

Group 11

# Predicting Seasonal Flu Vaccine Uptake

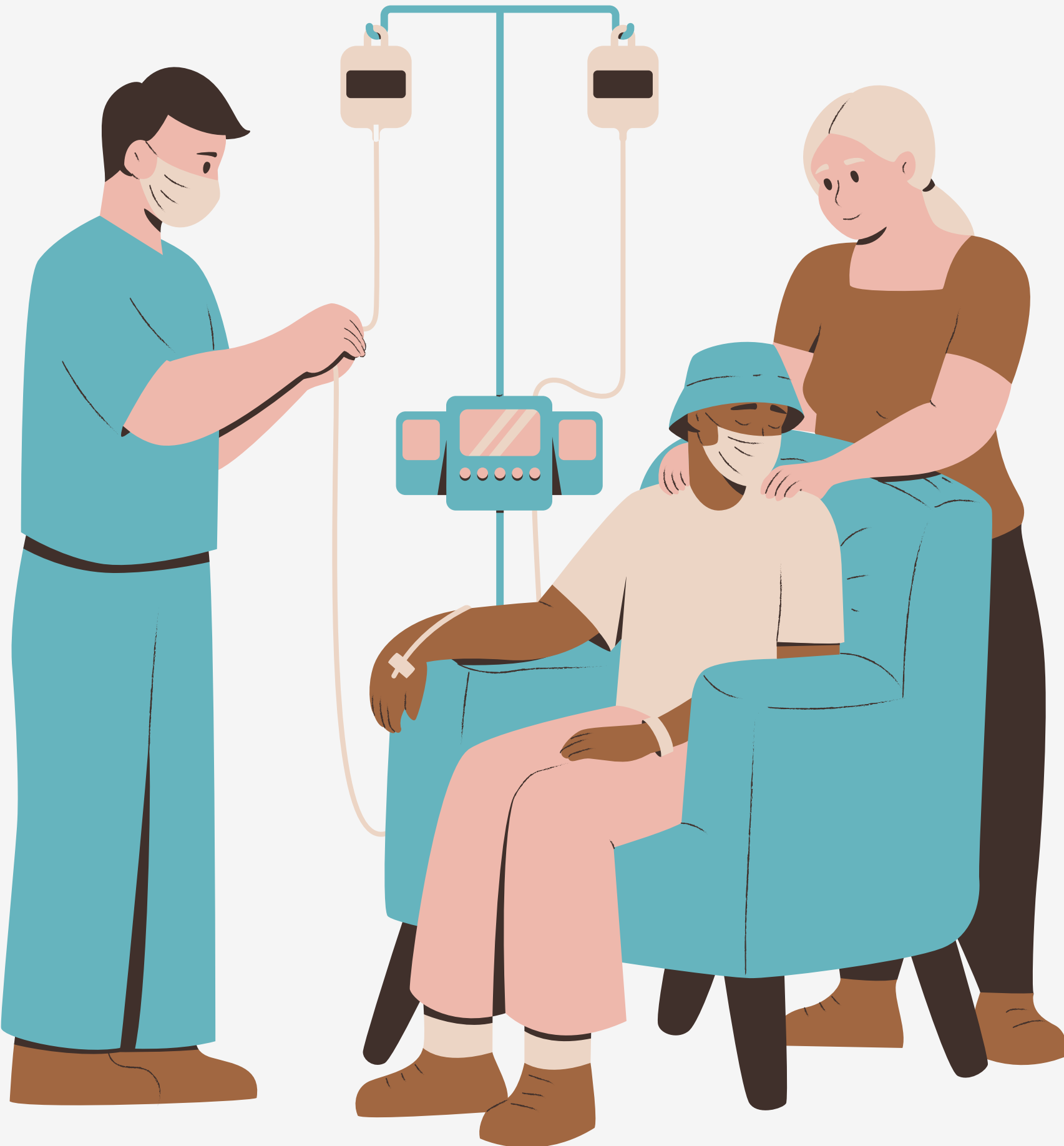
Moringa School Project – By  
Group 11

1. Latifa Riziki
2. Victor Ongaki
3. Eugene Mallah
4. Abdulkadir Diriye
5. Simon Irungu



sep 10 2025

# Purpose of the Project



- ***Context***

- Seasonal flu affects millions globally each year.
- Vaccination is the most effective prevention, but uptake remains uneven.
- Some groups are more likely to skip vaccination.

- ***Why It Matters***

- Helps public health officials design targeted awareness campaigns.
- Improves resource allocation (focus on groups less likely to vaccinate).

- ***Our goal:***

Predict whether an individual is less likely to get the seasonal flu vaccine using survey data.

