

# **National Vaccine Advisory Committee**

**Evaluation of the first year of the universal seasonal influenza vaccination recommendation**

**June 10, 2011**

## **A. Charge to the National Vaccine Advisory Committee (NVAC)**

Review seasonal influenza vaccination coverage and barriers during the first influenza season after the Advisory Committee on Immunization Practices (ACIP) recommended influenza vaccination for all people aged 6 months and older.

## **B. Universal influenza vaccination recommendation / ACIP rationale**

Routine influenza vaccination was recommended for all persons aged 6 months and older for the first time in 2010<sup>1</sup>. During the CDC's Advisory Committee on Immunization Practices (ACIP) February 2010 meeting in Atlanta, ACIP members voted to expand the recommendation for annual influenza vaccination to include all people ages 6 months and older in whom the vaccine is not contraindicated. The ACIP vote represented an expansion of the previous recommendations for annual vaccination of all adults aged 19-49 years with supporting evidence that annual influenza vaccination is a safe and effective preventive health action with potential benefit in all age groups. The new recommendation sought to remove barriers to influenza immunization such as confusion over who was recommended for vaccination, particularly with regard to presence of high-risk conditions, and signaled the importance of preventing influenza across the entire population.

## **C. Review methods**

The Charge to the NVAC was presented during the February 2011 regularly scheduled NVAC meeting. Following that meeting, a small ad hoc group of NVAC members, liaisons and ex officios met four times via teleconference to receive briefings on vaccination activities during the 2010-11 influenza season. Additionally, NVAC members who attended the National Influenza Vaccine Summit provided information based on the discussions and presentations at the Summit.

### **1. Ad hoc group**

The group was led by Guthrie Birkhead, NVAC Chair, and consisted of NVAC members Julie Morita, Amy Pisani, LJ Tan, Philip LaRussa, and Christine Nevin-Woods. Additional representation from non-NVAC members included Anne Bailowitz (NACCHO), Kathy Talkington (ASTHO), Virginia Lathrop (ASTHO), Claire Hannan (AIM) and Elizabeth Sobczyk (AAP). NVPO was represented by Designated Federal Officials Mark Grabowsky and Shary Jones. Other Federal *ex officios* who provided input to this process included Raymond Strikas, Pascale Wortley, Erin Kennedy, Abigail Shefer, and Carolyn Bridges (all from CDC).

### **2. Presentations**

The group received updates on influenza vaccine through the Vaccines for Children Program by Lance Rodewald (CDC), communications and outreach efforts by Glen Nowak and Cindy Fowler

(CDC), vaccine delivery in pharmacy settings by Mitch Rothholz (APhA), and vaccine coverage estimates from Rosanna Setse (CDC).

3. Process

During discussions in the February 2011 NVAC meeting, a list of potential evaluation topics was identified. This list served as the starting point for the group to develop a plan of detailed updates to request. Information was shared through teleconference updates, and the findings from this information gathering are summarized below. Preliminary discussions among the group led to the identification of key conclusions and potential recommendations for the NVAC to consider.

This report was drafted based on these discussions, and will be formally presented to the NVAC for deliberation and potential vote at its June 2011 meeting. If approved, it will be transmitted to the Assistant Secretary for Health (ASH) as an official report of the NVAC. The NVAC serves in an advisory capacity to the ASH, in his role as Director, National Vaccine Program.

**D. Findings from the review of the 2010-2011 influenza season**

4. Influenza vaccine production

Five manufacturers supplied influenza vaccine for use in the US during the 2010-2011 influenza season: Sanofi Pasteur, Novartis, GSK, MedImmune and Merck. Manufacturers reported production of 160-165 million influenza vaccine doses during the 2010-2011 influenza season. Vaccine distribution began in July 2010 and was completed by November 2010. Approximately 163 million vaccine doses were distributed, with about half of these distributed by the middle of September 2010 (Table 1)<sup>2</sup>. Compared to previous influenza seasons, this represents a large increase in the total doses of vaccine available as well as an earlier availability.

