2022 Improving Vaccination Rates

How Public Health Organizations Can Optimize Their Efforts

The Problem Statement

National Center for Health Statistics

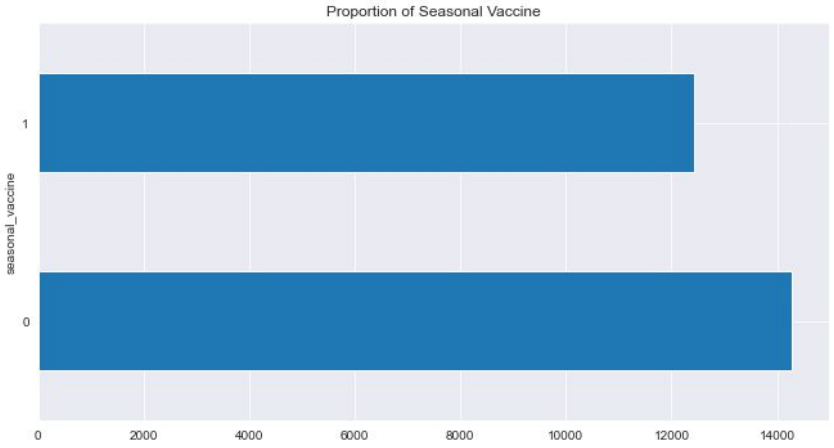
- 3 to 5 million cases of severe illness
- 290,000 to 650,000 deaths
- Mutating COVID-19 strains

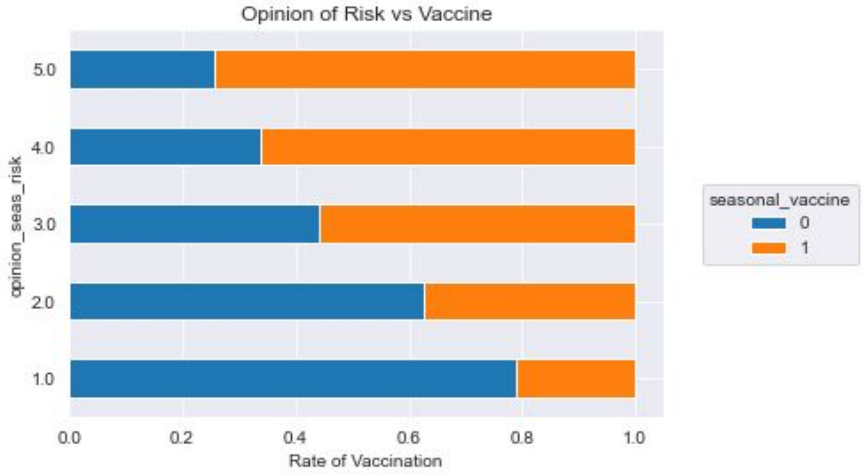
Objective: Learn what characteristics are associated with personal vaccination patterns can provide 3 actionable suggestions to guide future public health efforts

Data Used For Analysis

National Center for Health Statistics

- Phone Survey Data Collected by NCHS
- Had they received H1N1 and seasonal flu vaccines
- Additional social, economic, demographic and opinion questions
- Contains 35 features and 26,000 records





Machine Learning Models

Logistic Regression

79% Accurate

- 82% correct predictions for unvaccinated
- 75% correct predictions for vaccinated

Decision Tree

76% Accurate

- 85% correct predictions for unvaccinated
- 65% correct predictions for vaccinated

Random Forest

78% Accurate

- 78% correct predictions for unvaccinated
- 78% correct predictions for vaccinated

XGBoost

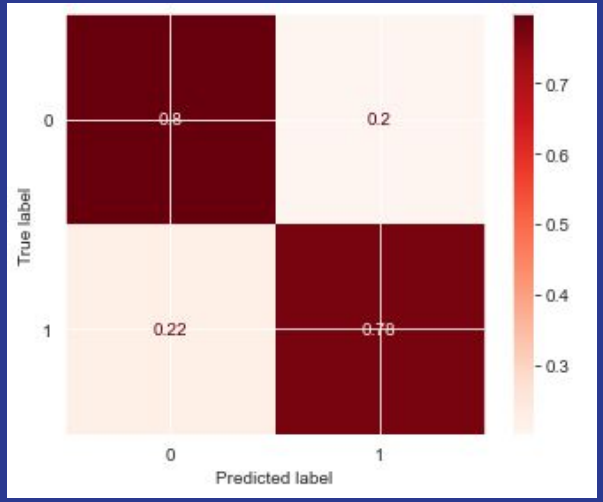
77% Accurate

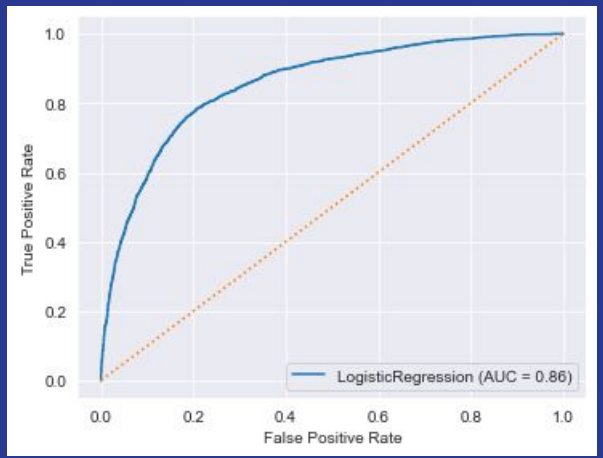
- 79% correct predictions for unvaccinated
- 74% correct predictions for vaccinated

Best Model

Logistic Regression

	precision	recall	f1-score	support
0	0.81	0.80	0.80	3634
1	0.76	0.78	0.77	3043
accuracy			0.79	6677
macro avg	0.79	0.79	0.79	6677
weighted avg	0.79	0.79	0.79	6677





Action Items

1. Inform the population of the risk
2. Explain the effectiveness
3. Doctors recommendations

Questions