SUPPLEMENTARY TABLE. CDC* and the National Committee for Quality Assurance (NCQA)† analytic approaches for vaccination coverage estimation using an age-appropriate composite adult vaccination quality measure, by age group — National Health Interview Survey, United States, 2018

	% (95% CI)							
	≥19 years (CDC)	**≥19 years (NCQA)**	**19–49 years (CDC)**	**19–49 years (NCQA)**	**50–64 years (CDC)**	**50–64 years (NCQA)**	**≥65 years (CDC)**	**≥65 years (NCQA)**
	(n§=25,207)	(n§=25,207)	(n§=11,318)	(n§=11,318)	(n§=6,592)	(n§=6,592)	(n§=7,297)	(n§=7,297)
Composite measure								
Includes influenza in past 12 months								
Method 1: Tdap only	13.5¶ (12.7, 14.3)	36.7** (35.8, 37.6)	18.7†† (17.4, 19.9)	35.8§§ (34.5, 37.1)	3.9¶¶ (3.2, 4.8)	26.9*** (25.7, 28.1)	11.2††† (10.0, 12.5)	47.3§§§ (45.9, 48.6)
Method 2: Td or Tdap	20.2¶¶¶ (19.4, 21.0)	49.7**** (48.9, 50.4)	25.7†††† (24.5, 26.9)	49.4§§§§ (48.4, 50.4)	6.7¶¶¶¶ (6.0, 7.6)	40.4***** (39.4, 41.3)	22.6††††† (21.2, 24.0)	58.9§§§§§ (57.8, 60.0)
Does not include influenza in past 12 months								
Method 1: Tdap only	24.0¶¶¶¶¶ (22.9, 25.2)	32.8****** (31.8, 33.9)	36.9††††† (35.2, 38.6)	36.9§§§§§§ (35.2, 38.6)	4.8¶¶¶¶¶¶ (4.1, 5.7)	18.4******* (17.2, 19.6)	12.1††††††† (10.9, 13.5)	41.2§§§§§§§ (39.7, 42.6)
Method 2: Td or Tdap	42.3¶¶¶¶¶¶¶ (41.3, 43.3)	52.8******** (51.9, 53.7)	64.5††††††† (63.1, 65.8)	64.5§§§§§§§ (63.1, 65.8)	8.7¶¶¶¶¶¶¶ (7.9-9.7)	37.0********* (36.0, 38.1)	25.4††††††††† (23.9, 26.8)	55.8§§§§§§§§ (54.5, 57.0)

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

* Estimates using data from the 2018 NHIS for age-based composite adult vaccination quality measure for tetanus toxoid-containing, pneumococcal, herpes zoster, and influenza vaccines. The CDC analytic approach uses persons as the unit of analysis, where estimates for each age group represent the proportion of adults who reported receipt of all the vaccines routinely recommended for that age group. The composite numerator includes only those persons who reported receiving ALL the recommended vaccines; the composite denominator includes ALL the persons with indications for vaccination based on the recommended vaccines for that specific age group (a unit of person, each person counted once). Individuals who did not answer the vaccination questions (answering "don't know" or "refused") were excluded from the analysis. Data were analyzed to determine estimates for vaccines routinely recommended for all adults aged ≥19 years (Td, Tdap, and influenza vaccines) or indicated based on age (herpes zoster and pneumococcal vaccines), and three age groups: for adults aged 19–49 years (influenza AND Td or Tdap vaccines); adults aged 50–64 years (influenza, Td or Tdap, AND herpes zoster vaccines); and adults aged ≥65 years (influenza, Td or Tdap, herpes zoster, AND pneumococcal vaccines). Influenza vaccination was measured as receipt in the past 12 months, in contrast to Table 1, where influenza vaccination coverage for July 2017–May 2018 was estimated using Kaplan–Meier survival analysis. Td/Tdap vaccination was measured as receipt in the past 10 years. Pneumococcal and herpes zoster vaccinations were measured as ever receiving at least one dose of either kind of vaccine. Estimates for the composite measures (see reference No. 11) for the CDC analytic approach were calculated to include Tdap vaccine in the past 10 years (Method 1) or any tetanus-toxoid containing vaccine in the past 10 years (Method 2), and both with and without influenza vaccination in the past 12 months. Using Method 1, percent of respondents excluded in vaccination coverage estimation including influenza vaccination was 40.7% overall, ranging from 38.4% in adults aged 19–49 years to 43.1% in adults aged ≥65 years; percent of respondents excluded in vaccination coverage estimation excluding influenza vaccination was 40.6% overall, ranging from 38.2% in adults aged 19–49 years to 43.1% in adults aged ≥65 years.

