U.S. Centers for Disease Control and Prevention
MMWR
Morbidity and Mortality Weekly Report
Weekly / Vol. 75 / No. 34
September 3, 2026

Vaccination Coverage Among Adolescents Aged 13–17 Years — National Immunization Survey-Teen, United States, 2025

Cassandra Pingali, MPH, MS[1]; David Yankey, PhD[1]; Laurie D. Elam-Evans, PhD[1]; Adam Trahan, MPH[1,2]; Lauri E. Markowitz, MD[3]; Carla L. DeSisto, PhD[3]; Michelle M. Hughes, PhD[4]; Madeleine R. Valier, MPH[1]; Nicole F. Dowling, PhD[1]; Georgina Peacock, MD[1]; Shannon Stokley, DrPH[1]

Abstract

Data from the 2025 National Immunization Survey-Teen for 18,692 adolescents aged 13–17 years were analyzed to assess trends in adolescent vaccination coverage. The 2025 CDC Child and Adolescent Immunization Schedule (updated July 2, 2025) recommended routine vaccination of persons aged 11–12 years with tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine (Tdap); quadrivalent meningococcal conjugate vaccine (MenACWY); and human papillomavirus (HPV) vaccine (which may be started at age 9 years). In 2025, coverage with ≥1 dose of Tdap and ≥1 dose of MenACWY decreased compared with 2024 but remained approximately 90%. HPV vaccination coverage (≥1 dose and up to date with HPV vaccination series) did not increase for the fourth consecutive year and remained lower than coverage with ≥1 dose of Tdap and ≥1 dose of MenACWY. Differences in vaccination coverage between nonmetropolitan statistical areas (mostly rural) and metropolitan statistical areas (mostly urban) persisted in 2025: coverage with ≥1 dose of HPV vaccine was 12.0 percentage points lower among adolescents living in mostly rural areas than among those living in mostly urban areas. Vaccination coverage varied by jurisdiction, with the largest variation observed for HPV vaccine. To ensure that adolescents are up to date, providers can review adolescent vaccination records, discuss recommended vaccines with families, and during all clinical encounters, administer all recommended vaccines that are due.

Introduction

Vaccination coverage among adolescents in the United States is monitored by the National Immunization Survey-Teen (NIS-Teen). This report describes national and jurisdiction-level coverage with vaccines recommended for adolescents aged 13–17 years in 2025. The 2025 CDC Child and Adolescent Immunization Schedule (updated July 2, 2025) recommended routine vaccination of persons aged 11–12 years with tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine (Tdap), quadrivalent meningococcal conjugate vaccine (MenACWY), and human papillomavirus (HPV) vaccine. HPV vaccination may begin at age 9 years (*1*). At age 16 years, adolescents are recommended to receive a booster dose of MenACWY and, based on shared clinical decision-making, may receive a 2-dose series of serogroup B meningococcal vaccine (MenB) (*2*). Pentavalent meningococcal vaccine (MenABCWY)* can be administered when both MenACWY and MenB are indicated (*3*). An annual influenza vaccination† is

*On October 25, 2023, the Advisory Committee on Immunization Practices (ACIP) recommended that a pentavalent MenABCWY vaccine (MenACWY-TT/MenB-FHbp) may be administered to persons aged ≥10 years when both a quadrivalent meningococcal conjugate vaccine (MenACWY) and meningococcal B vaccine (MenB) are indicated at the same visit. On April 16, 2025, ACIP recommended that a second pentavalent vaccine option (MenACWY-CRM/MenB-4C) (PENMENVY | FDA) may be administered when both MenACWY and MenB are indicated at the same visit. More information on MenABCWY is available online. Meningococcal Vaccine Recommendations | Meningococcal | CDC

†Influenza vaccination is recommended for all persons aged ≥6 months. Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger; United States 2025 Influenza vaccination coverage estimates are available online. FluVaxView | CDC

INSIDE

Continuing Education examination available at https://www.cdc.gov/mmwr/mmwr_continuingEducation.html

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION

recommended and a COVID-19 vaccination[§] may be administered based on shared clinical-decision making. Adolescents can benefit from catching up on missed childhood vaccinations.

Methods

Data Sources

NIS-Teen is a two-phase survey that begins with a random-digit–dialed mobile telephone survey[¶] among households with an adolescent aged 13–17 years[**] to collect information on sociodemographic characteristics, access to health care, and vaccination attitudes. At the end of the household survey, parental consent to contact the adolescent's vaccination providers is requested. With consent, during the second phase, a questionnaire is mailed to all identified providers (including providers in different states if applicable) to obtain the adolescent's vaccination record. These provider-reported vaccination data, abstracted by the provider's office from the adolescent's medical record through the provider's Immunization History Questionnaire, are combined to create a comprehensive vaccination history for each adolescent. This report reflects vaccine recommendations as they appeared in the 2025 CDC Child and Adolescent Immunization Schedule (updated July 2, 2025), which was the applicable immunization schedule at the time of household data collection from January 2, 2025, to January 9, 2026.

Analysis

The vaccination coverage estimates provided in this report are based on vaccination data reported by providers through the provider's Immunization History Questionnaire. Data for 18,692 adolescents aged 13–17 years[††] who were born during January 2007–December 2012[§§] and who had a completed parental interview in 2025 were analyzed. The Council of

[§] COVID-19 vaccination is recommended on the basis of shared clinical decision-making for all persons aged 6 months–17 years (Staying Up to Date with COVID-19 Vaccines | COVID-19 | CDC). Estimates of COVID-19 vaccination coverage are available at COVID-19 Vaccination Coverage and Intent for Vaccination, Children 6 months through 17 years, United States | COVIDVaxView | CDC.

[¶] Persons living in all identified households with mobile telephones were eligible for interview. Sampling weights were adjusted for survey nonresponse, adolescent multiplicity (number of chances for selection), and noncoverage of the survey sampling frame and were calibrated to known population totals. During 2011–2018, NIS-Teen sampled from a landline telephone frame in addition to a mobile telephone frame; therefore, sampling weights were also adjusted for overlapping samples of mixed telephone users. A description of NIS-Teen single-frame survey methodology and its effect on reported vaccination estimates is available online. National Immunization Survey-Teen, 2016–2017 | TeenVaxView | CDC

[**] Local areas that received federal vaccination funds under Section 317 of the Public Health Service Act were sampled separately: Bexar County, Texas; Chicago, Illinois; Houston, Texas; New York, New York; and Philadelphia County, Pennsylvania. Three U.S. territories (Guam, Puerto Rico, and the U.S. Virgin Islands) were sampled separately in 2025 and were not included in the calculation of national vaccination coverage estimates.

[††] The 2025 NIS-Teen sample included 8,885 adolescent girls and 9,807 adolescent boys. Adolescents from Guam (117), Puerto Rico (412), and the U.S. Virgin Islands (112) were excluded from the national estimates.

[§§] Estimates in this report include persons who might have received vaccinations on time or as catch-up vaccinations.

The *MMWR* series of publications is published by the Office of Science, Centers for Disease Control and Prevention (CDC), U.S. Department of Health and Human Services, Atlanta, GA 30329-4027.

Suggested citation: [Author names; first three, then et al., if more than six.] [Report title]. MMWR Morb Mortal Wkly Rep 2026;75:[inclusive page numbers].

American Survey Research Organizations (CASRO) response rate[¶¶] in 2025 was 21.4%, and adequate provider data were available for 42.0% of adolescents with complete interviews.[***] NIS-Teen uses complex survey weighting procedures to adjust for household and provider nonresponse and to account for adolescents living in landline-only and phoneless households that are not included in the cellular telephone sampling frame. Weights are calibrated to population totals by age, sex, race and ethnicity, and geography to improve representativeness and reduce potential bias. Weighted vaccination coverage estimates for 2025 were compared with previously published weighted estimates for 2024 (*4*).

Vaccination coverage was examined by metropolitan statistical area (MSA) status[†††] and poverty status.[§§§] MSA status was determined from household-reported city and county of residence using U.S. Census Bureau information and grouped into three categories: MSA principal city (mostly urban), MSA nonprincipal city (mostly suburban), and non-MSA (mostly rural). Adolescents were classified as living below the poverty level if their total family income was less than the federal poverty level specified for the applicable family size and number of children aged <18 years. All others were classified as living at or above the poverty level.

Differences in vaccination coverage were assessed using z-tests, and p-values <0.05 were considered statistically significant. Analyses were conducted using SAS (version 9.4; SAS Institute) and SAS-callable SUDAAN (version 11; RTI International). This activity was reviewed by CDC, deemed not research, and conducted consistent with applicable federal law and CDC policy.[¶¶¶]

[¶¶] The CASRO household response rate is the product of three other rates: 1) the resolution rate (the proportion of telephone numbers that can be identified as either business or residence), 2) the screening rate (the proportion of qualified households that complete the screening process), and 3) the cooperation rate (the proportion of contacted eligible households for which a completed interview is obtained).

