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Surveillance of Vaccination Coverage Among Adult Populations — United States, 2014

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CONTENTS

Front cover photo: The composite photograph on the cover shows two health care providers with patients who have received vaccination.

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Surveillance of Vaccination Coverage Among Adult Populations — United States, 2014

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Abstract

Problem/Condition: Overall, the prevalence of illness attributable to vaccine-preventable diseases is greater among adults than among children. Adults are recommended to receive vaccinations based on their age, underlying medical conditions, lifestyle, prior vaccinations, and other considerations. Updated vaccination recommendations from CDC are published annually in the U.S. Adult Immunization Schedule. Despite longstanding recommendations for use of many vaccines, vaccination coverage among U.S. adults is low.

Reporting Period: August 2013–June 2014 (for influenza vaccination) and January–December 2014 (for pneumococcal, tetanus and diphtheria [Td] and tetanus and diphtheria with acellular pertussis [Tdap], hepatitis A, hepatitis B, herpes zoster, and human papillomavirus [HPV] vaccination).

Description of System: The National Health Interview Survey (NHIS) is a continuous, cross-sectional national household survey of the noninstitutionalized U.S. civilian population. In-person interviews are conducted throughout the year in a probability sample of households, and NHIS data are compiled and released annually. The survey objective is to monitor the health of the U.S. population and provide estimates of health indicators, health care use and access, and health-related behaviors.

Results: Compared with data from the 2013 NHIS, increases in vaccination coverage occurred for Tdap vaccine among adults aged ≥19 years (a 2.9 percentage point increase to 20.1%) and herpes zoster vaccine among adults aged ≥60 years (a 3.6 percentage point increase to 27.9%). Aside from these modest improvements, vaccination coverage among adults in 2014 was similar to estimates from 2013 (for influenza coverage, similar to the 2012–13 season). Influenza vaccination coverage among adults aged ≥19 years was 43.2%. Pneumococcal vaccination coverage among high-risk persons aged 19–64 years was 20.3% and among adults aged ≥65 years was 61.3%. Td vaccination coverage among adults aged ≥19 years was 62.2%. Hepatitis A vaccination coverage among adults aged ≥19 years was 9.0%. Hepatitis B vaccination coverage among adults aged ≥19 years was 24.5%. HPV vaccination coverage among adults aged 19–26 years was 40.2% for females and 8.2% for males. Racial/ethnic differences in coverage persisted for all seven vaccines, with higher coverage generally for whites compared with most other groups. Adults without health insurance were significantly less likely than those with health insurance to report receipt of influenza vaccine (aged ≥19 years), pneumococcal vaccine (aged 19–64 years with high-risk conditions and aged ≥65 years), Td vaccine (aged ≥19 years), Tdap vaccine (aged ≥19 years and 19–64 years), hepatitis A vaccine (aged ≥19 years overall and among travelers), hepatitis B vaccine (aged ≥19 years, 19–49 years, and 19–59 years with diabetes), herpes zoster vaccine (aged ≥60 years and 60–64 years), and HPV vaccine (females aged 19–26 years and males aged 19–26 years). Adults who reported having a usual place for

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health care generally were more likely to receive recommended vaccinations than those who did not have a usual place for health care, regardless of whether they had health insurance. Vaccination coverage was significantly higher among those reporting one or more physician contacts in the past year compared with those who had not visited a physician in the past year, regardless of whether they had health insurance. Even among adults who had health insurance and ≥10 physician contacts within the past year, 23.8%–88.8% reported not having received vaccinations that were recommended either for all persons or for those with some specific indication. Overall, vaccination coverage among U.S.-born respondents was significantly higher than that of foreign-born respondents with few exceptions (influenza vaccination [adults aged 19–49 years], hepatitis A vaccination [adults aged ≥19 years], hepatitis B vaccination [adults with diabetes aged ≥60 years], and HPV vaccination [males aged 19–26 years]).

Interpretation: Overall, increases in adult vaccination coverage are needed. Although modest gains occurred in Tdap vaccination coverage among adults aged ≥19 years and herpes zoster vaccination coverage among adults aged ≥60 years, coverage for other vaccines and risk groups did not improve, and racial/ethnic disparities persisted for routinely recommended adult vaccines. Coverage for all vaccines for adults remained low, and missed opportunities to vaccinate adults continued. Although having health insurance coverage and a usual place for health care are associated with higher vaccination coverage, these factors alone do not assure optimal adult vaccination coverage.

Public Health Actions: Assessing associations with vaccination is important for understanding factors that contribute to low coverage rates and to disparities in vaccination, and for implementing strategies to improve vaccination coverage. Practices that have been demonstrated to improve vaccination coverage should be used. These practices include assessment of patients' vaccination indications by health care providers and routine recommendation and offer of needed vaccines to adults, implementation of reminder-recall systems, use of standing-order programs for vaccination, and assessment of practice-level vaccination rates with feedback to staff members. For vaccination to be improved among those least likely to be up-to-date on recommended adult vaccines, efforts also are needed to identify adults who do not have a regular provider or insurance and who report fewer health care visits.

Introduction

Overall, the prevalence of illness attributable to vaccine-preventable diseases is greater among adults aged ≥19 years than among children aged ≤12 years (*1–4*). The prevalence of illness among older persons is especially high. For example, in recent years, an estimated 50%–70% of the average 226,000 annual influenza-related hospitalizations, 80%–90% of the 3,000–49,000 influenza-related deaths (data available at http://www.cdc.gov/flu/about/disease/65over.htm), and approximately half of the 13,500 cases of invasive pneumococcal disease (IPD) in the United States occurred among persons aged ≥65 years (*1–3*). The lifetime risk for herpes zoster (also known as shingles) is approximately 30%, with the risk increasing with age (*4*). Vaccinations are recommended throughout a person's lifetime to prevent vaccine-preventable diseases and their sequelae. However, adult vaccination coverage remains low for most routinely recommended vaccines (*5*) and below *Healthy People 2020* targets (https://www.healthypeople.gov/2020/topics-objectives/topic/immunization-and-infectious-diseases/objectives).

Many factors contribute to low adult vaccination rates, including limited public awareness about adult vaccinations, misinformation about vaccines, lack of vaccine requirements for adults, gaps in incorporation of routine vaccine needs assessment and recommendations for adults during health care visits, the cost of stocking vaccines and providing vaccination services, inadequate and/or inconsistent payment for vaccines and vaccine administration, complexities in how adult vaccinations are paid for by private as well as public insurers, lack of health insurance and limited funding for programs to vaccinate uninsured adults, and acute medical care taking precedence over preventive services (*6–14*). In October 2015, the Advisory Committee on Immunization Practices (ACIP) approved the adult immunization schedule for 2016 (*15*). With the exception of influenza vaccination, which is recommended for all adults each year, other adult vaccinations are recommended for specific populations based on a person's age, health conditions, behavioral risk factors (e.g., injection drug use), occupation, travel, and other indications (*15*).

This report represents the first comprehensive release of adult vaccination coverage data to include assessment of associations with expanded data on demographic characteristics of respondents including access to health care. These findings can be used by public health practitioners, adult vaccination providers, and the general public to better understand factors that contribute to low vaccination and modify strategies and interventions to improve vaccination coverage.

Methods

To assess vaccination coverage among adults aged ≥19 years for selected vaccines and factors associated with vaccination, CDC analyzed data from the 2014 National Health Interview Survey (NHIS); for influenza coverage, data from the 2013 NHIS (August–December) also were used. This report

highlights results of that analysis for influenza, pneumococcal, tetanus toxoid-containing (tetanus and diphtheria vaccine [Td] or tetanus and diphtheria with acellular pertussis vaccine [Tdap]), hepatitis A, hepatitis B, herpes zoster (shingles), and human papillomavirus (HPV) vaccines by selected demographic and access-to-care characteristics (e.g., age, race/ethnicity, vaccination indication, health insurance status, contacts with physicians, nativity and citizenship). Estimates of influenza vaccination coverage using 2014–15 season data from other sources have been published (*16*–*18*). The attributes, strengths, and limitations of each of these data sources have been described (*19*). Proportions were estimated of adults aged ≥19 years who received selected vaccinations during 2010–2014. Additional information on NHIS methods is available at http://www.cdc.gov/nchs/nhis/methods.htm.

Data Source and Collection

NHIS collects information about the health and health care of the noninstitutionalized U.S. civilian population using nationally representative samples. Face-to-face interviews are conducted by the U.S. Census Bureau for CDC's National Center for Health Statistics. Questions about receipt of vaccinations recommended for adults are asked of one randomly selected adult within each family in the household. Respondents were asked if they had received an influenza shot or nasal spray in the past 12 months and if so, in which month and year. Respondents were asked if they had ever had a pneumonia shot. The proportion of pneumococcal vaccination by type of vaccine (23-valent pneumococcal polysaccharide vaccine or 13-valent pneumococcal conjugate vaccine) was not measured. The presence of selected high-risk conditions as defined by ACIP for pneumococcal disease (Box) (*15*) was determined by responses to questions in NHIS. Respondents were asked if they had received a tetanus shot in the past 10 years. Respondents who had received a tetanus shot in the past 10 years were asked if their most recent shot was received in 2005 or later. Respondents who had received a tetanus shot since 2005 were asked if they were told that their most recent tetanus shot included the pertussis or whooping cough vaccine. Respondents were asked if they had ever received the hepatitis A vaccine, and if yes, how many doses were received. Respondents were asked if they had ever received the hepatitis B vaccine, and if yes, whether they had received ≥3 doses or <3 doses. For hepatitis A and hepatitis B vaccination, data were collected on selected respondent characteristics that increase the risk for infection (travel to countries in which hepatitis A infections are endemic and having chronic liver disease, having diabetes, travel to countries in which hepatitis B infections are endemic, and having chronic liver disease, respectively). Respondents were asked if they had ever received a shingles vaccine and if they had ever received an HPV shot or cervical cancer vaccine, and if yes, age at the first dose.

Vaccination outcomes and demographic and other characteristics (e.g., health conditions, insurance status, and usual source and frequency of health care) are self-reported. Race/ethnicity was categorized as Hispanic or Latino, black, white, Asian, and "other." Persons identified as Hispanic or Latino might be of any race. Persons identified as black, white, Asian, or other race are non-Hispanic. "Other" includes American Indian/Alaska Native and multiple race. The five racial/ethnic categories are mutually exclusive. Adults were classified as health care personnel (HCP) if they reported that they currently volunteer or work in a hospital, medical clinic, doctor's office, dentist's office, nursing home, or some other health care facility including part-time and unpaid work in a health care facility as well as professional nursing care provided in the home. Adults were considered insured if they reported having public health insurance coverage (Medicare, Medicaid, military health care [TRICARE/VA/CHAMP-VA], Indian Health Service, state-sponsored health plan, or other government program insurance) or private health insurance coverage. Respondents were asked if there is a place to which they usually go when sick or need advice on their health. Respondents answering "yes" were defined as having a usual place for health care.

BOX. Selected high-risk conditions for pneumococcal disease as defined by the Advisory Committee on Immunization Practices

Adults were considered at high risk for pneumococcal disease or its complications if they

- had ever been told by a doctor or other health professional that they had diabetes, emphysema, chronic obstructive pulmonary disease, coronary heart disease, angina, heart attack, or other heart condition;
- had a diagnosis of cancer during the previous 12 months (excluding nonmelanoma skin cancer);
- had ever been told by a doctor or other health professional that they had lymphoma, leukemia, or blood cancer;
- had been told by a doctor or other health professional that they had chronic bronchitis or weak or failing kidneys during the preceding 12 months;
- had an asthma episode or attack during the preceding 12 months; or
- were current smokers.

Source: CDC. Advisory Committee on Immunization Practices recommended immunization schedule for adults aged 19 years and older—United States, 2016. MMWR Morb Mortal Wkly Rep 2016. In press.

Analysis

For the noninfluenza adult vaccination coverage estimates, the weighted proportion of respondents who reported receiving selected vaccinations was calculated. To better assess influenza vaccination coverage for the 2013–14 influenza season, CDC restricted reported coverage to persons who were interviewed during August 2013–June 2014 and vaccinated during July 2013–May 2014, using the Kaplan-Meier survival analysis procedure; 2013 NHIS data for August–December 2013 were used. Differences were measured as the simple difference between the 2012–13 and 2013–14 influenza seasons. Data for missing month and year (3.1%) were imputed.

To assess adjusted vaccination coverage and adjusted prevalence ratios for each vaccine, CDC used logistic regression and predicted marginal modeling for selected comparisons (health insurance status). Estimates were adjusted for age, sex, race/ethnicity, marital status, education, employment status, poverty level, number of physician contacts in the past year, usual source of health care, self-reported health status, nativity, and region of residence. Income-to-poverty ratio variables are included in the NHIS public use data file (http://www.cdc.gov/nchs/nhis/nhis_2014_data_release.htm). Poverty thresholds were defined according to family size using weighted average Census poverty thresholds from 2012, the average Consumer Price Index from 2012, actual Consumer Price Index values for January-July 2013, and projected Consumer Price Index values for August–December 2013 (ftp://ftp.cdc.gov/pub/Health_Statistics/NCHS/Dataset_Documentation/NHIS/2014/srvydesc.pd).

Weighted data were used to produce national vaccination coverage estimates. Point estimates and 95% confidence intervals (CIs) were calculated by using statistical software to account for the complex sample design. T tests were used for comparisons by race/ethnicity (with non-Hispanic white as the reference), for comparisons between 2014 and 2013, and comparisons of covariates to the reference group within each level of each characteristic (e.g., age group, health care personnel status, patient care status, access-to-care factors, nativity, years of residence in the United States, and citizenship status). For influenza vaccination, tests for linear trend were performed using a weighted linear regression on the season-specific estimates, using season number as the independent variable and weights as the inverse of the estimated variance of the estimated vaccination coverage. For vaccination with the other vaccines, tests for linear trend were performed in SUDAAN using the RATIO procedure. Statistical significance was defined as $p<0.05$. Coverage estimates are not reported for small sample size ($n<30$) or relative standard error (standard error/estimates) >0.3.

Results

The final sample adult component response rate for the 2014 NHIS was 58.9%. The total adult sample was 36,324 persons aged ≥19 years. The final sample adult component response rates for estimating influenza vaccination coverage for the 2013–14 influenza season were 61.2% for 2013 and 58.9% for 2014, respectively. The total adult sample for influenza coverage estimation was 32,296 persons aged ≥19 years.

Influenza Vaccination Coverage

Influenza vaccination coverage for the 2013–14 season among adults aged ≥19 years was 43.2%, similar to the NHIS estimate from the 2012–13 season (Table 1). Coverage among whites aged ≥19 years was higher (46.7%) than that for blacks (36.5%), Hispanics (33.2%) and those reporting other race (38.6%). Influenza coverage was 31.5% among adults aged 19–49 years and 47.7% among adults aged 50–64 years. Coverage among adults aged ≥65 years (71.5%) was higher compared with younger age groups. Among HCP aged ≥19 years, influenza vaccination coverage overall was 65.4%, similar to the estimate for 2013 (Table 2). Among HCP aged ≥19 years with and without direct patient care responsibilities, influenza vaccination coverage was 65.1% and 66.0%, respectively, similar to 2013 estimates (Table 3). Coverage was 74.8% for Hispanic HCP aged ≥19 years with direct patient care responsibilities, a 20.8 percentage point increase compared with the 2013 estimate. However, influenza vaccination coverage among HCP with direct patient care responsibilities was similar across all racial/ethnic groups (Table 3). During the 2009–10 through the 2013–14 influenza seasons, fewer than half of adults aged ≥19 years were vaccinated (range: 37.2%–43.2%) (Figures 1 and 2); 56.6%–67.3% of HCP reported influenza vaccination (Figure 2).

Pneumococcal Vaccination Coverage

Reported pneumococcal vaccination coverage (23-valent pneumococcal polysaccharide vaccine [PPSV23] and 13-valent pneumococcal conjugate vaccine [PCV13]) among adults aged 19–64 years at high risk was 20.3% overall, similar to the estimate from 2013 (Table 1). Coverage among whites aged 19–64 years at high risk was higher (21.1%) compared with Hispanics (16.4%) and Asians (14.6%) but was not significantly different for blacks (20.2%) and persons reporting other race (25.3%) compared with whites. Among adults aged ≥65 years, coverage was 61.3% overall, similar to the estimate for 2013. Coverage among whites aged ≥65 years (64.7%) was higher compared with blacks (49.8%), Hispanics (45.2%), and Asians (47.7%) (Table 1). During 2010–2014, pneumococcal

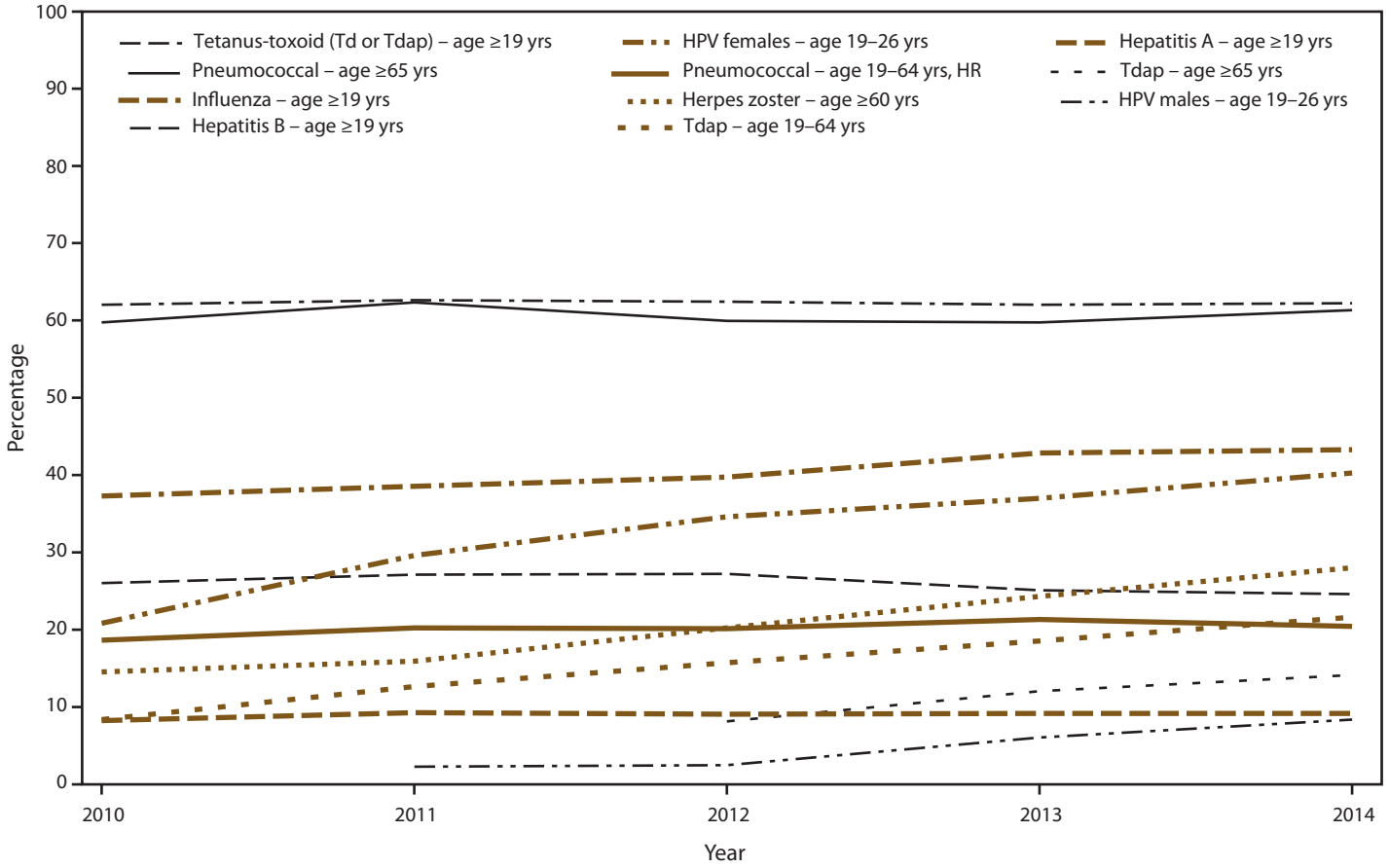
vaccination coverage among adults aged 19–64 years at high risk and adults aged ≥65 years ranged from 18.5%–21.2% to 59.7%–62.3%, respectively (Figures 1 and 2).

Tetanus Vaccination Coverage

In 2014, the proportion of adults reporting having received any tetanus toxoid-containing vaccination during the past 10 years was 62.2% overall for adults aged ≥19 years, 62.6% for adults aged 19–49 years, 64.7% for adults aged 50–64 years, and 57.7% for adults aged ≥65 years (Table 1). The proportion of adults receiving tetanus vaccination during the past 10 years across all age groups did not change compared with 2013. Whites had higher coverage across all age groups compared with blacks, Hispanics, and Asians. During 2010–2014, tetanus vaccination among adults aged ≥19 years was unchanged at approximately 62% (Figures 1 and 3).

