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# H1N1 Vaccine Model Analysis

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# Summary

Predicting whether someone received the H1N1 vaccine or not

Cost Trade-off:

- Missed Opportunity
- Sending survey/medical record request to the wrong person

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# Outline

- Business Problem
  - Data Understanding
  - Limitations
  - Features
  - Model
  - Conclusion
  - Next Steps
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# Business Problem

- Private Insurance Company; send follow-survey/request medical records
- Goal: predicting who received the H1N1 vaccine
  - Doctor recommendation, health worker, opinion on H1N1 risk
- Increased knowledge → better insurance policies → company growth

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# Data understanding

- National 2009 H1N1 Flu Survey Dataset
- Social, economic, and demographic background, opinions on risks of illness and vaccine effectiveness, and behaviors towards mitigating transmission
- 26,000 rows and 38 columns

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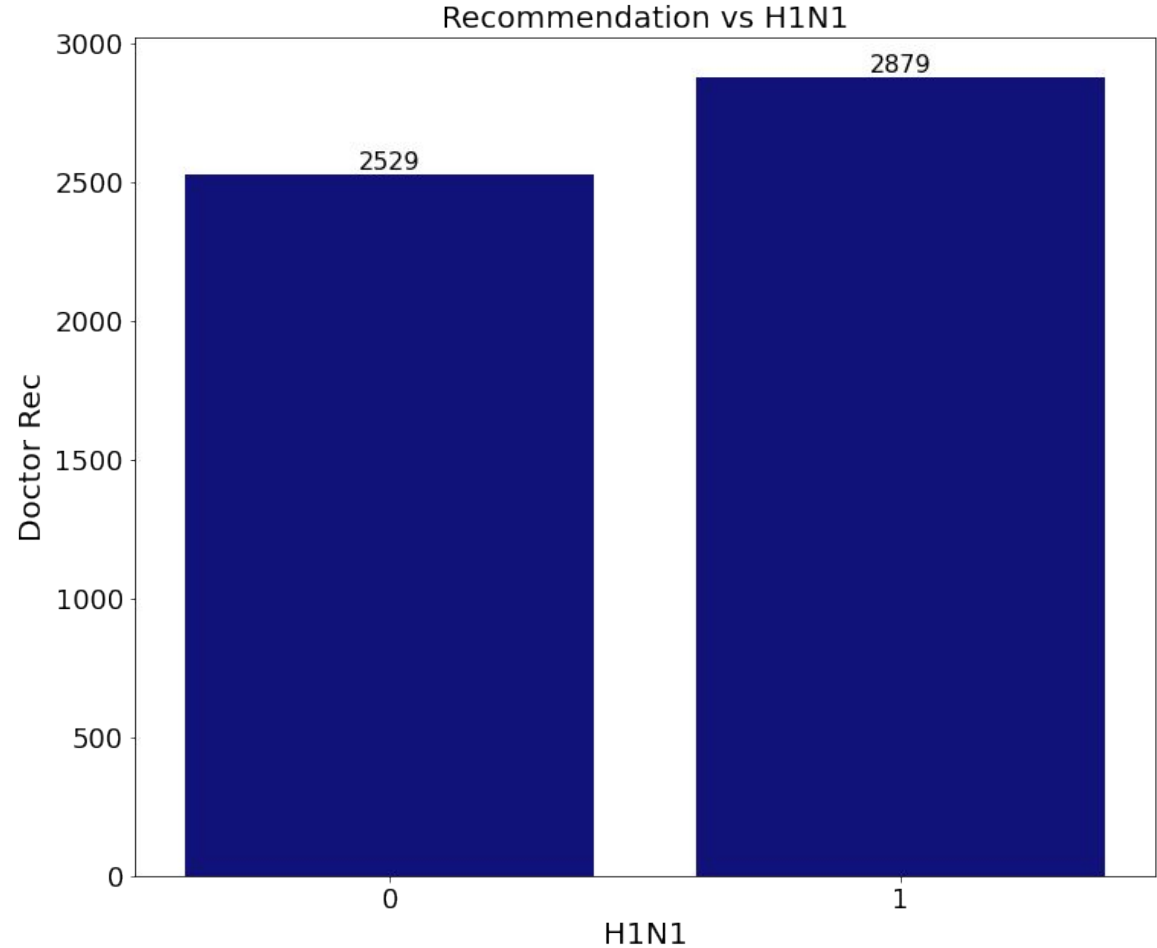
# Limitations

