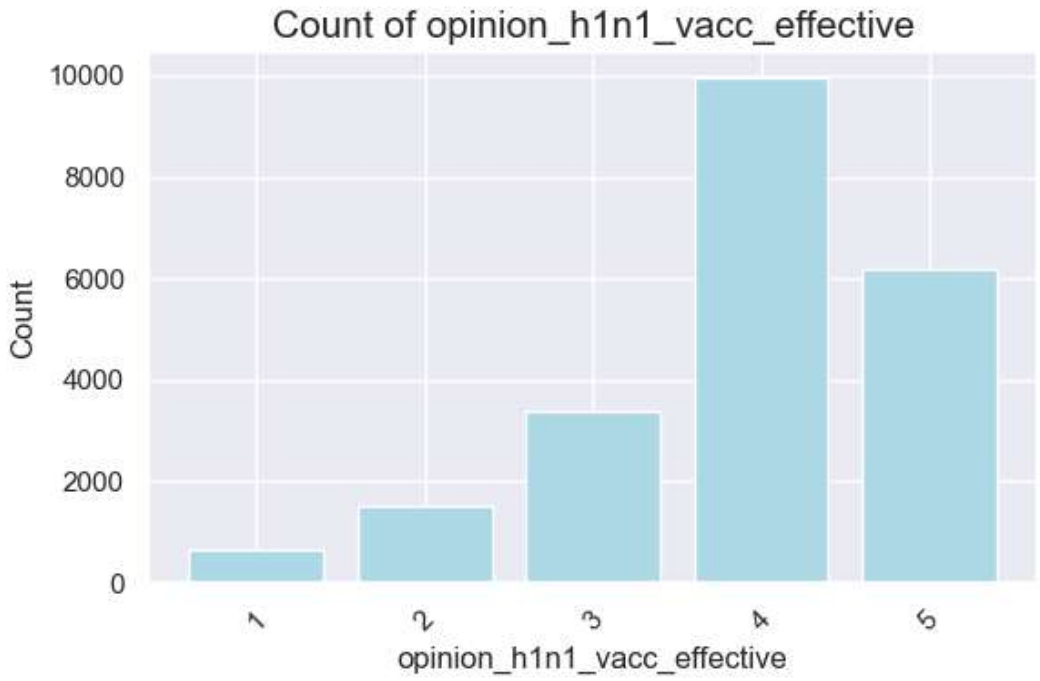

Distribution of behavioral_large_gatherings
1.0
35.7%
64.3%
0.0

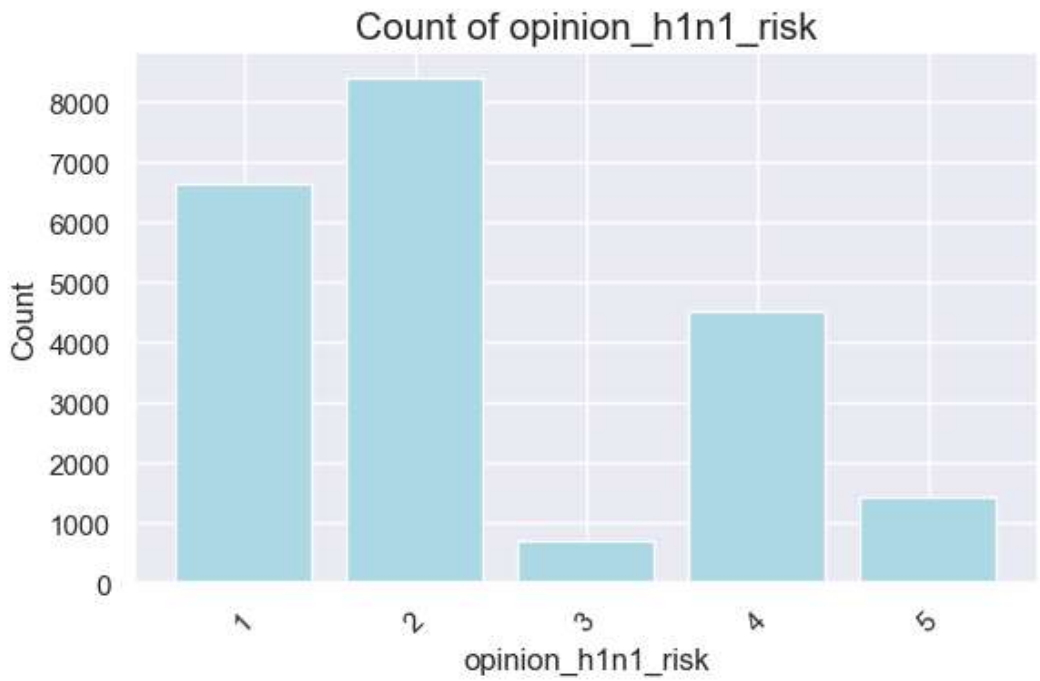

