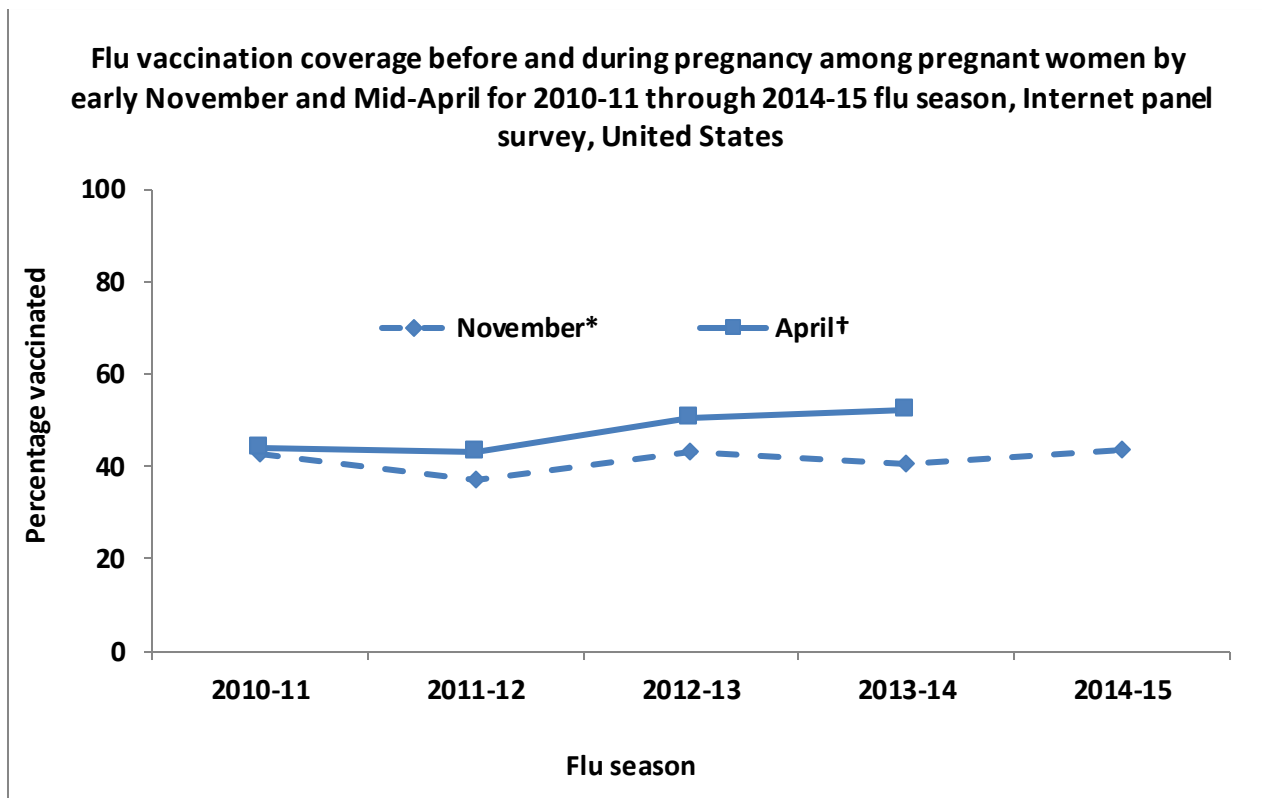


Pregnant Women and Flu Vaccination

Internet Panel Survey, United States, November 2014

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Figure 1.



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Influenza (flu) can cause severe illness among pregnant women and result in preterm labor and increased risk for hospitalization and death ([1](#)).

The best way for pregnant women to protect themselves from the flu is to get a flu shot ([1](#)). CDC, the American College of Obstetricians and Gynecologists, the American College of Nurse Midwives, and the American Academy of Family Physicians recommend flu shots for all women who are pregnant during the flu season ([1-3](#)).

Infants younger than 6 months are at high risk of severe complications from the flu, but they are too young to be vaccinated ([4](#)). Infants whose mothers get the flu shot while pregnant have a lower risk of flu illness and influenza-related hospitalizations during the first 6 months of life ([1](#), [5-6](#)).

Vaccination coverage among pregnant women increased in 2009-10, but has been relatively stable since that time.

- Before the 2009-10 season, flu vaccination coverage among women pregnant at the time of interview was below 30%, as measured by the [National Health Interview Survey \(NHIS\)](#) and the [Behavioral Risk Factor Surveillance System \(BRFSS\)](#) ([7-8](#)).
- During the 2009-10 flu season, 38.0% of women pregnant during the flu season were vaccinated before or during pregnancy as measured by BRFSS, 32.1% as measured by the National 2009 H1N1 Flu Survey (NHFS), and 47.1% as measured by the [Pregnancy Risk Assessment Monitoring System \(PRAMS\)](#)[†] ([8-10](#)).
- Vaccination coverage has been relatively stable since the 2009-10 flu season. Vaccination coverage among women vaccinated before or during pregnancy measured by the Internet panel surveys was

43.9% in the 2010-11 flu season, 43.2% in the 2011-12 flu season, 50.5% in the 2012-13 flu season, and 52.2% in the 2013-14 flu season ([11](#)).

For estimates of this early flu season, CDC analyzed data on influenza vaccination from an Internet panel survey conducted October 29 through November 5, 2014, among women who were pregnant any time since August 2014. The results of this survey provide information for use in vaccination campaigns during [National Influenza Vaccination Week](#) (December 7-13, 2014). This report provides early flu season (early November) estimates of vaccine uptake by pregnant women. Final 2014-15 flu season vaccination coverage estimates for pregnant women will become available after the end of the flu season.

KEY FINDINGS

- As of early November 2014, flu vaccination coverage before and during pregnancy among pregnant women was 43.5%, similar to 2013-14 early season vaccination coverage (40.7%).
 - In the previous two flu seasons, vaccination coverage increased by approximately 8-12 percentage points from the early season to the end of the season.
- Most women (98.1%) reported visiting a doctor or other medical professional at least once since July 1, 2014; among these women, 59.5% reported receiving a recommendation for and offer of vaccination from a doctor or other medical professional, 15.3% received only a recommendation for and no offer of vaccination, and 25.1% did not receive a recommendation for flu vaccination.
- Women who received a recommendation for and an offer of vaccination from a doctor or other medical professional were more likely to be vaccinated. They were:
 - Over two times more likely to be vaccinated as women who received only a recommendation for vaccination but no offer of vaccination (65.2% vs. 25.5%) and eleven times more likely to be vaccinated as women who did not receive a recommendation for vaccination (65.2% vs. 5.8%).

