Predicting Vaccine Compliance

National 2009 H1N1 Flu Survey

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CORONAVIRUS

National 2009 H1N1 Flu Survey

Telephone survey in **2009**

Estimated **vaccination coverage rates**:

- H1N1
- Seasonal Influenza

Goal: Recommendations for a New Survey on COVID-19 Vaccine Compliance

CDC wants:

- Relevant **questions**
- Other possible **improvements**

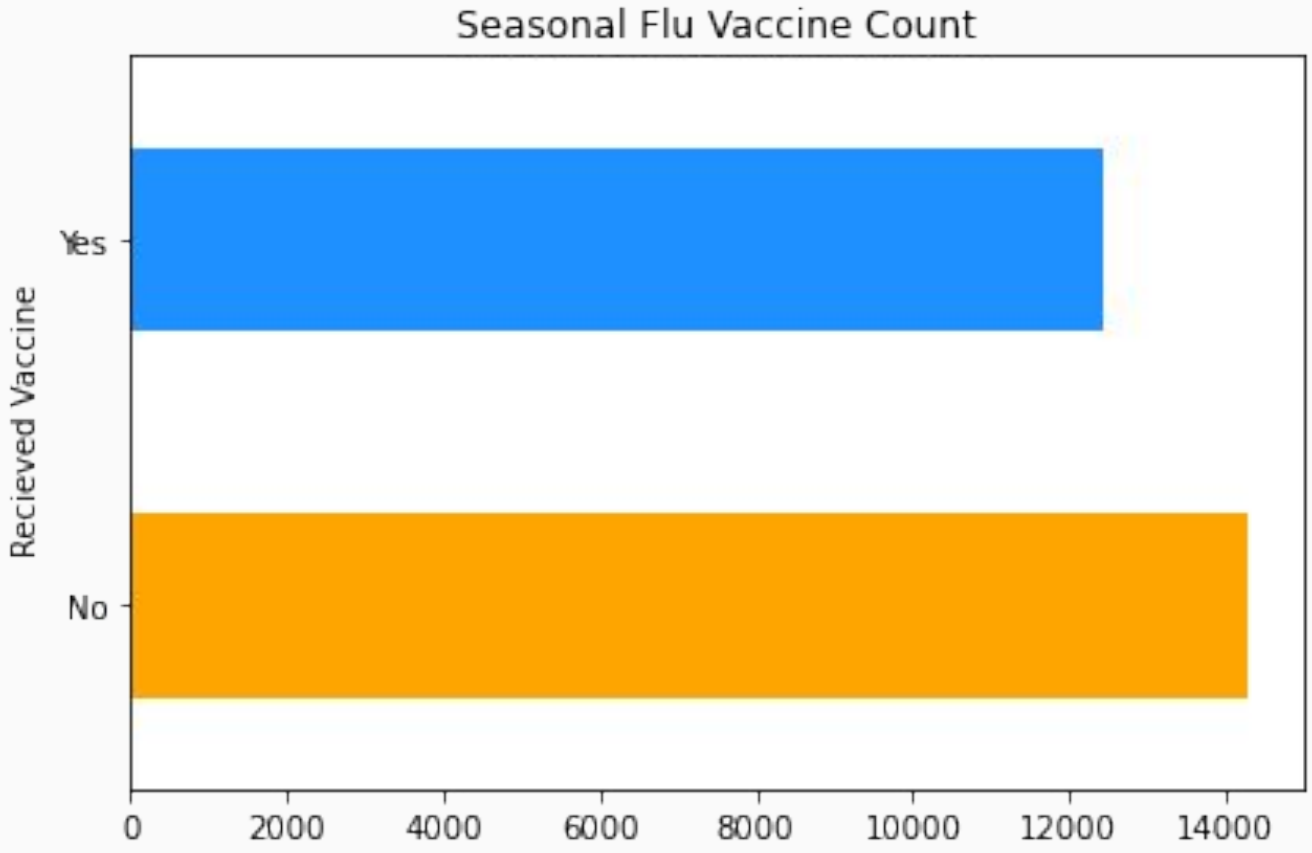
Data

Focus

- **Seasonal flu** vaccine
- COVID-19 vaccine today

Dataset

- **26,707** rows
- **27** columns



47% of respondents had the seasonal flu vaccine - **53%** did not.