Distribution of behavioral_outside_home
1.0
33.5%
66.5%
0.0

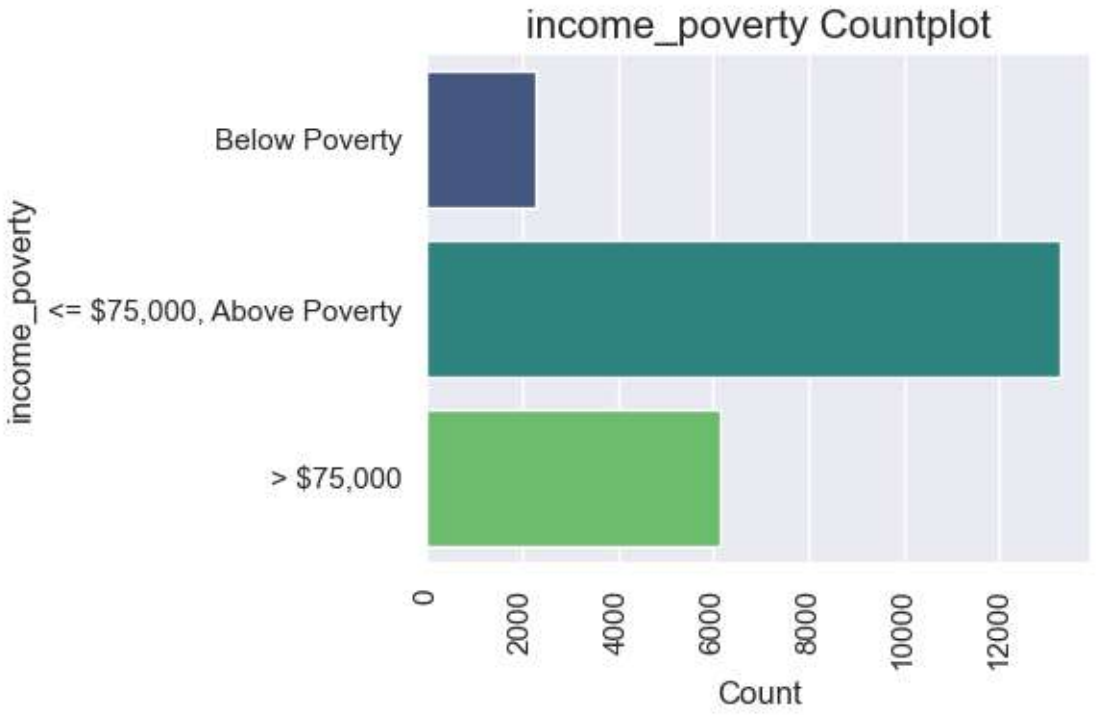

Distribution of behavioral_touch_face
0.0
31.5%
68.5%
