



**H1N1 AND SEASONAL FLU
VACCINES UPTAKE PREDICTION.**

A MACHINE LEARNING APPROACH.

PROJECT OVERVIEW

- Vaccination is a critical public health measure for preventing the spread of infectious diseases, including H1N1 and seasonal influenza.
- However, vaccine uptake can vary significantly across different populations due to factors such as access to healthcare, socioeconomic status, education, and cultural beliefs.

BUSINESS PROBLEM.

- The year is 2024. There has been an outbreak of H1N1 and Seasonal Flu in the country.
- Various measures need to be put in place to curb the spread of the flu.
- Health providers are stressed and worried by the situation because it is getting out of their hands, its becoming very alarming and causing a lot of panic across all divides

STAKEHOLDERS.

- The main stakeholders of this project or rather the beneficiaries are The Health Providers such as Ministry of Health-Kenya, Hospitals and NGOs such as Centre for Diseases Control (CDC) and World Health Organization (WHO).
- The models that I will come up with will enable them make informed decisions when rolling out vaccinations campaigns programmes across the country and eventually across the entire globe.

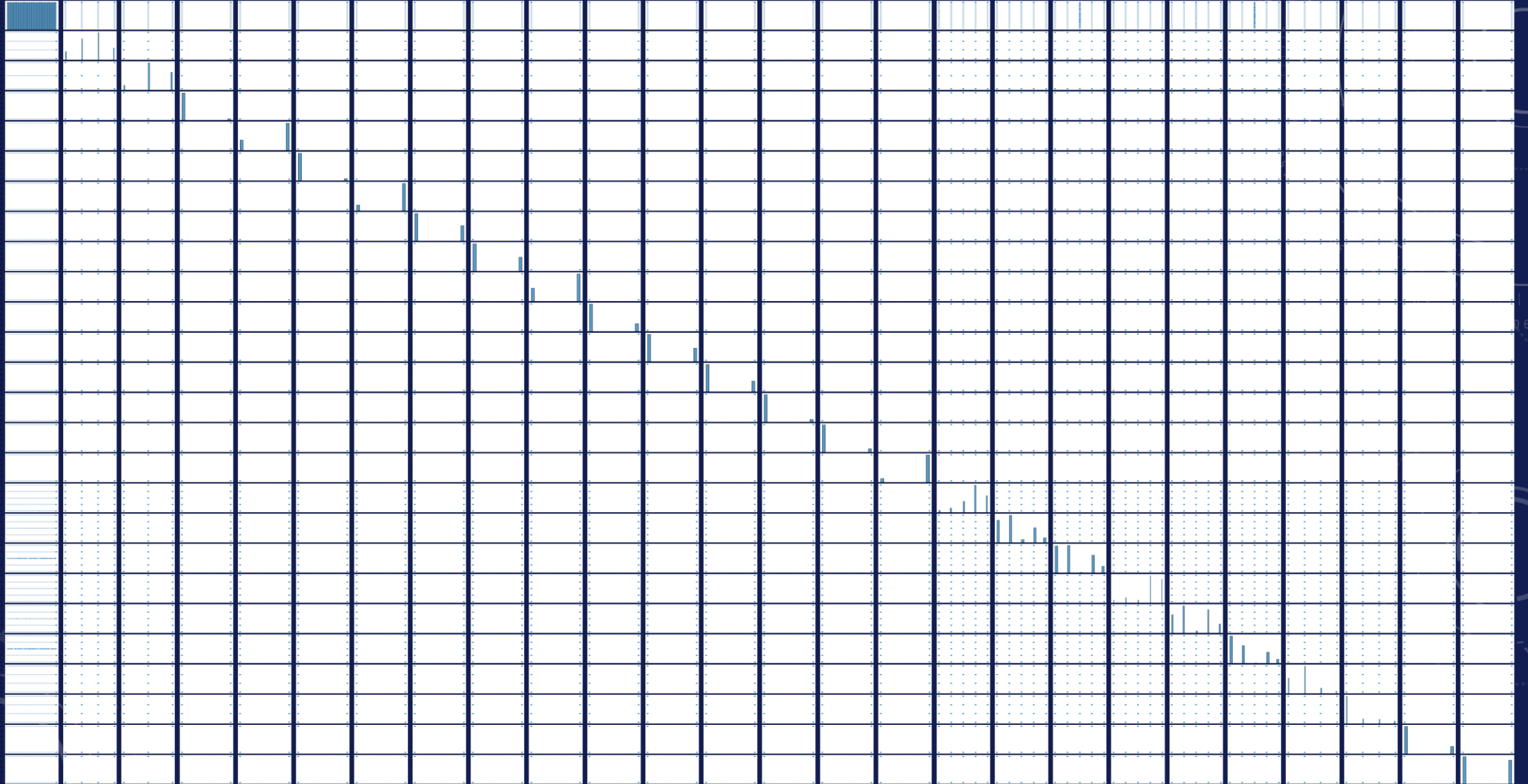
OBJECTIVES.

