



Adult Vaccination Update

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Overview of Presentation

- Adult vaccination coverage
 - Data source
 - Coverage using an age-appropriate composite measure
 - Coverage by age group, vaccination indication, race/ethnicity,
 - Associations of coverage with age, health insurance status, usual place for health care
 - Limitations
 - Conclusions
- Information Sources

Data Source

National Health Interview Survey, 2017

- Annual in-home survey of U.S. non-institutionalized civilian population
- Detailed health survey of one adult per family in each household sampled
- Provides national coverage estimates
- Final sample for estimating adult vaccination coverage:
 - Response rate: 53.0 %
 - n = 26,430
- Sample for estimating influenza coverage, 2016-17 season:
 - Response rate: 54.3 % (2016); 53.0% (2017)
 - n = 23,591

National Health Interview Survey, 2017

Vaccination Questions

- **Influenza**
- **PPSV or PCV13, Td/Tdap, HepA, HepB, Zoster, HPV**
 - No questions in NHIS to ascertain pneumococcal vaccination by type
- **High-risk/increased-risk status**
 - Limited information collected for Hep A and Hep B
 - Hep A (travel status & chronic liver disease)
 - Hep B (travel status, chronic liver disease, & diabetes mellitus)
 - PPSV or PCV13
- **Health Care Personnel (HCP)**

Definitions of the Adult Immunization Composite Measure

Age group, years	Vaccines included		
	Method 1	Method 2	Optional
≥19	Proportion of adults who received all vaccines recommended for their age group including Tdap	Proportion of adults who received all vaccines recommended for their age group including any Td-containing vaccine	Influenza (past 12 months)
19-59	Tdap vaccine in the past 10 years	Td-containing vaccine in the past 10 years	Influenza (past 12 months)
60-64	Tdap vaccine in the past 10 years AND Herpes zoster	Td-containing vaccine in the past 10 years AND Herpes zoster	Influenza (past 12 months)
≥65	Tdap vaccine in the past 10 years AND Herpes zoster AND PCV13 OR PPSV23	Td-containing vaccine in the past 10 years AND herpes zoster AND PCV13 OR PPSV23	Influenza (past 12 months)

* Shen AK, Williams WW, O'Halloran AC, et al. Promoting adult immunization using population-based data for a composite measure. Am J Prev Med 2018; 55(4):517-523.

Vaccination Coverage Estimates Using an Age-Appropriate Adult Vaccination Composite Measure

	% (95% CI)			
	≥19 years (n [†] =26,430)	19-59 years (n [†] =16,651)	60-64 years (n [†] =2,445)	≥65 years (n [†] =7,334)
Composite measure				
Includes influenza in past 12 months				
Method 1: Tdap only	16.4 (15.5-17.3) [§]	18.1 (17.1-19.2)	9.7 (8.0-11.7)	12.8 (11.5-14.3)
Method 2: Td or Tdap	25.2 (24.4-26.1) [¶]	26.7 (25.8-27.7)	14.5 (12.9-16.2)	24.3 (22.9-25.8)
Does not include influenza in past 12 months				
Method 1: Tdap only	28.3** (27.0-29.6)	34.0 (32.5-35.6)	11.4 (9.6-13.6)	14.2 (12.7-15.8)
Method 2: Td or Tdap	52.9 ^{††} (51.7-54.1)	64.1 (62.8-65.4)	18.3 (16.5-20.2)	27.7 (26.1-29.3)