Conclusion/Recommendation:

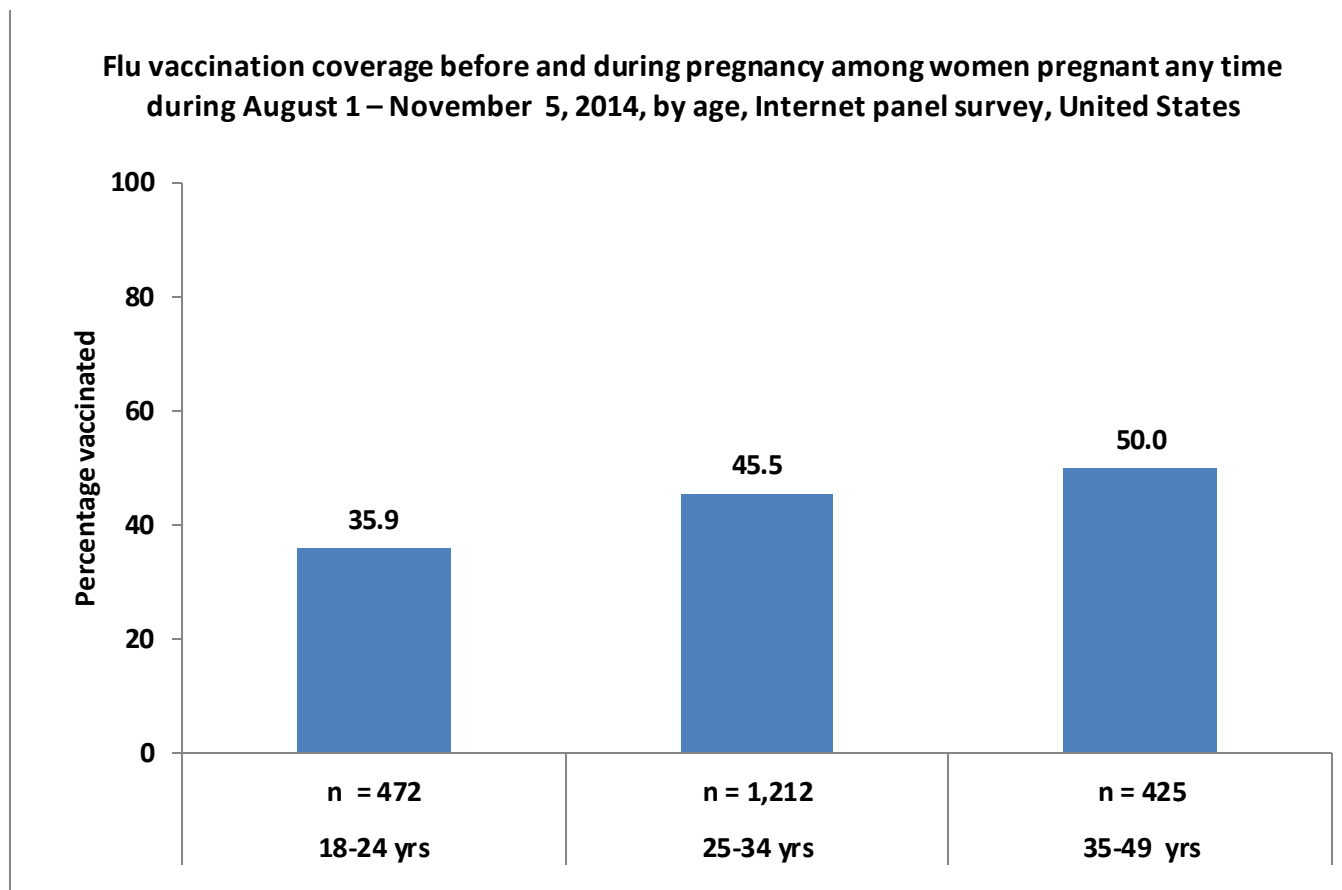
- Health care providers are encouraged to strongly recommend and offer flu shots to pregnant women throughout the flu season to prevent the flu.

WHO WAS VACCINATED?

Coverage by Age Group

- Younger pregnant women 18-24 years were less likely to be vaccinated (35.9%) than pregnant women 25-34 years (45.5%) and 35-49 years (50.0%).
 - Coverage among pregnant women 35-49 years was higher in early November 2014 compared to that in early November 2013 (50.0% vs. 41.8%). Coverage among women in other age groups was similar in both November surveys.

Figure 2.

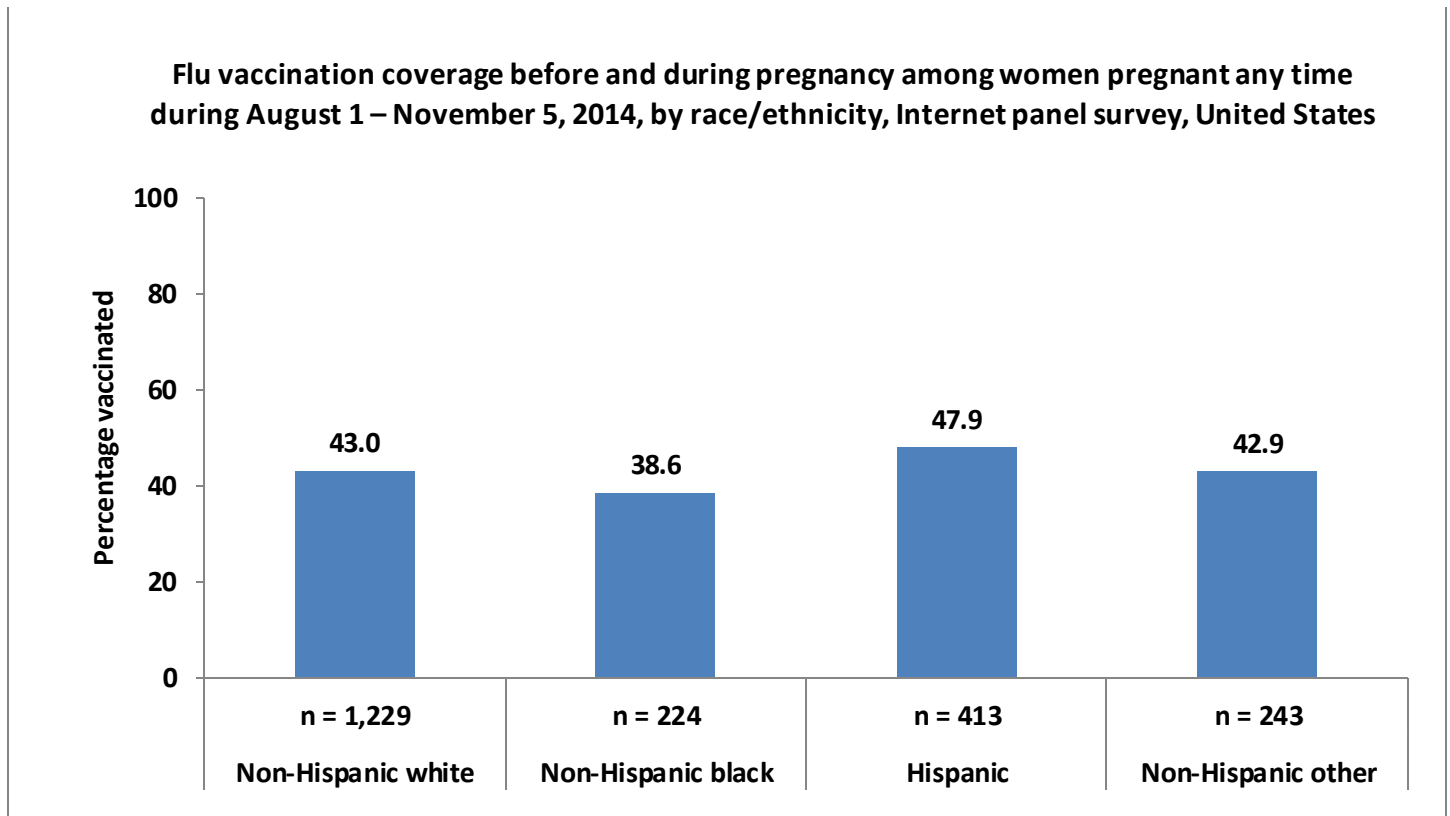


[Footnotes](#) | [Data Source and Methods](#) | [Limitations](#) | [Previous Year](#)

Coverage by Race/Ethnicity

- Flu vaccination coverage among Hispanic women was 47.9%, higher than among non-Hispanic black women (38.6%) and non-Hispanic other women (42.9%).
- Compared to the 2013 early season estimate, coverage in early November 2014 was higher among Hispanic women (47.9% vs. 39.8%) and lower among non-Hispanic other women (42.9% vs. 50.1%).

