

Influenza vaccination during the 2009-10 influenza pandemic : Differences in vaccination coverage and beliefs, by race/ethnicity, income, and education

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Background/Objective

- In April 2009, a novel influenza A (H1N1) virus emerged in the U.S. By the end of July 2009 a monovalent 2009 H1N1 vaccination had been developed, licensed, and recommended by the Advisory Committee on Immunization Practices. Initial target groups for vaccination were identified. The first vaccine was publicly available on October 5, 2009.
- National 2009 H1N1 Flu Survey (NHFS) was a CDC sponsored survey initiated in response to the influenza pandemic to obtain timely within season estimates of vaccination coverage, intent to be vaccinated, opinions, and other information. Data were used to produce weekly & monthly vaccine coverage estimates during the H1N1 pandemic. A supplemental sample from the National Immunization Survey (NIS) was used for vaccination coverage estimates for children.
- Racial/ethnic and socio-demographic disparities in seasonal influenza vaccination coverage among adults have been persistent for many years.
- The objective of this study was to identify socio-demographic differences in 2009 H1N1 vaccination coverage, beliefs, and reasons for non-vaccination.

Methods

National 2009 H1N1 Flu Survey (NHFS)

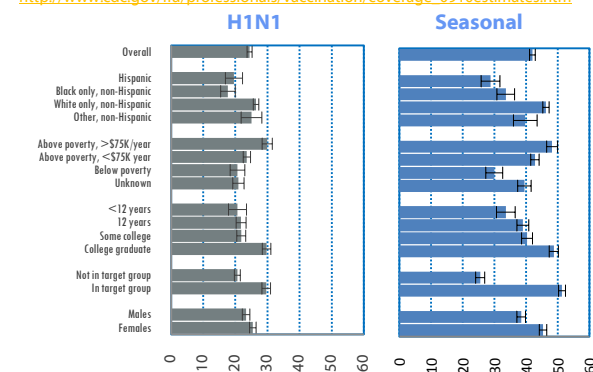
- Interviews were conducted October 2009-June 2010
- Random digit dialing (RDD) survey of 6,000 households per month. One adult and one child (if any) selected at random. Both landline and cell phone samples are included.
- A total of 71,308 completed stand-alone NHFS interviews from October 2009 through June 2010.
- Because the belief questions were only asked of adults, this report includes only adult respondents. This report further limits analysis to interviews completed January-June, 2010, after the peak of the influenza vaccination period. Analysis were based on an unweighted sample size of n=38,147.

Statistical Methods

- Wald-chi square tests followed by post-hoc pairwise t-tests.
- Logistic regression—Odds Ratios (OR), 95% Confidence Intervals, Predicted Marginals (PM). Full models reported.
- Analysis performed using SUDAAN—complex survey data.

Vaccination Coverage

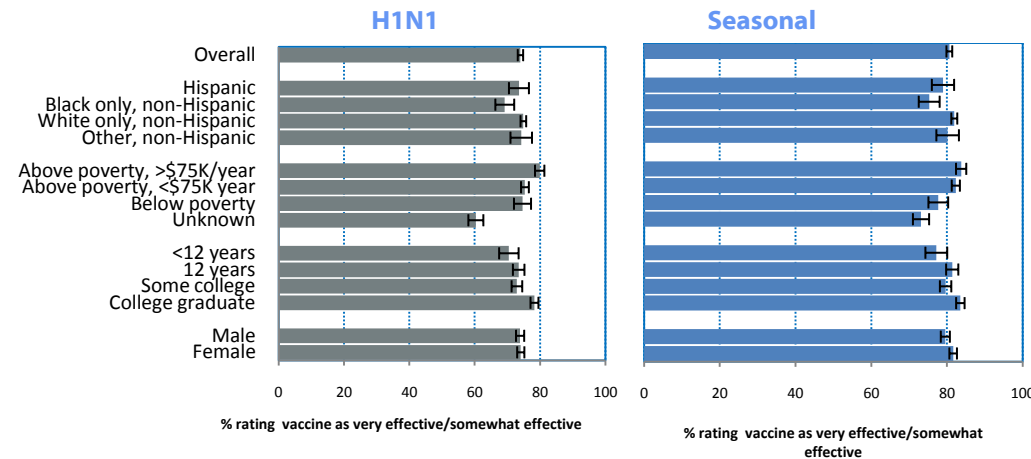
These vaccination coverage estimates are based on NHFS interviews, adults only, and the subset of January-June interviews. (For official final season estimates of H1N1 using survival analysis methods and NHFS/BRESS combined data see: http://www.cdc.gov/flu/professionals/vaccination/coverage_0910estimates.htm)