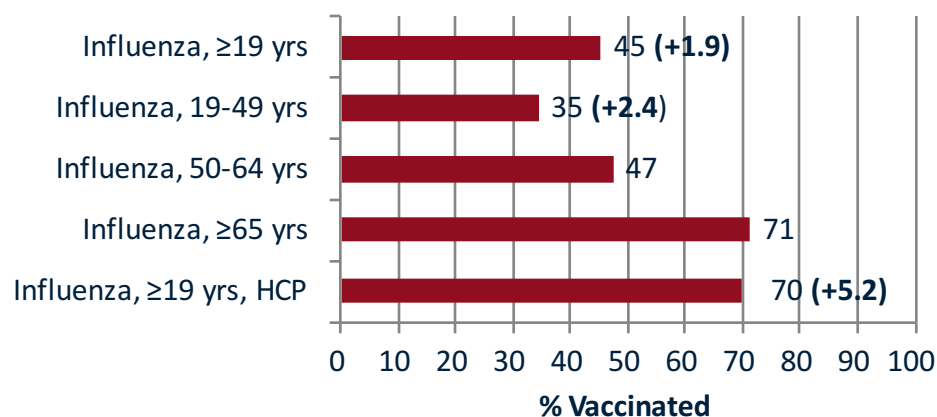
* Estimates using data from the 2017 NHIS for age-based composite adult vaccination measure for tetanus toxoid-containing, pneumococcal, herpes zoster, and influenza vaccines.

Vaccination Coverage Estimates for Individual Component Measures

Component measures	≥19 years	19-59 years	60-64 years	≥65 years
Influenza in past 12 months	43.6 (42.7-44.5)	35.5 (34.5-36.5)	52.2 (49.9-54.5)	67.8 (66.4-69.3)
Td or Tdap	63.4 (62.2-64.6)	64.1 (62.8-65.4)	64.2 (61.6-66.7)	60.8 (59.0-62.5)
Tdap	31.7 (30.3-33.1)	34.0 (32.5-35.6)	28.2 (25.2-31.3)	24.4 (22.5-26.4)
Herpes zoster	34.9 ^{¶¶} (33.5-36.4)	–	22.4 (20.5-24.6)	40.2 (38.6-41.9)
Pneumococcal	69.0 ^{***} (67.5-70.5)	–	–	69.0 (67.5-70.5)

* Estimates using data from the 2017 NHIS for age-based composite adult vaccination measure for tetanus toxoid-containing, pneumococcal, herpes zoster, and influenza vaccines.

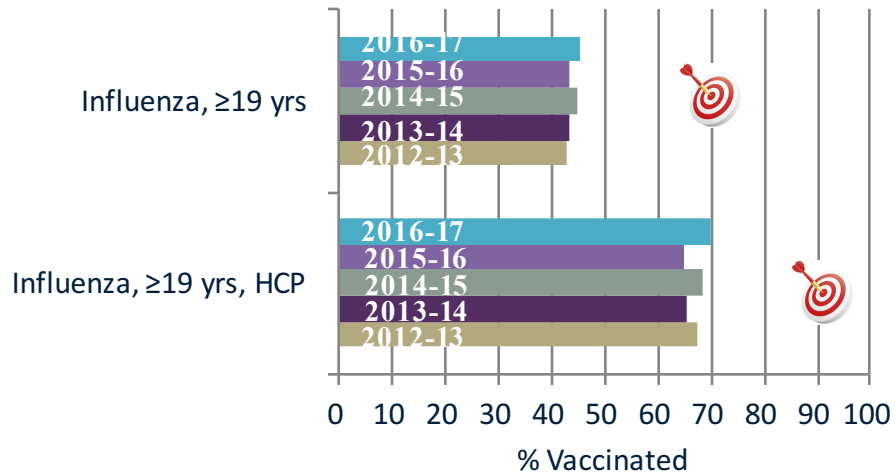
Adult Influenza Vaccination Coverage by Age, 2016-17 season, United States