Figure 3.

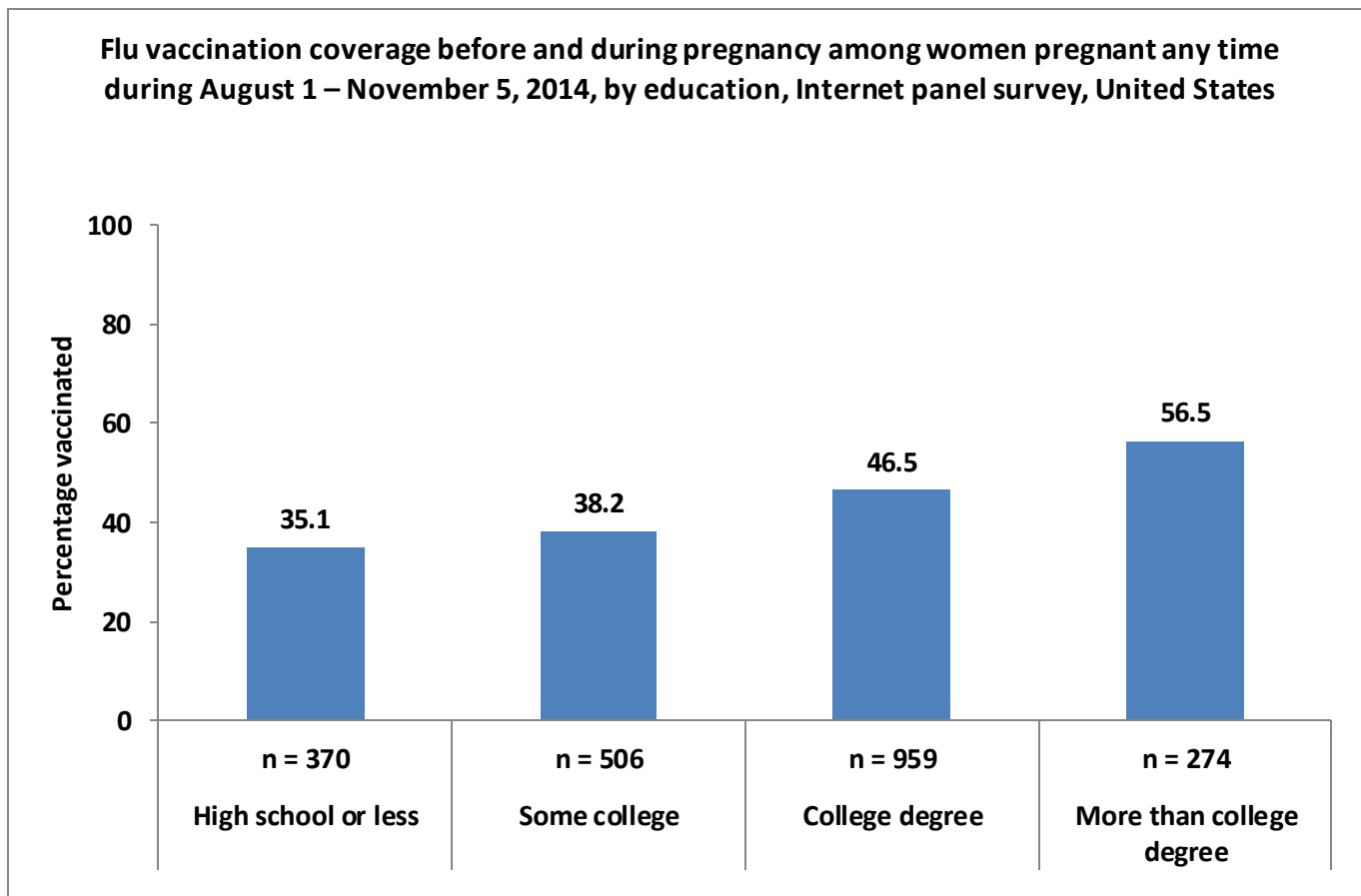


[Footnotes](#) | [Data Source and Methods](#) | [Limitations](#) | [Previous Year](#)

Coverage by Education

- Vaccination coverage was lower among pregnant women with a high school diploma or less (35.1%) or some college (38.2%) compared to women with a college degree (46.5%) or more than a college degree (56.5%).
- Compared to the 2013 early season estimate, coverage was higher in early November 2014 among women with more than a college degree (56.5% vs. 46.0%). Coverage for other educational groups was similar in early November 2014 and early November 2013.

Figure 4.