5. Influenza vaccine supply and distribution

Vaccine distribution can occur in two different ways. First, providers can order private stocks of vaccine directly from manufacturers. Second, for providers who serve Vaccines for Children (VFC)-eligible children or for whom Section 317 funds are used to purchase influenza vaccine, orders are placed through the VFC Program, and distributed through a centralized distribution network.

According to information provided by the CDC to immunization grantees, “each year, approximately 10% of all influenza vaccine doses are purchased on the CDC vaccine contracts for use in the VFC and Section 317 programs. The doses are distributed as part of the same

centralized vaccine distribution program that is used to distribute all other childhood and adult vaccine doses purchased on the CDC contracts. However, there are three unique aspects to flu vaccine distribution:

1. These orders are filled and shipped out on a shorter timeline than other routine vaccines in response to the limited window for flu vaccine administration.
2. For most products, flu vaccine shipments to the distribution depots come in multiple shipments over time, rather than arriving all at once. This is standard practice by most flu vaccine manufacturers in order get vaccine to as many providers as possible early in the season. The number of shipments to fill an order usually varies by the size of the order as well as the product.
3. Within each of the two distribution depots, flu vaccine doses are allocated to public health jurisdictions as each bulk shipment arrives at the depot to provide equitable access to the flu vaccine products.”

Because of the additional steps required to ship VFC influenza vaccine, providers have noted, anecdotally, that there were differences in the timing of receipt of private stock influenza vaccine versus VFC influenza vaccine.

Observational studies have produced mixed results, possibly due to different outcome measures. One study of 111 pediatric practices during the 2010-11 influenza season found no difference in the timing of vaccine administration between private stock and VFC influenza vaccine<sup>3</sup>.

However, another survey of physicians (n = 57) documented a difference in median time for private stock and VFC vaccine delivery to the practice ranging from 4 to 6 weeks, depending on the vaccine formulation (Table 2)<sup>4</sup>.

Limited data were also available from an informal survey of immunization grantees conducted by the Association of Immunization Managers on October 14, 2010. Of 64 immunization grantees (states, territories, local health departments), 20 locations responded. Sixteen of these 20 indicated that they received 40% or less of their order of public sector sanofi Pasteur multi-dose vial vaccine (range 7% to 92% of vaccine received)<sup>5</sup>. This stands in contrast to sanofi pasteur data that indicated that 57% of public sector multi-dose vials were shipped by the end of September, 2010.

Information provided from state and local public health representatives indicated that when VFC vaccine supply disruptions occur, there is not always clear communication of the extent of the

problem (e.g., does it affect only one immunization grantee or all grantees supplied by a particular VFC vaccine depot?).

#### 6. Preliminary coverage estimates

Interim coverage estimates for children 6 months to 17 years from the National Immunization Survey (NIS) and for adults 18 years and older from the Behavioral Risk Factor Surveillance System (BRFSS) were scheduled to be published in the Morbidity and Mortality Weekly Report on June 10<sup>6</sup>.

Overall, 43% of individuals aged 6 months and older were vaccinated against influenza in the 2010-11 influenza season. Vaccination coverage in children younger than 18 was slightly higher, than that for adults (49% versus 41%). Highest coverage was seen in elderly (65 years and older) adults (69%). Coverage among 18 to 49 year olds was 30% and among 50-64 year olds was 46%. However, among adults aged 18 to 64 with high-risk conditions, coverage was 48%<sup>6</sup>. (Table 3) The low uptake among 18 to 49 year olds, who were the final group to be covered with a routine immunization recommendation, is similar to past influenza seasons<sup>1</sup>. Since this group has typically been the least likely to seek influenza vaccination, it may take additional time to see large increases in influenza vaccine uptake as a result of the universal recommendation.

State-specific coverage levels for all persons aged 6 months and older ranged from 53% (Rhode Island and Hawaii) to 35% (Alaska). Five states achieved at least 50% total population coverage while coverage was less than 40% in seven states. Childhood (6 months to 17 years) coverage ranged from 85% (Hawaii) to 33% (Montana). Five states exceeded 60% childhood coverage while coverage was less than 40% of children in four states. Coverage of adults aged 18 years and older ranged from 51% (Iowa) to 32% (Alaska). Only two states reached 50% coverage of adults, while 15 were below 40% coverage<sup>6</sup>.

