Who Is Getting Vaccinated?

An Analysis By Ryan Werth

We are in the Midst of a Global Pandemic

- Vaccination is a key public health measure when fighting infectious diseases.
- Vaccination does not work if people are not getting vaccinated... duh.

Can We Determine Who Will Get Vaccinated?

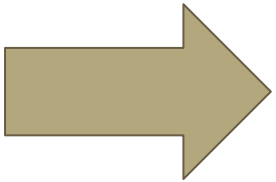
- Fortunately he have kind of seen this before...

H1N1 Scare of 2009

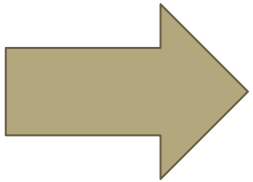
- In 2009 the H1N1 (Swine) flu swept across the globe.
- The United States conducted the National 2009 H1N1 Flu Survey, which asked respondents whether they had received the H1N1 and seasonal flu vaccines, in conjunction with questions about themselves

The Grand Plan

Take The Survey Results



Create a Model That Predicts Probability of Participant Getting Either Vaccination



Target People

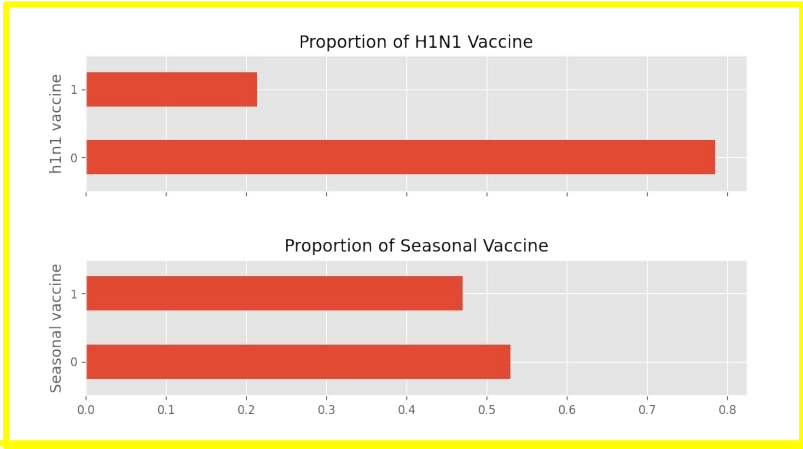
Cleaning The Data (Boring)

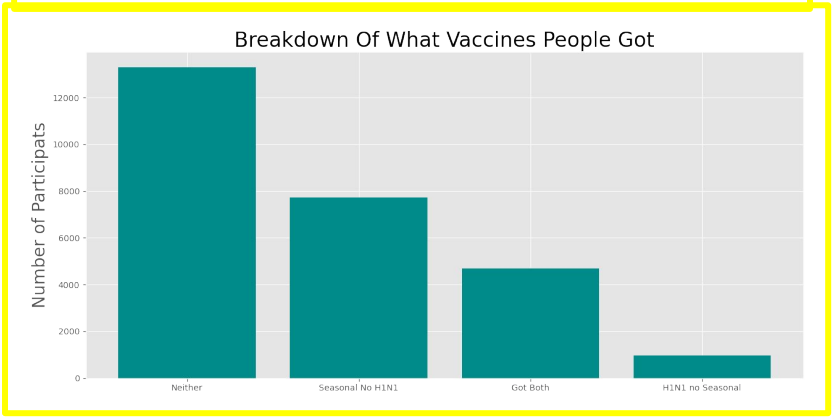
- What to Do With Null Values?
  - Throw Out Every Row (Participant) With Null Values Anywhere
  - Throw Out a Whole Column (Feature) With Too Many Null Values
  - Interpolate Missing Values
  - Create a “Dummy” Column for Null Values