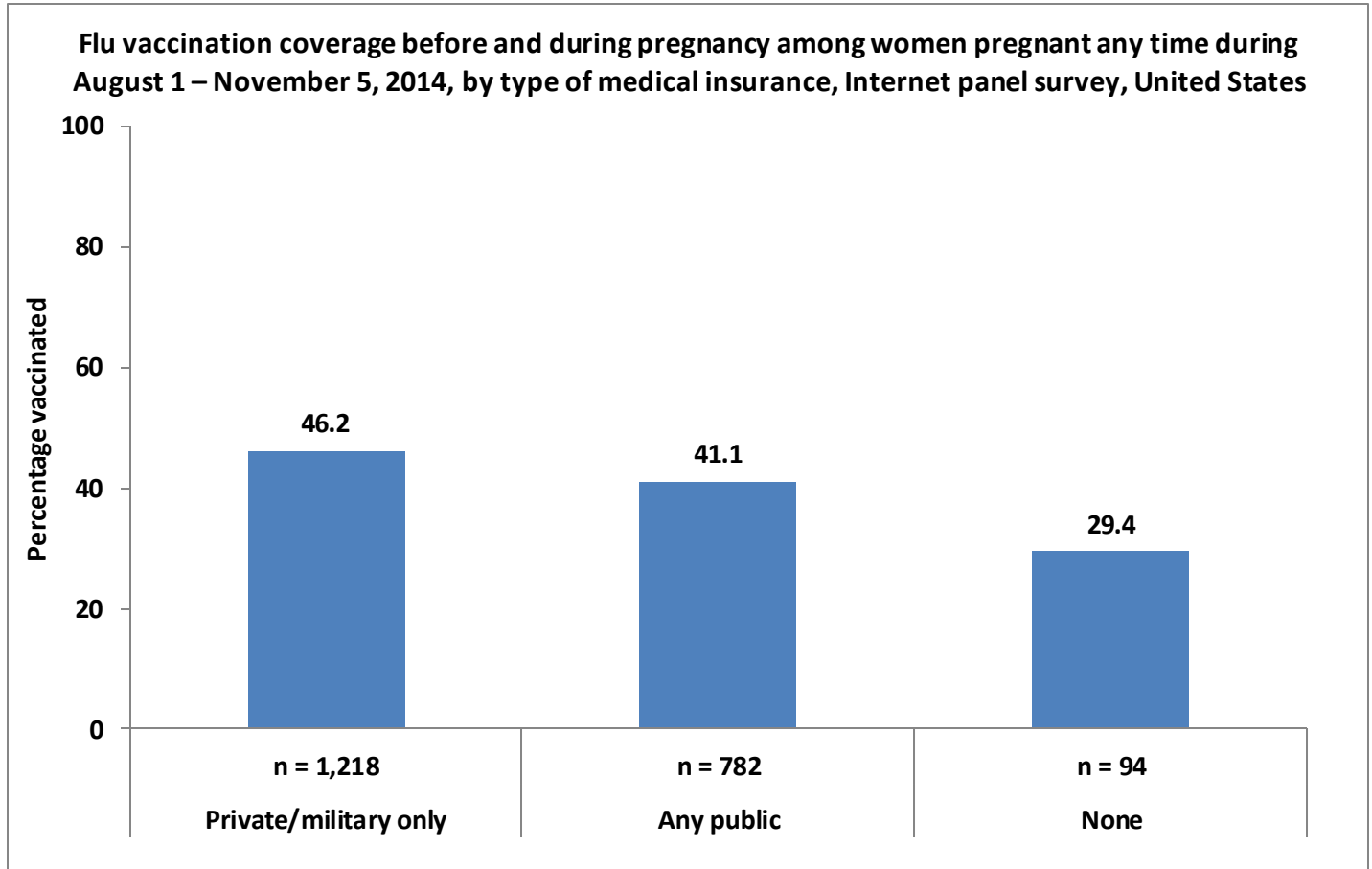


[Footnotes](#) | [Data Source and Methods](#) | [Limitations](#) | [Previous Year](#)

Coverage by Type of Medical Insurance

- Pregnant women who reported having only private/military insurance or any type of public medical insurance during pregnancy had higher vaccination coverage (46.2% and 41.1%, respectively) than pregnant women who reported not having insurance (29.4%).
 - Less than one in twenty (4.6%) pregnant women reported not having medical insurance.
- These estimates are similar to the results from early November 2013.

Figure 5.

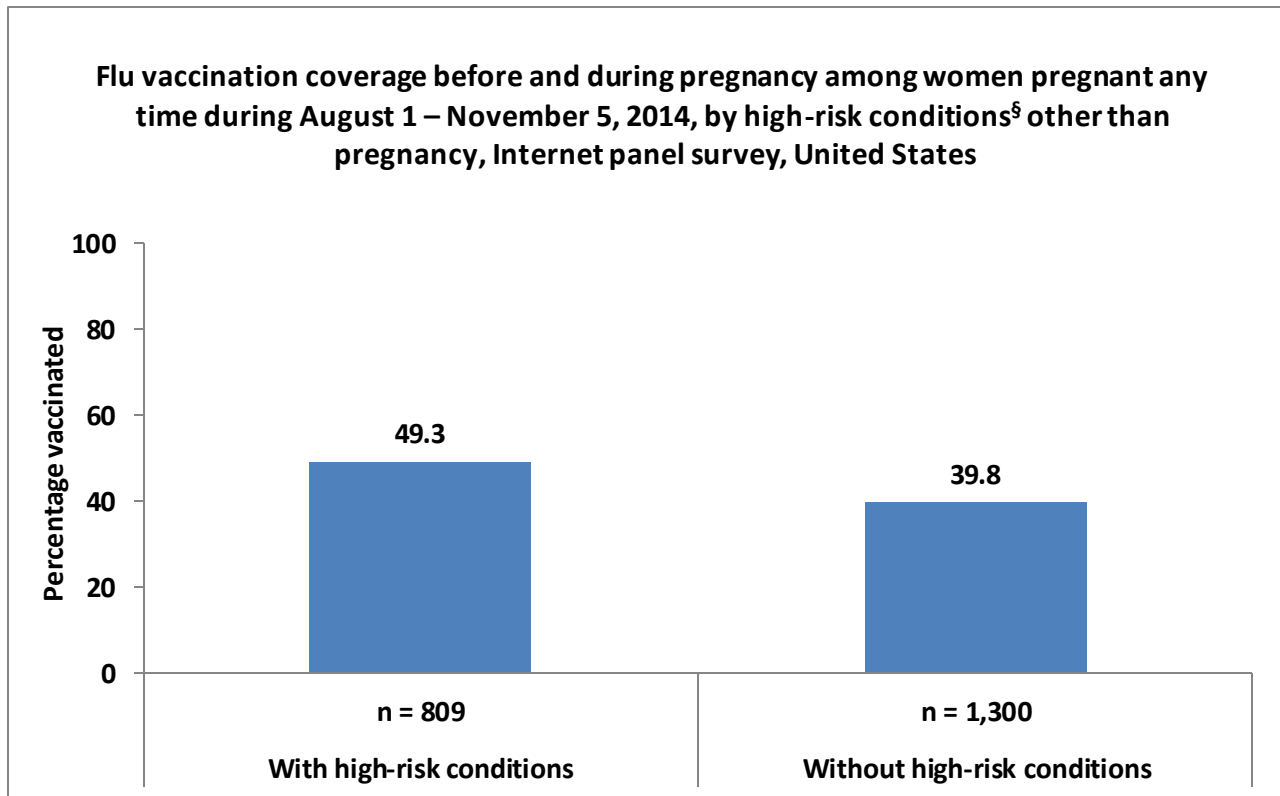


[Footnotes](#) | [Data Source and Methods](#) | [Limitations](#) | [Previous Year](#)

Coverage by Other High-Risk Conditions[§]

- Women with a high-risk condition (in addition to pregnancy) that increases the risk of severe flu had higher vaccination coverage (49.3%) than women with no additional high-risk conditions (39.8%).
- Compared to the early November 2013 survey, coverage in the early November 2014 survey was higher among women with high-risk conditions other than pregnancy (49.3% vs. 41.5%), and similar to coverage among women without additional high-risk conditions (39.8% vs. 40.2%).

Figure 6.