[†] Estimates using data from the 2018 NHIS for age-based composite adult vaccination quality measure for tetanus toxoid-containing, pneumococcal, herpes zoster, and influenza vaccines. Actual estimates generated by NCQA for the age-based composite measure using its approach are different than those derived using the CDC analytic approach. The NCQA analytic approach (https://www.ncqa.org/wp-content/uploads/2018/10/HEDIS-2019-Volume-2-Technical-Update.pdf; see pages 26-32) uses recommended vaccines as the unit of analysis: i.e., "a model that looks at the number of immunizations that were administered or contraindicated due to history of anaphylactic reaction or encephalopathy following vaccination [numerator] out of the possible number of immunizations needed to be administered to members per clinical guideline recommendations for the age group [denominator]". Also: 1) NCQA uses actual vaccination data from the participating health plans (commercial, Medicare, and Medicaid) to generate its estimates; 2) NCQA's criteria for exclusions are different than CDC's; 3) the NCQA "measurement periods" for ascertaining influenza and Td/Tdap vaccination status are different; 4) the NCQA criteria for herpes zoster vaccination are different (e.g., the criteria are vaccine-type specific with the recombinant zoster vaccine criterium requiring series completion to be counted); and, 5) the NCQA criterium for pneumococcal vaccination (plan members aged ≥66 years at the start of the measurement period) was based on the previous "series completion (i.e., receipt of both pneumococcal conjugate vaccine [PCV13] and pneumococcal polysaccharide vaccine [PPSV23] in a proper time interval)" Advisory Committee on Immunization Practices (ACIP) recommendations in effect during 2018. ACIP currently recommends a single dose of PPSV23 for adults aged ≥65 years and shared clinical decision-making for —administration of PCV13 to persons aged ≥65 years who do not have an immunocompromising condition, cerebrospinal fluid leak, or cochlear implant and who have not previously received PCV13 (https://www.cdc.gov/mmwr/volumes/68/wr/mm6846a5.htm). If a decision to administer PCV13 is made, PCV13 should be administered first, followed by PPSV23 at least 1 year later. For the comparison estimates in this table, we adapted recommended vaccines as the unit of analysis. The composite denominator indicates the number of recommended vaccinations for persons based on their age (a unit of recommended vaccinations); the composite numerator indicates whether the vaccination was administered (a unit of recommended vaccinations received). Data were analyzed to determine estimates for vaccines routinely recommended for all adults aged ≥19 years (Td/Tdap and influenza vaccines) or indicated based on age (adults aged ≥50 years for herpes zoster vaccine and ≥65 years for pneumococcal vaccine). The composite rate is the percentage of the total recommended number of vaccinations, per clinical guidelines according to age, that were administered as indicated (i.e., the sum of the individual vaccines administered divided by the sum of the individual vaccines required).

[§] Total unweighted sample size for the overall age group. Denominators for each point estimate vary because individuals who did not answer vaccination questions were excluded from the analysis.

[¶] **CDC approach, ≥19 years, including influenza, method 1 (Tdap only).** A composite estimate of overall vaccination coverage among adults aged ≥19 years who have received the select vaccines that are recommended for their age groups: adults aged 19-49 who have received influenza vaccine (past 12 months) AND Tdap vaccine (past 10 years); adults aged 50-64 years who have received influenza vaccine (past 12 months) AND Tdap (past 10 years) AND who have received herpes zoster vaccines (ever); and adults aged ≥65 years who have received influenza vaccine (past 12 months) AND Tdap (past 10 years) AND herpes zoster vaccines (ever) AND who have received pneumococcal vaccine (ever). Influenza vaccination was measured as receipt in the past 12 months, in contrast to Table 1, where influenza vaccination coverage for July 2017–May 2018 was estimated using Kaplan–Meier survival analysis. The NHIS composite estimates using the CDC approach will differ from practice-based NCQA estimates.

** **Adapted NCQA approach, ≥19 years, including influenza, method 1 (Tdap only).** A composite estimate of overall vaccination coverage among adults aged ≥19 years who have received the number of recommended vaccinations for persons based on their age: adults aged 19-49 years who have received influenza vaccine (past 12 months) AND Tdap vaccine (past 10 years); adults aged 50-64 years who have received influenza vaccine (past 12 months) AND Tdap (past 10 years) AND who have received herpes zoster vaccines (ever); and adults aged ≥65 years who have received influenza (past 12 months) AND Tdap (past 10 years) AND herpes zoster vaccines (ever) AND who have received pneumococcal vaccine (ever). Influenza vaccination was measured as receipt in the past 12 months, in contrast to Table 1, where influenza vaccination coverage for July 2017–May 2018 was estimated using Kaplan–Meier survival analysis. Actual estimates generated by NCQA for the age-based composite measure, which uses recommended vaccines as the unit of analysis, are different than those derived using the CDC analytic approach, which uses person as the unit of analysis. For actual NCQA estimates: 1) influenza vaccination was measured as receipt on or between July 1 of the year prior to the measurement period and June 30 of the measurement period; 2) Tdap vaccination was measured as receipt of at least one Tdap vaccine between nine years prior to the start of the measurement period and the end of the measurement period; 3) individuals received at least one dose of the herpes zoster live vaccine or two doses of the herpes zoster recombinant vaccine (at least 28 days apart) anytime on or after the individual's 50th birthday; and, 4) individuals were administered both the 13-valent pneumococcal conjugate vaccine and the 23-valent pneumococcal polysaccharide vaccine at least 12 months apart, with the first occurrence after the age of 60. The composite denominator indicates the number of recommended vaccinations for persons based on their age (a unit of recommended vaccinations); the composite numerator indicates whether the vaccination was administered (a unit of recommended vaccinations received); and, the composite rate is the percentage of the total recommended number of vaccinations, per clinical guidelines according to age, that were administered as indicated (i.e., the sum of the individual vaccines administered divided by the sum of the individual vaccines required).