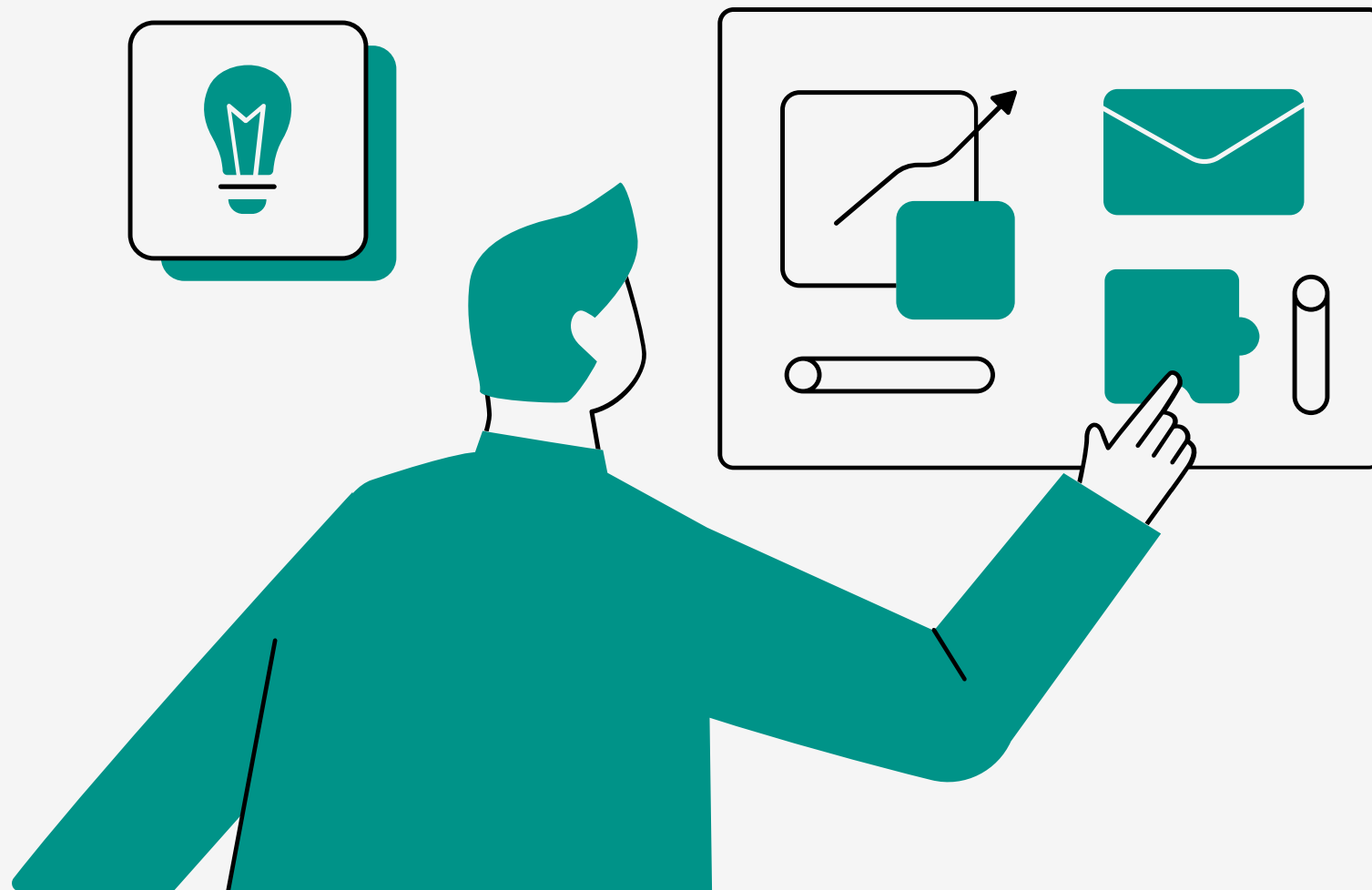
# Business Understanding

## Business Problem

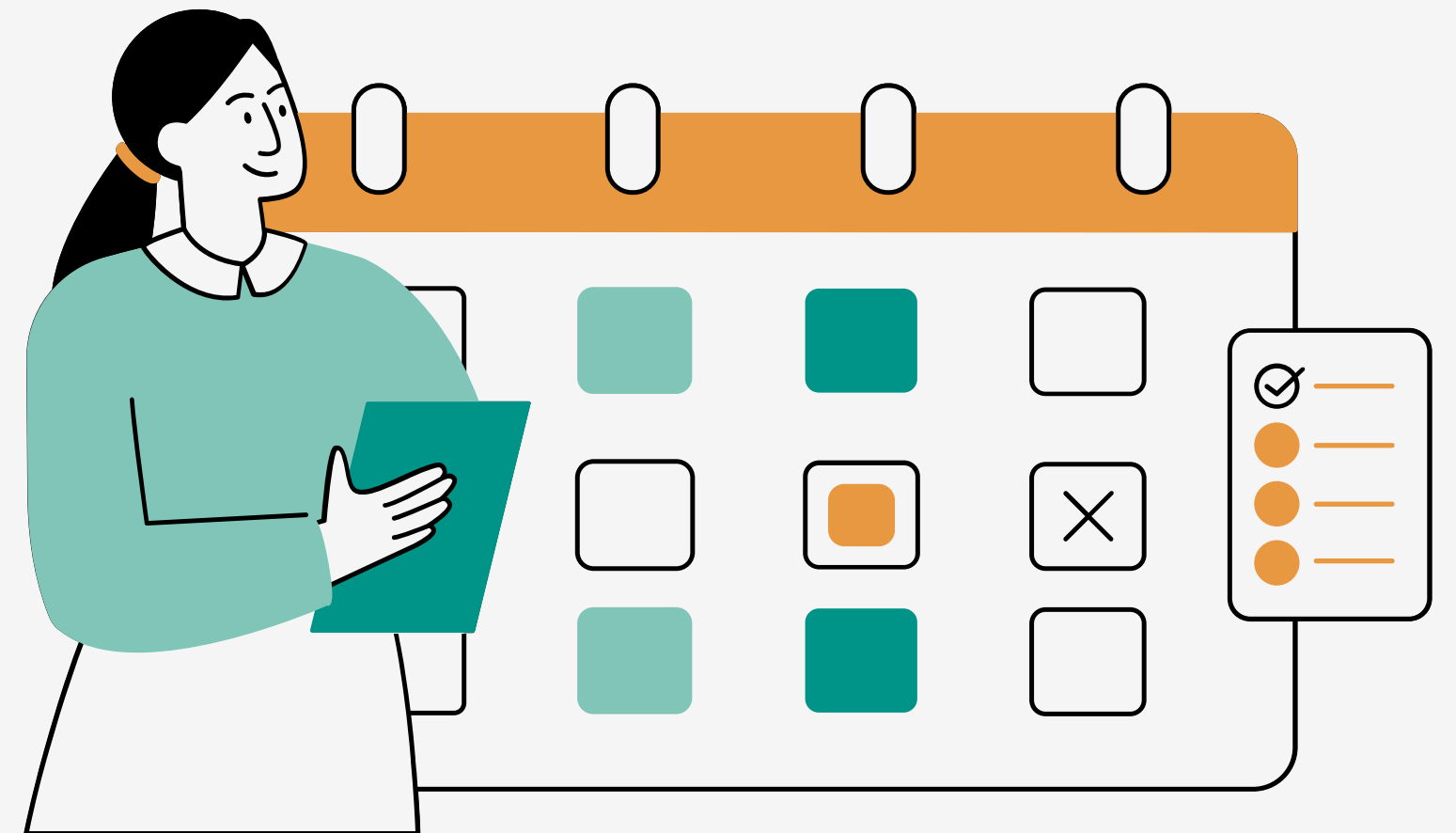
- Vaccination rates are not equal across all groups.
- Some demographics and behaviors strongly influence vaccine uptake.
- Public health officials want to improve vaccination rates, especially in vulnerable groups.

