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Does Receipt of Seasonal Influenza Vaccine Predict Intention to Receive Novel H1N1 Vaccine: Evidence from a Nationally Representative Survey of U.S. Adults

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Introduction

On June 11, 2009, the World Health Organization declared the outbreak of novel influenza A (H1N1) a flu pandemic.¹ The U.S. Department of Health and Human Services (HHS) has allocated approximately \$1 billion for large-scale production of a novel H1N1 vaccine.² If uptake of seasonal influenza vaccine is any indication, acceptance of novel H1N1 vaccine in the U.S. will be far from universal, particularly among younger adults. For example, data from the National Health Interview Survey suggests that less than 30% of adults age 18-49 with high-risk health conditions received seasonal influenza vaccine over the past decade, despite specific recommendations issued by the Centers for Disease Control and Prevention's Advisory Committee on Vaccine Practices.³

This short communication presents data stratified by age on the intention of U.S. adults to be vaccinated against novel H1N1 if vaccine were available and on the relationship between the intention to be vaccinated against novel H1N1 and the uptake of seasonal influenza vaccine last year.

Methods

We analyzed data from a nationally representative survey of US adults age 18 and older participating in RAND's American Life Panel (ALP). The ALP is a nationally representative Internet panel of U.S. adults. Panelists are recruited with known probability from respondents to the University of Michigan's long-standing Survey of Consumer Attitudes. Panelists agree to respond to surveys regularly in exchange for financial compensation. The panel covers both online and offline populations by supplying WebTV to participants who do not have Internet access. A more detailed description of the panel can be downloaded from RAND's website.⁴ Our survey was fielded between May 26th and June 8th, 2009. 54% (n=2,067) of all panelists responded to the survey. Survey respondents' ages ranged from 18 to 91.

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The survey measured the intention to be vaccinated against novel H1N1 by asking respondents to estimate the probability that they would get an H1N1 vaccine if available this Fall. Measuring intended behavior in this way has been shown to improve aggregate-level predictions of future actions relative to binary “yes-no” measures.^{5,6} The survey also asked respondents whether they received a seasonal influenza vaccine in the prior year. Data from the ALP were weighted to be nationally representative for the US adult population using data from the Current Population Survey as a benchmark. We calculated the potential demand for adult novel H1N1 vaccine by multiplying the average self-assessed probability of vaccine uptake estimated from our survey with the size of the U.S. adult population for relevant subpopulations defined by age as of November 1, 2008.⁷ We used two-group mean comparison tests (t-tests) to assess the statistical significance of different uptake intentions for novel H1N1 vaccine among persons with and without seasonal influenza vaccination. All calculations were performed using STATA SE 10.1 software (StataCorp, College Station, Texas).

Results

The table presents the average self-reported probability as of early June 2009 of being vaccinated against novel H1N1 if available, the estimated number of adults willing to be vaccinated against novel H1N1 based on these probabilities, and self-reported uptake of seasonal influenza vaccine in the past year for U.S. adults in three age categories.

Overall, the average self-reported probability of being vaccinated against novel H1N1 was 49.6%. These data imply that roughly 114.9 million adults intend to be vaccinated against novel H1N1 if available. The intention of being vaccinated against novel H1N1 increased with age, though the age-gradient was less pronounced than that evident in uptake of seasonal influenza vaccine. As a result, the average probability of being vaccinated against novel H1N1 exceeds the seasonal vaccine uptake for adults age 18-49 and 50-64 and falls short of seasonal vaccine uptake for those 65 and older.

Importantly, our data suggest a strong relationship between the stated probability of being vaccinated against novel H1N1 and uptake of seasonal influenza vaccine. Overall, the average stated probability of novel H1N1 vaccination was twice as high among vaccinated adults than among unvaccinated adults (73% vs. 34.2%, $p < 0.001$). This positive association was most pronounced among adults age 65 and older. Specifically, the average self-reported probability of being vaccinated against novel H1N1 among adults age 65 and older who were vaccinated against seasonal influenza was 75.4% compared to 28.8% among their unvaccinated counterparts ($p < 0.001$).

