Consumer Preferences for Attributes of Influenza Vaccines in the United States: Results From a Discrete-Choice Experiment Study

Christine Poulos, PhD[1]; Colton Leach, BA[1]; Cannon Kent, MA[1]; Deborah Rudin, MD[2]; Philip Buck, PhD[2]; Parinaz Ghaswalla, PhD[2]

[1]RTI Health Solutions, Research Triangle Park, NC, United States; [2]Moderna, Inc., Cambridge, MA, United States
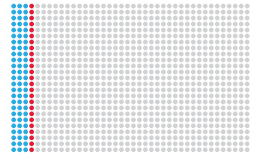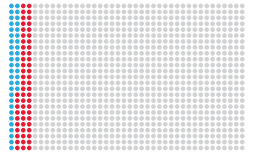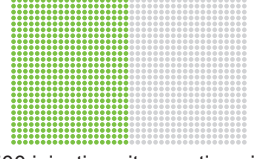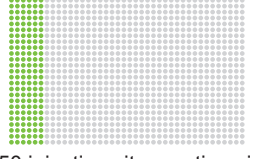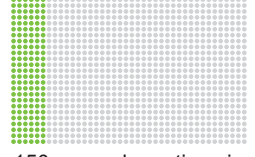
BACKGROUND AND STUDY OBJECTIVE

- A recent review of discrete-choice experiment (DCE) studies of influenza vaccine preferences found that only 1 study had been conducted in the United States (US), and only 1 study (conducted in the Netherlands) looked at side-effect risks of different severities.[1,2,3]

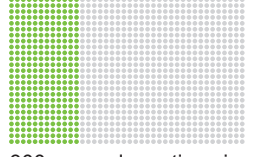- Consumer preferences for vaccines can inform economic analyses[4] and/or vaccination recommendations (via the Evidence to Recommendation framework).[5]

- The objective of this study was to quantify preferences for influenza vaccine attributes among consumers in the US.

METHODS

- Using a DCE survey, US adults were presented with a series of experimentally designed pairs of hypothetical influenza vaccines with varying levels of 5 attributes as shown in Figure 1 (attribute levels are displayed in Figure 3).

- In each choice question (Figure 1), respondents were asked to choose between 1 of the 2 vaccines or the option not to get vaccinated.

- Respondents meeting the following criteria were recruited from an online panel: resides in the US, aged 18 years or older, reads and understands English, and has internet access and a compatible device for survey completion.

- Results of a random-parameters logit analysis of the vaccine choices were used to calculate conditional relative attribute importance (CRAI) out of 100% and maximum acceptable risks (MARs) of moderate to severe vaccine side effects (i.e., systemic, "flu-like" reactions and local and injection site reactions [ISR]) in exchange for improvements in vaccine efficacy.

Figure 1. Example Choice Question

Note: There were 48 vaccine pairs in the experimental design, divided into 6 blocks of 8 vaccine choice questions. Each respondent was randomly assigned to 1 block of 8 vaccine choice questions.

RESULTS

- Figure 2 summarizes the characteristics of 601 adults in the US who completed the survey from May through June 2023.

- In 86.7% of choice questions, an influenza vaccine was preferred to no flu vaccine, resulting in negative preference weight for no flu vaccine (Figure 3).

- CRAI (Figure 3) shows that consumers placed the greatest importance on avoiding the risk of flu-like reaction (40.2%), followed by increasing vaccine efficacy (36.1%) and avoiding the risk of ISR (21.0%). Hospitalization prevention and durability attributes had no influence on vaccine choice.

- The MARs in Table 1 show that consumers were less tolerant of the risk of flu-like reactions than the risk of ISR.

  — For example, consumers would be willing to accept a 30.7% risk of ISR or a 16.2% risk of flu-like reactions for an improvement in vaccine efficacy from 25% to 50%.

Table 1. Maximum Acceptable Risk of Moderate to Severe Side Effects

| Improvement in vaccine efficacy		Mean MAR of ISR	Mean MAR of "flu-like" reaction
From this level	To this level		
50%	60%	26.0%	12.1%
25%	60%	> 50%	30.9%
15%	60%	> 50%	53.6%
25%	50%	30.7%	16.2%
15%	50%	> 50%	38.4%
15%	25%	34.4%	18.8%

Note: Estimates of MAR were not extrapolated outside the risk ranges presented in the survey. Mean MAR estimates that are reported as > 50% represent MARs greater than 50% (i.e., the maximum risk levels presented in the study).

