

H1N1 VACCINE PREDICTIVE MODEL

MORINGA SCHOOL

TABLE of contents

01. Introduction

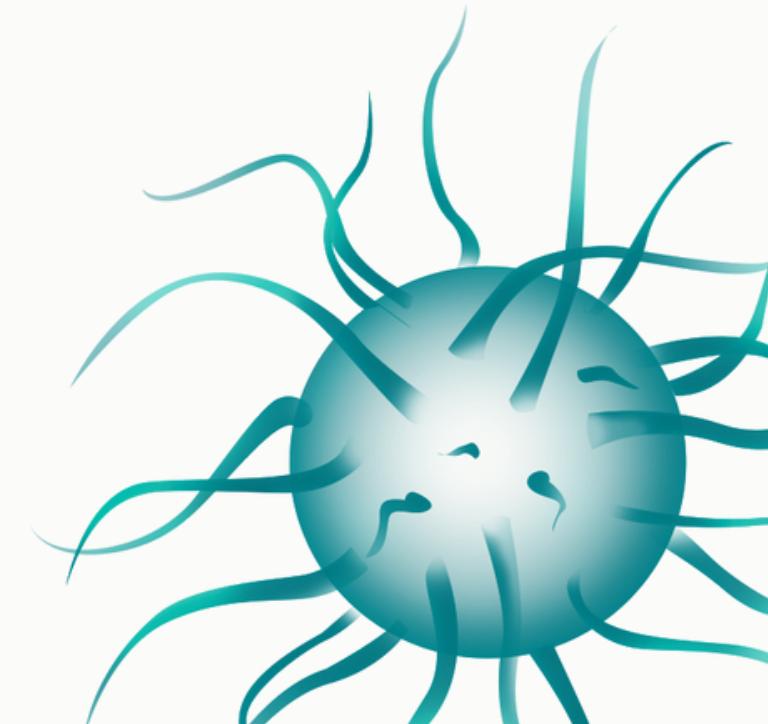
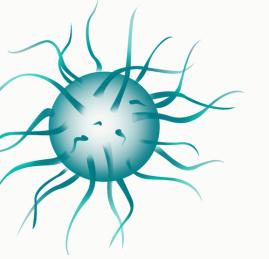
02 Problem statement

03. Objectives

04. Pattern and findings

05. Conclusions

06. Recommendations



Introduction

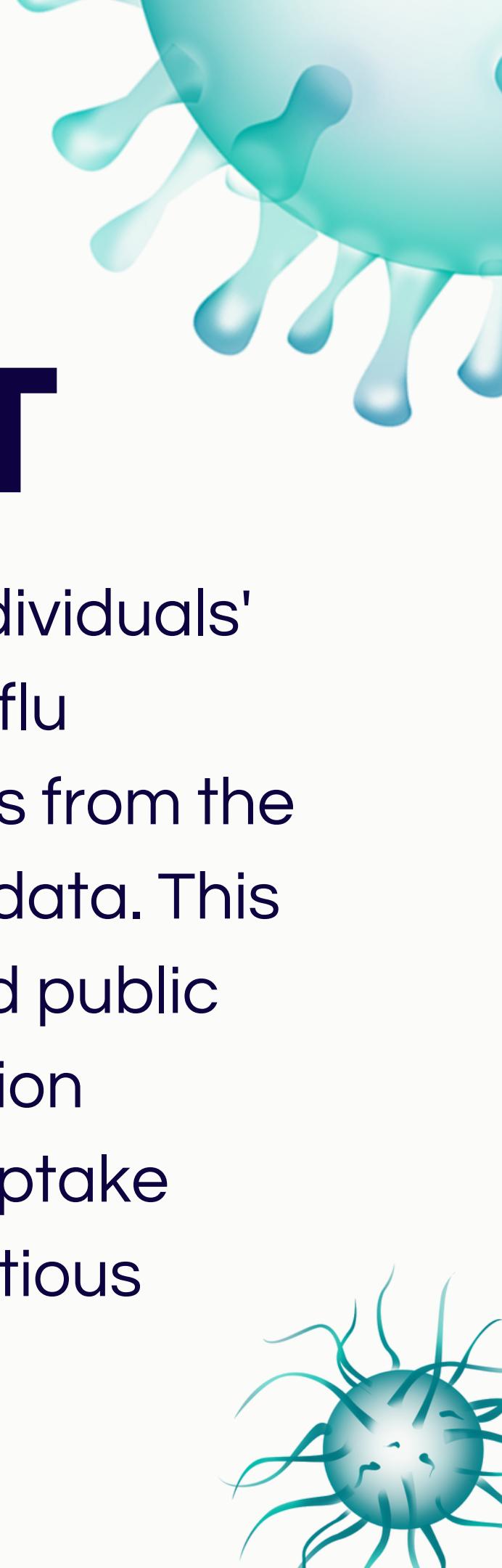
The H1N1 flu, also known as swine flu, was a major health concern during the 2009 global pandemic. It affected many people, especially young adults and those with health issues. To fight it, there were big vaccination campaigns. Understanding why some people got vaccinated and others didn't is really important for making sure we're ready to deal with similar outbreaks in the future.





PROBLEM STATEMENT

The study aims to determine individuals' likelihood of receiving the H1N1 flu vaccine based on certain factors from the National 2009 H1N1 Flu Survey data. This will be crucial for guiding tailored public health campaigns and vaccination strategies to increase vaccine uptake and mitigate the spread of infectious diseases.