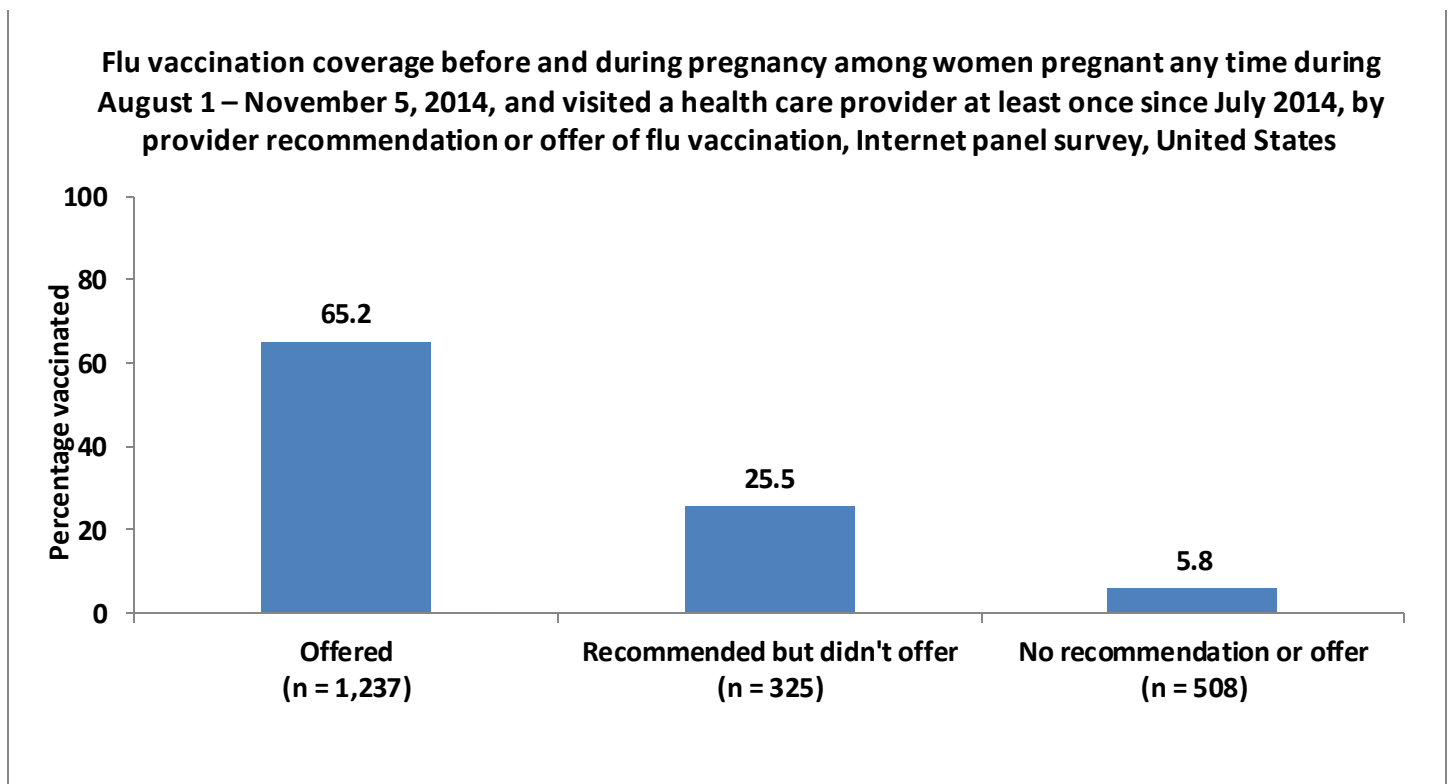


[Footnotes](#) | [Data Source and Methods](#) | [Limitations](#) | [Previous Year](#)

Coverage by Health Care Provider Recommendation and Offer

- Most women (98.1%) reported visiting a doctor or other medical professional at least once since July 1, 2014; among these women, 59.5% reported receiving a recommendation for and offer of flu vaccination from a doctor or other medical professional, 15.3% received only a recommendation but were not offered the vaccine, and 25.1% did not receive a recommendation for flu vaccination.
 - Compared to the November 2013 survey, there was an 8.7 percentage point increase in the proportion of pregnant women who reported receiving both a recommendation for and offer of vaccination, and a 7.4 percentage point decrease in the proportion of women who reported receiving no recommendation for vaccination.
- Flu vaccination coverage among pregnant women was highest (65.2%) among women who reported their doctor or other medical professional recommended and offered the vaccination.
 - 25.5% of pregnant women were vaccinated among those that reported they received only a recommendation for but no offer of vaccination from their doctor or other medical professional.
 - Only 5.8% of pregnant women were vaccinated among those that reported they did not receive a recommendation for vaccination from their doctor or other medical professional
- The relationships of vaccination coverage among pregnant women with health care provider recommendations for and offering of flu vaccination were similar in the early November 2014 survey compared to the early November 2013 survey.

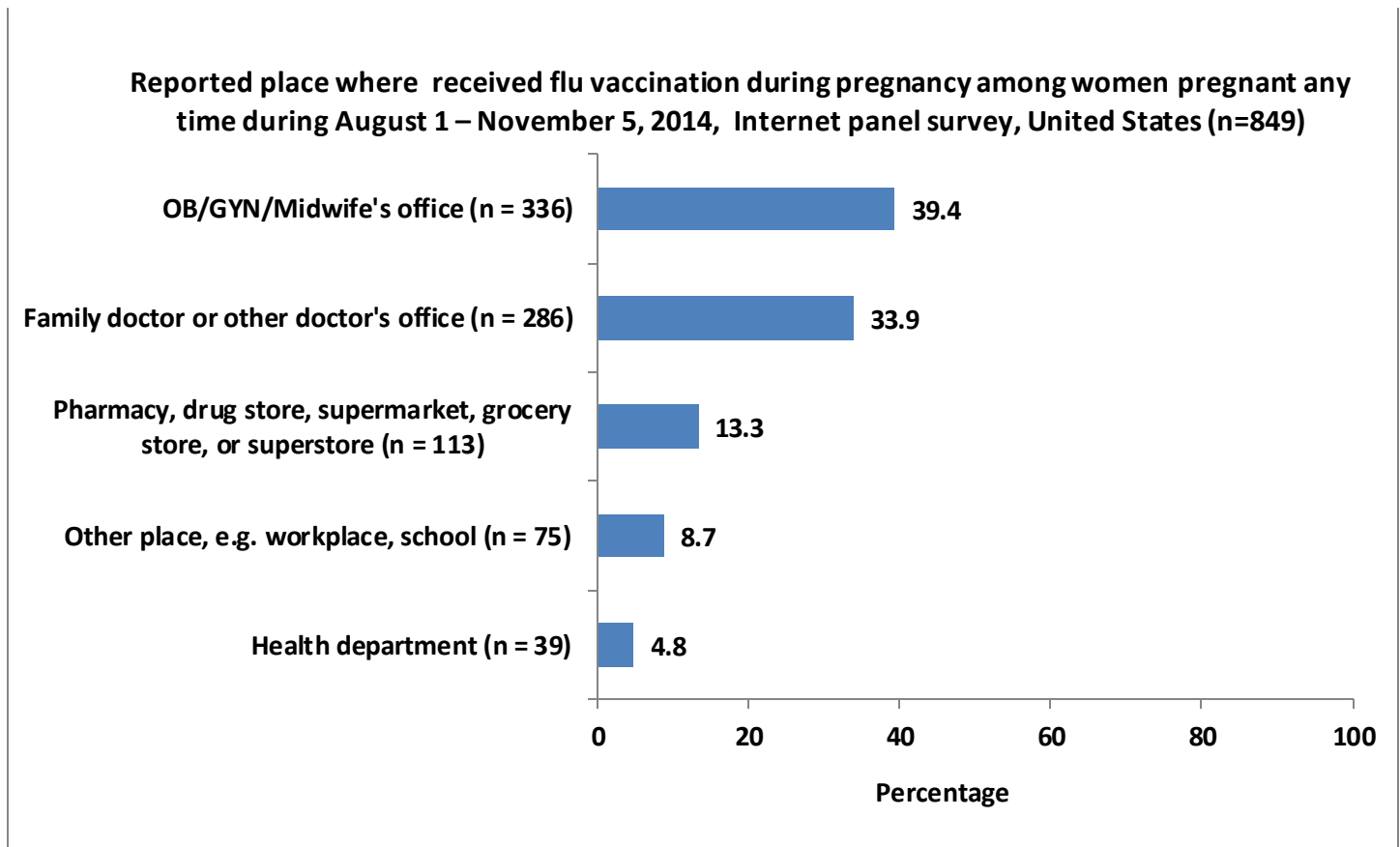
Figure 7.