## Key Question

- Which groups are most likely to skip the seasonal flu vaccine?
- How can predictive modeling help improve targeting in awareness campaigns?



# Data Understanding.



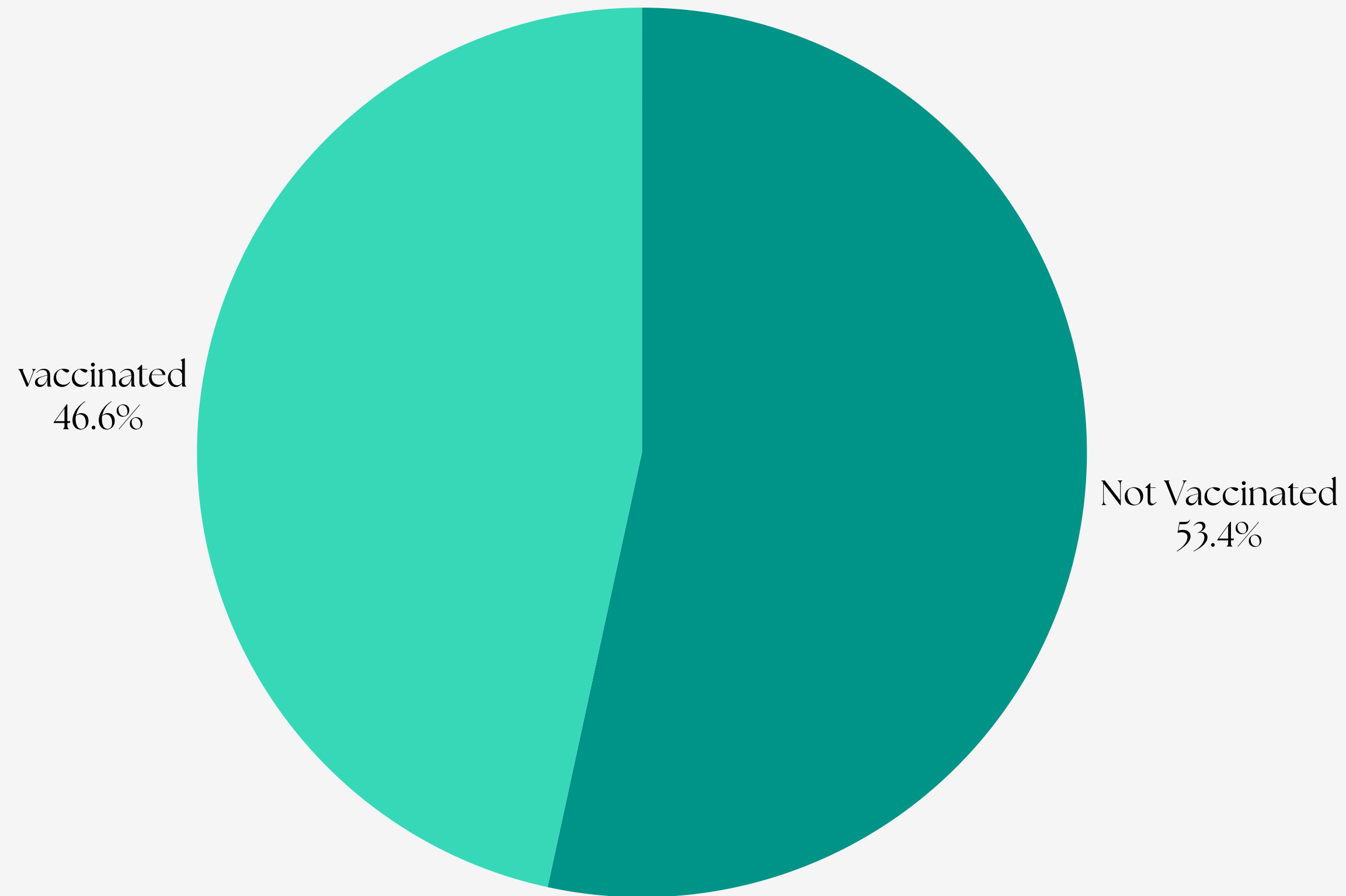
## Description of Data

- Data format: CSV file (H1N1\_Flu\_Vaccines.csv).
- Number of records (rows): 26,000 respondents (varies depending on version of dataset).
- Number of fields (columns): 36 features + 2 target labels (h1n1\_vaccine, seasonal\_vaccine).
- Field identities: Columns represent demographic, behavioral, medical, and opinion-based survey responses (e.g., age\_group, sex, h1n1\_concern, doctor\_recc\_h1n1, employment\_status).