Objectives

1

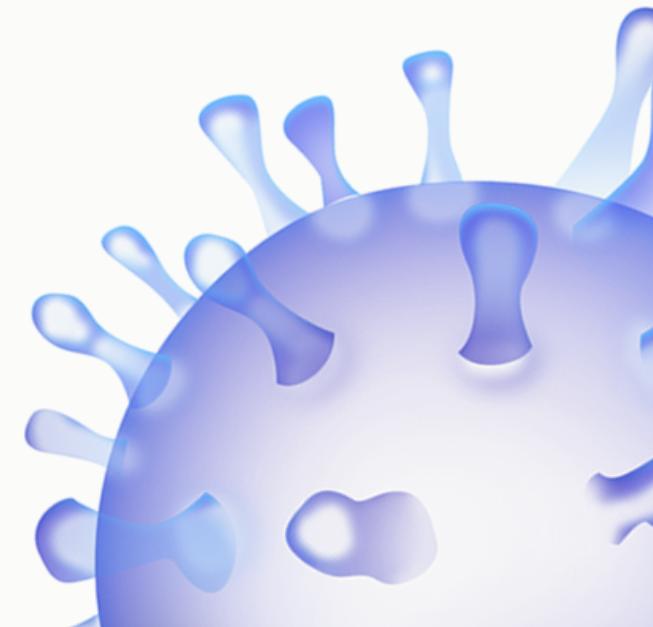
To develop predictive model to identify factors that significantly influence individuals' decisions to receive the H1N1 vaccine

2

Provide actionable insights to public health authorities, healthcare providers, and academic researchers to tailor outreach efforts, patient education, and further studies aimed at addressing vaccine hesitancy and improving vaccination rates

3

Utilize the predictive models to inform evidence-based vaccination strategies and public health interventions, ultimately contributing to the reduction of disease transmission and promotion of population health.



STAKEHOLDERS

Some of the potential stakeholders who might benefit greatly from this research include public health authorities such as World Health Organization (WHO) who are key stakeholders and can use predictive models to inform vaccination strategies. Healthcare Providers to Understanding vaccination patterns. Academic researchers and public health institutions may use the insights gained from predictive modeling to conduct further studies on vaccine hesitancy, social determinants of health, and health behaviors.



H1N1 DATASET

The data utilized in this analysis was sourced from Data Driven, a reputable provider of datasets and analytics solutions.

Through their comprehensive data offerings, I was able to access valuable insights into individuals' vaccination behaviors

obtained from the National 2009 H1N1 Flu Survey

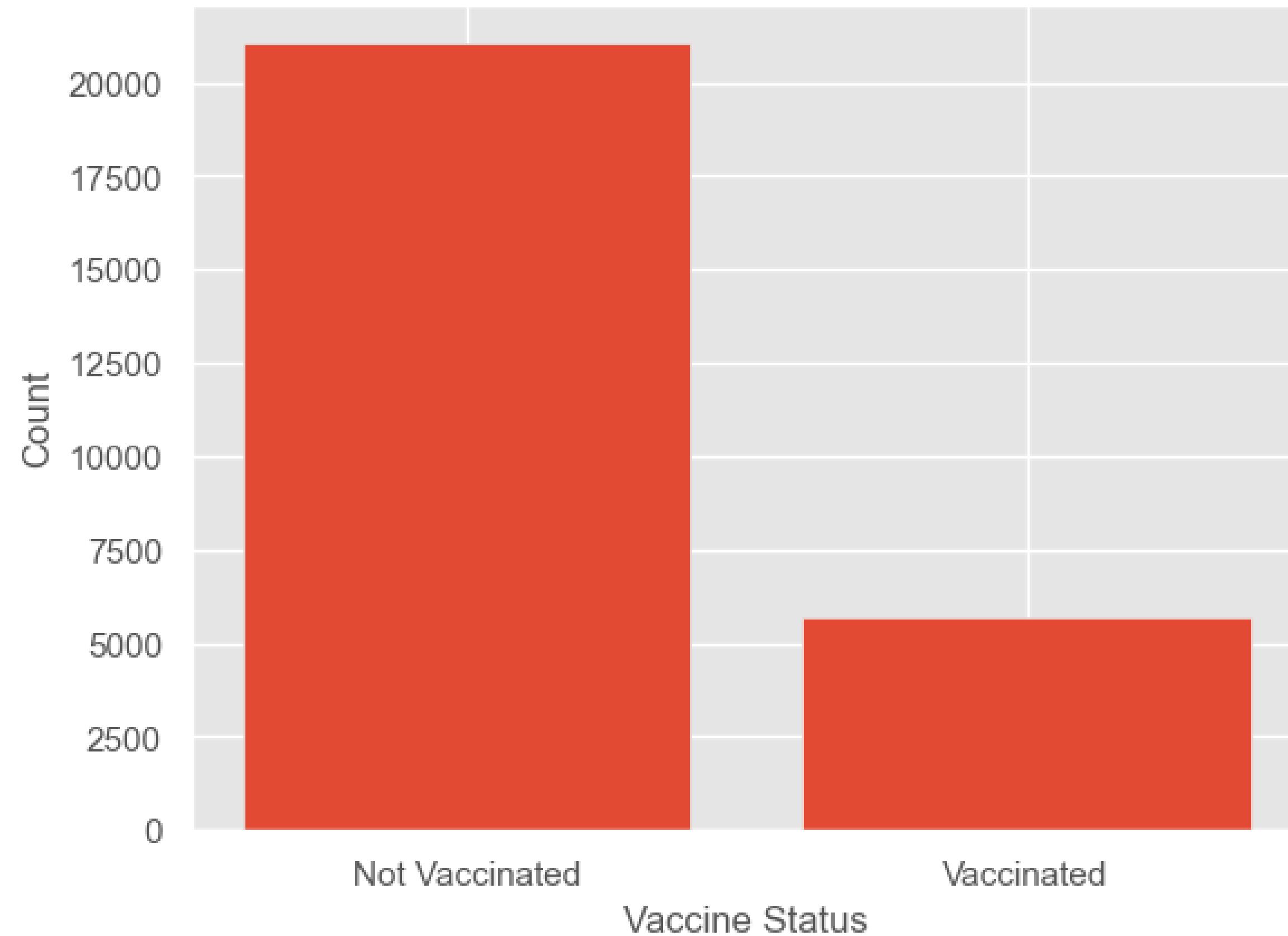
The dataset has different features that influence h1n1 vaccination such as gender,age,knowledge,education etc.