Data Source: 2016-2017 NHIS

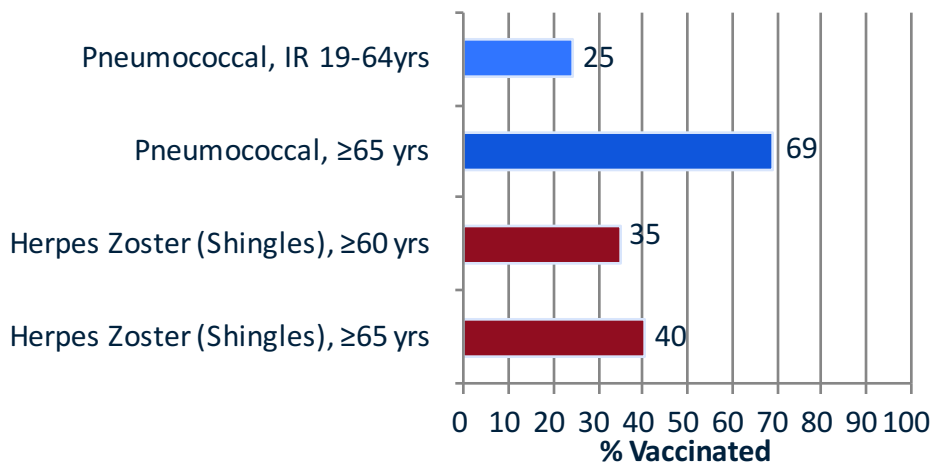
HP2020 Targets: 70% ≥19 years, 90% HCP ≥19 years

Adult Influenza Vaccination Coverage, by Age, 2012-13 through 2016-17 seasons, United States



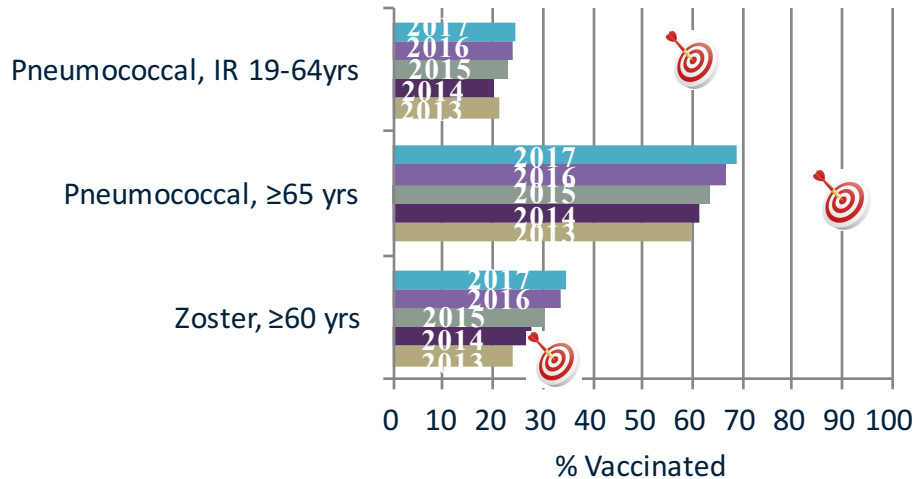
HP2020 Targets: 70% ≥19 years, 90% HCP ≥19 years
 Data Source: 2012, 2013, 2014, 2015, 2016, and 2017 NHIS

Adult Vaccination Coverage, Selected Vaccines by Age and Increased Risk (IR) Status, United States



HP2020 Targets: 60% PPV IR 19-64 years, 90% PPV ≥65 years, 30% Shingles ≥60 years
 Data Source: 2017 NHIS

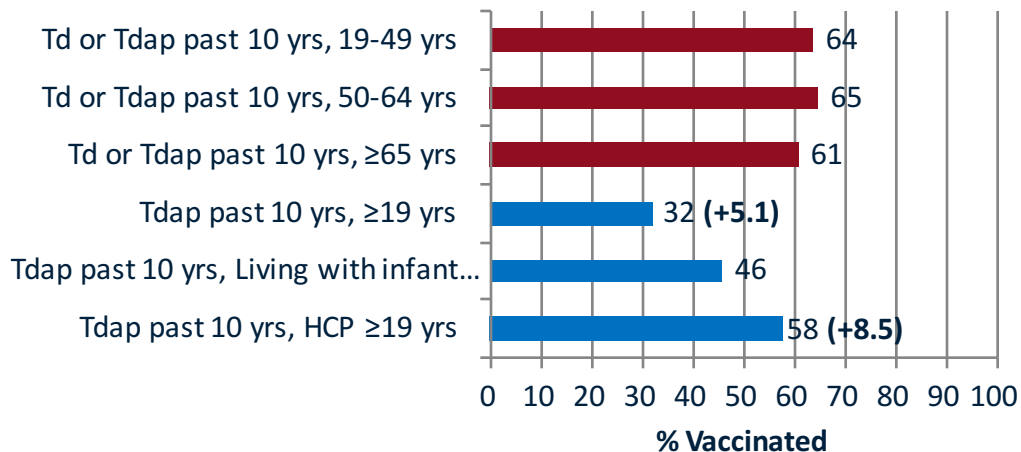
Adult Immunization Coverage, Selected Vaccines by Age and Increased-risk Status, 2013-2017, United States