- The main objective of this project is to predict whether or not respondents will receive the H1N1 and Seasonal Flu vaccines using machine learning models such as Logistic Regression and Decision Trees Classifier.
- Specific Objectives;
 - ✓ Examining whether doctor's recommendation has an effect on the vaccines uptake.
 - ✓ Come up with a Logistic regression and Decision tree classifier models to help predict vaccines uptake.

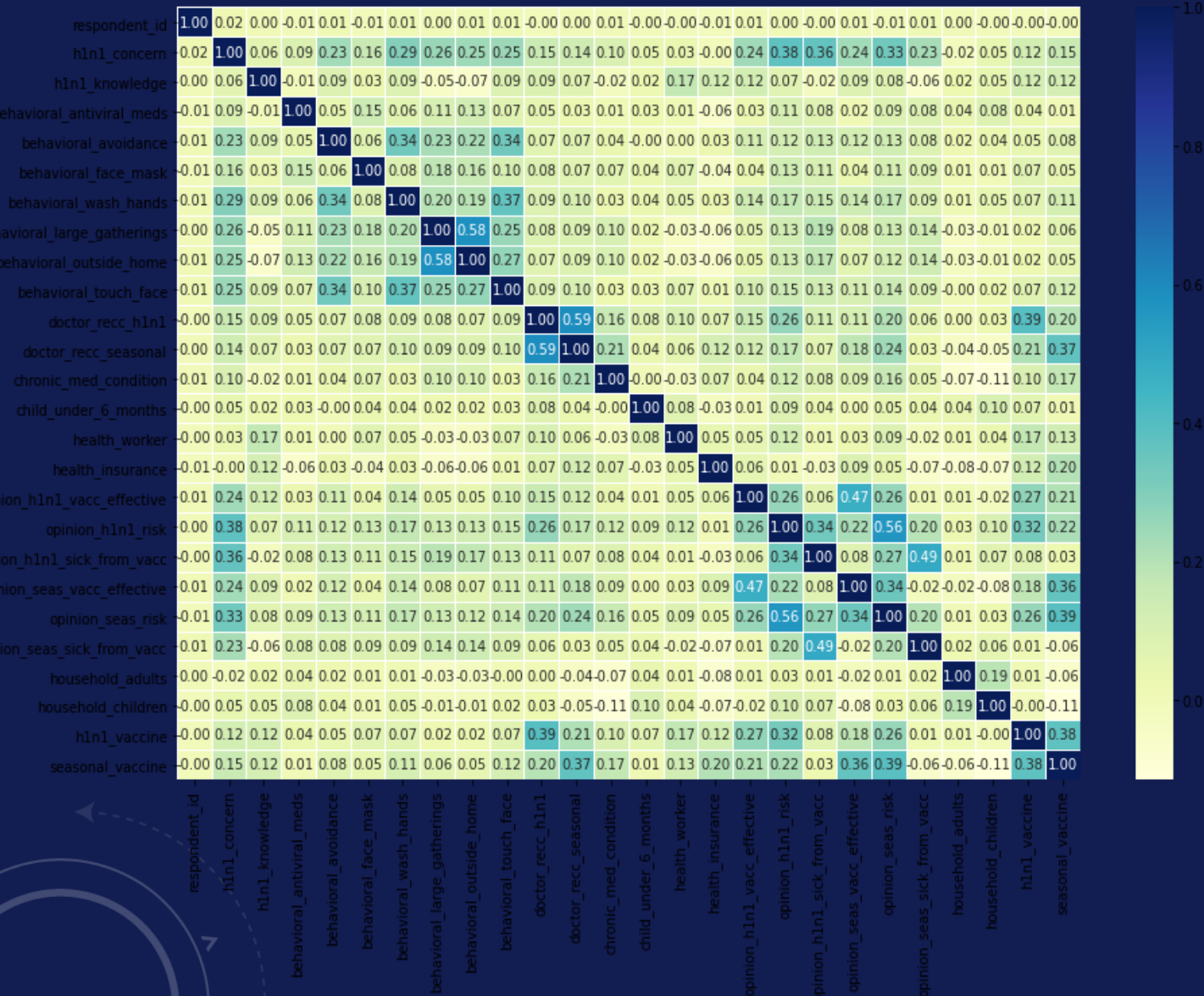
DATA SOURCE.

