

Youth Risk Behavior Surveillance — United States, 2025



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

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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.] [Title]. *MMWR Suppl* 2026;75(Suppl-#):[inclusive page numbers].

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Overview and Methods for the Youth Risk Behavior Surveillance System — United States, 2025

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Abstract

The Youth Risk Behavior Surveillance System (YRBSS) is the largest and most comprehensive source of data on adolescent health behaviors and experiences in the United States. Established in 1991, YRBSS includes a nationally representative Youth Risk Behavior Survey (YRBS) and separate site-level YRBSSs conducted by states, tribal governments, territories, and local school districts. This overview report describes 2025 YRBSS survey methodology, including sampling, data collection, response rates, data processing, weighting, and analytic methods. The 2025 national survey response rates and student demographic characteristics are also included, along with the site-level participation map. During 2025, in addition to the national YRBS, 64 sites across the United States (including 40 states, one tribal government, one territory, and 22 local school districts) administered site-level YRBSSs to high school students in their jurisdictions. YRBSS continues to capitalize on technological advances to make survey administration and data collection more efficient. The 2025 national YRBS was administered electronically using tablets for the second consecutive cycle. For the first time, approximately two thirds of participating sites also administered surveys electronically, representing a major milestone in the system's transition toward electronic data collection. The increase in the number of sites opting to conduct electronic data collection opens new pathways for data modernization at the local level, including reducing the amount of work required for survey administration and time for data processing, enabling real-time logic checks, and allowing sites to more easily tailor questionnaires to jurisdictional needs. Although low participation and declining response rates remain challenging, the flexibility, reach, and adaptability of YRBSS support its continued role as a primary source of data on adolescent health. Continued participation in and promotion of the YRBSS by state, local, community, and school- and youth-focused professional organizations are essential to sustaining YRBSS participation and surveillance capacity.

Introduction

The Youth Risk Behavior Surveillance System (YRBSS) is the leading source of data on adolescent health behaviors and experiences in the United States, with data from approximately 5 million youths who have participated at the national and local levels throughout the system's more than 35-year history. Established in 1991, the YRBSS is comprised of a national school-based Youth Risk Behavior Survey (YRBS) conducted by CDC, alongside a network of state, territorial, tribal, and local YRBSSs administered by health and education agencies. The structure of the YRBSS enables surveillance of a broad range of established and emerging adolescent health behaviors and experiences across national, state, and local levels and monitoring of changes in student health and well-being over time.

Adolescent health behaviors and outcomes are some of the most important predictors of adult health (1–3). Recent

national data on adolescent health highlight several areas of continued public health concern, including poor mental health, increases in sedentary behavior and obesity, and decreases in healthy dietary, physical activity, and sleep behaviors (4–7). Developing effective prevention and intervention efforts to address these trends requires accurate, high-quality measurement of adolescent health behaviors and experiences. Furthermore, adolescent health behaviors and experiences can change over time and increasingly occur within rapidly changing digital environments, including social media and artificial intelligence (AI) technologies (8–10), underscoring the need for high-quality data systems that can respond to these shifts.

The YRBSS continually evolves to monitor adolescent health and well-being as adolescents navigate changing social and physical environments. In recent years, YRBSS has included questions on emerging health concerns affecting adolescents, such as indicators of mental health, social media, vaping, school connectedness, and parental monitoring, reflecting the ability of the system to adapt to current and anticipated youth health needs. However, the ability of YRBSS to track

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adolescent health behaviors effectively requires widespread school and student participation. Continued engagement from state, local, community, and national school-based and youth-focused professional organizations remains essential to maintaining the YRBSS as a robust source of data on key adolescent health behaviors and experiences.

This report details the 2025 YRBSS methodology, including sampling, data collection, data processing, weighting, and analytic procedures used across the system at the national level and at state and local levels. The remaining five reports in this supplement highlight the 2025 national data on critical adolescent health topics, including nutrition and physical activity, cardiovascular health, unmet need for mental health services, binge eating, and urban-rural differences in substance use. The report on cardiovascular health incorporates a novel use of YRBS data to derive a composite score for cardiovascular health aligned with the American Heart Association's Life's Essential 8 framework, with implications for chronic disease prevention beginning in adolescence. Two of the reports introduce emerging adolescent health topics by providing the first YRBS national estimates of binge eating and receipt of mental health services among high school students. Although findings from state and local survey data are excluded from this publication, these data are publicly available through CDC's YRBSS web-based data dissemination tools, including YRBS Explorer (<https://yrbs-explorer.services.cdc.gov>), Youth Online (<https://youthonline.cdc.gov>), and the YRBS Analysis Tool (<https://yrbs-analysis.cdc.gov>).

National YRBS Methodology

Overview

The national YRBS is administered biennially during the spring semester of odd-numbered years among a nationally representative sample of students from public and private schools, including parochial schools, in grades 9–12 in the 50 U.S. states and the District of Columbia. Biennial administration enables CDC to assess temporal changes in behaviors among the U.S. high school population while adapting the instrument to identify emerging adolescent health behaviors and experiences affecting high school students. In addition, the national YRBS provides comparable data across survey years, enabling state and local jurisdictions conducting their own YRBS to demonstrate how behaviors and experiences of youths in their jurisdictions compare with those at the national level.

Questionnaire

The national YRBS questionnaire uses single-item measures to monitor and describe a wide variety of health behaviors and experiences. The 2025 questionnaire contained 106 questions. Of these, 86 were included in the standard questionnaire used as a baseline by state and local jurisdictions; the remaining 20 addressed high-priority topic areas for CDC and other partners. The standard questionnaire is periodically revised to include new questions that assess emerging problems and evolving health behaviors among high school students. Proposed revisions are reviewed by subject matter experts representing CDC, academia, other federal agencies, nongovernmental organizations, and YRBS coordinators from supported agencies and jurisdictions nationwide. Proposed new and modified items undergo cognitive testing with high school students to evaluate comprehension and interpretation before being included in the questionnaire. To maintain the 90-item limit on the standard questionnaire, a “one-in, one-out” rule is applied whereby items are removed if they are no longer applicable, exhibit low prevalence, or are frequently omitted by participating sites. Proposed changes are submitted to YRBS coordinators for a vote, and additions, modifications, and deletions are finalized by simple majority. To support accessibility and participation, the national YRBS questionnaire was administered in both English and Spanish.

Most survey questions used a multiple-choice structure with up to eight mutually exclusive options, allowing for only one response per question. Exceptions to this format were questions assessing height, weight, and race. A test-retest study of the 2021 YRBS survey questions demonstrated substantial reliability among these questions (11). The wording of each question, including recall periods, response options, and operational definitions for each variable, is available in the 2025 YRBS questionnaire and data user's guide. (YRBSS data and documentation are available at <https://www.cdc.gov/yrbs/data/index.html>.)

For the second consecutive YRBS administration, the 2025 national YRBS was self-administered electronically using tablets. Electronic data collection enhanced overall data integrity by incorporating real-time logic checks. For example, the questionnaire was programmed to prompt students to correct invalid or out-of-range responses for height and weight, thereby reducing the need for postcollection data cleaning. The national YRBS underwent the Office of Management and Budget (OMB) review process, and Paperwork Reduction Act determinations for these projects are available (<https://www.reginfo.gov/public/do/PRAOMBHistory?ombControlNumber=0920-0493>).

Sampling

The sampling frame for the 2025 national YRBS included regular public (including charter) schools and private (including parochial) schools with students in grades 9–12 in the 50 U.S. states and the District of Columbia. Exclusion criteria included alternative, special education, U.S. Department of Defense, Bureau of Indian Education, and vocational schools serving students who also attended another school. Schools with 40 or fewer students enrolled in grades 9–12 (combined) were excluded. The sampling frame was constructed from data files obtained from MDR (formerly Market Data Retrieval) and the National Center for Education Statistics (NCES). NCES data sources included the Common Core of Data (CCD) (<https://nces.ed.gov/ccd/>) for public schools and the Private School Universe Survey (PSS) (<https://nces.ed.gov/surveys/pss/>) for private schools.

A three-stage cluster sampling design was used to produce a nationally representative sample of students in grades 9–12 attending public and private schools. In the first stage, the sampling frame comprised 1,072 primary sampling units (PSUs), consisting of entire counties, groups of smaller adjacent counties, or parts of larger counties. PSUs were categorized into 16 strata according to metropolitan statistical area status (i.e., urban or nonurban) and the percentages of Black or African American (Black) and Hispanic or Latino (Hispanic) students. Of the 1,072 PSUs, 70 were selected with probability proportional to overall school enrollment size.

In the second stage, secondary sampling units (SSUs) within the 70 sampled PSUs were defined as a physical school containing grades 9–12 or a unit created by combining nearby schools to provide all four grades. A total of 210 SSUs were selected with probability proportional to school enrollment size. An additional 20 small SSUs were selected from a random subsample of the 70 PSUs to improve coverage of students attending small schools, resulting in 230 SSUs corresponding to 230 physical schools.

In the third stage, one or two classrooms in each of grades 9–12 were randomly selected within participating schools from a required subject (e.g., English or social studies) or a required period (e.g., homeroom or second period). All students in sampled classes who could independently complete the questionnaire were eligible to participate. Schools, classes, and students that declined participation were not replaced.

Data Collection Procedures

This study was reviewed and approved by institutional review boards at CDC and ICF, the survey contractor, and

was conducted consistent with applicable federal law and CDC policy.* Parental permission procedures were followed before survey administration. Survey procedures for electronic administration were designed to protect students' privacy and allow for anonymous and voluntary participation. During electronic administration, students completed the survey individually using tablets programmed with the survey instrument and no personally identifying information was collected. The tablets were not connected to the internet. Trained data collectors visited each participating school to distribute the tablets to the students and collect them after survey completion; at the end of each day, data collectors uploaded all locally stored data from the tablets to a secure data collection platform. These procedures were intended to maintain privacy and anonymity while students completed the survey in the classroom.

The 2025 national YRBS was administered during the spring semester. Students completed the self-administered questionnaire during one class period. Students typically completed the tablet-based questionnaire in under 20 minutes. Because data became available for processing immediately after the daily uploads, CDC was able to monitor data collection progress in near real-time. In addition, a web-based version of the questionnaire was provided for schools that preferred online administration and for students who were absent on the day of data collection or who were late in submitting their consent forms. A total of 827 surveys were completed using this web-based platform.

Response Rates and Data Processing

Of the 230 physical schools selected for the national sample, 108 participated, yielding a school response rate of 47.0%. Among sampled students in participating schools, the student response rate was 65.2%, resulting in an overall response rate (i.e., [student response rate] × [school response rate]) of 30.6%.

From these 108 schools, 11,097 students completed questionnaires. The data were cleaned to improve the quality and internal consistency of the final dataset. Responses were checked for valid response ranges, biologically plausible height and weight values, and logical consistency across related questions. Invalid responses, including responses outside the allowable range or logically inconsistent responses across related items, were set to missing. No statistical imputation was performed for missing data. Questionnaires failed quality control if fewer than 20 responses remained after editing or if they exhibited potential straightlining (the same response option was selected for 15 or more consecutive questions). Among the 11,097 completed questionnaires, 387 failed

* 45 C.F.R. part 46.114; 21 C.F.R. part 56.114.

quality control and were excluded from analysis, resulting in 10,710 usable questionnaires.

The 2025 YRBSS adopted the updated 2024 OMB standards for maintaining, collecting, and presenting race and ethnicity data (<https://www.federalregister.gov/documents/2024/03/29/2024-06469/revisions-to-ombs-statistical-policy-directive-no-15-standards-for-maintaining-collecting-and>). Data were collected using a single combined question (“What is your race and/or ethnicity?”), allowing students to select multiple options across seven categories: 1) American Indian or Alaska Native, 2) Asian, 3) Black or African American (Black), 4) Hispanic or Latino (Hispanic), 5) Middle Eastern or North African (ME/NA), 6) Native Hawaiian or Pacific Islander, or 7) White. For the analyses presented in this supplement, students who selected the Hispanic option were categorized exclusively as Hispanic, regardless of any additional racial categories selected (e.g., a student selecting both Hispanic and Black or White was classified as Hispanic). Consequently, all other single-race categories represent non-Hispanic students. Non-Hispanic students who selected two or more racial categories were classified as multiracial. Race and ethnicity were coded as missing for students who left this question blank.

Weighting

Weights were applied to the final 2025 national YRBS sample to produce a nationally representative sample of students from public and private schools, including parochial schools, in grades 9–12. The final survey weight incorporated the probability of selection at each stage of sampling and separate adjustments for school- and student-level nonresponse. The final weight was calculated as the product of the school base weight, student base weight, school nonresponse adjustment factor, student nonresponse adjustment factor, and poststratification adjustment factor. Thus, unequal probabilities of selection were incorporated into the base weights, whereas nonresponse adjustments accounted for observed participation at the school and student levels. The weights were then scaled so that the sum of the weights equaled the total sample size and the weighted distributions of students by sex, race and ethnicity, and grade matched national population proportions from the 2021–2022 CCD and 2021–2022 PSS.

Analytic Methods

Findings presented in this supplement are derived from analytic procedures similar to those described in this overview report. For more information about the detailed analyses presented in other reports in this supplement (e.g., variables analyzed, custom measures, and data years), see the Methods

section in each individual report. Missing data, whether resulting from questionnaire design or respondent-level missing data (e.g., skipped questions, out-of-range responses, or logical inconsistencies), were not statistically imputed; analyses used available valid responses for each measure, resulting in variable-specific analytic denominators.

All statistical analyses used SAS-callable SUDAAN (version 11.0.3 or 11.0.4; RTI International) to account for the complex sampling design and weighting. Prevalence estimates and CIs were computed for variables used in each report. Prevalence estimates with denominators <30 were considered statistically unreliable and therefore were suppressed. Differences in prevalence by demographic characteristics (e.g., sex, race and ethnicity, and grade) were assessed using design-adjusted *t* tests for specified pairwise comparisons. Domain analysis was used to calculate standard errors, CIs, and *p*-values appropriately in the presence of variable-specific missing data. Prevalence ratios were estimated using logistic regression with predicted marginals. All prevalence estimates and measures of association used Taylor series linearization. Differences were considered statistically significant at *p*<0.05; prevalence ratios were considered statistically significant when 95% CIs did not cross the null hypothesis value of 1.0.

For temporal trend analyses reported in YRBSS web-based data dissemination tools, logistic regression was used to assess linear and quadratic changes in estimates while controlling for changes over time in sex, grade, and race and ethnicity. Quadratic trends were used as an initial test for departures from linearity, such as leveling off, acceleration, or changes in direction. Linear trends were assessed to evaluate overall increases or decreases over time. Linear and quadratic time variables were treated as continuous and coded using orthogonal coefficients calculated with PROC IML in SAS (version 9.4; SAS Institute). A minimum of 3 survey years was required to assess linear trends and six survey years to assess quadratic trends; separate models were used for each. When a significant quadratic trend was identified, Joinpoint (version 5.02; National Cancer Institute) was used to identify the year when the trend changed, and regression models were then used to characterize linear trends before and after the identified change point. Cubic and higher-order trends were not assessed. A *p*-value <0.05 associated with a regression coefficient was considered statistically significant.

For analyses of 2-year changes in reports in this supplement and YRBSS web-based data dissemination tools, prevalence estimates from 2023 and 2025 were compared using design-adjusted *t* tests for behaviors, experiences, or conditions assessed with identically worded questions in both survey years. Prevalence estimates were considered statistically different if the *t* test *p*-value was <0.05.

State, Tribal, Territorial, and Local School District YRBS Methodology

Overview

Biennial administration of YRBS by state, tribal, territorial, and local education and health agencies (sites) allows them to monitor health behaviors, experiences, and conditions among their respective high school populations. Survey data are comparable across years within jurisdictions and can support comparisons of state and local estimates with national estimates. However, differences among the populations represented should be considered when making such comparisons: the national YRBS represents students attending public and private (including parochial) schools, whereas site-level YRBSs generally represent students attending public schools within their jurisdictions. During the 2025 cycle, 64 sites conducted a YRBS, including 40 states, one tribal government, one territory, and 22 local school districts (Figures 1 and 2). Survey administration was staggered: four sites conducted surveys in fall 2024, 38 in spring 2025, and 22 in fall 2025. The survey was self-administered anonymously within a single class period, taking ≤ 45 minutes to complete by paper and pencil and < 20 minutes for electronic administration. Each site followed jurisdictional requirements for institutional review board approval. Data collection, processing, and analytic methods generally followed those described for the national YRBS; however, in 2025, a total of 42 sites collected data electronically using computers, smartphones, or tablets, and 22 used paper-and-pencil questionnaires and scannable answer sheets.

Questionnaires

The 2025 standard YRBS questionnaire contained 86 questions and served as the baseline instrument for site-level YRBS questionnaires. Sites were allowed to add or delete questions but were required to retain at least 57 of the questions on the standard questionnaire, including all demographic questions. This flexibility allowed YRBS sites and other state and local partners the opportunity to tailor the instrument to meet local data needs and programmatic priorities.

Sampling

The sampling frame for the 2025 standard YRBS included regular public schools with students in grades 9–12. A two-stage cluster sampling design was used to produce representative samples of high school students in participating jurisdictions. In the first stage, public schools with any of grades 9–12 were sampled with probability proportional to school enrollment

size. In the second stage, classes from either a required subject (e.g., English or social studies) or a required period (e.g., homeroom or second period) were randomly sampled within participating schools. All students in sampled classes who could independently complete the survey were eligible to participate. Exceptions to this two-stage design occurred in two sites (Vermont and the District of Columbia) that conducted a complete census of all eligible schools and students.

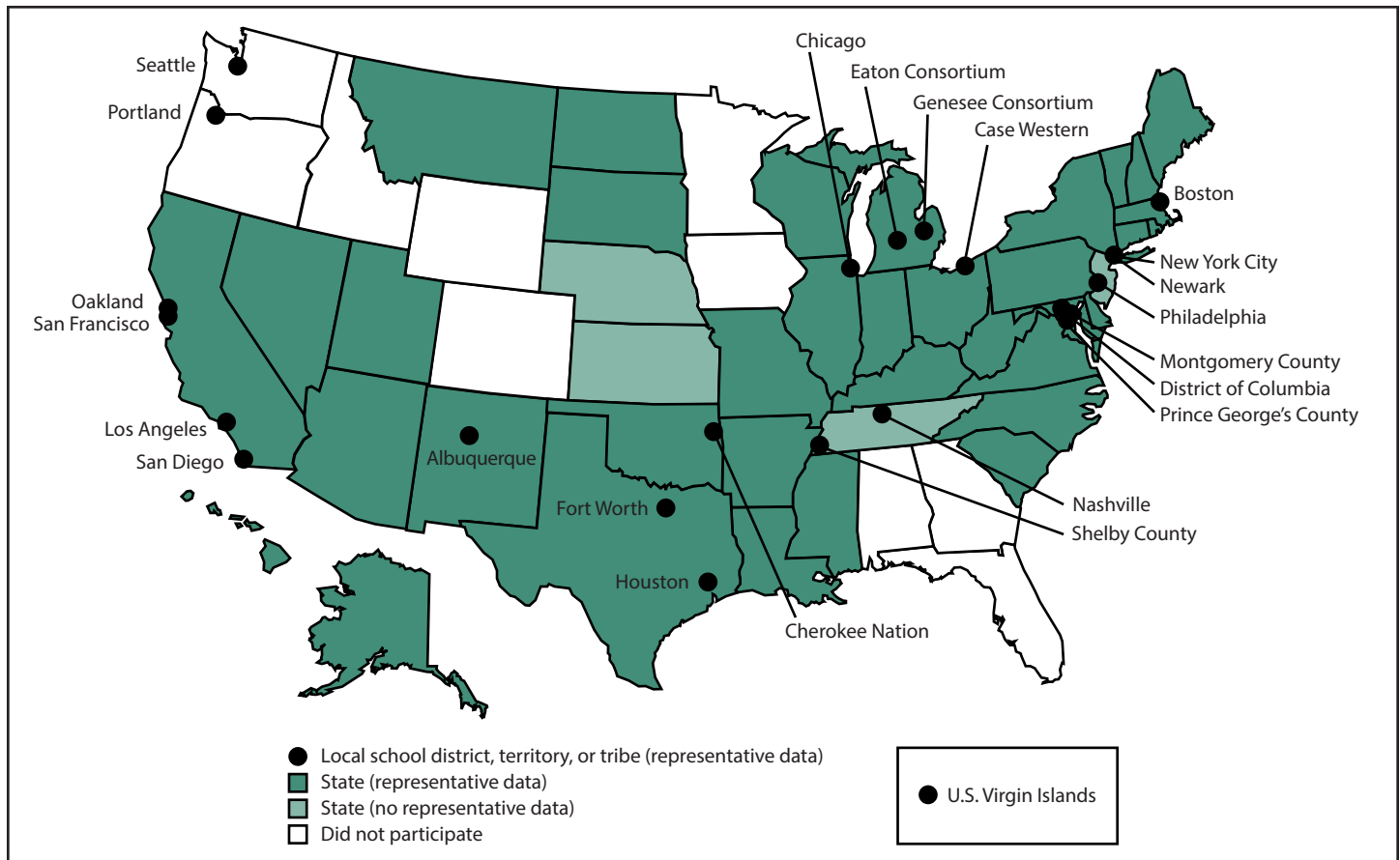
To reduce respondent effort, students in schools selected for both the national and site-level samples participated in only one YRBS. In these selected schools, either the national or the site-specific questionnaire was administered, and data from identical questions were subsequently shared between sites. Because site-specific questionnaires differ from the national questionnaire, students in schools sampled for the national and site-level surveys might not have been asked all national YRBS questions. Therefore, the total denominator of students answering each question in the national dataset varies.

Nonresponse Bias Analyses, Weighting, and Response Rates

Site-level datasets were cleaned and edited for inconsistencies. Missing data were not statistically imputed. A questionnaire failed quality control when fewer than 20 responses remained after editing or when it contained the same answer to 15 or more consecutive questions. CDC conducted nonresponse bias analyses (NRBAs) for all sites with response rates $\geq 10\%$ to determine whether data for each site could be weighted to be representative of its jurisdiction. These analyses compared responding and nonresponding schools on school enrollment size (small, medium, or large), a measure of the school's poverty level (usually the percentage of students eligible for free or reduced-price lunch), and locale type (city, suburban, town, or rural). Analyses also compared responding and nonresponding students by grade. Weighted sample distributions were then compared with population distributions by grade, sex, and race and ethnicity. If limited statistically significant differences between comparison groups were found, data were weighted to be representative of their respective populations.

Site-level survey weights were constructed using the same general weighting framework described for the national YRBS, including school and student base weights, school and student nonresponse adjustments, and poststratification adjustments. Site-level weights were calibrated to the student population within each jurisdiction so that the weighted count equaled the corresponding student population. A total of 36 states, one tribal government, one territory, and 22 local school districts had

FIGURE 1. States, tribal governments, territories, and local school districts that conducted site-level Youth Risk Behavior Surveys — selected U.S. sites, 2025



representative (weighted) data in 2025 (Figures 1 and 2). In two states, weighted estimates were representative of all students in grades 9–12 attending regular public schools.