Place of Vaccination

- The most commonly reported place for receiving flu vaccination among women pregnant at any time early in the flu season was in the office of an obstetrician/gynecologist or midwife (39.4%).
- The distribution of places where women received vaccination during pregnancy was similar in the early November 2014 survey to that in the early November 2013 survey.

Figure 8.

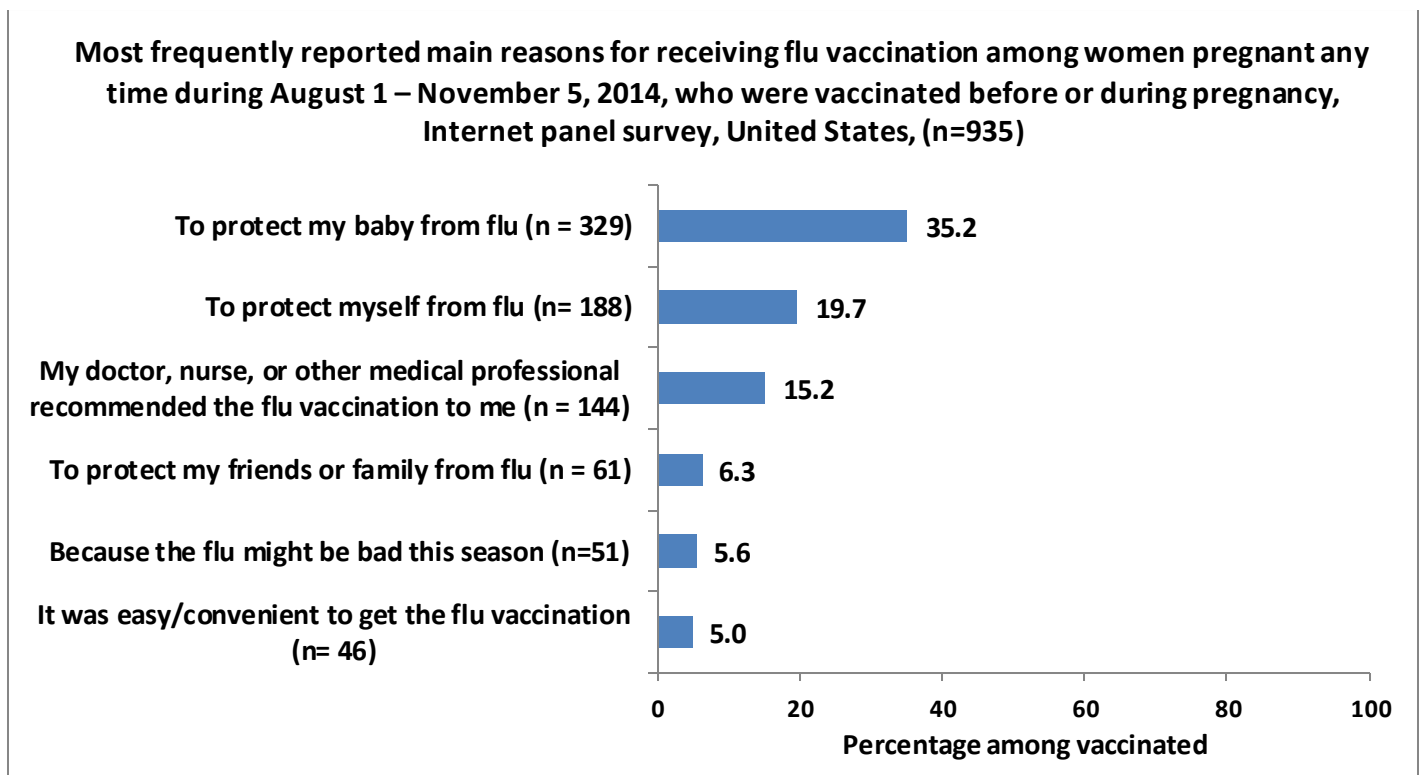


Main Reason for Receiving Vaccination

Respondents who had been vaccinated by the time of the survey were asked to report their main reason for receiving a flu shot.

- The most commonly reported reason for receiving a flu shot was to protect their baby from flu (35.2%).
- The second most commonly reported reason was to protect themselves from flu (19.7%).
- The same top two main reasons for vaccination were found in the early November 2013 survey, with proportions of 31.2% and 21.3%, respectively.

Figure 9.



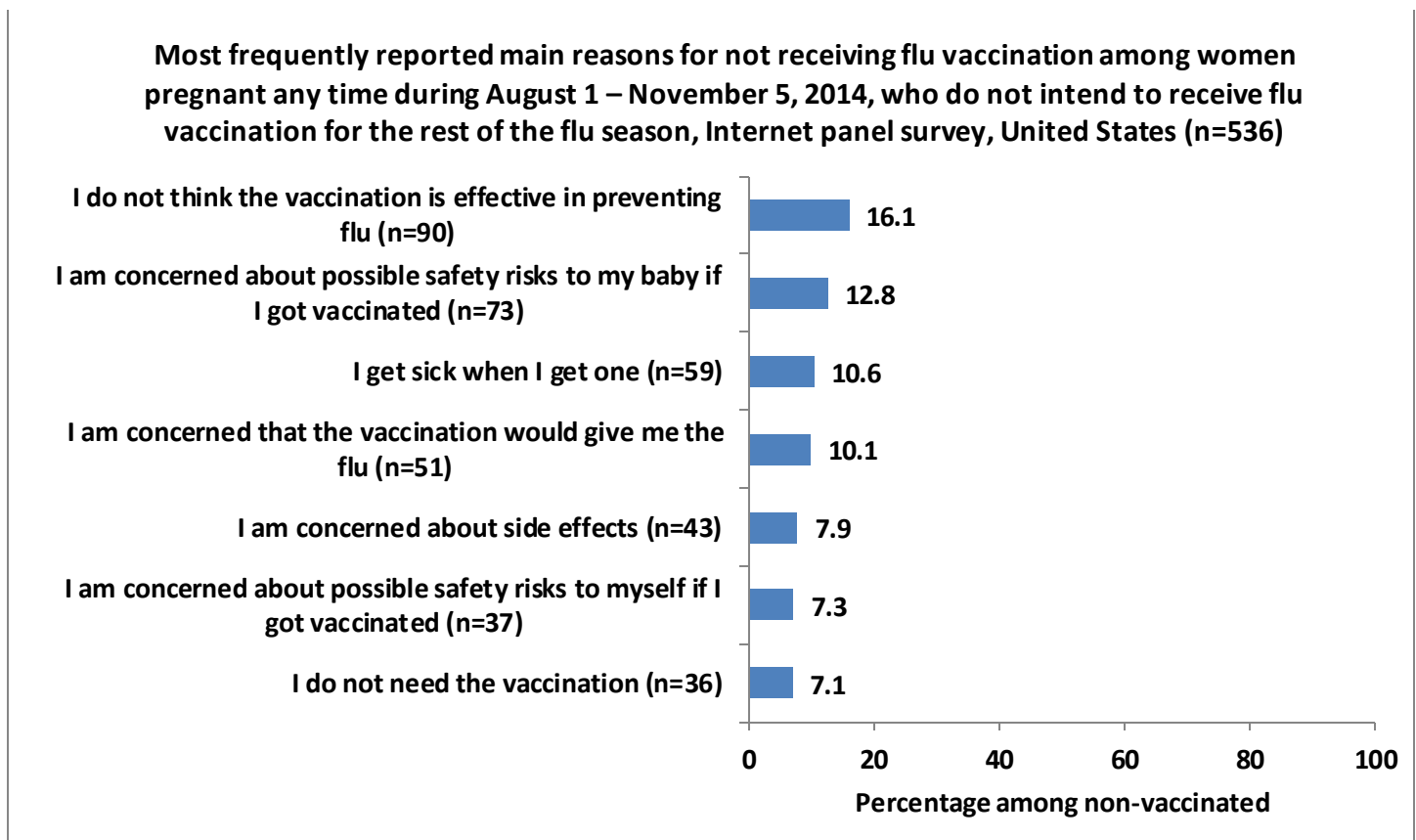
[Footnotes](#) | [Data Source and Methods](#) | [Limitations](#) | [Previous Year](#)

Main Reason for Not Receiving Vaccination

Unvaccinated respondents who reported that they did not intend to be vaccinated during this flu season¹¹ were asked to report their main reason for not receiving a flu shot.

