H1N1 And Seasonal Flu Vaccine

Understanding Vaccine uptake through behaviour and demographic analysis

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Overview

➢ Predict whether individuals received H1N1 and seasonal flu vaccines based on their backgrounds, opinions, and behaviors.

➢ Identify factors influencing vaccination decisions

➢ Develop predictive models to inform public health strategies

Problem Statement

➢ Predict the likelihood of receiving H1N1 and seasonal flu vaccines.
➢ Analyze the relationship between individual characteristics and vaccination patterns

Understanding these factors can guide initiatives to improve vaccine uptake in future campaigns

Data Understanding

Data Features and Analysis

Phone survey conducted in the United states. It has social,economic and demographic backgrounds ,opinions on illness risks and vaccine effectiveness

Data Preparation

On Data cleaning filled numeric data with median and categorical columns with mode. Also dropped columns with 50+ missing values and applied one-hot encoding to categorical features for modelling

Modelling

Models Used

- ➤ Logistic Regression
- ➤ Decision Tree

Evaluation metrics

- ○ Area under the curve(AUC): 81 % average
- ○ Mean squared error(MSE)- Training and test data was close enough showing no sign of overfitting or underfitting

Results

- ➤ Using Grid search CV, Logistic regression proved to be the best model with the following parameters:
    - C=**100**
    - Class_weight= **Balanced**
    - Solver = '**liblinear**'

Conclusion

- Logistic Regression effectively predicts vaccination likelihood.
- Behavioral and demographic insights can drive tailored public health strategies.

Future Work:

- Explore additional models for improved performance.
- Validate findings with more extensive datasets.

Thanks

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