2025 National YRBS Response Rates, Nonresponse Analyses, and Demographic Characteristics

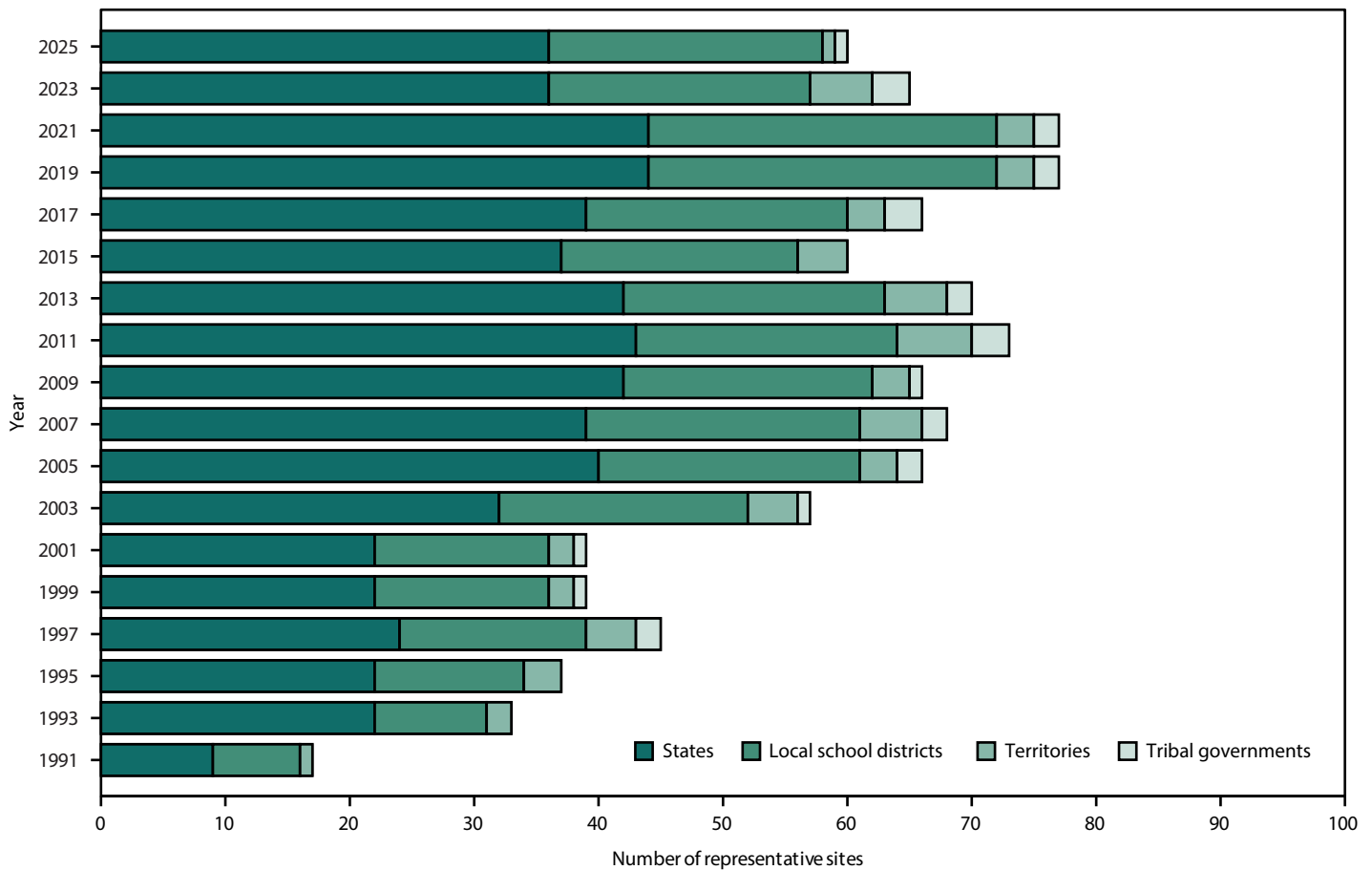
The overall response rate continued to decline, reaching 30.6% for the 2025 national YRBS cycle. Although student participation (65.2%) remained comparable to previous cycles (Figure 3), the school response rate (47.0%) declined slightly from 2023 and was substantially lower than historical levels. The student response rate reflects participation among sampled students and does not separately distinguish sources of student nonresponse, including absence, lack of parental permission, or student refusal.

Overall response rates in YRBSS have decreased steadily since 2011 and were <60% in 2021 during the COVID-19 pandemic. However, survey methodology research indicates

that a high response rate does not necessarily indicate an unbiased sample, nor does a low response rate inherently indicate greater bias (12). For the 2025 national YRBS, nonresponse analyses included bivariate and multivariable analyses of school and student-level characteristics associated with participation. Bivariate analyses identified significant differences between participating and nonparticipating schools by school type (public versus nonpublic), locale status (city, suburb, town, rural), city (versus noncity), lunch program participation, Title I expenditures, majority White status (no versus yes), and poverty rate. In a multivariable logistic regression model including these characteristics, school type, city status, and poverty level remained significant predictors of school participation: nonpublic schools and schools below the median poverty level were less likely to participate, whereas schools in cities were more likely to participate. Weighting adjustments incorporated these characteristics to reduce potential nonresponse bias (ICF, unpublished data, 2026).

These nonresponse analyses evaluate whether characteristics of responding and nonresponding schools and students differ but do not assess nonresponse bias separately for each health

FIGURE 2. Number of states, tribal governments, territories, and local school districts that conducted site-level Youth Risk Behavior Surveys with representative data (independent of the national survey), by year of survey — Youth Risk Behavior Survey, selected U.S. sites, 1991–2025



behavior or experience measured by YRBS. Because patterns of response and missing data can vary across survey items, the potential for item-specific nonresponse bias should be considered when interpreting individual estimates.

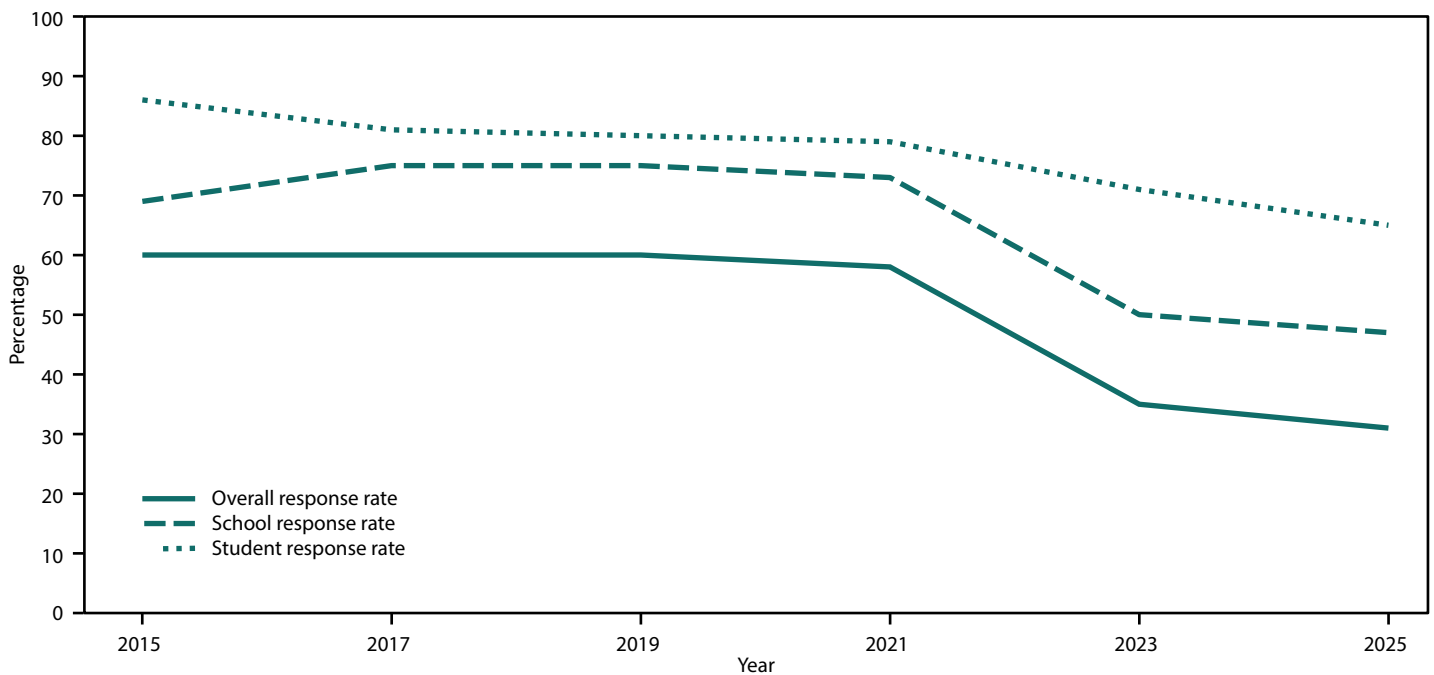
The 2025 national YRBS data were weighted to match national population proportions. After weighting, approximately half of students were male (51.7%), and percentages of students by grade were as follows: grade 9 (27.3%), grade 10 (25.4%), grade 11 (24.0%), and grade 12 (23.3%) (Table). In addition, 47.8% of students were White, followed by Hispanic (27.0%), Black (11.7%), multiracial (5.9%), Asian (5.4%), ME/NA (1.2%), American Indian or Alaska Native (0.6%), and Native Hawaiian or Pacific Islander (0.3%).

Data Availability and Dissemination

National and site-level YRBS data (2019–2025) are available in a combined dataset from the YRBSS data and documentation website (<https://www.cdc.gov/yrbs/data/index.html>), as are additional resources, including data

documentation and analysis guides. Data are available in both Access and ASCII formats, and SAS and SPSS programs are provided for converting the ASCII data into SAS and SPSS datasets. Variables are standardized to facilitate trend analyses and for combining data. YRBSS data also are available online via three web-based data dissemination tools: Youth Online, YRBS Analysis Tool, and YRBS Explorer. Youth Online allows point-and-click data analysis and creation of customized tables, graphs, maps, and fact sheets (<https://youthonline.cdc.gov>). Youth Online also performs statistical tests by health topic and filters and sorts data by demographic characteristic. The YRBS Analysis Tool allows real-time analysis of YRBS data and generates frequencies, cross-tabulations, and stratified results (<https://yrbs-analysis.cdc.gov>). YRBS Explorer is an application featuring options to view and compare national, state, and local data via tables and graphs (<https://yrbs-explorer.services.cdc.gov>).

FIGURE 3. Overall, school, and student response rates for the Youth Risk Behavior Survey — United States, 2015–2025



Availability of site data depends on survey participation, data quality, and data-sharing policies. Information about YRBSS data is available on the participation maps and history website (<https://www.cdc.gov/yrebs/data/yrebs-participation.html>). Site-level YRBS data collected during 1991–2025 are available through Youth Online (<https://youthonline.cdc.gov/>), the YRBS Analysis Tool (<https://yrebs-analysis.cdc.gov/>), and YRBS Explorer (<https://yrebs-explorer.services.cdc.gov/>).

Discussion

The YRBSS is the largest and most comprehensive collection of national and local data on youth health behaviors and experiences in the U.S., serving as a foundational resource for understanding adolescent health behaviors and outcomes. Innovations in the 2025 YRBS included the introduction of new national-level survey questions on binge eating and mental health services and the adoption of the updated 2024 OMB standards for maintaining, collecting, and presenting race and ethnicity data using a single combined question. This update introduced the ME/NA race and ethnicity category to YRBSS data collection.

YRBSS continues to face challenges with declining response rates. The 2025 national YRBS overall response rate of 30.6% was the lowest in the survey's history. Although weighting and nonresponse analyses are used to support use of the national estimates, declining participation at the state and local levels can

reduce the number of jurisdictions with representative YRBS data available to schools, communities, and decision makers. Multiple factors might contribute to declining participation, including challenges obtaining district and school participation and parental permission, competing demands on instructional time, and resource constraints. The relative contributions of these factors to changes in YRBSS participation have not been systematically evaluated.

CDC has implemented several approaches intended to support YRBSS participation and data quality. Since 2021, CDC has conducted NRBA for site-level YRBSs to determine whether data from sites with lower response rates can be weighted to represent their jurisdiction. This has allowed many sites with lower response rates to receive weighted data, which are of substantial benefit to states and local sites, staff members, and students who take time to participate in YRBS. The 2023 cycle also marked the full transition to electronic data collection for the national YRBS, reducing survey administration effort and data processing time; the percentage of sites electing electronic data collection increased from 47% in 2023 to 65% in 2025. Previous research comparing electronic and paper-and-pencil YRBS administration found that mode of administration did not meaningfully affect prevalence estimates, supporting comparability across administration modes (13). Maintaining comparability across survey cycles is essential to monitoring trends over time. Although core sampling, weighting, and analytic methods are designed to support temporal comparisons, YRBSS also evolves in response

TABLE. Student demographic characteristics — national Youth Risk Behavior Survey, United States, 2025

Characteristic	No. (%)
Student sample size*	10,710 (100)
Sex†	
Female	5,235 (48.3)
Male	5,435 (51.7)
Race and ethnicity§,¶	
American Indian or Alaska Native	78 (0.6)
Asian	517 (5.4)
Black or African American	2,169 (11.7)
Hispanic or Latino	3,353 (27.0)
Middle Eastern or North African	104 (1.2)
Native Hawaiian or Pacific Islander	33 (0.3)
White	3,603 (47.8)
Multiracial	760 (5.9)
Grade**	
9	3,086 (27.3)
10	2,763 (25.4)
11	2,610 (24.0)
12	2,209 (23.3)

* Among the 11,097 completed questionnaires, 387 failed quality control and were excluded from analysis, resulting in 10,710 usable questionnaires.

† Does not include 40 students who did not indicate sex.

§ Persons of Hispanic or Latino (Hispanic) origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.

¶ Does not include 93 students who did not indicate race, ethnicity, or both.

** Does not include 19 students who responded, "ungraded or other grade" and 23 students who did not indicate a grade.

to changes in technology, participation, and data collection needs. Continued methods research is important to determine whether such changes affect estimates or interpretation of trends.

Additional efforts are needed to improve YRBSS participation. Research on school surveys suggests that minimizing respondent fatigue, coordinating sampling, and providing incentives can support participation (14). Several recent and planned YRBSS enhancements align with these approaches. Electronic data collection is intended to reduce administrative effort and coordination of national and site-level samples reduces duplication for schools selected for both surveys. Planned increases in school and teacher incentives and provision of school-level data to schools participating in the 2027 national YRBS are intended to support participation and demonstrate its value. Partner organizations can also serve as trusted collaborators by communicating the value of YRBSS data and participation to state and local health and education agencies, school districts, and schools. The effects of these individual strategies on YRBSS response rates have not been established, underscoring the importance of continued evaluation. Findings from reports in this supplement using national YRBS data are aligned with longstanding public health priorities and initiatives and also support the need for improvements in adolescent health. For example, the report on dietary and physical activity behaviors suggests that, despite

certain improvements since 2023, the prevalence of students engaging in healthy dietary and physical activity behaviors, including behaviors aligned with the recently released 2025–2030 Dietary Guidelines for Americans, remains low (15,16). As chronic disease prevention among adolescents receives increasing national attention, another report uses YRBS data to estimate overall cardiovascular health among high school students using five of the eight metrics aligned with the American Heart Association's Life's Essential 8 framework (17). This novel application of YRBS data suggests that only one in five students had high, or favorable, cardiovascular health; among the five metrics assessed using YRBS data, diet, physical activity, and sleep health had the least favorable scores (18). In response to persistent concerns about adolescent mental health, a new YRBS question assessing receipt of mental health counseling or therapy was added in 2025. Findings from this report indicate that among students experiencing persistent feelings of sadness or hopelessness, approximately one in three reported an unmet need for counseling or therapy because of barriers such as cost or not knowing how or where to seek help (19). In collaboration with partners in the field of eating disorder prevention and research, YRBS also included a new item assessing binge eating for the first time in 2025. Approximately 17% of high school students reported binge eating on ≥ 3 days during the past 30 days, and prevalence was higher among students who used social media hourly or more and among those reporting indicators of poor mental health and suicide risk (20). Finally, recent enhancements to the surveillance system have enabled linkage of YRBS data with school-level information, allowing for examination of substance use behaviors by urban-rural classification using the national YRBS. Findings from this report indicate a higher prevalence of tobacco and nicotine product use among students in rural public schools, suggesting potential opportunities for tailored prevention strategies in rural schools and communities (21). Collectively, these reports demonstrate the usefulness of YRBSS for examining evolving public health priorities and generating actionable data to guide programs and interventions aimed at improving adolescent health.

Limitations

Each report in this supplement includes limitations specific to its variables and analyses. In general, YRBSS findings are subject to at least five limitations. First, national YRBS estimates apply to students in grades 9–12 attending U.S. public and private (including parochial) schools; site-level estimates apply to the school populations represented by each participating jurisdiction. Homeschooled youths and youths not attending

school are not represented. In 2022, approximately 5% of youths aged 14–17 years were not enrolled in school (https://nces.ed.gov/programs/digest/d23/tables/dt23_103.20.asp). Second, the 2025 national YRBS had an overall response rate of 30.6%, driven largely by a school response rate of 47.0%. Nonresponse analyses found that in a multivariable logistic regression model, school type, city, and poverty level were significant predictors of school participation (ICF, unpublished data, 2026). Third, health-related behaviors and experiences are self-reported, and the extent of underreporting or overreporting cannot be determined. Most YRBS questions undergo cognitive testing to determine whether students understand and interpret the questions as intended, and a 2021 study found substantial test-retest reliability for most YRBS questions (11). However, cognitive testing and test-retest reliability do not establish the accuracy of self-reported behaviors and experiences. Fourth, students in schools selected for both the national and a site-specific sample were surveyed only once, often using the site-specific questionnaire. As a consequence, certain students contributing to the national dataset were not administered all national YRBS questions. Available data therefore varied across questions because of questionnaire design as well as respondent-level missing data. Finally, YRBSS surveys are cross-sectional and can identify associations but cannot establish causality; the surveillance system is descriptive and is not designed to determine definitive reasons underlying observed trends.

Conclusion

YRBSS continues to provide data critical to guiding and supporting adolescent health and well-being in the United States. Despite persistent participation challenges, the system remains flexible and able to adapt and survey evolving adolescent health problems and data needs. YRBSS success depends on continued engagement from federal, state, and local partners, school and youth-focused organizations and the students and families who participate in the surveys nationwide.

This overview report describes 2025 YRBSS methods and procedures including those used to guide the analyses presented in this supplement. A full description of 2025 YRBSS findings and downloadable data from the national and site-specific surveys are available at <https://www.cdc.gov/yrebs/data/index.html>.

Acknowledgments

The authors acknowledge Smita Chavan, CDC.

During March–August 2026, the authors of this overview report, as well as the authors of reports included in this supplement, used AI tools including the U.S. Department of Health and Human Services instance of ChatGPT 5.3 through 5.6 (OpenAI, San

Francisco, California), Claude 4.6 Sonnet (Anthropic, San Francisco, California), and the Copilot environment (GPT-5; Microsoft, Redmond, Washington) to generate, debug, or edit analytic scripts or code, and for limited editing of manuscript text for grammar and clarity. All outputs were reviewed and finalized by the authors.

Conflicts of Interest

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

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Dietary and Physical Activity Behaviors Among High School Students — Youth Risk Behavior Survey, United States, 2025

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Abstract

Adolescence is a critical period for establishing healthy dietary and physical activity behaviors, which support growth, development, and chronic disease prevention. However, most adolescents do not meet national guidelines for healthy eating and daily physical activity, and previous data indicated declines in these behaviors. This report uses nationally representative data from the 2025 Youth Risk Behavior Survey to update estimates of dietary and physical activity behaviors among U.S. high school students overall and by sex, race and ethnicity, and grade. In addition, 2-year comparisons (2023 versus 2025) of these behaviors were examined. In 2025, during the 7 days before the survey was administered, 39% of high school students ate fruit ≥ 1 time per day, 63% ate vegetables ≥ 1 time per day, 27% ate breakfast daily, 30% had not drunk sugar-sweetened soda or pop, 51% had not drunk sports drinks, and 58% drank ≥ 3 glasses per day of plain water. In addition, approximately 25% of students met aerobic guidelines (were physically active for ≥ 60 minutes per day on all 7 days), 51% met muscle-strengthening guidelines (exercised to strengthen muscles on ≥ 3 days per week), 16% met both aerobic and muscle-strengthening guidelines, 20% attended physical education classes on all 5 school days, and 58% played on at least one sports team during the 12 months before the survey. From 2023 to 2025, overall increases were observed for eating fruit ≥ 1 time per day, eating vegetables ≥ 1 time per day, and drinking ≥ 3 glasses per day of plain water. Sports team participation also increased; however, students attending physical education class on all 5 school days decreased. Despite certain improvements since 2023, the 2025 prevalence of most healthy dietary behaviors and physical activity behaviors remained low. Understanding the current data can guide actions to create environments that support healthy

behaviors in schools, communities, and at home and might help adolescents meet national recommendations for healthy eating and physical activity.

Introduction

Adolescence is a critical period for establishing healthy dietary and physical activity behaviors that support growth and development, reduce the risk for chronic conditions such as heart disease and Type 2 diabetes (1,2), and are linked to better mental health and academic achievement (3,4). Despite these benefits, most adolescents do not meet recommended guidelines for healthy eating, such as eating enough vegetables and fruits and avoiding sugar-sweetened beverages, or for physical activity, including engaging in daily aerobic activity and muscle-strengthening activities at least 3 days a week (2,5,6).

Previously released data from the national Youth Risk Behavior Survey (YRBS) found that in the decade from 2013 to 2023, most adolescent dietary and physical activity behaviors either worsened or did not improve, with trends varying across demographic groups (5). Healthy People 2030, a set of national objectives for improving the health and well-being of all persons in the United States, continues to include and prioritize objectives related to dietary and physical activity health behaviors as well as evidence-based practices (e.g., physical education and participation in school breakfast programs) that support healthy development across multiple settings (7). Promoting these behaviors and practices is consistent with more than 2 decades of school-based research on approaches to support healthy eating and physical activity (8–10).

Continuing to monitor adolescent dietary and physical activity behaviors and differences across demographic groups is foundational to improving these behaviors and associated health outcomes among adolescents. Using recent nationally representative YRBS data, this report provides 2025 estimates of dietary and physical activity behaviors among adolescents overall and by sex, race and ethnicity, and grade level;

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identifies changes in these behaviors from 2023 to 2025; and presents supplemental analyses of selected dietary behaviors to provide additional context related to the newly released 2025–2030 Dietary Guidelines for Americans (DGA) (6). These findings can help prioritize actions that support healthy eating and physical activity in the places where adolescents spend their time, including in schools, in community spaces, and at home.

Methods

Data Source

This report includes data from the 2023 (N = 20,103) and 2025 (N = 10,710) YRBSs, the two most recent of the cross-sectional, school-based surveys conducted biennially since 1991. Each survey year, CDC collects data from a nationally representative sample of students from public and private schools, including parochial schools, in grades 9–12 in the 50 U.S. states and the District of Columbia. Additional information about YRBS sampling, data collection, response rates, and processing is available in the overview report of this supplement (11). The prevalence estimates for all YRBS variables among U.S. high school students overall and stratified by demographic characteristics are available at <https://youthonline.cdc.gov>. The full YRBS questionnaire, datasets, and documentation are available at <https://www.cdc.gov/yrbs/index.html>. This study was approved by institutional review boards at CDC and ICF, the survey contractor, and was conducted consistent with applicable federal law and CDC policy.*

Measures

Questions, response options, and analytic coding for the six dietary and five physical activity behaviors included in this report are provided (Table 1). Dietary behaviors included 1) eating fruit ≥ 1 time per day, 2) eating vegetables ≥ 1 time per day, 3) eating breakfast daily, 4) not drinking soda or pop (excluding diet soda or diet pop), 5) not drinking sports drinks (excluding low-calorie sports drinks), and 6) drinking ≥ 3 glasses per day of plain water, all during the 7 days before the survey was administered. In addition, two dietary measures were recoded for supplemental analyses to provide additional context related to DGA, which recommend eating two servings of fruit and three servings of vegetables each day for a 2000-calorie diet, adjusting as necessary for personal caloric needs (6). Although YRBS assesses frequency of intake rather than

servings eaten, data were analyzed to estimate the prevalence of eating fruit ≥ 2 times per day and vegetables ≥ 3 times per day during the past 7 days to more closely align with DGA. The percentage of missing responses for dietary behaviors ranged from 4.3% (eating fruit ≥ 1 time per day) to 36.9% (not drinking sports drinks). To reduce respondent effort, students in schools selected for both the national and site-level YRBS samples were administered only one questionnaire: either the national or site-specific questionnaire. Because site-specific questionnaires might not include all questions on the national YRBS questionnaire, some students included in the national sample were not asked certain dietary and physical activity questions. These procedures contributed to the higher levels of missing data observed for certain measures.

Physical activity behaviors included 1) being physically active for a total of ≥ 60 minutes per day on all 7 days during the 7 days before the survey (met the guideline for aerobic activity), 2) exercising to strengthen or tone muscles on ≥ 3 days during the 7 days before the survey (met the guideline for muscle-strengthening activity), 3) meeting both aerobic and muscle-strengthening guidelines in the past 7 days, 4) attending physical education classes on all 5 days during an average school week (daily physical education), and 5) playing on at least one sports team during the 12 months before the survey. The percentage of missing responses for physical activity behaviors ranged from 4.8% (being physically active for a total of ≥ 60 minutes per day on all 7 days) to 37.3% (exercising to strengthen or tone muscles on ≥ 3 days).