Weighted percentages displayed with 95% confidence intervals.

Beliefs about Influenza Vaccination and Disease

Belief in Effectiveness of the Influenza Vaccine



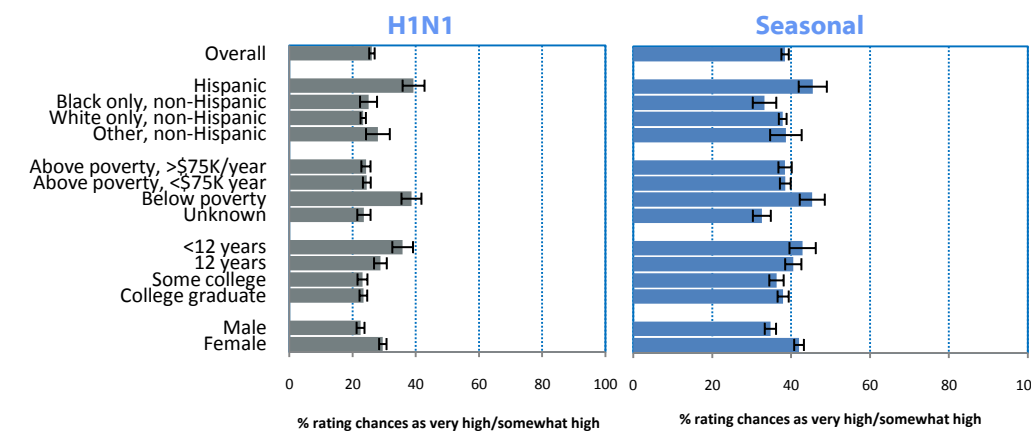
Race/ethnicity: Fewer blacks compared to Hispanics, whites, and others believed the H1N1 vaccine was effective (all P<.01). Fewer blacks as compared to whites and others believed the seasonal vaccine is effective (both P<.01).

Income: Fewer of those not reporting income believed the H1N1 vaccine was effective as compared to the other 3 income groups (all P<.01). More of those with income >\$75,000/year believed the H1N1 vaccine is effective compared to the other 3 income levels (all P<.01). Fewer of those not reporting income believed the seasonal vaccine was effective as compared to the other 3 income groups (all P<.01). More of adults with income above the poverty level (both >\$75K and <\$75K) believed the seasonal vaccine is effective compared to adults below the poverty level (both P<.01).

Education: More of the college graduates believe the H1N1 vaccine was effective compared to those with lower education levels (all P<.01). More of the college graduates believe the seasonal vaccine is effective compared to those with lower education levels (all P<.01). More adults with 12 years of education believed the seasonal vaccine is effective compared to those with less than 12 years of education.

Gender: There were no gender differences in belief in H1N1 vaccine effectiveness. For seasonal vaccine, more women believed the vaccine was effective compared to men (P<.01). No other pair-wise comparisons were statistically significant.