# DATA ANALYSIS

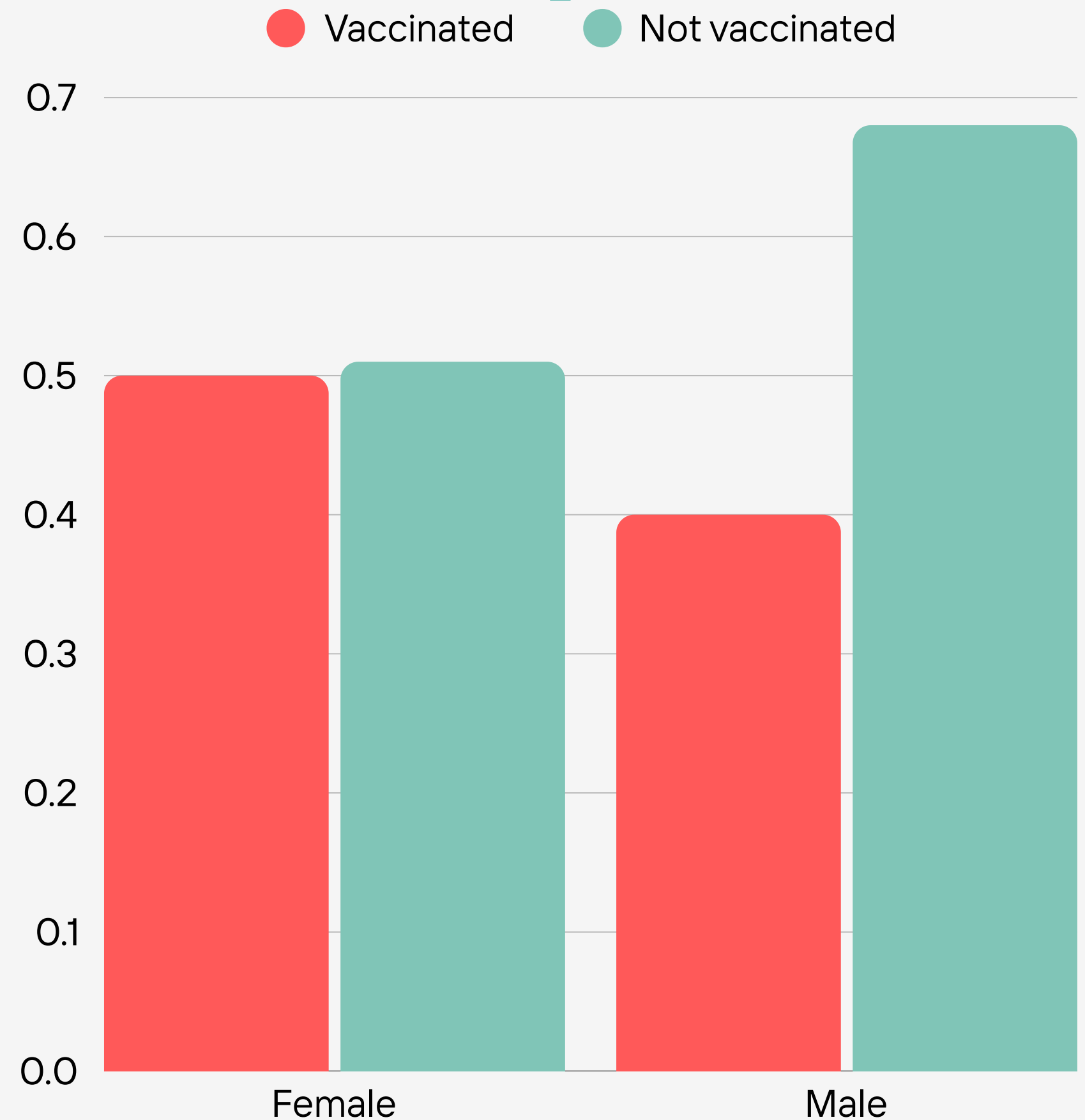


# Distribution of seasonal vaccine



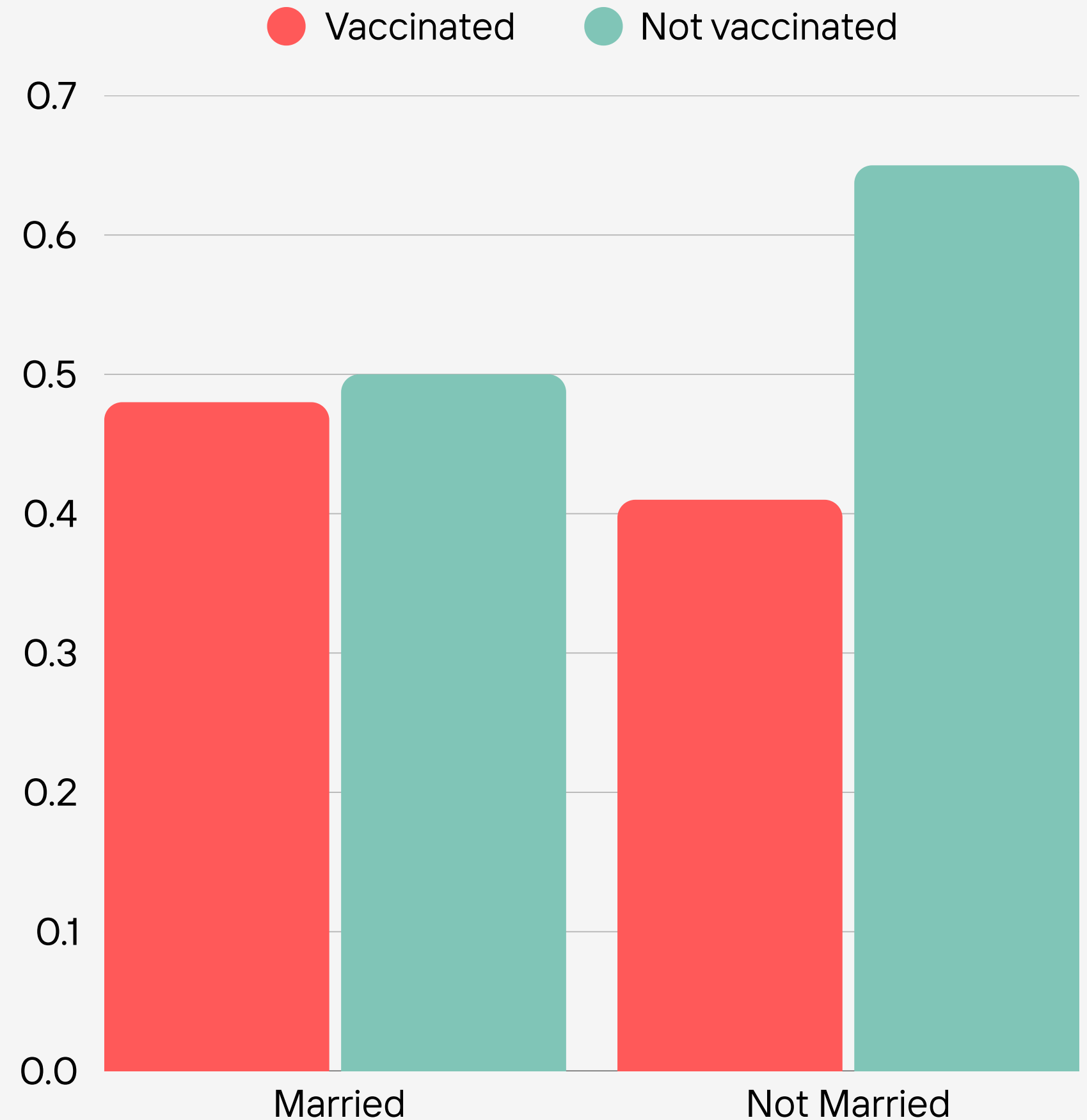
# Sex vs vaccine non-uptake

Male are less likely to