1.0

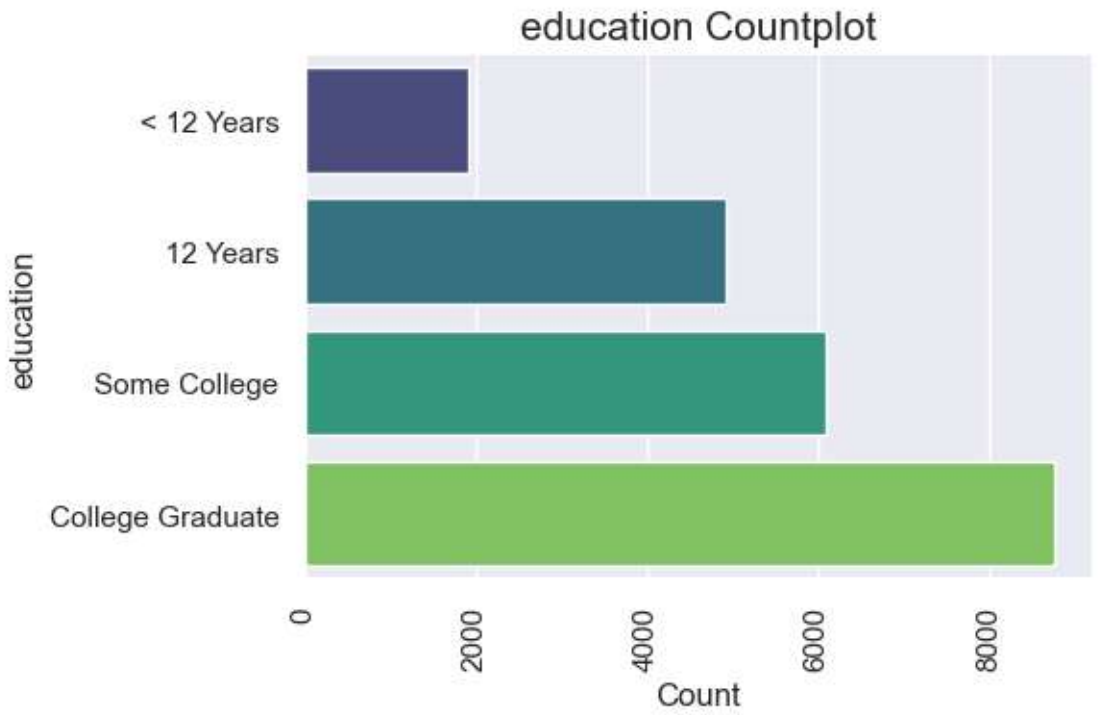

Count of doctor_recc_h1n1
Count
16000
14000
12000
10000
8000
6000
4000
2000
0
0.0
1.0
doctor_recc_h1n1