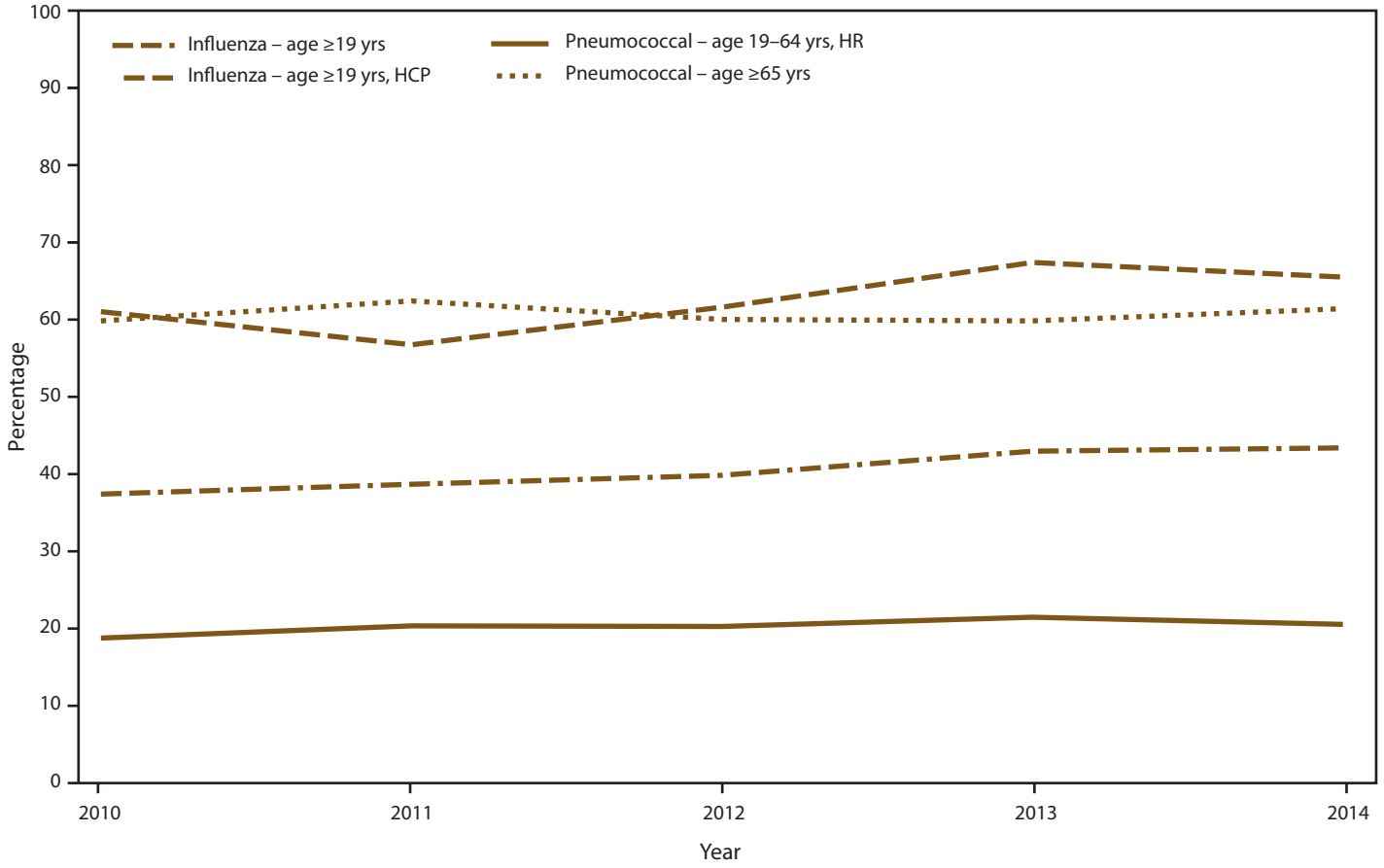
Among adults aged ≥19 years for whom Tdap vaccination specifically could be assessed, overall reported coverage in the past 9 years was 20.1%, a 2.9 percentage point increase compared with 2013 (Table 1). Tdap coverage for black (11.6%), Hispanic (12.4%), and Asian (15.5%) adults aged ≥19 years was lower compared with whites (23.8%). Coverage among adults aged ≥19 years who reported living with an infant

FIGURE 1. Estimated proportion of adults aged ≥19 years who received selected vaccines,* by age group and high-risk status† — National Health Interview Survey, United States, 2010–2014



NOTE: Additional tables for this figure are available at http://stacks.cdc.gov/view/cdc/37407.
Abbreviations: HPV = human papillomavirus; HR = high risk; Td = tetanus-diphtheria toxoid; Tdap = tetanus, diphtheria, and acellular pertussis vaccine.
* Influenza vaccination coverage for 2010 is coverage from the 2009–10 season, 2011 is coverage from the 2010–11 season, 2012 is coverage from the 2011–12 season, 2013 is coverage from the 2012–13 season, and 2014 is coverage from the 2013–14 season. Interviews from August through June of each season were used to estimate coverage from July through May using Kaplan Meier survival analysis. Tdap vaccination coverage data among adults aged ≥65 years are available beginning in the NHIS 2012 survey. The 2010 HPV vaccination coverage estimate among males is suppressed due to relative standard error >30%.
† Adults were considered at high risk for pneumococcal disease if they had ever been told by a doctor or other health professional that they had diabetes, emphysema, chronic obstructive pulmonary disease (beginning in 2012), coronary heart disease, angina, heart attack, or other heart condition; had a diagnosis of cancer during the previous 12 months (excluding nonmelanoma skin cancer); had ever been told by a doctor or other health professional that they had lymphoma, leukemia, or blood cancer; had been told by a doctor or other health professional that they had chronic bronchitis or weak or failing kidneys during the preceding 12 months; had an asthma episode or attack during the preceding 12 months; or they were current smokers.

FIGURE 2. Estimated proportion of adults* aged ≥19 years who received influenza† and pneumococcal vaccines, by age group and high-risk status§ — National Health Interview Survey, United States, 2010–2014



NOTE: Additional tables for this figure are available at http://stacks.cdc.gov/view/cdc/37407.
Abbreviations: HCP = health care personnel; HR = high risk.
* Adults were classified as health care personnel if they reported they currently volunteer or work in a hospital, medical clinic, doctor's office, dentist's office, nursing home or some other health-care facility including part-time and unpaid work in a health care facility as well as professional nursing care provided in the home.
† Influenza vaccination coverage for 2010 is coverage from the 2009–10 season, 2011 is coverage from the 2010–11 season, 2012 is coverage from the 2011–12 season, 2013 is coverage from the 2012–13 season, and 2014 is coverage from the 2013–14 season. Interviews from August through June of each season were used to estimate coverage from July through May using Kaplan Meier survival analysis.
§ Adults were considered at high risk for pneumococcal disease if they had ever been told by a doctor or other health professional that they had diabetes, emphysema, chronic obstructive pulmonary disease (beginning in 2012), coronary heart disease, angina, heart attack, or other heart condition; had a diagnosis of cancer during the previous 12 months (excluding nonmelanoma skin cancer); had ever been told by a doctor or other health professional that they had lymphoma, leukemia, or blood cancer; had been told by a doctor or other health professional that they had chronic bronchitis or weak or failing kidneys during the preceding 12 months; had an asthma episode or attack during the preceding 12 months; or were current smokers.

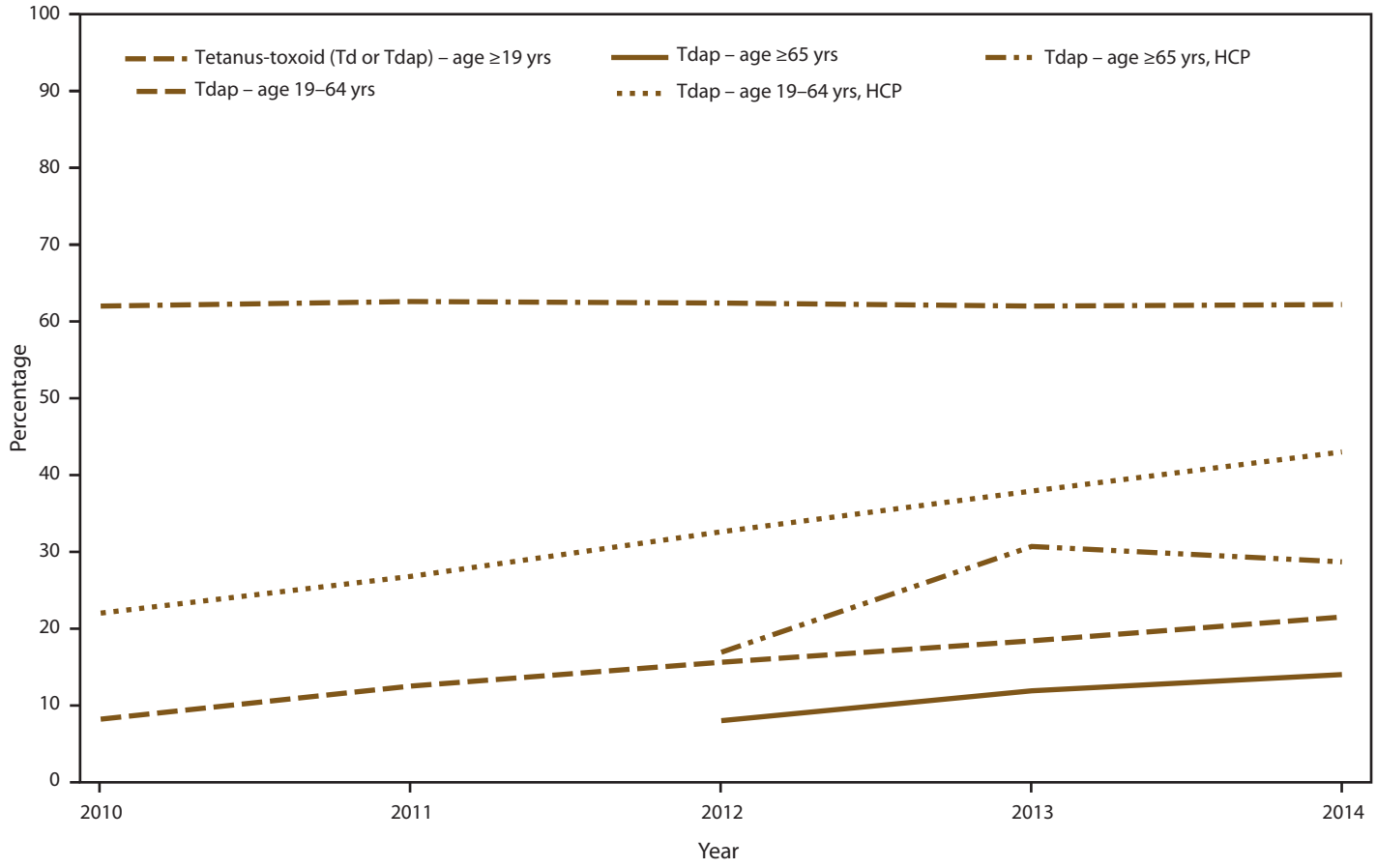
aged <1 year* was 32.0%, higher than the 19.6% coverage among adults aged ≥19 years without household contact with an infant aged <1 year. During 2010–2014, Tdap vaccination coverage increased from 8.2% to 21.5% among adults aged 19–64 years, and during 2012–2014 increased from 8.0% to 14.0% among adults aged ≥65 years (Figures 1 and 3).

Among 16,823 respondents who reported receiving a tetanus vaccination during 2005–2014, more than half (51.3%) reported that they were not informed of the vaccination type, and 11.3% could not recall what type of tetanus vaccination they had received (Table 4). Of the remaining 37.4% of respondents who reported that they knew what type of tetanus vaccine they received, 70.1% reported receiving Tdap.

Overall Tdap vaccination of HCP aged ≥19 years reported in 2014 was 42.1%, similar to the estimate from 2013 (Table 2). White HCP had higher Tdap coverage (46.4%) compared with black HCP (24.8%) and Hispanic HCP (35.8%). Among HCP aged ≥19 years with direct patient care responsibilities, Tdap vaccination coverage was 47.5%, similar to the 2013 estimate (Table 3). Black HCP with direct patient care responsibilities

* In 2006, a single dose of Tdap was recommended for adults who have or who anticipate having close contact with an infant aged <1 year (e.g., parents, grandparents, child care providers, and health care personnel) to reduce the risk for transmitting pertussis.

FIGURE 3. Estimated proportion of adults aged ≥19 years who received a tetanus toxoid-containing vaccine (Td or Tdap) and proportion of those who received Tdap vaccine, by age group* — National Health Interview Survey, United States, 2010–2014



NOTE: Additional tables for this figure are available at http://stacks.cdc.gov/view/cdc/37407.
Abbreviations: HCP = health care personnel; Td = tetanus-diphtheria toxoid; Tdap = tetanus, diphtheria, and acellular pertussis vaccine.
* Tdap vaccination coverage data among adults aged ≥65 years are available beginning in the NHIS 2012 survey.

had lower Tdap coverage (28.9%) compared with white HCP (52.4%), but coverage for HCP in the other racial/ethnic groups was similar to that for white HCP (Table 3). Tdap vaccination among HCP aged 19–64 years increased from 22.0% in 2010 to 43.0% in 2014. Tdap vaccination among HCP aged ≥65 years reported during 2012–2014 ranged from 16.9% to 30.7% (Figure 3). Among adults aged ≥19 years who received a tetanus vaccination and reported that they knew what type of tetanus vaccine they received, HCP were more likely to report receipt of Tdap (80.6%) than were non-HCP (68.0%) (Table 4).

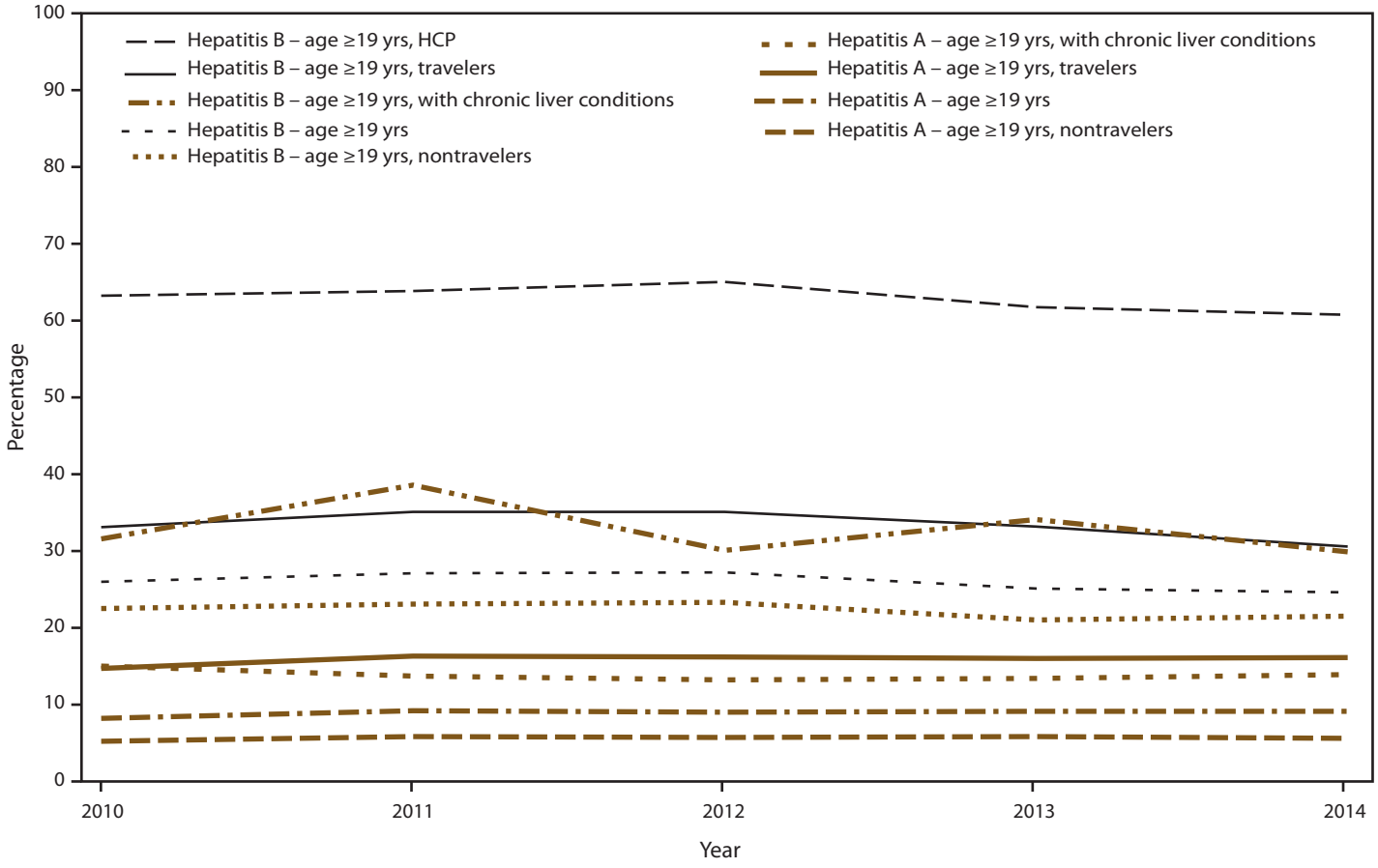
Hepatitis A Vaccination Coverage

In 2014, reported hepatitis A vaccination coverage (≥2 doses) was 9.0% for adults aged ≥19 years, 12.1% among adults aged 19–49 years, and 5.5% among adults aged ≥50 years, similar to the estimates for 2013 (Table 1). Among adults aged 19–49 years, coverage for Hispanics (9.6%) was lower than that for whites (12.7%). Vaccination coverage was higher among adults aged ≥19 years who had traveled outside the United States since 1995 to a country in which hepatitis A is of high or intermediate endemicity (countries other than the countries of Europe, Japan, Australia, New Zealand, or Canada) than among respondents who did not travel outside the United States or had traveled only to countries in which the disease is of low endemicity (16.0% versus 5.5%, respectively). Vaccination coverage among adult travelers to countries with high or intermediate endemicity was similar to the estimate for 2013 (Table 1). Overall coverage among adults aged ≥19 years with chronic liver conditions was 13.8%, similar to the 2013 estimate. During 2010–2014 among adults aged ≥19 years, hepatitis A vaccination among travelers to countries with high or intermediate endemicity, among nontravelers, and among persons with chronic liver conditions remained stable (range: 14.6%–16.2%, 5.1%–5.7%, and 13.1%–14.9%, respectively) (Figure 4).

Hepatitis B Vaccination Coverage

Reported hepatitis B vaccination coverage (≥3 doses) among adults was 24.5% for adults aged ≥19 years, 32.2% among adults aged 19–49 years, and 15.7% among adults aged ≥50 years. Overall vaccination coverage among adults aged ≥19 years was similar to the 2013 estimate (Table 1). Vaccination coverage was higher among adults aged ≥19 years who had traveled outside the United States since 1995 to a country in which hepatitis B is of high or intermediate endemicity (countries other than the countries of Europe, Japan, Australia, New Zealand, or Canada) than among respondents who did not travel outside the United States or had traveled only to countries in which hepatitis B is of low endemicity (30.5% versus 21.4%, respectively). Among adults aged 19–49 years, vaccination coverage was lower for blacks (29.9%) and Hispanics (20.2%) compared with whites (36.3%). Overall coverage among adults aged ≥19 years with chronic liver conditions was 29.8%, similar to the 2013 estimate. Vaccination coverage for persons with diabetes was 23.5% for those aged 19–59 years and 13.5% for those aged ≥60 years, similar to estimates for 2013. Overall, hepatitis B vaccination coverage among HCP aged ≥19 years was 60.7%, similar to the estimate for 2013. Black (51.4%) and Hispanic HCP (51.1%) had lower coverage compared with white HCP (63.0%) (Table 2). Among HCP aged ≥19 years with direct patient care responsibilities, hepatitis B vaccination coverage was 67.7%, similar to the 2013 estimate (Table 3). Coverage for black HCP aged ≥19 years with direct patient care responsibilities was lower (56.6%) than that for white HCP with direct patient care responsibilities (70.9%) (Table 3). During 2010–2014, among adults aged ≥19 years, hepatitis B vaccination coverage among travelers to areas of high or intermediate endemicity, nontravelers, persons

FIGURE 4. Estimated proportion of adults aged ≥19 years who received hepatitis A and hepatitis B vaccines, by age group and high-risk status — National Health Interview Survey, United States, 2010–2014



NOTE: Additional tables for this figure are available at http://stacks.cdc.gov/view/cdc/37407.
Abbreviations: HCP = health care personnel; travelers = persons who had traveled outside the United States to countries other than countries in Europe, Japan, Australia, New Zealand, or Canada since 1995; nontravelers = persons who had not traveled outside the United States to countries other than countries in Europe, Japan, Australia, New Zealand, or Canada since 1995.

with chronic liver disease, and HCP varied (range: 30.5%–35.0%, 20.9%–23.2%, 29.8%–38.5%, and 60.7%–65.0%, respectively (Figure 4).