receive the vaccine compared to females



# Marital status vs vaccination

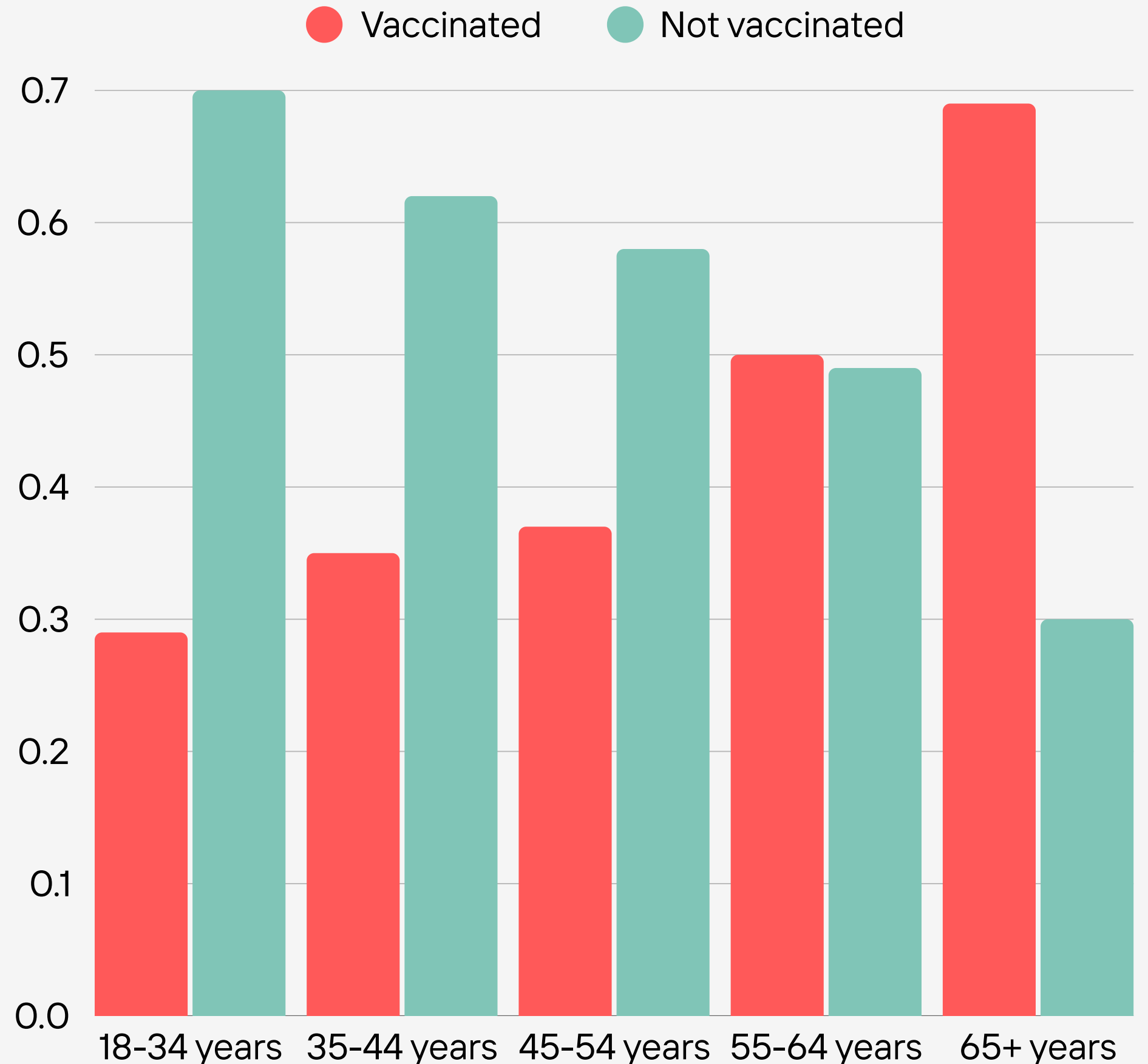
Single people are less likely to take the vaccine compared to married people