Figure 2. Summary of Respondent Characteristics
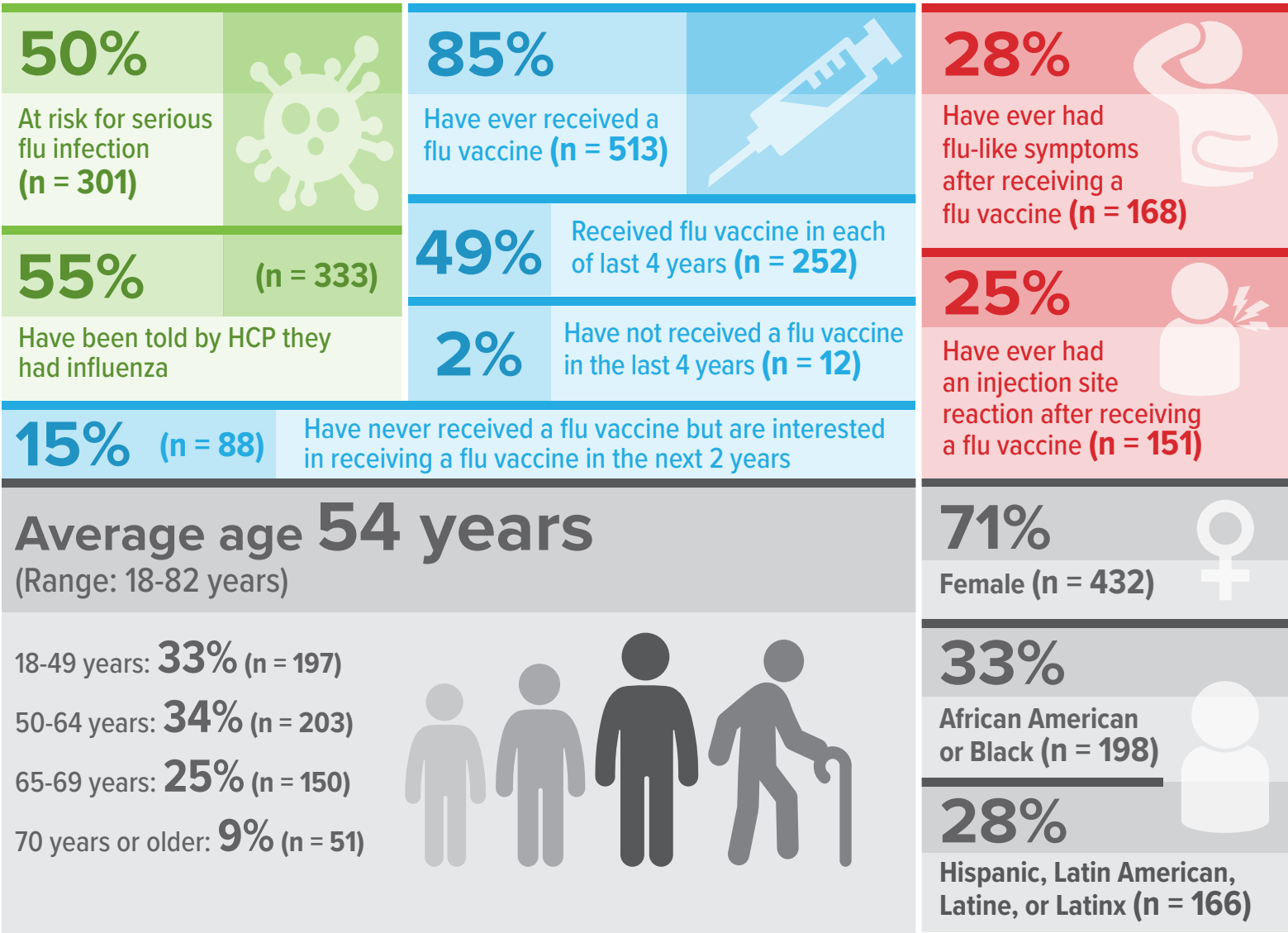
Note: The sample was stratified by age, risk factors for severe flu complications, flu vaccination history, and race and ethnicity.