Demographic variables included sex (female or male), race and ethnicity (American Indian or Alaska Native [AI/AN], Asian, Black or African American [Black], Hispanic or Latino [Hispanic], Middle Eastern or North African [ME/NA], Native Hawaiian or Pacific Islander, White, or multiracial [selected more than one racial category]), and grade (9, 10, 11, or 12). Persons of Hispanic origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.

Analysis

The prevalence and 95% CIs were estimated for each dietary and physical activity behavior overall and by demographic characteristics for 2023 and 2025. Pairwise design-adjusted *t* tests were used to compare differences in prevalence by demographic characteristics and year (2023 versus 2025); differences were considered statistically significant at $p < 0.05$. Corrections for multiple comparisons were not applied because the analyses were descriptive and hypothesis generating, and each statistical test addressed a distinct research question and was interpreted independently. All estimates were calculated using Taylor series linearization. Prevalence estimates with

* 45 C.F.R. part 46.114; 21 C.F.R. part 56.114.

denominators <30 were considered statistically unreliable and therefore were suppressed. All analyses accounted for complex sampling design and weighting and were conducted using SAS-callable SUDAAN (version 11.0.4; RTI International).

Results

Dietary Behaviors

In 2025, 38.9% of high school students had eaten fruit ≥ 1 time per day, 62.5% had eaten vegetables ≥ 1 time per day, 27.0% had eaten breakfast daily, 30.4% had not drunk soda or pop, 50.8% had not drunk sports drinks, and 58.3% had drunk ≥ 3 glasses per day of plain water (Table 2). A higher prevalence of male students than female students had eaten breakfast every day (31.3% versus 22.5%) and had drunk ≥ 3 glasses per day of plain water (60.7% versus 55.5%). In contrast, a higher prevalence of female students than male students had not drunk sports drinks (59.1% versus 43.1%). In general, a higher prevalence of Asian students than students in other racial and ethnic groups engaged in healthy eating behaviors, with certain exceptions. For example, ME/NA students had the highest prevalence of having eaten fruit ≥ 1 time per day (58.1%). Although differences by grade were also observed for three of the six dietary behaviors (having eaten fruit ≥ 1 time per day, eaten breakfast daily, and not drunk a soda or pop), a clear pattern was not evident.

From 2023 to 2025, significant changes were observed overall for three of the six dietary behaviors examined (Table 3). The prevalence of students who had eaten fruit ≥ 1 time per day increased overall and among female, male, and White students, as well as among students in grades 9, 10, and 11. The prevalence of students who had eaten vegetables ≥ 1 time per day increased overall and among female, male, and Hispanic students, and among students in grades 9, 11, and 12. The prevalence of students who had drunk ≥ 3 glasses per day of plain water increased overall and among male, Asian, and Hispanic students, and among students in grades 9 and 11. Although no changes in the full sample were observed for eating breakfast daily, this behavior did significantly increase from 2023 to 2025 for AI/AN students.

Supplemental Analysis of Fruit and Vegetable Consumption

In 2025, 28.1% of students had eaten fruit ≥ 2 times per day and 16.2% had eaten vegetables ≥ 3 times per day (Supplementary Table). Differences by race and ethnicity were similar to the primary analysis of having eaten fruit ≥ 1 time per day and having eaten vegetables ≥ 1 time per day. The

prevalence of students in grade 9 who had eaten fruit ≥ 2 times per day (31.9%) and vegetables ≥ 3 times per day (18.4%) was higher than the prevalence for students in grades 11 and 12.

From 2023 to 2025, significant increases were observed in the prevalence of students who had eaten fruit ≥ 2 times per day overall and among female, male, Hispanic, White, and multiracial students, as well as students in each grade (Supplementary Table). The prevalence of students who had eaten vegetables ≥ 3 times per day increased overall and among female, male, Hispanic, and White students and among students in grades 9 and 12.

Physical Activity Behaviors

In 2025, 25.0% of students had been physically active for ≥ 60 minutes per day on all 7 days, 50.6% had exercised to strengthen or tone muscles on ≥ 3 days per week, 16.1% had met both aerobic and muscle-strengthening guidelines, 19.8% had attended physical education classes on all 5 days in an average school week, and 57.6% had played on at least one sports team (Table 4). A higher prevalence of male students than female students had been physically active for ≥ 60 minutes per day on all 7 days (31.5% versus 18.2%), had exercised to strengthen or tone muscles on ≥ 3 days per week (61.2% versus 39.4%), had met both aerobic and muscle-strengthening physical activity guidelines (22.0% versus 10.0%), had attended physical education classes on all 5 days (23.4% versus 16.3%), and had played on at least one sports team (60.5% versus 54.6%). Differences by race and ethnicity did not indicate a consistent pattern across physical activity behaviors. Significant grade-level differences were observed for each physical activity behavior; when differences were identified, students in lower grade levels reported higher engagement in physical activity behaviors than students in higher grade levels.

From 2023 to 2025, significant changes were observed in two physical activity behaviors (Table 5). The prevalence of students attending physical education classes daily decreased overall and among female, AI/AN, White, and multiracial students, and those in grade 10. In contrast, the prevalence of playing on at least one sports team increased overall and among female students.

Discussion

Healthy eating and regular physical activity are important contributors to adolescents' physical and mental well-being. From 2023 to 2025, improvements were observed overall in four of the 11 dietary and physical activity behaviors examined, while only one behavior, daily physical education,

decreased. Ongoing national surveillance through YRBSSs can help identify population-level trends and possible differences across demographic groups that can guide priority setting, implementation, and evaluation of strategies to improve adolescent nutrition and physical activity.

Although the prevalence of students who had eaten fruit daily increased to approximately 40% and those who had eaten vegetables daily increased to approximately 60%, eating these foods only once daily is a low threshold. To benefit more from healthy eating, adolescents' fruit and vegetable consumption should be more than once daily (6). The supplemental analysis assessing higher intake frequencies demonstrates that, overall, in 2025, only 28% of students had eaten fruit ≥ 2 times per day and 16% had eaten vegetables ≥ 3 times per day, with the prevalence of both increasing since 2023. Although these findings represent frequency of intake rather than amount eaten, they suggest that many high school students might not eat recommended amounts (12).

The DGA recommend water and other unsweetened beverages for hydration. These findings indicate an increase in the prevalence of students who had drunk ≥ 3 glasses per day of plain water in 2025 compared with 2023. Consistent with a previous report (5), the prevalence of students who did not drink soda or sports drinks was unchanged. The 2025 data indicate that approximately seven in 10 students had drunk soda or pop, and approximately half of students had drunk sports drinks, during the past 7 days. Reducing sugary beverage consumption could help reduce adolescents' consumption of added sugars (1).

The prevalence of three physical activity behaviors remained consistent from 2023 to 2025, including meeting the guideline for aerobic activity, meeting the guideline for muscle-strengthening activity, and meeting both guidelines. Data indicate that in 2025, one in four high school students met the guideline for aerobic activity, approximately half met the guideline for muscle strengthening, and 16% of students met both. These findings suggest that many students are not meeting national physical activity guidelines, which could have implications for physical and mental well-being and long-term health outcomes (2,13).

The prevalence of two physical activity behaviors changed from 2023 to 2025. First, the prevalence of students attending physical education class on all 5 school days decreased overall and among demographic subgroups, with approximately one in five high school students (19.8%) meeting this recommended standard in 2025. Previous research indicates that students who attended physical education classes on all 5 days were twice as likely to meet both aerobic and muscle-strengthening guidelines as those who did not (14), suggesting the potential value of physical education for providing opportunities for

physical activity during the school day and building the knowledge, skills, and confidence to stay active in other settings and throughout life (9,10). Second, the prevalence for sports team participation increased from 52% in 2023 to 58% in 2025. This finding might be important because sports team participation can provide adolescents with structured opportunities for physical activity, skill development, confidence-building, and social connection beyond physical education class (15).

In 2025, differences by demographic subgroups were observed across all 11 dietary and physical activity behaviors analyzed. In addition, from 2023 to 2025, within certain demographic subgroups, several healthy eating behaviors increased, including fruit, vegetable, breakfast, and water consumption. No decreases were noted in any of the behaviors among demographic subgroups except daily physical education, which decreased among several demographic groups. In contrast, sports team participation increased among female students, which might reflect growing efforts by schools and communities to support female involvement in sports (16).

Findings from this study highlight potential opportunities for continued efforts across federal, state, and local levels to help adolescents meet recommendations for healthy eating and physical activity. National objectives and guidelines, including Healthy People 2030 and DGA, provide broader goals for improving these behaviors, whereas federal and state programs can support implementation of evidence-based strategies in the settings where adolescents spend their time, including home, communities, and schools (17). For example, CDC's Healthy Schools Program supports 19 state-level entities and one tribal nation (<https://www.cdc.gov/healthy-schools/partners/index.html>) that in turn work with school districts and schools to implement school health activities in the context of the Whole School, Whole Community, Whole Child (WSCC) framework. This framework is used to coordinate among schools, communities, and families to address the needs of the whole child (<https://www.cdc.gov/whole-school-community-child/about/index.html>). Within WSCC, CDC supports schools to implement a range of activities designed to improve school nutrition environments and offer increased opportunities for physical activity both within and beyond the school day. One of these recipients, the Missouri Department of Elementary and Secondary Education, has used CDC support to implement policies that support Comprehensive School Physical Activity Programs (CSPAP) across the state, especially in rural areas. The CSPAP framework helps schools increase physical activity opportunities before, during, and after school (9). In addition to including physical education and sports teams, CSPAP also supports implementation of school-level physical activity policies, active commuting

to and from school, and physical activity lessons in the classroom. Engagement of families and communities, as well as staff member involvement in CSPAP design, can help tailor activities to the students who need them and the capacity and priorities of the school.

Schools can also implement various strategies to increase student access to and consumption of nutritious foods at school. For example, providing school nutrition staff members with professional development to prepare healthy and appealing meals, engaging students in school gardens, and providing taste tests of new healthy menu items increases consumption of healthy foods (8). In addition, offering a grab-and-go breakfast when students arrive, or during morning breaks, can increase breakfast access for students by eliminating the need to arrive before the school day begins (18). YRBS data can complement these implementation efforts by helping state and local partners identify behaviors and populations that might warrant additional attention and by providing population-level context for program planning and evaluation.

Limitations

General limitations for the YRBS are available in the overview report of this supplement (11). The findings in this report are subject to at least four additional limitations. First, questions about fruit and vegetable intake measure frequency of consumption rather than number of servings. Therefore, determining whether students are meeting the current dietary recommendations is not possible. Second, the physical education (PE) question assessed attendance only during an average school week and did not account for PE policies at the individual schools, semester-based enrollment, or completion of PE requirements, which might have affected reported PE attendance. However, the PE measure has demonstrated strong test-retest reliability (19). Third, socioeconomic measures known to be associated with dietary and physical activity behaviors and opportunities were not collected by YRBS and therefore could not be examined. Finally, analytic denominators varied across dietary and physical activity variables because of item-specific missing data. Missing data resulted from student nonresponse, invalid responses, and survey design procedures used to minimize respondent fatigue when schools were selected for both national and site-level YRBS samples; in such instances, certain students were not asked all national YRBS questions. If responders and nonresponders systematically differed, this could have affected the generalizability of estimates.

Future Directions

Although decades of research have examined policies, practices, and programs to improve healthy eating and physical activity behaviors among children and adolescents, research that examines which strategies work best among high school students could help practitioners better plan interventions (4,8,9). Future research and program evaluation could focus on understanding contextual factors associated with implementation of strategies overall and among populations of high school students with a lower prevalence of healthy behaviors. Additional research could explore the extent to which data on the number of times particular foods were eaten aligns with number of servings, enhancing researchers' ability to understand the extent to which adolescents' dietary behaviors align per day with national recommendations.

Conclusion

Although the frequency of fruit and vegetable intake, the prevalence of students who drank ≥ 3 glasses per day of plain water, and sports team participation improved from 2023 to 2025, the prevalence of most healthy dietary and physical activity behaviors examined in this study remains low. Interventions that increase access to and opportunities for healthy food and beverage choices and physical activity could help support healthier behaviors. Data on observed differences in behaviors across demographic subgroups could help public health professionals better tailor interventions and identify groups that might benefit from additional support. Overall, findings can help decision makers prioritize actions to create healthy environments, including in schools, so that adolescents can meet national recommendations for healthy eating and physical activity.

Acknowledgments

The authors acknowledge David Chyen, Joana Lively, Cecily K. Mbaka, Zachary Myles, CDC.

During March–August 2026, authors used the U.S. Department of Health and Human Services instance of ChatGPT 5.3 through 5.6 (OpenAI, San Francisco, California) to generate, debug, or edit analytic scripts or code and for limited editing of manuscript text for grammar and clarity. All outputs were reviewed and finalized by the authors.

Conflicts of Interest

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.

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TABLE 1. Questions, response options, and analytic coding for included dietary and physical activity behavior variables — Youth Risk Behavior Survey, United States, 2023 and 2025

Variable	Question	Response option	Analytic coding
Dietary behavior			
Ate fruit ≥1 time per day	During the past 7 days, how many times did you eat fruit? (Do not count fruit juice.)	I did not eat fruit during the past 7 days, 1–3 times during the past 7 days, 4–6 times during the past 7 days, 1 time per day, 2 times per day, 3 times per day, or ≥4 times per day	≥1 time per day versus <1 time per day
Ate vegetables ≥1 time per day	During the past 7 days, how many times did you eat • green salad? • potatoes? (Do not count French fries, fried potatoes, or potato chips.) • carrots? • other vegetables? (Do not count green salad, potatoes, or carrots.)	I did not eat (green salad)/(potatoes)/(carrots)/(other vegetables) during the past 7 days, 1–3 times during the past 7 days, 4–6 times during the past 7 days, 1 time per day, 2 times per day, 3 times per day, or ≥4 times per day	≥1 time per day versus <1 time per day
Ate breakfast daily	During the past 7 days, on how many days did you eat breakfast?	0 days, 1 day, 2 days, 3 days, 4 days, 5 days, 6 days, or 7 days	7 days versus ≤6 days
Did not drink soda or pop	During the past 7 days, how many times did you drink a can, bottle, or glass of soda or pop, such as Coke, Pepsi, or Sprite? (Do not count diet soda or diet pop.)	I did not drink soda or pop during the past 7 days, 1–3 times during the past 7 days, 4–6 times during the past 7 days, 1 time per day, 2 times per day, 3 times per day, or ≥4 times per day	0 times during the past 7 days versus ≥1 time during the past 7 days
Did not drink a sports drink	During the past 7 days, how many times did you drink a can, bottle, or glass of a sports drink, such as Gatorade or Powerade? (Do not count low-calorie sports drinks such as Propel or G2.)	I did not drink sports drinks during the past 7 days, 1–3 times during the past 7 days, 4–6 times during the past 7 days, 1 time per day, 2 times per day, 3 times per day, or ≥4 times per day	0 times during the past 7 days versus ≥1 time during the past 7 days
Drank ≥3 glasses per day of plain water	During the past 7 days, how many times did you drink a bottle or glass of plain water? (Count tap, bottled, and unflavored sparkling water.)	I did not drink water during the past 7 days, 1–3 times during the past 7 days, 4–6 times during the past 7 days, 1 time per day, 2 times per day, 3 times per day, or ≥4 times per day	≥3 times per day versus <3 times per day
Physical activity behavior			
Were physically active for a total of ≥60 minutes per day on all 7 days (met the guideline for aerobic activity)	During the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day? (Add up all the time you spent in any kind of physical activity that increased your heart rate and made you breathe hard some of the time.)	0 days, 1 day, 2 days, 3 days, 4 days, 5 days, 6 days, or 7 days	7 days versus <7 days
Did exercises to strengthen or tone muscles on ≥3 days (met the guideline for muscle-strengthening activity)	During the past 7 days, on how many days did you do exercises to strengthen or tone your muscles, such as push-ups, sit-ups, or weightlifting?	0 days, 1 day, 2 days, 3 days, 4 days, 5 days, 6 days, or 7 days	≥3 days versus <3 days
Met both aerobic and muscle-strengthening guidelines	(See “were physically active for a total of ≥60 minutes per day on all 7 days” and “did exercises to strengthen or tone muscles on ≥3 days.”)	NA	Physically active for ≥60 minutes per day on all 7 days and did exercises to strengthen or tone muscles on ≥3 days versus physically active for <60 minutes per day on all 7 days or did exercises to strengthen or tone muscles on <3 days
Attended physical education classes on all 5 school days	In an average week when you are in school, on how many days do you go to physical education (PE) classes?	0 days, 1 day, 2 days, 3 days, 4 days, or 5 days	5 days versus <5 days
Played on at least 1 sports team	During the past 12 months, on how many sports teams did you play? (Count any teams run by your school or community groups.)	0 teams, 1 team, 2 teams, or ≥3 teams	≥1 team versus <1 team

Abbreviation: NA = not applicable.

TABLE 2. Percentage of high school students with selected dietary behaviors, by demographic characteristics — Youth Risk Behavior Survey, United States, 2025*

Characteristic	Ate fruit ≥1 time per day [†] % (95% CI)	Ate vegetables ≥1 time per day [§] % (95% CI)	Ate breakfast daily [¶] % (95% CI)	Did not drink sugar-sweetened soda or pop ^{**} % (95% CI)	Did not drink sports drink ^{††} % (95% CI)	Drank ≥3 glasses per day of plain water ^{§§} % (95% CI)
Overall	38.9 (36.6–41.3)	62.5 (60.1–64.9)	27.0 (25.0–29.1)	30.4 (27.9–33.0)	50.8 (47.1–54.5)	58.3 (54.5–61.9)
Sex						
Female	38.6 (35.4–41.8)	61.7 (58.4–64.9)	22.5 (20.1–25.0)	31.3 (28.4–34.4)	59.1 (54.8–63.3)	55.5 (51.4–59.5)
Male	39.3 (36.9–41.8)	63.5 (60.8–66.1)	31.3 (28.4–34.4)	29.3 (26.3–32.6)	43.1 (39.9–46.3)	60.7 (56.7–64.6)
Race and ethnicity^{¶¶}						
AI/AN	43.8 (25.4–64.1)	61.6 (42.4–77.8)	36.6 (22.6–53.3)	31.6 (16.8–51.3)	42.8 (25.2–62.4)	47.5 (25.1–71.1)
Asian	41.6 (36.9–46.4)	77.6 (72.1–82.2)	36.8 (29.5–44.8)	44.4 (40.4–48.4)	68.6 (60.4–75.8)	68.0 (59.9–75.1)
Black or African American	30.8 (27.1–34.7)	51.4 (47.2–55.6)	21.7 (19.3–24.1)	28.4 (25.4–31.6)	45.3 (39.8–51.0)	53.4 (47.2–59.4)
Hispanic or Latino	37.7 (35.1–40.5)	58.8 (56.3–61.2)	24.9 (22.2–27.7)	27.8 (25.0–30.7)	47.5 (43.3–51.6)	60.6 (57.1–64.0)
ME/NA	58.1 (41.6–73.1)	75.3 (58.1–87.0)	31.8 (23.0–42.0)	33.9 (24.0–45.5)	56.0 (39.9–70.8)	68.5 (52.4–81.1)
NH/PI	42.6 (22.6–65.2)	—***	11.7 (2.2–43.3)	—***	—***	—***
White	40.4 (36.7–44.2)	64.9 (61.3–68.3)	28.3 (25.4–31.3)	30.1 (26.3–34.2)	51.3 (46.4–56.1)	56.9 (52.8–60.9)
Multiracial	40.2 (33.1–47.8)	65.6 (58.0–72.5)	25.1 (20.9–29.8)	32.7 (25.4–40.9)	52.8 (45.5–60.1)	55.8 (46.9–64.3)
Grade						
9	41.8 (38.7–44.9)	62.9 (59.4–66.3)	29.3 (26.8–31.9)	28.1 (25.4–30.9)	48.2 (43.3–53.1)	57.8 (53.8–61.8)
10	40.0 (36.3–43.9)	61.0 (57.7–64.3)	27.9 (25.0–31.1)	31.2 (27.8–34.8)	49.3 (45.2–53.4)	57.5 (54.1–60.9)
11	38.6 (35.7–41.5)	63.3 (59.6–66.9)	25.3 (22.2–28.8)	31.1 (27.7–34.8)	51.9 (46.7–57.0)	59.0 (54.0–63.7)
12	34.5 (30.7–38.6)	63.0 (59.5–66.3)	24.7 (21.5–28.3)	31.4 (27.8–35.1)	54.7 (48.4–60.8)	59.0 (52.0–65.6)

Abbreviations: AI/AN = American Indian or Alaska Native; ME/NA = Middle Eastern or North African; NH/PI = Native Hawaiian or Pacific Islander; YRBS = Youth Risk Behavior Survey.

* N = 10,710 respondents. The total number (N) of students answering each question varied. Data might be missing because 1) students in schools selected for both national and site-specific YRBS samples completed only one questionnaire; therefore, when the site-specific questionnaire was administered, it might not have included all questions on the national YRBS; 2) the student did not answer the question; or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Prevalence estimates in each category are calculated based on nonmissing data.

[†] N = 10,252 respondents. As determined by t test analysis with Taylor series linearization (p<0.05), no differences were detected by sex; Asian students significantly differed from Black or African American (Black) and ME/NA students; Black students significantly differed from Hispanic or Latino (Hispanic), ME/NA, White, and multiracial students; Hispanic students significantly differed from ME/NA students; ME/NA students significantly differed from White and multiracial students; and grade 9, 10, and 11 students significantly differed from grade 12 students.

[§] N = 8,781 respondents. As determined by t test analysis with Taylor series linearization (p<0.05), no differences were detected by sex; Asian students significantly differed from Black, Hispanic, White, and multiracial students; Black students significantly differed from Hispanic, ME/NA, White, and multiracial students; Hispanic students significantly differed from ME/NA and White students; and no differences by grade were detected.

[¶] N = 10,172 respondents. As determined by t test analysis with Taylor series linearization (p<0.05), female students significantly differed from male students; AI/AN students significantly differed from NH/PI students; Asian students significantly differed from Black, Hispanic, NH/PI, White, and multiracial students; Black students significantly differed from Hispanic, ME/NA, and White students; Hispanic students significantly differed from White students; and grade 9 students significantly differed from grade 11 and 12 students.

^{**} N = 8,758 respondents. As determined by t test analysis with Taylor series linearization (p<0.05), no differences were detected by sex; Asian students significantly differed from Black, Hispanic, White, and multiracial students; and grade 9 students significantly differed from grade 12 students.

^{††} N = 6,763 respondents. As determined by t test analysis with Taylor series linearization (p<0.05), female students significantly differed from male students; AI/AN students significantly differed from Asian students; Asian students significantly differed from Black, Hispanic, White, and multiracial students; and no differences by grade were detected.

^{§§} N = 7,847 respondents. As determined by t test analysis with Taylor series linearization (p<0.05), female students significantly differed from male students; Asian students significantly differed from Black, White, and multiracial students; Black students significantly differed from Hispanic students; and no differences by grade were detected.

^{¶¶} Persons of Hispanic origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.

*** Prevalence estimates with a denominator of <30 were considered statistically unreliable and therefore were suppressed.