[***] Adolescents with receipt of ≥1 non–COVID-19 vaccine doses reported by a provider and those who had received no vaccinations were considered to have adequate provider data. "No vaccinations" indicates that the vaccination status is known because the parent or guardian indicated no vaccinations had been received by the adolescent, and the provider returned no immunization history forms or returned them indicating that no vaccinations had been administered.

[†††] MSA status was determined from household-reported city and county of residence and was grouped into three categories: MSA principal city (mostly urban), MSA nonprincipal city (mostly suburban), and non-MSA (mostly rural). Non-MSAs include urban populations not located within an MSA and completely rural areas. Metropolitan and Micropolitan | U.S. Census Bureau

[§§§] Adolescents were classified as living below the poverty level if their total family income was less than the federal poverty level specified for the applicable family size and number of children aged <18 years. All others were classified as living at or above the poverty level. Additional information is available online. U.S. Census Bureau Poverty Thresholds

[¶¶¶] 45 C.F.R. part 46.102(l)(2), 21 C.F.R. part 56; 42 U.S.C. Sect. 241(d); 5 U.S.C. Sect. 552a; 44 U.S.C. Sect. 3501 et seq.

Results

National Vaccination Coverage Among Adolescents Aged 13–17 Years

Coverage among adolescents aged 13–17 years declined from 2024 to 2025 for ≥1 dose of Tdap[****] (from 91.3% to 88.8%) and ≥1 dose of MenACWY[††††] (from 90.1% to 89.0%). Coverage with both vaccines was similar to coverage during 2019–2023 and remained approximately 90% (Table 1) (Supplementary Figure 1). Among adolescents aged 13 years, ≥1-dose Tdap coverage declined from 89.4% in 2024 to 86.0% in 2025 (*4*). Among adolescents aged 14 years, ≥1-dose Tdap coverage declined from 92.1% to 88.8%, and ≥1-dose MenACWY coverage declined from 90.8% to 88.5%. In 2025, among adolescents aged 13–17 years, 77.7% had received ≥1 dose of HPV vaccine[§§§§] and 63.4% were up to date with the HPV vaccination series.[¶¶¶¶] HPV vaccination coverage (≥1 dose and up to date with the series) did not increase for the fourth consecutive year and remained lower than coverage with ≥1 dose of Tdap and ≥1 dose of MenACWY. Coverage with ≥2 doses of MenB[*****] decreased from 15.9% in 2024 to 12.5% in 2025. Among recommended catch-up vaccines,[†††††] coverage with ≥2 doses of hepatitis A vaccine increased from 87.1% in 2024 to 88.6% in 2025.

[****] Tdap vaccination coverage represents coverage with ≥1 Tdap dose at age ≥10 years.

[††††] Meningococcal conjugate vaccination coverage represents coverage with ≥1 MenACWY dose, ≥1 MenABCWY dose, or meningococcal vaccine of unknown type.

[§§§§] HPV vaccination coverage includes receipt of any HPV vaccine and does not distinguish among nine-valent, quadrivalent, or bivalent vaccines.

[¶¶¶¶] Persons who are considered up to date with the HPV vaccination series are those who have received ≥3 doses and those who have received 2 doses when the first HPV vaccine dose was initiated at age <15 years, and ≥5 months minus 4 days have elapsed between receipt of the first and second doses (General Best Practices for Immunization | Vaccines and Immunizations | CDC). This update to the HPV vaccination recommendation occurred in December 2016. Some adolescents might have received more than the 2 or 3 recommended HPV vaccine doses.

[*****] MenB vaccination is not routinely recommended for all adolescents. Vaccination with a MenB-containing vaccine (MenB or MenABCWY) is recommended for adolescents and young adults aged 16–23 years based on shared clinical decision-making. To assess age-eligible vaccination, coverage estimates for receipt of ≥1 and ≥2 MenB vaccine doses were calculated among adolescents aged 17 years at the time of interview. Receipt of ≥2 doses was defined as receipt of ≥2 MenB-4C–containing doses administered ≥6 months minus 4 days apart or ≥2 MenB-FHBP–containing doses administered ≥6 months minus 4 days apart; doses received before age 10 years were excluded. Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger; United States 2025

[†††††] Vaccinations against hepatitis A; hepatitis B; varicella; and measles, mumps, and rubella are considered childhood vaccines and are recommended for adolescents who are not up to date with these vaccinations. Except as noted, coverage estimates for ≥1 and ≥2 varicella vaccine doses were obtained for adolescents with no history of varicella disease.

TABLE 1. Estimated vaccination coverage with selected vaccines and number of doses among adolescents aged 13–17* years, by age at interview — National Immunization Survey-Teen, United States, 2025

Vaccine and no. of doses	% (95% CI)†						
	Age at interview, yrs					Total	
	13 n = 3,671	14 n = 3,794	15 n = 3,784	16 n = 3,789	17 n = 3,654	2025 n = 18,692	2024 n = 16,325
Tdap§ ≥1 dose	86.0 (83.6–88.1)	88.8 (86.8–90.5)	89.0 (86.9–90.7)¶	90.3 (88.4–91.8)¶	89.7 (87.6–91.5)¶	**88.8 (87.9–89.6)****	**91.3 (90.6–92.0)**
MenACWY††							
≥1 dose	85.2 (82.8–87.3)	88.5 (86.7–90.1)¶	88.4 (86.3–90.1)¶	91.6 (90.0–93.0)¶	90.8 (88.6–92.5)¶	**89.0 (88.1–89.8)****	**90.1 (89.4–90.9)**
≥2 doses§§	NA	NA	NA	NA	60.5 (57.4–63.5)	**60.5 (57.4–63.5)**	**61.2 (58.4–63.9)**
HPV vaccine¶¶							
All adolescents							
≥1 dose	69.4 (66.5–72.0)	76.4 (74.1–78.6)¶	77.7 (75.3–79.8)¶	82.3 (80.3–84.2)¶	81.8 (79.4–83.9)¶	**77.7 (76.6–78.7)**	**78.2 (77.2–79.2)**
HPV UTD***	48.5 (45.5–51.4)	61.0 (58.3–63.6)¶	66.0 (63.4–68.6)¶	70.1 (67.7–72.5)¶	70.3 (67.5–73.0)¶	**63.4 (62.2–64.7)**	**62.9 (61.6–64.1)**
Girls							
≥1 dose	69.8 (65.6–73.6)	78.3 (75.0–81.4)¶	78.4 (75.1–81.4)¶	85.1 (82.6–87.3)¶	81.6 (78.1–84.6)¶	**78.7 (77.2–80.2)**	**79.1 (77.6–80.5)**
HPV UTD	47.0 (42.7–51.2)	64.0 (60.1–67.8)¶	64.9 (61.1–68.6)¶	75.2 (72.0–78.1)¶	69.6 (65.5–73.5)¶	**64.3 (62.5–66.1)**	**64.3 (62.5–66.1)**
Boys							
≥1 dose	68.9 (65.0–72.6)	74.5 (71.2–77.5)¶	77.0 (73.6–80.1)¶	79.9 (76.7–82.7)¶	81.9 (78.5–85.0)¶	**76.6 (75.1–78.1)**	**77.4 (75.9–78.8)**
HPV UTD	49.9 (45.8–54.0)	57.9 (54.1–61.5)¶	67.0 (63.3–70.4)¶	65.8 (62.0–69.3)¶	71.0 (67.2–74.6)¶	**62.6 (60.9–64.3)**	**61.6 (59.8–63.3)**
MenB†††							
≥1 dose	NA	NA	NA	NA	36.3 (33.5–39.2)	**36.3 (33.5–39.2)**	**36.9 (34.1–39.7)**
≥2 doses	NA	NA	NA	NA	12.5 (10.7–14.5)	**12.5 (10.7–14.5)****	**15.9 (13.9–18.2)**

See table footnotes on the next page.

Vaccination Coverage by Geographic Area

Vaccination coverage varied by MSA status. Coverage with ≥1 dose of MenACWY was 3.0 percentage points lower in mostly rural areas than in mostly urban areas (Table 2). Compared with coverage in mostly urban areas, coverage with ≥1 dose of HPV vaccine in mostly rural areas was 12.0 percentage points lower, and the percentage of adolescents who were up to date with the HPV vaccination series was 14.2 percentage points lower. Coverage with ≥1 dose of HPV vaccine was also 2.9 percentage points lower in MSA nonprincipal cities (mostly suburban areas) compared with coverage in mostly urban areas. The rural-urban difference in HPV vaccination coverage (≥1 dose and up to date with the series) was present regardless of poverty level. However, the rural-urban difference in coverage with ≥1 dose of MenACWY was observed only among adolescents living below the poverty level. Coverage with ≥1 dose of Tdap was similar across MSAs overall and remained similar among various poverty levels.