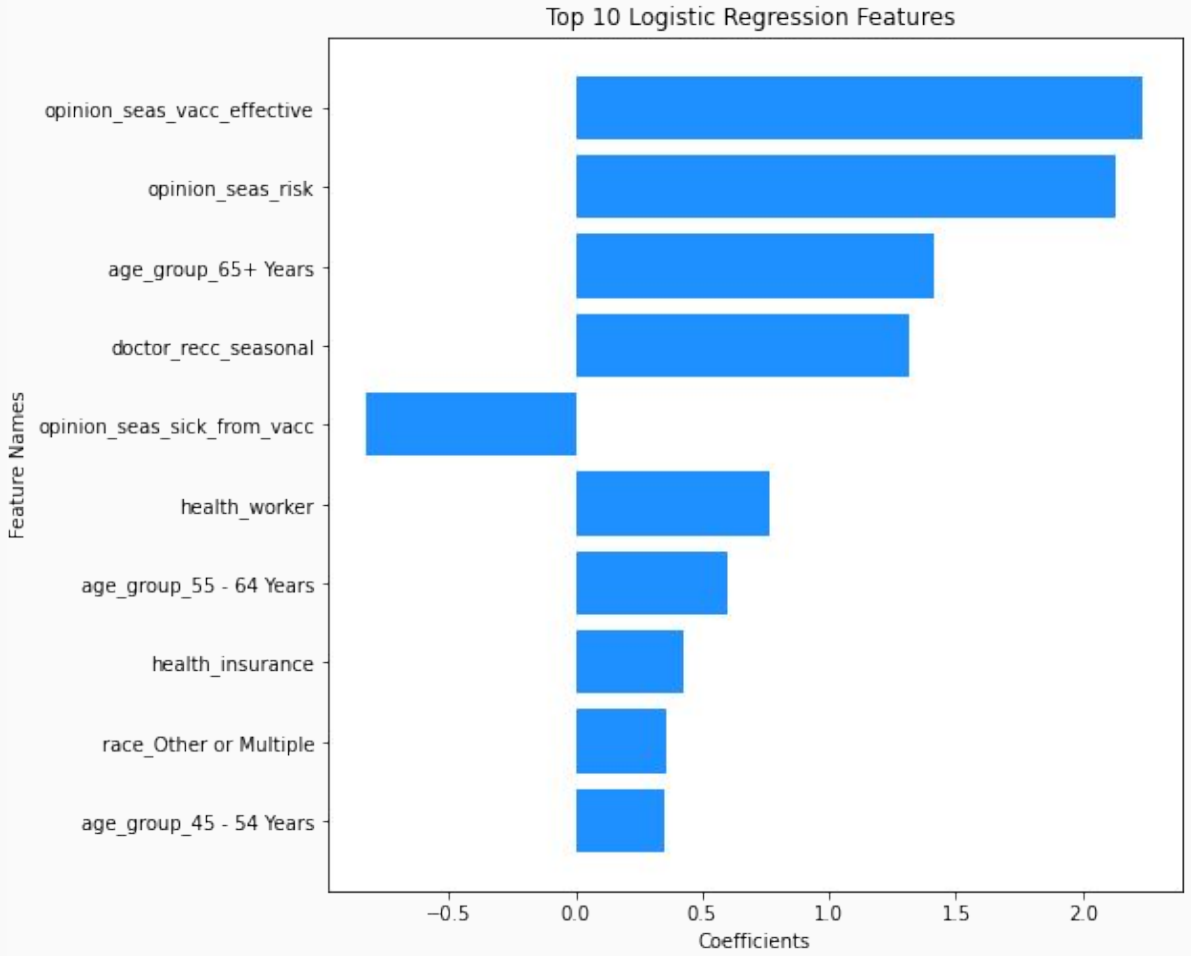
Use **models** to find **features** important to **vaccine compliance**.