DATASET ANALYSIS AND FINDINGS



Distribution of h1n1 vaccination

Distribution of h1n1_vaccine



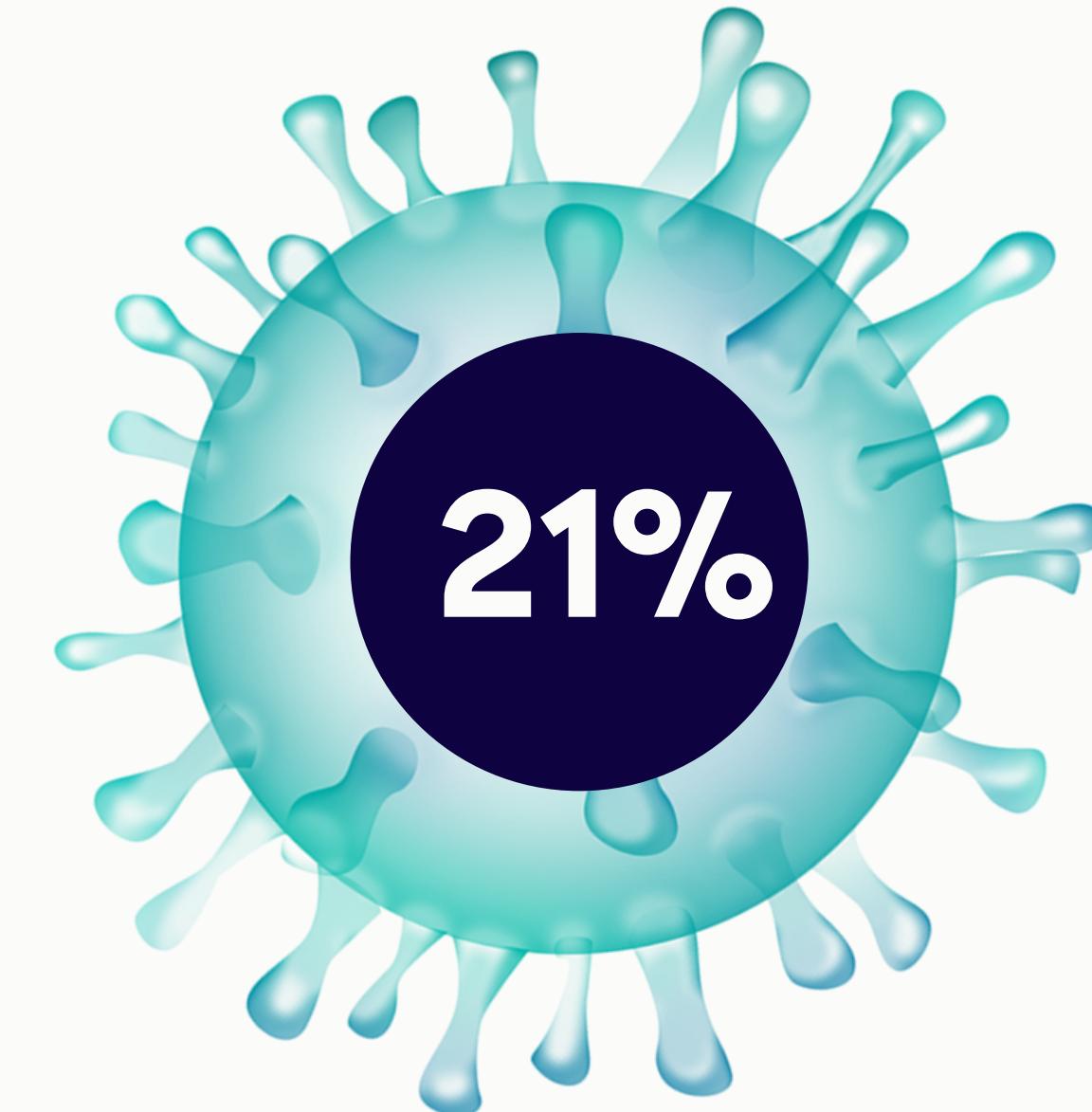
**This indicates that alot
of individuals are not vaccinated
against h1n1 flu**