Herpes Zoster Vaccination Coverage

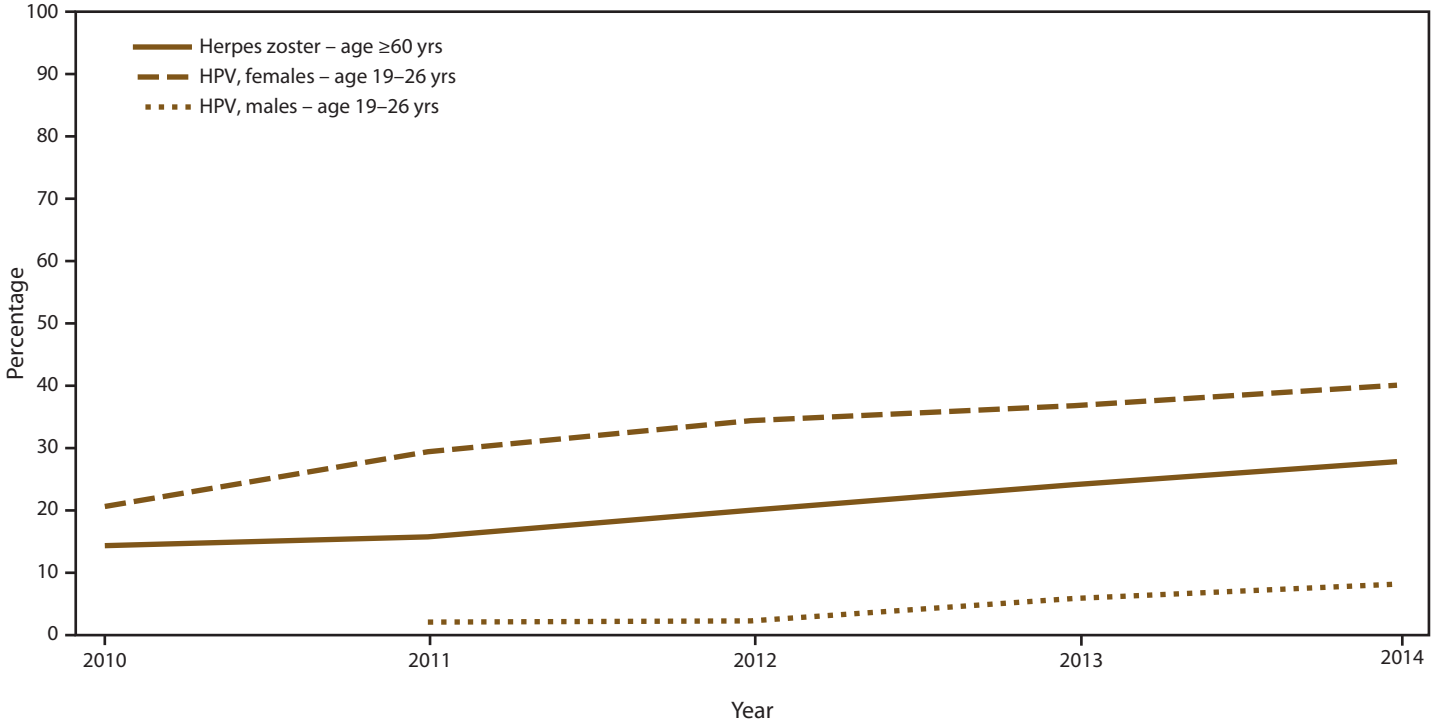
In 2014, among adults aged ≥60 years, 27.9% reported receiving herpes zoster vaccination to prevent shingles, an increase from the 24.2% reported in 2013 (Table 1). Whites aged ≥60 years had higher herpes zoster vaccination coverage (32.0%) compared with blacks (11.6%), Hispanics (14.6%), Asians (16.5%), and those reporting other race (16.2%). Among adults aged 60–64 years, 20.4% reported receiving herpes zoster vaccination, with blacks (8.1%) and Hispanics (11.2%) reporting lower coverage compared with that for whites (24.3%) (Table 1). Estimates were similar to those for 2013. Among adults aged ≥65 years, 31.1% reported herpes zoster vaccination, a 4.3 percentage point increase compared with 2013. Whites aged ≥65 years had higher herpes zoster vaccination coverage (35.0%) compared with blacks (13.5%), Hispanics (16.3%), Asians (20.7%), and those reporting other race (19.6%) (Table 1). Herpes zoster vaccination among adults aged ≥60 years increased from 14.4% in 2010 to 27.9% in 2014 (Figures 1 and 5).

HPV Vaccination Coverage

In 2014, among women aged 19–26 years, 40.2% reported receipt of ≥1 dose of HPV vaccine, similar to the estimate reported for 2013 (Table 1). Coverage was 44.8% among women aged 19–21 years, similar to the 2013 estimate. Coverage was 37.6% among those aged 22–26 years, a 5.3 percentage point increase compared with the 2013 estimate. Among women aged 19–26 years, Hispanics (28.1%) and Asians (22.8%) had lower coverage compared with whites (46.3%), but coverage for blacks (37.4%) and adults who indicated other race (47.3%) was similar to that for whites. Receipt of ≥1 dose of HPV vaccine among males aged 19–26 years was 8.2%, similar to the 2013 estimate. Coverage was 13.3% for males aged 19–21 years, a 5.6 percentage point increase compared with the estimate from 2013. Coverage was 5.4% for those aged 22–26 years, similar to the 2013 estimate.

Among women aged 19–26 years, 2.1% reported receiving the first dose of HPV vaccine at age 8–10 years, 7.4% at age 11–12 years, 58.1% at age 13–17 years, 12.5% at age 18 years, and 19.9% at age 19–26 years (Table 5). Among males aged 19–26 years, 13.0% reported receiving the first dose of HPV vaccine at age 8–10 years, 3.5% at age 11–12 years, 33.1% at age 13–17 years, 24.4% at age 18 years, and 25.9% at

FIGURE 5. Estimated proportion of adults aged ≥19 years who received herpes zoster and human papillomavirus* vaccines, by age group — National Health Interview Survey, United States, 2010–2014



NOTE: Additional tables for this figure are available at http://stacks.cdc.gov/view/cdc/37407.
Abbreviation: HPV = human papillomavirus.
* The 2010 HPV vaccination coverage estimate among males is suppressed due to relative standard error >30%.

age 19–26 years. Among respondents aged 19–26 years, the difference between the age reported at the time of the interview and the age at which respondents indicated that the first dose of HPV vaccine was received was ≥10 years for 7.1% of women and for 13.8% of males. This would imply receipt of vaccination in 2004 or earlier, before HPV vaccine was licensed for use in 2006. Among females and males aged 19–26 years who had not received HPV prior to age 19 years, 11.8% and 2.3% reported receiving the first dose of HPV vaccine at age 19–26 years, respectively (Table 1). Fewer Hispanic females aged 19–26 years (7.4%) reported receiving the first dose of HPV vaccine at age 19–26 years compared with white females aged 19–26 years (13.9%) (Table 1). HPV vaccination increased from 20.7% in 2010 to 40.2% in 2014 for females aged 19–26 years, and from 2.1% in 2011 to 8.2% in 2014 among males aged 19–26 years (Figures 1 and 5).

Trends in Adult Vaccination Coverage

Estimated proportions of adults aged ≥19 years who received selected vaccinations during the period 2010–2014 are shown (Figures 1, 2, 3, 4, and 5). Although the point estimates for each year vary by only a few percentage points, linear trend tests indicated that influenza vaccination coverage significantly increased overall among persons aged ≥19 years from the 2009–10 influenza season to the 2013–14 season (test for trend: $p = 0.01$) (Figures 1 and 2). Influenza vaccination coverage did not increase significantly among HCP during this period (test for trend: $p = 0.17$) (Figure 2). During 2010–2014, pneumococcal vaccination coverage increased significantly only among high-risk persons aged 19–64 years (test for trend: $p = 0.01$) (Figures 1 and 2). During 2010–2014, significant increases also occurred for Tdap vaccination overall among persons aged ≥19 years (test for trend: $p< 0.01$) and among HCP aged 19–64 years and those aged ≥65 years (tests for trend: $p< 0.01$ and 0.03, respectively), herpes zoster vaccination of persons aged ≥60 years (test for trend, $p< 0.01$), and HPV vaccination of females and males aged 19–26 years (test for trend, $p< 0.01$) (Figures 1, 3, and 5). There was a significant downward trend for hepatitis B vaccination among travelers to countries with high or intermediate endemicity and for nontravelers (test for trend: $p< 0.01$) (Figure 4). Coverage did not show statistically significant changes during 2010–2014 for the other vaccines routinely recommended for adult populations (pneumococcal vaccination [persons aged ≥65 years] and overall tetanus vaccination [persons aged ≥19 years]) (tests for trend: $p>0.05$) (Figure 1).

Association of Health Insurance Status with Vaccination Coverage Among Adult Populations

Most study respondents (86.7%) indicated having some type of health insurance. Overall, vaccination coverage was lower among adults without health insurance compared with those with health insurance, except for overall hepatitis B vaccination among those aged ≥19 years with chronic liver conditions or diabetes (Table 6). For influenza, pneumococcal, Tdap, herpes zoster, and HPV vaccination, coverage was two to five times higher among those with health insurance compared with those without insurance (Table 6).

Adult vaccination coverage differed by the type of health insurance. Vaccination coverage was higher among adults with private health insurance compared with those reporting public health insurance for pneumococcal vaccination among adults aged ≥65 years, tetanus and Tdap vaccination (all ages), overall hepatitis A vaccination among adults aged ≥19 years, hepatitis B vaccination among adults aged ≥19 years overall and those with diabetes aged ≥19 years and ≥60 years, and herpes zoster vaccination among adults aged ≥60 years (Table 6). Vaccination coverage was significantly lower among adults with private insurance compared with those with public insurance for overall influenza vaccination among adults aged ≥19 years and for pneumococcal vaccination among adults aged 19–64 years with high-risk conditions (Table 6).

Association of Health Insurance Status and Having a Usual Place for Health Care with Vaccination Coverage

Generally, adults with a usual place for health care were more likely to report having received recommended vaccinations than those who did not have a usual place for health care, regardless of whether they had health insurance. Among adults with health insurance, coverage was significantly higher among those who reported having a usual place for health care compared with those who did not have a usual place for health care except for hepatitis A vaccination and hepatitis B vaccination (Table 7). Among adults without health insurance, coverage was significantly higher among adults who had a usual place for health care compared with those who did not for influenza vaccination, pneumococcal vaccination among adults aged 19–64 years with high-risk conditions, and overall tetanus vaccination among adults aged ≥19 years (Table 7).

Adult Vaccination Coverage by Health Insurance Status and Physician Contacts

With a few exceptions (overall hepatitis A vaccination among adults aged ≥19 years and HPV vaccination among women aged 19–26 years), vaccination coverage was significantly higher among those reporting having had one or more physician contacts in the past year compared with those who had not visited a physician in the past year, regardless of whether they had health insurance (Table 8). In addition, vaccination coverage generally increased as the number of physician contacts increased (Table 8).

Among adults who had health insurance and reported having had ≥10 physician contacts within the past year, 23.8%–88.8% reported not receiving vaccinations that either are recommended for all persons or are recommended for those with some specific indication (not receiving influenza vaccination, 39.4% [aged ≥19 years], 51.4% [aged 19–49 years], 38.3% [aged 50–64 years], 23.8% [aged ≥65 years]; not receiving pneumococcal vaccination, 61.4% [high-risk, aged 19–64 years], 29.3% [aged ≥65 years]; not receiving Td, 30.1% [aged ≥19 years]; not receiving Tdap, 68.7% [aged 19–64 years], 83.9% [aged ≥65 years]; hepatitis A, 82.4% [travelers aged ≥19 years], 82.0% [persons aged ≥19 years with chronic liver conditions]; hepatitis B, 62.9% [travelers aged ≥19 years], 67.1% [persons aged ≥19 years with chronic liver conditions], 64.7% [adults aged 19–59 with diabetes], 88.8% [adults aged ≥60 years with diabetes]; herpes zoster, 67.7%; and HPV, 51.6% [women aged 19–26 years]) (Table 8).

Association of Respondent Age with Adult Vaccination Coverage

Influenza and pneumococcal vaccination coverage among adults aged ≥65 years was higher compared with coverage among adults aged 19–64 years; however, Td and Tdap coverage among adults aged ≥65 years was lower compared with coverage among adults aged <65 years. Hepatitis B vaccination coverage among adults with diabetes aged ≥60 years was lower compared with coverage among adults aged 19–59 years with diabetes (Tables 6, 7, and 8). Herpes zoster coverage among adults aged ≥65 years was higher compared with coverage among adults aged 60–64 years (Table 6).

Adult Vaccination Coverage Adjusted for Selected Demographic and Access to Care Characteristics

Adults without health insurance were significantly less likely than those with health insurance to be vaccinated after adjusting for confounders for influenza (aged ≥19 years); pneumococcal (aged 19–64 years with high-risk conditions); hepatitis B (aged ≥19 years and 19–49 years); herpes zoster (aged ≥60 years), and HPV (females aged 19–26 years) vaccination (Table 9). The difference in adjusted vaccination coverage between respondents with and without health insurance for those for whom the difference was statistically significant ranged from 2.9% (hepatitis B vaccination among adults aged ≥19 years) to 13.3% (influenza vaccination among adults aged ≥19 years) (Table 9).

Adult Vaccination Coverage by Nativity, Years Living in the United States, and Citizenship

Overall, vaccination coverage among U.S.-born respondents was significantly higher than that of foreign-born respondents with few exceptions (Table 10). Exceptions were noted for influenza vaccination (adults aged 19–49 years), overall hepatitis A vaccination (adults aged ≥19 years), hepatitis B vaccination among adults with diabetes aged ≥19 years and those aged ≥60 years, and HPV vaccination of males aged 19–26 years. Vaccination coverage was higher for foreign-born persons living in the United States ≥10 years compared with those in the United States <10 years for influenza vaccination (overall for persons aged ≥19 years and adults aged ≥65 years). Vaccination coverage was significantly lower for foreign-born persons living in the United States ≥10 years compared with those living in the United States <10 years for hepatitis A vaccination (adults aged ≥19 years overall), and hepatitis B vaccination (among adults ≥19 years overall and those aged ≥19 years with diabetes). Except for pneumococcal vaccination of adults aged ≥65 years, Td vaccination of adults aged ≥65 years, hepatitis A vaccination, hepatitis B vaccination among adults with diabetes aged ≥19 years, and HPV vaccination among females aged 19–26 years, coverage among foreign-born adults who were U.S. citizens was higher than that for foreign-born respondents who were not U.S. citizens (Table 10).

Discussion

In 2014, adult vaccination coverage in the United States did not improve from 2013, except for modest increases in Tdap vaccination for adults aged ≥19 years and herpes zoster vaccination among adults ≥60 years. Vaccination coverage estimates for the four vaccines in this report that are included in *Healthy People 2020* (influenza, pneumococcal, herpes zoster, and hepatitis B [for HCP] vaccines) are below the respective target levels, including among insured adults and adults with

multiple health care visits in the past year. Racial/ethnic gaps in coverage persisted for all seven vaccines in this report and widened for Tdap and herpes zoster vaccination, with higher coverage generally for whites compared with most other groups. These data indicate multiple missed opportunities for vaccination and the need to increase routine assessment of adult vaccination needs, and vaccination with needed vaccines.

Influenza Vaccination

Since 2010, ACIP has recommended that all persons aged ≥6 months be vaccinated annually against influenza to prevent illness and related complications (*20*). Fewer than half of adults aged ≥19 years were vaccinated during the influenza seasons spanning the 2009–10 through 2013–14 seasons. Higher vaccination rates could have resulted in prevention of a substantial greater number of influenza cases and hospitalizations. For example, using a model published in 2013 (*21*), CDC estimated the amount of influenza-associated outcomes during the 2012–13 influenza season, a moderately severe season, that might have been prevented by influenza vaccination (*22*). For the 2013–14 influenza season, using updated estimates of vaccination coverage, vaccine effectiveness, and influenza hospitalizations, CDC estimates that influenza vaccination prevented approximately 7.2 million illnesses, 3.1 million medically attended illnesses, and 90,000 hospitalizations associated with influenza (*23*). If influenza vaccination levels had reached the *Healthy People 2020* target of 70%, an estimated additional 5.9 million illnesses, 2.3 million medically attended illnesses, and 42,000 hospitalizations associated with influenza might have been averted. For the U.S. population to benefit more fully from influenza vaccines, more effort is needed to reach the *Healthy People 2020* target. Ensuring that all persons who visit a health care provider during the influenza season receive a vaccination recommendation and offer from their provider and use of vaccination information systems could increase influenza vaccination rates and reduce the incidence of illness (*24*,*25*).

HCP are recommended for routine annual influenza vaccination (*20*,*26*). Preventing influenza among HCP who might serve as sources of influenza virus transmission provides additional protection to patients at risk for influenza complications. Although annual vaccination has long been recommended for HCP and is a high priority for reducing morbidity associated with influenza in health care settings (*27–29*), influenza vaccination coverage level among HCP aged ≥19 years during the 2013–14 season was 65.4% overall and 65.1% among those with direct patient care responsibilities. Higher HCP influenza vaccination coverage has been associated with employer requirements for vaccination and access to vaccination at the workplace at no cost for >1 day (*17*,*30*). Although less effective than workplace on-site vaccination, active employer promotion of influenza vaccine through such methods as incentives and personal reminders also has been associated with higher coverage compared with HCP whose employers did not implement any policies or activities related to influenza vaccination (*17*). These results indicate that a comprehensive strategy that includes easy access to vaccination at no cost on multiple days along with promotion of vaccination might increase HCP vaccination coverage. Employers and health care administrators can make use of the Guide to Community Preventive Services (*24*), which provides guidance on effective interventions to increase uptake of influenza vaccination among HCP.

Pneumococcal Vaccination

In August 2014, ACIP recommended routine use of PCV13 among adults aged ≥65 years (*31*). PCV13 should be administered in series with PPSV23, the vaccine recommended for adults aged ≥65 years since 1983. PPSV23 contains 12 serotypes in common with PCV13 and 11 additional serotypes. PCV13 vaccine reduces the risk for pneumococcal pneumonia and both PCV13 and PPSV23 have been demonstrated to reduce the risk for invasive pneumococcal infections (*31*,*32*). Because of the high proportion of invasive pneumococcal disease caused by serotypes unique to PPSV23, broader protection is expected to be provided through use of both PCV13 and PPSV23 in series. Adults who have already received PPSV23 and are recommended to receive PCV13 should receive PCV13 at least 1 year after PPSV23 vaccine. The survey data from 2014 NHIS could not be used to estimate the proportion of pneumococcal vaccinations by type (PCV13 versus PPSV23). The overall pneumococcal vaccination estimates in this report include respondents who might have received PCV13 and/or PPSV23. Pneumococcal vaccination of persons aged 19–64 years at high risk increased during the 5 years covered in this report but was unchanged among those aged ≥65 years, and both were well below *Healthy People 2020* targets of 60% for persons aged 18–64 years at high risk and 90% for adults aged ≥65 years. Among persons aged ≥65 years, using PCV13 in series with PPSV23 could prevent an estimated 230 cases of invasive pneumococcal disease and approximately 12,000 cases of community-acquired pneumonia over the lifetime of a single cohort of persons aged 65 years (*31*). Achieving higher pneumococcal vaccination levels could improve these benefits.

Tetanus Toxoid-Containing Vaccination

In 2012, ACIP updated the adult Tdap vaccination recommendation to include all adults aged ≥19 years who have not yet received a dose of Tdap, including those aged ≥65 years (*33*). Tdap, when indicated, should be administered regardless of interval since the most recent Td. A single dose of Tdap is particularly important for adults who have or who anticipate having close contact with an infant aged <1 year (e.g., parents, grandparents, child care providers, and health care personnel) to reduce the risk for transmitting pertussis to infants too young to be vaccinated who are at greatest risk for severe pertussis, including hospitalization and death. Although there were modest increases in Tdap vaccination of adults from 2010 to 2014, coverage has remained low for all age groups and among adults living with an infant aged <1 year.

In hospital settings, transmission of pertussis has occurred from hospital visitors to patients, from HCP to patients, and from patients to HCP (*34–37*). Vaccinating HCP with Tdap will help protect them against pertussis and might reduce transmission to patients, other HCP, household members, and persons in the community (*26*,*38*). Health care providers should not miss an opportunity to vaccinate adults aged ≥19 years who have not received Tdap previously.

Hepatitis A Vaccination

Hepatitis A vaccination is recommended for any person seeking protection from hepatitis A virus infection, if some risk factor is present (e.g., on the basis of lifestyle, occupation, medical, or other indication), and for persons traveling to or working in countries that have high or intermediate endemicity of hepatitis A (*15*). Comprehensive information on all risk and occupation indications for hepatitis A vaccination were not collected in the 2014 NHIS. Information was available only for those with foreign travel to areas of high or intermediate endemicity and those with chronic liver disease. Although hepatitis A vaccination of persons who had traveled outside the United States to a country in which hepatitis A is of high or intermediate endemicity was higher in 2014 and preceding years than among respondents who did not travel outside the United States or had traveled only to countries in which the disease is of low endemicity, overall hepatitis A vaccination among travelers and persons with chronic liver disease has remained low. Health care providers are encouraged to assess the needs of their clients for this vaccine and offer it whenever appropriate.