TABLE 3. Changes from 2023 to 2025 in the percentage of high school students with selected dietary behaviors, by demographic characteristics and survey year — Youth Risk Behavior Survey, United States*

Behavior	2023 % (95% CI)	2025 % (95% CI)	Change from 2023 to 2025 [†]
Ate fruit ≥1 time per day	N = 19,027	N = 10,252	
Overall	32.9 (31.1–34.8)	38.9 (36.6–41.3)	Increase
Sex			
Female	31.4 (29.6–33.3)	38.6 (35.4–41.8)	Increase
Male	34.4 (32.0–36.9)	39.3 (36.9–41.8)	Increase
Race and ethnicity[§]			
AI/AN	22.6 (14.3–33.7)	43.8 (25.4–64.1)	No change
Asian	36.9 (30.1–44.2)	41.6 (36.9–46.4)	No change
Black or African American	28.8 (24.8–33.1)	30.8 (27.1–34.7)	No change
Hispanic or Latino	34.0 (30.7–37.4)	37.7 (35.1–40.5)	No change
ME/NA	— [¶]	58.1 (41.6–73.1)	— [¶]
NH/PI	36.3 (27.2–46.6)	42.6 (22.6–65.2)	No change
White	33.4 (31.1–35.7)	40.4 (36.7–44.2)	Increase
Multiracial	32.3 (27.1–38.0)	40.2 (33.1–47.8)	No change
Grade			
9	34.0 (31.3–36.7)	41.8 (38.7–44.9)	Increase
10	33.8 (31.3–36.4)	40.0 (36.3–43.9)	Increase
11	33.0 (30.1–36.1)	38.6 (35.7–41.5)	Increase
12	30.6 (27.5–33.8)	34.5 (30.7–38.6)	No change
Ate vegetables ≥1 time per day	N = 14,938	N = 8,781	
Overall	57.5 (55.5–59.6)	62.5 (60.1–64.9)	Increase
Sex			
Female	56.4 (53.7–58.9)	61.7 (58.4–64.9)	Increase
Male	58.6 (56.4–60.9)	63.5 (60.8–66.1)	Increase
Race and ethnicity[§]			
AI/AN	66.2 (49.5–79.7)	61.6 (42.4–77.8)	No change
Asian	71.4 (65.9–76.3)	77.6 (72.1–82.2)	No change
Black or African American	48.8 (44.3–53.2)	51.4 (47.2–55.6)	No change
Hispanic or Latino	54.3 (51.4–57.1)	58.8 (56.3–61.2)	Increase
ME/NA	— [¶]	75.3 (58.1–87.0)	— [¶]
NH/PI	52.8 (39.8–65.4)	— ^{**}	— ^{**}
White	61.0 (58.6–63.4)	64.9 (61.3–68.3)	No change
Multiracial	56.8 (50.4–63.0)	65.6 (58.0–72.5)	No change
Grade			
9	57.1 (53.7–60.4)	62.9 (59.4–66.3)	Increase
10	57.7 (55.2–60.2)	61.0 (57.7–64.3)	No change
11	58.2 (55.2–61.2)	63.3 (59.6–66.9)	Increase
12	57.1 (53.1–61.1)	63.0 (59.5–66.3)	Increase

TABLE 3. (Continued) Changes from 2023 to 2025 in the percentage of high school students with selected dietary behaviors, by demographic characteristics and survey year — Youth Risk Behavior Survey, United States*

Behavior	2023 % (95% CI)	2025 % (95% CI)	Change from 2023 to 2025 [†]
Ate breakfast daily	N = 14,268	N = 10,172	
Overall	27.4 (25.4–29.6)	27.0 (25.0–29.1)	No change
Sex			
Female	22.4 (20.4–24.6)	22.5 (20.1–25.0)	No change
Male	32.2 (29.6–34.8)	31.3 (28.4–34.4)	No change
Race and ethnicity[§]			
AI/AN	13.6 (6.9–25.1)	36.6 (22.6–53.3)	Increase
Asian	32.1 (26.0–39.0)	36.8 (29.5–44.8)	No change
Black or African American	23.8 (20.3–27.6)	21.7 (19.3–24.1)	No change
Hispanic or Latino	24.3 (20.9–28.0)	24.9 (22.2–27.7)	No change
ME/NA	— [¶]	31.8 (23.0–42.0)	— [¶]
NH/PI	22.4 (11.3–39.8)	11.7 (2.2–43.3)	No change
White	30.5 (27.8–33.3)	28.3 (25.4–31.3)	No change
Multiracial	27.0 (21.0–34.1)	25.1 (20.9–29.8)	No change
Grade			
9	29.0 (26.3–31.8)	29.3 (26.8–31.9)	No change
10	27.6 (24.7–30.7)	27.9 (25.0–31.1)	No change
11	25.1 (22.5–27.8)	25.3 (22.2–28.8)	No change
12	27.9 (24.8–31.2)	24.7 (21.5–28.3)	No change
Did not drink sugar-sweetened soda or pop	N = 15,183	N = 8,758	
Overall	30.9 (28.7–33.3)	30.4 (27.9–33.0)	No change
Sex			
Female	33.2 (30.9–35.6)	31.3 (28.4–34.4)	No change
Male	28.6 (26.1–31.2)	29.3 (26.3–32.6)	No change
Race and ethnicity[§]			
AI/AN	22.1 (12.6–35.9)	31.6 (16.8–51.3)	No change
Asian	39.8 (34.6–45.3)	44.4 (40.4–48.4)	No change
Black or African American	32.1 (28.1–36.4)	28.4 (25.4–31.6)	No change
Hispanic or Latino	30.0 (26.7–33.6)	27.8 (25.0–30.7)	No change
ME/NA	— [¶]	33.9 (24.0–45.5)	— [¶]
NH/PI	34.4 (24.4–46.0)	— ^{**}	— ^{**}
White	30.0 (27.8–32.3)	30.1 (26.3–34.2)	No change
Multiracial	30.8 (25.9–36.1)	32.7 (25.4–40.9)	No change
Grade			
9	28.7 (25.5–32.2)	28.1 (25.4–30.9)	No change
10	31.5 (29.4–33.8)	31.2 (27.8–34.8)	No change
11	30.2 (26.5–34.3)	31.1 (27.7–34.8)	No change
12	33.1 (30.2–36.2)	31.4 (27.8–35.1)	No change

See table footnotes on the next page.

TABLE 3. (Continued) Changes from 2023 to 2025 in the percentage of high school students with selected dietary behaviors, by demographic characteristics and survey year — Youth Risk Behavior Survey, United States*

Behavior	2023 % (95% CI)	2025 % (95% CI)	Change from 2023 to 2025 [†]
Did not drink a sports drink	N = 11,909	N = 6,763	
Overall	48.5 (45.4–51.6)	50.8 (47.1–54.5)	No change
Sex			
Female	58.3 (54.9–61.5)	59.1 (54.8–63.3)	No change
Male	39.3 (36.2–42.6)	43.1 (39.9–46.3)	No change
Race and ethnicity[§]			
AI/AN	46.1 (33.0–59.7)	42.8 (25.2–62.4)	No change
Asian	64.6 (58.1–70.5)	68.6 (60.4–75.8)	No change
Black or African American	43.0 (34.1–52.4)	45.3 (39.8–51.0)	No change
Hispanic or Latino	46.7 (42.9–50.6)	47.5 (43.3–51.6)	No change
ME/NA	—¶	56.0 (39.9–70.8)	—¶
NH/PI	41.3 (24.1–60.8)	—**	—**
White	49.4 (45.7–53.1)	51.3 (46.4–56.1)	No change
Multiracial	47.1 (40.0–54.3)	52.8 (45.5–60.1)	No change
Grade			
9	42.2 (38.3–46.2)	48.2 (43.3–53.1)	No change
10	47.8 (44.7–50.9)	49.3 (45.2–53.4)	No change
11	48.4 (43.9–52.9)	51.9 (46.7–57.0)	No change
12	55.7 (51.6–59.8)	54.7 (48.4–60.8)	No change

TABLE 3. (Continued) Changes from 2023 to 2025 in the percentage of high school students with selected dietary behaviors, by demographic characteristics and survey year — Youth Risk Behavior Survey, United States*

Behavior	2023 % (95% CI)	2025 % (95% CI)	Change from 2023 to 2025 [†]
Drank ≥3 glasses per day of plain water	N = 13,584	N = 7,847	
Overall	53.6 (51.6–55.7)	58.3 (54.5–61.9)	Increase
Sex			
Female	51.0 (48.8–53.3)	55.5 (51.4–59.5)	No change
Male	56.1 (53.7–58.5)	60.7 (56.7–64.6)	Increase
Race and ethnicity[§]			
AI/AN	51.7 (38.5–64.8)	47.5 (25.1–71.1)	No change
Asian	57.4 (50.4–64.2)	68.0 (59.9–75.1)	Increase
Black or African American	49.8 (44.4–55.3)	53.4 (47.2–59.4)	No change
Hispanic or Latino	52.4 (49.7–55.1)	60.6 (57.1–64.0)	Increase
ME/NA	—¶	68.5 (52.4–81.1)	—¶
NH/PI	73.4 (52.4–87.4)	—**	—**
White	54.4 (52.2–56.6)	56.9 (52.8–60.9)	No change
Multiracial	57.0 (50.8–63.1)	55.8 (46.9–64.3)	No change
Grade			
9	52.4 (49.3–55.4)	57.8 (53.8–61.8)	Increase
10	55.5 (52.7–58.2)	57.5 (54.1–60.9)	No change
11	51.0 (47.5–54.5)	59.0 (54.0–63.7)	Increase
12	55.9 (53.1–58.7)	59.0 (52.0–65.6)	No change

Abbreviations: AI/AN = American Indian or Alaska Native; ME/NA = Middle Eastern or North African; NH/PI = Native Hawaiian or Pacific Islander; YRBS = Youth Risk Behavior Survey.

* N = 20,103 respondents for 2023 and N = 10,710 respondents for 2025. The total number (N) of students answering each question varied. Data might be missing because 1) students in schools selected for both national and site-specific YRBS samples completed only one questionnaire; therefore, when the site-specific questionnaire was administered, it might not have included all questions on the national YRBS; 2) the student did not answer the question; or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Prevalence estimates in each category are calculated based on nonmissing data.

[†] As determined by *t* test analysis, *p* < 0.05.

[§] Persons of Hispanic or Latino (Hispanic) origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.

¶ Data for ME/NA students were not collected in 2023.

** Prevalence estimates with a denominator of <30 were considered statistically unreliable and therefore were suppressed.

TABLE 4. Percentage of high school students with selected physical activity behaviors, by demographic characteristics — Youth Risk Behavior Survey, United States, 2025*

Characteristic	Were physically active for a total of ≥60 minutes per day on all 7 days [†]	Did exercises to strengthen or tone muscles on ≥3 days [§]	Met both aerobic and muscle-strengthening guidelines [¶]	Went to physical education classes on all 5 days ^{**}	Played on at least one sports team ^{††}
	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Overall	25.0 (23.4–26.7)	50.6 (47.7–53.4)	16.1 (13.1–19.5)	19.8 (15.6–24.9)	57.6 (53.0–62.1)
Sex					
Female	18.2 (16.8–19.8)	39.4 (36.6–42.2)	10.0 (8.0–12.5)	16.3 (12.3–21.2)	54.6 (49.4–59.8)
Male	31.5 (29.6–33.5)	61.2 (57.7–64.5)	22.0 (18.3–26.2)	23.4 (18.7–28.7)	60.5 (55.7–65.2)
Race and ethnicity^{§§,¶¶}					
AI/AN	22.9 (11.9–39.5)	38.8 (21.6–59.3)	7.5 (2.8–18.4)	13.9 (5.6–30.3)	40.6 (22.3–62.0)
Asian	19.0 (14.2–24.8)	48.8 (40.6–57.0)	11.8 (7.4–18.3)	12.0 (8.0–17.6)	47.3 (39.9–54.9)
Black or African American	22.5 (19.4–25.9)	49.2 (45.0–53.5)	12.1 (9.0–15.9)	27.6 (20.3–36.3)	55.4 (50.4–60.3)
Hispanic or Latino	21.2 (19.4–23.2)	48.3 (44.0–52.6)	13.3 (10.6–16.5)	23.9 (18.4–30.4)	51.5 (47.6–55.4)
ME/NA	22.3 (11.9–38.1)	65.0 (53.8–74.7)	15.3 (7.1–29.9)	28.9 (16.7–45.1)	61.7 (49.8–72.4)
White	28.2 (26.0–30.5)	51.7 (47.5–55.9)	19.1 (15.4–23.4)	16.7 (12.7–21.5)	62.1 (55.8–68.0)
Multiracial	26.8 (21.2–33.3)	52.3 (45.7–58.8)	17.0 (12.4–23.0)	17.6 (12.7–24.0)	62.5 (54.8–69.6)
Grade					
9	26.1 (23.1–29.3)	53.4 (48.9–57.9)	17.3 (13.9–21.3)	29.2 (23.0–36.3)	61.2 (55.9–66.3)
10	27.5 (24.5–30.8)	52.5 (48.5–56.5)	17.9 (14.3–22.1)	18.5 (14.2–23.7)	60.2 (54.4–65.7)
11	22.7 (20.4–25.0)	48.8 (45.3–52.3)	14.2 (11.1–18.0)	15.9 (11.7–21.2)	57.3 (51.1–63.3)
12	23.3 (20.6–26.2)	46.9 (43.1–50.8)	14.6 (11.3–18.6)	14.7 (10.7–19.8)	50.7 (45.5–55.9)

Abbreviations: AI/AN = American Indian or Alaska Native; ME/NA = Middle Eastern or North African; YRBS = Youth Risk Behavior Survey.

* N = 10,710 respondents. The total number (N) of students answering each question varied. Data might be missing because 1) students in schools selected for both national and site-specific YRBS samples completed only one questionnaire; therefore, when the site-specific questionnaire was administered, it might not have included all questions on the national YRBS; 2) the student did not answer the question; or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Prevalence estimates in each category are calculated based on nonmissing data.

[†] N = 10,197 respondents. As determined by *t* test analysis with Taylor series linearization ($p < 0.05$), female students significantly differed from male students; Asian students significantly differed from White and multiracial students; Black or African American (Black) students significantly differed from White students; Hispanic or Latino (Hispanic) students significantly differed from White and multiracial students; and grade 9 and 10 students significantly differed from grade 11 students.

[§] N = 6,717 respondents. As determined by *t* test analysis with Taylor series linearization ($p < 0.05$), female students significantly differed from male students; ME/NA students significantly differed from AI/AN, Asian, Black, Hispanic, and White students; grade 9 students significantly differed from grade 11 and 12 students; and grade 10 students significantly differed from grade 12 students.

[¶] N = 9,433 respondents. As determined by *t* test analysis with Taylor series linearization ($p < 0.05$), female students significantly differed from male students; AI/AN students significantly differed from White and multiracial students; Asian students significantly differed from White students; Black students significantly differed from White and multiracial students; Hispanic students significantly differed from White students; grade 9 students significantly differed from grade 11 students; and grade 10 students significantly differed from grade 11 and 12 students.

^{**} N = 8,892 respondents. As determined by *t* test analysis with Taylor series linearization ($p < 0.05$), female students significantly differed from male students; AI/AN students significantly differed from Black students; Asian students significantly differed from Black, Hispanic, ME/NA, White, and multiracial students; Black students significantly differed from White and multiracial students; Hispanic students significantly differed from White students; grade 9 students significantly differed from grade 10, 11, and 12 students; and grade 10 students significantly differed from grade 12 students.

^{††} N = 7,109 respondents. As determined by *t* test analysis with Taylor series linearization ($p < 0.05$), female students significantly differed from male students; AI/AN students significantly differed from White and multiracial students; Asian students significantly differed from ME/NA, White, and multiracial students; Hispanic students significantly differed from ME/NA, White, and multiracial students; and grade 9, 10, and 11 students significantly differed from grade 12 students.

^{§§} Persons of Hispanic origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.

^{¶¶} Prevalence estimates with a denominator < 30 were considered statistically unreliable and were suppressed; therefore, estimates for Native Hawaiian or Pacific Islander students are not presented.

TABLE 5. Changes from 2023 to 2025 in the percentage of high school students with physical activity behaviors, by demographic characteristics and survey year — Youth Risk Behavior Survey, United States*

Behavior	2023	2025	Change from 2023 to 2025 [†]
	% (95% CI)	% (95% CI)	
Were physically active for a total of ≥60 minutes per day on all 7 days	N = 18,876	N = 10,197	
Overall	24.6 (22.8–26.5)	25.0 (23.4–26.7)	No change
Sex			
Female	16.6 (15.0–18.3)	18.2 (16.8–19.8)	No change
Male	32.2 (30.0–34.4)	31.5 (29.6–33.5)	No change
Race and ethnicity[§]			
AI/AN	31.9 (14.5–56.4)	22.9 (11.9–39.5)	No change
Asian	15.6 (11.6–20.7)	19.0 (14.2–24.8)	No change
Black or African American	21.5 (19.3–24.0)	22.5 (19.4–25.9)	No change
Hispanic or Latino	20.1 (17.3–23.3)	21.2 (19.4–23.2)	No change
ME/NA	—¶	22.3 (11.9–38.1)	—¶
NH/PI	29.3 (19.1–42.1)	—**	—**
White	29.0 (26.7–31.4)	28.2 (26.0–30.5)	No change
Multiracial	26.3 (21.6–31.5)	26.8 (21.2–33.3)	No change
Grade			
9	26.9 (24.4–29.6)	26.1 (23.1–29.3)	No change
10	26.4 (23.5–29.6)	27.5 (24.5–30.8)	No change
11	23.7 (21.1–26.4)	22.7 (20.4–25.0)	No change
12	21.0 (18.3–24.1)	23.3 (20.6–26.2)	No change
Did exercises to strengthen or tone muscles on ≥3 days	N = 11,197	N = 6,717	
Overall	51.1 (48.0–54.1)	50.6 (47.7–53.4)	No change
Sex			
Female	37.2 (34.3–40.2)	39.4 (36.6–42.2)	No change
Male	63.8 (60.7–66.8)	61.2 (57.7–64.5)	No change
Race and ethnicity[§]			
AI/AN	44.2 (31.2–58.1)	38.8 (21.6–59.3)	No change
Asian	45.6 (39.5–51.7)	48.8 (40.6–57.0)	No change
Black or African American	46.7 (42.5–51.0)	49.2 (45.0–53.5)	No change
Hispanic or Latino	48.8 (45.2–52.4)	48.3 (44.0–52.6)	No change
ME/NA	—¶	65.0 (53.8–74.7)	—¶
NH/PI	52.6 (39.1–65.7)	—**	—**
White	54.3 (49.5–59.0)	51.7 (47.5–55.9)	No change
Multiracial	56.2 (49.8–62.5)	52.3 (45.7–58.8)	No change
Grade			
9	55.3 (51.5–59.1)	53.4 (48.9–57.9)	No change
10	52.1 (47.5–56.6)	52.5 (48.5–56.5)	No change
11	48.8 (44.0–53.6)	48.8 (45.3–52.3)	No change
12	47.9 (44.0–51.7)	46.9 (43.1–50.8)	No change
Met both aerobic and muscle-strengthening guidelines	N = 17,042	N = 9,433 ^{††}	
Overall	16.5 (14.0–19.3)	16.1 (13.1–19.5)	No change
Sex			
Female	9.4 (7.7–11.3)	10.0 (8.0–12.5)	No change
Male	23.5 (20.2–27.1)	22.0 (18.3–26.2)	No change
Race and ethnicity[§]			
AI/AN	14.3 (9.1–21.9)	7.5 (2.8–18.4)	No change
Asian	9.1 (6.3–12.9)	11.8 (7.4–18.3)	No change
Black or African American	12.2 (9.2–16.0)	12.1 (9.0–15.9)	No change
Hispanic or Latino	14.4 (11.1–18.4)	13.3 (10.6–16.5)	No change
ME/NA	—¶	15.3 (7.1–29.9)	—¶
NH/PI	27.3 (17.9–39.1)	—**	—**
White	19.5 (16.1–23.3)	19.1 (15.4–23.4)	No change
Multiracial	20.4 (16.1–25.5)	17.0 (12.4–23.0)	No change
Grade			
9	17.5 (14.4–20.9)	17.3 (13.9–21.3)	No change
10	18.2 (14.6–22.4)	17.9 (14.3–22.1)	No change
11	16.2 (13.0–19.9)	14.2 (11.1–18.0)	No change
12	14.0 (11.3–17.2)	14.6 (11.3–18.6)	No change

See table footnotes on the next page.

TABLE 5. (Continued) Changes from 2023 to 2025 in the percentage of high school students with physical activity behaviors, by demographic characteristics and survey year — Youth Risk Behavior Survey, United States*

Behavior	2023	2025	Change from 2023 to 2025 [†]
	% (95% CI)	% (95% CI)	
Went to physical education classes on all 5 days	N = 13,876	N = 8,892	
Overall	27.4 (21.9–33.6)	19.8 (15.6–24.9)	Decrease
Sex			
Female	23.1 (18.3–28.9)	16.3 (12.3–21.2)	Decrease
Male	31.4 (24.9–38.6)	23.4 (18.7–28.7)	No change
Race and ethnicity[§]			
AI/AN	34.9 (23.0–49.0)	13.9 (5.6–30.3)	Decrease
Asian	20.6 (12.8–31.3)	12.0 (8.0–17.6)	No change
Black or African American	24.4 (17.2–33.3)	27.6 (20.3–36.3)	No change
Hispanic or Latino	30.9 (23.4–39.7)	23.9 (18.4–30.4)	No change
ME/NA	— [¶]	28.9 (16.7–45.1)	— [¶]
NH/PI	35.2 (19.8–54.5)	— ^{**}	— ^{**}
White	26.2 (20.5–33.0)	16.7 (12.7–21.5)	Decrease
Multiracial	28.9 (20.9–38.6)	17.6 (12.7–24.0)	Decrease
Grade			
9	39.5 (30.5–49.3)	29.2 (23.0–36.3)	No change
10	30.3 (23.5–38.1)	18.5 (14.2–23.7)	Decrease
11	21.4 (16.2–27.7)	15.9 (11.7–21.2)	No change
12	17.1 (12.9–22.3)	14.7 (10.7–19.8)	No change
Played on at least one sports team	N = 12,964	N = 7,109	
Overall	51.9 (48.9–54.9)	57.6 (53.0–62.1)	Increase
Sex			
Female	48.1 (45.0–51.2)	54.6 (49.4–59.8)	Increase
Male	55.7 (52.0–59.4)	60.5 (55.7–65.2)	No change
Race and ethnicity[§]			
AI/AN	57.0 (44.7–68.4)	40.6 (22.3–62.0)	No change
Asian	46.0 (37.5–54.8)	47.3 (39.9–54.9)	No change
Black or African American	49.8 (45.7–53.9)	55.4 (50.4–60.3)	No change
Hispanic or Latino	47.3 (43.6–51.0)	51.5 (47.6–55.4)	No change
ME/NA	— [¶]	61.7 (49.8–72.4)	— [¶]
NH/PI	56.6 (44.6–67.9)	— ^{**}	— ^{**}
White	56.2 (52.0–60.3)	62.1 (55.8–68.0)	No change
Multiracial	57.0 (51.2–62.5)	62.5 (54.8–69.6)	No change
Grade			
9	57.2 (53.1–61.2)	61.2 (55.9–66.3)	No change
10	54.2 (50.2–58.2)	60.2 (54.4–65.7)	No change
11	50.2 (45.9–54.5)	57.3 (51.1–63.3)	No change
12	46.1 (41.1–51.3)	50.7 (45.5–55.9)	No change

Abbreviations: AI/AN = American Indian or Alaska Native; ME/NA = Middle Eastern or North African; NH/PI = Native Hawaiian or Pacific Islander; YRBS = Youth Risk Behavior Survey.

* N = 20,103 respondents for 2023 and N = 10,710 respondents for 2025. The total number (N) of students answering each question varied. Data might be missing because 1) students in schools selected for both national and site-specific YRBS samples completed only one questionnaire; therefore, when the site-specific questionnaire was administered, it might not have included all questions on the national YRBS; 2) the student did not answer the question; or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Prevalence estimates in each category are calculated based on nonmissing data.

[†] As determined by t test analysis, p<0.05.

[§] Persons of Hispanic or Latino (Hispanic) origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.

[¶] Data for ME/NA students were not collected in 2023.

^{**} Prevalence estimates with a denominator of <30 were considered statistically unreliable and therefore were suppressed.

^{††} Participants were classified as meeting the combined guideline only if they met both components and as not meeting the combined guideline if they did not meet either component, regardless of missing data for the other component. Participants were classified as missing if both components were missing or if one component was missing and the observed component was met.

Cardiovascular Health Among High School Students — Youth Risk Behavior Survey, United States, 2025

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Abstract

Monitoring cardiovascular health (CVH) among adolescents can identify opportunities for school and community programs to promote healthy behaviors and reduce cardiovascular disease risk. In this report, data from the nationally representative 2025 Youth Risk Behavior Survey (YRBS) of U.S. high school students were used to calculate scores for five metrics of CVH aligned with the American Heart Association's Life's Essential 8 framework: diet, physical activity, nicotine exposure, sleep health, and body mass index (BMI). Each of the five metrics assessed in this analysis was scored from 0 to 100, with higher scores indicating more favorable levels of the corresponding metric. The five metric scores were averaged to produce an overall CVH score, with higher scores indicating a more favorable overall CVH score. Weighted mean scores and the prevalence of high (80–100), moderate (50–79), and low (0–49) scores were estimated overall and by sex, grade, and race and ethnicity.