[††] **CDC approach, 19-49 years, including influenza, method 1 (Tdap only).** A composite estimate of vaccination coverage among adults aged 19-49 years who have received the select vaccines that are recommended for their age group: adults who have received influenza vaccine (past 12 months) AND Tdap vaccine (past 10 years). Influenza vaccination was measured as receipt in the past 12 months, in contrast to Table 1, where influenza vaccination coverage for July 2017–May 2018 was estimated using Kaplan-Meier survival analysis. The NHIS composite estimates using the CDC approach will differ from practice-based NCQA estimates.

[§§] **Adapted NCQA approach, 19-49 years, including influenza, method 1 (Tdap only).** A composite estimate of vaccination coverage among adults aged 19–49 years who have received the number of recommended vaccinations for persons based on their age: adults who have received influenza vaccine (past 12 months) AND Tdap vaccine (past 10 years). Influenza vaccination was measured as receipt in the past 12 months, in contrast to Table 1, where influenza vaccination coverage for July 2017–May 2018 was estimated using Kaplan–Meier survival analysis. Actual estimates generated by NCQA for the age-based composite measure using its approach are different than those derived using the CDC analytic approach. For actual NCQA estimates: 1) influenza vaccination was measured as receipt on or between July 1 of the year prior to the measurement period and June 30 of the measurement period; and, 2) Tdap vaccination was measured as receipt of at least one Tdap vaccine between nine years prior to the start of the measurement period and the end of the measurement period. The composite denominator indicates the number of recommended vaccinations for persons based on their age (a unit of recommended vaccinations); the composite numerator indicates whether the vaccination was administered (a unit of recommended vaccinations received); and, the composite rate is the percentage of the total recommended number of vaccinations, per clinical guidelines according to age, that were administered as indicated (i.e., the sum of the individual vaccines administered divided by the sum of the individual vaccines required).

[¶¶] **CDC approach, 50-64 years, including influenza, method 1 (Tdap only).** A composite estimate of vaccination coverage among adults aged 50-64 years who have received the select vaccines that are recommended for their age group: adults who have received influenza vaccine (past 12 months) AND Tdap (past 10 years) AND herpes zoster vaccines (ever). Influenza vaccination was measured as receipt in the past 12 months, in contrast to Table 1, where influenza vaccination coverage for July 2017–May 2018 was estimated using Kaplan–Meier survival analysis. The NHIS composite estimates using the CDC approach will differ from practice-based NCQA estimates.

*** **Adapted NCQA approach, 50-64 years, including influenza, method 1 (Tdap only).** A composite estimate of vaccination coverage among adults aged 50–64 years who have received the number of recommended vaccinations for persons based on their age: adults who have received influenza vaccine (past 12 months) AND Tdap (past 10 years) AND herpes zoster vaccines (ever). Influenza vaccination was measured as receipt in the past 12 months, in contrast to Table 1, where influenza vaccination coverage for July 2017–May 2018 was estimated using Kaplan–Meier survival analysis. Actual estimates generated by NCQA for the age-based composite measure using its approach are different than those derived using the CDC analytic approach. For actual NCQA estimates: 1) influenza vaccination was measured as receipt on or between July 1 of the year prior to the measurement period and June 30 of the measurement period; 2) Tdap vaccination was measured as receipt of at least one dose of Tdap vaccine between nine years prior to the start of the measurement period and the end of the measurement period; and, 3) individuals received at least one dose of the herpes zoster live vaccine or two doses of the herpes zoster recombinant vaccine (at least 28 days apart) anytime on or after the individual's 50th birthday. The composite denominator indicates the number of recommended vaccinations for persons based on their age (a unit of recommended vaccinations); the composite numerator indicates whether the vaccination was administered (a unit of recommended vaccinations received); and, the composite rate is the percentage of the total recommended number of vaccinations, per clinical guidelines according to age, that were administered as indicated (i.e., the sum of the individual vaccines administered divided by the sum of the individual vaccines required).

