

# A Dive into Vaccination Decisions

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# Outline

- Introduction to Business Problem
- Dataset
- Method
- Model
- Conclusion
- Future Improvements





# Business Problem

- Pandemics greatly affect the populations day to day lives
- Results in many deaths, lack of resources, economic crisis
- Majority of the population opt not to be vaccinated





## Overall Goals

- Increase vaccination rate
- Increase vaccination knowledge
- Help prevent or mitigate future outbreaks



## Research Goals

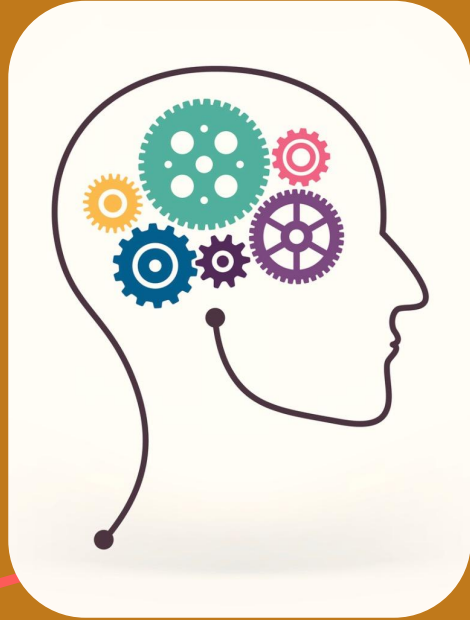
- Find most important features regarding vaccination decision
- Provide reasonable recommendations to utilize findings

- 2009 H1N1 Vaccination Survey
- Randomly Selected US Households
- 26707 entries
  - 21.2% Vaccinated
  - 78.8% Unvaccinated
- 35 Features
  - Respondent Characteristic Information
  - Vaccination and Risk Opinions

## Dataset



# Method



## Classification Model

- Predicts class of respondent
  - Vaccinated/Unvaccinated

## Precision

- High accuracy of predicted positives
- Ensures strong feature importance



# Model

## Performance

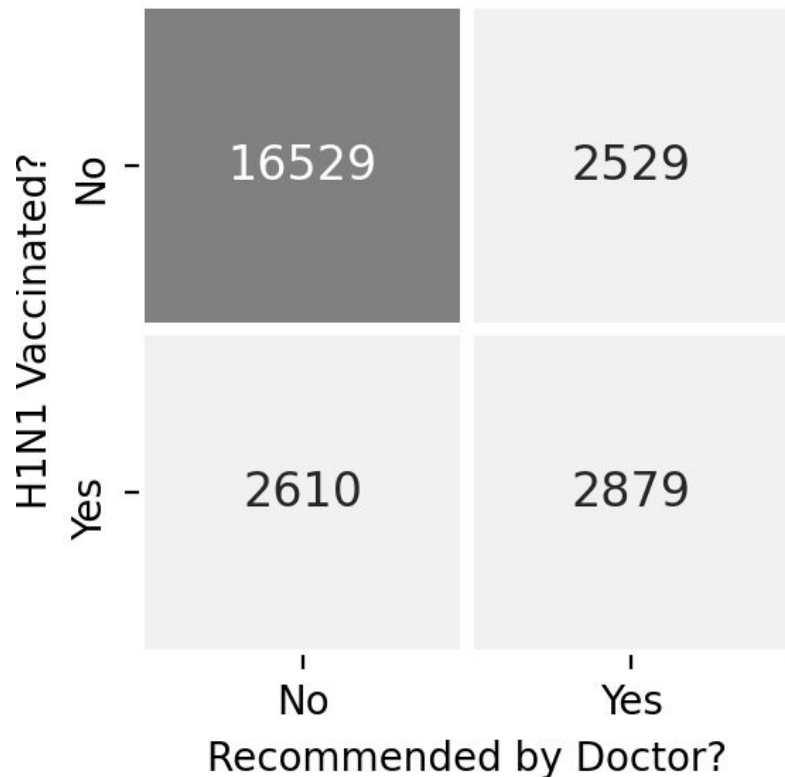
- Precision = 86%
- Accuracy = 84%

## Top Factors

- Doctor Recommendation
- Opinion of vaccination effectiveness
- Opinion of H1N1 risk

# Doctor Recommended

- 22% Recommended
- 53% Vaccination Rate
- Recommended patients accounted for 52% of all vaccinations



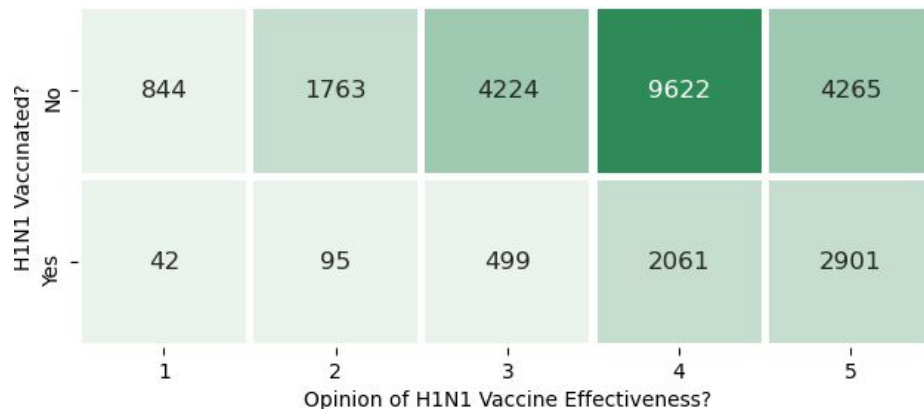




# Opinion of Vaccination Effectiveness

## Vaccination Rates

- |    |                      |       |
|----|----------------------|-------|
| 1. | Not at all Effective | 4.7%  |
| 2. | Not Very Effective   | 5.1%  |
| 3. | Don't Know           | 10.6% |
| 4. | Somewhat Effective   | 17.6% |
| 5. | Very Effective       | 40.5% |





# Opinion of H1N1 Flu Risk

## Vaccination Rates

- |    |               |       |
|----|---------------|-------|
| 1. | Very Low      | 8.8%  |
| 2. | Somewhat Low  | 16.8% |
| 3. | Don't Know    | 17.4% |
| 4. | Somewhat High | 39.2% |
| 5. | Very High     | 51.1% |





# Conclusion

## General Practitioners

- Much higher rates with doctor recommendation ( $13.6\% < 53\%$ )
- Only 22% were recommended vaccine
- High Trust
- Source of Information





# Future Improvements

## Deeper Dive

- Subgroups
- Narrower Audience

## Fill Health Insurance Data

- Omitted Feature
- May Play Important Role
- More Inclined to Visit General Physicians

# The End.

## Any Questions?

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