Vaccination coverage varied substantially by jurisdiction (Table 3). Coverage with ≥1 dose of Tdap varied the least and ranged from 80.5% in the District of Columbia to 94.6% in Vermont. Coverage with ≥1 dose of MenACWY ranged from 61.2% in Mississippi to 96.5% in Rhode Island. Variation was larger for HPV vaccination, with ≥1-dose coverage ranging from 49.5% in Mississippi to 94.1% in Rhode Island (Table 3) (Supplementary Figure 2). The widest variation in coverage was observed for those up to date with the HPV vaccination series, which ranged from 30.9% in Mississippi to 84.5% in Rhode Island. Compared with 2024 (*4*), five jurisdictions experienced increases and six jurisdictions experienced decreases in coverage for one or more routine vaccines recommended for adolescents.§§§§§

§§§§§ From 2024 to 2025, coverage with ≥1 Tdap dose increased in Wisconsin, coverage with ≥1 HPV vaccine dose increased in Maine and New Jersey, and the percentage of adolescents who were up to date with the HPV vaccination series increased in Hawaii. New Jersey, and Wyoming. From 2024 to 2025, coverage with ≥1 Tdap dose decreased in Arkansas, Florida, Georgia, and West Virginia; coverage with ≥1 MenACWY dose decreased in Arkansas, Florida, Georgia, and Iowa; coverage with ≥1 dose of HPV vaccine decreased in Arkansas and Florida; and the percentage of adolescents who were up to date with the HPV vaccination series decreased in Kentucky.

TABLE 1. (*Continued*) Estimated vaccination coverage with selected vaccines and number of doses among adolescents aged 13–17* years, by age at interview — National Immunization Survey-Teen, United States, 2025

Vaccine and no. of doses	% (95% CI)†						
	Age at interview, yrs					Total	
	13 n = 3,671	14 n = 3,794	15 n = 3,784	16 n = 3,789	17 n = 3,654	2025 n = 18,692	2024 n = 16,325
MMR ≥2 doses	92.5 (90.4–94.2)	92.8 (91.2–94.1)	92.2 (90.4–93.6)	94.2 (92.9–95.3)	90.8 (88.6–92.6)	**92.5 (91.7–93.2)**	**92.6 (91.9–93.2)**
Hepatitis A vaccine ≥2 doses§§§	89.0 (86.6–90.9)	87.7 (85.6–89.6)	88.8 (86.9–90.5)	89.8 (88.0–91.3)	87.7 (85.5–89.7)	**88.6 (87.7–89.4)****	**87.1 (86.1–88.0)**
Hepatitis B vaccine ≥3 doses	91.0 (88.4–93.1)	92.4 (90.8–93.8)	93.1 (91.5–94.4)	94.2 (92.9–95.3)¶	90.5 (88.3–92.4)	**92.3 (91.5–93.0)**	**92.2 (91.5–92.9)**
Varicella							
History of varicella¶¶¶	5.7 (4.6–7.1)	5.6 (4.5–6.9)	7.2 (5.8–8.9)	8.9 (7.1–11.1)¶	6.3 (5.0–7.9)	**6.8 (6.1–7.5)**	**7.5 (6.8–8.2)**
No history							
≥1 dose vaccine	95.6 (93.7–97.0)	95.5 (94.1–96.6)	95.5 (94.1–96.6)	96.6 (95.6–97.3)	93.9 (91.9–95.4)	**95.4 (94.8–96.0)**	**95.3 (94.7–95.8)**
≥2 doses vaccine	92.4 (90.1–94.2)	92.9 (91.4–94.2)	91.6 (89.7–93.1)	93.7 (92.3–94.8)	91.2 (89.0–93.0)	**92.4 (91.6–93.1)**	**91.9 (91.1–92.6)**
History of varicella or received ≥2 doses vaccine	92.8 (90.6–94.5)	93.3 (91.9–94.5)	92.2 (90.4–93.6)	94.2 (93.0–95.3)	91.8 (89.7–93.4)	**92.9 (92.1–93.5)**	**92.5 (91.8–93.2)**

Abbreviations: HPV = human papillomavirus; MenABCWY = pentavalent meningococcal vaccine; MenACWY = quadrivalent meningococcal conjugate vaccine; MenB = serogroup B meningococcal vaccine; MMR = measles, mumps, and rubella vaccine; NIS-Teen = National Immunization Survey-Teen; Tdap = tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine; UTD = up to date; NA = not applicable.

* Adolescents (18,692) in the 2025 NIS-Teen were born during January 2007–December 2012. Adolescents from Guam (117), Puerto Rico (412), and the U.S. Virgin Islands (112) were excluded from the national estimates.

† Estimates with 95% CIs >20 might not be reliable.

§ Includes percentages of persons who received Tdap at age ≥10 years.

¶ Statistically significant difference (p<0.05) in estimated vaccination coverage by age: reference group was adolescents aged 13 years.

** Statistically significant difference (p<0.05) compared with 2024 NIS-Teen estimates.

†† Includes percentages of persons who received MenACWY, MenABCWY, or an unknown type of meningococcal vaccine.

§§ At least 2 doses of MenACWY, MenABCWY, or an unknown type of meningococcal vaccine. Calculated only among adolescents who were aged 17 years at the time of interview. Does not include adolescents who received their first dose of MenACWY at age ≥16 years.

¶¶ HPV vaccine, nine-valent, quadrivalent, or bivalent. For ≥1 dose and HPV UTD measures, percentages are reported among girls and boys combined (18,692) and for girls only (8,885) and boys only (9,807).

*** HPV UTD includes those who received ≥3 doses and those who received 2 doses when the first HPV vaccine dose was initiated before age 15 years, and ≥5 months minus 4 days have elapsed between receipt of the first and second doses. This update to the HPV recommendation occurred in December 2016. Some adolescents might have received more than the 2 or 3 recommended HPV vaccine doses.

††† MenB is not routinely recommended for all adolescents. Vaccination with a MenB-containing vaccine (MenB or MenABCWY) is recommended for adolescents and young adults aged 16–23 years based on shared clinical decision-making. To assess age-eligible vaccination, coverage estimates for receipt of ≥1 and ≥2 MenB doses were calculated among adolescents aged 17 years at the time of interview. Receipt of ≥2 doses was defined as receipt of ≥2 MenB-4C–containing doses administered ≥6 months minus 4 days apart or ≥2 MenB-FHBP–containing doses administered ≥6 months minus 4 days apart; doses received before age 10 years were excluded. Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger; United States 2025

§§§ In July 2020, the Advisory Committee on Immunization Practices revised recommendations for hepatitis A vaccination to include catch-up vaccination for children and adolescents aged 2–18 years who had not previously received hepatitis A vaccine at any age.

¶¶¶ By parent or guardian report or provider records.

Discussion

Although coverage among adolescents aged 13–17 years with ≥1 dose of Tdap and ≥1 dose of MenACWY decreased from 2024 to 2025, coverage with both vaccines remained approximately 90%. These decreases were similar in magnitude to the increases in coverage with these vaccines observed in 2024 compared with 2023 (*4*), resulting in coverage levels in 2025 similar to those observed during 2019–2023, and might reflect year-to-year variation in survey estimates around a high and stable level of coverage. However, the declines observed from 2024 to 2025 among adolescents aged 13 and 14 years might be an early indication of declining vaccination coverage. Continued monitoring is needed to determine whether this pattern persists.

HPV vaccination coverage among adolescents aged 13–17 years in 2025 continues to be lower than coverage with ≥1 dose of Tdap and ≥1 dose of MenACWY. HPV vaccination coverage did not increase for the fourth consecutive year. The consistently lower HPV vaccination coverage compared with other routine adolescent vaccines might, in part, reflect differences in school entry requirements. Tdap is required for school entry in all states, and MenACWY is required in most states; however, few states require HPV vaccination (*5*). Geographic differences in coverage were larger for HPV vaccination than for ≥1 dose of Tdap or MenACWY, with an approximate 40 percentage point difference between the highest and lowest ≥1-dose HPV vaccination coverage jurisdictions and an

TABLE 2. Estimated vaccination coverage and number of doses for selected vaccines among adolescents aged 13–17* years, by metropolitan statistical area† and poverty level§ — National Immunization Survey-Teen, United States, 2025