[†††] **CDC approach, ≥65 years, including influenza, method 1 (Tdap only).** A composite estimate of vaccination coverage among adults aged ≥65 years who have received the select vaccines that are recommended for their age group: adults who have received influenza vaccine (past 12 months) AND Tdap (past 10 years) AND herpes zoster vaccines (ever) AND who have received pneumococcal vaccine (ever). Influenza vaccination was measured as receipt in the past 12 months, in contrast to Table 1, where influenza vaccination coverage for July 2017–May 2018 was estimated using Kaplan–Meier survival analysis. The NHIS composite estimates using the CDC approach will differ from practice-based NCQA estimates.

§§§ **Adapted NCQA approach, ≥65 years, including influenza, method 1 (Tdap only).** A composite estimate of vaccination coverage among adults aged ≥65 who have received the number of recommended vaccinations for persons based on their age: adults who have received influenza vaccine (past 12 months) AND Tdap (past 10 years) AND herpes zoster vaccines (ever) AND who have received pneumococcal vaccine (ever). Influenza vaccination was measured as receipt in the past 12 months, in contrast to Table 1, where influenza vaccination coverage for July 2017–May 2018 was estimated using Kaplan–Meier survival analysis. Actual estimates generated by NCQA for the age-based composite measure using its approach are different than those derived using the CDC analytic approach. For actual NCQA estimates: 1) influenza vaccination was measured as receipt on or between July 1 of the year prior to the measurement period and June 30 of the measurement period; 2) Tdap vaccination was measured as receipt of at least one dose of Tdap vaccine between nine years prior to the start of the measurement period and the end of the measurement period; 3) individuals received at least one dose of the herpes zoster live vaccine or two doses of the herpes zoster recombinant vaccine (at least 28 days apart) anytime on or after the individual's 50th birthday; and, 4) individuals were administered both the 13-valent pneumococcal conjugate vaccine and the 23-valent pneumococcal polysaccharide vaccine at least 12 months apart, with the first occurrence after the age of 60. The composite denominator indicates the number of recommended vaccinations for persons based on their age (a unit of recommended vaccinations); the composite numerator indicates whether the vaccination was administered (a unit of recommended vaccinations received); and, the composite rate is the percentage of the total recommended number of vaccinations, per clinical guidelines according to age, that were administered as indicated (i.e., the sum of the individual vaccines administered divided by the sum of the individual vaccines required).

¶¶¶ **CDC approach, ≥19 years, including influenza, method 2 (Td or Tdap).** A composite estimate of overall vaccination coverage among adults aged ≥19 years who have received the select vaccines that are recommended for their age groups: adults aged 19-49 who have received influenza vaccine (past 12 months) AND Td or Tdap vaccine (past 10 years); adults aged 50-64 years who have received influenza vaccine (past 12 months) AND Td or Tdap (past 10 years) AND herpes zoster vaccines (ever); and adults aged ≥65 years who have received influenza vaccine (past 12 months) AND Td or Tdap (past 10 years) AND herpes zoster vaccines (ever) AND who have received pneumococcal vaccine (ever). Influenza vaccination was measured as receipt in the past 12 months, in contrast to Table 1, where influenza vaccination coverage for July 2017–May 2018 was estimated using Kaplan–Meier survival analysis. The NHIS composite estimates using the CDC approach will differ from practice-based NCQA estimates.

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†††† **CDC approach, 19-49 years, including influenza, method 2 (Td or Tdap).** A composite estimate of vaccination coverage among adults aged 19-49 years who have received the select vaccines that are recommended for their age group: adults who have received influenza vaccine (past 12 months) AND Td or Tdap vaccine (past 10 years). Influenza vaccination was measured as receipt in the past 12 months, in contrast to Table 1, where influenza vaccination coverage for July 2017–May 2018 was estimated using Kaplan–Meier survival analysis. The NHIS composite estimates using the CDC approach will differ from practice-based NCQA estimates.

§§§§ **Adapted NCQA approach, 19-49 years, including influenza, method 2 (Td or Tdap).** A composite estimate of vaccination coverage among adults aged 19–49 years who have received the number of recommended vaccinations for persons based on their age: adults who have received influenza vaccine (past 12 months) AND Td or Tdap vaccine (past 10 years). Influenza vaccination was measured as receipt in the past 12 months, in contrast to Table 1, where influenza vaccination coverage for July 2017–May 2018 was estimated using Kaplan–Meier survival analysis. Actual estimates generated by NCQA for the age-based composite measure using its approach are different than those derived using the CDC analytic approach. For actual NCQA estimates: 1) influenza vaccination was measured as receipt on or between July 1 of the year prior to the measurement period and June 30 of the measurement period; and, 2) Td or Tdap vaccination was measured as receipt of at least one Td vaccine or one Tdap vaccine between nine years prior to the start of the measurement period and the end of the measurement period. The composite denominator indicates the number of recommended vaccinations for persons based on their age (a unit ofrecommended vaccinations); the composite numerator indicates whether the vaccination was administered (a unit of recommended vaccinations received); and, the composite rate is the percentage of the total recommended number of vaccinations, per clinical guidelines according to age, that were administered as indicated (i.e., the sum of the individual vaccines administered divided by the sum of the individual vaccines required).