Among 5,192 students with complete data, the mean overall CVH score was 65.3; 20.7% had high, 61.3% had moderate, and 18.0% had low overall CVH scores. For the CVH metrics, mean scores were highest for BMI (85.4, reflecting lower BMI) and nicotine exposure (80.5, reflecting lower exposure), and lowest for diet (39.3), sleep health (59.1), and physical activity (62.0). The overall CVH score was lower among female (64.2) than male (66.2) students. The overall CVH score was higher for grade 9 students (68.3) than for grade 10 (65.9), 11 (63.7), and 12 (62.7) students. Compared with most other racial and ethnic groups, the overall CVH score was higher among Asian students (70.2) and lower among Black or African American students (60.2). Similar demographic patterns were observed for the prevalence of high overall CVH scores.

In 2025, approximately four in five U.S. high school students had a low or moderate overall CVH score, underscoring the importance of promoting healthy adolescent behaviors, such as healthy eating, sleep, and physical activity, to support healthier trajectories into adulthood. These findings highlight opportunities to monitor and improve CVH-related behaviors and indicators among adolescents, including within school and community settings.

Introduction

Cardiovascular diseases (CVDs), which include conditions such as coronary heart disease, heart failure, stroke, and hypertension (1), remain leading causes of death in the United States (2), and many risk factors for CVD originate during childhood and adolescence (3). The American Heart Association (AHA) has emphasized preventing CVD by promoting modifiable lifestyle choices that contribute to cardiovascular health (CVH) (3). AHA's Life's Essential 8 (LE8) defines CVH using eight metrics, including four health behaviors (diet, physical activity, nicotine exposure, and sleep health) and four health factors (weight status assessed by body mass index [BMI], blood lipid level, blood pressure, and blood

glucose level), which are key modifiable determinants of risk for CVD (4). National data indicate that optimal CVH is uncommon and has declined among U.S. adults (5), and the prevalence of obesity, prediabetes, and other CVD risk factors has increased among adolescents (1,3).

Adolescence is a critical period for the development of health behaviors that can persist into adulthood and influence long-term cardiovascular outcomes (6,7). Diet, physical activity, sleep, nicotine exposure, and BMI are each independently associated with CVD and are also interrelated, making their combined assessment important for understanding overall CVH (4,6). Differences in CVH-related behaviors and health factors have been observed by sex, age, and race and ethnicity. Previous reports have indicated that female students report less physical activity and are less likely to report sufficient sleep duration than male students (<https://www.cdc.gov/yrbs/dstr/pdf/DSTR-Dietary-PhysicalActivity-SleepBehavior2013-2023-508.pdf>), and that multiple

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CVH-related behaviors decline as adolescents get older (1,7,8). Patterns in these behaviors and health factors also vary among racial and ethnic groups (1,4,7,8). These differences highlight the importance of examining CVH by sex, grade, and race and ethnicity. National public health priorities, including Healthy People 2030 (<https://odphp.health.gov/healthypeople>), emphasize improving nutrition, physical activity, sleep, and tobacco use outcomes among adolescents, aligning with the core metrics of CVH.

The Youth Risk Behavior Surveillance System (YRBSS), the largest school-based surveillance system in the United States, provides data on these behaviors among high school students and includes nationally representative data as well as data from states, territories, tribal governments, and local school districts (9). This report analyzed data from the 2025 national Youth Risk Behavior Survey (YRBS), a component of YRBSS, to estimate five CVH metrics (diet, physical activity, nicotine exposure, sleep health, and BMI) and an overall CVH score among U.S. high school students. Differences in CVH metric scores and the overall CVH score were examined by sex, grade, and race and ethnicity. These findings are intended for public health practitioners, school and education professionals, researchers, and policymakers to guide efforts for monitoring CVH among adolescents and strengthen school and community policies and practices that support healthy behaviors.

Methods

Data Source

This report includes data from the 2025 YRBS (N = 10,710), a cross-sectional, school-based survey conducted biennially since 1991. Each survey year, CDC collects data from a nationally representative sample of students from public and private schools, including parochial schools, in grades 9–12 in the 50 U.S. states and the District of Columbia. Additional information about YRBS sampling, data collection, response rates, and processing is available in the overview report of this supplement (9). The prevalence estimates for all YRBS variables among U.S. high school students overall and stratified by demographic characteristics are available at <https://youthonline.cdc.gov>. The full YRBS questionnaire, datasets, and documentation are available at <https://www.cdc.gov/yrebs/index.html>. This study was approved by institutional review boards at CDC and ICF, the survey contractor, and was conducted consistent with applicable federal law and CDC policy.*

* 45 C.F.R. part 46.114; 21 C.F.R. part 56.114.

Measures

CVH was assessed using five metrics aligned with LE8: diet, physical activity, nicotine exposure, sleep health, and BMI. Because YRBS does not include blood collection or a physical examination, blood lipid levels, blood glucose levels, and blood pressure were not assessed.

Each CVH metric was scored on a scale from 0 to 100, with higher scores indicating more favorable health behaviors or factors. Physical activity and BMI were scored using algorithms consistent with AHA guidance for children and persons aged 2–19 years (4). BMI was calculated from self-reported height and weight and converted to age- and sex-specific percentiles using CDC growth charts (https://www.cdc.gov/growthcharts/cdc_charts.htm). Sleep health was scored using the recommended sleep duration of 8–10 hours per night for adolescents. However, the highest YRBS response category is “10 or more hours”; therefore, students reporting >10 hours of sleep, which is above the recommended range, could not be distinguished from those reporting exactly 10 hours, which is within the recommended range. Overall, 1.7% of students reported ≥10 hours of sleep on an average school night (unweighted n = 164).

Diet and nicotine exposure metrics were constructed using available YRBS measures to approximate LE8 scoring algorithms; however, certain LE8 components were not available in YRBS for these metrics. For example, the diet metric was based on reported consumption of fruits, vegetables, soda and sports drinks and does not include other components of diet (e.g., whole grains). The nicotine exposure metric did not include secondhand smoke exposure in the home. Additional details on the construction and scoring of each CVH metric are provided (Table 1).

An overall CVH score was calculated for each student as the mean of the five metric scores. Consistent with the AHA LE8 scoring approach, the five available metric scores were weighted equally. Individual metrics and the overall CVH score were categorized as high (80–100; favorable), moderate (50–79), or low (0–49) on the basis of LE8 cut points and accepted clinical thresholds. Demographic variables included sex (female or male), grade (9, 10, 11, or 12), and race and ethnicity (American Indian or Alaska Native, Asian, Black or African American [Black], Hispanic or Latino [Hispanic], Middle Eastern or North African [ME/NA], Native Hawaiian or Pacific Islander, White, or multiracial [selected more than one racial category]). Persons of Hispanic origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.

Analysis

Among students who participated in the 2025 national YRBS, those with complete data for all five CVH metrics were included in the analytic sample. Students missing data for one or more CVH metrics were excluded. Item-level missing data resulted from student nonresponse, invalid responses, and, for some measures, differences in questionnaire administration. Weighted mean scores and 95% CIs were calculated for each CVH metric and for the overall CVH score. Weighted prevalence estimates and 95% CIs were calculated for high, moderate, and low categories of each metric and the overall CVH score. Estimates were calculated for the overall sample and stratified by sex, grade, and race and ethnicity.

All pairwise differences in mean scores and the prevalence of students in high score categories by sex, grade, and race and ethnicity were assessed using design-adjusted *t* tests. Statistical significance was defined as $p < 0.05$. Corrections for multiple comparisons were not applied because the analyses were descriptive and hypothesis generating; each statistical test addressed a distinct research question and was interpreted independently. All estimates were calculated using Taylor series linearization. Mean and prevalence estimates with a denominator < 30 were considered statistically unreliable and were therefore suppressed; thus, estimates among Native Hawaiian or Pacific Islander students are not presented. A sensitivity analysis was conducted to compare the distribution of sex, grade, and race and ethnicity between the analytic sample and excluded students to assess potential bias from missing data. All analyses were conducted using SAS-callable SUDAAN (version 11.0.4; RTI International) to account for the complex sampling design and weighting.

Results

Among 10,710 students who participated in the 2025 national YRBS, a total of 5,192 (48%) had complete data for all five CVH metrics and were included in the analytic sample. A flow diagram describing exclusions that are due to missing data is provided ([Supplementary Figure](#)). Compared with excluded students, the analytic sample did not differ by sex or grade; however, a greater proportion of White students were included in the analytic sample (52.5%) than among those excluded (41.8%) ([Supplementary Table 1](#)).

The mean overall CVH score was 65.3, which falls within the moderate CVH score range (Table 2). Mean scores for individual CVH metrics ranged from 39.3 for diet (less favorable) to 85.4 for BMI (more favorable, indicating lower BMI). Scores were also high for nicotine exposure

(80.5, indicating less exposure) and moderate for physical activity (62.0) and sleep health (59.1).

The mean overall CVH score was lower among female (64.2) than male students (66.2). Compared with male students, female students had lower mean scores for physical activity and sleep health but a higher (more favorable) BMI score. The mean overall CVH score was lower among students in grades 10 (65.9), 11 (63.7), and 12 (62.7) than among students in grade 9 (68.3), and scores were also lower among students in grade 12 compared with those in grade 10. Differences in scores across grades were observed for physical activity, nicotine exposure, and sleep health. Mean overall CVH scores varied by race and ethnicity: Asian (70.2), ME/NA (69.8), White (66.8), and multiracial (65.8) students had higher scores, whereas Black (60.2) and Hispanic (62.5) students had lower scores.

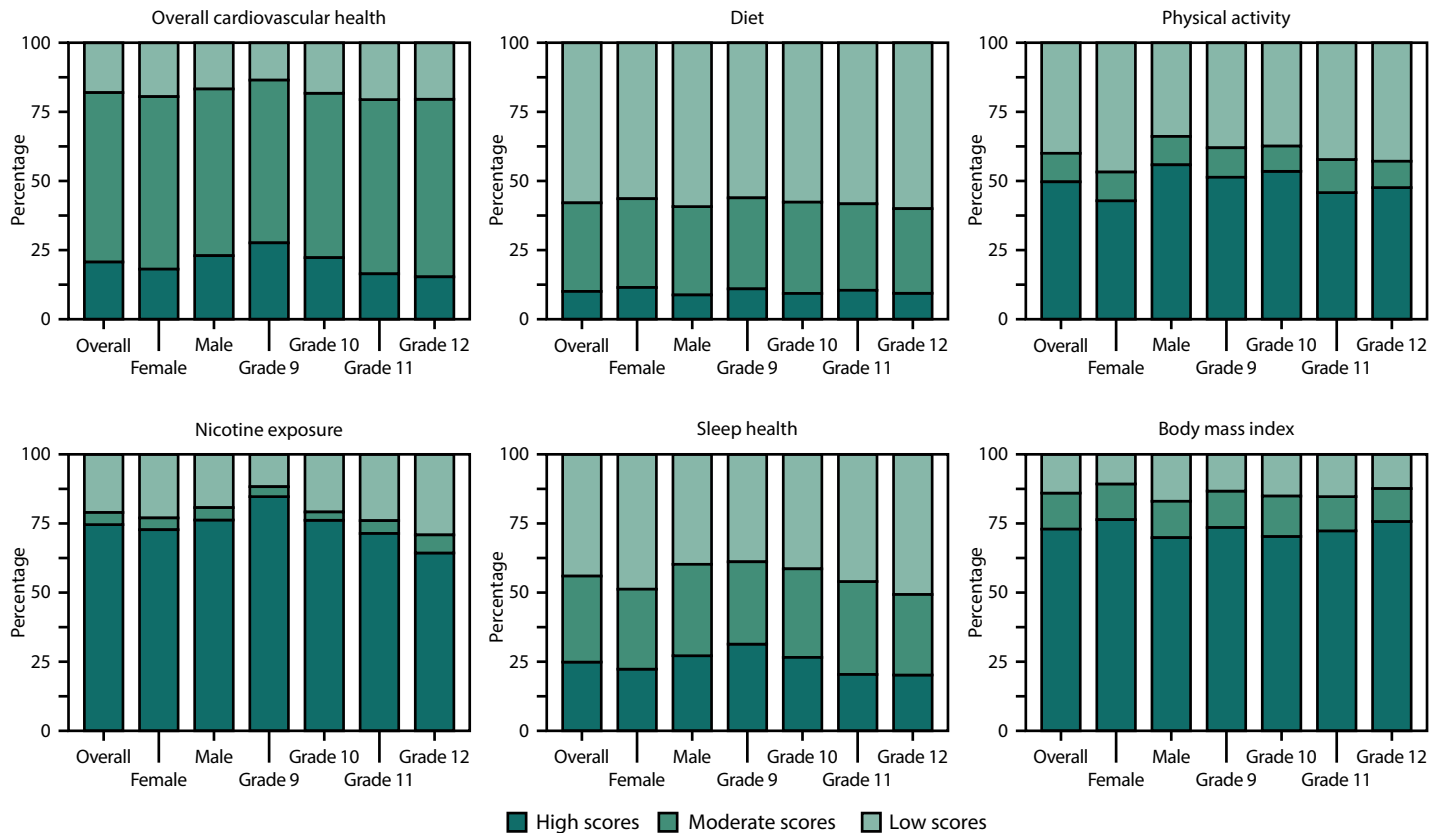
Overall, 20.7% of students had high, 61.3% had moderate, and 18.0% had low overall CVH scores (Figure 1) ([Supplementary Table 2](#)). The prevalence of students with high overall CVH scores was lower among female than male students (18.1% versus 23.0%) and lower among students in grades 10 (22.3%), 11 (16.4%), and 12 (15.3%) than among those in grade 9 (27.6%); students in grades 11 and 12 also had lower prevalences than students in grade 10. In pairwise comparisons by race and ethnicity, Black (11.2%) and Hispanic (14.9%) students had lower prevalences of high overall CVH scores than multiracial (21.0%), White (24.3%), and ME/NA (37.2%) students (Figure 2) ([Supplementary Table 2](#)).

Discussion

This report demonstrates the usefulness of YRBSS for monitoring CVH among adolescents using a modified version of the AHA's LE8 CVH score, adapted to the five metrics available in YRBSS. YRBSS provides a flexible and widely used surveillance platform for estimating these CVH metrics at national, state, territorial, tribal, and local school district levels. In this study using 2025 national data, approximately 80% of U.S. high school students had low or moderate overall CVH scores. Among the five CVH metrics, diet, sleep health, and physical activity had the least favorable scores, whereas BMI and nicotine exposure had the most favorable scores. These findings highlight potential areas for improvement across multiple modifiable health behaviors.

Certain YRBS-based CVH metrics approximated LE8 scoring because not all LE8 components were available in YRBS. However, the relative pattern of CVH metric scores and overall CVH scores in this 2025 YRBS study of high school students was similar to that reported for persons aged 2–19 years in AHA's 2026 heart disease and stroke statistics

FIGURE 1. Prevalence of high, moderate, and low scores for cardiovascular health metrics and overall cardiovascular health,* overall and by sex and grade — Youth Risk Behavior Survey, United States, 2025



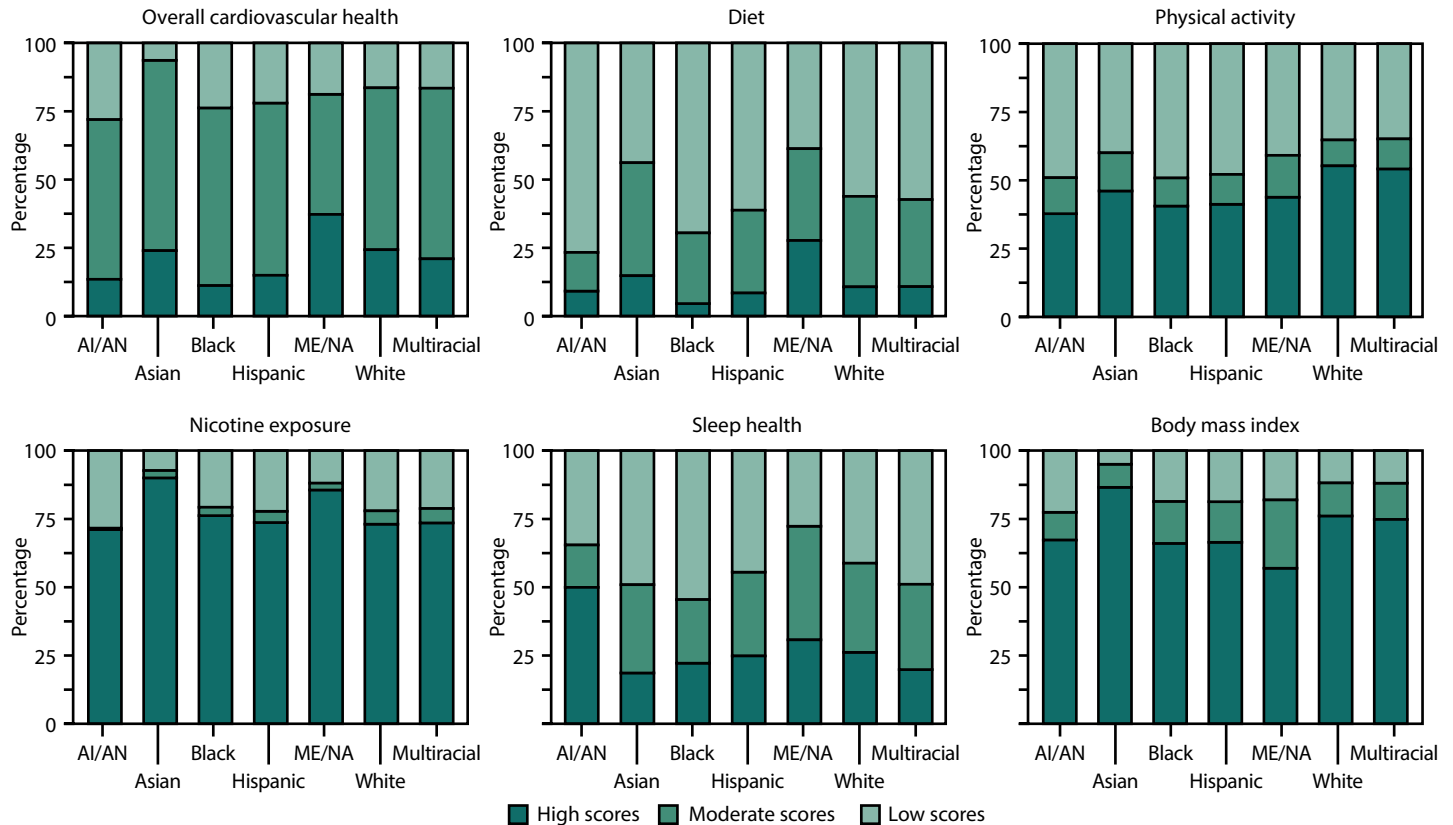
* The score categories and their associated values are low (0–49), moderate (50–79), and high (80–100). High scores are considered more favorable.

update (1), which used 2013–2023 National Health and Nutrition Examination Survey (NHANES) data. NHANES provides a useful comparison because its measures align more closely with LE8. BMI (NHANES = 80.4; YRBS = 85.4) and nicotine exposure (NHANES = 86.5; YRBS = 80.5) scores were highest (more favorable), and diet score (NHANES = 43.9; YRBS = 39.3) was lowest (less favorable) in both surveys. The coexistence of relatively low diet scores with higher (more favorable) BMI scores might reflect both measurement and developmental factors. The BMI metric of LE8 assigns optimal scores to all adolescents below the 85th percentile (4), which might limit its ability to reflect less favorable dietary quality; in addition, dietary quality might influence cardiometabolic risk through pathways not immediately reflected in BMI, particularly during adolescence (3). The overall CVH score estimated using 2013–2023 NHANES data among persons aged 16–19 years was 73.2, compared with 65.3 estimated using 2025 YRBS data. Differences in absolute scores between YRBS- and NHANES-based estimates might reflect differences in measurement approaches, including the use of self-reported data in YRBS, differences in survey period, and the absence

of clinical and biomarker-based metrics (e.g., blood pressure, blood lipid levels, and blood glucose levels) in this analysis. Nonetheless, the consistency in relative patterns across metrics supports the usefulness of YRBS data for monitoring key metrics of CVH.

The differences in overall CVH scores by sex, grade, and race and ethnicity observed in this report are also consistent with previous research (7,10,11). Female students had lower overall CVH scores than male students. Overall CVH scores were also lower among students in higher grades; students in grades 10, 11, and 12 had lower overall CVH scores than students in grade 9, suggesting that less favorable CVH is evident as early as grade 10. Lower physical activity and sleep health scores were also observed among female students and students in higher grades, along with lower nicotine exposure scores among students in higher grades. Black and Hispanic students had lower overall CVH scores than Asian, ME/NA, White, and multiracial students. The comparatively high prevalence of high overall CVH among ME/NA students warrants further examination. Limited research among U.S. adults of Middle Eastern origin has identified lower prevalence of selected CVD

FIGURE 2. Prevalence of high, moderate, and low scores for cardiovascular health metrics and overall cardiovascular health,* by race and ethnicity — Youth Risk Behavior Survey, United States, 2025



Abbreviations: AI/AN = American Indian or Alaska Native; ME/NA = Middle Eastern or North African.

* The score categories and their associated values are low (0–49), moderate (50–79), and high (80–100). High scores are considered more favorable.

risk factors, including hypertension and obesity, relative to non-Hispanic White adults (12); however, findings across other risk factors and cardiovascular outcomes have been mixed. Evidence specific to ME/NA adolescents is sparse, and the wide CI for this estimate and heterogeneity within this population warrant cautious interpretation. More studies are needed to confirm this finding and examine factors that might contribute to CVH among ME/NA adolescents. Although the specific pairwise differences among racial and ethnic groups varied by metric, Black students had significantly lower scores for each individual CVH metric than students in at least one other racial or ethnic group. In addition, Hispanic students had significantly lower scores for each metric except sleep health than students in at least one other racial or ethnic group. These observed racial and ethnic differences might reflect the interaction of individual, developmental, interpersonal, community, and societal factors that influence health behaviors and access to resources differently across groups (4). These findings suggest that communities might experience different CVH-related challenges and needs and that prevention efforts

should be designed to address the specific context in which they are implemented.

The findings in this report have implications for school and community policies and practices aimed at improving adolescent CVH. Because YRBSS is a school-based surveillance system, it provides an opportunity to examine CVH-related metrics within the settings where many adolescent health promotion policies and programs are implemented. Schools are uniquely positioned to influence health behaviors through coordinated policies, programs, and supportive environments. Strategies such as implementing and strengthening nutrition standards for school meals and competitive foods (i.e., foods and beverages sold outside school meal programs), offering taste tests of new menu items, providing free school meals for all students, and offering alternative breakfast models (i.e., “second chance” breakfast) can support healthy eating (13). Opportunities for regular physical activity, including access to physical education and participation in school- or community-based programs, can help students meet recommended activity levels (7,14). These opportunities can be part of a

comprehensive school physical activity program that promotes physical activity before, during, and after school (14).

Through its Healthy Schools cooperative agreement (<https://www.cdc.gov/healthy-schools/partners/index.html>), CDC supports the implementation of evidence-based healthy eating and physical activity strategies across in-school and out-of-school settings. This initiative currently engages 20 state education and health agencies, universities, and tribes to strengthen policies and practices that promote student and staff member well-being within districts and schools. For example, Faribault Public School District in Minnesota introduced classroom physical activity carts[†] in each school, expanded gymnasium access for high school students throughout the day, and facilitated community hiking initiatives. Similarly, Pattonville School District in Missouri (<https://www.youtube.com/watch?v=MemgJnI2d0>) addressed healthy eating and food insecurity by establishing school gardens, greenhouse operations, and hydroponic systems and incorporating nutrition education that engages students in the “science of taste,” including approaches to reduce sodium intake such as substituting herbs and peppers in cooking. These initiatives demonstrate how educational settings use CDC support to cultivate healthier school environments.