Hepatitis B Vaccination

In December 2011, ACIP recommended that all previously unvaccinated adults aged 19–59 years with diabetes mellitus (type 1 and type 2) be vaccinated against hepatitis B as soon as possible after receiving a diagnosis of diabetes and that unvaccinated adults aged ≥60 years with diabetes may be vaccinated at the discretion of the treating clinician after assessing their risk and the likelihood of an adequate immune response to vaccination (*39*). Hepatitis B vaccination coverage in 2014 among persons with diabetes showed no improvement over estimates obtained before this recommendation, which underscores the need to improve awareness of increased risk for contracting acute hepatitis B among persons with diabetes and to increase hepatitis B vaccination in this population.

During 1982, when hepatitis B vaccine was first recommended for HCP, an estimated 10,000 infections occurred among persons employed in a medical or dental field. By 2004, the number of hepatitis B virus (HBV) infections among HCP had decreased to an estimated 304 infections, largely resulting from the implementation of routine pre-exposure vaccination and improved infection-control precautions (*40–42*). The risk for acquiring HBV infection from occupational exposures is dependent on the frequency of percutaneous and mucosal exposures to blood or body fluids (e.g., semen, and wound exudates) containing HBV, particularly fluids containing hepatitis B e antigen, a marker for high HBV replication and viral load (*26*). The risk is higher during the professional training period and can vary throughout a person's career (*43*). All unvaccinated persons whose work- and training-related activities involve reasonably anticipated risk for exposure to blood or other infectious body fluids (e.g., HCP, long-term–care facility staff, and public safety workers) should be vaccinated with the complete, ≥3-dose hepatitis B vaccine series and undergo postvaccination serological testing to demonstrate protective antibody levels (*44*). During 2010–2014, estimates of hepatitis vaccination among HCP have not improved, ranging from 61%–65%, well below the *Healthy People 2020* target of 90%. The Hospital Infection Control Practices Advisory Committee (HICPAC) has encouraged all facilities or organizations that provide direct patient care to formulate a comprehensive vaccination policy for all HCP (*45*). Implementation of HICPAC and CDC recommendations can assist hospital administrators, infection-control practitioners, employee health clinicians, and HCP in optimizing infection prevention and control programs.

Herpes Zoster Vaccination

ACIP recommends herpes zoster vaccination for adults aged ≥60 years (*46*). Although herpes zoster vaccination coverage increased in 2014 compared with 2013, it was 2.1 percentage points below the *Healthy People 2020* target of 30%. Shortages of herpes zoster vaccine and a resulting lack of vaccine promotion likely contributed to low uptake during the first years after licensure. These shortages now appear to be resolved; however,

other barriers persist, particularly the high cost for providers to purchase a supply, challenges to stocking the vaccine (which requires freezer storage), coverage for the vaccine under Medicare Part D, which results in billing challenges for medical providers (except pharmacist vaccine providers), and out-of-pocket payments for some Medicare Part D beneficiaries depending on their specific plan (*47*,*48*). Providers often refer patients to pharmacies for herpes zoster vaccination because reimbursement for Medicare Part D benefits is less complex. For adults aged ≥60 years with nongrandfathered private health insurance plans, herpes zoster vaccine is available with no out-of-pocket costs because of provisions of the Affordable Care Act (*14*,*47*,*48*).

HPV Vaccination

Although HPV vaccination increased significantly among age-eligible females during 2010–2014 (*5*,*49*,*50*), coverage has remained low. Since 2006, ACIP has recommended routine vaccination of adolescent girls and boys at ages 11 or 12 years and vaccination for females aged 13–26 years who have not been vaccinated previously (*51*). Since 2011, ACIP has recommended vaccination for males aged 13–21 years who have not been vaccinated previously or who have not completed the 3-dose series; males aged 22–26 years may be vaccinated. Approximately 12% of females and 2% of males aged 19–26 years not vaccinated at age ≤18 years reported receiving the first dose of HPV vaccine as catch-up at age 19–26 years. As more adolescents are vaccinated at the target age group and age into the group monitored in NHIS, vaccine coverage estimates are expected to increase.

Data on age at first dose of HPV vaccination of adults was collected for the first time in 2013. Most female and male respondents in the 2014 NHIS reported receiving the first dose of HPV vaccine at age ≥13 years, consistent with the fact that female respondents aged ≥21 years and all male respondents would have been aged >13 years at the time HPV vaccination was first recommended. Some respondents also indicated the first HPV vaccination dose was received before HPV vaccine was licensed for use in 2006, suggesting inaccurate recall.

In 2014, white women reported higher HPV coverage than Hispanic or Asian women. Black women and women reporting other race had coverage similar to that for whites. The findings for black, Hispanic, and Asian women contrast with data on HPV vaccination of adolescent girls aged 13–17 years reported in the 2014 National Immunization Survey–Teen (NIS-Teen) (*52*), which indicated that, among females, ≥1, ≥2, and ≥3 HPV dose coverage was higher among Hispanic adolescents and similar for Asian adolescents compared with white adolescents. Among black adolescents, ≥1 and ≥2 HPV dose coverage was also higher compared with estimates for white adolescents. HPV vaccination coverage for each HPV dose was higher for females living below poverty level compared with those at or above the poverty level. The higher coverage in NIS-Teen among black and Hispanic females and those living below the poverty level might be attributable in part to the continued effectiveness of the Vaccines for Children program, which provides recommended vaccines at no cost to eligible children through age 18 years (*53*). NIS-Teen estimates also are based on provider reports from medical records whereas NHIS vaccination data are self-reported. Young adults might not be able to recall accurately which vaccines they received as adolescents.

Although vaccination coverage has increased since a licensed HPV vaccine has been available and recommended by ACIP, many adolescent and young adult females remain unvaccinated and vulnerable to develop cancers that safe, effective HPV vaccines can prevent (*51*). Studies on the prevalence of genital HPV infection among women in the United States (*54*) and the seroprevalence of the nine HPV types in the 9-valent vaccine (*55*) indicated that many adult women have not been infected with high-risk HPV types, supporting implementation of ACIP-recommended catch-up vaccination. Until HPV vaccination increases among adolescents, a high proportion of unprotected young women eligible for HPV vaccination will be expected. Results from modeling and studies of the cost-effectiveness of HPV vaccination of young women have suggested that catch-up vaccination could reduce the amount of time needed to achieve population level impacts of vaccination (*56*,*57*). Findings from initial studies of vaccine impact in settings in which catch-up vaccination programs were successful in achieving high coverage rates among young women are consistent with these models (*56*,*57*). Continued efforts are needed to improve coverage among members of the primary target group for HPV vaccine, girls and boys aged 11–12 years, and among all racial and ethnic groups. Efforts also are needed to improve catch-up vaccination among those who have not started or completed their vaccination.

Health Insurance Status and Usual Place for Health Care

The findings in this report are consistent with a previous report (*12*) indicating that having health insurance was generally associated with a greater likelihood of having received recommended vaccinations. Even after demographic and access-to-care variables are controlled for, persons with health insurance were more likely to be vaccinated than those without insurance for several vaccines. The type of health insurance indicated by respondents had a significant association with vaccination coverage. Vaccination coverage was higher among adults with private health insurance compared with those reporting public health insurance for many of the vaccines, but this finding

was not consistent for all vaccines and age groups. The factors contributing to vaccination levels by type of health insurance are not well understood. In one study (*58*), the percentage of persons with private health insurance declined during 1999–2011, ranging from 67% to 74% during 1999–2008, and was 64% during 2009–2011. This downward shift in private insurance coverage might have had an impact on adult vaccination coverage. The Affordable Care Act also might have had an impact on vaccination coverage (*48*). A better understanding of factors influencing vaccination by type of health insurance is needed.

Health insurance coverage, although beneficial in improving access to health care services, might not be sufficient in itself to achieve optimal adult vaccination. In this report, even among those with health insurance and ≥10 contacts with physicians during the preceding year and no contraindications, vaccination was still not routine. Up to 88.8% of adults reported not receiving one or more recommended vaccines. Provider attitudes toward adult vaccination, practice patterns that do not routinely incorporate assessments for vaccines for adults, and other barriers to vaccination might determine whether patients are offered and receive vaccines (*6*,*8*–*10*,*12*,*14*,*59*).

In general, persons with a usual place for health care were more likely to report having received recommended vaccinations than those who did not have a usual place for health care, regardless of whether they had health insurance, and vaccination coverage generally increased as the number of physician contacts increased. This observation suggests that an increased number of physician contacts might have facilitated opportunities to be reminded of the need for vaccinations, discussions about indicated vaccinations, and a recommendation and decision to vaccinate. These findings are also consistent with previous reports indicating that persons who have a usual place for health care or medical home and who seek medical care one or more times during the year are more likely to be vaccinated and receive other preventive services than those without a usual place for health care (*59*,*60*). Having a usual place for health care and routine physician contact can provide important opportunities for providers to educate their patients about vaccine-preventable diseases and recommend and offer vaccination (*61*–*65*).

Nativity

Overall, vaccination coverage was generally lower among the foreign-born compared with U.S.-born persons. Vaccination coverage for the foreign born differed by time lived in the United States. In a previous report (*65*), vaccination also was associated with language used for interview, race/ethnicity, and birth country/region. Among foreign born, vaccination coverage was generally lower among those who were not U.S. citizens, those interviewed in a language other than English, and non-Hispanic blacks or Hispanics compared with U.S. citizens, those interviewed in English, and non-Hispanic whites. The Hispanic foreign born had the lowest coverage for several vaccines. This finding is notable because foreign-born persons from Latin America account for more than half of all foreign-born adults in the United States (*66*–*68*). Vaccination coverage among the foreign born in the United States depends on the vaccinations they received as children or adults premigration, during migration, postmigration, or during return visits to their country of origin. Vaccination coverage and immunization schedules are different in many countries compared with the United States and vary by country and even by regions within countries (*65*,*69*–*71*). Although immigrant visa applicants and refugees destined for permanent resettlement in the United States are subject to ACIP-recommended vaccination requirements, the differences between the United States and other countries in the schedules of routine vaccinations among adults might contribute to differences in the coverage levels of the vaccines studied. In most countries, vaccination programs have focused historically on children (*72*–*74*). Depending on their origin, age at arrival, and year of arrival, foreign-born adults arriving in the United States might have differences in vaccination coverage compared with U.S.-born populations (*75*,*76*). After arrival in the United States, many foreign-born adults experience socioeconomic, cultural, linguistic, and other barriers to accessing health care and preventive services, including vaccination (*66*,*67*,*77*). The percentage of uninsured persons also is higher among non-U.S. citizens, recent immigrants, and those with poor/fair English proficiency (*68*,*78*). These populations might also be less aware of U.S. adult immunization recommendations (*79*). As the size and race/ethnic diversity of the foreign born population in the United States continues to increase, the findings of this and previous studies indicate that this population will be increasingly important to elimination of national adult vaccination disparities (*80*). Public policy makers, vaccination programs, and healthcare providers should consider foreign-born populations in their public health assessment, evaluation, and outreach programs that target disadvantaged groups (*80*).

Improving Adult Vaccination Coverage

Racial/ethnic gaps in coverage persisted for all seven vaccines in this report with higher coverage generally for whites compared with most other groups. Previous research has indicated a variety of factors that contribute to racial/ethnic differences in adult vaccination rates, including patient, provider, and system factors (*81*–*84*). Standardized offering of vaccines reduces these differences (*85*,*86*). Using an intensive combination of patient tracking, vaccination reminders for providers and patients,

and patient outreach and assistance also reduces racial/ethnic vaccination differences (*87*). Incorporating standards for adult vaccination practices, which include routinely assessing vaccination needs during clinical encounters, providing a strong recommendation for vaccination to patients with indications, and then offering vaccination at the visit, can have a substantial impact on reducing vaccination disparities (*25*).

Many factors contribute to low adult vaccination rates, including limited awareness among the public about adult vaccinations, vaccine needs assessment often not routinely included in adult patient care, lack of vaccine requirements for adults, complexities in how adult vaccinations are paid for by private and public insurers, the financial risks for providers to stock vaccines and provide vaccination services, limited funding for programs to vaccinate uninsured adults, and acute medical care taking precedence over preventive services (*6–14*).

The most successful strategies to improve adult immunizations involve organizational change, such as initiating standing orders or protocols to ensure immunization assessment is routinely done and needed vaccines administered when indicated. The Community Preventive Services Task Force has evaluated vaccination interventions and identified effective, evidence-based strategies to improve vaccine use which can be applied to the adult population, including systems interventions, such as the use of standing orders or protocols for vaccinations, provider reminders, and reminders for patients for vaccines that are due (*6*,*24*). Provider recommendation remains an important factor associated with receipt of vaccine (*18*). In addition, ensuring convenient access to vaccination also is important for adults (*88*,*89*). The expanded availability of vaccine services in pharmacies and other retail settings provides an opportunity for patients to receive vaccines not stocked by their medical provider and to obtain vaccines outside of typical office hours (*88*,*89*).

Challenges posed by increasing access to vaccines for adults among a range of providers include vaccine record keeping and ensuring good communication among providers about a patient's vaccination history. Both are essential to ensuring patients receive needed vaccines at recommended intervals and do not receive unnecessary vaccinations. State-based immunization information systems (also known as vaccine registries) are available for entry of adult vaccinations in 47 states (http://www.cdc.gov/vaccines/programs/iis/about.html) and can serve as a central point of access for providers to check for vaccinations received by adult patients and to document vaccinations they provide (*90*). Providers should check with their health department to identify those immunization information systems that have the capacity to enroll adult providers as some systems might be limited in their capacity to substantially expand access to immunization information systems beyond pediatric vaccine providers. Information about and contact information regarding use of IIS is available at http://www.cdc.gov/vaccines/programs/iis/contacts-registry-staff.html.

The use of clinical decision support systems in electronic medical records systems also can facilitate improved vaccination rates. For example, use of prompts in electronic medical records systems for adult vaccines by the Indian Health Service has resulted in substantially higher coverage rates compared to national estimates from the NHIS (*6*).

On the basis of the importance of the provider recommendation, evidence-based strategies for improving vaccine uptake in adults, the recognition that not all medical providers stock all ACIP-recommended vaccines for adults, the need for improved communication among the different health care providers that adults might have and other factors, the National Vaccine Advisory Committee published updated standards for adult immunization practice in 2014 with the intent of improving adult vaccination coverage of ACIP recommended vaccines. This guidance calls on health care providers, including those who do not stock vaccines, to 1) assess the vaccination status of patients at every clinical encounter; 2) recommend needed vaccines for patients; 3) offer recommended vaccines or, for providers who do not stock a needed vaccine, refer patients to a vaccine provider; and 4) document vaccines administered, including in IIS when available for use among adult patients (*25*). Resources to assist providers with implementation of the standards for adult immunization practice are available at http://www.cdc.gov/vaccines/hcp/patient-ed/adults/for-practice/standards/index.html. Additional resources are also available through the National Adult and Influenza Summit (NAIIS) (http://www.izsummitpartners.org) website resource library. NAIIS is a national coalition representing more than 130 public and private organizations interested in improving the use of ACIP-recommended vaccines for adults and influenza vaccine for persons of all ages.

Limitations

The findings in this report are subject to at least seven limitations. First, the NHIS sample excludes persons in the military and those residing in institutions, which might result in underestimation or overestimation of vaccination coverage levels. Second, the response rate was 58.9%. Nonresponse bias can result if respondents and nonrespondents differ in their vaccination rates. Third, the determination of vaccination status and identification of high-risk conditions in NHIS were not validated by medical records. Fourth, self-report of vaccination might be subject to recall bias. Young adults particularly might not be able to recall accurately vaccines received as infants or adolescents. However, adult self-reported vaccination status is

sensitive for all seven vaccines in this report and specific for all except tetanus vaccination (*91*). Fifth, demographic and other characteristics (e.g., insurance status, usual source, and frequency of health care) were self-reported and were not validated. Sixth, the Tdap estimate is subject to considerable uncertainty. Respondents who reported a tetanus vaccination but were unable to say whether Td or Tdap was used during 2005–2014 were excluded from estimations of Tdap coverage, creating a potential for bias. Sensitivity calculations were conducted to assess the magnitude of potential bias. Depending on what proportion of excluded respondents actually received Tdap, actual Tdap coverage could fall within the range of 14.5%–46.9% for adults aged 19–64 years and 9.5%–41.6% for adults aged ≥65 years. Comparisons of Tdap coverage across years within subgroups might be affected by bias resulting from excluding persons who did not report the type of tetanus vaccine they received. Finally, the prevalence of selected behavioral characteristics in populations, including the use of preventive health services, vaccine safety concerns, state laws and vaccination intervention programs, cultural, religious, and other factors might affect vaccination coverage. Although NHIS collects information on use of other preventive health services, this information was not included in this analysis. NHIS did not collect information on these other factors.

Conclusion

Vaccination coverage levels among U.S. adults are low. Improvement in adult vaccination is needed to reduce the health consequences of vaccine-preventable diseases among adults. Awareness of the need for vaccines for adults is low among the general population and adult patients rely on provider recommendations for vaccination (*6–9,11*). Successful vaccination programs combine 1) education of potential vaccine recipients and publicity to promote vaccination; 2) increased access to vaccination services in health care settings; and 3) use of practices that improve vaccination coverage, including reminder-recall systems, efforts to remove administrative and financial barriers to vaccination, use of standing order programs for vaccination, and assessment of practice-level vaccination rates with feedback to staff members (*24*,*25*,*92*). Health care provider recommendations for vaccination are strongly associated with a patient's receipt of vaccines (*10*,*62–64*). Incorporation of routine assessment of adult patient vaccination needs, recommendation, and offer of needed vaccinations for adults into routine clinical care of adults can help improve vaccination rates and narrow widening racial and ethnic disparities in vaccination coverage (*24*,*25*). The adult immunization schedule (*15*), updated annually, provides current recommendations for vaccinating adults and a ready resource for persons who provide health care services for adults in various settings. Assessing associations with vaccination is important for understanding factors that contribute to low coverage rates and to disparities in vaccination, and for implementing strategies to improve vaccination coverage.

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TABLE 1. Estimated proportion of adults aged ≥19 years who received selected vaccinations, by age group, high-risk status,* and race/ethnicity† — National Health Interview Survey, United States, 2014

Vaccination, age group, high-risk status, and race/ethnicity	Sample size	%	(95% CI)	Simple difference from 2013
Influenza vaccination, 2013–14 season§				
≥19 yrs				
Total	**32,296**	**43.2**	**(42.1–44.4)**	**0.5**
White	19,836	46.7	(45.3–48.2)	0.2
Black	4,424	36.5	(34.2–39.0)¶	2.7
Hispanic or Latino	5,341	33.2	(30.8–35.7)¶	2.4
Asian	1,847	44.6	(40.4–49.0)	-3.8
Other	848	38.6	(32.6–45.3)¶	-2.9
19–49 yrs				
Total	**16,454**	**31.5**	**(30.1–32.9)**	**1.1**
White	8,954	32.8	(30.8–34.8)	1.0
Black	2,249	29.8	(26.7–33.0)	3.0
Hispanic or Latino	3,619	27.0	(24.2–30.0)¶	2.7
Asian	1,145	36.0	(31.6–40.8)	-5.6
Other	487	32.4	(24.5–42.0)	-1.7
50–64 yrs				
Total	**8,401**	**47.7**	**(45.7–49.7)**	**-0.3**
White	5,522	49.8	(47.4–52.3)	-0.8
Black	1,304	39.9	(35.5–44.5)¶	3.0
Hispanic or Latino	1,014	40.7	(36.2–45.6)¶	1.5
Asian	347	51.6	(42.3–61.6)	0.3
Other	214	43.9	(31.6–58.5)	-8.3
≥65 yrs				
Total	**7,441**	**71.5**	**(69.6–73.3)**	**-0.2**
White	5,360	73.4	(71.2–75.5)	-0.2
Black	871	60.5	(54.3–66.9)¶	1.3
Hispanic or Latino	708	64.0	(58.2–69.7)¶	-0.3
Asian	355	72.5	(63.2–81.1)	-3.1
Other	147	63.6	(50.7–76.4)	1.2
Pneumococcal vaccination, ever**				
19–64 yrs, high risk				
Total	**9,478**	**20.3**	**(19.0–21.6)**	**-0.9**
White	5,976	21.1	(19.5–22.8)	-1.2
Black	1,450	20.2	(17.6–23.2)	-1.0
Hispanic or Latino	1,403	16.4	(14.1–18.9)¶	-1.5
Asian	300	14.6	(9.9–20.9)¶	3.6
Other	349	25.3	(18.5–33.6)	5.5
≥65 yrs				
Total	**8,281**	**61.3**	**(59.9–62.7)**	**1.6**
White	6,054	64.7	(63.1–66.3)	1.1
Black	955	49.8	(45.4–54.1)¶	1.1
Hispanic or Latino	739	45.2	(40.8–49.7)¶	6.1
Asian	372	47.7	(41.3–54.2)¶	2.4
Other	161	69.4	(57.7–79.1)	14.8
Tetanus vaccination (received in past 10 years)††				
≥19 yrs				
Total	**34,347**	**62.2**	**(61.4–63.1)**	**0.3**
White	21,443	67.3	(66.3–68.2)	0.8
Black	4,591	50.7	(48.7–52.7)¶	-1.6
Hispanic or Latino	5,601	52.1	(50.5–53.8)¶	-0.2
Asian	1,839	50.5	(47.2–53.7)¶	-1.1
Other	873	71.4	(66.6–75.8)	3.8

See table footnotes on page 22.