HP2020 Targets: 90% PPV ≥65 yrs, 60% PPV IR 19-64 yrs, 30% zoster ≥60 yrs

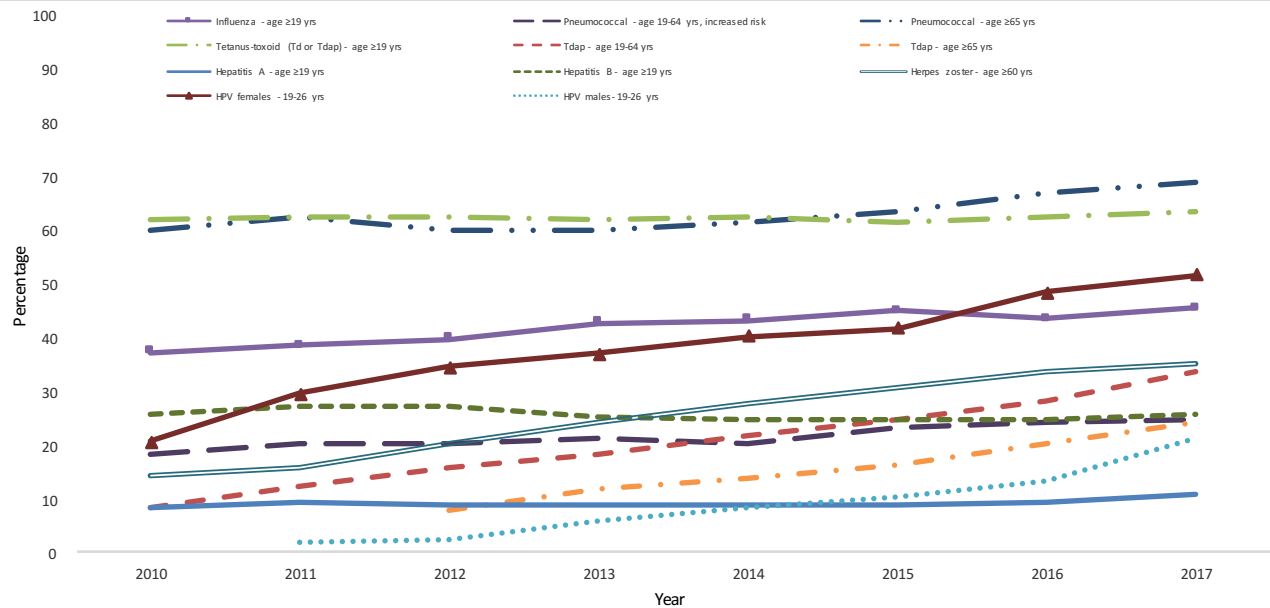
Data Source: 2013, 2014, 2015, 2016 and 2017 NHIS

Adult Tetanus-containing Vaccination Coverage by Age and High-risk Status, United States



Data Source: 2017 NHIS

Trends in Adult Vaccination Coverage – NHIS, 2010-2017



Proportion of HCP ≥19 years of age who received selected vaccines, by direct patient care

Group	%
Influenza (2016-17 season), ≥19 years, with direct patient care	71
Influenza (2016-17 season), ≥19 years, without direct patient care	68 (+7.1)
Tdap, ≥19 years, with direct patient care	62 (+8.6)
Tdap, ≥19 years, without direct patient care	49*
HepB (>3 doses), ≥19 years, with direct patient care	70
HepB (>3 doses), ≥19 years, without direct patient care	43*