Percentage distribution of h1n1 vaccination

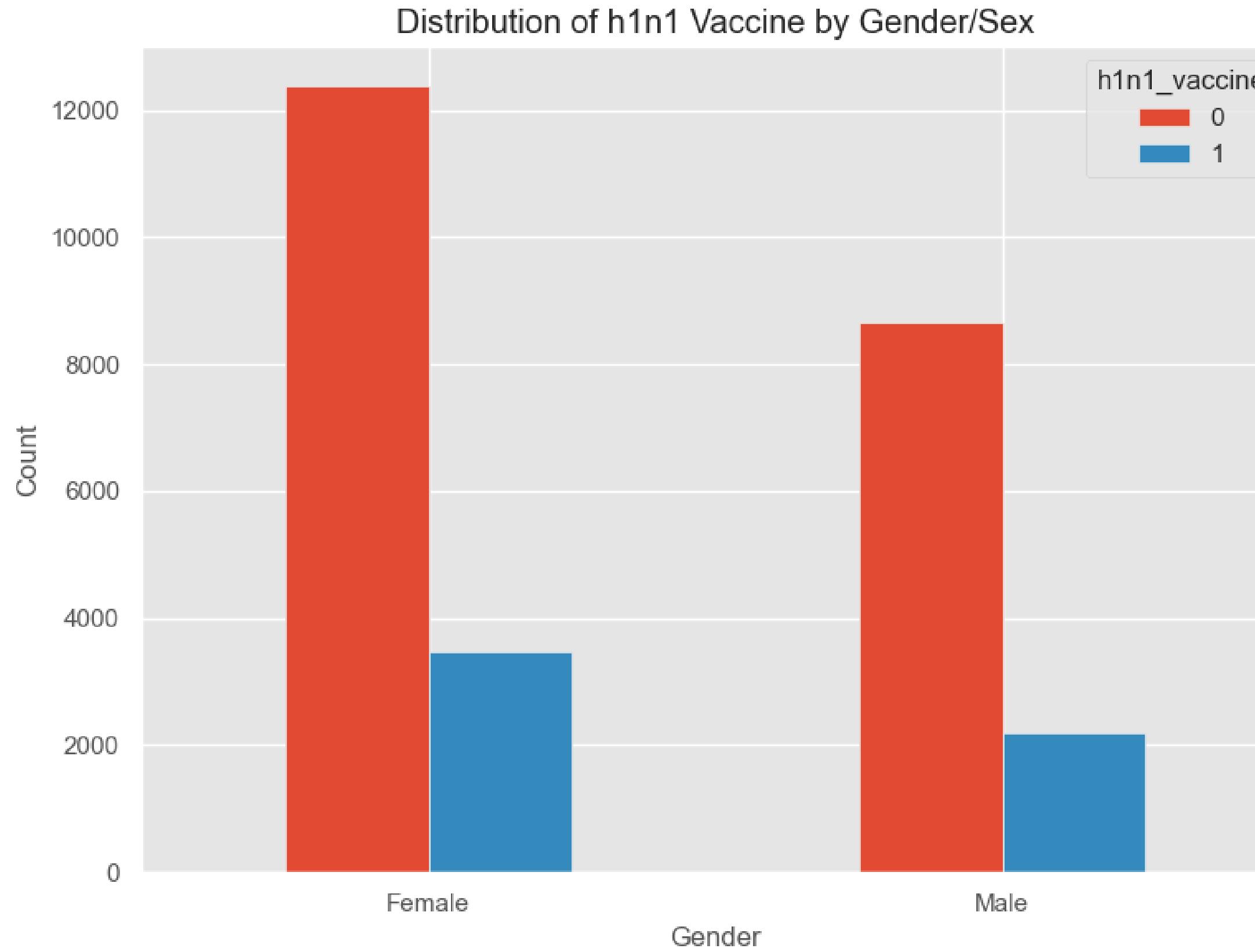


Not vaccinated



Vaccinated

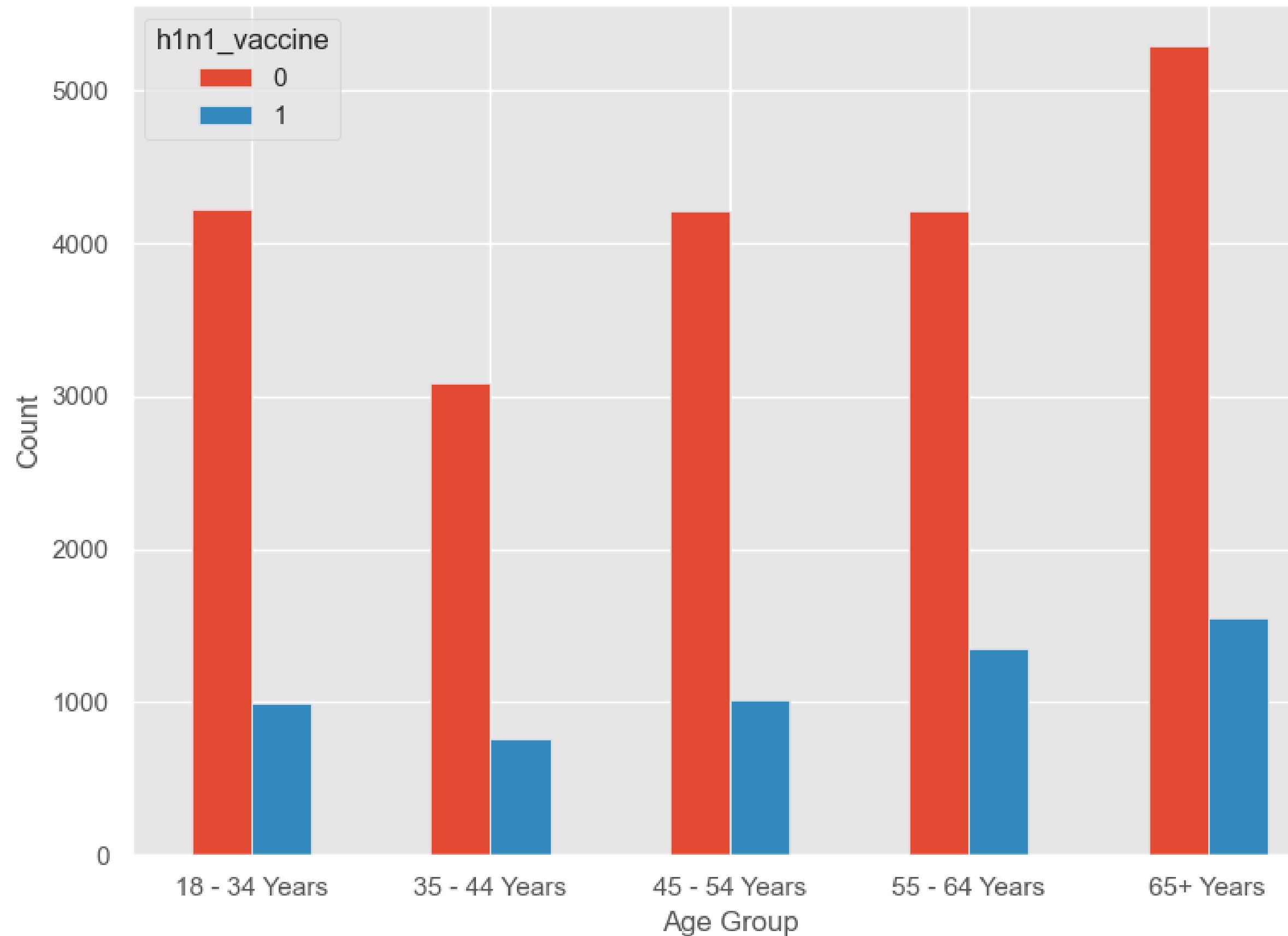
Gender vs of h1n1 vaccination



This shows that more females are vaccinated compared to men but also more women are not vaccinated