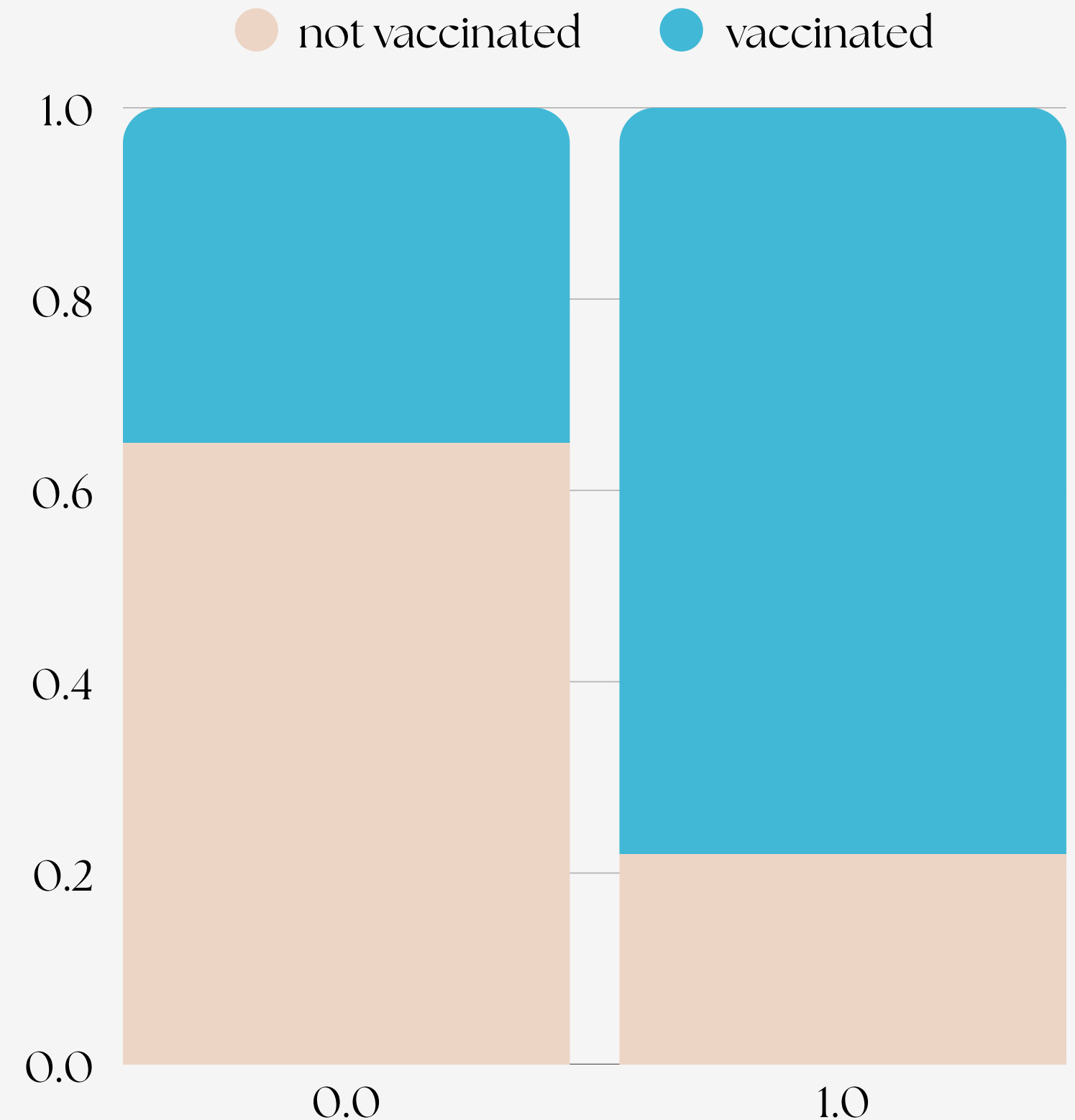
# Age group vs vaccination

Young people are less likely to receive the vaccine



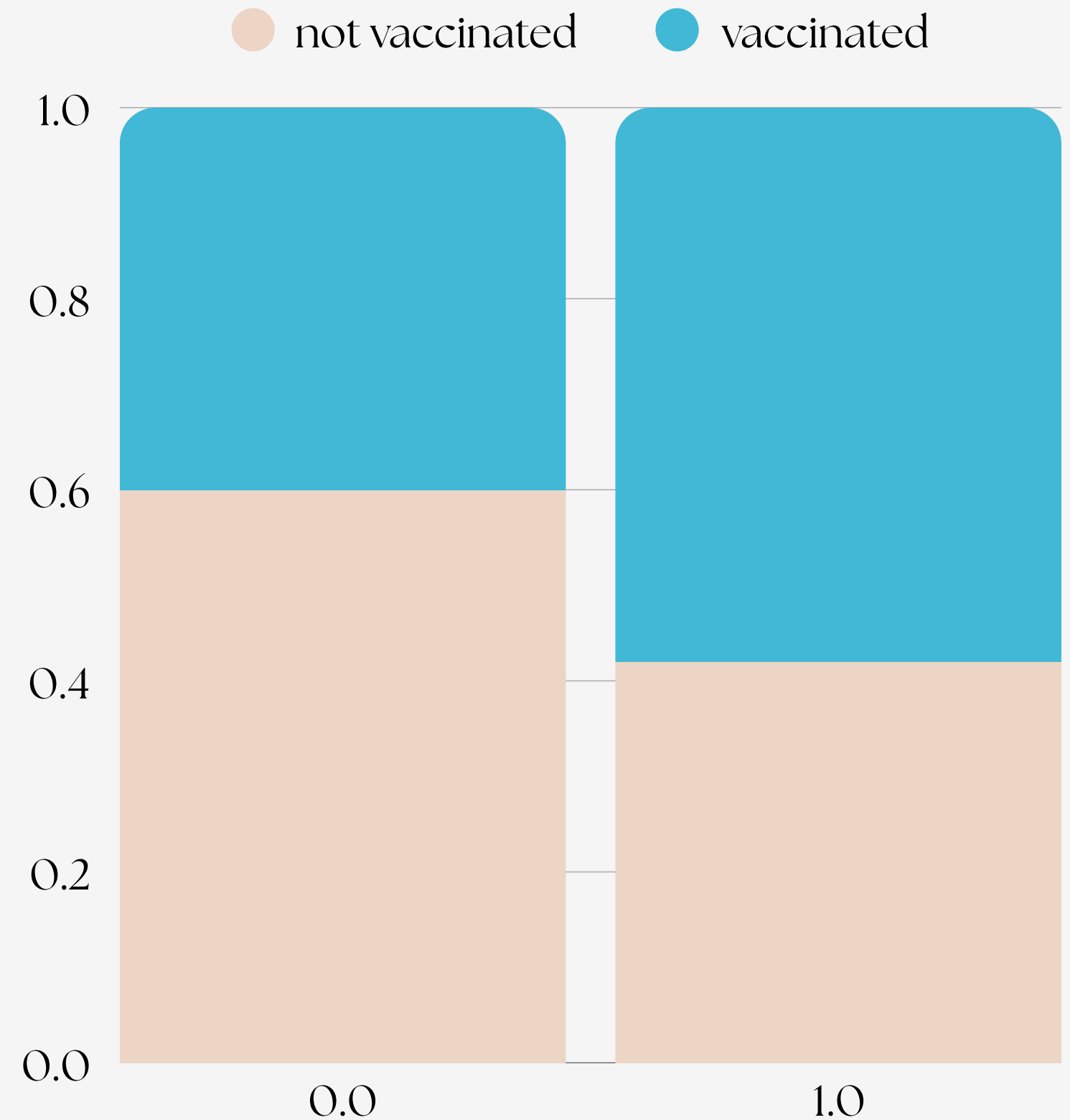
# Doc\_recc vs vaccination

People not recommended by  
the doctor are less likely  
to receive the vaccine



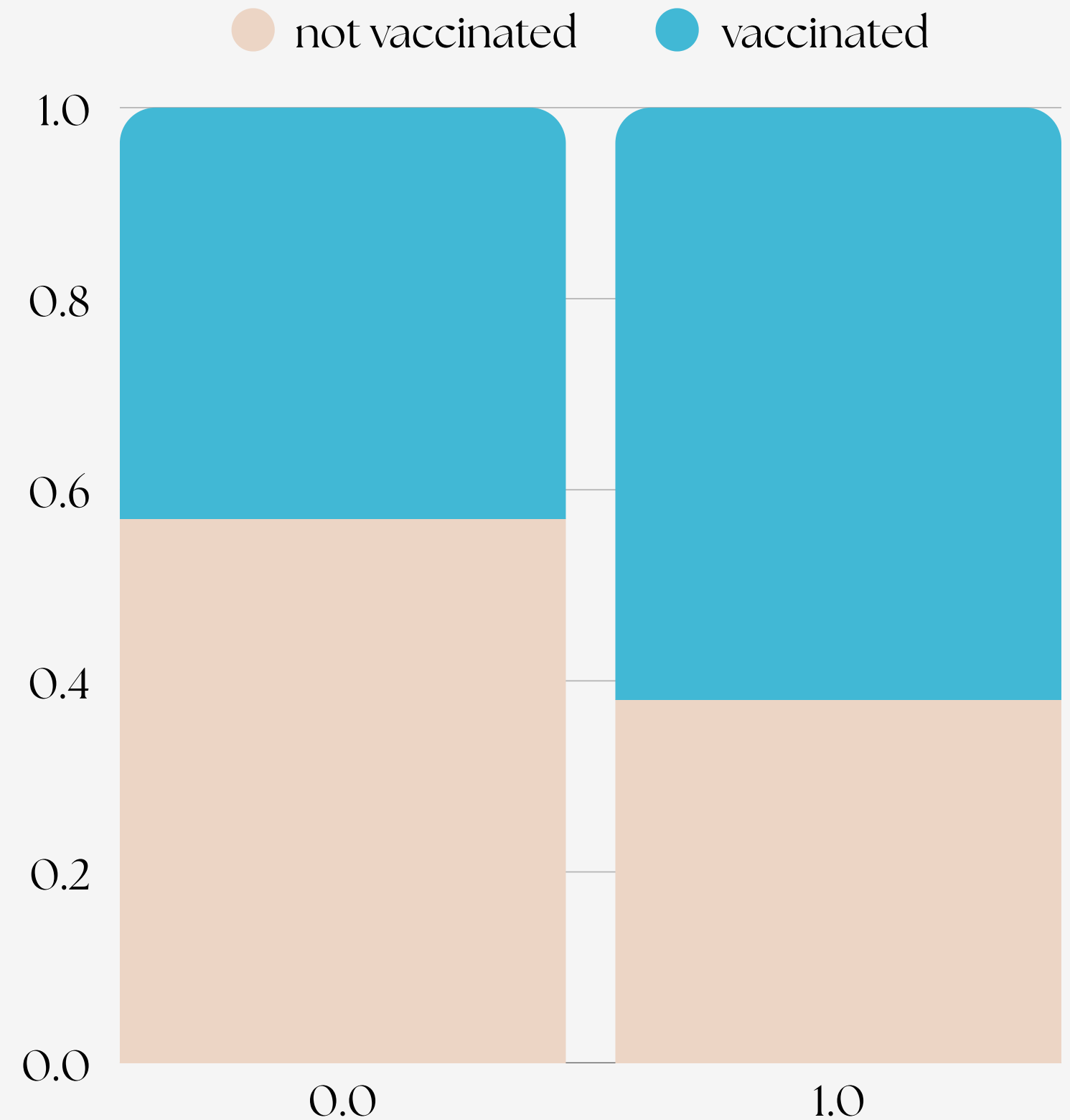
# chronic\_cond vs vaccination

People with no chronic condition  
are less likely to receive the  
vaccine



# health\_worker vs vaccine

Non-health workers are  
less likely to receive  
the vaccine



# Model Results

**Best Model:** Logistic Regression with a test accuracy of 85% and balanced performance across both classes

**Other Models:** Random Forest and decision Tree showed good performance, but had some issues like overfitting or lower accuracy

**confusion Matrix :** Logistic regression achieved 3568 true negatives and 2705 true positives indicating good performance

# Conclusion

- 🦠 Males had lower seasonal flu uptake compared to females.
- 🦠 Younger age groups, especially the 18-34 age group, had lower seasonal flu uptake compared to older individuals.