Racial and ethnic disparities in influenza vaccine coverage for all individuals 6 months and older were also observed, with non-Hispanic whites having the highest uptake, at 44%, followed by persons of other race/ethnicity (43%), Hispanics (41%) and non-Hispanic Blacks (39%).(Table 3)<sup>7</sup> (Table 3). The pattern in racial/ethnic vaccination differences is similar to disparities observed during the 2009-10 influenza season<sup>8,9</sup>. CDC reports “Although racial/ethnic disparities in vaccination coverage among adults persisted, the gap in coverage decreased somewhat.

Improved coverage among non-Hispanic black and Hispanic children eliminated racial/ethnic disparities in child coverage during the 2010-11 season.”<sup>6</sup>

Influenza vaccine uptake among children younger than 18 was higher in the 2010-11 season than the 2009-10 season, both for the season as a whole and in monthly estimates. For adults, uptake patterns in 2010-11 were nearly identical to those of 2009-10<sup>6</sup>.

Analysis of the National Flu Surveys conducted in November 2010<sup>10</sup> and March 2011<sup>7</sup> allows for a comparison of both how quickly vaccine was administered and how much vaccine was administered after the initial early season push. Of individuals who received the influenza vaccine, most were immunized early in the season, as there often were not substantial gains in vaccine coverage between November 2010 and March 2011 (Table 4)<sup>7,10</sup>. Considering that the peak proportion of specimens testing positive for influenza did not occur until the first week of February 2011 and the weekly percentage of outpatient visits for influenza-like illness did not peak until the week ending February 19, 2011<sup>11</sup>, it appears there would be sufficient time to continue with large-scale immunization campaigns prior to the peak of influenza activity.

Compared to the 2008-09 influenza season, the last season without a concomitant influenza pandemic, influenza vaccine coverage estimates were higher in the 2010-11 influenza season for all age groups (Table 5). During, and after, the H1N1 pandemic, large gains in vaccine coverage were seen for pregnant women. In the 2008-09 influenza season, estimates of vaccine uptake among pregnant women ranged from 6% to 19%. Following the heightened push for vaccinating pregnant women during the H1N1 pandemic, seasonal flu vaccine uptake among pregnant women was estimated at 32% to 51 % in 2009-10 and 44 % to 49% in 2010-11<sup>9</sup>. Estimates are presented using ranges as they are compiled from a collection of different surveys conducted over the previous three influenza seasons.

The newly implemented interactive influenza vaccination coverage reports (<http://cdc.gov/flu/professionals/vaccination/vaccinecoverage.htm>) offer a greater ability to examine influenza vaccine coverage patterns. However, as of June 9, 2011, the interactive data available on these reports were current only through November 2010.

## 7. Communications and outreach programs

### *Governmental*

CDC communications and outreach programs centered around a several campaign audiences and encompassed numerous campaign elements, including:

- Formative research and message testing
- Television and radio
- Print products
- Earned and paid media
- Web and social media
- Education and outreach to health care professionals
- National observance-National Influenza Vaccination Week
- Partner outreach and activities
- Evaluation

A majority of communication and outreach efforts, conducted by the CDC, centered on partnerships and collaborations with over 250 organizations, highlighting an increase in outreach efforts compared to prior influenza seasons. The upcoming season will build on these efforts and continue to engage partners on the local, state and national levels, as well as utilizing additional information streams, such as digital media.

### *Non-governmental/Private sector/advocacy groups*

The American Pharmacists Association estimates that over \$40 million was spent on pharmacy-based marketing and patient communication efforts. Advocacy groups, such as Every Child by Two, Families Fighting Flu and the American Lung Association (through their Faces of Influenza campaign) have increased outreach to encourage seasonal influenza vaccination and increase awareness of the universal vaccination recommendation. Examples of multimedia outreach programs are available at <http://www.familiesfightingflu.org/multimedia/> and <http://www.facesofinfluenza.org/>.