Age group vs h1n1 vaccination

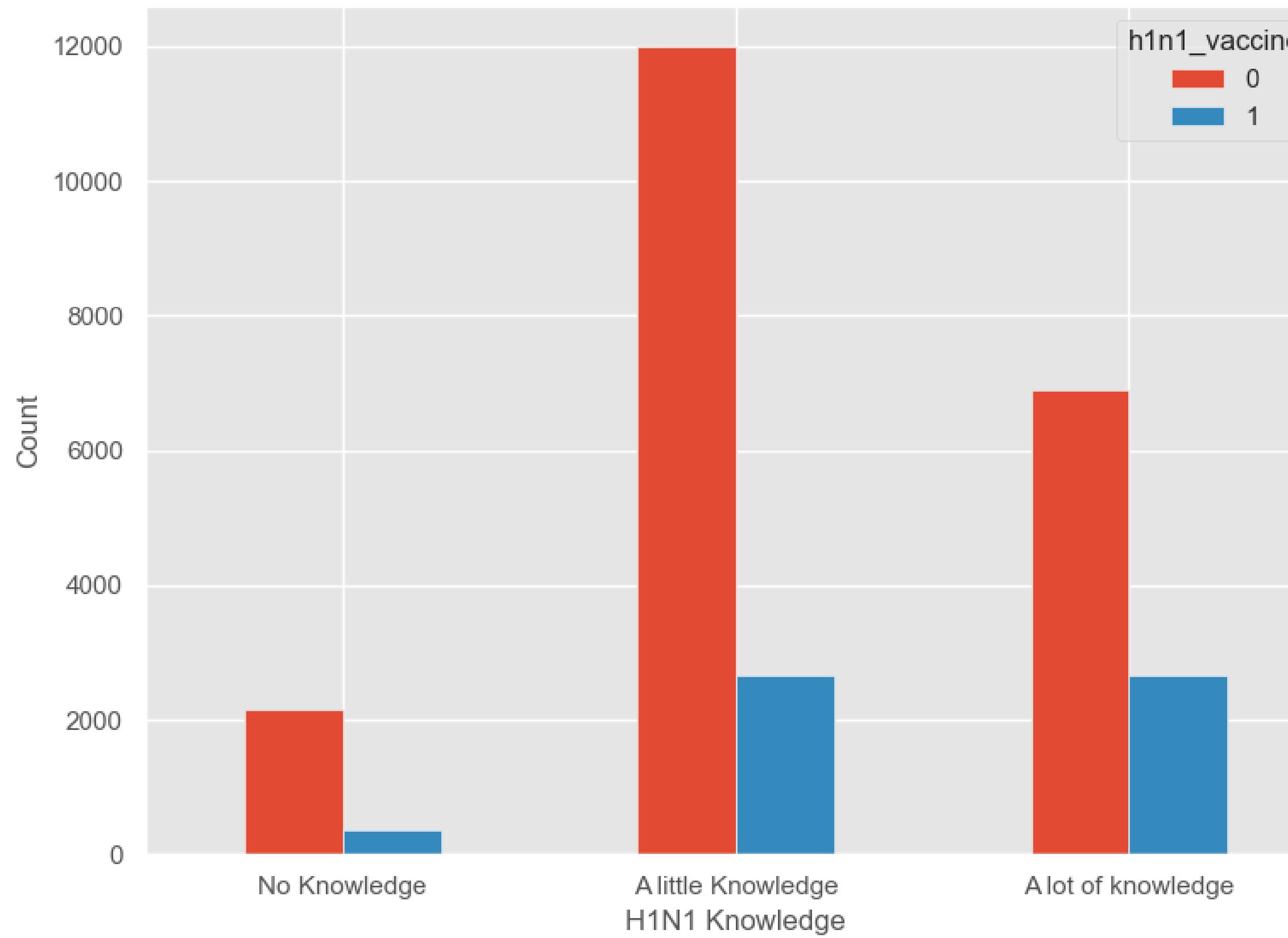
Distribution of h1n1 Vaccine by Age Group



Individuals aged 36-44 are the least vaccinated while those above 65 years have the highest vaccination count and highest count of those not vaccinated