Vaccine and no. of doses	% (95% CI)¶								
	MSA status			Below poverty level			At or above poverty level		
	Non-MSA n = 4,043	MSA nonprincipal city n = 7,547	MSA principal city n = 7,102	Non-MSA n = 668	MSA nonprincipal city n = 835	MSA principal city n = 1,239	Non-MSA n = 3,292	MSA nonprincipal city n = 6,503	MSA principal city n = 5,644
Tdap ≥1 dose**	87.5 (85.4–89.4)	89.2 (87.9–90.4)	88.7 (87.2–90.0)	86.0 (80.9–89.9)	89.0 (85.0–92.1)	87.3 (82.9–90.7)	88.0 (85.5–90.2)	88.8 (87.4–90.1)	88.9 (87.3–90.3)
**MenACWY†† **									
≥1 dose	86.0 (83.8–88.0)§§	89.7 (88.4–90.8)	89.0 (87.6–90.3)	82.7 (76.8–87.3)§§	90.1 (87.1–92.4)	90.0 (86.1–92.9)	87.0 (84.5–89.1)	89.3 (87.8–90.6)	88.4 (86.8–89.9)
≥2 doses¶¶	53.7 (47.9–59.5)§§	60.7 (56.0–65.1)	62.4 (57.3–67.2)	49.3 (36.1–62.5)§§	48.0 (34.7–61.6)§§	69.3 (58.2–78.5)	55.7 (49.1–62.0)	64.5 (59.8–68.9)	59.4 (53.6–65.0)
HPV vaccine* **									
All adolescents									
≥1 dose	68.5 (65.9–71.0)§§	77.6 (76.0–79.1)§§	80.5 (78.8–82.1)	68.8 (62.5–74.5)§§	81.6 (77.6–85.0)	85.4 (81.4–88.6)	68.4 (65.4–71.1)§§	76.3 (74.5–77.9)§§	79.1 (77.2–80.9)
HPV UTD	52.2 (49.5–54.8)§§	63.8 (62.0–65.6)	66.4 (64.4–68.4)	49.9 (43.6–56.1)§§	62.3 (57.0–67.2)	67.0 (62.1–71.6)	52.5 (49.5–55.5)§§	64.0 (62.0–65.8)	66.7 (64.5–68.8)
Girls									
≥1 dose	71.0 (67.3–74.5)§§	78.6 (76.3–80.6)	81.3 (78.8–83.5)	68.9 (59.8–76.7)§§	84.2 (78.6–88.5)	82.4 (75.2–87.9)	71.4 (67.3–75.2)§§	76.7 (74.2–79.1)§§	80.6 (77.9–83.0)
HPV UTD	55.0 (51.1–58.9)§§	63.8 (61.1–66.4)§§	67.7 (64.8–70.5)	49.9 (41.1–58.8)§§	67.2 (59.9–73.8)	68.4 (60.6–75.2)	56.0 (51.6–60.2)§§	63.3 (60.5–66.0)§§	68.1 (64.9–71.0)
Boys									
≥1 dose	66.1 (62.4–69.6)§§	76.7 (74.4–78.8)	79.8 (77.3–82.1)	68.7 (59.6–76.5)§§	79.7 (73.9–84.5)§§	87.8 (83.3–91.1)	65.4 (61.3–69.4)§§	75.8 (73.3–78.2)	77.7 (74.8–80.3)
HPV UTD	49.5 (45.8–53.1)§§	63.8 (61.4–66.3)	65.2 (62.3–67.9)	49.8 (41.1–58.5)§§	58.6 (51.1–65.7)	65.9 (59.4–71.8)	49.2 (45.2–53.3)§§	64.6 (61.9–67.2)	65.4 (62.3–68.4)

Abbreviations: HPV = human papillomavirus; MenACWY = quadrivalent meningococcal conjugate vaccine; MMR = measles, mumps, and rubella vaccine; MSA = metropolitan statistical area; NIS-Teen = National Immunization Survey-Teen; Tdap = tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine; UTD = up to date.

* Adolescents (18,692) in the 2025 NIS-Teen were born January 2007–December 2012. Adolescents from Guam (117), Puerto Rico (412), and the U.S. Virgin Islands (112) were excluded from the national estimates.

† MSA status was determined from household-reported city and county of residence and was grouped into three categories: MSA principal city (mostly urban areas), MSA nonprincipal city (mostly suburban areas), and non-MSA (mostly rural areas). Non-MSAs include urban populations not located within an MSA and completely rural areas.

§ Adolescents were classified as living below poverty level if their total family income was less than the federal poverty level specified for the applicable family size and number of children aged <18 years. All others were classified as living at or above the poverty level. U.S. Census Bureau Poverty Thresholds

¶ Estimates with 95% CIs >20 might not be reliable.

** Includes percentages of persons who received Tdap at age ≥10 years.

†† Includes percentages of persons who received MenACWY, MenABCWY, and an unknown type of meningococca vaccine.

§§ Statistically significant difference ($p<0.05$) in estimated vaccination coverage by MSA; referent group was adolescents living in MSA principal city areas.

¶¶ At least 2 doses of MenACWY, MenABCWY, or an unknown type of meningococcal vaccine. Calculated only among adolescents who were aged 17 years at the time of interview. Does not include adolescents who received their first dose of MenACWY vaccine at age ≥16 years.

*** HPV vaccine, nine-valent, quadrivalent, or bivalent in adolescent girls and boys combined.

††† HPV UTD includes those who received ≥3 doses and those who received 2 doses when the first HPV vaccine dose was initiated before age 15 years, and ≥5 months minus 4 days have elapsed between receipt of the first and second doses. This update to the HPV recommendation occurred in December 2016. Some adolescents might have received more than the 2 or 3 recommended HPV vaccine doses.

approximate 50 percentage point difference in the percentage of adolescents who are up to date with the HPV vaccination series. Coverage with ≥1 dose of HPV vaccine was generally highest in New England and along the West Coast.

Coverage with both HPV and measles, mumps, and rubella (MMR) vaccines remained below Healthy People 2030 targets. In 2025, 58.6% of adolescents aged 13–15 years had completed the HPV vaccination series, which is below the Healthy People 2030 target of 80% of adolescents aged 13–15 years receiving the recommended number of HPV vaccine doses. Similarly, coverage with ≥2 doses of MMR vaccine among adolescents aged 13–17 years was 92.5% in 2025, below the Healthy People 2030 target of 95% coverage at kindergarten entry, suggesting that catch-up vaccination among adolescents did not meet the Healthy People 2030 target, the estimated population-level immunity necessary to prevent measles outbreaks.

Differences in vaccination coverage were also observed by MSA status. Coverage with ≥1 MenACWY dose was 3.0 percentage points lower among adolescents living in mostly rural areas compared with those living in mostly urban areas. After

TABLE 3. Estimated vaccination coverage and number of doses for selected vaccines* among adolescents aged 13–17 years,† by U.S. Department of Health and Human Services region, state, selected local area, or territory — National Immunization Survey-Teen, United States, 2025