TABLE 1. (*Continued*) Estimated proportion of adults aged ≥19 years who received selected vaccinations, by age group, high-risk status,* and race/ethnicity† — National Health Interview Survey, United States, 2014

Vaccination, age group, high-risk status, and race/ethnicity	Sample size	%	(95% CI)	Simple difference from 2013
19–49 yrs				
Total	**17,231**	**62.6**	**(61.5–63.7)**	**-0.3**
White	9,526	69.0	(67.7–70.3)	0
Black	2,319	52.8	(50.1–55.6)¶	-1.3
Hispanic or Latino	3,769	51.9	(49.9–53.9)¶	-0.6
Asian	1,110	51.8	(47.5–56.1)¶	-0.9
Other	507	72.0	(66.0–77.3)	6.0
50–64 yrs				
Total	**9,024**	**64.7**	**(63.1–66.1)**	**0.7**
White	6,012	69.5	(67.7–71.2)	2.1
Black	1,325	49.9	(46.1–53.6)¶	-4.5
Hispanic or Latino	1,104	54.6	(51.3–57.8)¶	-0.4
Asian	373	49.1	(41.8–56.4)¶	-4.3
Other	210	74.9	(66.1–82.1)	5.1
≥65 yrs				
Total	**8,092**	**57.7**	**(56.3–59.2)**	**1.4**
White	5,905	60.6	(58.9–62.3)	1.1
Black	947	43.1	(39.4–47.0)¶	2.8
Hispanic or Latino	728	49.1	(44.7–53.6)¶	3.9
Asian	356	46.6	(40.2–53.1)¶	3.8
Other	156	63.1	(51.9–73.0)	-9.3
Tetanus vaccination including pertussis vaccine (received in past 9 yrs)§§				
≥19 yrs				
Total	**22,867**	**20.1**	**(19.3–20.8)**	**2.9¶¶**
White	13,743	23.8	(22.8–24.8)	4.1¶¶
Black	3,212	11.6	(10.1–13.3)¶	-1.0
Hispanic or Latino	3,945	12.4	(11.2–13.8)¶	2.3¶¶
Asian	1,366	15.5	(13.2–18.2)¶	0.1
Other	601	27.4	(22.2–33.3)	5.0
Living with an infant aged <1 yr	707	32.0	(27.7–36.6)	2.6
Not living with an infant aged <1 yr	22,160	19.6	(18.8–20.4)	2.9¶¶
19–64 yrs				
Total	**17,503**	**21.5**	**(20.6–22.3)**	**3.1¶¶**
White	9,957	26.1	(25.0–27.3)	4.5¶¶
Black	2,542	12.7	(10.9–14.6)¶	-1.0
Hispanic or Latino	3,422	13.0	(11.6–14.6)¶	2.6¶¶
Asian	1,094	15.6	(13.2–18.3)¶	-0.6
Other	488	28.6	(23.0–35.0)	5.8
Living with an infant aged <1 yr	692	32.5	(28.1–37.1)	2.9
Not living with an infant aged <1 yr	16,811	20.9	(20.1–21.8)	3.1¶¶
≥65 yrs				
Total	**5,364**	**14.0**	**(12.7–15.5)**	**2.2**
White	3,786	15.7	(14.1–17.6)	2.8¶¶
Black	670	5.0	(3.6–7.0)¶	-1.5
Hispanic or Latino	523	6.6	(4.5–9.5)¶	-0.8
Asian	272	15.2	(10.2–22.1)	4.1
Other	113	20.1	(11.6–32.5)	1.8
Living with an infant aged <1 yr	15	—***	—	—
Not living with an infant aged <1 yr	5,349	14.0	(12.7–15.5)	2.2

See table footnotes on page 22.

TABLE 1. (*Continued*) Estimated proportion of adults aged ≥19 years who received selected vaccinations, by age group, high-risk status,* and race/ethnicity† — National Health Interview Survey, United States, 2014

Vaccination, age group, high-risk status, and race/ethnicity	Sample size	%	(95% CI)	Simple difference from 2013
Hepatitis A vaccination (at least 2 doses), ever†††				
≥19 yrs				
Total	**31,392**	**9.0**	**(8.5–9.5)**	**-0.1**
Traveler§§§	9,781	16.0	(14.9–17.0)	0.1
Nontraveler¶¶¶	21,570	5.5	(5.0–6.0)****	-0.2
With chronic liver conditions, overall	422	13.8	(10.0–18.8)	0.5
19–49 yrs				
Total	**15,069**	**12.1**	**(11.3–12.9)**	**-0.2**
White	8,292	12.7	(11.7–13.9)	0.2
Black	2,063	11.1	(9.5–13.0)	0.1
Hispanic or Latino	3,323	9.6	(8.1–11.2)¶	-1.1
Asian	957	15.2	(12.4–18.4)	-0.9
Other	434	14.7	(10.5–20.2)	-0.5
Traveler	5,487	18.8	(17.4–20.4)	0.1
Nontraveler	9,564	8.1	(7.4–8.9)****	-0.5
With chronic liver conditions, overall	100	18.2	(10.3–30.0)	3.7
≥50 yrs				
Total	**16,323**	**5.5**	**(5.1–6.0)**	**0.2**
Traveler	4,294	11.9	(10.8–13.2)	0.2
Nontraveler	12,006	2.9	(2.5–3.4)****	0.1
With chronic liver conditions, overall	322	12.3	(8.3–17.9)	-0.4
Hepatitis B vaccination (at least 3 doses), ever††††				
≥19 yrs				
Total	**32,571**	**24.5**	**(23.8–25.3)**	**-0.5**
Traveler	10,442	30.5	(29.2–31.8)	-2.6¶¶
Nontraveler	22,088	21.4	(20.5–22.3)****	0.5
With chronic liver conditions, overall	448	29.8	(23.9–36.5)	-4.2
19–49 yrs				
Total	**15,987**	**32.2**	**(31.2–33.3)**	**-0.4**
White	8,839	36.3	(34.9–37.8)	1.1
Black	2,160	29.9	(27.4–32.5)¶	-0.6
Hispanic or Latino	3,495	20.2	(18.2–22.3)¶	-3.5¶¶
Asian	1,025	35.6	(32.1–39.2)	-3.7
Other	468	33.5	(27.9–39.7)	-1.3
Traveler	5,963	36.9	(35.2–38.7)	-2.8¶¶
Nontraveler	10,007	29.4	(28.1–30.7)****	1.0
With chronic liver conditions, overall	116	41.6	(30.3–53.8)	2.1
≥50 yrs				
Total	**16,584**	**15.7**	**(14.9–16.4)**	**-0.4**
Traveler	4,479	21.2	(19.7–22.7)	-2.1
Nontraveler	12,081	13.3	(12.4–14.2)****	0.2
With chronic liver conditions, overall	332	25.1	(18.9–32.6)	-6.2
With diabetes, overall				
19–59 yrs	**1,367**	**23.5**	**(20.7–26.7)**	**-2.8**
≥60 yrs	**2,097**	**13.5**	**(11.4–16.0)**	**-0.3**

See table footnotes on page 22.

TABLE 1. (*Continued*) Estimated proportion of adults aged ≥19 years who received selected vaccinations, by age group, high-risk status,* and race/ethnicity† — National Health Interview Survey, United States, 2014

Vaccination, age group, high-risk status, and race/ethnicity	Sample size	%	(95% CI)	Simple difference from 2013
Herpes zoster (shingles) vaccination, ever§§§§				
≥60 yrs				
Total	**11,263**	**27.9**	**(26.6–29.1)**	**3.6¶¶**
White	8,153	32.0	(30.5–33.5)	4.6¶¶
Black	1,352	11.6	(9.6–13.8)¶	0.9
Hispanic or Latino	1,037	14.6	(12.2–17.5)¶	5.2¶¶
Asian	492	16.5	(12.9–20.8)¶	-6.1
Other	229	16.2	(9.9–25.3)¶	-8.3
60–64 yrs				
Total	**2,912**	**20.4**	**(18.4–22.5)**	**2.2**
White	2,038	24.3	(21.9–26.9)	3.4
Black	394	8.1	(5.1–12.5)¶	0.3
Hispanic or Latino	294	11.2	(7.6–16.3)¶	3.7
Asian	118	—	—	—
Other	68	—	—	—
≥65 yrs				
Total	**8,351**	**31.1**	**(29.6–32.6)**	**4.3¶¶**
White	6,115	35.0	(33.3–36.9)	5.1¶¶
Black	958	13.5	(11.0–16.4)¶	1.3
Hispanic or Latino	743	16.3	(13.2–20.1)¶	5.9¶¶
Asian	374	20.7	(16.3–26.1)¶	-4.2
Other	161	19.6	(11.2–32.0)¶	-6.3
HPV vaccination among females (at least 1 dose), ever¶¶¶¶				
19–21 yrs				
Total	**613**	**44.8**	**(37.3–52.6)**	**0.2**
22–26 yrs				
Total	**1,427**	**37.6**	**(34.2–41.2)**	**5.3¶¶**
19–26 yrs				
Total	**2,040**	**40.2**	**(36.6–44.0)**	**3.4**
White	1,137	46.3	(40.9–51.7)	4.5
Black	279	37.4	(30.6–44.6)	6.8
Hispanic or Latino	408	28.1	(22.6–34.3)¶	-2.3
Asian	137	22.8	(15.4–32.2)¶	2.9
Other	79	47.3	(31.3–63.9)	4.2
HPV vaccination among males (at least 1 dose), ever¶¶¶¶				
19–26 yrs				
Total	**1,895**	**8.2**	**(6.6–10.3)**	**2.3**
19–21 yrs				
Total	**596**	**13.3**	**(9.7–18.0)**	**5.6¶¶**
22–26 yrs				
Total	**1,299**	**5.4**	**(4.0–7.2)**	**0.4**
HPV vaccination among females (at least 1 dose), ever¶¶¶¶ who reported first HPV dose at age 19–26 yrs***				
Total	**1,420**	**11.8**	**(9.8–14.3)**	**-2.1**
White	734	13.9	(10.8–17.7)	-2.1
Black	208	14.1	(9.2–21.1)	1.8
Hispanic or Latino	314	7.4	(4.6–11.6)¶	-2.8
Asian	113	—	—	—
Other	51	—	—	—

See table footnotes on page 22.

TABLE 1. (*Continued*) Estimated proportion of adults aged ≥19 years who received selected vaccinations, by age group, high-risk status,* and race/ethnicity† — National Health Interview Survey, United States, 2014

Vaccination, age group, high-risk status, and race/ethnicity	Sample size	%	(95% CI)	Simple difference from 2013
HPV vaccination among males (at least 1 dose), ever¶¶¶¶ who reported first HPV dose at age 19–26 yrs***				
Total	**1,781**	**2.3**	**(1.5–3.5)**	**0.6**
White	999	2.0	(1.1–3.4)	0.1
Black	215	—	—	—
Hispanic or Latino	372	—	—	—
Asian	124	—	—	—
Other	71	—	—	—

Abbreviations: CI = confidence interval; HPV = human papillomavirus; Td = tetanus-diphtheria toxoid; Tdap = tetanus, diphtheria, and acellular pertussis vaccine.

* Adults were considered at high risk for pneumococcal disease if they had ever been told by a doctor or other health professional that they had diabetes, emphysema, chronic obstructive pulmonary disease, coronary heart disease, angina, heart attack, or other heart condition; had a diagnosis of cancer during the previous 12 months (excluding nonmelanoma skin cancer); had ever been told by a doctor or other health professional that they had lymphoma, leukemia, or blood cancer; had been told by a doctor or other health professional that they had chronic bronchitis or weak or failing kidneys during the preceding 12 months; had an asthma episode or attack during the preceding 12 months; or were current smokers. For hepatitis A and hepatitis B vaccination, data were collected on selected respondent characteristics that increase the risk for infection (travel to countries where hepatitis A infections are endemic and having chronic liver disease; having diabetes, travel to countries where hepatitis B infections are endemic, and having chronic liver disease, respectively).

† Race/ethnicity was categorized as follows: Hispanic, black, white, Asian and "other." In this report, persons identified as Hispanic might be of any race. Persons identified as black, white, Asian, or other race are non-Hispanic. "Other" includes American Indian/Alaska Native and multiple race. The five racial/ethnic categories are mutually exclusive.

§ Respondents were asked if they had received an influenza shot or nasal spray in the past 12 months and if so, in which month and year. Missing month and year were imputed (3.1%) and interviews conducted during August 2013–June 2014 were used to estimate vaccination coverage during July 2013–May 2014 using Kaplan–Meier survival analysis. Differences were measured as the simple difference between the 2012–13 and 2013–14 influenza seasons.

¶ p<0.05 by T test for comparisons with non-Hispanic white as the reference.

TABLE 1. (*Continued*) Estimated proportion of adults aged ≥19 years who received selected vaccinations, by age group, high-risk status,* and race/ethnicity† — National Health Interview Survey, United States, 2014

** Respondents were asked if they had ever had a pneumonia shot.

†† Respondents were asked if they had received a tetanus shot in the past 10 years. Vaccinated respondents included adults who received Td during the past 10 years or Tdap during 2005–2014.

§§ Respondents who had received a tetanus shot in the past 10 years were asked if their most recent shot was given in 2005 or later. Respondents who had received a tetanus shot since 2005 were asked if they were told that their most recent tetanus shot included the pertussis or whooping cough vaccine. Among 36,324 respondents aged ≥19 yrs, those without a "yes" or "no" classification for tetanus vaccination status within the preceding 10 years (n = 1,977 [5.4%]), for tetanus vaccination status during 2005–2014 (n = 1,098 [3.0%]), or those who reported tetanus vaccination during 2005–2014, but were not told vaccine type by the provider (n = 8,612 [23.7%]), did not know vaccine type (Td or Tdap) (n = 1,765 [4.9%]), or refused to answer or for whom data were not obtained (n=5 [0.01%]) were excluded, yielding a sample of 22,867 respondents aged ≥19 years for whom Tdap vaccination status could be assessed. In February 2012, ACIP recommended Tdap vaccination for all adults aged ≥19 years, including adults aged ≥65 years.

¶¶ p<0.05 by T test for comparisons between 2014 and 2013 within each level of each characteristic.

*** Estimate is not reliable due to small sample size (n<30) or relative standard error (standard error/estimates) >0.3.

††† Respondents were asked if they had ever received the hepatitis A vaccine, and if yes, were asked how many doses were received.

§§§ Had traveled outside the United States to countries other than countries in Europe, Japan, Australia, New Zealand, or Canada since 1995.

¶¶¶ Had not traveled outside the United States to countries other than countries in Europe, Japan, Australia, New Zealand, or Canada since 1995.

**** p<0.05 by T test for comparisons between persons who had traveled outside the United States to countries other than countries in Europe, Japan, Australia, New Zealand, or Canada since 1995 and persons who had not traveled outside the United States to these areas since 1995.

†††† Respondents were asked if they had ever received the hepatitis B vaccine, and if yes, if they had received at least 3 doses or less than 3 doses.

§§§§ Respondents were asked if they had ever received a shingles vaccine.

¶¶¶¶ Respondents were asked if they had ever received the HPV shot or cervical cancer vaccine, and if yes, age at the first dose.

***** The denominator includes persons aged 19–26 years without HPV vaccination prior to age 19 years, and the numerator includes those in the denominator who reported first HPV dose at age 19–26 years.

TABLE 2. Estimated proportion of health care personnel* who received selected vaccinations, by race/ethnicity† — National Health Interview Survey, United States, 2014

Vaccination and race/ethnicity	Sample size	%	(95% CI)	Simple difference from 2013
Influenza vaccination, 2013–14 season§				
≥19 yrs				
Total	**2,636**	**65.4**	**(61.0–69.9)**	**-1.9**
White	1,729	67.6	(61.7–73.4)	-2.7
Black	406	50.3	(42.9–58.2)¶	-1.8
Hispanic or Latino	288	65.6	(53.3–77.7)	6.1
Asian	157	77.7	(63.9–89.0)	-2.6
Other	56	60.3	(37.1–84.1)	-0.4
19–49 yrs				
Total	**1,590**	**61.7**	**(55.3–68.1)**	**-1.5**
White	947	63.4	(54.6–72.2)	0.3
Black	268	48.0	(38.8–58.1)¶	-7.4
Hispanic or Latino	222	67.3	(50.8–82.9)	12.7
Asian	109	75.3	(62.6–86.4)	-8.7
Other	44	61.0	(36.6–85.7)	-8.0
50–64 yrs				
Total	**770**	**71.1**	**(65.8–76.3)**	**-2.7**
White	556	72.1	(66.0–77.9)	-8.9**
Black	117	58.5	(43.6–74.0)	19.5
Hispanic or Latino	53	77.9	(60.0–91.7)	8.1
Asian	37	78.8	(48.4–97.4)	22.3
Other	7	—††	—	—
≥65 yrs				
Total	**276**	**75.2**	**(66.6–83.0)**	**-3.2**
White	226	79.6	(70.8–87.2)	1.7
Black	21	—	—	—
Hispanic or Latino	13	—	—	—
Asian	11	—	—	—
Other	5	—	—	—
Tetanus vaccination including pertussis vaccine, past 9 years§§				
≥19 yrs				
Total	**2,062**	**42.1**	**(39.1–45.0)**	**4.7**
White	1,353	46.4	(42.7–50.2)	6.5**
Black	315	24.8	(18.8–31.9)¶	-7.4
Hispanic or Latino	218	35.8	(27.8–44.7)¶	6.3
Asian	120	41.2	(29.9–53.5)	8.5
Other	56	39.5	(24.3–57.1)	-7.3
19–64 yrs				
Total	**1,863**	**43.0**	**(40.0–46.1)**	**5.1**
White	1,194	47.9	(44.0–51.8)	7.1**
Black	299	25.0	(18.9–32.3)¶	-8.3
Hispanic or Latino	208	36.4	(28.2–45.4)¶	7.8
Asian	109	42.0	(30.3–54.7)	8.2
Other	53	39.6	(24.0–57.7)	-9.2
≥65 yrs				
Total	**199**	**28.7**	**(21.2–37.6)**	**-2.0**
White	159	29.6	(20.9–40.0)	-2.8
Black	16	—	—	—
Hispanic or Latino	10	—	—	—
Asian	11	—	—	—
Other	3	—	—	—

TABLE 2. (*Continued*) Estimated proportion of health care personnel* who received selected vaccinations, by race/ethnicity† — National Health Interview Survey, United States, 2014

Vaccination and race/ethnicity	Sample size	%	(95% CI)	Simple difference from 2013
Hepatitis B vaccination (at least 3 doses), ever¶¶				
≥19 yrs				
Total	2,757	60.7	(58.1–63.2)	-1.0
White	1,822	63.0	(59.7–66.3)	0.1
Black	420	51.4	(45.6–57.1)¶	-7.5
Hispanic or Latino	295	51.1	(43.2–59.0)¶	-2.9
Asian	154	68.2	(58.7–76.5)	-0.7
Other	66	60.8	(44.7–74.8)	4.8

Abbreviations: CI = confidence interval; Td = tetanus-diphtheria toxoid; Tdap = tetanus, diphtheria, and acellular pertussis vaccine.

* Adults were classified as health care personnel if they reported they currently volunteer or work in a hospital, medical clinic, doctor's office, dentist's office, nursing home or some other health care facility including part-time and unpaid work in a health care facility as well as professional nursing care provided in the home.

† Race/ethnicity was categorized as follows: Hispanic, black, white, Asian and "other." In this report, persons identified as Hispanic might be of any race. Persons identified as black, white, Asian, or other race are non-Hispanic. "Other" includes American Indian/Alaska Native and multiple race. The five racial/ethnic categories are mutually exclusive.

§ Respondents were asked if they had received an influenza shot or nasal spray in the past 12 months and if so, in which month and year. Missing month and year were imputed (3.1%), and interviews conducted during August 2013–June 2014 were used to estimate vaccination coverage during July 2013–May 2014 using Kaplan-Meier survival analysis. Differences were measured as the simple difference between the 2012–13 and 2013–14 influenza seasons.

¶ p<0.05 by T test for comparisons with non-Hispanic white as the reference.

** p<0.05 by T test for comparisons between 2014 and 2013 within each level of each characteristic.

†† Estimate is not reliable due to small sample size (n<30) or relative standard error (standard error/estimates) >0.3.