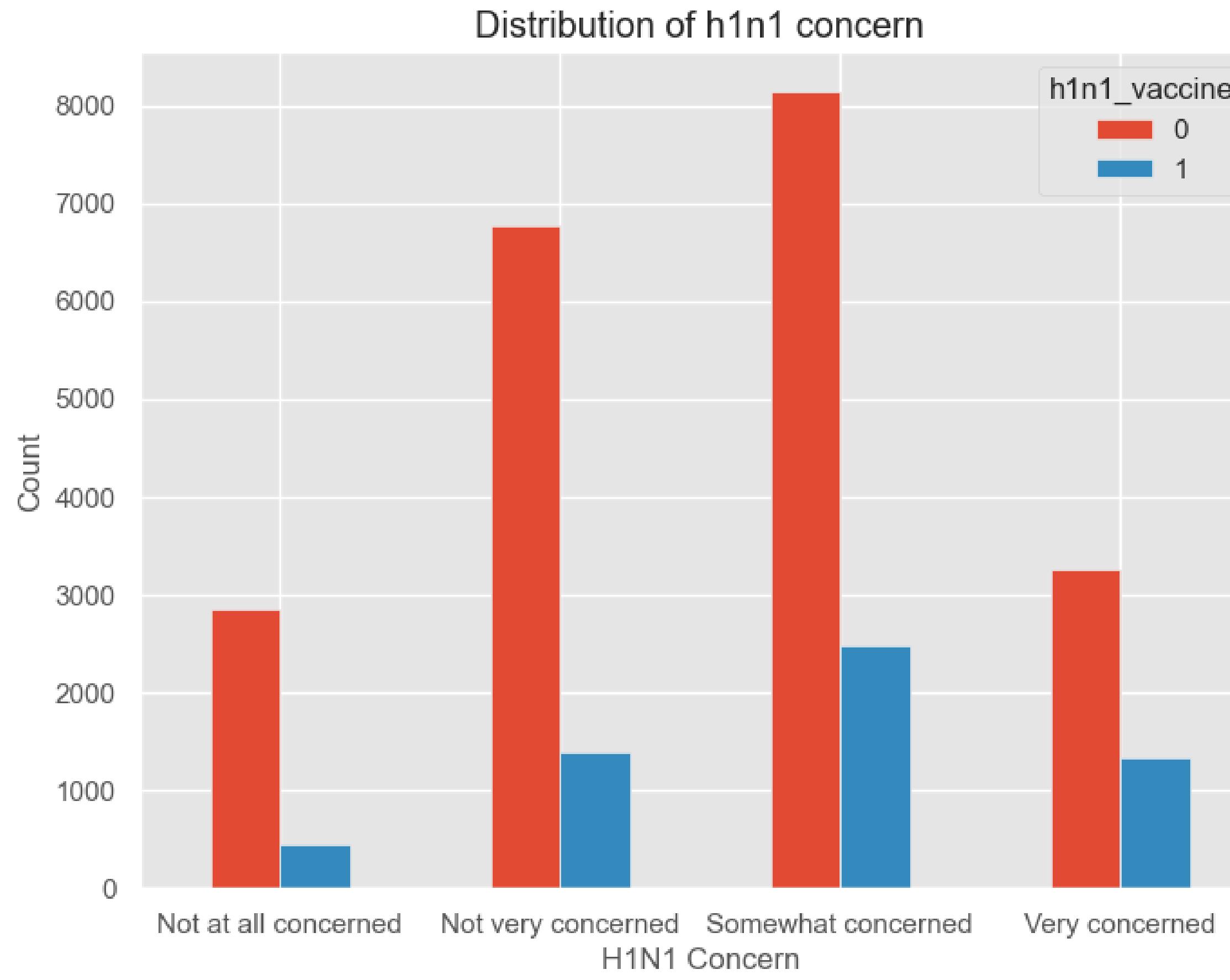
H1N1 knowledge vs of h1n1 vaccination

Distribution of h1n1 Vaccine by Knowledge



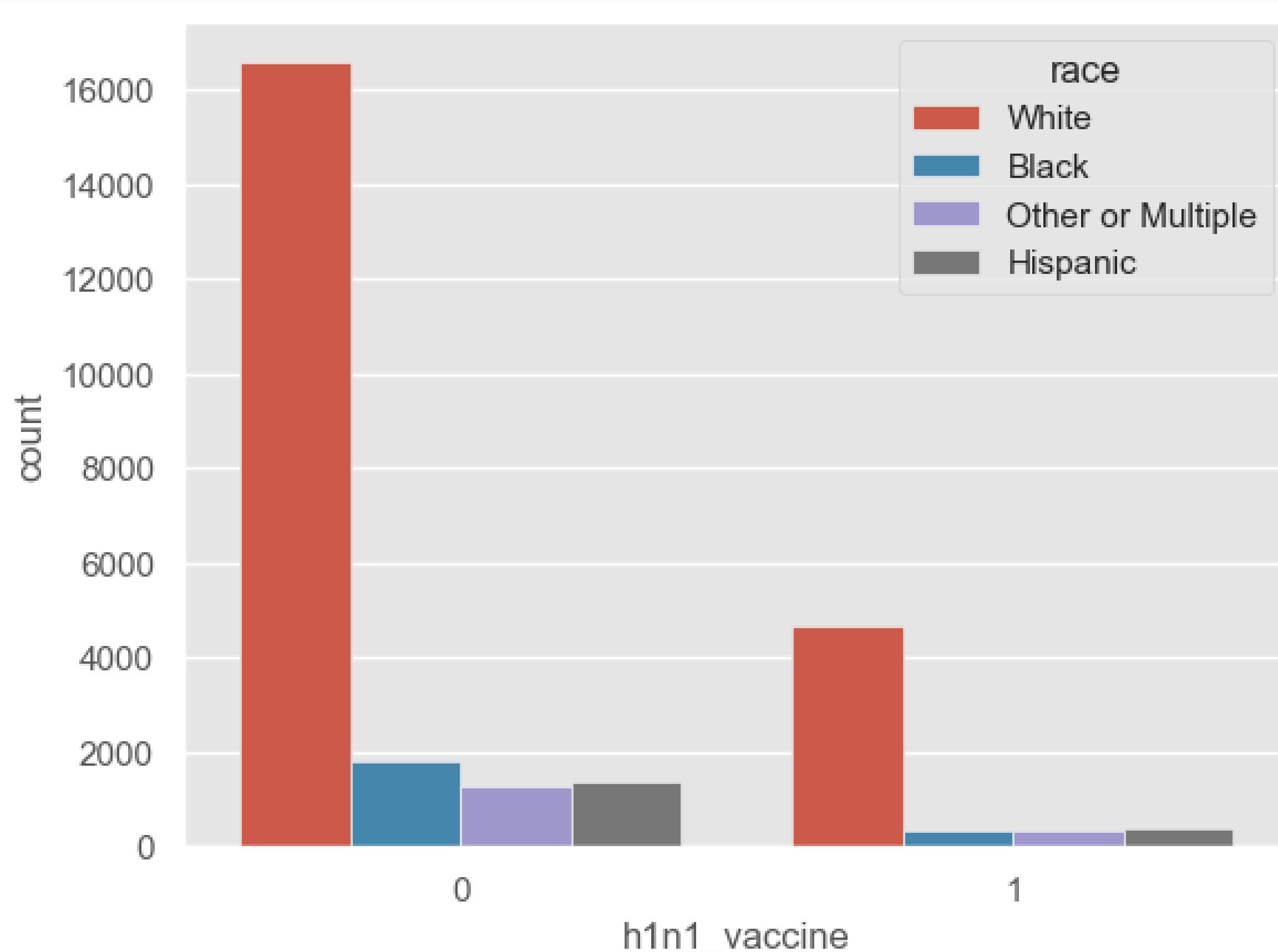
Individuals with a rough knowledge on h1n1 vaccination and those with alot of knowledge had similar numbers with those vaccinated but those with a little knowledge had the highest number of those not vaccinated