¶¶¶¶ **CDC approach, 50-64 years, including influenza, method 2 (Td or Tdap).** A composite estimate of vaccination coverage among adults aged 50-64 years who have received the select vaccines that are recommended for their age group: adults who have received influenza vaccine (past 12 months) AND Td or Tdap (past 10 years) AND herpes zoster vaccines (ever). Influenza vaccination was measured as receipt in the past 12 months, in contrast to Table 1, where influenza vaccination coverage for July 2017–May 2018 was estimated using Kaplan–Meier survival analysis. The NHIS composite estimates using the CDC approach will differ from practice-based NCQA estimates.

***** **Adapted NCQA approach, 50-64 years, including influenza, method 2 (Td or Tdap).** A composite estimate of vaccination coverage among adults aged 50–64 years who have received the number of recommended vaccinations for influenza vaccine (past 12 months) AND Td or Tdap (past 10 years) AND herpes zoster vaccines (ever). Influenza vaccination was measured as receipt in the past 12 months, in contrast to Table 1, where influenza vaccination coverage for July 2017–May 2018 was estimated using Kaplan–Meier survival analysis. Actual estimates generated by NCQA for the age-based composite measure using its approach are different than those derived using the CDC analytic approach. For actual NCQA estimates: 1) influenza vaccination was measured as receipt on or between July 1 of the year prior to the measurement period and June 30 of the measurement period; 2) Td or Tdap vaccination was measured as receipt of at least one Td vaccine or one Tdap vaccine between nine years prior to the start of the measurement period and the end of the measurement period; and, 3) individuals received at least one dose of the herpes zoster live vaccine or two doses of the herpes zoster recombinant vaccine (at least 28 days apart) anytime on or after the individual's 50^{th} birthday. The composite denominator indicates the number of recommended vaccinations for persons based on their age (a unit of recommended vaccinations); the composite numerator indicates whether the vaccination was administered (a unit of recommended vaccinations received); and, the composite rate is the percentage of the total recommended number of vaccinations, per clinical guidelines according to age, that were administered as indicated (i.e., the sum of the individual vaccines administered divided by the sum of the individual vaccines required).

†††† **CDC approach, ≥65 years, including influenza, method 2 (Td or Tdap).** A composite estimate of vaccination coverage among adults aged ≥65 years who have received the select vaccines that are recommended for their age group: adults who have received influenza vaccine (past 12 months) AND Td or Tdap (past 10 years) AND herpes zoster vaccines (ever) AND who have received pneumococcal vaccine (ever). Influenza vaccination was measured as receipt in the past 12 months, in contrast to Table 1, where influenza vaccination coverage for July 2017–May 2018 was estimated using Kaplan–Meier survival analysis. The NHIS composite estimates using the CDC approach will differ from practice-based NCQA estimates.

§§§§§ **Adapted NCQA approach, ≥65 years, including influenza, method 2 (Td or Tdap).** A composite estimate of vaccination coverage among adults aged ≥65 years who have received the number of recommended vaccinations for persons based on their age: adults who have received influenza vaccine (past 12 months) AND Td or Tdap (past 10 years) AND herpes zoster vaccines (ever) AND who have received pneumococcal vaccine (ever). Influenza vaccination was measured as receipt in the past 12 months, in contrast to Table 1, where influenza vaccination coverage for July 2017–May 2018 was estimated using Kaplan–Meier survival analysis. Actual estimates generated by NCQA for the age-based composite measure using its approach are different than those derived using the CDC analytic approach.For actual NCQA estimates: 1) influenza vaccination was measured as receipt on or between July 1 of the year prior to the measurement period and June 30 of the measurement period; 2) Td or Tdap vaccination was measured as receipt of at least one Td vaccine or one Tdap vaccine between nine years prior to the start of the measurement period and the end of the measurement period; 3) individuals received at least one dose of the herpes zoster live vaccine or two doses of the herpes zoster recombinant vaccine (at least 28 days apart) anytime on or after the individual's 50th birthday; and, 4) individuals were administered both the 13-valent pneumococcal conjugate vaccine and the 23-valent pneumococcal polysaccharide vaccine at least 12 months apart, with the first occurrence after the age of 60. The composite denominator indicates the number of recommended vaccinations for persons based on their age (a unit of recommended vaccinations); the composite numerator indicates whether the vaccination was administered (a unit of recommended vaccinations received); and, the composite rate is the percentage of the total recommended number of vaccinations, per clinical guidelines according to age, that were administered as indicated (i.e., the sum of the individual vaccines administered divided by the sum of the individual vaccines required).