Baseline: must have higher than **53% accuracy**

Logistic Regression Model

Handles **binary classification** well

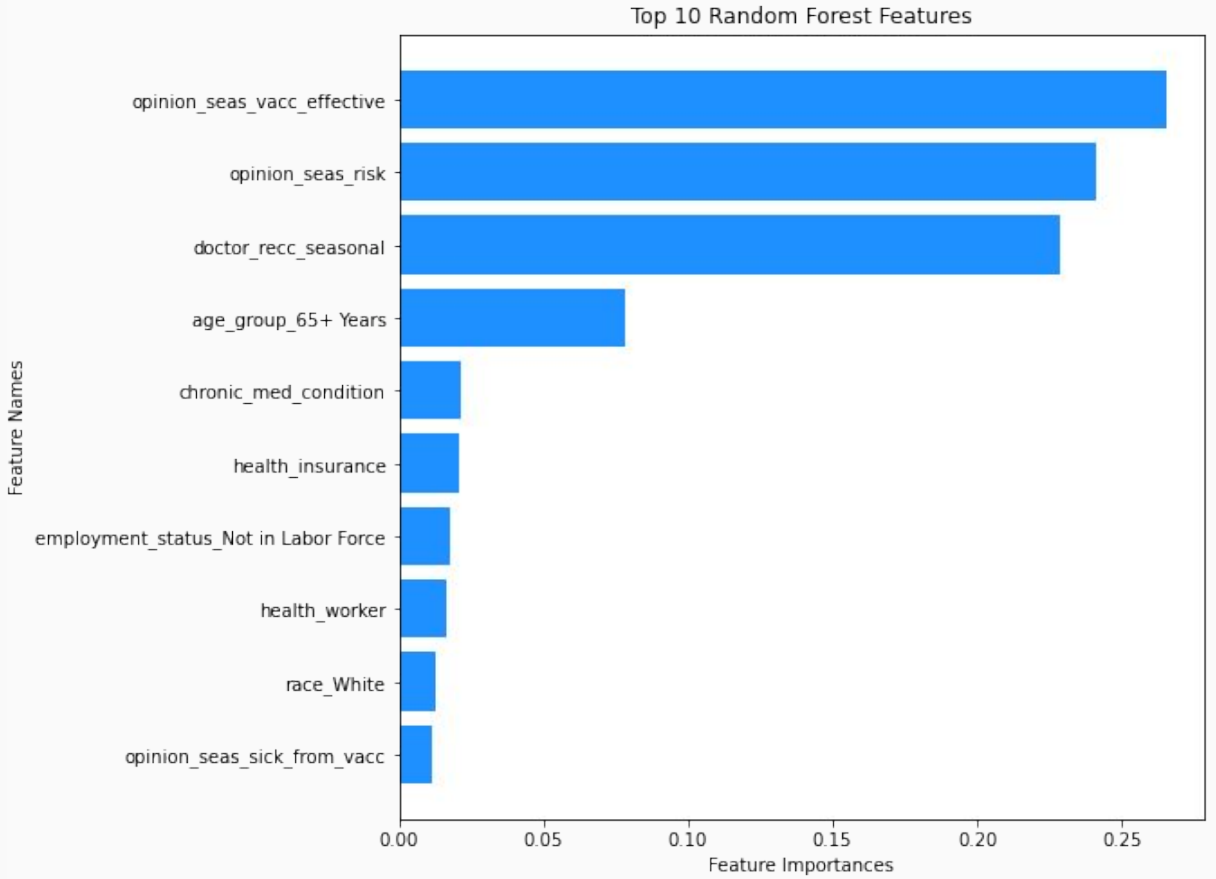
Accuracy: **78.098%**



Random Forests Model

Ensemble method that works for **non-linear** problems

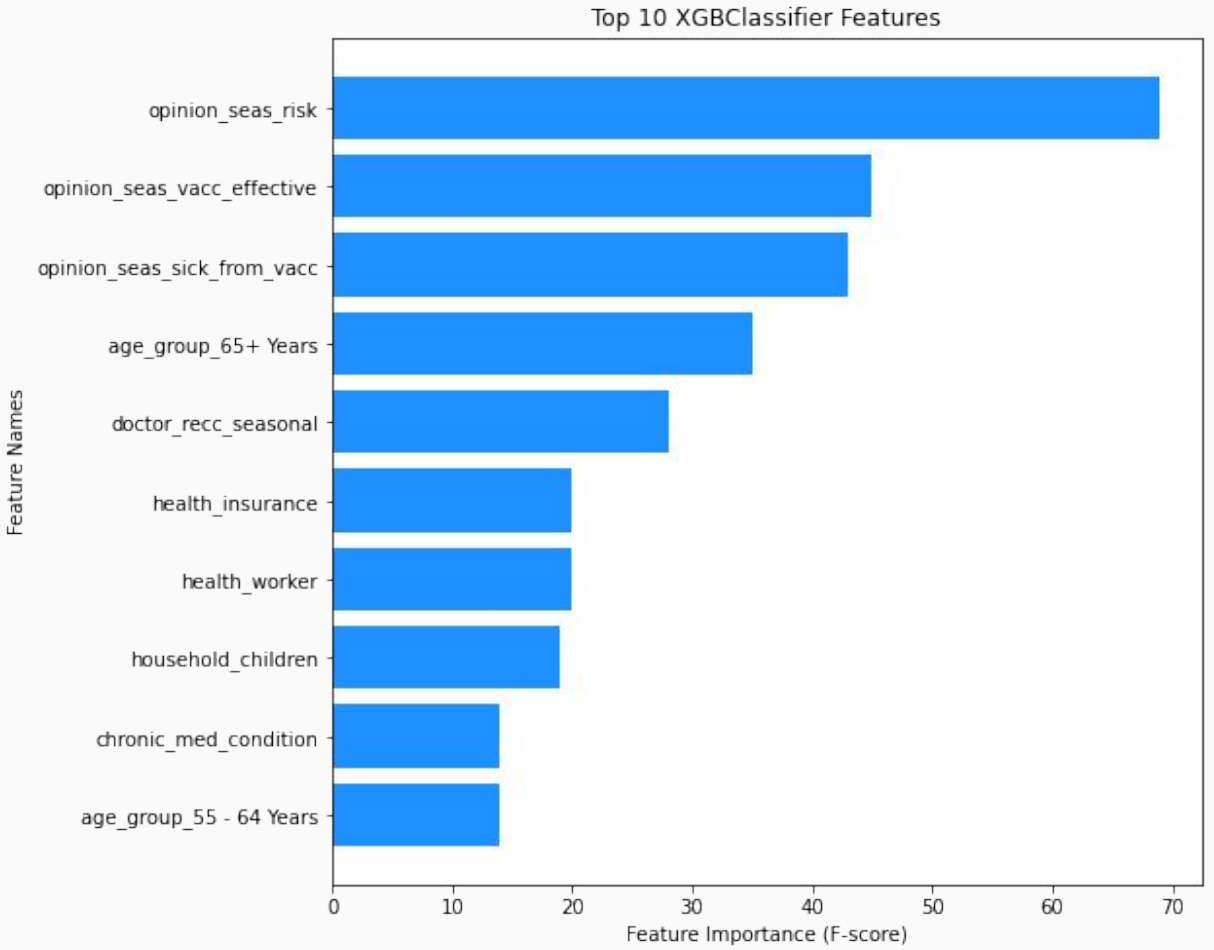
Accuracy: **77.33%**



