

A decorative graphic on the left side of the slide consists of two overlapping parallelograms. The front one is blue and the back one is a light green. They are positioned diagonally, with the blue one partially covering the green one.

Using A Past Disease Outbreak Data to increase Vaccine Rates

By Lucas Fishbein



Understanding the Problem

The Next Pandemic May be Coming

In our world of global travel diseases can spread like wildfire

One of our best defenses against many diseases are vaccines

Through COVID-19 Vaccinations have become a political Issue rather than global health

Vaccine Rates are Dropping

In 2021:

Global immunization coverage dropped to 81%, the lowest rate in a decade

18 Million Children did not receive any vaccine, lowest since 2005

Source: CDC.gov, 2022

Project Goal: Increase Vaccination Rates





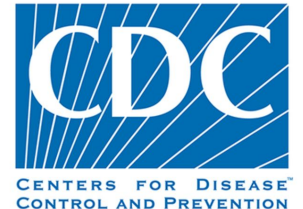
Project Overview and Goals

- Build a Model trained with Past Disease outbreak data
- Uncover Factors that may Contribute to Vaccine Acceptance
- Identify Groups that may be Vaccine Hesitant
- Recommend Action Steps That can be taken to Increase Vaccination rates for current and future diseases



Data Source Understanding

- Survey results from 26707 subjects taken after the 2009 H1N1 influenza.
- There are 36 demographic and behavioral features including H1N1 vaccination status
 - a. Sourced from The National 2009 H1N1 Flu Survey. Hyattsville, MD: Centers for Disease Control and Prevention, 2012.



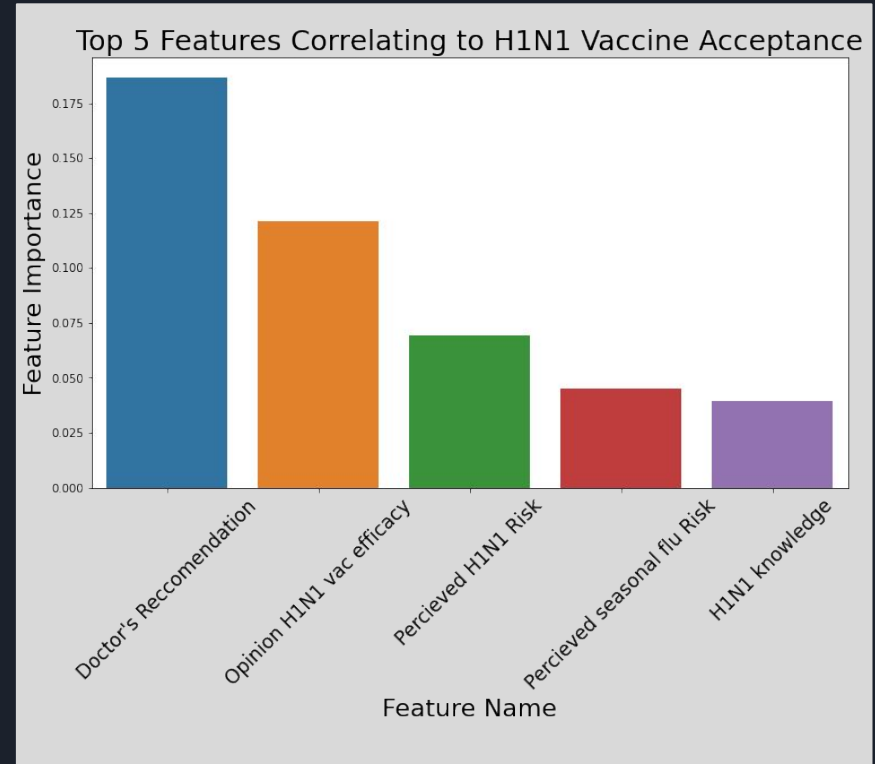


Building Predictive Classification Model

- Four different modeling styles were built out, tuned and compared
 - The Best performing Model used an XGBoost framework
- Model's performing model's abilities
 - 84% Overall Predictive Accuracy
 - 94% Correct Classification of Non-Vaccine group

Top Feature For Vaccine Acceptance

1. **A doctor's recommendation to take the vaccine**
2. One's Opinion on the effectiveness of the vaccine
3. One's opinion on the risk of H1N1
4. One's opinion on the risk of seasonal flu
5. One's Knowledge of the H1N1 disease





Identified Vaccine Hesitant Groups

- The Unemployed
- People with "Some College"
- People of Multi-racial or non-white, black or hispanic descent



Recommended Actions to Increase Vaccine Rates

Doctor's Recommendation

- Have trusted Doctors such as PCPs recommend Vaccines

Efficacy of Vaccine

- Spread information on the effectiveness of the Vaccine
- Removal of false anti-vaccine rhetoric

Risks of Disease

- Spread Info on true Risks of diseases without causing panic

Overall Disease Knowledge

- Create non-technical visualizations that explain the nature disease



Citations

Centers for Disease Control and Prevention. (2022, September 22). *Fast facts on global immunization*. Centers for Disease Control and Prevention. Retrieved April 13, 2023, from <https://www.cdc.gov/globalhealth/immunization/data/fast-facts.html>



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Github Repository: https://github.com/LayFish21/H1N1_Vaccine_Status_Predictor

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