- The two most commonly reported main reasons for not receiving a flu shot were belief that the flu vaccine is not effective in preventing the flu (16.1%) and concern about the possible safety risk to their baby (12.8%) if vaccinated, similar to what we found in the early November 2013 survey (13.6% and 13.4%, respectively).
- Barriers to vaccination access, such as lack of medical insurance or cost, lack of time, unavailability of the vaccine, and lack of knowledge regarding where to get the vaccine were rarely reported as a main reason for not receiving a flu shot.

Figure 10.



WHAT CAN BE DONE?

Overall, early 2014-15 season estimates of flu vaccination coverage before or during pregnancy among women pregnant anytime from August 2014 through the time of the survey were similar to the 2013-14 early season estimates. Flu vaccination coverage was highest among pregnant women who reported that their doctor or other medical professional recommended and offered the flu vaccine (65.2%). Coverage estimates were substantially lower among pregnant women who reported receiving only a recommendation without an offer of vaccine (25.5%) or among those who did not receive a recommendation at all (5.8%). Concerns about the effectiveness of the flu vaccine and safety concerns for their baby were the most common reasons for not receiving a flu vaccination (reported by 16.1% and 12.8% of unvaccinated respondents, respectively). Continued efforts are needed to improve flu vaccination coverage among pregnant women, including:

Increase the proportion of pregnant women who receive a recommendation for and offer of flu vaccination from their doctor or other medical professional:

- All medical professionals should assess the vaccination status of pregnant women at each visit.
- Recommendation from a doctor or other medical professional is strongly associated with vaccination during pregnancy.
- If more pregnant women are assessed for vaccination status and receive both a recommendation for and offer of flu vaccination from their doctor or other medical professional, vaccination coverage should increase.

Continue to vaccinate pregnant women throughout the flu season:

- Over half of the pregnant women in this survey had not been vaccinated as of early November.
- Providers should continue to encourage their unvaccinated patients to receive vaccination as soon as possible, before flu activity increases in their community. Peak flu activity in the United States most often occurs in January or February, but can occur earlier.
- Providers should continue to offer flu shots to unvaccinated pregnant women for the duration of the flu season, even if flu activity has decreased in their community, since more than one type or subtype of flu may cause illness in a single flu season.

Inform pregnant women about the risk of flu infection for them and their infants and about the benefits and risks of flu vaccination:

- Health care providers and immunization programs should provide pregnant women with accurate information on the following topics:
 - The risk of the flu and related complications, including hospitalization and death, for pregnant women and their babies;
 - The benefits and risks of flu vaccination for mothers and their babies;
 - The protection transferred to unborn babies by vaccination during pregnancy, since infants younger than 6 months old cannot be vaccinated themselves.
- Information is available at:
 - [http://www.immunizationforwomen.org/site/assets/docs/Tear%20pad%20FAQ%20PregPat\(1\).pdf](http://www.immunizationforwomen.org/site/assets/docs/Tear%20pad%20FAQ%20PregPat(1).pdf). American College of Obstetricians and Gynecologists. Flu shot for pregnant patients: frequently asked questions.
 - <http://www.immunizationforwomen.org/site/assets/docs/Physicians%20Script%20Imm%202013.pdf>. American College of Obstetricians and Gynecologists. Physician script on influenza immunization during pregnancy. Washington, DC: American College of Obstetricians and Gynecologists; 2013.

- <http://www.cdc.gov/flu/protect/vaccine/pregnant.htm> : Pregnant Women and Influenza (Flu)
- http://www.cdc.gov/flu/pdf/freeresources/pregnant/flushot_pregnant_factsheet.pdf: Pregnant Women and the Flu Shot: Fact Sheet
- http://www.cdc.gov/vaccinesafety/Concerns/pregnancy_influenza.html: Pregnancy and Influenza Vaccine Safety
- <http://www.cdc.gov/flu/pdf/nivw/influenza-pregnancy-letter.pdf> : Influenza Vaccination of Pregnant Women: Letter to Providers
- <http://www.text4baby.org/> : Tips for Mom with support throughout pregnancy through free text messages on topics like prenatal care, baby health, parenting, vaccination, and more.

The November Internet panel survey of pregnant women is designed to provide timely estimates of national flu vaccination coverage and to assess the effectiveness of current vaccination efforts. The follow-up survey in April 2015 will provide end-of-season flu vaccination coverage estimates.

DATA SOURCE and METHODS

CDC conducted an Internet panel survey from October 29–November 5, 2014, to provide early season estimates of flu vaccination coverage and information on knowledge, attitudes, and behaviors related to flu vaccination among pregnant women. Women 18–49 years who were pregnant at any time since August 1, 2014, were recruited from SurveySpot, a general population Internet panel. SurveySpot is the same recruitment mechanism that was used in the November 2013 survey. Eligible respondents were either pregnant at the time of the survey or had recently been pregnant. Of 2,178 panel members who were eligible and started the survey, 2,111 (96.9%) completed the online survey. The sample was weighted to reflect the age group, racial/ethnic, and geographic distribution of the total U.S. population of pregnant women during 1995–2008 ([12–13](#)).

Survey respondents were asked if they had a flu vaccination since July 1, 2014, and if yes, in which month and whether they received the vaccination before, during, or after pregnancy. Pregnancy status questions included whether respondents were currently pregnant at interview or had been pregnant anytime since August 1, 2014. The beginning and end of pregnancy date or expected due date were asked to determine the actual month of pregnancy. Women who reported receiving vaccination since July 1, 2014, and who were vaccinated before or during pregnancy were counted as vaccinated. All respondents were asked if their doctor or other medical professional had recommended or offered the flu vaccine. They were also asked about their attitudes toward and beliefs about flu and flu vaccination.

Weighted analyses were conducted using SAS v9.2 survey procedures. Because the opt-in Internet panel sample was based on those who initially self-selected for participation in the panel rather than a random probability sample, statistical measures such as calculation of confidence intervals and tests of differences were not performed ([14](#)). A difference of five percentage points was considered a notable difference.