¶¶¶¶¶ **CDC approach, ≥19 years, does not include influenza, method 1 (Tdap only).** A composite estimate of overall vaccination coverage among adults aged ≥19 years who have received the select vaccines that are recommended for their age groups: adults aged 19-49 years who have received Tdap vaccine (past 10 years); adults aged 50-64 years who have received Tdap (past 10 years) AND herpes zoster vaccines (ever); and adults aged ≥65 years who have received Tdap (past 10 years) AND herpes zoster vaccines (ever) AND who have received pneumococcal vaccine (ever). The NHIS composite estimates using the CDC approach will differ from practice-based NCQA estimates.

****** **Adapted NCQA approach, ≥19 years, does not include influenza, method 1 (Tdap only).** A composite estimate of overall vaccination coverage among adults aged ≥19 years who have received the number of recommended vaccinations for persons based on their age: adults aged 19-49 years who have received Tdap vaccine (past 10 years); adults aged 50-64 years who have received Tdap (past 10 years) AND herpes zoster vaccines (ever); and adults aged ≥65 years who have received Tdap (past 10 years) AND herpes zoster vaccines (ever) AND who have received pneumococcal vaccine (ever). Actual estimates generated by NCQA for the age-based composite measure using its approach are different than those derived using the CDC analytic approach. For actual NCQA estimates: 1) Tdap vaccination was measured as receipt of at least one Tdap vaccine between nine years prior to the start of the measurement period and the end of the measurement period; 2) individuals received at least one dose of the herpes zoster live vaccine or two doses of the herpes zoster recombinant vaccine (at least 28 days apart) anytime on or after the individual's 50th birthday; and, 3) Individuals were administered both the 13-valent pneumococcal conjugate vaccine and the 23-valent pneumococcal polysaccharide vaccine at least 12 months apart, with the first occurrence after the age of 60. The composite denominator indicates the number of recommended vaccinations for persons based on their age (a unit of recommended vaccinations); the composite numerator indicates whether the vaccination was administered (a unit of recommended vaccinations received); and, the composite rate is the percentage of the total recommended number of vaccinations, per clinical guidelines according to age, that were administered as indicated (i.e., the sum of the individual vaccines administered divided by the sum of the individual vaccines required).

†††††† **CDC approach, 19-49 years, does not include influenza, method 1 (Tdap only).** A composite estimate of vaccination coverage among adults aged 19-49 years who have received the select vaccines that are recommended for their age group: adults who have received Tdap vaccine (past 10 years). The NHIS composite estimates using the CDC approach will differ from practice-based NCQA estimates.

§§§§§§ **Adapted NCQA approach, 19-49 years, does not include influenza, method 1 (Tdap only).** A composite estimate of vaccination coverage among adults aged 19-49 years who have received the number of recommended vaccinations for persons based on their age: adults who have received Tdap vaccine (past 10 years). Actual estimates generated by NCQA for the age-based composite measure using its approach are different than those derived using the CDC analytic approach. For actual NCQA estimates: Tdap vaccination was measured as receipt of at least one Tdap vaccine between nine years prior to the start of the measurement period and the end of the measurement period. The composite denominator indicates the number of recommended vaccinations for persons based on their age (a unit of recommended vaccinations); the composite numerator indicates whether the vaccination was administered (a unit of recommended vaccinations received); and, the composite rate is the percentage of the total recommended number of vaccinations, per clinical guidelines according to age, that were administered as indicated (i.e., the sum of the individual vaccines administered divided by the sum of the individual vaccines required).

¶¶¶¶¶¶ **CDC approach, 50-64 years, does not include influenza, method 1 (Tdap only).** A composite estimate of vaccination coverage among adults aged 50-64 years who have received the select vaccines that are recommended for their age group: adults who have received Tdap (past 10 years) AND —herpes zoster vaccines (ever). The NHIS composite estimates using the CDC approach will differ from practice-based NCQA estimates.