Area	% (95% CI)§			
	Vaccine and no. of doses received			
	≥1 Tdap¶	≥1 MenACWY**	≥1 HPV††	HPV UTD§§
United States (N = 18,692)	**88.8 (87.9–89.6)*** **	**89.0 (88.1–89.8)*** **	**77.7 (76.6–78.7)**	**63.4 (62.2–64.7)**
Region I	**93.5 (91.3–95.2)**	**95.1 (93.4–96.3)**	**87.0 (84.6–89.0)**	**76.7 (73.8–79.4)**
Connecticut	94.3 (91.0–96.5)	96.5 (94.0–98.0)	82.5 (77.4–86.6)	72.8 (67.3–77.8)
Maine	93.5 (90.0–95.9)	94.1 (90.4–96.4)	83.2 (78.1–87.2)¶¶	71.4 (65.8–76.4)
Massachusetts	93.0 (88.2–95.9)	95.0 (91.5–97.1)	89.6 (85.0–92.8)	79.8 (74.2–84.5)
New Hampshire	94.3 (91.0–96.4)	92.8 (89.1–95.3)	84.9 (80.2–88.6)	74.0 (68.3–78.9)
Rhode Island	92.6 (88.1–95.5)	96.5 (93.4–98.2)	94.1 (90.5–96.3)	84.5 (78.8–88.9)
Vermont	94.6 (91.3–96.7)	91.6 (87.7–94.3)	85.7 (81.4–89.1)	70.0 (64.4–74.9)
Region II	**91.5 (89.1–93.4)**	**94.5 (92.5–96.0)**	**79.4 (76.0–82.4)**	**67.9 (64.1–71.4)**
New Jersey	91.1 (87.0–94.0)	94.8 (91.3–96.9)	80.8 (75.3–85.3)¶¶	67.7 (61.5–73.3)¶¶
New York	91.7 (88.6–94.1)	94.3 (91.6–96.2)	78.6 (74.3–82.4)	68.0 (63.2–72.5)
New York City	91.3 (85.4–95.0)	94.0 (89.0–96.8)	82.5 (75.4–87.9)	72.4 (64.8–79.0)
New York, excluding New York City	92.0 (88.1–94.7)	94.5 (91.0–96.7)	76.0 (70.3–81.0)	65.0 (58.7–70.9)
Region III	**89.6 (87.6–91.2)**	**92.4 (90.7–93.7)**	**79.5 (76.9–81.9)**	**68.6 (65.6–71.4)**
Delaware	89.1 (84.3–92.6)	91.9 (87.8–94.7)	80.7 (75.3–85.1)	71.9 (66.0–77.2)
District of Columbia	80.5 (71.8–87.0)	82.8 (75.8–88.1)	81.7 (74.3–87.4)	74.2 (66.2–80.8)
Maryland	86.4 (81.7–90.0)	91.2 (87.4–94.0)	80.9 (75.4–85.5)	70.5 (64.5–75.8)
Pennsylvania	90.6 (86.9–93.3)	93.1 (90.0–95.3)	77.6 (72.6–81.8)	68.4 (63.1–73.2)
Philadelphia	90.6 (86.6–93.5)	92.6 (89.0–95.2)	87.8 (83.5–91.1)	75.9 (70.4–80.6)
Pennsylvania, excluding Philadelphia	90.6 (86.4–93.5)	93.2 (89.6–95.6)	76.2 (70.6–81.0)	67.4 (61.4–72.8)
Virginia	91.5 (87.8–94.2)	93.3 (89.9–95.6)	82.8 (77.9–86.8)	69.0 (63.1–74.3)
West Virginia	87.5 (83.4–90.7)***	89.2 (85.2–92.2)	70.0 (64.7–74.8)	57.1 (51.6–62.5)
Region IV	**89.3 (87.5–90.9)*** **	**85.9 (84.0–87.5)*** **	**73.4 (71.0–75.6)*** **	**56.7 (54.0–59.3)**
Alabama	93.0 (90.0–95.2)	84.1 (79.7–87.7)	76.3 (71.4–80.5)	59.9 (54.3–65.2)
Florida	88.8 (84.1–92.2)***	82.4 (77.3–86.6)***	74.1 (68.3–79.1)***	58.6 (52.1–64.7)
Georgia	88.4 (82.5–92.5)***	93.6 (89.3–96.2)***	78.2 (71.8–83.5)	59.2 (51.6–66.3)
Kentucky	89.0 (84.4–92.3)	89.8 (85.3–93.0)	73.1 (67.4–78.1)	50.3 (44.4–56.3)***
Mississippi	91.5 (88.6–93.8)	61.2 (55.8–66.3)	49.5 (44.0–54.9)	30.9 (26.1–36.2)
North Carolina	89.0 (84.5–92.3)	94.5 (91.5–96.5)	76.2 (70.7–81.0)	61.1 (54.9–67.0)
South Carolina	89.3 (84.7–92.7)	84.2 (79.2–88.1)	68.0 (62.1–73.5)	54.7 (48.5–60.8)
Tennessee	89.1 (84.9–92.2)	80.8 (75.6–85.1)	71.5 (66.1–76.4)	54.9 (49.1–60.7)
Region V	**91.2 (89.7–92.4)**	**92.2 (90.7–93.4)**	**78.0 (76.0–79.8)**	**65.3 (63.1–67.4)**
Illinois	92.2 (89.2–94.4)	93.4 (90.5–95.4)	75.9 (71.5–79.9)	61.9 (57.1–66.5)
Chicago	91.8 (87.5–94.8)	95.0 (91.6–97.0)	88.9 (82.8–93.0)	77.3 (70.4–83.0)
Illinois, excluding Chicago	92.3 (88.6–94.8)	93.0 (89.4–95.4)	72.9 (67.6–77.7)	58.3 (52.6–63.8)
Indiana	92.0 (88.2–94.6)	92.2 (88.1–94.9)	75.6 (70.1–80.4)	60.6 (54.4–66.4)
Michigan	91.9 (88.4–94.4)	95.6 (92.9–97.3)	78.2 (73.5–82.3)	68.9 (63.8–73.6)
Minnesota	88.0 (83.0–91.7)	88.9 (84.0–92.4)	77.9 (72.2–82.6)	62.0 (55.6–68.0)
Ohio	89.0 (84.7–92.3)	89.8 (85.4–93.0)	80.0 (75.5–83.8)	67.7 (62.7–72.4)
Wisconsin	94.3 (91.2–96.3)¶¶	92.0 (87.7–94.9)	81.1 (76.0–85.4)	70.7 (65.0–75.8)
Region VI	**84.7 (81.6–87.4)**	**86.9 (84.1–89.3)**	**73.4 (69.8–76.7)**	**56.8 (53.0–60.6)**
Arkansas	88.9 (84.9–92.0)***	90.9 (87.0–93.7)***	73.5 (68.6–78.0)***	52.0 (46.6–57.5)
Louisiana	90.6 (86.6–93.5)	89.4 (85.3–92.5)	79.4 (74.3–83.7)	64.2 (58.0–70.0)
New Mexico	91.8 (88.0–94.5)	95.0 (92.1–96.9)	81.2 (76.4–85.3)	61.6 (55.9–67.1)
Oklahoma	87.0 (83.0–90.2)	77.6 (72.6–81.9)	66.6 (61.2–71.6)	45.6 (40.1–51.1)
Texas	82.8 (78.3–86.5)	86.9 (82.9–90.1)	73.0 (67.9–77.4)	57.4 (52.1–62.6)
Bexar County	87.4 (83.1–90.7)	88.5 (84.4–91.7)	78.0 (72.6–82.6)	61.8 (55.7–67.6)
Houston	83.1 (76.7–88.0)	86.2 (80.4–90.5)	79.0 (72.4–84.4)	66.7 (59.2–73.4)
Texas, excluding Bexar County and Houston	82.4 (77.2–86.6)	86.9 (82.1–90.5)	72.1 (66.3–77.2)	56.3 (50.2–62.2)

See table footnotes on the next page.

stratification by poverty level, this difference persisted only among adolescents living below the poverty level, suggesting that economic or access-related barriers might contribute to lower MenACWY coverage among rural adolescents. Coverage with ≥1 dose of HPV vaccine and the percentage of adolescents who were up to date with the HPV vaccination series were both approximately 10 percentage points lower in mostly rural areas than in mostly urban areas. Differences were observed across poverty levels, suggesting that lower HPV vaccination coverage in rural areas is not explained by poverty alone. Other studies have documented lower HPV vaccine acceptance in rural communities (*6*,*7*). Differences in access to health care

TABLE 3. (*Continued*) Estimated vaccination coverage and number of doses for selected vaccines* among adolescents aged 13–17 years,† by U.S. Department of Health and Human Services region, state, selected local area, or territory — National Immunization Survey-Teen, United States, 2025

Area	% (95% CI)§ Vaccine and no. of doses received			
	≥1 Tdap¶	≥1 MenACWY**	≥1 HPV††	HPV UTD§§
Region VII	**89.0 (86.7–90.9)**	**90.8 (88.7–92.6)**	**76.1 (73.2–78.9)**	**62.8 (59.4–66.1)**
Iowa	88.1 (83.7–91.5)	90.5 (86.1–93.5)***	71.4 (65.8–76.5)	60.4 (54.4–66.0)
Kansas	91.5 (87.5–94.3)	90.9 (86.8–93.8)	75.9 (70.3–80.7)	63.6 (57.3–69.5)
Missouri	88.2 (83.4–91.7)	91.1 (86.8–94.2)	76.4 (70.6–81.4)	61.2 (54.6–67.5)
Nebraska	88.8 (84.9–91.8)	90.5 (87.0–93.1)	82.7 (78.2–86.5)	69.5 (64.2–74.3)
Region VIII	89.5 (87.0–91.5)	86.3 (83.6–88.7)	78.6 (75.5–81.5)	65.2 (61.6–68.5)
Colorado	90.9 (86.1–94.1)	86.1 (80.6–90.2)	83.4 (77.7–87.9)	69.6 (63.1–75.4)
Montana	89.3 (85.4–92.2)	79.4 (74.7–83.5)	73.6 (68.5–78.2)	56.9 (51.4–62.2)
North Dakota	89.4 (85.0–92.5)	91.4 (87.4–94.2)	81.2 (76.2–85.3)	70.5 (64.8–75.6)
South Dakota	90.0 (86.3–92.7)	90.7 (87.1–93.4)	79.3 (74.8–83.3)	66.5 (61.3–71.3)
Utah	87.5 (82.3–91.3)	87.9 (82.5–91.8)	74.2 (67.6–79.8)	61.4 (54.5–67.8)
Wyoming	90.8 (87.3–93.4)	75.9 (71.0–80.2)	71.8 (66.8–76.3)	56.7 (51.3–61.9)¶¶
Region IX	**85.8 (81.9–89.0)*****	**86.0 (82.0–89.2)**	**81.9 (77.7–85.5)**	**67.0 (62.1–71.6)**
Arizona	85.0 (76.4–90.9)	89.8 (82.2–94.4)	79.5 (71.3–85.9)	65.7 (57.1–73.3)
California	85.5 (80.5–89.4)	84.6 (79.5–88.6)	82.2 (76.9–86.5)	67.1 (60.9–72.8)
Hawaii	89.0 (84.7–92.2)	90.9 (86.8–93.7)	90.6 (86.5–93.5)	82.4 (77.4–86.4)¶¶
Nevada	90.9 (83.7–95.1)	92.6 (88.0–95.5)	80.6 (73.9–85.9)	62.7 (54.3–70.4)
Region X	**90.1 (87.6–92.1)**	**86.9 (84.0–89.3)**	**81.3 (78.1–84.1)**	**66.5 (62.6–70.2)**
Alaska	89.2 (83.3–93.2)	82.1 (75.4–87.3)	78.9 (72.1–84.3)	57.2 (50.1–64.0)
Idaho	88.3 (83.8–91.6)	88.1 (83.6–91.5)	72.9 (67.3–77.8)	57.7 (51.9–63.3)
Oregon	89.9 (86.0–92.8)	85.8 (81.1–89.5)	84.9 (80.2–88.6)	69.3 (63.6–74.5)
Washington	90.8 (86.4–93.9)	87.6 (82.4–91.3)	82.2 (76.7–86.7)	68.6 (61.9–74.7)
Range†††	80.5–94.6	61.2–96.5	49.5–94.1	30.9–84.5
Territory				
Guam	67.7 (55.3–78.1)	74.6 (62.9–83.6)	64.6 (52.3–75.3)	48.9 (37.4–60.5)
Puerto Rico	88.1 (83.9–91.3)	90.6 (86.9–93.3)	89.6 (85.7–92.6)	77.9 (72.2–82.7)
the U.S. Virgin Islands	74.8 (60.8–85.0)	76.7 (62.6–86.7)	56.7 (43.9–68.6)	30.5 (21.1–41.8)