- I did a little bit of everything

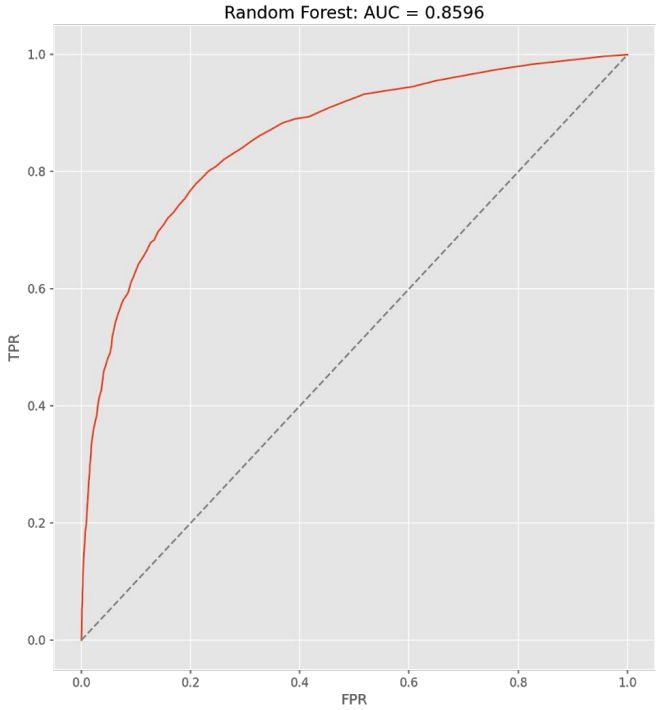
Initial Breakdown

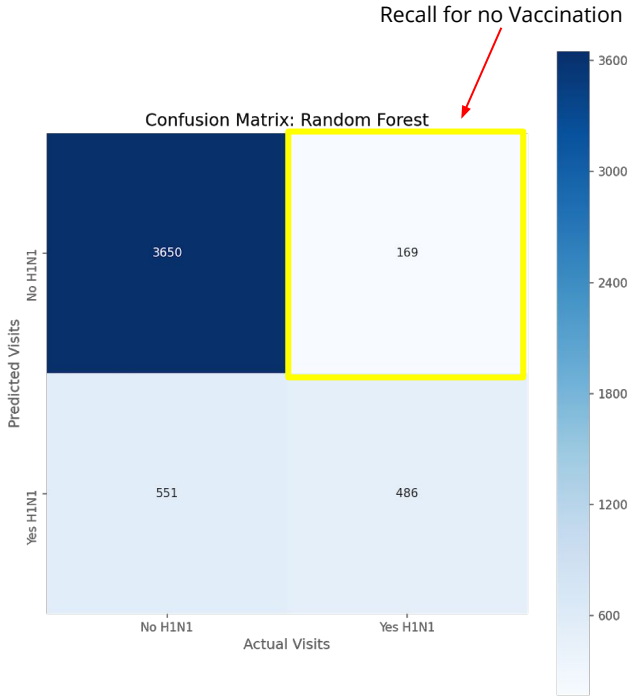
- Two Target Variables (H1N1 and Seasonal)
- H1N1 is highly unbalanced
- Seasonal is evenly split