§§ Respondents who had received a tetanus shot in the past 10 years were asked if their most recent shot was given in 2005 or later. Respondents who had received a tetanus shot since 2005 were asked if they were told that their most recent tetanus shot included the pertussis or whooping cough vaccine. Among 2,933 health care personnel aged ≥19 years, those without a "yes" or "no" classification for tetanus vaccination status within the preceding 10 years (n = 68 [2.3%]), for tetanus vaccination status during 2005–2014 (n = 75 [2.6%]), or those who reported tetanus vaccination during 2005–2014, but were not told vaccine type by the provider (n = 608 [20.7%]) or did not know vaccine type (Td or Tdap) (n = 120 [4.1%]) were excluded, yielding a sample of 2,062 respondents aged ≥19 years for whom Tdap vaccination status could be assessed. In February 2012, ACIP recommended Tdap vaccination for all adults aged ≥19 years, including adults aged ≥65 years.

¶¶ Respondents were asked if they had ever received the hepatitis B vaccine, and if yes, if they had received at least 3 doses or less than 3 doses.

TABLE 3. Estimated proportion of health care personnel* with direct patient care responsibilities who received selected vaccinations, by race/ethnicity — National Health Interview Survey, United States, 2014

Vaccination, direct patient care responsibilities,† and race/ethnicity§	Sample size	%	(95% CI)	Simple difference from 2013
Influenza vaccination, 2013–14 season¶				
≥19 yrs, with direct patient care responsibilities				
Total	**1,620**	**65.1**	**(58.6–71.6)**	**-2.9**
White	1,037	65.6	(56.7–74.3)	-6.4
Black	268	52.9	(43.8–62.5)	4.3
Hispanic or Latino	175	74.8	(57.8–89.0)	20.8**
Asian	105	79.8	(62.9–92.5)	-6.2
Other	35	60.7	(32.0–89.5)	-4.4
≥19 yrs, without direct patient care responsibilities				
Total	**1,016**	**66.0**	**(59.9–72.1)**	**-0.1**
White	692	70.7	(63.3–77.8)	3.0
Black	138	43.9	(33.8–55.4)††	-11.9
Hispanic or Latino	113	52.6	(35.8–71.6)	-16.9
Asian	52	72.3	(50.6–90.3)	0.1
Other	21	—§§	—	—
Tetanus vaccination including pertussis vaccine, past 9 years¶¶				
≥19 yrs, with direct patient care responsibilities				
Total	**1,355**	**47.5**	**(43.9–51.2)**	**5.6**
White	880	52.4	(47.9–56.8)	7.6**
Black	220	28.9	(21.8–37.2)††	-7.7
Hispanic or Latino	139	43.5	(33.0–54.7)	8.5
Asian	82	45.1	(30.6–60.5)	10.7
Other	34	46.4	(25.7–68.3)	-7.0
≥19 yrs, without direct patient care responsibilities				
Total	**707**	**31.6**	**(26.9–36.8)*** **	**2.0**
White	473	35.5	(29.2–42.4)***	3.4
Black	95	—	—	—
Hispanic or Latino	79	22.8	(12.5–38.1)***	3.5
Asian	38	33.6	(18.2–53.7)	4.3
Other	22	—	—	—
Hepatitis B vaccination (at least 3 doses), ever†††				
≥19 yrs, with direct patient care responsibilities				
Total	**1,754**	**67.7**	**(63.8–71.4)**	**-5.0**
White	1,140	70.9	(65.6–75.8)	-3.8
Black	287	56.6	(49.6–63.3)††	-11.2**
Hispanic or Latino	178	59.4	(48.1–69.7)	-5.6
Asian	107	69.2	(56.8–79.3)	-4.1
Other	42	70.2	(52.4–83.5)	-7.8
≥19 yrs, without direct patient care responsibilities				
Total	**1,003**	**47.6**	**(43.6–51.7)*** **	**2.5**
White	682	49.1	(43.7–54.4)***	4.0
Black	133	38.4	(29.4–48.3)***	-7.8
Hispanic or Latino	117	38.7	(29.0–49.4)***	2.7
Asian	47	66.2	(48.3–80.4)	3.7
Other	24	—	—	—§§

TABLE 3. (*Continued*) Estimated proportion of health care personnel* with direct patient care responsibilities who received selected vaccinations, by race/ethnicity — National Health Interview Survey, United States, 2014

Abbreviations: CI = confidence interval; HCP = health care personnel; Td = tetanus-diphtheria toxoid; Tdap = tetanus, diphtheria, and acellular pertussis vaccine.

* Adults were classified as HCP if they reported that they currently volunteer or work in a hospital, medical clinic, doctor's office, dentist's office, nursing home or some other health care facility including part-time and unpaid work in a health care facility as well as professional nursing care provided in the home.

† HCP were classified as having direct patient care responsibilities if they reported providing direct patient care (physical or hands-on contact with patients) as part of their routine work.

§ Race/ethnicity was categorized as follows: Hispanic, black, white, Asian and "other." In this report, persons identified as Hispanic might be of any race. Persons identified as black, white, Asian, or other race are non-Hispanic. "Other" includes American Indian/Alaska Native and multiple race. The five racial/ethnic categories are mutually exclusive.

¶ Respondents were asked if they had received an influenza shot or nasal spray in the past 12 months and if so, in which month and year. Missing month and year were imputed (3.1%), and interviews conducted during August 2013–June 2014 were used to estimate vaccination coverage during July 2013–May 2014 using Kaplan-Meier survival analysis. Differences were measured as the simple difference between the 2012–13 and 2013–14 influenza seasons.

** p<0.05 by T test for comparisons between 2014 and 2013 within each level of each characteristic.

†† p<0.05 by T test for comparisons with non-Hispanic white as the reference.

§§ Estimate is not reliable due to small sample size (n<30) or relative standard error (standard error/estimates) >0.3.

¶¶ Respondents who had received a tetanus shot in the past 10 years were asked if their most recent shot was given in 2005 or later. Respondents who had received a tetanus shot since 2005 were asked if they were told that their most recent tetanus shot included the pertussis or whooping cough vaccine. Among 2,933 HCP aged ≥19 years, those without a "yes" or "no" classification for tetanus vaccination status within the preceding 10 years (n = 68 [2.3%]), for tetanus vaccination status during 2005–2014 (n = 75 [2.6%]), or those who reported tetanus vaccination during 2005–2014, but were not told vaccine type by the provider (n = 608 [20.7%]) or did not know vaccine type (Td or Tdap) (n = 120 [4.1%]) were excluded, yielding a sample of 2,062 respondents aged ≥19 years for whom Tdap vaccination status could be assessed. In February 2012, ACIP recommended Tdap vaccination for all adults aged ≥19 years, including adults aged ≥65 years.

*** p<0.05 by T test for comparisons between HCP with direct patient care responsibilities and HCP without direct patient care responsibilities.

††† Respondents were asked if they had ever received the hepatitis B vaccine, and if yes, if they had received at least 3 doses or less than 3 doses.

TABLE 4. Type of tetanus vaccine received, and proportion that were tetanus, diphtheria, acellular pertussis (Tdap) vaccine, among adults aged ≥19 years, by selected characteristics — National Health Interview Survey, United States, 2014

	Type of tetanus toxoid-containing vaccine received during 2005–2014									Proportion that was Tdap of the total tetanus toxoid-containing vaccine received during 2005–2014*		
		Received Tdap		Received other tetanus vaccine		Doctor did not inform patient		Could not recall vaccine type				
Characteristic	No. in sample	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	No. in sample	%	(95% CI)
Age group (yrs)												
≥19												
Total	**16,823**	**26.2**	**(25.2–27.3)**	**11.2**	**(10.4–12.0)**	**51.3**	**(49.9–52.8)**	**11.3**	**(10.3–12.3)**	**6,437**	**70.1**	**(68.2–72.0)**
HCP†	1,800	46.6	(43.3–50.0)	11.2	(9.2–13.6)	35.1	(30.7–39.7)	7.1	(5.4–9.3)	1,072	80.6§	(77.2–83.6)
Non-HCP	15,009	23.8	(22.7–24.9)	11.2	(10.4–12.1)	53.3	(51.8–54.7)	11.7	(10.8–12.8)	5,363	68.0	(65.9–70.1)
19–64												
Total	**13,364**	**27.4**	**(26.3–28.6)**	**11.4**	**(10.5–12.3)**	**50.0**	**(48.5–51.5)**	**11.2**	**(10.2–12.3)**	**5,358**	**70.7**	**(68.6–72.7)**
HCP	1,614	48.3	(44.7–51.9)	11.3	(9.2–13.7)	33.5	(28.9–38.3)	7.0	(5.2–9.2)	996	81.1§	(77.8–84.1)
Non–HCP	11,738	24.6	(23.4–25.8)	11.4	(10.4–12.4)	52.2	(50.7–53.8)	11.8	(10.8–12.9)	4,360	68.4	(66.0–70.7)
≥65												
Total	**3,459**	**20.5**	**(18.6–22.6)**	**10.3**	**(8.9–11.9)**	**57.7**	**(55.2–60.2)**	**11.4**	**(10.0–13.1)**	**1,079**	**66.5**	**(62.3–70.5)**
HCP	186	27.2	(19.8–36.0)	10.6	(6.1–17.7)	53.3	(44.2–62.2)	8.9	(4.1–18.2)	76	71.9	(57.1–83.1)
Non-HCP	3,271	20.2	(18.2–22.3)	10.3	(8.9–11.9)	58.0	(55.5–60.5)	11.5	(10.0–13.2)	1,003	66.2	(61.8–70.3)

Abbreviations: CI = confidence interval; HCP = health care personnel; Td = tetanus-diphtheria toxoid; Tdap = tetanus, diphtheria, and acellular pertussis vaccine.

* Calculated by dividing the number of respondents who reported receiving Tdap by the sum of those who reported receiving Tdap and those who reported receiving other tetanus vaccination; respondents who reported that the doctor did not inform them of the vaccine type they received and those who could not recall the vaccine type were excluded.

† Adults were classified as HCP if they reported they currently volunteer or work in a hospital, medical clinic, doctor's office, dentist's office, nursing home or some other health care facility including part-time and unpaid work in a health care facility as well as professional nursing care provided in the home.

§ $p<0.05$ by T test for comparisons between HCP and non–HCP.

TABLE 5. Age at first dose of human papillomavirus vaccination* and difference between age at interview† among adults aged 19–26 years — National Health Interview Survey, 2014, United States

	Female (N = 811)		Male (N = 159)	
Characteristic	**No.**	**Weighted %**	**No.**	**Weighted %**
Age at first dose (yrs)				
8–10	**21**	**2.1**	**18**	**13.0**
8	7	0.8	8	6.4
9	6	0.5	2	0.1
10	8	0.8	8	6.5
11–12	**37**	**7.4**	**9**	**3.5**
11	5	0.6	2	0.6
12	32	6.8	7	2.9
13–17	**443**	**58.1**	**45**	**33.1**
13	55	6.4	8	3.2
14	65	7.1	4	1.2
15	86	11.7	7	5.1
16	147	22.6	12	10.0
17	90	10.4	14	13.5
18	**119**	**12.5**	**42**	**24.4**
19–26	**191**	**19.9**	**45**	**25.9**
19	49	6.5	9	7.3
20	49	4.3	12	8.4
21	28	2.8	4	2.8
22	18	1.4	8	3.0
23	20	2.3	7	1.9
24	19	1.9	2	0.8
25	6	0.5	2	0.3
26	2	0.2	1	1.5
Difference between age at interview and age at first dose (yrs)				
0	14	2.0	10	3.2
1	32	3.7	19	10.8
2	55	5.4	23	21.5
3	72	11.9	13	10.4
4	90	11.2	25	16.2
5	97	11.1	10	6.5
6	111	11.7	13	5.7
7	130	15.5	15	7.8
8	86	14.4	4	1.9
9	52	5.9	3	2.2
10	31	3.8	1	0
11	15	1.2	4	5.2
12	10	0.9	7	2.4
13	8	0.5	7	4.3
14	6	0.6	2	1.0
15	1	0.1	0	0
16	1	0	1	0.6
17	0	0	1	0
18	0	0	1	0.3

Abbreviation: HPV = human papillomavirus.

* Respondents were asked, "How old were you when you received your first HPV shot?"

† The simple difference between age reported at time of interview and age the respondent indicated the first dose of the HPV vaccine was received. A difference of "zero" indicates that a respondent's reported age at first dose was the same as their age at interview.

TABLE 6. Estimated proportion of adults aged ≥19 years who received selected vaccinations, by age group, high-risk status,* and health insurance status† — National Health Interview Survey, United States, 2014

	With health insurance						Without health insurance	
	Overall		Public		Private			
Vaccination, age group, high-risk status	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Influenza vaccination (2013–14 season)§								
≥19 yrs	48.0	(46.8–49.2)¶	54.3	(52.3–56.3)¶,**	45.7	(44.2–47.2)¶	15.9	(14.2–17.9)
19–49 yrs	35.9	(34.3–37.6)¶	37.0	(33.2–41.0)¶	35.7	(33.9–37.6)¶	14.3	(12.4–16.5)
50–64 yrs	51.3	(49.1–53.5)¶,††	54.2	(50.3–58.2)¶,††	50.5	(47.9–53.2)¶,††	20.4	(16.6–24.8)††
≥65 yrs	72.0	(70.1–73.8)¶,††	70.2	(67.5–72.8)¶,††	73.7	(71.0–76.4)¶,††	35.1	(22.3–52.5)††
Pneumococcal vaccination, ever§§								
19–64 yrs, high risk	22.5	(21.1–23.9)¶	29.2	(26.8–31.8)¶,**	19.5	(17.8–21.2)¶	11.0	(9.3–13.1)
≥65 yrs	61.7	(60.2–63.1)¶,††	58.3	(56.4–60.3)¶,**,††	64.9	(62.8–66.8)¶,††	24.3	(14.1–38.7)††
Tetanus vaccination, past 10 years¶¶								
≥19 yrs	63.9	(63.0–64.7)¶	58.2	(56.7–59.8)¶,**	65.8	(64.8–66.8)¶	52.0	(50.0–54.0)
19–49 yrs	65.0	(63.7–66.1)¶	61.7	(59.0–64.3)¶,**	65.7	(64.4–67.0)¶	52.5	(50.2–54.8)
50–64 yrs	66.5	(64.9–68.1)¶	60.7	(57.7–63.7)¶,**	68.0	(66.1–69.8)¶,††	50.7	(46.8–54.6)
≥65 yrs	57.9	(56.5–59.4)¶,††	53.8	(51.7–55.8)¶,**,††	61.9	(59.9–63.9)¶,††	37.1	(24.8–51.4)††
Tetanus vaccination including pertussis vaccine, past 9 years***								
≥19 yrs	21.5	(20.7–22.3)¶	17.1	(15.7–18.6)¶,**	23.1	(22.1–24.1)¶	11.5	(10.0–13.2)
19–64 yrs	23.5	(22.6–24.5)¶	20.6	(18.5–22.8)¶,**	24.3	(23.2–25.3)¶	11.5	(10.0–13.2)
≥65 yrs	14.1	(12.8–15.5)††	12.3	(10.5–14.2)**,††	16.0	(14.0–18.2)††	—†††	—
Hepatitis A vaccination (at least 2 doses), ever§§§								
≥19 yrs, all adults	9.2	(8.7–9.8)¶	7.6	(6.8–8.5)**	9.8	(9.1–10.4)¶	7.6	(6.6–8.7)
≥19 yrs, traveler¶¶¶	16.7	(15.6–17.8)¶	15.7	(13.2–18.6)¶	16.9	(15.7–18.1)¶	11.0	(8.5–14.1)
Hepatitis B vaccination (at least 3 doses), ever****								
≥19 yrs, all adults	25.2	(24.4–26.0)¶	19.5	(18.2–20.9)**	27.2	(26.3–28.2)¶	20.2	(18.4–22.1)
19–49 yrs	34.6	(33.4–35.8)¶	32.5	(29.7–35.4)¶	35.1	(33.8–36.4)¶	22.8	(20.7–25.1)
≥19 yrs, traveler	31.5	(30.1–32.8)¶	26.7	(24.0–29.6)**	32.5	(31.0–34.0)¶	23.2	(20.1–26.6)
≥19 yrs, with chronic liver conditions	29.1	(23.0–36.1)	20.6	(14.0–29.1)**	36.4	(27.5–46.5)	37.0	(21.3–56.0)
≥19 yrs, with diabetes	18.2	(16.4–20.3)	14.3	(12.2–16.6)**	21.4	(18.6–24.5)¶	14.1	(9.3–20.8)
19–59 yrs, with diabetes	25.1	(22.0–28.6)¶	22.0	(17.5–27.3)¶	26.8	(22.7–31.4)¶	12.9	(7.8–20.6)
≥60 yrs, with diabetes	13.5	(11.3–15.9)††	10.6	(8.4–13.3)**,††	16.4	(13.1–20.4)††	—	—
**Herpes zoster (shingles) vaccination, ever†††† **								
≥60 yrs	28.7	(27.4–30.0)¶	25.6	(23.9–27.4)¶**	30.9	(29.2–32.6)¶	5.6	(3.2–9.4)
60–64 yrs	22.0	(19.9–24.2)¶	15.5	(12.2–19.4)¶,**	23.9	(21.5–26.5)¶	6.0	(3.4–10.5)
≥65 yrs	31.3	(29.8–32.8)††	27.5	(25.6–29.4)**,††	34.9	(32.9–37.1)††	—	—

See table footnotes on page 28.

TABLE 6. (*Continued*) Estimated proportion of adults aged ≥19 years who received selected vaccinations, by age group, high-risk status,* and health insurance status† — National Health Interview Survey, United States, 2014

	With health insurance						Without health insurance	
	Overall		Public		Private			
Vaccination, age group, high-risk status	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Human papillomavirus (HPV) vaccination among females (at least 1 dose), ever§§§§								
19–26 yrs	44.5	(40.4–48.7)¶	39.4	(32.8–46.5)¶	46.6	(41.4–51.8)¶	21.3	(16.1–27.6)
HPV vaccination among males (at least 1 dose), ever§§§§								
19–26 yrs	9.5	(7.4–12.0)¶	15.6	(9.5–24.5)¶	8.0	(6.2–10.4)¶	4.4	(2.6–7.2)
Human papillomavirus (HPV) vaccination among females (at least 1 dose), ever§§§§ who reported first HPV dose at age 19–26 years¶¶¶¶								
19–26 yrs	13.8	(11.3–16.8)¶	12.1	(8.5–17.0)¶	14.5	(11.3–18.4)¶	5.5	(3.2–9.3)
HPV vaccination among males (at least 1 dose), ever§§§§ who reported first HPV dose at age 19–26 years¶¶¶¶								
19–26 yrs	2.9	(1.9–4.5)	—	—	2.7	(1.7–4.3)	—	—

Abbreviations: CI = confidence interval; HPV = human papillomavirus; Td = tetanus-diphtheria toxoid; Tdap = tetanus, diphtheria, and acellular pertussis vaccine.

* Adults were considered at high risk for pneumococcal disease if they had ever been told by a doctor or other health professional that they had diabetes, emphysema, chronic obstructive pulmonary disease, coronary heart disease, angina, heart attack, or other heart condition; had a diagnosis of cancer during the previous 12 months (excluding nonmelanoma skin cancer); had ever been told by a doctor or other health professional that they had lymphoma, leukemia, or blood cancer; had been told by a doctor or other health professional that they had chronic bronchitis or weak or failing kidneys during the preceding 12 months; had an asthma episode or attack during the preceding 12 months; or were current smokers. For hepatitis A and hepatitis B vaccination, data were collected on selected respondent characteristics that increase the risk for infection (travel to countries where hepatitis A infections are endemic and having chronic liver disease; having diabetes, travel to countries where hepatitis B infections are endemic, and having chronic liver disease, respectively).

† Adults were considered insured if they reported having public health insurance coverage (Medicare, Medicaid, military health care (TRICARE/VA/CHAMP-VA), Indian Health Service, state-sponsored health plan, or other government program insurance) or private health insurance coverage.

§ Respondents were asked if they had received an influenza shot or nasal spray in the past 12 months and if so, in which month and year. Missing month and year were imputed (3.1%), and interviews conducted during August 2013–June 2014 were used to estimate vaccination coverage during July 2013–May 2014 using Kaplan-Meier survival analysis.

¶ p<0.05 by T test for comparisons with "without health insurance" as the reference group.

** p<0.05 by T test for comparisons between private and public health insurance within each level of each characteristic.

†† p<0.05 by T test comparing persons aged 50–64 years and aged ≥65 years with persons aged 19–49 years for influenza; persons aged 19–64 years with high-risk conditions with persons aged ≥65 years for pneumococcal; persons aged 50–64 years and ≥65 years with persons aged 19–49 years for tetanus; persons aged 19–64 years with persons aged ≥65 years for Tdap; persons aged 19–59 years with diabetes with persons aged ≥60 years with diabetes for hepatitis B; and persons aged 60–64 years with persons aged ≥65 years for shingles.

§§ Respondents were asked if they had ever had a pneumonia shot.

¶¶ Respondents were asked if they had received a tetanus shot in the past 10 years. Vaccinated respondents included adults who received Td during the past 10 years or Tdap during 2005–2014.