H1N1 concern vs of h1n1 vaccination

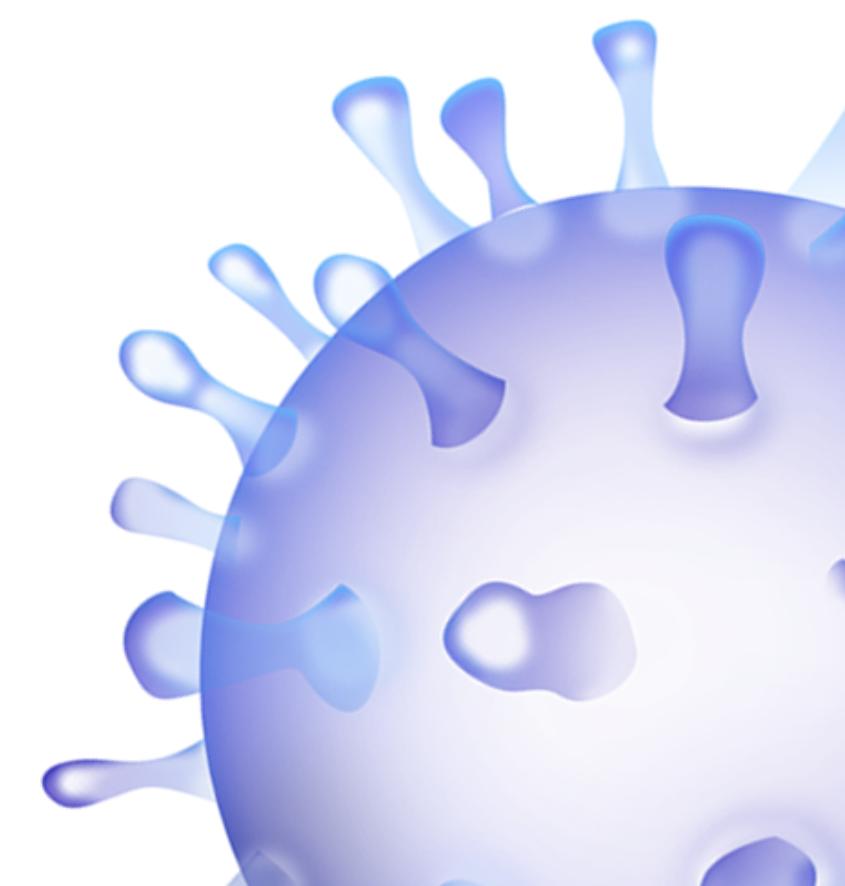
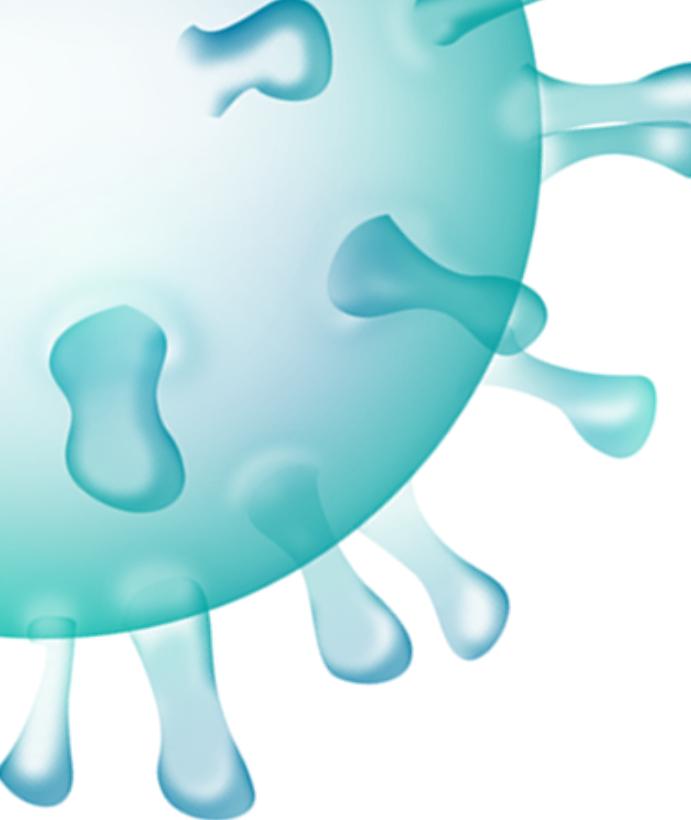


Individuals who were somewhat concerned had the highest number of vaccination with those not concerned having the lowest as expected

