Seasonal Flu Vaccination Analysis For Jelly Insurance

Team 2

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Team Introduction

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Project Overview

Importance of Mass Immunization / Vaccination

→ **$402B in direct costs and $1.5T in societal cost saved** from childhood vaccinations in the US between 1994 and 2013 [1]

→ Every dollar invested in childhood vaccinations in the US yields a return of **$10.10 in healthcare savings** and **$18.40 in overall societal benefits** [2]

→ **ROI of immunization program is estimated to be $52 per $1 invested** when considering the broader social and economic costs avoided by vaccination for low- and middle-income countries [3]

Current Challenge

→ Jelly Insurance Co.'s policyholders have **the lowest vaccination rate** of 30% amongst all US insurance companies (avg. vacc. rate of 45%)

Project Scope

→ Understand what are the most effective methods to **increase vaccination rate**

Data Source:
[1] Journal of the American Medical Association
[2] Centers for Disease Control and Prevention (CDC)
[3] Centers for Disease Control and Prevention (CDC)

Data Overview

Source:

➜ 2009 National H1N1 and Flu Vaccination phone survey by the United States National Center for Health Statistics

Overview:

➜ ~27K survey records with ~40 columns/questions *(e.g., vaccination status, social, economic, demographic background, opinions on risks of illness, and vaccine effectiveness)*
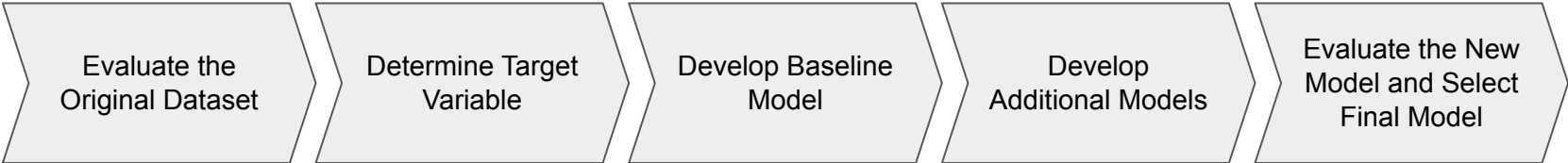
Limitations:

➜ Respondents were predominantly white; lack of balanced racial representation

➜ Half of the health insurance information is missing

➜ Dataset is relatively small

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Modeling Process and Evaluation Method

Modeling Process

Evaluate the Original Dataset	Determine Target Variable	Develop Baseline Model	Develop Additional Models	Evaluate the New Model and Select Final Model

Model Used

➜ Logistic Regression

➜ Decision Tree

Evaluation Method

➜ Accuracy Score

Final Model Overview

➜ Logistic Regression Model
  ◆ Accuracy of 83%

Top 3 Factors that Had the Greatest Impact on Vaccination Status Based on Final Model

➜ Doctor's Recommendation for Seasonal Vaccine

➜ Opinion on Effectiveness of Seasonal Vaccine

➜ Opinion on Risk of Getting Seasonal Flu

Modeling Process and Evaluation Method (continued)

Review of the Original Dataset for the Top 3 Factors on Vaccination Status

Doctor's Recommendation for Seasonal Flu Vaccination

Opinion on Effectiveness of Seasonal Vaccine

Opinion on Risk of Getting Seasonal Flu
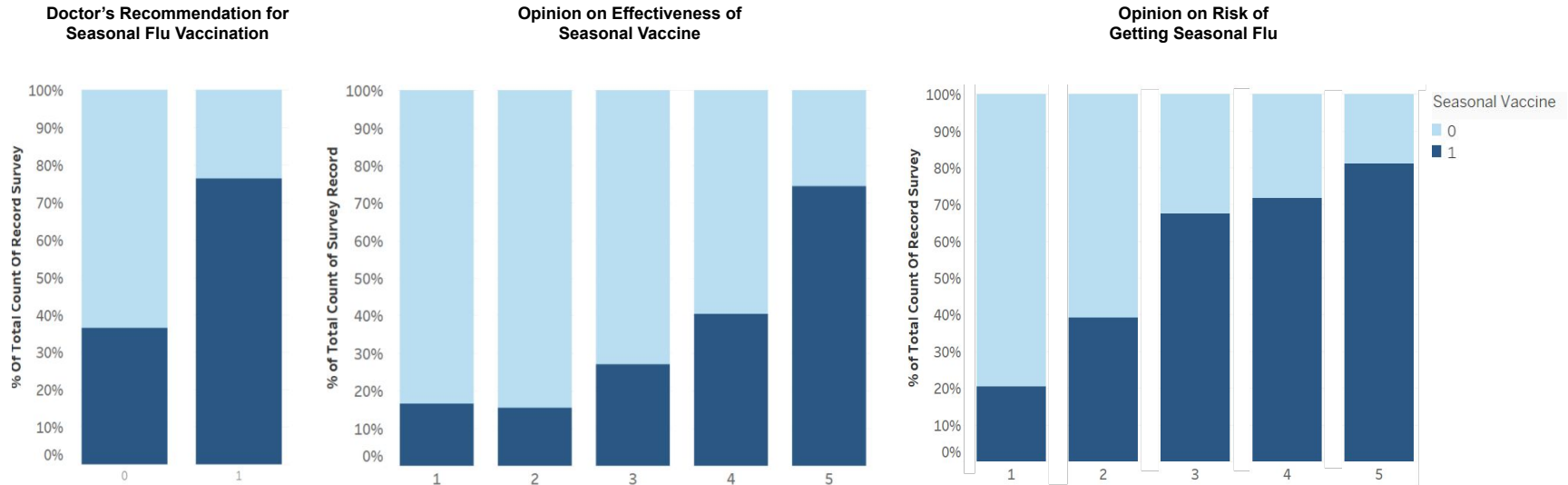
➔ Top 3 factors on vaccination status suggested by the final model __are in line__ with the original dataset

Recommendations

1

Doctor Training

Educate primary care physicians to recommend vaccination for seasonal flu

2

Marketing Campaign

Increase marketing campaign budget for effectiveness of seasonal flu vaccine

3

Raise Awareness

Raise awareness of seasonal flu risk via various marketing and communication channels

Based on the recommendations, Jelly Insurance Co. will be able to **lower its insurance payouts** by reducing the risk of its policyholders from getting sick

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Next Steps

➔ Perform analysis with **balanced racial representation**

➔ Extend the analysis to the **policyholders**

➔ Investigate **correlation** amongst different vaccines

Question?

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