- Account for all people that received H1N1 vaccines
- Account for all the factors that lead to receiving H1N1 vaccines
- Missing health insurance and employment data
- Survey Data:
  - Biased, Inaccurate, Unreliable
- Patterns/trends
- Follow-up Survey, Medical Records

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# Feature 1:

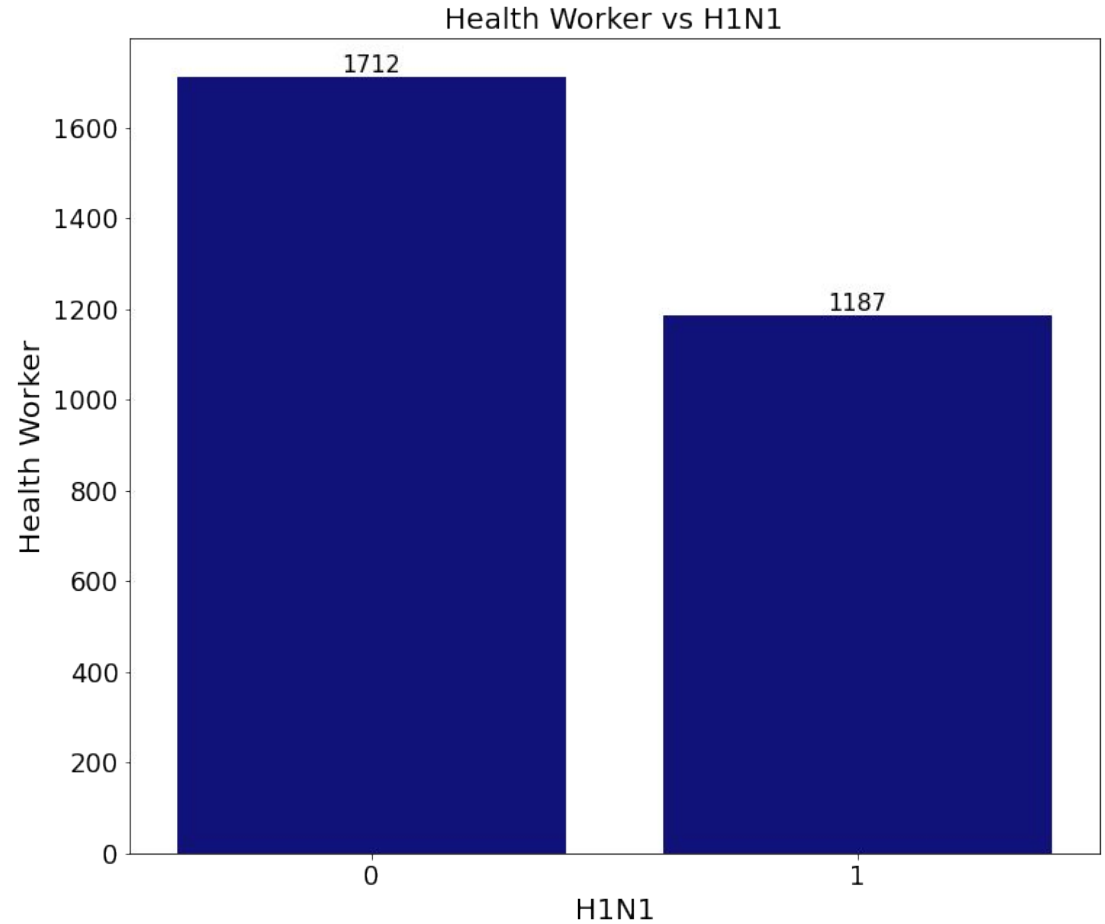
- Doctor recommended vaccine
- Doctor rec vs. H1N1 vaccine



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## Feature 2:

- Is a healthcare worker
- Health worker vs H1N1 vaccine

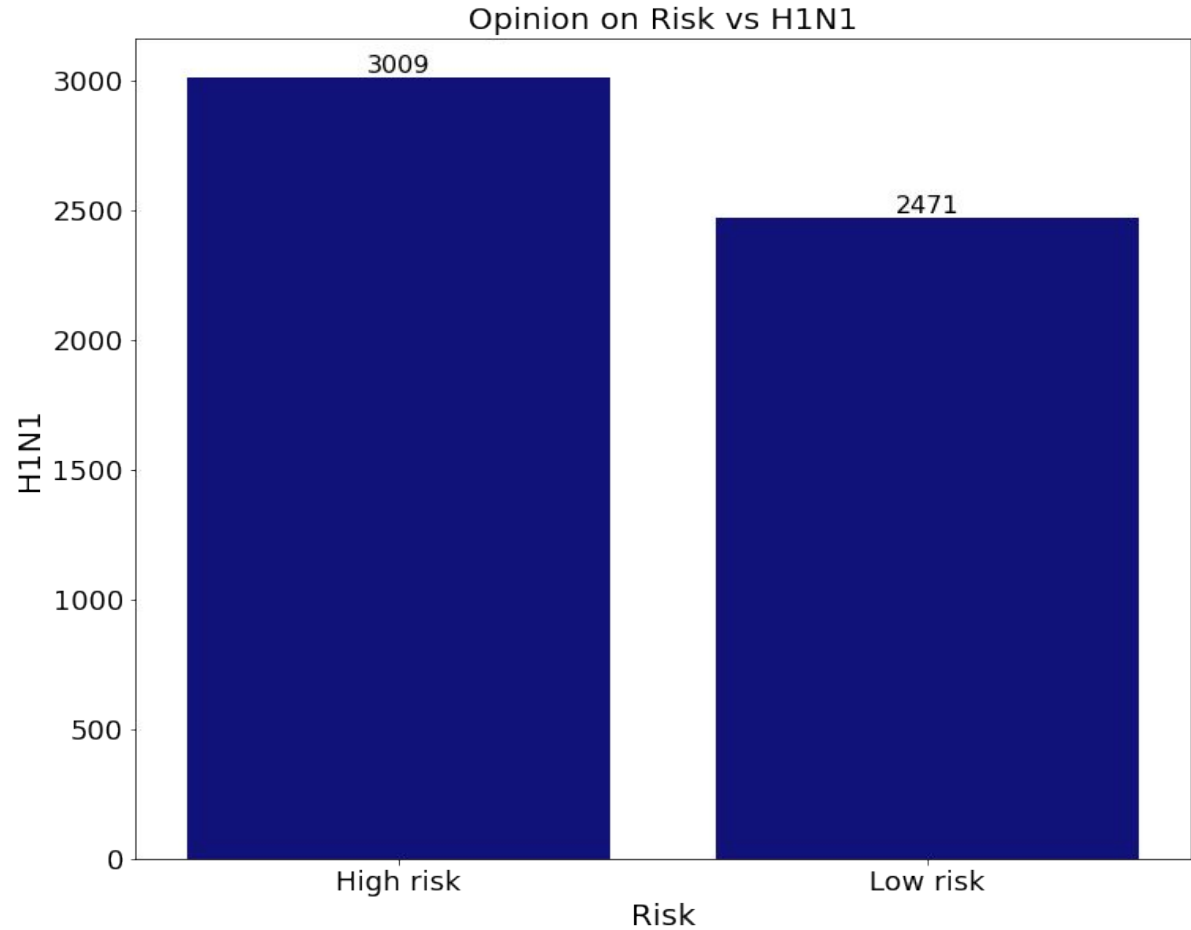




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# Feature 3

- H1N1 vaccine received
- Opinion on risk vs H1N1 vaccine



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# Model

- Logistic Regression
  - Cost Trade-off
    - Missed opportunity vs sending to wrong person
  - Three Scenarios based on hypothetical: Surveying 10,000 people with a cost of \$1 to create/ship
    - Model = ~72%, cost = \$1,800
    - Model = ~81%, cost = \$3,000
    - Model = ~91%, cost = \$4,800
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# Conclusion

- Predict who received the H1N1 vaccine
  - Send follow-up survey, request medical records
- Increased knowledge → better insurance policies → company growth
- Three features:
  - Doctor recommendation, health worker, opinion on H1N1 risk
- Logistic Regression

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# Next Steps

- Cost trade-off
- Send follow-up survey/request medical records → reduce limitations
- Survey focus:
  - Three features, insurance/employment information
- More reliable/accurate model

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# Questions

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# Thank you

Email: [jackdlocke@gmail.com](mailto:jackdlocke@gmail.com)

Github: [https://github.com/johnlocke333/h1n1\\_flu\\_analysis](https://github.com/johnlocke333/h1n1_flu_analysis)

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