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

Data Source: 2016 and 2017 NHIS

Racial/Ethnic Vaccination Differences in Adult Influenza Vaccination Coverage, NHIS 2017

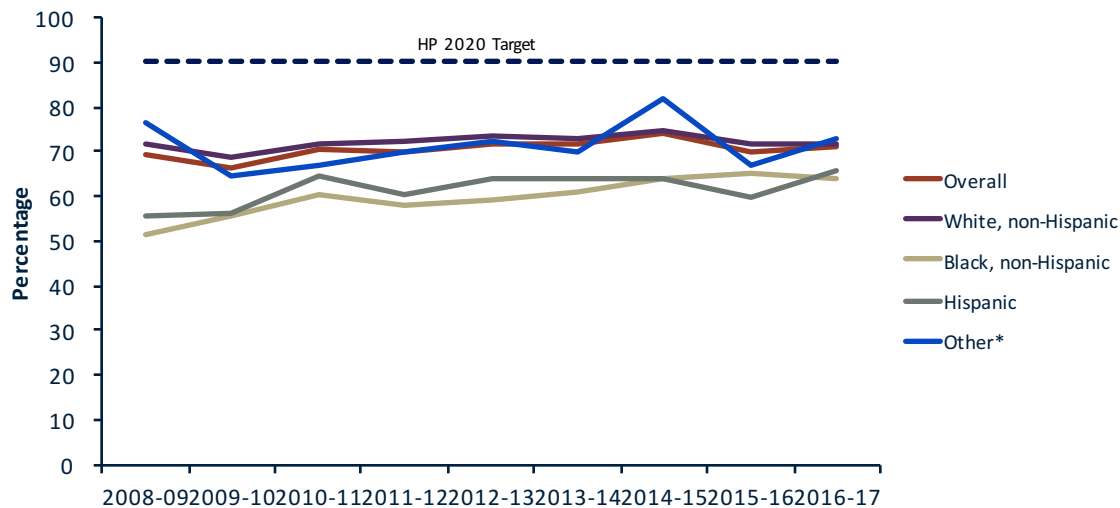
Vaccination Group	% Vaccinated Whites	Disparity, Blacks	Disparity, Hispanics	Disparity, Asians
Influenza, ≥19 yrs	48	-10	-11	+2
Influenza, 19-49 yrs	35	-6	-4	+7
Influenza, 50-64 yrs	49	-7	-9	+9
Influenza, ≥65 yrs	72	-8	-7	-3
Influenza, HCP ≥19 yrs	72	-11	-6	+6

Data Source: 2017 NHIS

Vaccination Differences, Select Vaccines, NHIS 2017

Vaccination Group	% Vaccinated Whites	Disparity, Blacks	Disparity, Hispanics	Disparity, Asians
Pneumo., IR 19-64 yrs	25	-2	-2	-2
Pneumo., ≥65 yrs	73	-16	-22	-18
Tetanus, 19-49 yrs	71	-20	-17	-14
Tetanus, 50-64 yrs	69	-16	-14	-17
Tetanus, ≥65 yrs	65	-16	-18	-20
Tdap, ≥19 yrs	37	-16	-16	-7
Tdap, 19-64 yrs	39	-18	-17	-8
Tdap, ≥65 yrs	27	-12	-15	-7
HepA, 19-49 yrs	16	-5	-3	7
HepB, 19-49 yrs	37	-6	-9	3.1
Herpes Zoster, ≥60 yrs	39	-22	-19	-8
HPV, Females 19-26 yrs	57	-10	-19	-12
Tdap, HCP ≥19 yrs	60	-16	-7	6
HepB, HCP ≥19 yrs	64	-16	-12	11

Trends in Influenza Vaccination, ≥ 65 years, by Race/Ethnicity: 2008-09 – 2016-17 Seasons, NHIS, United States



* Other includes Asian, American Indian/Alaska Native, and multiple race.