Belief in Chances/Risk of Getting Influenza Disease if Unvaccinated



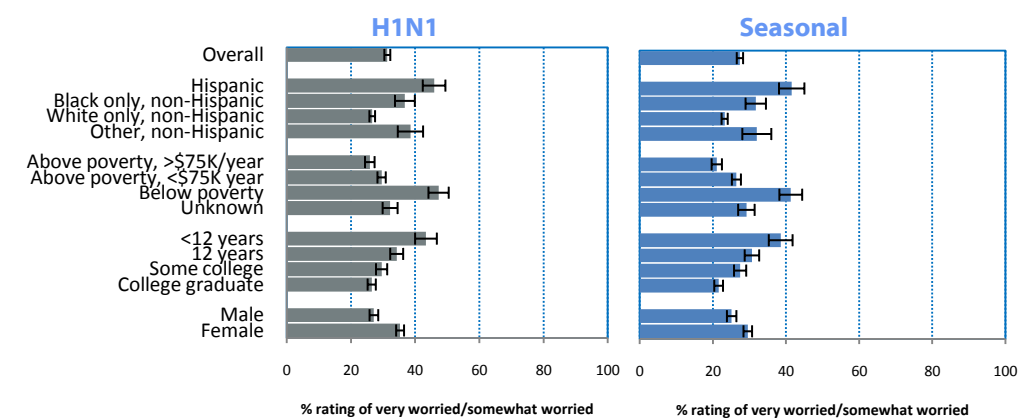
Race/ethnicity: More Hispanics than blacks, whites, and others believed they were susceptible to H1N1 if unvaccinated (all P<.01). Fewer whites than those with other race believed they were susceptible to H1N1 (P<.01). More Hispanics than blacks (P<.01), whites (P<.01), and others (P<.05) believed they were susceptible to seasonal influenza if they are unvaccinated. Fewer blacks believed they were susceptible to seasonal influenza than whites (P<.01) and others (P<.05).

Income: More adults living below the poverty level believed they were susceptible to H1N1 influenza if they were unvaccinated than all 3 other income groups (all P<.01). More adults living below the poverty level believed they were susceptible to seasonal influenza if they were unvaccinated compared to the other 3 income groups (all P<.01). Fewer of those with unknown income level believed they were susceptible to seasonal influenza than the other 3 groups (all P<.01).

Education: All of the education comparisons for susceptibility to H1N1 were statistically significant except for some college versus college graduated. (all P<.01). Fewer of those with some college or college graduates believed they were susceptible to seasonal influenza compared to those with <12 years education (both P<.01). Fewer of those with some college (P<.01) and college graduates (P<.05) believed they were susceptible to seasonal influenza compared to those with 12 years education.

Gender: For both H1N1 and seasonal, a higher percentage of females as compared to males believed they were susceptible to influenza disease if they didn't get vaccinated. (both P<.01). No other pair-wise comparisons were statistically significant.

Worry about Getting Sick From the Influenza Vaccine



Race/ethnicity: For worry about H1N1 and for seasonal vaccination, all of the pair-wise comparisons were statistically significant (all P<.01) except for black versus other.

Income: For worry about H1N1 and about seasonal vaccination, all of the pair-wise comparisons were statistically significant (all P<.01) except for <\$75K versus unknown income which was not significant for H1N1 and was for seasonal (P<.05).

Education: All of the education comparisons for worry about the H1N1 vaccine were statistically significant (all P<.01). Likewise, all of the education comparisons for worry about seasonal vaccine were statistically significant (P<.01 or <.05).

Gender: For both H1N1 and seasonal, a higher percentage of females as compared to males worried about getting sick from the influenza vaccination (both P<.01). No other pair-wise comparisons were statistically significant.