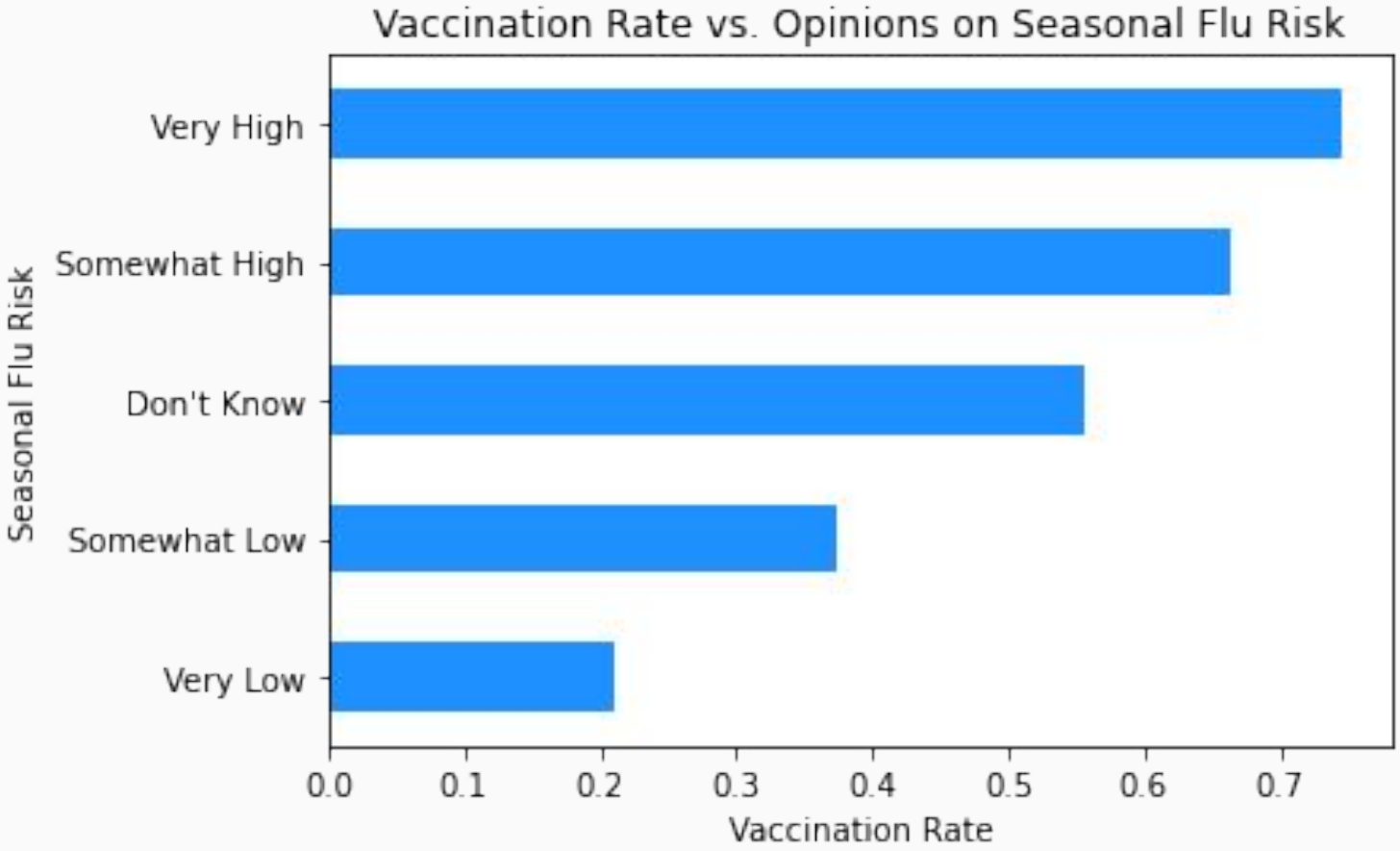
Final Model:
XGBoost

Ensemble method - considered **best-in-class** at the moment

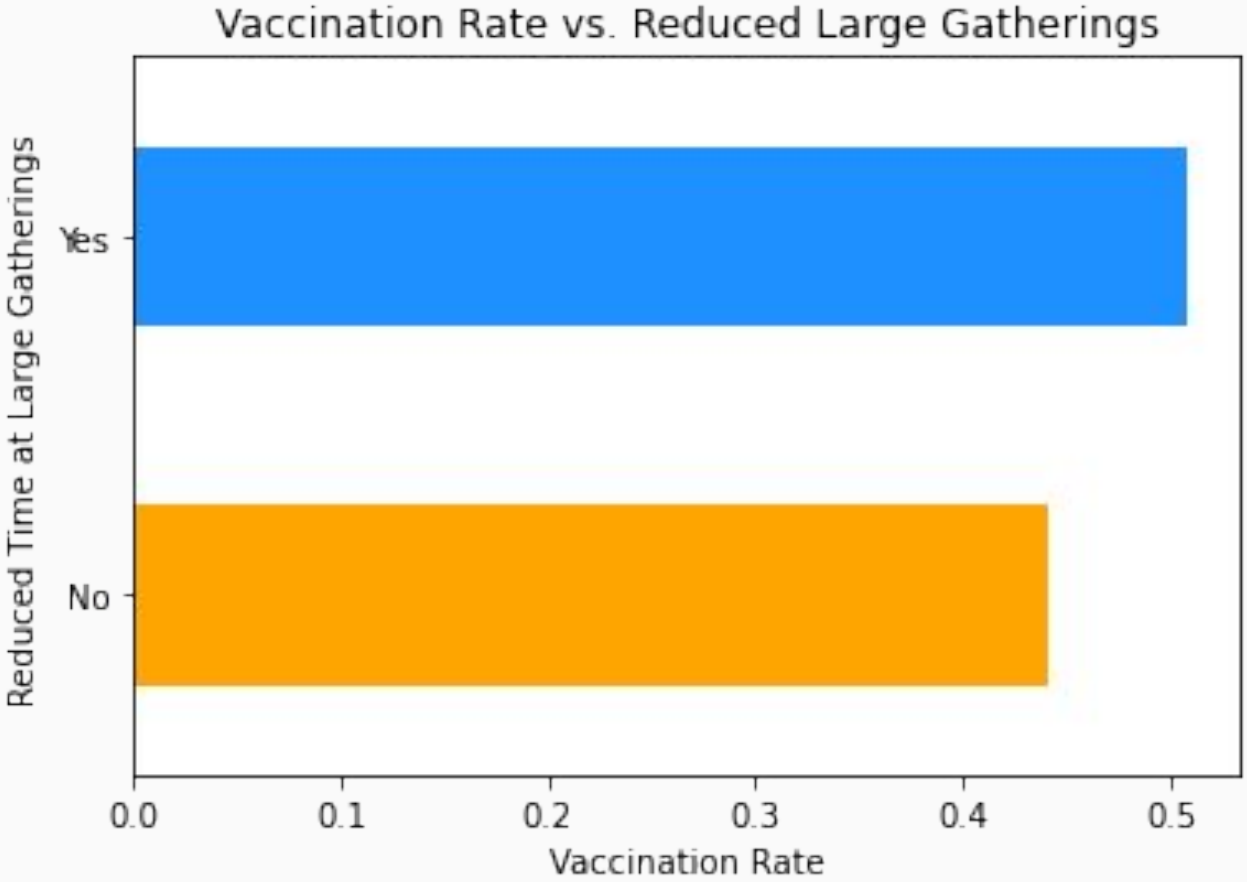
Accuracy: **78.82%**



Best Performing Feature



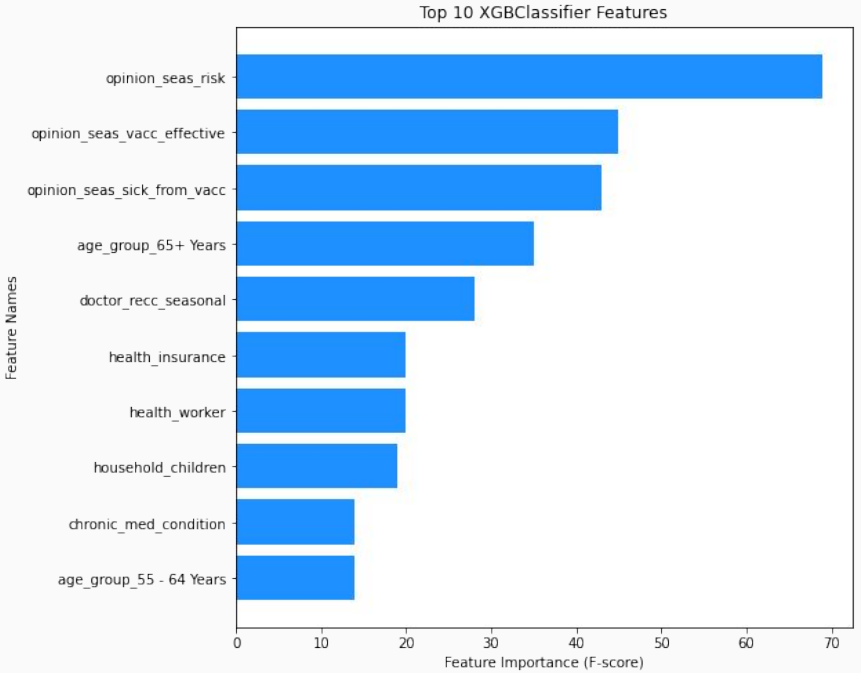
Worst Performing Feature



Use **models** to find **features** important to **vaccine compliance**.

Important Features

- **Opinion questions**
- **Age, doctor recommendations**



Other Insights:

Fewer Questions = Higher Response Compliance

Cultural and Behavioral Changes Due to COVID-19

Summary: Survey Suggestions

Relevant features:

- **Vaccine Opinions**
- Age
- Doctor Recommendation

Recommendations:

- **Minimum** No. of Questions
- Recognize **Cultural/Social Impact** of COVID-19 on behavior

- Check if **KNN** is a better way to handle the missing data
- Re-examine **behavioral questions**
- Keep an eye out for **changes to COVID-19 vaccine accessibility**
- Create and test **short survey**

Thank you!

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