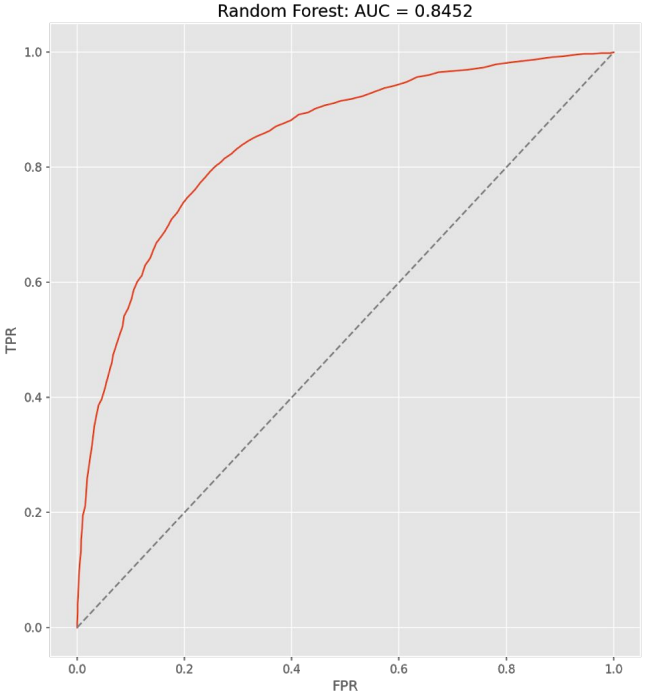


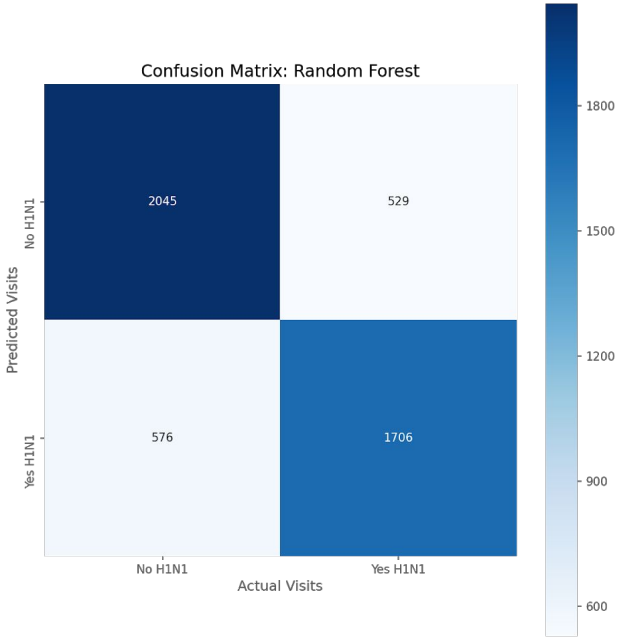
Random Forest For H1N1



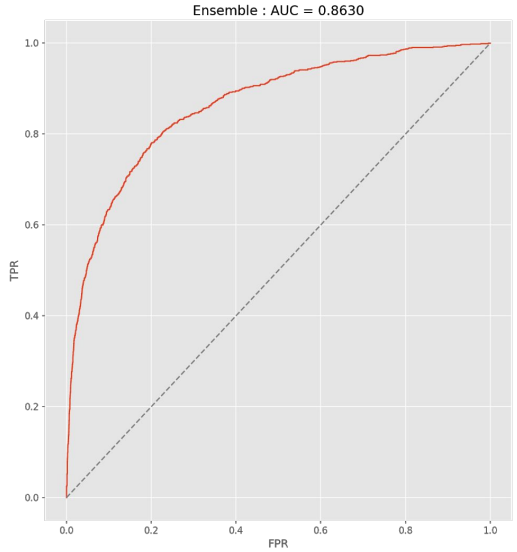


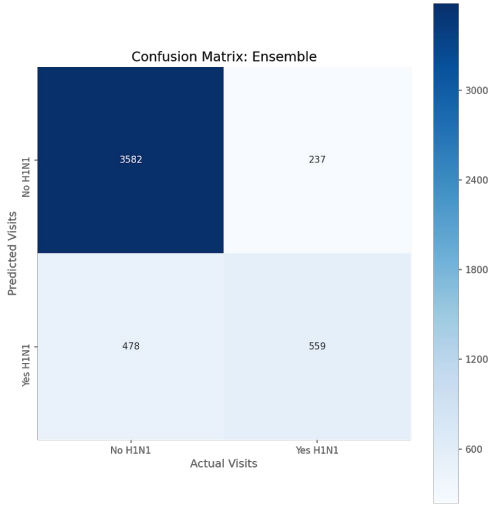
Random Forest For Seasonal





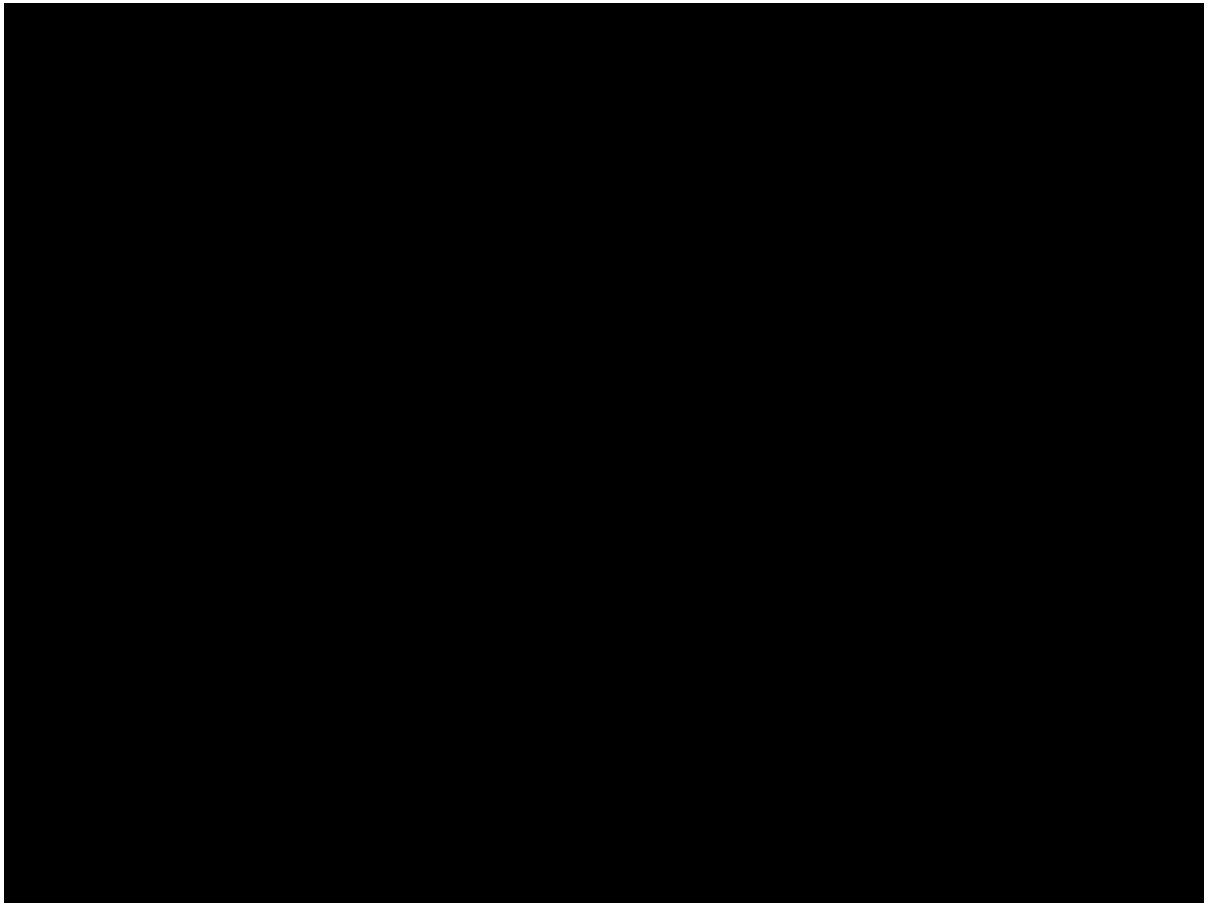
Ensemble With Smote (Best Model)





	Precision	Recall	F1 Score
No Vaccine	0.88	0.94	0.91
Yes Vaccine	0.70	0.54	0.61

Final Result!



Takeaways

- Opinions are important
- People listen to their doctors
- Health Insurance plays a big role