Average Change in Racial/Ethnic Vaccination Differences 2010-2017

Vaccination Group	Average Change in % Vaccination Coverage Differences Compared with Whites			
	Black	Hispanic	Asian	Other
Pneumo., IR 19-64 yrs	-0.3	0.2	0.5	0.1
Pneumo., ≥65 yrs	0.3	0.1	0.5	-0.3
Tetanus, ≥19 yrs	-0.8	-0.4	0.3	-0.2
Tetanus, 19-49 yrs	-1.0	-0.4	0.6	-0.3
Tetanus, 50-64 yrs	-0.4	0.2	0.1	0.9
Tetanus, ≥65 yrs	-0.3	-0.2	0.0	-1.2
Tdap, ≥19 yrs	-2.4	-1.7	-1.4	-0.7
Tdap, 19-64 yrs	-2.7	-2.1	-1.7	0.0
Tdap, ≥65 yrs	-2.1	-1.5	-0.4	-1.4
HepA, 19-49 yrs	-0.6	-0.4	-0.3	-0.7
HepB, 19-49 yrs	-0.8	-0.3	-0.1	-0.2
HepB, HCP ≥19 yrs	-1.8	-0.9	-0.2	-2.0
Herpes Zoster, ≥60 yrs	-1.9	-1.3	-1.5	-0.3

Association of Health Insurance Status with Vaccination Coverage

- Most study respondents (91%) indicated having some type of health insurance
- Coverage was generally lower among adults without health insurance compared with those with health insurance
- Coverage differed by type of health insurance
 - Coverage was generally higher among those reporting private versus public insurance

Data Source: 2017 NHIS

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, among those with or without health insurance

Data Source: 2017 NHIS

Adult Vaccination Coverage by Health Insurance Status and Physician Contacts

- With few exceptions, coverage was higher among those reporting having had one or more physician contacts in the past year compared with those who had not visited a physician, regardless of whether they had health insurance
- Vaccination coverage generally increased as the number of physician contacts increased
- Missed opportunities to vaccinate occurred among 21.0%–87.9% of respondents with ≥ 10 physician contacts, depending on the vaccine

Data Source: 2017 NHIS

Limitations of Findings

- NHIS excludes persons in the military and those residing in institutions – results apply to the civilian, non-institutionalized population
- Response rate 53.0% -- low response rate can result in selection bias if the nonresponse is unequal among participants regarding vaccination
- Reported vaccination status and high-risk/increased-risk conditions not validated by medical records
- Self-report of vaccination subject to recall bias
- Tdap estimates: potential bias due to exclusions of those unable to say whether Td or Tdap was used

Conclusions

- **Overall coverage remains below HP2020 targets**
 - 70% for 19+ years for influenza vaccine
 - 90% for 65+ years for pneumococcal vaccine
 - 60% for increased risk 19-64 years for pneumococcal vaccine
 - 30% for 60+ years for Zoster vaccine
 - 90% for hepatitis B vaccine for healthcare personnel
- **Some improvement from 2016**
 - Influenza (≥ 19 years), Tdap (≥ 19 years), hepatitis A (19-49 years) and HPV (males, 19-26 years) vaccines
 - No improvements for other vaccines
- **Racial and ethnic disparities remain**
- **Much remains to be done to increase vaccine utilization among adults and to eliminate disparities**

Collaborators

- Peng-Jun Lu, MD, PhD
- Mei-Chuan Hung, MS, PhD
- LaDora O. Woods
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For Additional Information:

ACIP Recommendations for Specific Vaccines

- <http://www.cdc.gov/vaccines/hcp/acip-recs/index.html>

Surveillance of Adult Vaccination Coverage, NHIS 2016

- <https://www.cdc.gov/mmwr/volumes/66/ss/ss6611a1.htm>

Online Report on Adult Vaccination Coverage, February 2017:

- <https://www.cdc.gov/vaccines/imz-managers/coverage/adultvaxview/pubs-resources/NHIS-2016.html>

AdultVaxView

- <https://www.cdc.gov/vaccines/imz-managers/coverage/adultvaxview/pubs-resources/NHIS-2016.html>



For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

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