### *Influenza vaccine knowledge and attitudes*

During the March 2011 Influenza Survey, respondents were asked about their perceptions of the influenza vaccine. Few considered the vaccine not too effective or not at all effective (16%). About a quarter of respondents were very/somewhat worried about getting sick from the flu vaccine, though only 14% considered the vaccine somewhat/very unsafe<sup>7</sup>. However, there was

no research identified that addressed awareness of the universal recommendation and possible changes in practices related to this recommendation.

#### 8. Infrastructure and funding

The infrastructure for vaccine distribution is described above. Recent increases in staffing and vaccination infrastructure that came about as a result of the American Recovery and Reinvestment Act (ARRA) and H1N1 Public Health Emergency Response (PHER) led to increased ability to administer vaccinations, particularly through public health organizations such as local health departments (LHDs), which have been recognized as being an important component of response efforts<sup>12</sup>. However, these funding streams were designed to be time-limited, and while efforts are underway to reauthorize the Pandemic and All-Hazards Preparedness Act (PAHPA), there have been notable job losses in local public health<sup>13</sup>. The PAHPA allowed LHDs to build capacity which often overflowed into other areas such as general immunization capacity. The NVAC has previously recommended that steps be taken to preserve the advances in vaccination infrastructure that resulted from ARRA and PHER funding systems<sup>14</sup>.

The NVAC Adult Immunization Working Group has prepared a report for the full Committee to deliberate and vote on that addresses development of a comprehensive adult immunization program. Among the draft recommendations in this report is a call for increased coordination among immunization providers, including traditional and non-traditional providers. As discussed in greater detail below, it was estimated that for the 2010-11 influenza season, approximately 20% of influenza vaccine was administered in pharmacies/drug stores/supermarkets/superstores. Without a comprehensive and coordinated immunization infrastructure that includes interoperable electronic health records and/or immunization information systems, the ability to monitor and appropriately target immunization interventions may be lost. Additionally, the extent to which vaccination services are provided through organizations such as school-located or occupational health clinics need to be appropriately quantified and coordinated to ensure that different provider types have vaccine supply commensurate with need.

#### 9. Service delivery

According to the results from the March 2011 National Flu Survey<sup>7</sup>, physician provider offices were the most common site of influenza vaccination, for both children and adults. For children younger than 18, 69% of vaccine was administered in doctor's offices, with an additional 17% administered in clinics or health centers. Vaccines administered in school settings accounted for

an additional 6%. For adults aged 18 to 64, 49% of vaccine was administered in doctor's offices (21%) and clinics or health centers (28%); workplace vaccination and pharmacies/drug stores/supermarkets/superstores accounted for 19% each. The top places of vaccination for adults 65 years and older were doctor's offices (40%), clinics or health centers (20%) and pharmacies/drug stores/supermarkets/supercenters (26%)<sup>7,9</sup>.

There has been much discussion regarding the increase in non-traditional sites or places of vaccination. The proportion of vaccine administered in pharmacies has nearly doubled since the 2009-10 influenza season. Many pharmacy organizations are partnering with various government agencies to increase uptake of seasonal influenza vaccine, while 147,000 pharmacists have also been trained to administer vaccines as of the 2010-11 influenza season. One particular program, the Walgreens voucher program disseminated vouchers to community residents in several cities for an influenza vaccine. Preliminary estimates of utilization of these vouchers were low, but the final evaluation of the program is underway<sup>15,16</sup>. Final results and conclusions were not available in time for the June 2011 NVAC meeting.

While there is not direct empirical evidence about the impact of increased non-physician administration of influenza vaccine, anecdotal evidence indicates that while a greater number of vaccines were administered by pharmacies, the marketing and outreach conducted in the pharmacy setting did prompt some adults to seek vaccination from their physician. An additional area of research may be the extent to which pharmacists increased their outreach to their patients following the universal vaccination recommendation.