******* **Adapted NCQA approach, 50-64 years, does not include influenza, method 1 (Tdap only).** A composite estimate of vaccination coverage among adults aged 50-64 years who have received the number of recommended vaccinations for persons based on their age: adults who have received Tdap (past 10 years) AND herpes zoster vaccines (ever). Actual estimates generated by NCQA for the age-based composite measure using its approach are different than those derived using the CDC analytic approach. For actual NCQA estimates: 1) Tdap vaccination was measured as receipt of at least one Tdap vaccine between nine years prior to the start of the measurement period and the end of the measurement period; and, 2) individuals received at least one dose of the herpes zoster live vaccine or two doses of the herpes zoster recombinant vaccine (at least 28 days apart) anytime on or after the individual's 50th birthday. The composite denominator indicates the number of recommended vaccinations for persons based on their age (a unit of recommended vaccinations); the composite numerator indicates whether the vaccination was administered (a unit of recommended vaccinations received); and, the composite rate is the percentage of the total recommended number of vaccinations, per clinical guidelines according to age, that were administered as indicated (i.e., the sum of the individual vaccines administered divided by the sum of the individual vaccines required).

†††††††† **CDC approach, ≥65 years, does not include influenza, method 1 (Tdap only).** A composite estimate of vaccination coverage among adults aged ≥65 years who have received the select vaccines that are recommended for their age group: adults who have received Tdap (past 10 years) AND herpes zoster vaccines (ever) AND who have received pneumococcal vaccine (ever). The NHIS composite estimates using the CDC approach will differ from practice-based NCQA estimates.

§§§§§§§ **Adapted NCQA approach, ≥65 years, does not include influenza, method 1 (Tdap only).** A composite estimate of vaccination coverage among adults aged ≥65 years who have received the number of recommended vaccinations for persons based on their age: adults who have received Tdap (past 10 years) AND herpes zoster vaccines (ever) AND who have received pneumococcal vaccine (ever). Actual estimates generated by NCQA for the age-based composite measure using its approach are different than those derived using the CDC analytic approach. For actual NCQA estimates: 1) Tdap vaccination was measured as receipt of at least of one Tdap vaccine between nine years prior to the start of the measurement period and the end of the measurement period; 2) individuals received at least one dose of the herpes zoster live vaccine or two doses of the herpes zoster recombinant vaccine (at least 28 days apart) anytime on or after the individual's 50th birthday; and, 3) individuals were administered both the 13-valent pneumococcal conjugate vaccine and the 23-valent pneumococcal polysaccharide vaccine at least 12 months apart, with the first occurrence after the age of 60. The composite denominator indicates the number of recommended vaccinations for persons based on their age (a unit of recommended vaccinations); the composite numerator indicates whether the vaccination was administered (a unit of recommended vaccinations received); and, the composite rate is the percentage of the total recommended number of vaccinations, per clinical guidelines according to age, that were administered as indicated (i.e., the sum of the individual vaccines administered divided by the sum of the individual vaccines required).

¶¶¶¶¶¶¶ **CDC approach, ≥19 years, does not include influenza, method 2 (Td or Tdap).** A composite estimate of overall vaccination coverage among adults aged ≥19 years who have received the select vaccines that are recommended for their age groups: adults aged 19-49 who have received Td or Tdap vaccine (past 10 years); adults aged 50-64 years who have received Td or Tdap (past 10 years) AND herpes zoster vaccines (ever); and adults aged ≥65 years who have received Td or Tdap (past 10 years) AND herpes zoster vaccines (ever) AND who have received pneumococcal vaccine (ever). The NHIS composite estimates using the CDC approach will differ from practice-based NCQA estimates.

******** **Adapted NCQA approach, ≥19 years, does not include influenza, method 2 (Td or Tdap).** A composite estimate of overall vaccination coverage among adults aged ≥19 years who have received the number of recommended vaccinations for persons based on their age: adults aged 19-49 years who have received Td or Tdap vaccine (past 10 years); adults aged 50-64 years who have received Td or Tdap (past 10 years) AND herpes zoster vaccines (ever); and adults aged ≥65 years who have received Td or Tdap (past 10 years) AND herpes zoster vaccines (ever) AND who have received pneumococcal vaccine (ever). Actual estimates generated by NCQA for the age-based composite measure using its approach are different than those derived using the CDC analytic approach. For actual NCQA estimates: 1) Td or Tdap vaccination was measured as receipt of at least one Td vaccine or one Tdap vaccine between nine years prior to the start of the measurement period and the end of the measurement period; 2) individuals received at least one dose of the herpes zoster live vaccine or two doses of the herpes zoster recombinant vaccine (at least 28 days apart) anytime on or after the individual's 50th birthday; and, 3) individuals were administered both the 13-valent pneumococcal conjugate vaccine and the 23-valent pneumococcal polysaccharide vaccine at least 12 months apart, with the first occurrence after the age of 60. The composite denominator indicates the number of recommended vaccinations for persons based on their age (a unit of recommended vaccinations); the composite numerator indicates whether the vaccination was administered (a unit of recommended vaccinations received); and, the composite rate is the percentage of the total recommended number of vaccinations, per clinical guidelines according to age, that were administered as indicated (i.e., the sum of the individual vaccines administered divided by the sum of the individual vaccines required).