*** Respondents who had received a tetanus shot in the past 10 years were asked if their most recent shot was given in 2005 or later. Respondents who had received a tetanus shot since 2005 were asked if they were told that their most recent tetanus shot included the pertussis or whooping cough vaccine. Among 36,324 respondents aged ≥19 years, those without a "yes" or "no" classification for tetanus vaccination status within the preceding 10 years (n = 1,977 [5.4%]), for tetanus vaccination status during 2005–2014 (n = 1,098 [3.0%]), or those who reported tetanus vaccination during 2005–2014, but were not told vaccine type by the provider (n = 8,612 [23.7%]), did not know vaccine type (Td or Tdap) (n = 1,765 [4.9%]), or refused to answer or for whom data were not obtained (n=5 [0.01%]) were excluded, yielding a sample of 22,867 respondents aged ≥19 years for whom Tdap vaccination status could be assessed. In February 2012, ACIP recommended Tdap vaccination for all adults aged ≥19 years, including adults aged ≥65 years.

††† Estimate is not reliable due to small sample size (n<30) or relative standard error (standard error/estimates) >0.3.

§§§ Respondents were asked if they had ever received the hepatitis A vaccine, and if yes, were asked how many doses were received.

¶¶¶ Had traveled outside the United States to countries other than countries in Europe, Japan, Australia, New Zealand, or Canada since 1995.

**** Respondents were asked if they had ever received the hepatitis B vaccine, and if yes, if they had received at least 3 doses or less than 3 doses.

†††† Respondents were asked if they had ever received a shingles vaccine.

§§§§ Respondents were asked if they had ever received the HPV shot or cervical cancer vaccine, and if yes, age at the first dose.

¶¶¶¶ The denominator includes persons aged 19–26 years without HPV vaccination prior to age 19 years, and the numerator includes those in the denominator who reported first HPV dose at age 19–26 years.

TABLE 7. Estimated proportion of adults aged ≥19 years who received selected vaccinations, by age group, high-risk status,* health insurance status,† and having a usual place for health care — National Health Interview Survey, United States, 2014

	With health insurance				Without health insurance			
	Have a usual place for health care§		Do not have a usual place for health care		Have a usual place for health care		Do not have a usual place for health care	
Vaccination, age group, high-risk status	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Influenza vaccination (2013–14 season)¶								
≥19 yrs	50.1	(48.9–51.4)	24.2	(20.8–28.2)**	21.7	(19.0–24.7)	9.7	(7.8–12.1)**
19–49 yrs	37.7	(35.9–39.5)	23.9	(20.3–28.0)**	19.7	(16.7–23.2)	9.3	(7.3–11.8)**
50–64 yrs	52.8	(50.8–54.9)††	24.1	(16.2–35.0)**	26.1	(20.9–32.2)	10.4	(6.0–17.6)**
≥65 yrs	73.1	(71.2–74.9)††	30.0	(19.6–44.2)**	40.6	(23.2–64.2)††	—§§	—
Pneumococcal vaccination, ever¶¶								
19–64 yrs, HR	24.0	(22.5–25.5)	7.9	(5.8–10.6)**	13.9	(11.5–16.7)	7.8	(5.5–10.9)**
≥65 yrs	62.6	(61.2–64.0)††	24.2	(17.8–32.0)**,††	34.0	(17.5–55.5)††	—	—
Tetanus vaccination, past 10 years* **								
≥19 yrs	64.7	(63.8–65.6)	54.4	(51.5–57.3)**	54.5	(51.7–57.2)	49.3	(46.2–52.4)**
19–49 yrs	66.1	(64.7–67.4)	57.1	(54.2–60.0)**	54.9	(51.6–58.3)	50.3	(46.7–53.8)
50–64 yrs	67.3	(65.8–68.9)	51.3	(41.8–60.8)**	53.5	(48.5–58.5)	46.1	(39.8–52.6)
≥65 yrs	58.6	(57.1–60.1)††	30.3	(22.5–39.4)**,††	48.6	(30.8–66.7)	—	—
Tetanus vaccination including pertussis vaccine, past 9 years†††								
≥19 yrs	22.0	(21.1–22.9)	16.3	(13.9–18.9)**	13.0	(11.0–15.3)	10.0	(7.9–12.5)
19–64 yrs	24.3	(23.3–25.3)	17.2	(14.7–20.1)**	13.0	(11.0–15.3)	10.0	(8.0–12.6)
≥65 yrs	14.4	(13.0–15.9)††	—	—	—	—	—	—
Hepatitis A vaccination (at least 2 doses), ever§§§								
≥19 yrs	9.0	(8.5–9.6)	11.4	(9.6–13.4)**	7.7	(6.3–9.3)	7.5	(5.8–9.6)
≥19 yrs, traveler¶¶¶	16.3	(15.2–17.5)	20.5	(17.3–24.0)**	8.8	(6.7–11.5)	13.1	(8.9–18.9)
Hepatitis B vaccination (at least 3 doses), ever** **								
≥19 yrs	25.0	(24.2–25.8)	27.7	(25.0–30.5)	21.2	(18.9–23.8)	19.1	(16.5–22.0)
19–49 yrs	34.8	(33.6–36.1)	32.8	(29.8–35.8)	23.8	(21.1–26.8)	21.9	(18.8–25.3)
≥19 yrs, traveler	31.1	(29.7–32.5)	35.6	(31.8–39.7)**	24.2	(20.2–28.6)	22.2	(17.3–28.1)
≥19 yrs, with chronic liver conditions	29.1	(22.9–36.2)	—	—	—	—	—	—
≥19 yrs, with diabetes	18.4	(16.5–20.4)	—	—	13.6	(8.3–21.4)		—
19–59 yrs, with diabetes	25.5	(22.3–29.0)	—	—	—	—	—	—
≥60 yrs, with diabetes	13.5	(11.3–16.0)††	—	—	—	—	—	—
Herpes zoster (shingles) vaccination, ever††††								
≥60 yrs	29.2	(28.0–30.6)	9.9	(6.2–15.5)**	—	—	—	—

See table footnotes on page 30.

TABLE 7. (*Continued*) Estimated proportion of adults aged ≥19 years who received selected vaccinations, by age group, high-risk status,* health insurance status,† and having a usual place for health care — National Health Interview Survey, United States, 2014

	With health insurance				Without health insurance			
	Have a usual place for health care§		Do not have a usual place for health care		Have a usual place for health care		Do not have a usual place for health care	
Vaccination, age group, high-risk status	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
HPV vaccination among females (at least 1 dose), ever§§§§								
19–26 yrs	45.9	(41.5–50.3)	33.8	(26.7–41.8)**	24.7	(17.3–33.9)	17.4	(11.3–25.8)
HPV vaccination among males (at least 1 dose), ever§§§§								
19–26 yrs	10.5	(8.0–13.5)	—	—	—	—	—	—
HPV vaccination among females (at least 1 dose), ever§§§§ who reported first HPV dose at age 19–26 years¶¶¶¶								
19–26 yrs	14.4	(11.6–17.7)	9.7	(5.9–15.5)	—	—	—	—
HPV vaccination among males (at least 1 dose), ever§§§§ who reported first HPV dose at age 19–26 years¶¶¶¶								
19–26 yrs	3.0	(1.9–4.9)	—	—	0	*****	—	—

Abbreviations: CI = confidence interval; HPV = human papillomavirus; Td = tetanus-diphtheria toxoid; Tdap = tetanus, diphtheria, and acellular pertussis vaccine.

* Adults were considered at high risk for pneumococcal disease if they had ever been told by a doctor or other health professional that they had diabetes, emphysema, chronic obstructive pulmonary disease, coronary heart disease, angina, heart attack, or other heart condition; had a diagnosis of cancer during the previous 12 months (excluding nonmelanoma skin cancer); had ever been told by a doctor or other health professional that they had lymphoma, leukemia, or blood cancer; had been told by a doctor or other health professional that they had chronic bronchitis or weak or failing kidneys during the preceding 12 months; had an asthma episode or attack during the preceding 12 months; or were current smokers. For hepatitis A and hepatitis B vaccination, data were collected on selected respondent characteristics that increase the risk for infection (travel to countries where hepatitis A infections are endemic and having chronic liver disease; having diabetes, travel to countries where hepatitis B infections are endemic, and having chronic liver disease, respectively).

† Adults were considered insured if they reported having public health insurance coverage (Medicare, Medicaid, military health care (TRICARE/VA/CHAMP-VA), Indian Health Service, state-sponsored health plan, or other government program insurance) or private health insurance coverage.

§ Respondents were asked if there is a place they usually go when sick or need advice on their health. Respondents answering "yes" are defined as having a usual place for health care.

¶ Respondents were asked if they had received an influenza shot or nasal spray in the past 12 months and if so, in which month and year. Missing month and year were imputed (3.1%), and interviews conducted during August 2013–June 2014 were used to estimate vaccination coverage during July 2013–May 2014 using Kaplan-Meier survival analysis.

** p<0.05 by T test for comparisons with "have a usual place for healthcare" as the reference group.

†† p<0.05 by T test comparing persons aged 50–64 years and ≥65 years with persons aged 19–49 years for influenza; persons aged 19–64 years with high-risk conditions with persons aged ≥65 years for pneumococcal; persons aged 50–64 years and aged ≥65 years with persons aged 19–49 years for tetanus; persons aged 19–64 years with persons aged ≥65 years for Tdap; and persons aged 19–59 years with diabetes with persons aged ≥60 years with diabetes for hepatitis B.

§§ Estimate is not reliable due to small sample size (n<30) or relative standard error (standard error/estimates) >0.3.

¶¶ Respondents were asked if they had ever had a pneumonia shot.

*** Respondents were asked if they had received a tetanus shot in the past 10 years. Vaccinated respondents included adults who received Td during the past 10 years or Tdap during 2005–2014.

††† Respondents who had received a tetanus shot in the past 10 years were asked if their most recent shot was given in 2005 or later. Respondents who had received a tetanus shot since 2005 were asked if they were told that their most recent tetanus shot included the pertussis or whooping cough vaccine. Among 36,324 respondents aged ≥19 years, those without a "yes" or "no" classification for tetanus vaccination status within the preceding 10 years (n = 1,977 [5.4%]), for tetanus vaccination status during 2005–2014 (n = 1,098 [3.0%]), or those who reported tetanus vaccination during 2005–2014, but were not told vaccine type by the provider (n = 8,612 [23.7%]), did not know vaccine type (Td or Tdap) (n = 1,765 [4.9%]), or refused to answer or for whom data were not obtained (n=5 [0.01%]) were excluded, yielding a sample of 22,867 respondents aged ≥19 years for whom Tdap vaccination status could be assessed. In February 2012, ACIP recommended Tdap vaccination for all adults aged ≥19 years, including adults aged ≥65 years.

§§§ Respondents were asked if they had ever received the hepatitis A vaccine, and if yes, were asked how many doses were received.

¶¶¶ Had traveled outside the United States to countries other than countries in Europe, Japan, Australia, New Zealand, or Canada since 1995.

**** Respondents were asked if they had ever received the hepatitis B vaccine, and if yes, if they had received at least 3 doses or less than 3 doses.

†††† Respondents were asked if they had ever received a shingles vaccine.

§§§§ Respondents were asked if they had ever received the HPV shot or cervical cancer vaccine, and if yes, age at the first dose.

¶¶¶¶ The denominator includes persons aged 19–26 years without HPV vaccination prior to age 19 years, and the numerator includes those in the denominator who reported first HPV dose at age 19–26 years.

***** The confidence interval has not been generated because the estimate is zero.

TABLE 8. Estimated proportion of adults aged ≥19 years who received selected vaccinations, by age group, high-risk status,* health insurance status,† and physician contacts§ — National Health Interview Survey, United States, 2014

Vaccination, age group, high-risk status	With health insurance								Without health insurance							
	No. of physician contacts in the past 12 months								No. of physician contacts in the past 12 months							
	None		1–3		4–9		≥10		None		1–3		4–9		≥10	
	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Influenza vaccination (2013–14 season)¶																
≥19 yrs	21.8	(19.3–24.6)	44.9	(43.3–46.6)**	60.1	(57.8–62.5)**	60.6	(57.9–63.2)**	9.0	(7.2–11.2)	19.7	(16.6–23.4)**	28.4	(21.6–36.8)**	27.6	(20.1–37.1)**
19–49 yrs	18.6	(15.9–21.7)	36.1	(33.8–38.5)**	44.5	(40.8–48.4)**	48.6	(43.9–53.5)**	7.9	(6.1–10.3)	19.0	(15.5–23.1)**	26.1	(17.9–37.0)**	25.1	(16.4–37.1)**
50–64 yrs	25.3	(19.7–32.1)	47.9	(45.1–50.7)**,††	61.4	(57.6–65.2)**,††	61.7	(57.2–66.3)**,††	13.5	(8.7–20.6)	22.0	(15.7–30.4)	29.8	(20.6–41.7)**	26.9	(16.0–43.1)
≥65 yrs	37.4	(30.4–45.5)††	68.6	(65.8–71.4)**,††	78.1	(75.1–81.0)**,††	76.2	(72.0–80.3)**,††	—§§	—	—	—	—	—	—	—
Pneumococcal vaccination, ever¶¶																
19–64 yrs, HR	7.1	(5.4–9.4)	16.6	(15.0–18.4)**	26.3	(23.8–29.0)**	38.6	(34.9–42.4)**	7.8	(5.4–11.1)	11.2	(8.3–14.8)	19.3	(13.4–26.9)**	18.3	(10.7–29.5)**
≥65 yrs	32.6	(27.1–38.5)††	57.2	(54.9–59.5)**,††	66.4	(64.0–68.7)**,††	70.7	(67.4–73.8)**,††	—	—	—	—	—	—	—	—
Tetanus vaccination, past 10 years* **																
≥19 yrs	51.0	(48.6–53.3)	64.2	(62.9–65.5)**	66.9	(65.4–68.5)**	69.9	(67.9–71.7)**	47.7	(44.8–50.6)	54.2	(50.9–57.5)**	59.1	(52.8–65.0)**	63.9	(55.4–71.7)**
19–49 yrs	52.6	(49.9–55.3)	65.9	(64.3–67.5)**	70.2	(67.4–72.8)**	71.9	(68.5–75.0)**	48.4	(45.1–51.8)	55.9	(51.9–59.8)**	59.6	(51.6–67.1)**	58.1	(48.3–67.4)
50–64 yrs	52.5	(46.8–58.2)	65.2	(63.0–67.3)**	70.2	(67.5–72.7)**	74.6	(71.2–77.7)**	45.7	(39.7–51.7)	50.2	(44.0–56.3)	57.7	(47.5–67.3)**	78.0	(63.5–87.8)**,††
≥65 yrs	35.6	(29.6–42.1)††	57.3	(55.0–59.6)**,††	59.9	(57.5–62.3)**,††	62.2	(58.9–65.5)**,††	—	—	—	—	—	—	—	—
Tetanus vaccination including pertussis vaccine, past 9 years†††																
≥19 yrs	12.0	(10.4–13.8)	22.0	(20.8–23.2)**	23.7	(22.0–25.5)**	26.8	(24.6–29.0)**	9.0	(7.3–11.2)	12.4	(10.1–15.3)**	17.4	(12.3–24.1)**	19.8	(12.9–29.1)**
19–64 yrs	12.7	(10.9–14.7)	23.7	(22.4–25.1)**	27.7	(25.6–29.9)**	31.3	(28.6–34.2)**	9.1	(7.3–11.2)	12.6	(10.2–15.5)**	17.3	(12.2–24.0)**	19.0	(12.2–28.3)**
≥65 yrs	6.0	(3.7–9.7)††	13.7	(11.7–16.0)**,††	15.2	(13.2–17.6)**,††	16.1	(13.0–19.7)**,††	—	—	—	—	—	—	—	—
Hepatitis A vaccination (at least 2 doses), ever§§§																
≥19 yrs	7.1	(6.1–8.3)	9.4	(8.7–10.1)**	9.1	(8.2–10.1)**	11.1	(9.7–12.7)**	6.1	(4.8–7.6)	8.9	(6.7–11.6)	8.4	(5.7–12.1)	10.5	(6.5–16.6)
≥19 yrs, traveler¶¶¶	12.8	(10.5–15.6)	16.5	(15.0–18.1)**	18.4	(16.2–20.9)**	17.6	(14.7–20.8)**	7.7	(5.4–11.0)	14.4	(9.5–21.3)**	11.6	(6.8–19.0)	—	—
≥19 yrs, with chronic liver conditions	—	—	13.3	(7.2–23.1)	—	—	18.0	(11.1–27.9)	—	—	—	—	—	—	—	—
Hepatitis B vaccination (at least 3 doses), ever** **																
≥19 yrs	20.4	(18.6–22.3)	25.6	(24.5–26.8)**	25.5	(23.9–27.2)**	28.2	(26.1–30.4)**	17.1	(14.8–19.6)	22.6	(19.5–25.9)**	22.2	(17.6–27.6)	30.6	(22.9–39.5)**
19–49 yrs	24.4	(22.2–26.9)	33.9	(32.3–35.5)**	40.5	(37.5–43.6)**	44.0	(40.5–47.6)**	18.9	(16.3–21.9)	26.2	(22.6–30.2)**	27.5	(21.2–35.0)**	30.9	(21.7–42.1)**
≥19 yrs, traveler	24.9	(21.8–28.3)	31.9	(29.9–33.9)**	30.9	(28.3–33.6)**	37.1	(33.3–41.1)**	16.3	(12.4–21.1)	28.7	(23.3–34.8)**	26.4	(18.1–36.9)	39.8	(23.8–58.3)**
≥19 yrs, with chronic liver conditions	—	—	30.1	(19.5–43.4)	26.6	(17.8–37.9)	32.9	(22.4–45.4)	—	—	—	—	—	—	—	—
19–59 yrs, with diabetes	—	—	22.6	(17.7–28.3)	22.6	(17.7–28.4)	35.3	(28.5–42.8)	—	—	—	—	—	—	—	—
≥60 yrs, with diabetes	—	—	11.3	(8.3–15.2)††	16.0	(12.4–20.4)††	11.2	(8.1–15.4)††	—	—	—	—	—	—	—	—

See table footnotes on page 32.

TABLE 8. (*Continued*) Estimated proportion of adults aged ≥19 years who received selected vaccinations, by age group, high-risk status,* health insurance status,† and physician contacts§ — National Health Interview Survey, United States, 2014

Vaccination, age group, high-risk status	With health insurance								Without health insurance							
	No. of physician contacts in the past 12 months								No. of physician contacts in the past 12 months							
	None		1–3		4–9		≥10		None		1–3		4–9		≥10	
	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Herpes zoster (shingles) vaccination, ever††††																
≥60 yrs	10.2	(7.8–13.2)	28.0	(26.0–30.1)**	31.0	(29.0–33.0)**	32.3	(29.3–35.3)**	—	—	—	—	—	—	—	—
HPV vaccination among females (at least 1 dose), ever§§§§																
19–26 yrs	24.9	(18.3–33.0)	41.5	(36.9–46.3)**	57.1	(46.7–66.9)**	48.4	(39.9–56.9)**	20.0	(12.3–30.8)	19.5	(12.6–29.0)	—	—	—	—
HPV vaccination among males (at least 1 dose), ever§§§§																
19–26 yrs	5.7	(3.6–9.0)	9.1	(6.6–12.4)	19.1	(10.4–32.6)**	—	—	—	—	—	—	—	—	—	—
HPV vaccination among females (at least 1 dose), ever§§§§ who reported first HPV dose at age 19–26 years¶¶¶¶																
19–26 yrs	—	—	13.5	(10.4–17.4)	20.3	(13.9–28.6)	12.5	(7.6–19.9)	—	—	—	—	—	—	—	—
HPV vaccination among males (at least 1 dose), ever§§§§ who reported first HPV dose at age 19–26 years¶¶¶¶																
19–26 yrs	—	—	—	—	—	—	—	—	0	*****	—	—	—	—	—	—

Abbreviations: CI = confidence interval; HPV = human papillomavirus; HR = high risk; Td = tetanus-diphtheria toxoid; Tdap = tetanus, diphtheria, and acellular pertussis vaccine.

* Adults were considered at high risk for pneumococcal disease if they had ever been told by a doctor or other health professional that they had diabetes, emphysema, chronic obstructive pulmonary disease, coronary heart disease, angina, heart attack, or other heart condition; had a diagnosis of cancer during the previous 12 months (excluding nonmelanoma skin cancer); had ever been told by a doctor or other health professional that they had lymphoma, leukemia, or blood cancer; had been told by a doctor or other health professional that they had chronic bronchitis or weak or failing kidneys during the preceding 12 months; had an asthma episode or attack during the preceding 12 months; or were current smokers. For hepatitis A and hepatitis B vaccination, data were collected on selected respondent characteristics that increase the risk for infection (travel to countries where hepatitis A infections are endemic and having chronic liver disease; having diabetes, travel to countries where hepatitis B infections are endemic, and having chronic liver disease, respectively).

† Adults were considered insured if they reported having public health insurance coverage (Medicare, Medicaid, military health care [TRICARE/VA/CHAMP-VA], Indian Health Service, state-sponsored health plan, or other government program insurance) or private health insurance coverage.

§ Respondents were asked the number of times in the past 12 months that they saw a doctor other health care professional about their own health.

¶ Respondents were asked if they had received an influenza shot or nasal spray in the past 12 months and if so, in which month and year. Missing month and year were imputed (3.1%), and interviews conducted during August 2013–June 2014 were used to estimate vaccination coverage during July 2013–May 2014 using Kaplan-Meier survival analysis.