Race vs of h1n1 vaccination

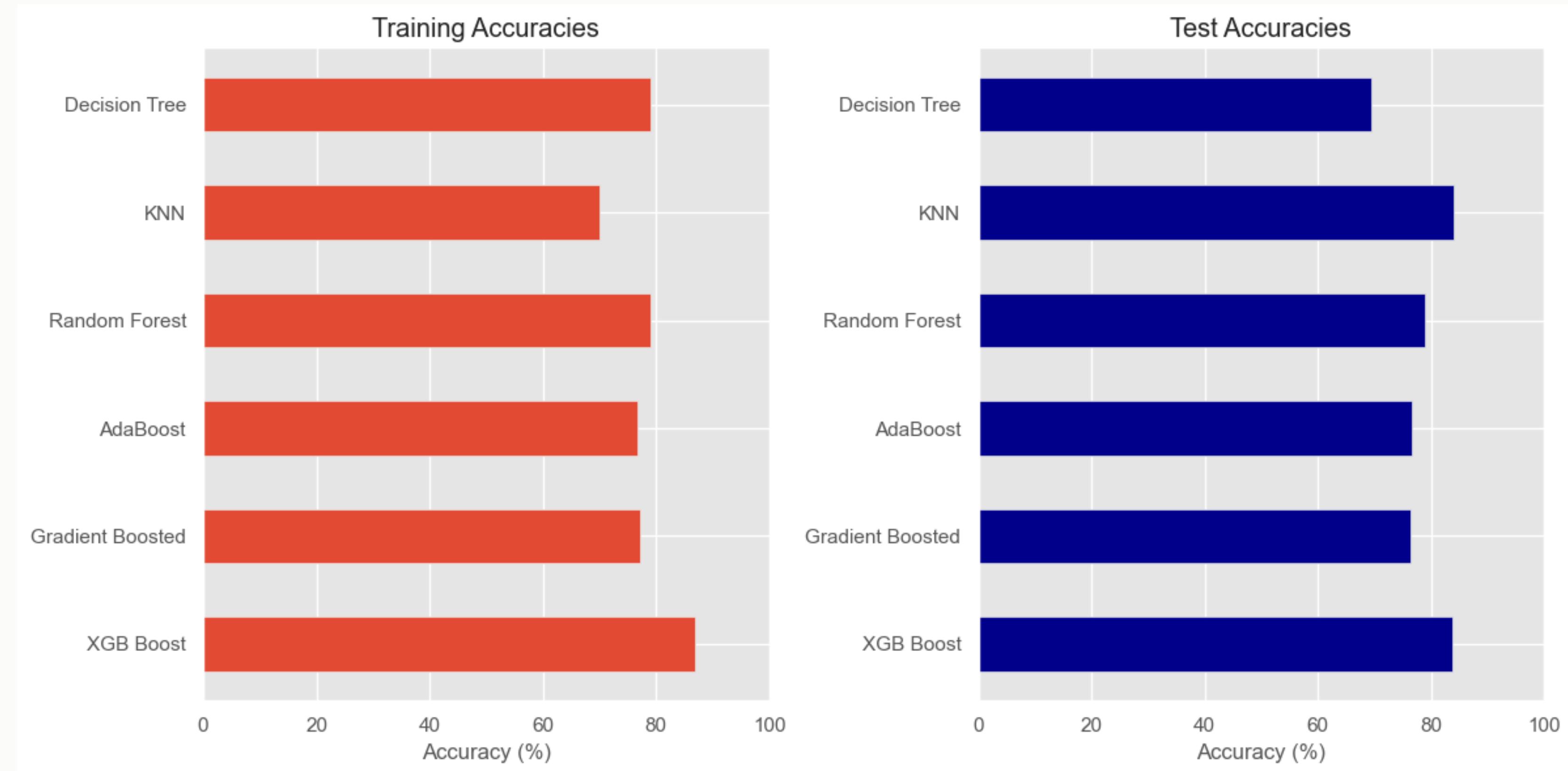


**In terms of race whites were leading
in both vaccinated and not vaccinated
with Hispanic registering low numbers**



MODELLING

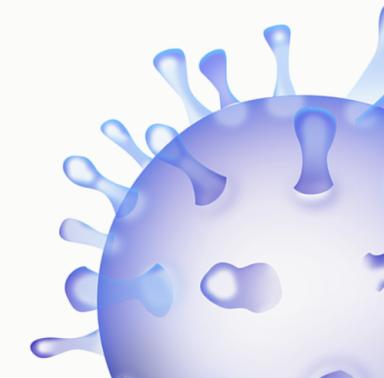
Accuracies of Models Applied

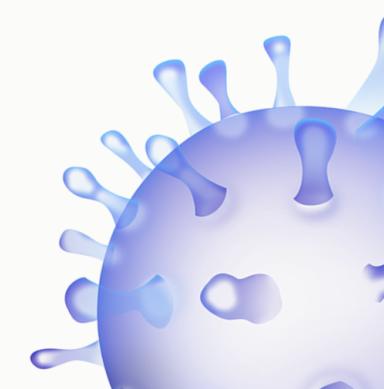




XGB Boost

This model achieved the highest training accuracy of 86.87% and a test accuracy of 83.7%. This indicates that the model generalizes well to unseen data, as it maintains a high accuracy on both the training and test sets. Which makes it the best model to use





To achieve the best optimal parameters the model
had to be tuned to avoid overfitting on the data
That means different parameters were used to try
and find the best
Tuning method used was GridSearchCV to achieve
highest possible accuracy

Conclusions

- ***Conclusion 1***

it is evident that a significant portion of the population remains unvaccinated, indicating potential gaps in vaccination campaigns or barriers to accessing vaccines.

- ***Conclusion 2***

The higher vaccination rate among females suggests that they may be more receptive to vaccination messages or have better access to healthcare services



Conclusions

- ***Conclusion 3***

Factors such as language barriers, cultural beliefs, and mistrust of healthcare systems may contribute to lower vaccination rates among certain racial or ethnic groups. Addressing vaccination disparities requires a multifaceted approach that addresses social, cultural, and knowledge-related barriers to vaccine access and acceptance.

- ***Conclusion 4***

By targeting specific demographic groups, tailoring communication strategies, and promoting health literacy, public health authorities can improve vaccine coverage



RECOMMENDATIONS

- By understanding the factors influencing vaccination patterns, stakeholders can tailor vaccination campaigns, allocate resources effectively, and make informed decisions to improve public health outcomes
- Moving forward, continued collaboration between stakeholders and researchers is essential for translating these insights into tangible public health interventions and addressing the challenges posed by infectious diseases
- Further research is needed to explore additional features and refine the predictive models for better accuracy and generalizability.

RECOMMENDATIONS

- Continuous monitoring and evaluation of vaccination campaigns and public health interventions are crucial for assessing the impact of the predictive models and guiding future strategies.
- Collaboration and knowledge sharing among public health authorities, healthcare providers, and researchers are essential for leveraging the insights gained from predictive modeling to improve vaccination uptake and mitigate the spread of infectious diseases.



THANK YOU

Presented by:



EDGAR KIPRONO

<https://www.linkedin.com/in/edgar-kiprono/>