Policies that support adequate sleep, including later school start times, along with education promoting consistent sleep schedules and reduced use of stimulating technology and screens at night, might improve sleep health among adolescents (15). In addition, comprehensive tobacco prevention and cessation efforts, including policies that address electronic vapor product use, can reduce nicotine exposure among adolescents (<https://www.hhs.gov/sites/default/files/2024-sgr-tobacco-related-health-disparities-full-report.pdf>). Incorporating CVH-related topics into school curricula aligned with the national health and physical education standards can further support student knowledge and skills related to healthy eating, physical activity, sleep, and tobacco prevention. Family and community engagement might help ensure that school-based strategies are relevant and can reinforce healthy choices and connect students with resources. Coordinated approaches that address multiple behaviors simultaneously might have the greatest impact on improving overall CVH.

Limitations

General limitations for the YRBS are available in the overview report of this supplement (9). The findings in this report are subject to at least three additional limitations. First,

the analytic sample was restricted to students with complete data for all five CVH metrics to ensure consistent calculation of the composite CVH score across all included participants. As a result, approximately 52% of students were excluded because of missing data. Missing data were concentrated in composite measures derived from multiple survey items (particularly diet and nicotine exposure) and reflected both student-level item nonresponse and site-level omission of survey items (9). Although the analytic and excluded samples did not differ by sex or grade, a greater proportion of White students were included in the analytic sample, which might affect the generalizability of findings. Second, the YRBS-based CVH metrics approximated LE8 metrics but were limited by the absence of certain components and health factors, including certain dietary components, secondhand smoke exposure, sleep durations >10 hours, blood pressure, blood lipid levels, and blood glucose levels. Although other studies among younger age groups have similarly lacked data for all LE8 metrics (13), these limitations might affect comparability with other studies and warrant caution when interpreting overall CVH scores. Finally, all measures were based on self-report and might be subject to reporting bias. Self-reported height and weight might result in underestimation of BMI (16). Although the anonymous, self-administered nature of the survey might improve reporting of sensitive behaviors among adolescents, certain misclassifications might remain.

Future Directions

Future research can build on these findings by further examining factors associated with CVH among adolescents, including school, family, and community factors that might influence diet, physical activity, sleep, and nicotine use. Opportunities also exist to expand the use of YRBSS data to assess CVH at state, territorial, tribal, and local levels and to examine variation across jurisdictions. Linking CVH metrics with information on school and district policies and practices could help identify which strategies are associated with more favorable CVH metric scores and overall CVH scores among adolescents. Examining associations between CVH scores and school programs and policies related to nutrition, physical activity, sleep, and tobacco prevention could help public health and education agencies prioritize evidence-based interventions and allocate resources toward practices associated with improved adolescent CVH. Continued surveillance of CVH using YRBS can support the monitoring of trends over time and guide tailored, data-driven prevention and early intervention efforts in school-based health services and pediatric care settings.

[†] Physical activity carts are mobile carts containing equipment and materials that teachers and staff members can use to facilitate classroom-based physical activity.

Conclusion

In 2025, approximately four in five U.S. high school students had a low or moderate CVH score. Among the five CVH metrics, diet, sleep health, and physical activity had the least favorable scores, highlighting potential areas for improvement during adolescence. These findings underscore the importance of promoting healthy behaviors early in life to support improved cardiovascular health in adulthood. Schools and communities can use these findings to strengthen policies and practices that support healthy eating, regular physical activity, adequate sleep, and avoidance of nicotine products. By using YRBS data to construct CVH metrics, this study establishes an approach for monitoring and studying adolescent CVH metrics over time and across national, state, territorial, tribal, and local school district populations.

Acknowledgments

The authors acknowledge David Chyen, Joana Lively, Cecily K. Mbaka, Zachary Myles, CDC.

During March–August 2026, authors used the U.S. Department of Health and Human Services instance of ChatGPT 5.3 through 5.6 (OpenAI, San Francisco, California) to generate, debug, or edit analytic scripts or code and for limited editing of manuscript text for grammar and clarity. All outputs were reviewed and finalized by the authors.

Conflicts of Interest

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.

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TABLE 1. Questions, response options, and analytic coding for Youth Risk Behavior Survey measures used to construct cardiovascular health metrics aligned with American Heart Association's Life's Essential 8 — Youth Risk Behavior Survey, United States, 2025

CVH metric	Question	Response option	Analytic coding
Diet*			
Fruit	During the past 7 days, how many times did you eat fruit? (Do not count fruit juice.)	I did not eat or drink it during the past 7 days, ate or drank it 1–3 times during the past 7 days, ate or drank it 4–6 times during the past 7 days, ate or drank it 1 time per day, ate or drank it 2 times per day, ate or drank it 3 times per day, or ate or drank it ≥4 times per day	• 10 points for intake ≥2 times per day • 5 points for intake 1 time per day • 0 points for <1 time per day
Vegetables	• During the past 7 days, how many times did you eat green salad? • During the past 7 days, how many times did you eat potatoes? (Do not count French fries, fried potatoes, or potato chips.) • During the past 7 days, how many times did you eat carrots? • During the past 7 days, how many times did you eat other vegetables? (Do not count green salad, potatoes, or carrots.)		• 10 points for intake ≥3 times per day • 5 points for intake ≥1 to <3 times per day • 0 points for <1 time per day
Sugar-sweetened beverages	• During the past 7 days, how many times did you drink a can, bottle, or glass of soda or pop, such as Coke, Pepsi, or Sprite? (Do not count diet soda or diet pop.) • During the past 7 days, how many times did you drink a can, bottle, or glass of a sports drink, such as Gatorade or Powerade? (Do not count low-calorie sports drinks such as Propel or G2.)		• 10 points for intake 0 times per week • 5 points for intake >0 times per week to <1 time per day • 0 points for ≥1 time per day
Physical activity [†]	During the past 7 days, on how many days were you physically active for a total of at least 60 minutes per day? (Add up all the time you spent in any kind of physical activity that increased your heart rate and made you breathe hard some of the time.)	0 days, 1 day, 2 days, 3 days, 4 days, 5 days, 6 days, or 7 days	• 100 points for 7 days • 90 points for 6 days • 80 points for 5 days • 60 points for 4 days • 40 points for 2 or 3 days • 20 points for 1 day • 0 points for 0 days
Nicotine exposure [§]	• Have you ever smoked a cigarette, even one or two puffs? • During the past 30 days, on how many days did you smoke cigarettes? • Have you ever used an electronic vapor product? • During the past 30 days, on how many days did you use an electronic vapor product? • During the past 30 days, on how many days did you smoke cigars, cigarillos, or little cigars, such as Swisher Sweets, Middleton's (including Black and Mild), or Backwoods?	For ever measures Yes or No For past 30 days measures 0 days, 1 or 2 days, 3–5 days, 6–9 days, 10–19 days, 20–29 days, or all 30 days	• 100 points for never tried • 50 points for tried any nicotine product, but >30 days ago • 25 points for current use of an electronic vapor product • 0 points for current use of combustible products

See table footnotes on the next page.

TABLE 1. (Continued) Questions, response options, and analytic coding for YRBS measures used to construct cardiovascular health metrics aligned with American Heart Association's Life's Essential 8 — Youth Risk Behavior Survey, United States, 2025

CVH metric	Question	Response option	Analytic coding
Sleep health[†]	On an average school night, how many hours of sleep do you get?	≤4 hrs, 5 hrs, 6 hrs, 7 hrs, 8 hrs, 9 hrs, or ≥10 hrs	• 100 points for 8, 9, or ≥10 hrs • 70 points for 7 hrs • 40 points for 6 hrs • 20 points for 5 hrs • 0 points for ≤4 hrs
BMI^{**}	• How tall are you without your shoes on? • How much do you weigh without shoes on? • How old are you? • What is your sex?	Height and weight are free-text entry Age ≤12 yrs, 13 yrs, 14 yrs, 15 yrs, 16 yrs, 17 yrs, or ≥18 yrs Sex Female or male	• 100 points for <85th percentile • 70 points for 85th to <95th percentile • 30 points for 95th percentile to <120% of the 95th percentile • 15 points for 120% of the 95th percentile to <140% of the 95th percentile • 0 points for ≥140% of the 95th percentile

Abbreviations: BMI = body mass index; CVH = cardiovascular health; LE8 = American Heart Association's Life's Essential 8; YRBS = Youth Risk Behavior Survey.

* YRBS assesses dietary behaviors using self-reported frequency of fruit, vegetable, and sugar-sweetened beverage (soda and sports drink) consumption. These YRBS measures overlap with components included in LE8 dietary scoring approaches (e.g., Dietary Approaches to Stop Hypertension, Healthy Eating Index, and Mediterranean Eating Patterns for Americans), although several components of these comprehensive assessments are not collected in YRBS. Consistent with these approaches, dietary components were equally weighted to construct a composite score. An allocation of 10 points indicates more favorable practice and an allocation of 0 points indicates less favorable practice.

All fruit, vegetable, soda, and sports drink items used the same seven response options shown. For scoring, responses were converted to estimated intake frequency in times per day. "I did not eat/drink [item] during the past 7 days" was assigned 0 times per day; "1 to 3 times during the past 7 days" was assigned 2/7 times per day; and "4 to 6 times during the past 7 days" was assigned 5/7 times per day. Responses of 1, 2, 3, or ≥4 times per day were assigned their corresponding daily frequencies. Thus, the scoring category "<1 time/day" is a derived category and includes the weekly-frequency response options. For fruit intake, the single-item measure of fruit consumption was categorized directly using the response options. For vegetables, the estimated times-per-day values from the four vegetable items were summed to create a composite vegetable intake estimate. For sugar-sweetened beverages, the estimated times-per-day values from the soda and sports drink items were summed to create a composite sugar-sweetened beverage intake estimate. The fruit, vegetable, and sugar-sweetened beverage intake estimates were then categorized using the thresholds shown and assigned 0, 5, or 10 points. Points for the three dietary components were averaged and multiplied by 10 to create a composite diet score of 0–100.

The Dietary Guidelines for Americans recommend approximately two servings of fruit and three servings of vegetables per day (<https://www.dietaryguidelines.gov/>). Accordingly, ideal intake was defined as ≥2 times per day for fruit and ≥3 times per day for vegetables (10 points each). Intake <1 time per day was considered least ideal (0 points), and intermediate intake levels were assigned 5 points. Previous research comparing frequency-based survey measures with 24-hour dietary recall data indicates that times per day does not directly correspond to number of servings per day and might overestimate actual consumption (**Source:** Eaton DK, Olsen EO, Brener ND, et al. A comparison of fruit and vegetable intake estimates from three survey question sets to estimates from 24-hour dietary recall interviews *J Acad Nutr Diet* 2013;113:1165–74). Because frequency does not directly correspond to quantity consumed, and recommendations vary by sex, body size, and physical activity level, this approach might overestimate adherence to dietary guidelines. For sugar-sweetened beverages, no consumption was considered ideal (10 points), whereas ≥1 time per day was least ideal (0 points); intermediate intake levels were assigned 5 points.

[†] YRBS's time-based measure of days of at least 60 minutes of aerobic physical activity aligns with LE8's recommended scoring for moderate to vigorous physical activity in minutes per week. Although YRBS also includes data for muscle strengthening activity aligned with overall physical activity recommendations for adolescents, this activity is not explicitly part of LE8's scoring recommendations for children and adolescents as related to CVH. An allocation of 100 points indicates more favorable practice and an allocation of 0 points indicates less favorable practice.

[§] Consistent with the LE8 nicotine exposure scoring approach, current use of combustible nicotine products was assigned a lower score than current use of electronic vapor products. Accordingly, students reporting current combustible product use, including cigarettes or cigars, were assigned 0 points, whereas students reporting current electronic vapor product use but no current combustible product use were assigned 25 points. Students who had tried cigarettes or electronic vapor products but had not used them in the past 30 days were assigned 50 points, and students who had never tried either product were assigned 100 points. Although YRBS includes both lifetime ("ever") and past 30-day use measures for cigarettes and electronic vapor products, only past 30-day cigar use is assessed. Therefore, scoring could not account for lifetime cigar use, which might result in certain students receiving higher nicotine exposure scores than warranted. In addition, the 2025 national YRBS did not include measures of secondhand smoke exposure, which also could not be incorporated into scoring. An allocation of 100 points indicates more favorable practice and an allocation of 0 points indicates less favorable practice.

[¶] The American Academy of Sleep Medicine recommends 8–10 hours of sleep per night for persons aged 13–18 years. Because the highest YRBS sleep response category is "10 or more hours," students reporting >10 hours of sleep, which is above the recommended range, could not be distinguished from those reporting exactly 10 hours of sleep, which is within the recommended range. Under the American Heart Association's scoring algorithm, sleep durations above the recommended range would receive lower scores; however, students in this response category were assigned the maximum score, which might have resulted in misclassification of the sleep health metric and overestimation of population sleep scores. An allocation of 100 points indicates more favorable practice and an allocation of 0 points indicates less favorable practice.

^{**} BMI percentile calculation for YRBS data uses self-reported height, weight, sex, and age. CDC provides a SAS program that calculates BMI percentiles for children accounting for age and sex from CDC growth charts (<https://www.cdc.gov/growth-chart-training/hcp/computer-programs/sas.html>). Consistent with CDC guidance for datasets in which age is measured in years, students reporting their age as "12 years old or younger" or "18 years old or older" were assigned ages of 12 and 18 years, respectively. The formula for calculating ≥140% of the 95th percentile was added to the SAS program. Because evidence regarding the relationship between low BMI and CVH is limited and mixed, BMI <5th percentile was classified within the ideal BMI range (100 points). An allocation of 100 points indicates a more favorable score and an allocation of 0 points indicates a less favorable score.

TABLE 2. Mean scores for cardiovascular health metrics and overall cardiovascular health* among high school students with complete data for all five metrics, by demographic characteristics — Youth Risk Behavior Survey, United States, 2025[†]

Characteristic	Overall CVH [§]	Diet [¶]	Physical activity ^{**}	Nicotine exposure ^{††}	Sleep health ^{§§}	Body mass index ^{¶¶}
	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)
Overall	65.3 (63.4–67.1)	39.3 (36.8–41.8)	62.0 (59.2–64.8)	80.5 (77.8–83.3)	59.1 (56.7–61.6)	85.4 (83.5–87.3)
Sex						
Female	64.2 (62.1–66.3)	40.4 (37.1–43.7)	56.5 (53.3–59.7)	79.6 (76.3–82.9)	56.4 (54.0–58.9)	88.1 (86.1–90.1)
Male	66.2 (64.4–68.0)	38.3 (36.1–40.5)	66.9 (64.2–69.7)	81.4 (78.9–83.9)	61.5 (58.8–64.3)	83.0 (80.9–85.2)
Grade						
9	68.3 (66.0–70.7)	40.3 (37.7–42.9)	63.8 (60.5–67.2)	88.8 (85.3–92.2)	62.8 (59.1–66.5)	85.9 (83.2–88.5)
10	65.9 (63.2–68.6)	39.3 (36.2–42.5)	63.8 (59.9–67.8)	81.6 (77.5–85.7)	60.8 (57.0–64.6)	84.0 (80.9–87.1)
11	63.7 (61.6–65.7)	39.5 (36.4–42.6)	59.3 (55.2–63.4)	77.8 (73.1–82.6)	57.0 (54.0–60.1)	84.7 (81.8–87.6)
12	62.7 (60.7–64.7)	37.9 (34.5–41.2)	60.5 (57.6–63.4)	72.6 (68.6–76.5)	55.4 (52.2–58.6)	87.2 (85.3–89.0)
Race and ethnicity^{***,†††}						
AI/AN	62.3 (52.6–71.9)	35.3 (22.3–48.3)	54.0 (37.6–70.3)	75.8 (53.7–97.9)	65.4 (42.6–88.2)	80.9 (61.4–100 ^{§§§})
Asian	70.2 (68.0–72.4)	48.7 (46.0–51.3)	60.0 (55.8–64.1)	92.5 (89.8–95.2)	56.0 (48.8–63.3)	93.7 (90.6–96.8)
Black or African American	60.2 (58.9–61.5)	33.7 (31.7–35.7)	53.4 (50.3–56.4)	81.4 (78.0–84.9)	51.8 (48.9–54.8)	80.8 (78.7–82.8)
Hispanic or Latino	62.5 (60.7–64.4)	37.6 (35.3–39.8)	55.8 (52.2–59.4)	79.8 (75.9–83.7)	58.2 (53.8–62.7)	81.2 (79.2–83.2)
ME/NA	69.8 (61.6–78.0)	53.8 (42.4–65.3)	62.4 (52.0–72.9)	87.1 (73.8–100 ^{§§§})	66.0 (53.5–78.6)	79.5 (69.5–89.6)
White	66.8 (64.5–69.1)	39.7 (36.2–43.2)	66.2 (63.0–69.4)	79.4 (75.9–82.9)	61.3 (58.6–64.0)	87.4 (85.0–89.8)
Multiracial	65.8 (62.9–68.7)	39.9 (34.6–45.2)	66.1 (61.5–70.6)	80.0 (73.6–86.4)	55.9 (51.9–60.0)	86.9 (82.6–91.1)

Abbreviations: AI/AN = American Indian or Alaska Native; CVH = cardiovascular health; NH/PI = Native Hawaiian or Pacific Islander; ME/NA = Middle Eastern or North African; YRBS = Youth Risk Behavior Survey.

* An overall CVH score was calculated for each student as the mean of the five metric scores.

[†] N = 5,192 respondents with complete data for all five CVH metrics (complete case analysis). Students with missing data were excluded. The total number (N) of students answering each question varied. Data might be missing because 1) students in schools selected for both national and site-specific YRBS samples completed only one questionnaire; therefore, when the site-specific questionnaire was administered, it might not have included all questions on the national YRBS; 2) the student did not answer the question; or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Mean estimates in each category are calculated based on nonmissing data.

[§] As determined by *t* test analysis with Taylor series linearization ($p < 0.05$), female students significantly differed from male students; grade 9 students significantly differed from grade 10, 11, and 12 students; grade 10 students significantly differed from grade 12 students; Asian students significantly differed from Black or African American (Black), Hispanic or Latino (Hispanic), White, and multiracial students; Black students significantly differed from Hispanic, ME/NA, White, and multiracial students; and Hispanic students significantly differed from White and multiracial students.

[¶] As determined by *t* test analysis with Taylor series linearization ($p < 0.05$), no significant differences were detected by sex or grade level; AI/AN significantly differed from Asian and ME/NA students; Asian students significantly differed from Black, Hispanic, White, and multiracial students; Black students significantly differed from Hispanic, ME/NA, White, and multiracial students; and Hispanic students significantly differed from ME/NA students.

^{**} As determined by *t* test analysis with Taylor series linearization ($p < 0.05$), female students significantly differed from male students; grade 9 students significantly differed from grade 11 and 12 students; grade 10 students significantly differed from grade 11 students; Asian students significantly differed from Black, ME/NA, and White students; Black students significantly differed from White and multiracial students; and Hispanic students significantly differed from White and multiracial students.

^{††} As determined by *t* test analysis with Taylor series linearization ($p < 0.05$), no significant differences were detected by sex; grade 9 students significantly differed from grade 10, 11, and 12 students; grade 10 students significantly differed from grade 12 students; and Asian students significantly differed from Black, Hispanic, White, and multiracial students.

^{§§} As determined by *t* test analysis with Taylor series linearization ($p < 0.05$), female students significantly differed from male students; grade 9 students significantly differed from grade 11 and 12 students; grade 10 students significantly differed from grade 12 students; Asian students significantly differed from Hispanic, ME/NA, and White students; and White students significantly differed from multiracial students.

^{¶¶} As determined by *t* test analysis with Taylor series linearization ($p < 0.05$), no significant differences were detected by grade level; female students significantly differed from male students; Asian students significantly differed from Black, Hispanic, ME/NA, White, and multiracial students; Black students significantly differed from White and multiracial students; and Hispanic students significantly differed from White and multiracial students.

^{***} Persons of Hispanic origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.

^{†††} Mean estimates with a denominator < 30 were considered statistically unreliable and were suppressed; therefore, estimates for NH/PI students are not presented.

^{§§§} CIs higher than the maximum of the theoretical score range of 0–100 were truncated at 100.

Unmet Need for Mental Health Services Among High School Students Experiencing Persistent Feelings of Sadness or Hopelessness — Youth Risk Behavior Survey, United States, 2025

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Abstract

For the first time, in 2025, CDC's nationally representative Youth Risk Behavior Survey (YRBS) included an item assessing U.S. high school students' use of mental health services. Data from this survey were used to examine the prevalence of persistent feelings of sadness or hopelessness among U.S. high school students and their receipt of counseling or therapy. Overall, 33.3% of students reported persistent feelings of sadness or hopelessness, with a higher prevalence among female than male students (43.4% versus 23.9%). Among students reporting persistent feelings of sadness or hopelessness, 29.6% reported receiving counseling or therapy, 28.8% reported an unmet need for counseling or therapy, and 41.5% reported no perceived need for counseling or therapy. A higher prevalence of female students than male students reported receiving counseling or therapy (33.2% versus 23.3%) and an unmet need for counseling or therapy (31.7% versus 23.8%) among those reporting persistent feelings of sadness or hopelessness. Conversely, a higher prevalence of male students than female students reported no perceived need for counseling or therapy (52.9% versus 35.1%). Asian and Black or African American students had both the lowest prevalence of receiving counseling or therapy (15.7% and 15.4%, respectively) and the highest prevalence of an unmet need for counseling or therapy (38.4% and 33.9%, respectively). After controlling for sex, grade, and race and ethnicity, students with persistent feelings of sadness or hopelessness were approximately twice as likely to report receiving counseling or therapy and three times as likely to report an unmet need compared with students who did not report these feelings. These findings highlight potential opportunities for tailored interventions to support adolescent use of mental health services, particularly approaches that address the unmet need for mental health services among female students and the low perceived need for services among male students. Strategies that might improve access to care include school-based mental health services and culturally appropriate family and community engagement.

Introduction

Adolescence is a period of rapid developmental, emotional, cognitive, and social transition. These changes, combined with increasing academic demands, social pressures, and challenges with identity formation, can increase the risk for mental health disorders among youths (1). Data from the 2023 national Youth Risk Behavior Survey (YRBS) indicate that 40% of U.S. high school students reported persistent feelings of sadness or hopelessness, and 29% reported poor mental health, underscoring the magnitude of this public health concern (2). Despite the high prevalence of poor mental health, many adolescents do not receive mental health services because of barriers that can be broadly grouped as personal (e.g., stigma), interpersonal (e.g., lack of trusted relationships),

and structural factors (e.g., cost, transportation barriers, and limited availability of mental health providers) (3,4). Although receipt of evidence-based mental health services is associated with improved outcomes (5), little is known about the extent to which adolescents experiencing persistent feelings of sadness or hopelessness access counseling or treatment services. Research suggests that mental health symptoms might vary by sex, grade, and race and ethnicity (2), yet it remains unclear how these demographic characteristics are associated with access to mental health services among U.S. high school students.

This report uses 2025 YRBS data to provide the first nationally representative estimates of mental health service use among adolescents experiencing persistent feelings of sadness or hopelessness. Previous research has shown a strong association between having felt sad or hopeless for ≥ 2 weeks in the past year with moderate to severe depressive symptoms, frequent mental distress, and functional limitations resulting from poor mental health (6). The goal is to identify critical gaps in the mental

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health care needs of adolescents, particularly among youths experiencing persistent feelings of sadness or hopelessness, and to guide efforts that promote accessible mental health services for adolescents. Findings from this report are intended for public health practitioners, mental health providers, school and education professionals, researchers, and federal, state, and local mental health and public health agencies.