Abbreviations: HPV = human papillomavirus; MenACWY = quadrivalent meningococcal conjugate vaccine; MMR = measles, mumps, and rubella vaccine; NIS-Teen = National Immunization Survey-Teen; Tdap = tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine; UTD = up to date.

* Estimates for additional measures, including MMR, hepatitis B, and varicella vaccines, as well as 2024 and earlier vaccination coverage estimates, are available online (Vaccination Coverage among Adolescents (13–17 Years) | TeenVaxView | CDC). Additional information on 2024 NIS-Teen vaccination coverage estimates is available at https://doi.org/10.15585/mmwr.mm7430a1.

† Adolescents (18,692) in the 2025 NIS-Teen were born January 2007–December 2012. Adolescents from Guam (117), Puerto Rico (412), and the U.S. Virgin Islands (112) were excluded from the national estimates.

§ Estimates with 95% CIs >20 might not be reliable.

¶ Includes percentages of persons who received Tdap at age ≥10 years.

** Includes percentages of persons who received MenACWY, MenABCWY, or an unknown type of meningococcal vaccine.

†† HPV vaccine, nine-valent, quadrivalent, or bivalent in females and males combined.

§§ HPV UTD includes those who received ≥3 doses and those who received 2 doses when the first HPV vaccine dose was initiated before age 15 years, and ≥5 months minus 4 days have elapsed between receipt of the first and second doses. This update to the HPV recommendation occurred in December 2016. Some adolescents might have received more than the 2 or 3 recommended HPV vaccine doses.

¶¶ Statistically significant (p<0.05) percentage point increase from 2024.

*** Statistically significant (p<0.05) percentage point decrease from 2024.

††† Range excludes selected local areas and territories.

might also contribute to lower HPV vaccination coverage in rural areas compared with urban areas. In a previous analysis of NIS-Teen data, adolescents living in mostly rural areas were less likely than those living in mostly urban areas to attend an 11- or 12-year well-child visit or receive a provider recommendation for HPV vaccination (*8*). Lower attendance at 11- or 12-year well-child visits and fewer provider recommendations for HPV vaccination among adolescents living in mostly rural areas might contribute to the lower HPV vaccination coverage in rural communities (*4*,*8*,*9*). These findings suggest that lower HPV vaccination coverage in rural communities reflects multiple factors, including differences in vaccine acceptance, provider recommendation practices, and use of preventive health care services.

Limitations

The findings in this report are subject to at least two limitations. First, the CASRO response rate was low, and only 42.0% of adolescents had adequate provider data. Although data were adjusted using survey weights for household and provider nonresponse, residual nonresponse bias might have remained if respondents differed systematically from nonrespondents.

Summary

What is already known about this topic?

Human papillomavirus (HPV) vaccination coverage among U.S. adolescents aged 13–17 years has not increased since 2021. Coverage with ≥1 dose of tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine (Tdap) and ≥1 dose of quadrivalent meningococcal conjugate vaccine (MenACWY) has been approximately 90% since 2019.

What is added by this report?

HPV vaccination coverage did not increase for the fourth consecutive year, varied substantially by geographic area, and continues to lag behind Tdap and MenACWY coverage. Tdap and MenACWY coverage remained approximately 90%, with less geographic variation than HPV vaccination coverage. Differences in HPV and MenACWY vaccination coverage were observed among adolescents living in mostly rural areas compared with mostly urban areas. The rural–urban difference in HPV vaccination coverage was observed across poverty levels, whereas the rural–urban difference in MenACWY coverage was observed only among adolescents living below the poverty level.

What are the implications for public health practice?

Health care providers can review vaccination records, use reminder and recall systems to notify parents of recommended vaccines, and at every clinical encounter, recommend vaccines that are due to ensure that adolescents are up to date with recommended vaccinations.

Second, incomplete adolescent vaccination histories resulting from underascertainment of provider records could have biased coverage estimates. A bias assessment of the 2025 NIS-Teen data indicated that the observed declines in Tdap and MenACWY coverage might be partly attributable to a higher percentage of adolescents with two or more vaccination providers for whom provider questionnaires were not returned by all nominated providers in 2025. Therefore, these decreases should be interpreted with caution. The decreases were small, and coverage with both vaccines remained high. The 2024 total survey error report further indicated that NIS-Teen estimates might underestimate true vaccination coverage, with the largest underestimation observed for the percentage of adolescents who were up to date with the HPV vaccination series (–5.4 percentage points) (*10*).

Implications for Public Health Practice

Continued efforts are needed to increase adolescent vaccination coverage with recommended vaccines and reduce geographic differences in coverage, particularly with HPV vaccine. Efforts to address barriers to vaccination, including improving access to preventive care, strengthening provider communication regarding recommendations, and increasing vaccine confidence, could help improve coverage. Health care providers can support these efforts by reviewing patient vaccination records for needed vaccines, using reminder and recall systems to notify families when adolescents are due or overdue for recommended vaccines, discussing recommended vaccines with families, and during all clinical encounters, administering all recommended vaccines due.

Corresponding author: Cassandra Pingali, ncu9@cdc.gov.

[1]Immunization Services Division, National Center for Immunization and Respiratory Diseases, CDC; [2]Military & Health Research Foundation, Laurel, Maryland; [3]Division of Viral Diseases, National Center for Immunization and Respiratory Diseases, CDC; [4]Division of Bacterial Diseases, National Center for Immunization and Respiratory Diseases, CDC.

All authors have completed and submitted the International Committee of Medical Journal Editors form for disclosure of potential conflicts of interest.

References

1. Issa AN, Wodi AP, Moser CA, Cineas S. Advisory Committee on Immunization Practices recommended immunization schedule for children and adolescents aged 18 years or younger—United States, 2025. MMWR Morb Mortal Wkly Rep 2025;74:26–9. PMID:39819853 https://doi.org/10.15585/mmwr.mm7402a2
2. Mbaeyi SA, Bozio CH, Duffy J, et al. Meningococcal vaccination: recommendations of the Advisory Committee on Immunization Practices, United States, 2020. MMWR Recomm Rep 2020;69(No. RR-9):1–41. PMID:33417592 https://doi.org/10.15585/mmwr.rr6909a1
3. Collins JP, Crowe SJ, Ortega-Sanchez IR, et al. Use of the Pfizer pentavalent meningococcal vaccine among persons aged ≥10 years: recommendations of the Advisory Committee on Immunization Practices—United States, 2023. MMWR Morb Mortal Wkly Rep 2024;73:345–50. PMID:38635488 https://doi.org/10.15585/mmwr.mm7315a4
4. Pingali C, Yankey D, Elam-Evans LD, et al. Vaccination coverage among adolescents aged 13–17 years—National Immunization Survey-Teen, United States, 2024. MMWR Morb Mortal Wkly Rep 2025;74:466–72. PMID:40811113 https://doi.org/10.15585/mmwr.mm7430a1
5. Immunize.org. School and childcare vaccine-specific requirements. Saint Paul, MN: Immunize.org; 2026. https://www.immunize.org/official-guidance/state-policies/requirements/
6. Santibanez TA, Black CL, Zhou T, Srivastav A, Singleton JA. Parental hesitancy about COVID-19, influenza, HPV, and other childhood vaccines. Vaccine 2024;42:126139. PMID:39019662 https://doi.org/10.1016/j.vaccine.2024.07.040
7. Vasudevan L, Wang Y, Ostermann J, et al. Rural-urban disparities in human papillomavirus vaccination: findings from a cross-sectional survey of 13 southern US states, December 2019–January 2020. J Rural Health 2025;41:e12913. PMID:40200105 https://doi.org/10.1111/jrh.12913
8. Williams CL, Walker TY, Elam-Evans LD, et al. Factors associated with not receiving HPV vaccine among adolescents by metropolitan statistical area status, United States, National Immunization Survey-Teen, 2016–2017. Hum Vaccin Immunother 2020;16:562–72. PMID:31584312 https://doi.org/10.1080/21645515.2019.1670036
9. Lu P-J, Yankey D, Fredua B, et al. Human papillomavirus vaccination trends among adolescents: 2015 to 2020. Pediatrics 2022;150:e2022056597. PMID:35730334 https://doi.org/10.1542/peds.2022-056597
10. CDC. National Immunization Survey-Teen error profile for the 2024 NIS-Teen. Atlanta, GA: US Department of Health and Human Services, CDC; 2025. https://www.cdc.gov/teenvaxview/media/pdfs/2025/11/Error-Profile-for-the-2024-NIS-Teen_508.pdf