Logistic Regression Models

Factors Associated with Influenza Vaccination:

Variables	H1N1			Seasonal		
	OR	(95% CI)	PM (%)	OR	(95% CI)	PM (%)
Race/ethnicity:						
Hispanic	REF	REF	17.8	REF	REF	34.1
Black, NH	1.1	(0.9-1.5)	19.5	1.3	(1.0-1.6)	38.5
White, NH	1.9	(1.5-2.3)	27.1	1.8	(1.4-2.2)	44.7
Other, NH	1.6	(1.2-2.2)	24.7	1.6	(1.3-2.1)	43.2
Income/poverty:						
>\$75K/year	1.5	(1.2-1.8)	27.0	1.6	(1.3-1.9)	44.9
<\$75K/year	1.2	(1.0-1.5)	24.1	1.4	(1.2-1.7)	42.1
Below poverty	REF	REF	21.0	REF	REF	36.0
Unknown	1.4	(1.1-1.7)	25.5	1.5	(1.4-2.0)	45.2
Education level:						
<12 years	REF	REF	21.9	REF	REF	38.2
12 years	1.0	(0.8-1.3)	22.0	1.1	(0.9-1.3)	39.4
Some college	1.1	(0.8-1.3)	22.7	1.2	(1.0-1.4)	41.6
College graduate	1.5	(1.2-1.9)	28.4	1.5	(1.3-1.8)	46.1
Opinion:						
Effective (No Risk (Low) Worry (No)	REF	REF	8.7	REF	REF	14.6
Effective (No Risk (Low) Worry (Yes)	1.4	(1.0-1.9)	11.8	0.9	(0.6-1.3)	12.9
Effective (No Risk (High) Worry (No)	4.2	(2.8-6.2)	27.7	4.3	(2.9-6.5)	40.3
Effective (No Risk (High) Worry (Yes)	4.5	(3.2-6.5)	29.4	2.9	(1.8-4.7)	31.8
Effective (Yes Risk (Low) Worry (No)	2.2	(1.9-2.6)	17.1	3.4	(2.9-4.0)	35.1
Effective (Yes Risk (Low) Worry (Yes)	3.5	(2.8-4.3)	24.3	2.6	(2.1-3.3)	29.9
Effective (Yes Risk (High) Worry (No)	13.6	(11.2-16.4)	54.4	17.0	(14.3-20.2)	69.7
Effective (Yes Risk (High) Worry (Yes)	12.5	(10.3-15.2)	52.5	10.5	(8.7-12.6)	59.8
Gender:						
Male	1.1	(1.0-1.2)	25.2	0.9	(0.8-1.0)	41.3
Female	REF	REF	24.2	REF	REF	43.6
Priority group : Yes	1.4	(1.3-1.5)	27.6	3.0	(2.7-3.3)	49.6
No	REF	REF	22.4	REF	REF	28.8

PM=Predicted Marginal

Conclusions

- Beliefs about influenza varied by race/ethnicity, income, education, and gender.
- There was more variation in adjusted coverage (PM) by beliefs than by any socio-demographic factors. Among beliefs, risk of influenza was most strongly associated with vaccination, followed by belief in vaccine effectiveness, then worry about influenza vaccination safety.
- Race/ethnicity, income, education level, and beliefs about vaccine effectiveness and safety and risk of influenza were associated with 2009 H1N1 and seasonal vaccination. This is similar to what has been found in previous influenza seasons.
- Providers should use every opportunity to discuss influenza vaccination with all of their patients. The demographic differences in beliefs suggest that targeted education efforts about vaccine safety and effectiveness is needed. This could be done in partnership with providers, community leaders, and community and faith-based organizations using a variety of strategies including social media.
- A better understanding is needed of the factors influencing influenza vaccination behaviors.
- Influenza vaccination is now recommended for all person ≥ 6months.

Response Rate & Limitations

CASRO Response rate:

- landline: 34.7% (=79.3% resolution rate X 99.7% eligibility rate X 43.9% completion rate).
- Cell phone: 27.0% (=55.9% resolution rate X 85.9% eligibility rate X 56.2% completion rate).

Limitations:

- All results, even the vaccination coverage estimates, are based upon self-report. Self-reported vaccination status was not validated with medical records.
- There is possibly some selection bias due to the non-inclusion of households with no telephone service.
- The CASRO response rate was low.
- Non-response bias may remain after weighting adjustments.