- 🦠 Black respondents had lower seasonal flu uptake compared to White respondents.

# Conclusion

- Single and divorced individuals had lower seasonal flu uptake compared to married individuals.
- Lower-income groups had lower seasonal flu uptake, especially those below the poverty line.
- Renters had lower seasonal flu uptake compared to homeowners.
- Less educated individuals, especially those without a high school diploma, had lower seasonal flu uptake compared to those with higher education levels.



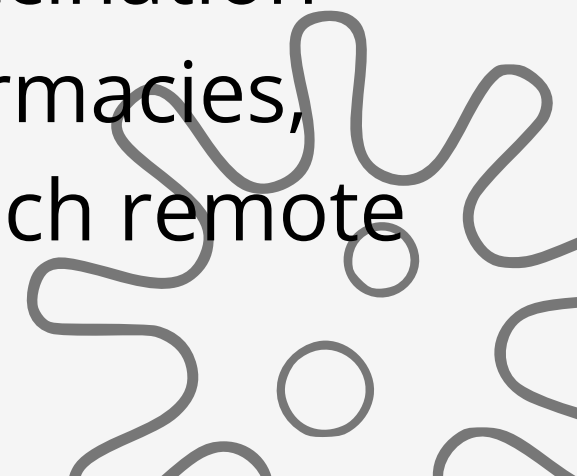

# Recommendation



Targeted Awareness Campaigns: Create health education campaigns specifically aimed at men and younger adults (18–34 years), using social media, influencers, and relatable messaging to stress the importance of flu vaccination. Implement SMS reminders, workplace wellness rewards, or small incentives (like grocery vouchers) to encourage vaccination among low-uptake groups.



Community-Based Outreach for Minority Groups and Rural Areas: Partner with Black community leaders, churches, and local organizations to promote flu vaccination and address cultural or historical distrust in healthcare systems. Increase vaccination points in non-metropolitan areas, including partnerships with local pharmacies, churches, and community centers. Use mobile vans and health fairs to reach remote populations.





# Recommendation



Affordable and Accessible Vaccines for Low-Income & Less-Educated Groups: Provide free or subsidized vaccination clinics in low-income neighborhoods and workplaces.

Organize mobile vaccination drives to reach those with transportation or time barriers. Collaborate with schools, adult education centers, and vocational training programs to educate less-educated populations on vaccine benefits using simple, visual, and culturally relevant materials.



Housing-Specific Interventions: Bring vaccination services closer to renters through pop-up clinics in apartment complexes and rental housing areas.

# THANK YOU

Presented By :

**Group 11**