†††††††† **CDC approach, 19-49 years, does not include influenza, method 2 (Td or Tdap).** A composite estimate of vaccination coverage among adults aged 19-49 years who have received the select vaccines that are recommended for their age group: adults who have received Td or Tdap vaccine (past 10 years). The NHIS composite estimates using the CDC approach will differ from practice-based NCQA estimates.

§§§§§§§ **Adapted NCQA approach, 19-49 years, does not include influenza, method 2 (Td or Tdap).** A composite estimate of vaccination coverage among adults aged 19-49 years who have received the number of recommended vaccinations for persons based on their age: adults who have received Td or Tdap vaccine (past 10 years). Actual estimates generated by NCQA for the age-based composite measure using its approach are different than those derived using the CDC analytic approach. For actual NCQA estimates: Td or Tdap vaccination was measured as receipt of at least one Td vaccine or one Tdap vaccine between nine years prior to the start of the measurement period and the end of the measurement period. The composite denominator indicates the number of recommended vaccinations for persons based on their age (a unit of recommended vaccinations); the composite numerator indicates whether the vaccination was administered (a unit of recommended vaccinations received); and, the composite rate is the percentage of the total recommended number of vaccinations, per clinical guidelines according to age, that were administered as indicated (i.e., the sum of the individual vaccines administered divided by the sum of the individual vaccines required).

¶¶¶¶¶¶¶¶ **CDC approach, 50-64 years, does not include influenza, method 2 (Td or Tdap).** A composite estimate of vaccination coverage among adults aged 50-64 years who have received the select vaccines that are recommended for their age group: adults who have received Td or Tdap vaccine (past 10 years) AND herpes zoster vaccines (ever). The NHIS composite estimates using the CDC approach will differ from practice-based NCQA estimates.

********* **Adapted NCQA approach, 50-64 years, does not include influenza, method 2 (Td or Tdap).** A composite estimate of vaccination coverage among adults aged 50-64 years who have received the number of recommended vaccinations for persons based on their age: adults who have received Td or Tdap (past 10 years) AND herpes zoster vaccines (ever). Actual estimates generated by NCQA for the age-based composite measure using its approach are different than those derived using the CDC analytic approach. For actual NCQA estimates: 1) Td or Tdap vaccination was measured as receipt of at least one Td vaccine or one Tdap vaccine between nine years prior to the start of the measurement period and the end of the measurement period; and, 2) individuals received at least one dose of the herpes zoster live vaccine or two doses of the herpes zoster recombinant vaccine (at least 28 days apart) anytime on or after the individual's 50th birthday. The composite denominator indicates the number of recommended vaccinations for persons based on their age (a unit of recommended vaccinations); the composite numerator indicates whether the vaccination was administered (a unit of recommended vaccinations received); and, the composite rate is the percentage of the total recommended number of vaccinations, per clinical guidelines according to age, that were administered as indicated (i.e., the sum of the individual vaccines administered divided by the sum of the individual vaccines required).

††††††††† **CDC approach, ≥65 years, does not include influenza, method 2 (Td or Tdap).** A composite estimate of vaccination coverage among adults aged ≥65 years who have received the select vaccines that are recommended for their age group: adults who have received Td or Tdap (past 10 years) AND herpes zoster vaccines (ever) AND who have received pneumococcal vaccine (ever). The NHIS composite estimates using the CDC approach will differ from practice-based NCQA estimates.

§§§§§§§§§ **Adapted NCQA approach, ≥65 years, does not include influenza, method 2 (Td or Tdap).** A composite estimate of vaccination coverage among adults aged ≥65 years who have received the number of recommended vaccinations for persons based on their age: adults who have received Td or Tdap (past 10 years) AND herpes zoster vaccines (ever) AND who have received pneumococcal vaccine (ever). Actual estimates generated by NCQA for the age-based composite measure using its approach are different than those derived using the CDC analytic approach. For actual NCQA estimates: 1) Td or Tdap vaccination was measured as receipt of at least one Td vaccine or one Tdap vaccine between nine years prior to the start of the measurement period and the end of the measurement period; 2) individuals received at least one dose of the herpes zoster live vaccine or two doses of the herpes zoster recombinant vaccine (at least 28 days apart) anytime on or after the individual's 50th birthday; and, 3) individuals were administered both the 13-valent pneumococcal conjugate vaccine and the 23-valent pneumococcal polysaccharide vaccine at least 12 months apart, with the first occurrence after the age of 60. The composite denominator indicates the number of recommended vaccinations for persons based on their age (a unit of recommended vaccinations); the composite numerator indicates whether the vaccination was administered (a unit of recommended vaccinations received); and, the composite rate is the percentage of the total recommended number of vaccinations, per clinical guidelines according to age, that were administered as indicated (i.e., the sum of the individual vaccines administered divided by the sum of the individual vaccines required).