With increased influenza vaccination through non-traditional immunizers, such as pharmacies, there has been a perception on the part of physicians that pharmacies receive influenza vaccine earlier and in greater initial quantities than physician providers. An example of actions rising from such concerns is the resolution approved in 2010 by the Michigan State Medical Society calling for "vaccine makers to commit to delivering all of the seasonal vaccine to all of the physician offices that have ordered it before delivering it to the non-medical venues or retail/urgent care clinics;" and "legislation that requires physician orders for seasonal vaccine be delivered before delivery to non-medical venues or retail/urgent care clinics."<sup>17</sup> However, there is a lack of empirical evidence of lack of equitable distribution of vaccine among various types of vaccination providers.

To achieve universal influenza vaccination in the US, all available avenues of vaccine administration will need to be utilized to their fullest capacity. This includes vaccination in a wide variety of locations including, but not limited to, provider's offices, pharmacies and retail outlets, hospitals and outpatient clinics, school-located vaccination clinics and occupational health clinics. Due to the variation in influenza vaccination venues, recordkeeping and record access can be a major concern, and immunization registries or immunization information systems should be utilized across all vaccination venues, for individuals of all ages.

A proposed rule recently published for comment by the Centers for Medicare and Medicaid Services would require many Medicare providers to offer all patients an annual seasonal influenza vaccine<sup>18</sup>. This proposed rule only addresses the offering of vaccine, and patients would still be able to decline vaccination. Adoption of this rule could help increase immunization coverage by ensuring that all Medicare providers are, at a minimum, offering vaccination to the patients they serve.

## **E. Conclusions**

Following this examination of the state of influenza vaccination in the first year of the universal influenza vaccination recommendation, the National Vaccine Advisory Committee makes the following conclusions.

1. During the 2010-11 influenza season, more seasonal influenza vaccine was produced, distributed and administered than any previous influenza season. Vaccine was also available earlier in the season than ever before.
2. Increased seasonal influenza vaccine uptake during the 2009-10 influenza season may have been due to concern about the H1N1 influenza pandemic. However, the increases in seasonal influenza vaccination in that season appear to have held relatively steady during the 2010-11 influenza season. Surveillance needs to be maintained to track and understand vaccination in non-pandemic influenza seasons.
3. Influenza vaccination disparities remain among adult racial and ethnic groups where these disparities have historically been seen.
4. The timing of the distribution of VFC influenza vaccine was unclear to some state immunization programs and VFC providers, and was variable among some VFC providers. There is an opportunity to increase situational awareness and communication regarding vaccine distribution, particularly for VFC vaccine.

5. The majority of influenza vaccine that is administered is typically given early in the season. There is time for a larger proportion of individuals to be vaccinated if active vaccination programs continued later in the season, before influenza activity increases.
6. Efforts by CDC and a number of public health partners to promote influenza vaccination during the 2010-11 season were numerous and designed to reach a wide variety of subpopulations.
7. With increases in immunization through non-traditional providers, there is an opportunity for collaboration between traditional and non-traditional immunizers to increase immunization uptake. Collaborative efforts need to be increased, particularly with regard to perception of vaccine availability, interconnectedness of information systems (e.g., immunization registries), and widespread provision of influenza vaccine (e.g., physician offices, hospitals and outpatient settings, pharmacies and other non-traditional immunizers, community immunizers).
8. Immunization registries can play an important role in aiding assessments of those needing influenza vaccination, particularly for vaccines delivered in non-traditional settings, so all providers can access their immunization information.
9. Public health infrastructure and funding, including funding in the Section 317 Program, needs to be maintained, particularly to support continuity within the systems developed or strengthened with ARRA and H1N1 funding.
10. There is a need for increased research on provider and consumer knowledge, attitudes and practices concerning awareness of, and actions toward meeting, the universal recommendation.

## **F. Recommendations**

The National Vaccine Advisory Committee makes the following recommendations. The NVAC serves in an advisory role to the Assistant Secretary for Health, United States Department of Health and Human Services. Thus, the recommendations below will be formally transmitted to the ASH for his consideration, which may, at his discretion, include communication with various components of the Department and other interested parties.