Methods

Data Source

This report includes data from the 2025 YRBS (N = 10,710), a cross-sectional, school-based survey conducted biennially since 1991. Each survey year, CDC collects data from a nationally representative sample of students from public and private schools, including parochial schools, in grades 9–12 in the 50 U.S. states and the District of Columbia. Additional information about YRBS sampling, data collection, response rates, and processing is available in the overview report of this supplement (7). The prevalence estimates for use of mental health counseling or therapy and other YRBS variables among U.S. high school students overall and stratified by demographic characteristics are available at <https://youthonline.cdc.gov>. The full YRBS questionnaire, datasets, and documentation are available at <https://www.cdc.gov/yrebs/index.html>. This study was approved by institutional review boards at CDC and ICF, the survey contractor, and was conducted consistent with applicable federal law and CDC policy.*

Measures

Questions, response options, and analytic coding for persistent feelings of sadness or hopelessness and use of mental health counseling or therapy are provided (Table 1). Persistent feelings of sadness or hopelessness were assessed with the question, “During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?” with “yes” or “no” response options. The mental health counseling or therapy question was administered independently of the persistent feelings of sadness or hopelessness question and did not depend on whether a student responded “yes” to experiencing persistent feelings of sadness or hopelessness. The question assessed counseling or therapy for a broader range of concerns, including emotions, concentration, behavior, or mental health. Students were asked, “During the past 12 months, which of the following best describes your experience with counseling or therapy from a health professional, such as a doctor, nurse,

psychologist, or therapist to help with emotions, concentration, behavior, or mental health?” Students selected from the following response options: “I did not receive counseling or therapy because I did not need it” (defined as no perceived need), “I needed counseling or therapy but did not get it because of cost, not knowing how or where to get help, or another reason” (defined as unmet need), and “I received counseling or therapy” (Table 1). Of the 10,710 students in the analytic sample, 1,941 were not asked the mental health counseling or therapy question because of survey procedures for schools selected for both the national and site-specific YRBS samples. Students in these schools completed only one questionnaire; when the site-specific questionnaire was administered, it might not have included all questions on the national YRBS (7), including the mental health counseling or therapy question. Among the 8,769 students who were administered the mental health counseling or therapy question, 569 did not provide a valid response, resulting in 8,200 students with valid mental health counseling or therapy data. For the persistent feelings of sadness or hopelessness question, 98 of the 10,710 students in the analytic sample were not asked the question because they completed a site-specific questionnaire that did not include the persistent feelings of sadness or hopelessness question. Among the 10,612 students who were administered the persistent feelings of sadness or hopelessness question, 129 did not provide a valid response, resulting in 10,483 students with valid data on persistent feelings of sadness or hopelessness. A total of 8,049 students had valid responses to both the persistent feelings of sadness or hopelessness and the mental health counseling or therapy questions.

Demographic variables included sex (female or male), grade (9, 10, 11, or 12), and race and ethnicity (American Indian or Alaska Native [AI/AN], Asian, Black or African American [Black], Hispanic or Latino [Hispanic], Middle Eastern or North African [ME/NA], Native Hawaiian or Pacific Islander [NH/PI], White, or multiracial [selected more than one racial category]). Persons of Hispanic origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.

Analysis

Weighted prevalence estimates and 95% CIs were calculated for persistent feelings of sadness or hopelessness and receipt of, unmet need for, and no perceived need for mental health counseling or therapy. Among students who reported persistent feelings of sadness or hopelessness, prevalence and 95% CIs were estimated for all three counseling or therapy outcomes. Differences in prevalence by demographic characteristics were assessed using design-adjusted *t* tests for pairwise comparisons.

* 45 C.F.R. part 46.114; 21 C.F.R. part 56.114.

Corrections for multiple comparisons were not applied because the analyses were descriptive and hypothesis generating, and each statistical test addressed a distinct research question and was interpreted independently. Taylor series linearization was used for all estimates and measures of association, with statistical significance set at $p < 0.05$. Prevalence estimates with a denominator < 30 were considered statistically unreliable and were suppressed (7).

Adjusted prevalence ratios (aPRs) and 95% CIs for the association between persistent feelings of sadness or hopelessness and mental health counseling or therapy outcomes were calculated using logistic regression models with predicted marginals. Sex-stratified analyses were conducted a priori to assess whether associations between persistent feelings of sadness or hopelessness and mental health counseling or therapy differed between female and male adolescents, given previously documented sex differences in adolescent mental health symptoms and help-seeking behaviors (2). Overall models controlled for sex, grade, and race and ethnicity; sex-stratified models controlled for grade and race and ethnicity. Prevalence ratios were considered statistically significant if the 95% CI excluded the null hypothesis value of 1.0. All analyses were conducted using SAS-callable SUDAAN (version 11.0.4; RTI International) to account for the complex sampling design and weighting.

Results

Overall, in 2025, 33.3% of U.S. high school students reported persistent feelings of sadness or hopelessness. The prevalence was higher among female students than male students (43.4% versus 23.9%) and similar across grade levels (Table 2). Across racial and ethnic groups, the highest prevalence was among NH/PI students (40.6%), followed by AI/AN (39.5%) and multiracial students (39.3%); prevalence was lowest among ME/NA students (20.9%).

Overall, 18.6% of students reported receiving counseling or therapy, 15.4% reported an unmet need for counseling or therapy, and 66.0% reported no perceived need for counseling or therapy (Table 3). Compared with male students, female students had a higher prevalence of receiving counseling or therapy (25.1% versus 12.3%) and reporting an unmet need for counseling or therapy (21.1% versus 9.9%). Conversely, a higher prevalence of male students than female students reported no perceived need for counseling or therapy (77.7% versus 53.7%). Compared with other racial and ethnic groups, Asian students had the lowest prevalence of receiving counseling or therapy (6.4%) and the highest prevalence of reporting no perceived need for counseling or therapy (77.4%).

Among students reporting persistent feelings of sadness or hopelessness, 29.6% reported receiving counseling or therapy, 28.8% reported an unmet need for counseling or therapy, and 41.5% reported no perceived need for counseling or therapy (Table 4). Compared with male students, female students had a higher prevalence of receiving counseling or therapy (33.2% versus 23.3%) and reporting an unmet need for counseling or therapy (31.7% versus 23.8%). Conversely, a higher prevalence of male students than female students reported no perceived need for counseling or therapy (52.9% versus 35.1%).

Differences in receipt of counseling or therapy were observed by race and ethnicity. Among those reporting persistent feelings of sadness or hopelessness, receipt of counseling or therapy was lowest among Black (15.4%) and Asian (15.7%) students and highest among multiracial (39.6%) and White (36.5%) students (Table 4). Unmet need for counseling or therapy was highest among Asian (38.4%) and Black (33.9%) students. Compared with other racial and ethnic groups, the prevalence of reporting no perceived need for counseling or therapy was highest among Black (50.8%), Hispanic (46.0%), and Asian students (45.8%).

After adjusting for sex, grade, and race and ethnicity, students reporting persistent feelings of sadness or hopelessness were more likely to report receiving counseling or therapy (aPR = 2.08; 95% CI = 1.83–2.36) and more likely to report an unmet need (aPR = 3.05; 95% CI = 2.62–3.56) compared with students who did not report these feelings (Table 5). Conversely, students reporting persistent feelings of sadness or hopelessness were less likely to report no perceived need for counseling or therapy (aPR = 0.57; 95% CI = 0.54–0.61). In sex-stratified analyses, findings were consistent with the overall adjusted model for both male and female students.

Discussion

This report provides the first nationally representative estimates for receipt of, unmet need for, and no perceived need for counseling or therapy among U.S. high school students reporting persistent feelings of sadness or hopelessness, a key measure collected by YRBS that has been associated with depressive symptoms (6). In 2025, approximately one in three students reported persistent feelings of sadness or hopelessness. Of those students, only about one third reported receiving counseling or therapy. An additional one third reported an unmet need for counseling or therapy, indicating they wanted help but did not get it because of cost, not knowing how or where to get help, or another reason. These findings are consistent with household-based surveys, such as the 2024 National Survey on Drug Use and Health, which found

that among adolescents aged 12–17 years with a past-year major depressive episode who did not receive mental health treatment, 34.2% reported not seeking treatment despite believing they needed it (8).

Patterns of mental health service use and perceived need for services varied significantly by sex and race and ethnicity. Consistent with previous research, the prevalence of persistent feelings of sadness or hopelessness among female students was nearly twice that of male students (2). Pressures to conform to gender-role expectations and hormonal changes associated with puberty have been proposed as potential contributing factors to the emergence of sex differences in adolescent depression (9). During puberty, biologic changes occur alongside psychosocial transitions that might interact in ways associated with greater risk for depressive symptoms, particularly among girls (9). Although female students had a higher prevalence of receiving counseling or therapy than male students, they also had a higher prevalence of unmet need for counseling or therapy. Conversely, male students had a higher prevalence of reporting no perceived need for counseling or therapy. For male students, lower perceived need and lower use of mental health services might be related to social norms that stigmatize poor mental health and seeking help as signs of personal weakness (10). Although seeking help for mental health concerns might be considered more acceptable for females, structural and interpersonal barriers such as the cost of services, limited provider availability, and negative family attitudes might impede access for students, regardless of sex (3,4).

Differences were also apparent by race and ethnicity. Among students reporting persistent feelings of sadness or hopelessness, Black and Asian students had the lowest prevalence of receiving counseling or therapy and the highest prevalence of unmet need; in addition, Black, Asian, and Hispanic students had the highest prevalence of reporting no perceived need for counseling or therapy. Although these data do not allow for a direct examination of why these students did not receive counseling or therapy or perceived that they did not need care, previous research suggests that stigma, parental beliefs, and structural barriers such as low income and insurance status might discourage both acknowledgment of need and formal help-seeking behaviors among racial and ethnic minorities (11). For all students, multiple barriers might impede access to mental health services. Frequently cited structural barriers include financial constraints, transportation issues, long wait times, and difficulty navigating health resources (3,4,8). Personal and interpersonal factors, such as stigma, low perceived symptom severity, and a preference for self-reliance, also might discourage youths from seeking help (3,4,8). Negative family and community attitudes toward mental health concerns, including distrust of health professionals

or skepticism regarding treatment effectiveness, have been associated with lower help-seeking behaviors and use of mental health services (3). Because past negative experiences with health care providers have been associated with low trust in mental health services (3,12), creating supportive, adolescent-friendly care environments might help reduce barriers to mental health service use.

Population-level strategies, such as improving mental health literacy, might help address these multifaceted challenges. Mental health literacy is the ability to recognize warning signs of poor mental health, understand when and how to seek help from trusted adults or mental health professionals, and use healthy coping strategies to manage stress and promote well-being (3). Health education, generally, and efforts to increase mental health literacy, specifically, have been associated with increased use of health care and positive engagement with health care providers (3).

Schools might play an important role in promoting mental health and supporting students facing a wide range of emotional and mental health concerns (13). For example, school-based mental health services might improve access by reducing transportation and cost barriers for families. In 2025, 55% of public school administrators reported an increase in the percentage of school staff members expressing concerns about students exhibiting depression, anxiety, trauma, or emotional dysregulation or disturbance (<https://nces.ed.gov/surveys/spp/results.asp>). However, only 52% of administrators reported that their school was able to provide mental health services for all students who needed them. Addressing mental health workforce shortages and expanding the school-based mental health workforce might improve access to both prevention and treatment services. Initiatives that streamline referral processes and expand school-based care might help address gaps between the prevalence of mental health challenges and the use of services (14).

In addition to providing access to services, schools might play a preventive role by fostering safe and supportive environments that promote mental health and well-being. In 2023, CDC released *Promoting Mental Health and Well-Being in Schools: An Action Guide for School and District Leaders* (<https://www.cdc.gov/mental-health-action-guide/about/index.html>), which outlines evidence-based strategies to support student mental health and well-being. Key strategies include increasing students' mental health literacy by delivering classroom-based mental health education and implementing peer modeling programs that support students at all grade levels to build resilience and manage emotional challenges. CDC-supported programs in several school districts have implemented evidence-based approaches incorporating trauma-informed practices, mindfulness activities, and social-emotional skill

development to support student mental health and well-being, consistent with recommended school-based mental health promotion strategies. For example, Chicago Public Schools adopted a comprehensive mental health and suicide prevention policy in 2022 (<https://www.cps.edu/sites/cps-policy-rules/policies/700/704/704-13/>) that requires each of its 647 K–12 schools to establish a behavioral health team responsible for providing universal and targeted prevention and composed of a school psychologist, nurses, case managers, social workers, and other relevant stakeholders. Other CDC–supported recipients, such as the Arkansas Department of Education and Eaton Regional Education Services Agency, have leveraged CDC’s What Works in Schools program (<https://www.cdc.gov/healthy-youth/what-works-in-schools/overview.html>) and the Substance Abuse and Mental Health Services Administration’s (SAMHSA’s) Project AWARE (Advancing Wellness and Resiliency in Education) program (<https://www.samhsa.gov/mental-health/children-and-families/school-health/project-aware>) to support sustainable infrastructure for school-based mental health programs and services, including primary prevention.

Programs like these provide examples of how schools can move beyond service provision alone to proactively support students’ emotional development and overall well-being in a classroom setting through implementation of comprehensive, multitiered systems of support and collaboration with community-based partners. Integrating mental health services into primary care, expanding telehealth capacity, and increasing school-based counseling services might improve the continuity of care for adolescents (14). Strengthening trusting relationships between youths and parents, teachers, and counselors might facilitate help-seeking behaviors (14). Peer support programs and interventions that equip parents and guardians to recognize signs of distress and support adolescents in seeking help might further reduce barriers to accessing mental health services (15). For adolescents and families who are seeking services, care navigator programs might provide additional support by helping them connect with appropriate mental health resources, potentially improving continuity of care and reducing unmet need (16).

Limitations

General limitations for YRBS are available in the overview report of this supplement (7). The findings in this report are subject to at least three additional limitations. First, the YRBS measure of mental health counseling or therapy does not capture the type, frequency, or quality of services received, nor can it be used to assess the adequacy of care. Second,

the survey’s response options for unmet need (e.g., cost, not knowing how or where to get help, or another reason) do not collect specific reasons, which limits the ability to fully examine specific barriers to accessing care. Finally, the majority of missing data for the mental health counseling or therapy item were from students who were not asked the question to reduce respondent effort in schools selected for both national and site-level YRBS samples, which might limit generalizability. However, students with and without mental health counseling or therapy data did not differ significantly by sex, race and ethnicity, or grade.

Future Directions

Given the higher prevalence of unmet need for mental health counseling or therapy among female and racial and ethnic minority students experiencing persistent feelings of sadness or hopelessness, future research is needed to identify effective strategies for addressing barriers to care in these populations. Although evidence-based primary prevention strategies have been identified, additional research is needed to evaluate their implementation and effectiveness in schools and community settings, because improving access to clinical services alone might not fully address adolescent mental health needs. Potential primary prevention strategies include mental health education, violence prevention programming, peer mentoring, brief interventions, support groups, and other low-intensity, school-based supports.

Studies should also explore how adolescents access mental health information online, including through social media and generative artificial intelligence (AI). Approximately one in eight U.S. adolescents reported using generative AI chatbots for mental health support (17). Although these technologies might reduce barriers related to cost, accessibility, and stigma, concerns remain regarding the lack of scientific validation, safety protocols, and regulatory oversight (<https://www.apa.org/topics/artificial-intelligence-machine-learning/health-advisory-ai-chatbots-wellness-apps-mental-health.pdf>). Potential priorities include developmentally appropriate digital literacy education, dissemination of accurate mental health information, and support for parents, caregivers, and school professionals in guiding adolescents’ use of these technologies.

Conclusion

Approximately one in three U.S. high school students reported persistent feelings of sadness or hopelessness, yet fewer than one third of these students received counseling or therapy. An unmet need for mental health counseling or therapy was

most prevalent among female students and certain racial and ethnic groups, whereas male students had a higher prevalence of reporting no perceived need for counseling or therapy. These findings highlight potential opportunities for a multitiered response that includes school-based mental health services, improved mental health literacy, and socially and culturally appropriate interventions that engage all youths, families, and communities. CDC resources such as Promoting Mental Health and Well-Being in Schools: An Action Guide for School and District Leaders, as well as What Works in Schools, might support implementation of such approaches in school settings. Increasing access to appropriate and inclusive mental health support for adolescents remains a public health priority.

Acknowledgments

The authors acknowledge David Chyen, Joana Lively, Cecily K. Mbaka, and Zachary Myles, CDC.

During March–August 2026, authors used the U.S. Department of Health and Human Services instance of ChatGPT 5.3 through 5.6 (OpenAI, San Francisco, California) and Claude 4.6 Sonnet (Anthropic, San Francisco, California) to generate, debug, or edit analytic scripts or code and for limited editing of manuscript text for grammar and clarity. All outputs were reviewed and finalized by the authors.

Conflicts of Interest

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.

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TABLE 1. Questions, response options, and analytic coding for persistent feelings of sadness or hopelessness and use of mental health services — Youth Risk Behavior Survey, United States, 2025

Variable	Question	Response option	Analytic coding
Persistent feelings of sadness or hopelessness	During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?	Yes or no	Yes versus no
Use of mental health counseling or therapy	During the past 12 months, which of the following best describes your experience with counseling or therapy from a health professional, such as a doctor, nurse, psychologist, or therapist to help with emotions, concentration, behavior, or mental health?	I did not receive counseling or therapy because I did not need it; I needed counseling or therapy but did not get it because of cost, not knowing how or where to get help, or another reason; I received counseling or therapy	Did not receive counseling or therapy because I did not need it (no perceived need) versus unmet need for counseling or therapy (unmet need) versus received counseling or therapy

TABLE 2. Prevalence of persistent feelings of sadness or hopelessness among high school students, by demographic characteristics — Youth Risk Behavior Survey, United States, 2025*

Characteristic	Persistent feelings of sadness or hopelessness during the past 12 months
	% (95% CI)
Overall	33.3 (31.2–35.5)
Sex	
Female [†]	43.4 (40.1–46.8)
Male	23.9 (21.9–26.0)
Grade	
9	32.7 (29.9–35.7)
10	34.2 (31.4–37.1)
11	34.3 (30.8–38.0)
12	32.0 (29.1–35.1)
Race and ethnicity[§]	
AI/AN [¶]	39.5 (27.2–53.2)
Asian ^{**}	23.9 (18.7–29.9)
Black or African American ^{††}	34.3 (31.7–37.0)
Hispanic or Latino ^{§§}	37.0 (34.1–40.0)
ME/NA ^{¶¶}	20.9 (11.7–34.5)
NH/PI ^{***}	40.6 (33.2–48.6)
White	31.5 (28.1–35.1)
Multiracial ^{†††}	39.3 (33.7–45.2)

Abbreviations: AI/AN = American Indian or Alaska Native; ME/NA = Middle Eastern or North African; NH/PI = Native Hawaiian or Pacific Islander.

* N = 10,483 respondents with valid responses for the persistent feelings of sadness or hopelessness question (of 10,710 participants in the 2025 national YRBS). The total number (N) of students answering each question varied. Data might be missing because 1) students in schools selected for both national and site-specific YRBS samples completed only one questionnaire; therefore, when the site-specific questionnaire was administered, it might not have included all questions on the national YRBS; 2) the student did not answer the question; or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Prevalence estimates in each category are calculated based on nonmissing data.

[†] Female students differed significantly from male students in the prevalence of persistent feelings of sadness or hopelessness as determined by t test analysis with Taylor series linearization (p<0.05).

[§] Persons of Hispanic or Latino (Hispanic) origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.

[¶] AI/AN students differed significantly from Asian and ME/NA students in the prevalence of persistent feelings of sadness or hopelessness as determined by t test analysis with Taylor series linearization (p<0.05).

^{**} Asian students differed significantly from Black or African American (Black), Hispanic, NH/PI, multiracial, and White students in the prevalence of persistent feelings of sadness or hopelessness as determined by t test analysis with Taylor series linearization (p<0.05).

^{††} Black students differed significantly from ME/NA students in the prevalence of persistent feelings of sadness or hopelessness as determined by t test analysis with Taylor series linearization (p<0.05).

^{§§} Hispanic students differed significantly from ME/NA and White students in the prevalence of persistent feelings of sadness or hopelessness as determined by t test analysis with Taylor series linearization (p<0.05).

^{¶¶} ME/NA students differed significantly from NH/PI and multiracial students in the prevalence of persistent feelings of sadness or hopelessness as determined by t test analysis with Taylor series linearization (p<0.05).

^{***} NH/PI students differed significantly from White students in the prevalence of persistent feelings of sadness or hopelessness as determined by t test analysis with Taylor series linearization (p<0.05).

^{†††} Multiracial students differed significantly from White students in the prevalence of persistent feelings of sadness or hopelessness as determined by t test analysis with Taylor series linearization (p<0.05).

TABLE 3. Use of mental health services among high school students, by demographic characteristics — Youth Risk Behavior Survey, United States, 2025*

Characteristic	Received counseling or therapy	Unmet need for counseling or therapy	No perceived need for counseling or therapy
	% (95% CI)	% (95% CI)	% (95% CI)
Overall	18.6 (16.5–20.9)	15.4 (14.5–16.4)	66.0 (63.8–68.1)
Sex			
Female [†]	25.1 (22.2–28.3)	21.1 (19.4–23.0)	53.7 (50.8–56.6)
Male	12.3 (10.9–13.9)	9.9 (8.8–11.1)	77.7 (76.1–79.3)
Grade			
9	16.3 (13.5–19.4) [§]	14.7 (13.0–16.6)	69.0 (66.1–71.8) [¶]
10	20.2 (17.1–23.6)	15.3 (13.1–17.7)	64.6 (60.7–68.2)
11	18.4 (15.6–21.4)	17.2 (14.8–19.9)	64.4 (60.9–67.8)
12	19.8 (16.4–23.8)	14.7 (12.3–17.5)	65.5 (61.7–69.1)
Race and ethnicity^{**},^{††}			
AI/AN	8.1 (3.3–18.3) ^{§§}	19.1 (8.2–38.7)	72.8 (55.2–85.3)
Asian	6.4 (4.0–10.0) ^{¶¶}	16.2 (13.2–19.7)	77.4 (73.2–81.1) ^{***}
Black or African American	12.8 (9.9–16.4) ^{†††}	17.2 (14.8–19.8)	70.0 (65.8–74.0) ^{§§§}
Hispanic or Latino	16.8 (14.4–19.5) ^{¶¶¶}	15.9 (13.8–18.2)	67.3 (63.9–70.6) ^{****}
ME/NA	20.2 (10.8–34.7)	13.3 (7.0–23.9)	66.4 (53.7–77.1)
White	21.6 (19.2–24.3)	14.7 (13.1–16.4)	63.6 (60.7–66.5)
Multiracial	24.8 (20.6–29.6)	15.6 (12.3–19.6)	59.5 (54.2–64.7)

Abbreviations: AI/AN = American Indian or Alaska Native; ME/NA = Middle Eastern or North African.

* N = 8,200 respondents with valid responses for the mental health service use item (of 10,710 participants in the 2025 national YRBS). The total number (N) of students answering each question varied. Data might be missing because 1) students in schools selected for both national and site-specific YRBS samples completed only one questionnaire; therefore, when the site-specific questionnaire was administered, it might not have included all questions on the national YRBS; 2) the student did not answer the question; or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Prevalence estimates in each category are calculated based on nonmissing data.

[†] Female students differed significantly from male students in the prevalence of receiving counseling or therapy, unmet need, and no perceived need as determined by *t* test analysis with Taylor series linearization (*p*<0.05).

[§] Students in grade 9 differed significantly from students in grades 10 and 12 in the prevalence of receiving counseling or therapy as determined by *t* test analysis with Taylor series linearization (*p*<0.05).

[¶] Students in grade 9 differed significantly from students in grades 10 and 11 in the prevalence of no perceived need as determined by *t* test analysis with Taylor series linearization (*p*<0.05).

^{**} Persons of Hispanic or Latino (Hispanic) origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.

^{††} Prevalence estimates with a denominator <30 were considered statistically unreliable and were suppressed; therefore, estimates for Native Hawaiian or Pacific Islander students are not presented.

^{§§} AI/AN students differed significantly from Hispanic, multiracial, and White students in the prevalence of receiving counseling or therapy as determined by *t* test analysis with Taylor series linearization (*p*<0.05).

^{¶¶} Asian students differed significantly from Black or African American (Black), Hispanic, ME/NA, multiracial, and White students in the prevalence of receiving counseling or therapy as determined by *t* test analysis with Taylor series linearization (*p*<0.05).

^{***} Asian students differed significantly from Black, Hispanic, multiracial, and White students in the prevalence of no perceived need for counseling or therapy as determined by *t* test analysis with Taylor series linearization (*p*<0.05).

^{†††} Black students differed significantly from Hispanic, multiracial, and White students in the prevalence of receiving counseling or therapy as determined by *t* test analysis with Taylor series linearization (*p*<0.05).

^{§§§} Black students differed significantly from multiracial and White students in the prevalence of no perceived need for counseling or therapy as determined by *t* test analysis with Taylor series linearization (*p*<0.05).