Comment

As of early June 2009, Americans' likely acceptance of novel H1N1 vaccine appears far from universal. Intentions to be vaccinated against novel H1N1 varied widely by age and with receipt of seasonal influenza vaccine in the previous year. This finding may be helpful in planning how much vaccine will be needed in the Fall of 2009 and in understanding who is likely to use it.

Our study has several limitations. First, our data provide a snapshot of novel H1N1 vaccination intentions as of early June 2009, and intentions may change as the pandemic unfolds and more information becomes available. Second, seasonal influenza vaccine uptake for the 2008-09 seasons in the ALP seems somewhat higher than recent uptake rates measured in federal health data.³ Apart from referring to different vaccination seasons, these differences may also reflect differences in the length of the recall period or survey methodology. The somewhat higher estimates for seasonal vaccine uptake in the ALP and its high positive correlation with novel H1N1 vaccination intentions, suggests that our results represent an upper bound estimate for

novel H1N1 vaccination intentions. Third, intentions data are not perfect predictors for future behavior, but nonetheless provide valuable information about prevailing attitudes motivating future actions.

Despite these limitations, our findings suggest that attitudes and beliefs regarding seasonal influenza vaccination may influence uptake of novel H1N1 vaccine and as such, caution against taking high uptake rates for a potential novel H1N1 vaccine for granted. While our estimates indicate uptake of novel H1N1 vaccine is likely to exceed seasonal influenza vaccine uptake during the last season, they also suggest that more than 50% of the US adult population may remain unvaccinated for novel H1N1, even if sufficient vaccine would become available.

Prior research on seasonal influenza vaccination suggests that achieving high rates of uptake of novel H1N1 vaccine uptake will likely require a very aggressive and culturally appropriate public information campaign and strong recommendations from health care providers.⁸ Our data indicate that it may be appropriate to target these recommendations toward those not vaccinated against seasonal influenza.

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Table

Self-reported vaccination intentions against novel H1N1 if vaccine becomes available by uptake of seasonal influenza vaccine during the 2008-09 season for US adults age 18 and older

		Novel H1N1 vaccination intentions by seasonal influenza immunization status		
		All Adults	Vaccinated against seasonal influenza	Unvaccinated against seasonal influenza
Overall sample				
	Average probability of being vaccinated against H1N1 vaccine in percent (95% CI)	49.6 (47.4-51.8)	73.0 (70.3-75.8)	34.2 (31.6-36.9)
	Millions of persons intending H1N1 vaccination (95% CI)	114.9 (109.8-120.0)	67.1 (61.7-72.6)	47.8 (43.4-52.2)
	Percent vaccinated against seasonal influenza (95% CI)	39.7 (36.8-42.6)	--	--
	Unweighted sample size (N)	2,067	901	1,166
Age category				
<i>Age 18-49</i>				
	Average probability of being vaccinated against H1N1 vaccine in percent (95% CI)	45.3 (42.1-48.4)	70.3 (65.2-75.4)	35.5 (32.2-38.9)
	Millions of persons intending H1N1 vaccination (95% CI)	61.9 (57.6-66.2)	26.9 (22.7-31.2)	34.9 (31.1-38.8)
	Percent vaccinated against seasonal influenza (95% CI)	28.0 (24.3-31.8)	--	--
	Unweighted sample size (N)	911	268	643
<i>Age 50-64</i>				
	Average probability of being vaccinated against H1N1 vaccine in percent (95% CI)	50.7 (47.4-53.9)	74.5 (70.5-78.5)	31.9 (28.1-35.6)
	Millions of persons intending H1N1 vaccination (95% CI)	28.2 (26.4-30.0)	18.3 (16.3-20.3)	9.9 (8.5-11.3)
	Percent vaccinated against seasonal influenza (95% CI)	44.1 (39.7-48.5)	--	--
	Unweighted sample size (N)	811	371	440
<i>Age 65 and older</i>				
	Average probability of being vaccinated against H1N1 vaccine in percent (95% CI)	63.3 (58.2-68.5)	75.4 (70.8-80.1)	28.8 (18.8-38.8)
	Millions of persons intending H1N1 vaccination (95% CI)	24.8 (22.8-26.8)	21.8 (19.6-24.1)	2.9 (1.7-4.2)
	Percent vaccinated against seasonal influenza (95% CI)	74.1 (67.6-80.6)	--	--
	Unweighted sample size (N)	345	262	83