Figure 3. DCE Preference Weights (N = 601)
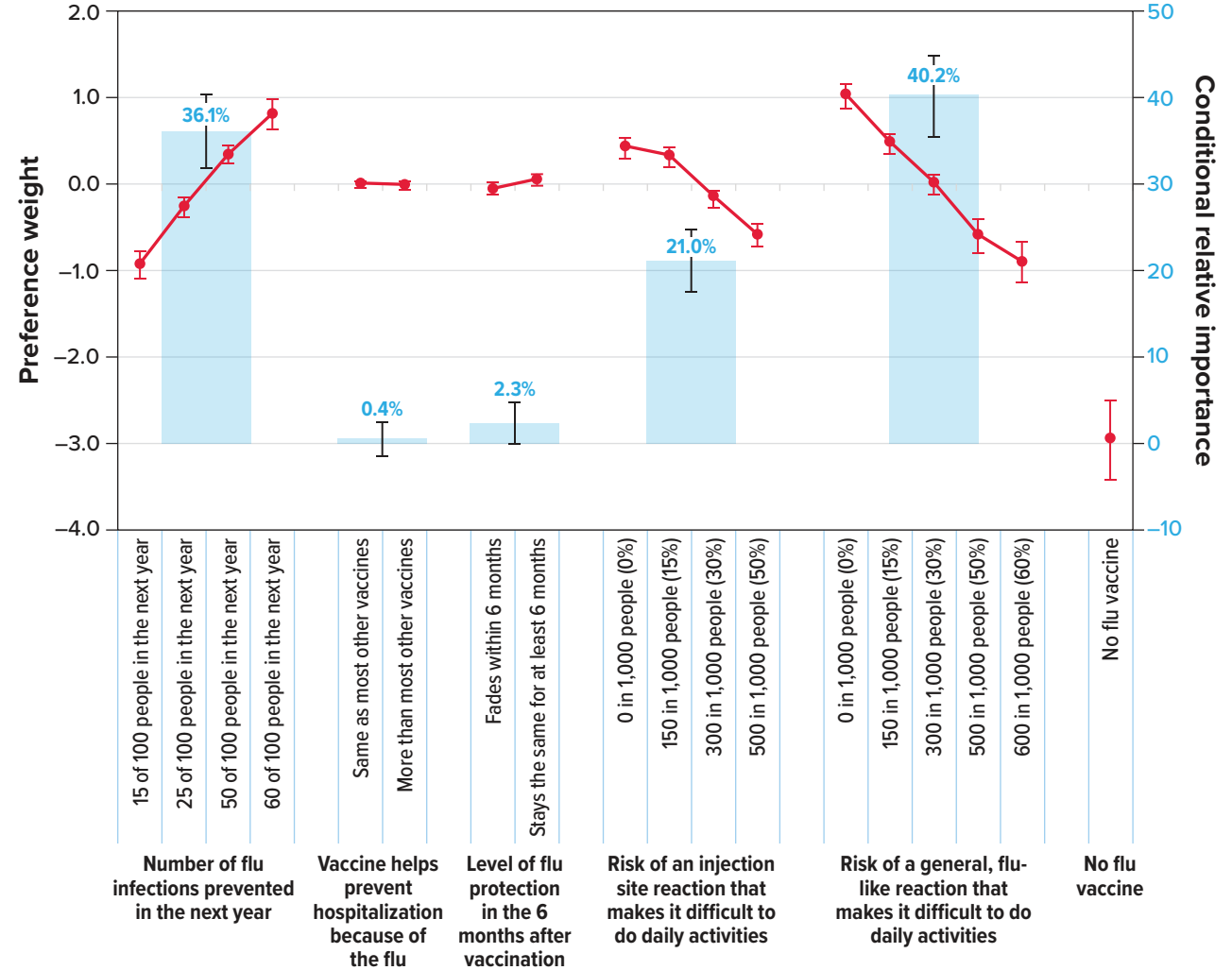
Note: The preference weights, plotted using the scale displayed on the left y-axis, are the estimated parameters corresponding to the effects-coded attribute levels. They are log-odds distributed symmetrically around 0.

The CRAI, plotted as a bar using the scale displayed on the right y-axis, is calculated as the ratio of the difference between the preference weights corresponding to the most and least desirable levels to the sum of all attributes' differences and is scaled to 100.

The vertical bars surrounding each mean preference weight and importance weight denote the 95% confidence interval of the point estimate.

CONCLUSIONS

- In this study, US adults preferred a flu vaccine to no vaccine and their hypothetical vaccine choices were driven by the lower risks of moderate to severe systemic (flu-like) reactions and higher vaccine efficacy. Respondents were indifferent to changes in attributes describing hospitalization prevention and durability of flu protection.

- Consumers were more tolerant of risk of moderate to severe local ISR than risk of general, flu-like (systemic) reaction in exchange for improved vaccine efficacy.

References

1. Pereira CC, Mulligan M, Bridges JF, Bishai D. Determinants of influenza vaccine purchasing decision in the US: a conjoint analysis. Vaccine. 2011 Feb 4;29(7):1443-7. doi: 10.1016/j.vaccine.2010.12.027.
2. McMichael A, Poulos C, Vass C, Boeri M. PCR98 A Literature Review Assessing the Most Common Attributes Used in Stated-Preference Studies Assessing Influenza Vaccination: Do We Know What Health Care Professionals Value? Value Health. 2023;26(6):S329-30.
3. de Bekker-Grob EW, Veldwijk J, Jonker M, Donkers B, Huisman J, et al. The impact of vaccination and patient characteristics on influenza vaccination uptake of elderly people: A discrete choice experiment. Vaccine. 2018 Mar 7;36(11):1467-76. doi: 10.1016/j.vaccine.2018.01.054.
4. Jeuland M, Maskery B, Cook J, Poulos C, Clemens J, Lauria D, et al. Incorporating cholera vaccine herd protection into economic cost-benefit and cost-effectiveness models. Procedia Vaccinol. 2010 2:140-146.
5. Poulos C, Pierce A, Chintakayala PK. PCR191: A review of the influence of stakeholder preference research on the EtR framework. Value Health. 2023;26(6):S347. https://doi.org/10.1016/j.jval.2023.03.2370

Acknowledgments

Contact information

Christine Poulos, PhD
Senior Economist and Vice President, Health Preference Assessment

Email: cpoulos@rti.org

RTI Health Solutions