Notes from the Field

Cannabis Detection Among Overdose Deaths — United States, 2021–2025

Lauren J. Tanz, ScD[1]; Zerleen S. Quader, PhD[1]; Christine L. Mattson, PhD[1]; Alana M. Vivolo-Kantor, PhD[1]

In the United States, cannabis is the most commonly used drug that is illegal under federal law*; in 2024, an estimated 64.2 million persons aged ≥12 years used cannabis (*1*). Frequent cannabis use is associated with various adverse health effects, including memory impairment, cannabis hyperemesis syndrome, chronic psychosis disorders, and cannabis use disorder (i.e., cannabis use leading to clinically significant impairment or distress) (*2*,*3*). Although cannabis alone rarely causes fatal overdoses (*2*), detection on postmortem toxicology testing among overdose deaths might help identify populations at high risk for other adverse health consequences (e.g., substance use disorders), including death, and help guide tailored prevention efforts. It is not known how often cannabis is detected among overdose deaths and whether detection varies by age.

Investigation and Outcomes

Data Source

CDC's State Unintentional Drug Overdose Reporting System (SUDORS)† collects data on unintentional and undetermined intent drug overdose deaths from death certificates, medical examiner and coroner reports, and postmortem toxicology reports. SUDORS captures all drugs detected by postmortem toxicology, even those not ruled by a medical examiner or coroner to have been involved in (i.e., caused) the death. Percentages of overdose deaths with cannabis detected were calculated by age and year for deaths that occurred during January 2021–June 2025 in 31 states and the District of Columbia.§ Cannabis included cannabinoids derived from cannabis (e.g., cannabidiol, tetrahydrocannabinol [THC], and tetrahydrocannabivarin) and dronabinol and excluded synthetic cannabinoids (synthetic substances not derived from cannabis).¶,** This activity was reviewed by CDC, deemed not research, and conducted consistent with applicable federal law and CDC policy.††

Overdose Deaths with Cannabis Detected

Among 209,166 overdose deaths during January 2021–June 2025, cannabis was detected in 43,880 (21.0%); the percentage of overdose deaths with cannabis detected was stable over time (Figure). Cannabis was listed as causing death (i.e., involved) in 0.8% (1,687) of all overdose deaths and was the only drug involved in 0.004% (nine). The percentage of deaths with cannabis detected decreased with increasing decedent age. Among decedents aged 12–17 years, cannabis was detected in 42.7% (439) of overdose deaths. Within this age group, the percentage decreased from 49.2% in 2021 to 35.9% in 2024 and increased to 44.6% during January–June 2025. The percentage of deaths with cannabis detected was lowest among adults aged ≥50 years (13,076; 16.7%); however, the percentage increased slightly from 14.8% in 2021 to 18.1% during January–June 2025. Among all deaths with cannabis detected, most involved illegally manufactured fentanyls (73.5%) or stimulants (e.g., cocaine or methamphetamine; 60.4%), including 88.6% and 69.0%, respectively, of deaths among adolescents aged 12–17 years.

Preliminary Conclusions and Actions

One in five overdose deaths during January 2021–June 2025 had cannabis detected; the percentage was highest among adolescents aged 12–17 years, despite this age group having the lowest prevalence of self-reported past-year cannabis use in the general population and stable or slightly declining prevalence of cannabis use in recent years (*1*,*4*). Although past-year prevalence of self-reported cannabis use increased

* Although cannabis is illegal under federal law, 41 states and the District of Columbia allow medical use of cannabis, and 24 states and the District of Columbia allow or regulate nonmedical use of cannabis by adults. State Medical Cannabis Laws | National Conference of State Legislatures

† For SUDORS, overdose deaths were identified by funded jurisdictions both through *International Classification of Diseases, Tenth Revision* underlying cause-of-death codes X40–44 (unintentional) and Y10–14 (undetermined intent) and through text searches of literal cause-of-death fields on death certificates that indicated acute drug toxicity.

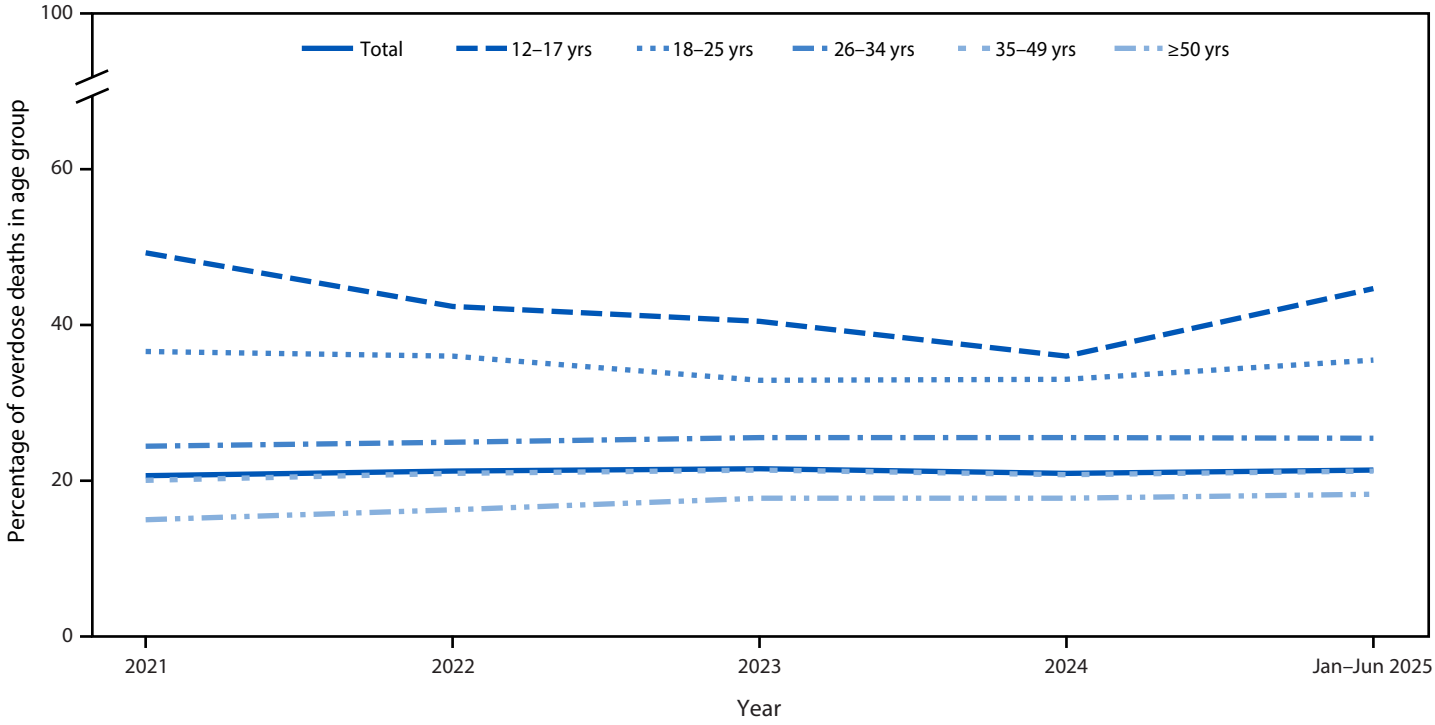
§ Alaska, Arizona, Arkansas, Colorado, Connecticut, Delaware, District of Columbia, Georgia, Hawaii, Illinois, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Minnesota, Nebraska, Nevada, New Jersey, New Mexico, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, Utah, Vermont, Virginia, Washington, and West Virginia. For inclusion, jurisdictions were required to report ≥75% of overdose deaths in their jurisdiction and have toxicology reports for ≥75% of deaths for the full period of analysis. Analyses were restricted to deaths with toxicology reports (95.2% of deaths in included jurisdictions).