** p<0.05 by T test for comparisons with no physician contacts in the past 12 months as the reference group.

†† p<0.05 by T test comparing persons aged 50–64 years and aged ≥65 years with persons aged 19–49 years for influenza; persons aged 19–64 years with high-risk conditions with persons aged ≥65 years for pneumococcal; persons aged 50–64 years and aged ≥65 years with persons aged 19–49 years for tetanus; persons aged 19–64 years with persons aged ≥65 years for Tdap; and persons aged 19–59 years with diabetes with persons aged ≥60 years with diabetes for hepatitis B.

§§ Estimate is not reliable due to small sample size (n<30) or relative standard error (standard error/estimates) >0.3.

¶¶ Respondents were asked if they had ever had a pneumonia shot.

*** Respondents were asked if they had received a tetanus shot in the past 10 years. Vaccinated respondents included adults who received Td during the past 10 years or Tdap during 2005–2014.

††† Respondents who had received a tetanus shot in the past 10 years were asked if their most recent shot was given in 2005 or later. Respondents who had received a tetanus shot since 2005 were asked if they were told that their most recent tetanus shot included the pertussis or whooping cough vaccine. Among 36,324 respondents aged ≥19 years, those without a "yes" or "no" classification for tetanus vaccination status within the preceding 10 years (n = 1,977 [5.4%]), for tetanus vaccination status during 2005–2014 (n = 1,098 [3.0%]), or those who reported tetanus vaccination during 2005–2014, but were not told vaccine type by the provider (n = 8,612 [23.7%]), did not know vaccine type (Td or Tdap) (n = 1,765 [4.9%]), or refused to answer or for whom data were not obtained (n=5 [0.01%]) were excluded, yielding a sample of 22,867 respondents aged ≥19 years for whom Tdap vaccination status could be assessed. In February 2012, ACIP recommended Tdap vaccination for all adults aged ≥19 years, including adults aged ≥65 years.

§§§ Respondents were asked if they had ever received the hepatitis A vaccine, and if yes, were asked how many doses were received.

¶¶¶ Had traveled outside the United States to countries other than countries in Europe, Japan, Australia, New Zealand, or Canada since 1995.

**** Respondents were asked if they had ever received the hepatitis B vaccine, and if yes, if they had received at least 3 doses or less than 3 doses.

†††† Respondents were asked if they had ever received a shingles vaccine.

§§§§ Respondents were asked if they had ever received the HPV shot or cervical cancer vaccine, and if yes, age at the first dose.

¶¶¶¶ The denominator includes persons aged 19–26 years without HPV vaccination prior to age 19 years, and the numerator includes those in the denominator who reported first HPV dose at age 19–26 years.

***** The confidence interval has not been generated because the estimate is zero.

TABLE 9. Adjusted vaccination coverage among adults aged ≥19 years, by age group, high-risk status,* and health insurance status† — National Health Interview Survey, United States, 2014

	With health insurance		Without health insurance				
Vaccination, age group, high-risk status	Adjusted§ vaccination coverage	(95% CI)	Adjusted vaccination coverage	(95% CI)	Adjusted prevalence ratio¶	(95% CI)	Adjusted prevalence difference**
Influenza vaccination (2013–14 season)††							
≥19 yrs	43.1	(42.2–44.1)	29.9	(27.6–32.2)	0.7	(0.6–0.7)§§	13.3
Pneumococcal vaccination, ever¶¶							
19–64 yrs, HR	20.8	(19.4–22.2)	17.7	(15.0–20.8)	0.9	(0.7–1.0)§§	3.1
≥65 yrs	61.6	(60.2–63.1)	55.1	(36.1–72.7)	0.9	(0.6–1.3)	6.6
Tetanus vaccination, past 10 years***							
≥19 yrs	62.8	(61.9–63.8)	61.8	(59.7–63.9)	1.0	(0.9–1.0)	1.0
Tetanus vaccination including pertussis vaccine, past 9 years†††							
≥19 yrs	20.8	(20.0–21.7)	18.4	(16.0–21.0)	0.9	(0.8–1.0)	2.5
Hepatitis A vaccination (at least 2 doses), ever§§§							
≥19 yrs	9.3	(8.8–9.8)	8.4	(7.2–9.9)	0.9	(0.8–1.1)	0.8
≥19 yrs, traveler¶¶¶	16.6	(15.5–17.7)	13.4	(10.1–17.5)	0.8	(0.6–1.1)	3.2
Hepatitis B vaccination (at least 3 doses), ever****							
≥19 yrs	25.2	(24.5–26.0)	22.4	(20.4–24.4)	0.9	(0.8–1.0)§§	2.9
19–49 yrs	33.0	(31.9–34.1)	29.8	(27.2–32.6)	0.9	(0.8–1.0)§§	3.2
≥19 yrs, with diabetes	17.9	(16.0–20.0)	15.2	(9.8–22.9)	0.9	(0.6–1.3)	2.7
Herpes zoster (shingles) vaccination, ever†††††							
≥60 yrs	28.1	(26.8–29.4)	17.7	(10.8–27.5)	0.6	(0.4–1.0)§§	10.4
HPV vaccination among females (at least 1 dose), ever§§§§							
19–26 yrs	41.7	(38.0–45.5)	29.3	(22.1–37.7)	0.7	(0.5–0.9)§§	12.4
HPV vaccination among males (at least 1 dose), ever§§§§							
19–26 yrs	—¶¶¶¶	—	—	—	—	—	—
HPV vaccination among females (at least 1 dose), ever§§§§ who reported first HPV dose at age 19–26 years******							
19–26 yrs	12.5	(10.2–15.3)	7.7	(4.6–12.8)	0.6	(0.4–1.1)§§	4.8
HPV vaccination among males (at least 1 dose), ever§§§§ who reported first HPV dose at age 19–26 years******							
19–26 yrs	—	—	—	—	—	—	—

See table footnotes on page 34.

TABLE 9. (*Continued*) Adjusted vaccination coverage among adults aged ≥19 years, by age group, high-risk status,* and health insurance status† — National Health Interview Survey, United States, 2014

Abbreviations: CI = confidence interval; HPV = human papillomavirus; HR = high risk; Td = tetanus-diphtheria toxoid; Tdap = tetanus, diphtheria, and acellular pertussis vaccine.

* Adults were considered at high risk for pneumococcal disease if they had ever been told by a doctor or other health professional that they had diabetes, emphysema, chronic obstructive pulmonary disease, coronary heart disease, angina, heart attack, or other heart condition; had a diagnosis of cancer during the previous 12 months (excluding nonmelanoma skin cancer); had ever been told by a doctor or other health professional that they had lymphoma, leukemia, or blood cancer; had been told by a doctor or other health professional that they had chronic bronchitis or weak or failing kidneys during the preceding 12 months; had an asthma episode or attack during the preceding 12 months; or were current smokers. For hepatitis A and hepatitis B vaccination, data were collected on selected respondent characteristics that increase the risk for infection (travel to countries where hepatitis A infections are endemic and having chronic liver disease; having diabetes, travel to countries where hepatitis B infections are endemic, and having chronic liver disease, respectively).

† Adults were considered insured if they reported having public health insurance coverage (Medicare, Medicaid, military health care [TRICARE/VA/CHAMP-VA], Indian Health Service, state-sponsored health plan, or other government program insurance) or private health insurance coverage.

§ Adjusted coverage estimates are based on predicted marginals from a multivariable logistic regression model. Estimates were adjusted for age, gender, race/ethnicity, marital status, education, employment status, poverty level, number of physician contacts in the past year, usual source of care, self-reported health status, nativity, and region of U.S. residence.

¶ "With health insurance" is the reference group. The adjusted prevalence ratio is calculated by dividing adjusted vaccination coverage among those without health insurance by adjusted coverage among those with health insurance.

** Adjusted coverage among those with health insurance minus adjusted coverage among those without health insurance.

†† Respondents were asked if they had received an influenza shot or nasal spray in the past 12 months. Influenza vaccination estimates are based on interviews conducted during August 2013–June 2014 and vaccination received during the past 12 months.

§§ $p<0.05$ by T test comparing adjusted coverage among those with health insurance to adjusted coverage among those without health insurance.

¶¶ Respondents were asked if they had ever had a pneumonia shot.

*** Respondents were asked if they had received a tetanus shot in the past 10 years. Vaccinated respondents included adults who received Td during the past 10 years or Tdap during 2005–2014.

††† Respondents who had received a tetanus shot in the past 10 years were asked if their most recent shot was given in 2005 or later. Respondents who had received a tetanus shot since 2005 were asked if they were told that their most recent tetanus shot included the pertussis or whooping cough vaccine. Among 36,324 respondents aged ≥19 years, those without a "yes" or "no" classification for tetanus vaccination status within the preceding 10 years (n = 1,977 [5.4%]), for tetanus vaccination status during 2005–2014 (n = 1,098 [3.0%]), or those who reported tetanus vaccination during 2005–2014, but were not told vaccine type by the provider (n = 8,612 [23.7%]), did not know vaccine type (Td or Tdap) (n = 1,765 [4.9%]), or refused to answer or for whom data were not obtained (n=5 [0.01%]) were excluded, yielding a sample of 22,867 respondents aged ≥19 years for whom Tdap vaccination status could be assessed. In February 2012, ACIP recommended Tdap vaccination for all adults aged ≥19 years, including adults aged ≥65 years.

§§§ Respondents were asked if they had ever received the hepatitis A vaccine, and if yes, were asked how many doses were received.

¶¶¶ Had traveled outside the United States to countries other than countries in Europe, Japan, Australia, New Zealand, or Canada since 1995.

**** Respondents were asked if they had ever received the hepatitis B vaccine, and if yes, if they had received at least 3 doses or less than 3 doses.

†††† Respondents were asked if they had ever received a shingles vaccine.

§§§§ Respondents were asked if they had ever received the HPV shot or cervical cancer vaccine, and if yes, age at the first dose.

¶¶¶¶ Sample size too small to run adjusted models.

***** The denominator includes persons aged 19–26 years without HPV vaccination prior to age 19 years, and the numerator includes those in the denominator who reported first HPV dose at age 19–26 years.

TABLE 10. Estimated proportion of adults aged ≥19 years who received selected vaccinations, by age group, high-risk status,* nativity, number of years living in the United States, and citizenship — National Health Interview Survey, United States, 2014

Vaccination, age group, high-risk status	U.S.-born		Foreign-born		Foreign-born							
					Living in U.S. <10 yrs		Living in U.S. ≥10 yrs		U.S. citizen		Non-U.S. citizen	
	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Influenza vaccination (2013–14 season)†												
≥19 yrs	44.4	(43.1–45.6)	38.2	(35.9–40.6)§	32.1	(26.9–38.0)	39.8	(37.4–42.3)¶	44.7	(41.9–47.5)	30.9	(27.8–34.3)**
19–49 yrs	31.7	(30.2–33.3)	30.4	(27.5–33.6)	31.3	(25.7–37.7)	30.3	(27.1–33.8)	33.8	(29.7–38.2)	28.1	(24.6–31.9)**
50–64 yrs	48.6	(46.5–50.7)††	43.0	(38.6–47.7)§,††	36.0	(20.0–59.0)	43.3	(38.8–48.1)††	46.4	(40.9–52.2)††	36.0	(29.0–44.0)**
≥65 yrs	72.7	(70.6–74.7)††	63.8	(59.0–68.6)§,††	38.9	(23.9–58.9)	66.7	(61.9–71.6)¶††	67.5	(61.9–73.1)††	51.3	(41.3–62.2)**,††
Pneumococcal vaccination, ever§§												
19–64 yrs, HR	21.1	(19.7–22.5)	14.9	(12.7–17.5)§	13.6	(8.2–21.8)	15.1	(12.7–17.8)	17.6	(14.1–21.7)	12.2	(9.1–16.0)**
≥65 yrs	64.7	(63.3–66.2)††	40.8	(37.4–44.3)§,††	31.8	(19.7–47.0)††	41.8	(38.3–45.5)††	42.2	(38.4–46.1)††	35.2	(27.6–43.6)††
Tetanus vaccination, past 10 years¶¶												
≥19 yrs	65.3	(64.4–66.2)	48.8	(47.1–50.4)§	47.3	(43.7–50.9)	49.3	(47.4–51.2)	50.9	(48.7–53.2)	46.5	(44.1–48.9)**
19–49 yrs	66.3	(65.1–67.5)	48.7	(46.6–50.9)§	47.3	(43.5–51.2)	49.5	(46.9–52.1)	52.3	(48.7–56.0)	46.4	(43.5–49.2)**
50–64 yrs	67.2	(65.6–68.8)	51.5	(48.3–54.6)§	49.5	(37.7–61.4)	51.7	(48.3–55.1)	54.0	(49.8–58.2)	46.8	(41.3–52.3)**
≥65 yrs	59.9	(58.3–61.4)††	44.5	(40.7–48.3)§	42.0	(26.8–58.9)	45.0	(41.2–49.0)	43.8	(39.6–48.1)††	47.8	(39.6–56.1)
Tetanus vaccination including pertussis vaccine, past 9 years***												
≥19 yrs	22.4	(21.6–23.3)	10.7	(9.5–12.0)§	11.2	(8.9–14.0)	10.6	(9.2–12.1)	12.1	(10.3–14.0)	9.2	(7.8–10.8)**
19–64 yrs	24.2	(23.2–25.2)	11.2	(9.8–12.7)§	11.3	(9.0–14.2)	11.1	(9.5–12.9)	13.2	(11.2–15.6)	9.3	(7.9–11.1)**
≥65 yrs	15.2	(13.7–16.8)††	7.8	(5.7–10.7)§,††	—†††	—	7.8	(5.6–10.8)††	8.1	(5.7–11.5)††	—	—
Hepatitis A vaccination (at least 2 doses), ever§§§												
≥19 yrs	9.1	(8.6–9.6)	8.3	(7.4–9.4)	11.7	(9.5–14.3)	7.5	(6.5–8.7)¶	8.7	(7.4–10.2)	8.0	(6.7–9.4)
≥19 yrs, traveler¶¶¶	17.9	(16.7–19.2)	11.2	(9.7–12.9)§	13.5	(10.7–17.0)	10.7	(9.1–12.5)	11.8	(9.9–14.1)	10.5	(8.5–12.9)
Hepatitis B vaccination (at least 3 doses), ever****												
≥19 yrs	25.6	(24.8–26.4)	19.7	(18.4–21.2)§	24.8	(21.8–28.0)	18.7	(17.2–20.2)¶	21.6	(19.7–23.7)	17.7	(16.0–19.6)**
19–49 yrs	34.6	(33.4–35.8)	23.3	(21.5–25.2)§	25.3	(22.1–28.7)	22.7	(20.7–24.8)	28.7	(25.9–31.6)	19.6	(17.6–21.7)**
≥19 yrs, with diabetes	18.5	(16.5–20.8)	14.9	(11.6–18.9)	39.1	(19.8–62.4)	13.5	(10.3–17.4)¶	16.2	(12.2–21.2)	12.8	(7.8–20.4)
19–59 yrs, with diabetes	26.5	(23.1–30.2)	11.6	(7.5–17.6)§	—	—	12.5	(8.0–18.8)	14.5	(8.5–23.7)	—	—
≥60 yrs, with diabetes	12.7	(10.4–15.4)††	18.0	(12.8–24.6)	—	—	14.4	(9.8–20.8)	17.3	(11.6–25.1)	—	—

See table footnotes on page 36.

TABLE 10. (*Continued*) Estimated proportion of adults aged ≥19 years who received selected vaccinations, by age group, high-risk status,* nativity, number of years living in the United States, and citizenship — National Health Interview Survey, United States, 2014

Vaccination, age group, high-risk status	U.S.-born		Foreign-born		Foreign-born							
					Living in U.S. <10 yrs		Living in U.S. ≥10 yrs		U.S. citizen		Non-U.S. citizen	
	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)	%	(95% CI)
Herpes zoster (shingles) vaccination, ever††††												
≥60 yrs	30.0	(28.6–31.4)	15.2	(13.1–17.6)§	—	—	15.5	(13.3–18.0)	17.1	(14.5–19.9)	8.5	(5.5–13.0)**
HPV vaccination among females (at least 1 dose), ever§§§§												
19–26 yrs	43.2	(39.0–47.4)	18.6	(13.9–24.4)§	15.7	(9.4–25.0)	21.8	(14.7–31.2)	25.2	(16.1–37.3)	15.2	(9.6–23.3)
HPV vaccination among males (at least 1 dose), ever§§§§												
19–26 yrs	8.5	(6.7–10.8)	6.8	(3.8–11.8)	—	—	—	—	—	—	—	—
HPV vaccination among females (at least 1 dose), ever§§§§ who reported first HPV dose at age 19–26 years¶¶¶¶												
19–26 yrs	13.0	(10.6–15.9)	5.2	(3.0–9.0)§	—	—	—	—	—	—	—	—
HPV vaccination among males (at least 1 dose), ever§§§§ who reported first HPV dose at age 19–26 years¶¶¶¶												
19–26 yrs	2.4	(1.5–3.7)	—	—	—	—	—	—	—	—	—	—

Abbreviations: CI = confidence interval; HPV = human papillomavirus; HR = high risk; Td = tetanus-diphtheria toxoid; Tdap = tetanus, diphtheria, and acellular pertussis vaccine.

* Adults were considered at high risk for pneumococcal disease if they had ever been told by a doctor or other health professional that they had diabetes, emphysema, chronic obstructive pulmonary disease, coronary heart disease, angina, heart attack, or other heart condition; had a diagnosis of cancer during the previous 12 months (excluding nonmelanoma skin cancer); had ever been told by a doctor or other health professional that they had lymphoma, leukemia, or blood cancer; had been told by a doctor or other health professional that they had chronic bronchitis or weak or failing kidneys during the preceding 12 months; had an asthma episode or attack during the preceding 12 months; or were current smokers. For hepatitis A and hepatitis B vaccination, data were collected on selected respondent characteristics that increase the risk for infection (travel to countries where hepatitis A infections are endemic and having chronic liver disease; having diabetes, travel to countries where hepatitis B infections are endemic, and having chronic liver disease, respectively).

† Respondents were asked if they had received an influenza shot or nasal spray in the past 12 months and if so, in which month and year. Missing month and year were imputed (3.1%), and interviews from August 2013–June 2014 were used to estimate vaccination coverage during July 2013–May 2014 using Kaplan-Meier survival analysis.

§ p<0.05 by T test for comparisons between U.S. born and foreign born.

¶ p<0.05 by T test for comparisons between those living in the U.S. <10 years and those living in the United States ≥10 years.

** p<0.05 by T test comparing U.S. citizens and non-U.S. citizens.

†† p<0.05 by T test comparing persons aged 50–64 years and aged ≥65 years with persons 19–49 years for influenza; persons aged 19–64 years with high–risk conditions with persons aged ≥65 years for pneumococcal; persons aged 50–64 years and aged ≥65 years with persons aged 19–49 years for tetanus; persons aged 19–64 years with persons aged ≥65 years for Tdap; and persons aged 19–59 years with diabetes with persons aged ≥60 years with diabetes for hepatitis B.

§§ Respondents were asked if they had ever had a pneumonia shot.

¶¶ Respondents were asked if they had received a tetanus shot in the past 10 years. Vaccinated respondents included adults who received Td during the past 10 years or Tdap during 2005–2014.

*** Respondents who had received a tetanus shot in the past 10 years were asked if their most recent shot was given in 2005 or later. Respondents who had received a tetanus shot since 2005 were asked if they were told that their most recent tetanus shot included the pertussis or whooping cough vaccine. Among 36,324 respondents aged ≥19 years, those without a "yes" or "no" classification for tetanus vaccination status within the preceding 10 years (n = 1,977 [5.4%]), for tetanus vaccination status during 2005–2014 (n = 1,098 [3.0%]), or those who reported tetanus vaccination during 2005–2014, but were not told vaccine type by the provider (n = 8,612 [23.7%]), did not know vaccine type (Td or Tdap) (n = 1,765 [4.9%]), or refused to answer or for whom data were not obtained (n=5 [0.01%]) were excluded, yielding a sample of 22,867 respondents aged ≥19 years for whom Tdap vaccination status could be assessed. In February 2012, ACIP recommended Tdap vaccination for all adults aged ≥19 years, including adults aged ≥65 years.

††† Estimate is not reliable due to small sample size (n<30) or relative standard error (standard error/estimates)>0.3.

§§§ Respondents were asked if they had ever received the hepatitis A vaccine, and if yes, were asked how many doses were received.

¶¶¶ Had traveled outside the United States to countries other than countries in Europe, Japan, Australia, New Zealand, or Canada since 1995.

**** Respondents were asked if they had ever received the hepatitis B vaccine, and if yes, if they had received at least 3 doses or less than 3 doses.

†††† Respondents were asked if they had ever received a shingles vaccine.

§§§§ Respondents were asked if they had ever received the HPV shot or cervical cancer vaccine, and if yes, age at the first dose.

¶¶¶¶ The denominator includes persons aged 19–26 years without HPV vaccination prior to age 19 years, and the numerator includes those in the denominator who reported first HPV dose at age 19–26 years.

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