Sample Demographics

- A total of 2,109 women pregnant any time from August 1–November 5, 2014 were included in the survey, with sample sizes and weighted percentages by demographic variables as follows:
 - By age, 472 (28.4%) were 18–24 years, 1,212 (56.0%) were 25–34 years, and 425 (15.6%) were 35–49 years.
 - By race/ethnicity, 413 (22.9%) were Hispanic, 1,229 (51.6%) were non-Hispanic white, 224 (14.8%) were non-Hispanic black, and 243 (10.7%) were non-Hispanic other race/ethnicity.
 - By education, 370 (18.8%) were high school graduates or less, 506 (25.3%) were women with some college but no degree, 959 (43.9%) were women with a college degree, and 274 (11.9%) were women with greater than a college degree.
 - By type of medical insurance, 1,218 (55.0%) were women with private or military insurance only, 782 (39.8%) were women with any public insurance, and 94 (4.6%) were women with no insurance.
 - By high-risk conditions other than pregnancy^s 809 (38.4%) were women with high-risk conditions and 1,300 (61.6%) were women without high-risk conditions.

LIMITATIONS

These results are preliminary and should be interpreted with caution. The follow-up Internet panel survey in April 2015 will assess flu vaccination coverage at the end of the flu season. State-specific estimates of flu vaccination coverage for the 2014-15 season will be provided later from the Pregnancy Risk Assessment Monitoring System (PRAMS). National coverage estimates from the Behavioral Risk Factor Surveillance System (BRFSS) and National Health Interview Survey (NHIS) will be provided later for comparison to the Internet panel survey estimates.

The findings in the report are subject to several limitations.

- The sample was not necessarily representative of all pregnant women in the United States, because the survey was conducted among a smaller group of volunteers who were already enrolled in SurveySpot rather than a randomly-selected sample.
- Some bias might remain after weighting adjustments, given the exclusion of women with no Internet access and the self-selection processes for entry into the panel and participation in the survey. Estimates might be biased if the selection processes for entry into the Internet panel and a woman's decision to participate in this particular survey were related to receipt of vaccination.
- All vaccination results are based on self-report and not validated by medical record review. Estimates from Internet panel surveys may not be directly comparable to estimates from population-based surveys because of the difference in sampling between the surveys. However,
 - The estimates of flu vaccination coverage among women pregnant anytime during October 2010-January 2011 from the same 21 states in both PRAMS and the Internet panel survey was similar (45.6% vs. 44.9%) ([15](#)).
 - Compared to the estimates from the BRFSS, flu vaccination coverage estimates among pregnant women from the Internet panel survey were similar for the 2010-11 flu season (43.9% from internet panel survey vs. 39.7% from BRFSS), 2011-12 flu season (43.2% vs. 39.0%), higher in 2012-13 flu season (50.5% vs. 39.9%) and in 2013-14 flu season (52.2% vs. 46.4%). (CDC, unpublished data).

Despite these limitations, Internet panel surveys are a useful surveillance tool for timely early season and postseason evaluation of flu vaccination coverage and knowledge, attitude, practice, and barrier data.

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RELATED LINKS

- American College of Obstetricians and Gynecologists. Flu shot for pregnant patients: frequently asked questions. Washington, DC: American College of Obstetricians and Gynecologists; 2013. Available at: [http://www.immunizationforwomen.org/site/assets/docs/Tear%20pad%20FAQ%20PregPat\(1\).pdf](http://www.immunizationforwomen.org/site/assets/docs/Tear%20pad%20FAQ%20PregPat(1).pdf).
- Pregnant? Get a flu shot <http://www.cdc.gov/Features/PregnancyAndFlu/>
- Standards for Adults Immunization Practice. <http://www.cdc.gov/vaccines/hcp/patient-ed/adults/for-practice/standards/>
- Influenza vaccination coverage: FluVaxView <http://www.cdc.gov/flu/fluvoxview/index.htm>
- 2013-14 end-of-season MMWR: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6337a3.htm>
- 2013-14 early season online report: <http://www.cdc.gov/flu/fluvoxview/pregnant-women-nov2013.htm>
- 2012-13 end-of-season MMWR: http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6238a3.htm?s_cid=mm6238a3_w
- 2012-13 early season online report: <http://www.cdc.gov/flu/fluvoxview/pregnant-women-2012.htm>
- 2011-12 end-of-season MMWR: http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6138a2.htm?s_cid=mm6138a2_w
- 2011-12 early season online report: <http://www.cdc.gov/flu/professionals/vaccination/pregnant-women.htm>
- 2010-2011 end-of-season MMWR: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6032a2.htm>
- 2010-2011 early season online report: <http://www.cdc.gov/flu/pdf/professionals/vaccination/dinginternetpanelsurveypregnantwomen.pdf>
- Flu vaccination accepted by pregnant women not linked with miscarriage: https://www.aaps.org/News_Feed/News/2011/Flu_Vaccine_Accepted_by_Pregnant_Women,_Not_Linked_to_Miscarriage
- Pregnancy Risk Assessment Monitoring System website: <http://www.cdc.gov/prams/>
- Prevention and Control of Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices (ACIP)-United States, 2013-14 influenza Season: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr6207a1.htm?s_cid=rr6207a1_w
- Who is at risk? Pregnant women. <http://www.flu.gov/at-risk/pregnant/index.html>
- Joint statement for pregnant women about Influenza from American Academy of Family Physicians, American Academy of Pediatrics, American College of Nurse-Midwives, American College of Obstetricians and Gynecologists, Association of Women's Health, Obstetric, and Neonatal Nurses, Infectious Disease Society for Obstetrics and Gynecology, March of Dimes Foundation, Society of Maternal and Fetal Medicine <http://www.marchofdimes.org/news/print/joint-statement-for-pregnant-women-about-influenza.html>
- Text4Baby: <http://www.text4baby.org/>
- SSI: <http://www.surveysampling.com>
- SurveySpot: <https://www.surveyspot.com/>
- Follow CDC Flu on Twitter: [@CDCFlu](https://twitter.com/CDCFlu)

ACKNOWLEDGMENT

Cindi Knighton, Immunization Service Division, National Center for Immunization and Respiratory Disease, CDC; Alissa O'Halloran, Seth A Meador, Leidos; Deborah K Walker, Rebecca Fink, Abt Associates; Charles DiSogra, John Sokolowski, Abt SRBI.

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FOOTNOTES

* The November trend line indicates flu vaccination coverage estimates before and during pregnancy among women who provided a response to vaccination status questions and who were pregnant anytime from August-November during the 2010-11 flu season (n=1,496), 2011-12 flu season (n=2,047), 2012-13 flu season (n=1,796), 2013-14 flu season (n=2,096), and 2014-15 flu season (n=2,109). Beginning in the 2012-13 season, women vaccinated since July 1 to early November were counted as vaccinated. In prior seasons, only women vaccinated since August 1 to early November were counted as vaccinated.

†The April trend line indicates flu vaccination coverage estimates before and during pregnancy among women who provided a response to vaccination status questions and who were pregnant anytime from October-January during the 2010-11 flu season (n=1,457), 2011-12 flu season (n=1,660), 2012-13 flu season (n=1,702), and 2013-14 flu season (n=1,619). Beginning in the 2012-13 season, women vaccinated since July 1 to mid-April were counted as vaccinated. In prior seasons, only women vaccinated since August 1 to mid-April were counted as vaccinated.

‡Includes women who may have been vaccinated after their pregnancy ended. The PRAMS estimate includes pregnant women from 21 states and is not a national estimate.

§Currently have conditions other than pregnancy associated with increased risk for serious medical complications from influenza, including chronic asthma, a lung condition other than asthma, a heart condition, diabetes, a kidney condition, a liver condition, a weakened immune system caused by a chronic illness or by medicines taken for a chronic illness, or obesity.

||Includes unvaccinated respondents who reported that they probably or definitely do not intend to be vaccinated before the end of the flu season.