- A vaccine for the H1N1 flu virus became publicly available in October 2009. In late 2009 and early 2010, the United States conducted the National 2009 H1N1 Flu Survey. This phone survey asked respondents whether they had received the H1N1 and seasonal flu vaccines, in conjunction with questions about themselves.
- These additional questions covered their social, economic, and demographic background, opinions on risks of illness and vaccine effectiveness, and behaviors towards mitigating transmission. A better understanding of how these characteristics are associated with personal vaccination patterns can provide guidance for future public health efforts.

PAIR PLOT.

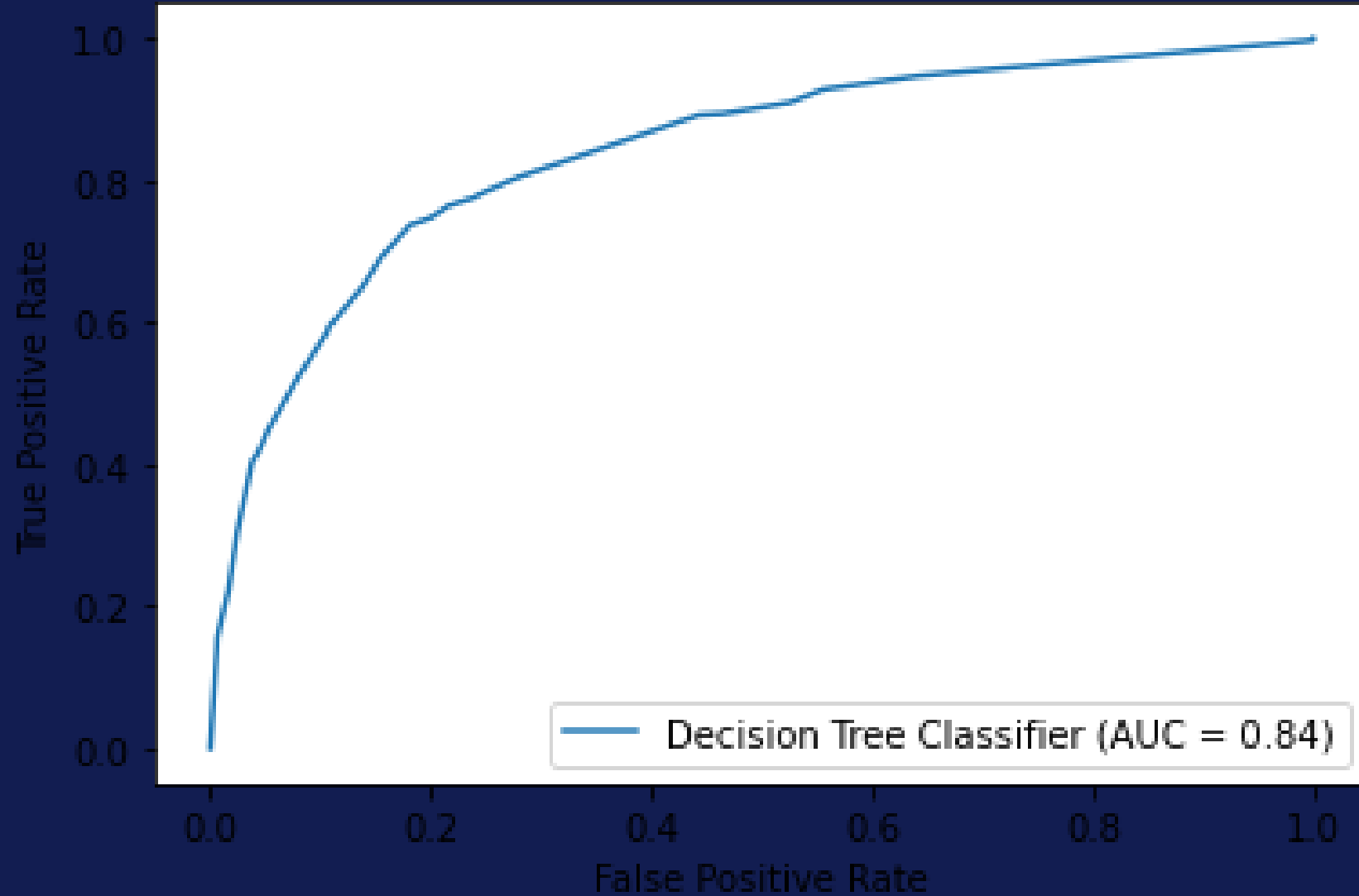


CORRELATION HEATMAP.