10. Influenza vaccine manufacturers should continue to increase the level of vaccine production and supply for each influenza season.
11. CDC should continue surveillance of influenza vaccine uptake, with sufficiently large sample sizes to allow evaluations of subpopulations (e.g., by age, by race and ethnicity, by pregnancy status, by geographic area).
12. CDC should coordinate efforts to clarify and streamline, to the extent possible, VFC ordering systems and ensure shipping through the VFC depots is balanced to prevent localized shipping

disparities and develop robust communication and feedback systems with states, large cities and territories.

13. Mechanisms to supply near real-time information (e.g., through a “dashboard” tracking system) to immunization grantees about current levels of VFC vaccine supply in the distribution depots, vaccine availability, and localized shortages, should be developed to increase situational awareness among immunization grantees.
14. CDC should continue to conduct public information campaigns targeting the general population and coordinate partner efforts to promote influenza vaccination later into the influenza season.
15. Governmental (e.g., HHS, CDC) and non-governmental (e.g., advocacy organizations) partners should ensure that communications and outreach efforts are, at a minimum, maintained, and when possible, increased. Targeted increases should be aimed at groups for whom seasonal influenza vaccination has not previously been a priority (e.g. 13-17 year olds, 18-49 year olds without high-risk conditions) as well as in populations with remaining racial or ethnic disparities. Additional target populations are those who question the effectiveness or safety of the influenza vaccine. Efforts to utilize technologies such as social media should be explored and utilized as appropriate.
16. Governmental (e.g., HHS, CDC) and non-governmental (e.g., advocacy organizations) partners should ensure that funding and support for National Influenza Vaccination Week are continued. If possible, additional campaigns related to before-season awareness of influenza and/or late season vaccination should be conducted.
17. Both traditional and non-traditional providers of influenza vaccination should continue their efforts to offer influenza vaccination in all settings and during all patient contacts when influenza vaccination is available.
18. CMS should adopt its proposed rule<sup>18</sup> for offering influenza vaccine to all patients in Medicare facilities.
19. HHS, acting through CDC, should convene a meeting of traditional and non-traditional immunizers and vaccine distributors prior to the start of the influenza vaccination season to discuss opportunities for collaboration to achieve universal influenza vaccine coverage and perceptions of inequitable vaccine distribution.
20. Barriers to IIS use and intercommunication across the wide variety of influenza vaccinators should be identified with development and dissemination of appropriate strategies to mitigate these barriers.
21. Federal funding to state and local public health for promotion and coordination of influenza vaccination should be provided to ensure continuity of influenza programs with the enhanced or

newly developed infrastructure that came as a result of ARRA and H1N1 funding, which will have ended by the 2011-12 influenza season.

22. CDC, in conjunction with academic researchers, should continue examinations of knowledge and attitudes regarding influenza vaccine (e.g., perceptions of vaccine effectiveness and safety) as well as evaluations of awareness of the universal recommendation and intentions to change vaccination practices because of this recommendation.
23. NVAC should continue to periodically review universal influenza implementation.

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## Tables

Table 1. Weekly cumulative totals of 2010-11 seasonal influenza vaccine distribution<sup>2</sup>

<b>Week</b>	<b>Total Doses Distributed</b>
11/26/10	≈ 163 million doses
11/19/10	≈ 162.8 million doses
11/5/10	≈ 160 million doses
10/29/10	≈ 152 million doses
10/22/10	≈ 149 million doses
10/15/10	≈ 139 million doses
10/8/2010	≈ 129 million doses
10/1/2010	≈ 119 million doses
9/24/2010	≈ 103 million doses
9/17/2010	≈ 89 million doses
9/10/2010	≈ 67 million doses
9/3/2010	≈ 37 million doses
8/27/2010	≈ 30 million doses

Table 2. Median dates of delivery of private versus Vaccines for Children stock of influenza vaccine, Fall 2010.<sup>4</sup>

<b>Vials</b>	<b>Private stock</b>	<b>VFC stock</b>	<b>Difference</b>
Multidose vials	09/02/10	09/30/10	4 weeks
Preservative free vials	09/02/10	10/05/10	4.5 weeks
Flumist	08/04/10	09/20/10	6 weeks