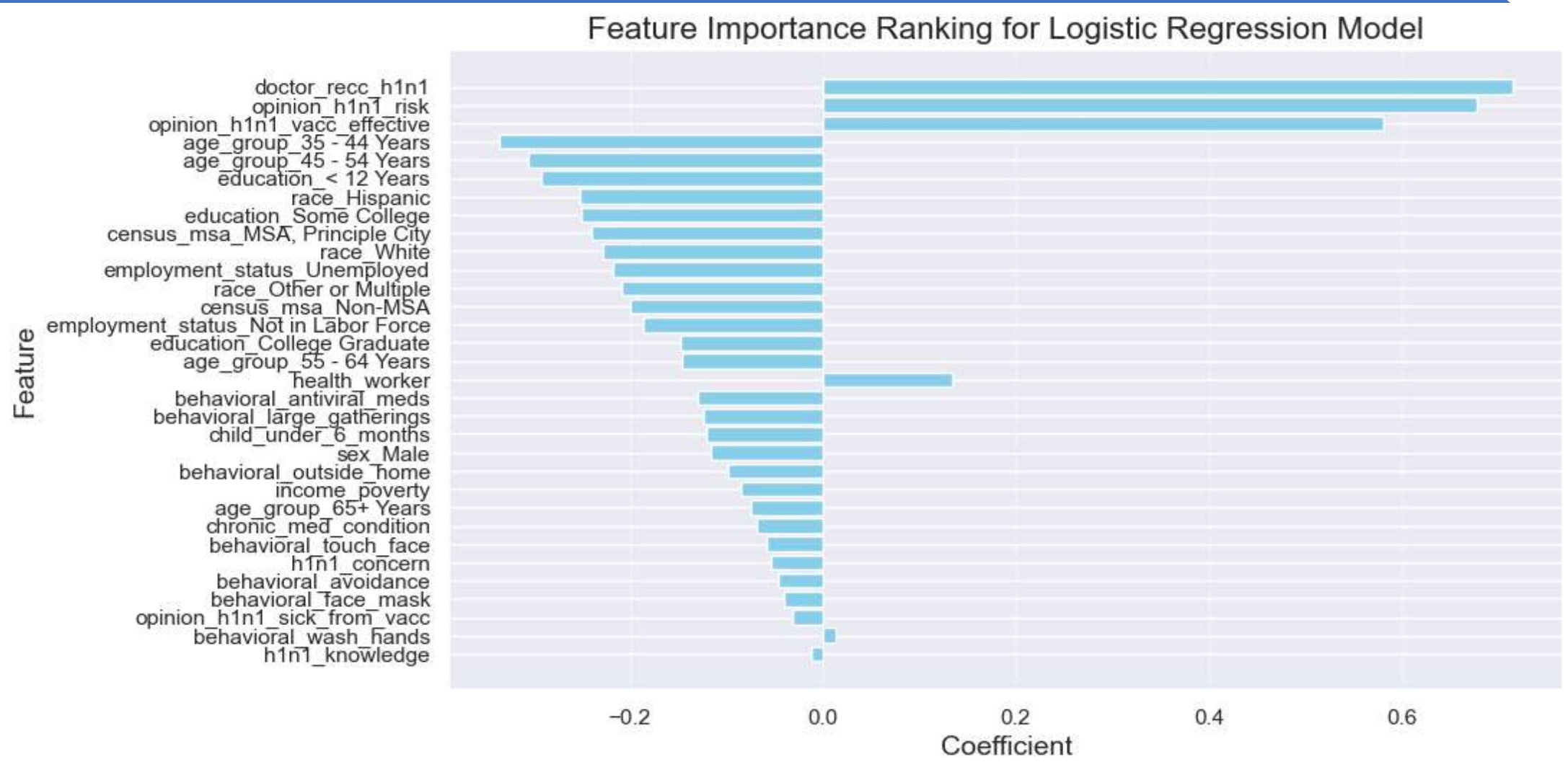

Count of health_worker
Count
20000
17500
15000
12500
10000
7500
5000
2500
0
0.0
1.0
health_worker


Count of opinion_h1n1_vacc_effective
Count
10000
8000
6000
4000
2000
0
1
2
3
4
5
opinion_h1n1_vacc_effective


Count of opinion_h1n1_risk
Count
8000
7000
6000
5000
4000
3000
2000
1000
0
1
2
3
4
5
opinion_h1n1_risk


income_poverty Countplot
Below Poverty
<= $75,000, Above Poverty
> $75,000
income_poverty
0
2000
4000
6000
8000
10000
12000
Count


education Countplot
< 12 Years
12 Years
Some College
College Graduate
education
0
2000
4000
6000
8000
Count


Feature Importance Ranking for Logistic Regression Model
Feature
doctor_recc_h1n1
opinion_h1n1_risk
opinion_h1n1_vacc_effective
age_group_35 - 44 Years
age_group_45 - 54 Years
education_< 12 Years
race_Hispanic
education_Some College
census_msa_MSA, Principle City
race_White
employment_status_Unemployed
race_Other or Multiple
census_msa_Non-MSA
employment_status_Not in Labor Force
education_College Graduate
age_group_55 - 64 Years
health_worker
behavioral_antiviral_meds
behavioral_large_gatherings
child_under_6_months
sex_Male
behavioral_outside_home
income_poverty
age_group_65+ Years
chronic_med_condition
behavioral_touch_face
h1n1_concern
behavioral_avoidance
behavioral_face_mask
opinion_h1n1_sick_from_vacc
behavioral_wash_hands
h1n1_knowledge
−0.2
0.0
0.2
0.4
0.6
Coefficient

Key Factors Influencing H1N1 Vaccine Uptake:

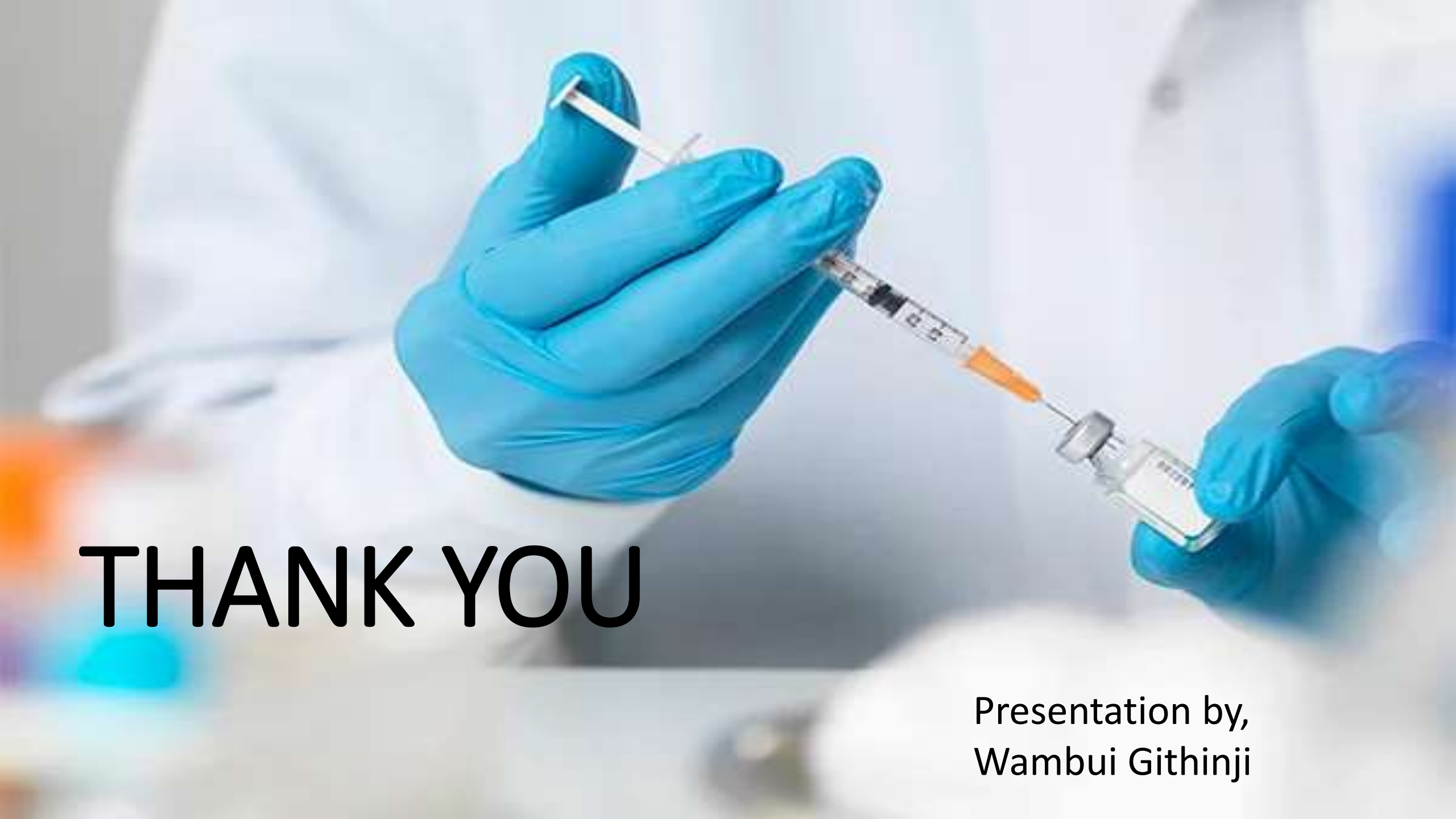
1. Doctor's Recommendation
2. Perception of Infection Risk
3. Belief in Vaccine Effectiveness
4. Healthcare Worker Status Behavioural Practices

Recommendations

- Promote Doctor Recommendations: Encourage healthcare providers to recommend the H1N1 vaccine.
- Highlight Health Risks: Emphasize risks of contracting H1N1 without vaccination.
- Address Perceived Risks: Clarify misconceptions about H1N1 vaccine risks.
- Enhance Awareness: Strengthen communication on H1N1 vaccine effectiveness.
- Target Health Workers: Promote vaccination among healthcare workers.

Next steps

- Provider Training: Train healthcare staff to promote H1N1 vaccine benefits.
- Research Needs: Investigate reasons for negative vaccine associations.
- Monitor and Adapt: Continuously assess and adjust strategies for uptake improvement.



THANK YOU

Presentation by,
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