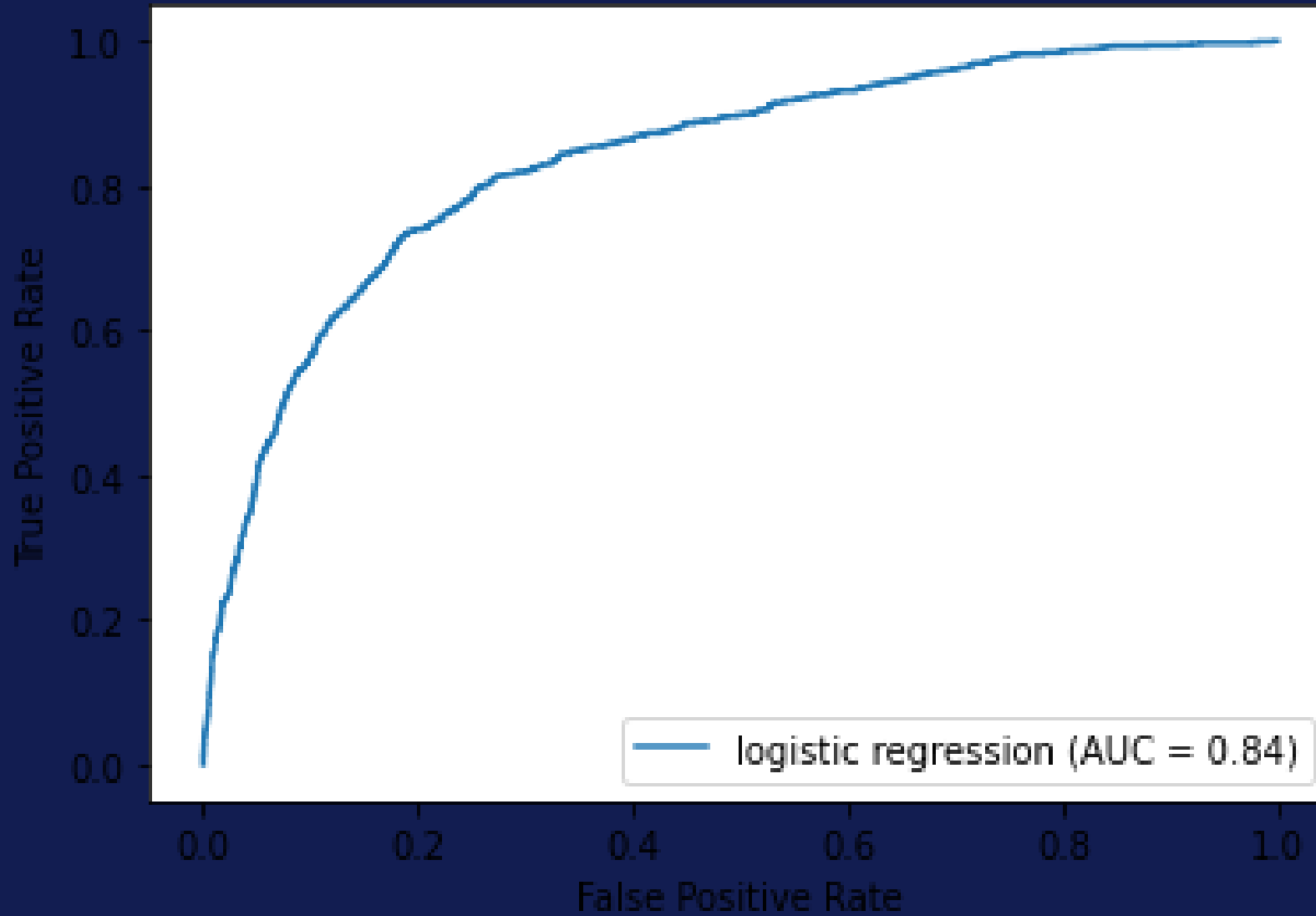


The heatmap was evaluated for a potential presence of correlation between different features. It is noted that, no significant association is observed for almost all features except for the very few ones. There is a correlation between doctors recommending H1N1 flu vaccine and seasonal flu.

DECISION TREES



LOGISTIC REGRESSION.



CONCLUSION.

- Our analysis might not fully resolve the goal of predicting H1N1 vaccination status because we were not able to fully rule out false negatives, or people who we predicted as not getting vaccinated but actually did get the vaccine. Additionally, there are other factors at play which were not tapped into by this survey's questions which could also play a role in vaccination prediction. For our next steps, we would like to look at more recent flu survey data, so as to get the most recent results. We would also like to do more feature engineering to improve accuracy. Lastly, since we chose to focus only on predicting H1N1 vaccination status, we would like to focus in the future on predicting seasonal flu vaccine status.

RECOMENDATIONS.

- We recommend that public health officials at the Ministry of Health (APHA) communicate to doctors the importance of recommending to patients that they get the H1N1 vaccine.
- We also recommend that they find a way to make the vaccine accesible to people regardless of health insurance status.
- Additionally, because opinion on H1N1 vaccine effectiveness and H1N1 risk to health are highly influential in determining vaccination status, we recommend that the APHA make educational outreach a priority.

The background is a solid dark blue. It features several faint, light blue technical diagrams. In the top right, there is a large circular gauge with concentric circles and radial lines, resembling a speedometer or a dial. In the bottom right, there is a smaller circular diagram with concentric circles and arrows indicating a clockwise direction. In the bottom left, there is a partial view of a similar circular diagram. The text 'Q & A' is centered in the upper half of the image in a large, bold, yellow serif font.

Q & A

THE END.