Table 3. Estimated influenza vaccination coverage among all children and adults, by selected age groups and race/ethnicity, United States, National Immunization Survey and Behavioral Risk Factor Surveillance System, end of February 2011\*<sup>6</sup>

	<b>Influenza vaccine coverage</b>	
	End of February 2011	
	%	95% CI*
All	42.8	± 0.5
By age -groups		
Children 6m-17 years	49.0	± 1.3
Adults ≥18 years	40.9	±0.6
18-49 years	30.2	±1.0
50-64 years	45.6	±1.0
18-64 years, high-risk†	48.4	±2.2
65+ years	68.6	±0.8
By race/ethnicity (all 6 months and older):		
White, non-Hispanic	44.0	±0.5
Black, non-Hispanic	38.8	±2.2
Hispanic	40.6	± 2.2
Other race/ethnicity	42.8	±2.5

\* Percentages are weighted to the U.S. population; confidence interval half-width

† High risk includes asthma, other lung problems, diabetes, heart disease, kidney problems, anemia, weakened immune system caused by a chronic illness or by medicines taken for a chronic illness.

Table 4. Estimated influenza vaccination coverage among all children and adults, by selected age groups and race/ethnicity, United States, National Flu Survey, November 2010<sup>10</sup> and March 2011<sup>\*7</sup>

	Influenza vaccination coverage				
	November 2010 <sup>10</sup>		March 2011 <sup>7</sup>		November – March increase
	%	95% CI*	%	95% CI*	%
All	32.8	± 2.4	42.3	± 3.0	9.5
By age -groups					
Children 6m-17 years	30.6	± 5.0	46.2	± 6.9	15.6
6m – 4 years	44.4	± 11.2	60.9†	± 13.5	16.5
5 – 12 years	28.2	± 7.0	46.9†	± 10.5	18.7
13-17 years	21.4	± 9.3	32.1†	± 10.9	10.7
Adults ≥18 years					
18-49 years, HR§	32.8	±7.9	35.4†	± 10.6	2.6
18-49 years, non-HR	19.9	±3.5	26.0	± 4.7	6.1
18-49 years, HR unknown	27.1	±15.7	36.9†	± 14.8	9.8
50-64 years	38.0	±4.7	47.7	± 5.6	9.7
65+ years	64.3	±4.8	74.7	± 4.8	10.4
By race/ethnicity:					
Hispanic	25.4	± 6.3	37.7	± 8.1	12.3
Non-Hispanic, White only	35.8	±2.8	45.5	± 3.4	9.7
Non-Hispanic, Black only	27.1	±8.0	35.5†	± 11.8	8.4
Non-Hispanic, Other or multiple race	31.3	±10.2	32.9	± 9.0	1.6

\* Percentages are weighted to the U.S. population; confidence interval half-width

† Estimate may not be reliable, confidence interval half-width >10.0

§ High risk includes asthma, other lung problems, diabetes, heart disease, kidney problems, anemia, weakened immune system caused by a chronic illness or by medicines taken for a chronic illness.

Table 5. Estimated seasonal influenza vaccination coverage among all children and adults, by selected age groups, United States, 2008-11. Adapted from compiled influenza survey data<sup>6,8,9</sup>.

Population group	%	%	%
	2008-9	2009-10	2010-11
Persons aged $\geq 6$ mos	33	41	43
Children, 6 mos to 17 yrs	29	44	49
Persons $\geq 18$ yrs	34	40	41
Persons 18–49 yrs, at high risk*	33	38	No estimate <sup>†</sup>
Persons 18–49 yrs, not at high risk*	20	28	No estimate <sup>†</sup>
Persons 18–49 yrs, all	No estimate <sup>†</sup>	No estimate <sup>†</sup>	30
Persons 50–64 yrs	40	45	46
Persons aged $\geq 65$ yrs	66	70	69
Pregnant women	6-19	32-51	44-49

\* High risk includes asthma, other lung problems, diabetes, heart disease, kidney problems, anemia, weakened immune system caused by a chronic illness or by medicines taken for a chronic illness.

† Due to differences in the types of surveys compared, direct comparisons for high-risk/not at high-risk adults could not be made.