¶ Screening for cannabinoids in postmortem fluids typically uses immunoassay analysis that cannot distinguish delta-8-THC and delta-9-THC. Definitive identification of delta-8-THC, delta-9-THC, and their metabolic byproducts necessitates confirmatory testing.

** Among deaths in this analysis with cannabis detected, delta-9-THC was detected in 73.1%, delta-8-THC in 1.1%, dronabinol in none, and a different cannabis derivative (e.g., cannabidiol, cannabigerol, or tetrahydrocannabivarin) in 0.1%; cannabis that was not otherwise specified as a specific cannabinoid detected (e.g., marijuana metabolite) was detected in 26.6%. Categories are not mutually exclusive except for the category of cannabis not otherwise specified as a specific cannabinoid.

†† 45 C.F.R. part 46.102(l)(2), 21 C.F.R. part 56; 42 U.S.C. Sect. 241(d); 5 U.S.C. Sect. 552a; 44 U.S.C. Sect. 3501 et seq.

FIGURE. Percentage* of overdose deaths with cannabis detected, by decedent age group — State Unintentional Drug Overdose Reporting System, United States,† January 2021–June 2025



* Percentages were calculated among overdose deaths that occurred in the specified age group. During 2021–June 2025, 1,028 overdose deaths occurred among decedents aged 12–17 years, 13,014 among those aged 18–25 years, 39,842 among those aged 26–34 years, 76,807 among those aged 35–49 years, and 78,475 among those aged ≥50 years. Total sample size was 209,166 deaths.

† Alaska, Arizona, Arkansas, Colorado, Connecticut, Delaware, District of Columbia, Georgia, Hawaii, Illinois, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Minnesota, Nebraska, Nevada, New Jersey, New Mexico, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, Utah, Vermont, Virginia, Washington, and West Virginia. For inclusion, jurisdictions were required to report ≥75% of overdose deaths in their jurisdiction and have toxicology reports for ≥75% of deaths for the full period of analysis. Analyses were restricted to deaths with toxicology reports (95.2% of deaths in included jurisdictions).

during 2021–2024 among adults aged ≥26 years (*1*), detection in overdose deaths remained relatively stable. Fewer than 1% of deaths had cannabis listed as a cause of death, and all but nine deaths had at least one other drug involved. This evidence indicates that overdose deaths caused by cannabis are rare, and detection of cannabis among overdose deaths is primarily indicative of polysubstance use. Because cannabinoids are rarely implicated in the cause of death (*2*), cannabinoid screening and confirmatory testing is not universally conducted. Thus, the identification of cannabis use among overdose deaths is likely underestimated.

Cannabis use among youths represents an important opportunity for early intervention to prevent cannabis use disorder and address other substance use disorders and related adverse health effects (*5*). Implementation of programs, such as CDC's Drug Free Communities Support Program and Evidence-Based Strategies to Prevent Youth Substance Use (ENGAGE), that use interdisciplinary community-based approaches to prevent and reduce youth substance use, including cannabis use, might improve the health of youths in the United States now and, over time, reduce substance use in adults.

Acknowledgments

Jurisdictions participating in CDC's Overdose Data to Action (OD2A) program and providing data to the State Unintentional Drug Overdose Reporting System, including state and jurisdictional health departments, vital registrar offices, and medical examiner and coroner offices; CDC OD2A-States team, Division of Overdose Prevention, National Center for Injury Prevention and Control, CDC.

Corresponding author: Lauren J. Tanz, ltanz@cdc.gov.

[1]Division of Overdose Prevention, National Center for Injury Prevention and Control, CDC.

All authors have completed and submitted the International Committee of Medical Journal Editors form for disclosure of potential conflicts of interest. No potential conflicts of interest were disclosed.

Summary

What is already known about this topic?

In the United States, cannabis is the most commonly used drug that is illegal under federal law; however, little is known about the frequency of cannabis detection in drug overdose deaths or age distribution of persons who died of an overdose with cannabis detected.

What is added by this report?

During January 2021–June 2025, cannabis was detected in 21.0% of overdose deaths; the percentage was stable over time. Cannabis was listed as causing death in 0.8% of overdose deaths. Percentages of deaths with cannabis detected were highest among adolescents aged 12–17 years and decreased with increasing age.

What are the implications for public health practice?

Community-based approaches to preventing and reducing youth cannabis use have the potential to improve the health of youths now and as they move into adulthood.

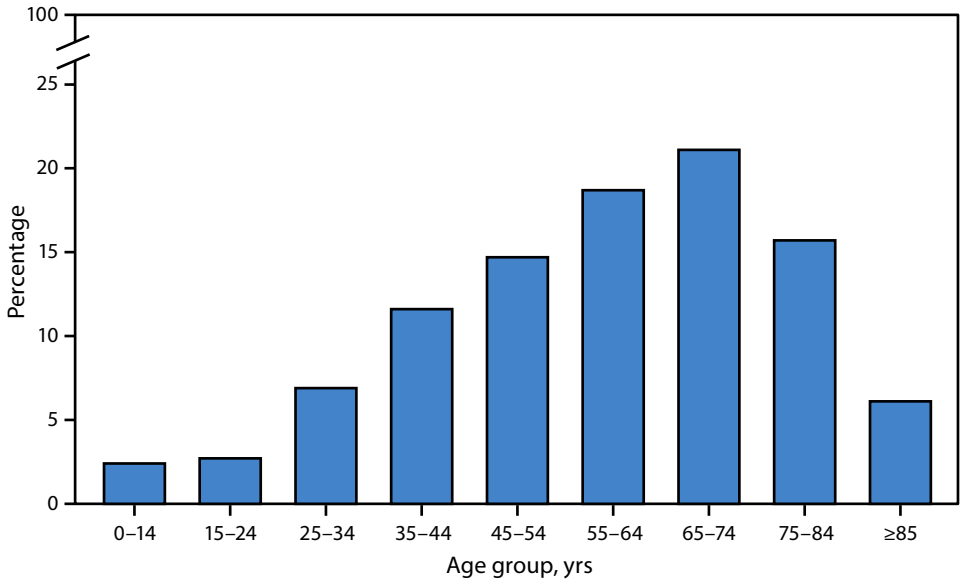
References

1. Substance Abuse and Mental Health Services Administration. Key substance use and mental health indicators in the United States: results from the 2024 National Survey on Drug Use and Health. Rockville, MD: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration; 2025. https://www.samhsa.gov/data/sites/default/files/reports/rpt56287/2024-nsduh-annual-national-report.pdf
2. Hoch E, Volkow ND, Friemel CM, Lorenzetti V, Freeman TP, Hall W. Cannabis, cannabinoids and health: a review of evidence on risks and medical benefits. Eur Arch Psychiatry Clin Neurosci 2025;275:281–92. PMID:39299947 https://doi.org/10.1007/s00406-024-01880-2
3. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 5th ed., text revision. Washington, DC: American Psychiatric Association; 2022.
4. Miech RA, Patrick ME, O'Malley PM, Jager JO, Jang JB. Monitoring the future study annual report. Monitoring the future national survey results on drug use, 1975–2025: overview and key findings for secondary school students. Ann Arbor, MI: Institute for Social Research, University of Michigan; 2026. https://monitoringthefuture.org/wp-content/uploads/2025/12/mtfvol12026.pdf
5. Lundahl LH, Ledgerwood DM. Adolescent cannabis use disorder [Chapter 9]. In: Marusak H, ed. Cannabis and the developing brain. Cham, Switzerland: Springer Nature Switzerland AG; 2025:308–28.

QuickStats

FROM THE NATIONAL CENTER FOR HEALTH STATISTICS

Percentage Distribution of Heat-Related Deaths, by Age Group — United States, 2024



In 2024, a total of 2,391 heat-related deaths were reported in the United States. The percentage of heat-related deaths increased with age through ages 65–74 years, with the highest percentage (21.1%) reported among adults in this age group. The percentage of heat-related deaths then decreased through age ≥85 years.

Supplementary Table: https://stacks.cdc.gov/view/cdc/258541

Source: National Center for Health Statistics, National Vital Statistics System, Mortality Data, 2024

Reported by: Matthew Garnett, MPH, Mgarnett@cdc.gov.

For more information on this topic, CDC recommends the following link: Heat & Health Tracker | CDC

The *Morbidity and Mortality Weekly Report (MMWR)* Series is prepared by the U.S. Centers for Disease Control and Prevention (CDC) and is available free of charge in electronic format. To receive an electronic copy each week, visit *MMWR* at *https://www.cdc.gov/mmwr/index.html*.

Readers who have difficulty accessing this PDF file may access the HTML file at https://www.cdc.gov/mmwr/index2026.html. Address all inquiries about the *MMWR* Series to Editor-in-Chief, *MMWR* Series, Mailstop V25-5, CDC, 1600 Clifton Rd., N.E., Atlanta, GA 30329-4027 or to mmwrq@cdc.gov.

ISSN: 0149-2195 (Print)