^{¶¶¶} Hispanic students differed significantly from multiracial and White students in the prevalence of receiving counseling or therapy as determined by *t* test analysis with Taylor series linearization (*p*<0.05).

^{****} Hispanic students significantly differed from multiracial students in the prevalence of no perceived need for counseling or therapy as determined by *t* test analysis with Taylor series linearization (*p*<0.05).

TABLE 4. Mental health service use among students who reported persistent feelings of sadness or hopelessness for ≥ 2 weeks during the past 12 months, by demographic characteristics — Youth Risk Behavior Survey, United States, 2025*

Characteristic	Received counseling or therapy	Unmet need for counseling or therapy	No perceived need for counseling or therapy
	% (95% CI)	% (95% CI)	% (95% CI)
Overall	29.6 (25.4–34.2)	28.8 (26.8–31.0)	41.5 (38.0–45.2)
Sex			
Female [†]	33.2 (28.5–38.4)	31.7 (29.1–34.3)	35.1 (31.0–39.3)
Male	23.3 (18.8–28.5)	23.8 (20.1–27.8)	52.9 (48.6–57.2)
Grade			
9	26.6 (21.5–32.4)	29.6 (26.6–32.9)	43.8 (38.8–48.9)
10	31.7 (25.7–38.4)	28.9 (25.5–32.5)	39.4 (33.5–45.6)
11	28.1 (22.4–34.5)	29.4 (24.6–34.7)	42.5 (36.7–48.5)
12	32.5 (26.3–39.4)	27.3 (22.9–32.2)	40.2 (33.8–46.8)
Race and ethnicity^{§,¶}			
Asian	15.7 (9.0–26.1)**	38.4 (30.1–47.5) ^{††}	45.8 (37.2–54.7) ^{§§}
Black or African American	15.4 (11.0–21.1) ^{¶¶}	33.9 (29.0–39.0) ^{***}	50.8 (43.6–57.9) ^{†††}
Hispanic or Latino	25.1 (20.6–30.1) ^{§§§}	29.0 (25.1–33.2)	46.0 (40.9–51.1) ^{¶¶¶}
White	36.5 (31.8–41.5)	27.1 (24.6–29.9)	36.3 (32.6–40.2)
Multiracial	39.6 (30.5–49.4)	24.4 (18.5–31.4)	36.0 (29.9–42.6)

* N = 3,623 respondents who responded yes to the item assessing persistent feelings of sadness or hopelessness for ≥ 2 weeks during the past 12 months (of 10,710 participants in the 2025 national YRBS). The total number (N) of students answering each question varied. Data might be missing because 1) students in schools selected for both national and site-specific YRBS samples completed only one questionnaire; therefore, when the site-specific questionnaire was administered, it might not have included all questions on the national YRBS; 2) the student did not answer the question; or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Prevalence estimates in each category are calculated based on nonmissing data.

[†] Among students who reported persistent feelings of sadness or hopelessness, female students differed significantly from male students in the prevalence of receiving counseling or therapy, unmet need, and no perceived need as determined by *t* test analysis with Taylor series linearization ($p < 0.05$).

[§] Persons of Hispanic or Latino (Hispanic) origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.

[¶] Prevalence estimates with a denominator < 30 were considered statistically unreliable and were suppressed; therefore, estimates for American Indian or Alaska Native, Middle Eastern or North African, and Native Hawaiian or Pacific Islander students are not presented.

^{**} Among students who reported persistent feelings of sadness or hopelessness, Asian students significantly differed from Hispanic, multiracial, and White students in the prevalence of receiving counseling or therapy as determined by *t* test analysis with Taylor series linearization ($p < 0.05$).

^{††} Among students who reported persistent feelings of sadness or hopelessness, Asian students significantly differed from Hispanic, multiracial, and White students in the prevalence of unmet need for counseling or therapy as determined by *t* test analysis with Taylor series linearization ($p < 0.05$).

^{§§} Among students who reported persistent feelings of sadness or hopelessness, Asian students significantly differed from White students in the prevalence of no perceived need for counseling or therapy as determined by *t* test analysis with Taylor series linearization ($p < 0.05$).

^{¶¶} Among students who reported persistent feelings of sadness or hopelessness, Black or African American (Black) students significantly differed from Hispanic, multiracial, and White students in the prevalence of receiving counseling or therapy as determined by *t* test analysis with Taylor series linearization ($p < 0.05$).

^{***} Among students who reported persistent feelings of sadness or hopelessness, Black students significantly differed from multiracial and White students in the prevalence of unmet need for counseling or therapy as determined by *t* test analysis with Taylor series linearization ($p < 0.05$).

^{†††} Among students who reported persistent feelings of sadness or hopelessness, Black students significantly differed from multiracial and White students in the prevalence of no perceived need for counseling or therapy as determined by *t* test analysis with Taylor series linearization ($p < 0.05$).

^{§§§} Among students who reported persistent feelings of sadness or hopelessness, Hispanic students significantly differed from multiracial and White students in the prevalence of receiving counseling or therapy as determined by *t* test analysis with Taylor series linearization ($p < 0.05$).

^{¶¶¶} Among students who reported persistent feelings of sadness or hopelessness, Hispanic students significantly differed from multiracial and White students in the prevalence of no perceived need for counseling or therapy as determined by *t* test analysis with Taylor series linearization ($p < 0.05$).

TABLE 5. Association between persistent feelings of sadness or hopelessness and mental health service use, by sex — Youth Risk Behavior Survey, United States, 2025

	Persistent feelings of sadness or hopelessness								
	Overall			Female			Male		
	Yes	No	aPR*	Yes	No	aPR [†]	Yes	No	aPR [†]
Mental health service use	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)	% (95% CI)
Received counseling or therapy	29.6 (25.4–34.2)	12.8 (11.2–14.7)	2.08 (1.83–2.36)	33.2 (28.5–38.4)	18.5 (15.9–21.3)	1.83 (1.59–2.11)	23.3 (18.8–28.5)	8.9 (7.6–10.2)	2.65 (2.09–3.36)
Unmet need for counseling or therapy	28.8 (26.8–31.0)	8.5 (7.6–9.6)	3.05 (2.62–3.56)	31.7 (29.2–34.3)	12.8 (11.3–14.5)	2.52 (2.21–2.87)	23.8 (20.1–27.8)	5.5 (4.4–6.7)	4.20 (3.11–5.69)
No perceived need for counseling or therapy	41.5 (38.0–45.2)	78.6 (76.4–80.7)	0.57 (0.54–0.61)	35.1 (31.0–39.3)	68.7 (65.6–71.7)	0.50 (0.45–0.55)	52.9 (48.6–57.2)	85.7 (83.9–87.3)	0.62 (0.57–0.68)

Abbreviation: aPR = adjusted prevalence ratio.

* Adjusted for sex, grade, and race and ethnicity. The aPR compares students with persistent feelings of sadness or hopelessness (answered “yes”) to those without (answered “no”; referent group).

[†] Adjusted for grade and race and ethnicity. The aPR compares students with persistent feelings of sadness or hopelessness (answered “yes”) to those without (answered “no”; referent group).

Prevalence of Binge Eating Behavior Among High School Students and Associations with Social Media Use, Mental Health, and Suicide Risk — Youth Risk Behavior Survey, United States, 2025

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Abstract

Disordered eating among adolescents is a public health concern, and binge eating, which is eating an unusually large amount of food while feeling a loss of control, is among the most prevalent forms. In 2025, for the first time, the nationally representative Youth Risk Behavior Survey (YRBS) included an item assessing binge eating among U.S. high school students. Among students with binge eating information available (N = 6,898), this report describes the first national prevalence estimates of binge eating overall and by demographic characteristics and examines associations between binge eating and social media use, mental health, and suicide risk. Pairwise *t* tests were used to identify demographic differences, and logistic regression models with predicted marginals were used to estimate adjusted prevalence ratios to compare binge eating prevalence by social media use, mental health, and suicide risk, overall and by sex. During 2025, 40.5% of U.S. high school students reported binge eating at least 1 day in the past 30 days, with 17.2% reporting ≥ 3 days. Prevalence of binge eating on ≥ 3 days was higher among female (18.6%) than male students (15.9%); higher among Hispanic (20.5%) and Black or African American (18.7%) than White (14.6%) and Middle Eastern or North African (9.9%) students; and higher among multiracial (19.6%) than Middle Eastern or North African students. Overall, students who reported using social media hourly or more, having poor mental health, having persistent sadness or hopelessness, or having seriously considered attempting suicide had a higher prevalence of binge eating on ≥ 3 days than those who did not report these factors. These associations between binge eating and social media use, mental health, and suicide risk were observed among both female and male students. The findings might guide efforts to expand binge eating surveillance among adolescents and identify correlates that could support surveillance and future intervention research.

Introduction

Eating disorders, including anorexia nervosa, bulimia nervosa, and binge eating disorder, are serious diagnosed mental illnesses characterized by meaningful disturbances in eating patterns and, often, body image (1). Initial onset of eating disorders occurs primarily during adolescence and young adulthood (1). Disordered eating, which is defined as eating- and weight-related behaviors such as fasting, purging, and binge eating that might negatively affect health but do not necessarily meet diagnostic criteria for an eating disorder, might be common, with estimates varying depending on the measure and population studied. In a systematic review

and meta-analysis using the Sick, Control, One, Fat, Food (SCOFF) screening tool, estimates of disordered eating ranged from 5.6% to 20.5% across studies with different samples of U.S. children and adolescents (2). Separately, 29.1% of Arizona high school students reported unhealthy weight-control behaviors in the 2021 Arizona Youth Risk Behavior Survey (3). These behaviors might be symptoms, correlates, or markers of eating-disorder risk and are associated with adverse health outcomes in adolescent and young adult populations. Among adolescents, disordered eating behaviors have been associated with depressive symptoms and lower self-esteem (4), whereas among young adults, these behaviors have been associated with poor self-rated health and psychological distress (5).

Binge eating is a common form of disordered eating among youths and involves eating an unusually large amount of food while feeling a loss of control (2,4). As with all forms of disordered eating, binge eating might occur without meeting

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the frequency, duration, severity, or other criteria required for a diagnosis of binge eating disorder. Previous research found that among adolescents, binge eating behaviors varied by sociodemographic characteristics, including age, sex, race and ethnicity, and household income (6). Binge eating also has been associated with psychological distress, including depression, anxiety, suicidal ideation, and suicide attempts (7,8). Taken together, these associations suggest that binge eating might be an important consideration within the broader youth mental health crisis (9).

Social media might be another important factor to consider in relation to binge eating given its widespread use among adolescents; in 2023, 77.0% of U.S. high school students reported using social media at least several times per day (10,11). More recent national data indicate that teens continue to use multiple social media platforms frequently, with overall usage patterns remaining relatively stable since 2022 (12). A growing body of evidence suggests that social media use might be related to binge eating through greater exposure to appearance- and diet-related content, social comparison, and the internalization of idealized body standards, all of which have been proposed as possible pathways to body dissatisfaction and can result in cycles of dietary restriction and binge eating (10).

Using 2025 Youth Risk Behavior Survey (YRBS) data, this report estimates the prevalence of binge eating among U.S. high school students, identifies disproportionately affected groups, and examines associations between binge eating and social media use, mental health, and suicide risk. This is the first YRBS since the 2013 survey that CDC has collected nationally representative data on any disordered eating behaviors among youths. The 2025 survey was also the first YRBS to capture data specifically on binge eating, providing the first national estimates of binge eating behavior among U.S. high school students. This survey addition was made in response to growing interest from partners in the field (e.g., researchers, public health practitioners, and school and education professionals) and used the flexibility of the YRBS system in capturing data on emerging adolescent health behaviors and experiences. The findings in this report are intended to guide these partners' efforts to expand surveillance of binge eating among adolescents and identify groups and factors to consider for future intervention research and surveillance planning.

Methods

Data Source

This report includes data from the 2025 YRBS (N = 10,710), a cross-sectional, school-based survey conducted biennially since 1991. Each survey year, CDC collects data from a

nationally representative sample of students from public and private schools, including parochial schools, in grades 9–12 in the 50 U.S. states and the District of Columbia. Additional information about YRBS sampling, data collection, response rates, and processing is available in the overview report of this supplement (13). The prevalence estimates for binge eating and other YRBS variables among U.S. high school students overall and stratified by demographic characteristics are available at <https://youthonline.cdc.gov>. The full YRBS questionnaire, datasets, and documentation are available at <https://www.cdc.gov/yrb/index.html>. This study was approved by institutional review boards at CDC and ICF, the survey contractor, and was conducted consistent with applicable federal law and CDC policy.*

Measures

Questions, response options, and analytic coding for binge eating and the other health behaviors and experiences examined are provided (Table 1). Information for binge eating was obtained from responses to the question, “During the past 30 days, on how many days did you eat an unusually large amount of food in a short period of time and experience a loss of control over how much you were eating or a feeling that you could not stop eating even when full?” Responses were dichotomized as binge eating on ≥ 3 days in the past 30 days (3–5 days, 6–9 days, 10–19 days, 20–29 days, or all 30 days) versus < 3 days (0 days or 1 or 2 days). The threshold of ≥ 3 days was selected as a conservative analytic approach intended to distinguish recurrent binge eating from isolated overeating when using a single self-report item. Of the 10,710 students in the analytic sample, 3,501 were not administered the binge eating question because of survey procedures for schools selected for both the national and site-specific YRBS samples. Students in these schools completed only one questionnaire; when the site-specific questionnaire was administered, it might not have included all questions on the national YRBS, including the binge eating question (13). Among the 7,209 students who were administered the binge eating question, 311 did not provide a valid response, resulting in 6,898 students with valid binge eating data. Four additional health behaviors or experiences were examined: 1) social media use, categorized as a three-level variable (hourly or more, several times per day, once per day or less); 2) poor mental health, defined as reporting that their mental health was not good most of the time or always in the past 30 days; 3) persistent feelings of sadness or hopelessness, defined as reporting feelings of sadness or hopelessness for ≥ 2 weeks in a row in the past 12 months; and 4) seriously considered

* 45 C.F.R. part 46.114; 21 C.F.R. part 56.114.

attempting suicide in the past 12 months. Distributions of response options for social media use, mental health, and suicide risk measures among students with valid binge eating data are provided ([Supplementary Table 1](#)).

Demographic variables included sex (female or male), grade (9, 10, 11, or 12), and race and ethnicity (American Indian or Alaska Native [AI/AN], Asian, Black or African American [Black], Hispanic or Latino [Hispanic], Middle Eastern or North African [ME/NA], Native Hawaiian or Pacific Islander, White, or multiracial [selected more than one racial category]). Persons of Hispanic origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.

Analysis

Weighted prevalence estimates and corresponding 95% CIs were calculated for each response option for binge eating in the past 30 days. In addition, the weighted prevalence of binge eating on ≥ 3 days, with corresponding 95% CIs, was estimated overall and by demographic characteristics and the other health behaviors and experiences. Differences in the weighted prevalence of binge eating on ≥ 3 days by demographic characteristics were assessed using pairwise design-adjusted *t* tests. Logistic regression models with predicted marginals were used to estimate unadjusted and adjusted prevalence ratios (aPRs) and adjusted prevalence differences (aPDs) comparing the prevalence of binge eating on ≥ 3 days by social media use, mental health, and suicide risk measures. Separate models were fit for each social media use, poor mental health, persistent feelings of sadness or hopelessness, and suicide risk measure, controlling for sex, grade, and race and ethnicity. Sex-specific aPRs and aPDs also were estimated using models adjusted for grade and race and ethnicity. Unadjusted prevalence ratios and prevalence differences are provided ([Supplementary Table 2](#)). The prevalence of binge eating was compared across social media use categories, with once per day or less as the referent group. A secondary comparison examined students reporting social media use hourly or more compared with several times per day as the referent group. All prevalence estimates and measures of association used Taylor series linearization. Pairwise *t* tests and prevalence differences were considered statistically significant at $p < 0.05$, and prevalence ratios were considered statistically significant when the 95% CI did not cross the null hypothesis value of 1.0. Corrections for multiple comparisons were not applied because the analyses were descriptive and hypothesis generating, and each statistical test addressed a distinct research question and was interpreted independently. Prevalence estimates with a denominator < 30 were considered

statistically unreliable and were suppressed; therefore, prevalence estimates for Native Hawaiian or Pacific Islander students were suppressed. All analyses were conducted with SAS-callable SUDAAN (version 11.0.4; RTI International) and accounted for the complex sampling design and weighting. Survey weights accounted for the complex sampling design and survey-level nonresponse but were not adjusted separately for item-specific missing data. In a sensitivity analysis to assess potential bias from missing binge eating data, distributions of sex, race and ethnicity, and grade were compared between students with and without available binge eating data; no statistically significant differences were observed.

Results

In weighted analyses, 59.5% of students reported 0 days of binge eating, indicating that 40.5% of students reported binge eating on at least 1 day in the past 30 days (Table 2). In addition, 17.2% of students reported binge eating on ≥ 3 days (Table 3). Female students had a higher prevalence of reporting binge eating on ≥ 3 days compared with male students (18.6% versus 15.9%) (Table 3). No statistically significant differences were observed by grade level. Hispanic (20.5%) and Black (18.7%) students had a higher prevalence of binge eating on ≥ 3 days compared with White (14.6%) and ME/NA (9.9%) students. Multiracial (19.6%) students had a higher prevalence of binge eating on ≥ 3 days than ME/NA students.

Among all students, those using social media hourly or more had a higher prevalence of binge eating on ≥ 3 days than did those using social media once per day or less (22.8% versus 12.9%; aPR = 1.70; aPD = 9.2) (Table 4). Students using social media hourly or more also had a higher prevalence of binge eating than did those using social media several times per day (22.8% versus 14.4%; aPR = 1.56; aPD = 8.1). The prevalence of binge eating on ≥ 3 days was higher among students who reported poor mental health than among those who did not (27.2% versus 14.0%; aPR = 1.95; aPD = 13.2) and higher among students who reported persistent feelings of sadness or hopelessness than among those who did not (25.4% versus 12.8%; aPR = 1.91; aPD = 11.8). Students who had seriously considered attempting suicide had a higher prevalence of binge eating on ≥ 3 days than those who had not (27.1% versus 15.3%; aPR = 1.72; aPD = 11.1). These associations between binge eating and social media use, mental health, and suicide risk were also observed among both female and male students (Table 4).

Discussion

This report provides the first national prevalence estimate of binge eating behavior from a representative sample of U.S. high school students. In 2025, 40.5% of students reported binge eating on at least 1 day, and 17.2% reported binge eating on ≥ 3 days in the past 30 days. The prevalence of binge eating on ≥ 3 days was higher among female students (18.6%) than among male students (15.9%). Racial and ethnic differences were also observed for binge eating on ≥ 3 days, with Black and Hispanic students reporting higher prevalences than White and ME/NA students and multiracial students reporting a higher prevalence than ME/NA students. However, comparisons involving ME/NA students should be interpreted with caution because the ME/NA estimate was imprecise due to the small sample size. Furthermore, using social media hourly or more, having poor mental health, having persistent sadness or hopelessness, and having seriously considered attempting suicide were associated with a higher prevalence of binge eating on ≥ 3 days, and these associations were observed among both female and male students.

The proportion of students reporting binge eating on ≥ 3 days might be concerning, given reported associations of binge eating with increased risk for eating disorders and negative health outcomes (5,7,8). Although binge eating prevalence was lower among male than female students, prevalence among male students was still notable, and associations with social media use, mental health, and suicide risk were observed among both female and male students. These findings suggest that male students might be an important population to consider in prevention and early identification efforts, along with female students, particularly given previous studies indicating that disordered eating among male youths could be underrecognized (14). In addition, the prevalence of binge eating on ≥ 3 days was 18.7% among Black students, 20.5% among Hispanic students, and 25.6% among AI/AN students; however, the estimate for AI/AN students was imprecise, and larger sample sizes are needed. These findings could be considered in the context of concerns that eating disorders might be underrecognized in some racial and ethnic groups and suggest the importance of greater attention to binge eating and disordered eating risk across different subpopulations (15).

The findings on binge eating and social media use are consistent with previous research suggesting that frequent social media use is associated with binge eating, although studies that have focused on school-aged populations remain limited (10). In this report, the prevalence of binge eating on ≥ 3 days was higher among students who reported social media use hourly or more than among those who reported use several times per day or once per day or less, whereas the prevalence

did not differ significantly between the two lower-use groups. Although the underlying mechanisms of this pattern remain unclear, research suggests that exposure to appearance- and diet-related content, comparisons with others' appearances, and internalization of idealized body standards might contribute to body dissatisfaction and subsequent binge eating risk (10,16). These dynamics might be of particular concern during adolescence, given their substantial exposure to social media during a period of physical and social development (10,16).

Findings regarding the association between binge eating, mental health, and suicide risk are consistent with previous research. For example, a study that analyzed 2023 Alaska YRBS data demonstrated statistically significant associations between binge eating and both depressive symptoms and suicidal ideation among high school students (8). These findings also align with other research reporting associations between youth binge eating and co-occurring mental health conditions, including depression, anxiety, and suicide risk (7). One proposed hypothesis is that some youths might use binge eating to regulate their emotions and then experience shame or guilt afterward; however, the direction and timing of the association between binge eating and mental health remain uncertain (7,17).

The findings in this report highlight the importance of continued emphasis on disordered eating prevention and intervention among youths by national, state, and local public health and education professionals. Efforts to address disordered eating among youths could benefit from coordination with families, health care providers, and mental health clinicians to support prevention, early identification, and treatment (18). Resources from the Substance Abuse and Mental Health Services Administration's National Center of Excellence for Eating Disorders (<https://nceedus.org>), including eating disorder training and toolkits for health care providers and resources for families, could support these efforts.

Schools might be well-positioned to complement these efforts through prevention and early identification, particularly when staff members are trained and receive support through school resources and planning (18). Such efforts could be embedded within school health offices, health education initiatives, and broader school environments and policies. Existing frameworks for improving health education and school environments could help guide implementation. For example, the Whole School, Whole Community, Whole Child framework (<https://www.cdc.gov/whole-school-community-child/about/index.html>) could be used to address a wide range of health issues through schools. In addition, CDC has two school health programs, What Works in Schools (<https://www.cdc.gov/healthy-youth/what-works-in-schools/index.html>) and the Healthy Schools Program (<https://www.cdc.gov/healthy-schools/about/index.html>), that address health and physical

education, connection to health services and supporting students with health conditions, healthy school environments, and family and community engagement. Programs and models such as these provide frameworks that could be adapted to incorporate prevention and recognition of disordered eating. Specifically, school staff members, including nurses, counselors, psychologists, teachers, and coaches, could consider using nonstigmatizing language in nutrition education, discussing media literacy and the use of enhanced images, fostering an environment inclusive of all body sizes, and supporting early identification and referral (19). These approaches were not evaluated in this study.

Given the associations between binge eating, poor mental health, and suicide risk described in this report, strategies to reduce mental distress and suicide risk, such as those described in the National Strategy for Suicide Prevention (<https://www.hhs.gov/programs/prevention-and-wellness/mental-health-substance-use-disorder/national-strategy-suicide-prevention/index.html>) and CDC's Suicide Prevention Resource for Action (<https://www.cdc.gov/suicide/php/public-health-strategy/index.html>), could also be integrated into school and community prevention efforts.

The inclusion of the binge eating question on the 2025 national YRBS demonstrates how collaboration between CDC and partners in adolescent health and eating disorder prevention can guide surveillance priorities. A 2024 report from the Eating Disorder Public Health Surveillance Working Group recommended assessment of disordered eating in YRBS (20); external collaborators on this report participated in this working group. This partner input helped guide inclusion of binge eating as a surveillance priority and the collection of national data on disordered eating behaviors among high school students. CDC supports nongovernmental organizations that in turn support state education and health agencies in improving the health and well-being of students and staff through professional development and technical assistance, dissemination, and partnerships focused on disordered eating. These activities highlight the potential importance of partnerships among researchers, public health agencies, school districts, and organizations focused on eating disorder prevention in strengthening surveillance and supporting school-based prevention and early identification efforts across U.S. schools.

Limitations

General limitations for YRBS are available in the overview report of this supplement (13). The findings in this report are subject to at least five additional limitations. First, the

majority of missing binge eating data were from students who were not administered the question, which might limit generalizability. However, students with and without available binge eating data did not differ significantly by sex, race and ethnicity, or grade. Second, the cross-sectional design and differing recall periods across survey questions (e.g., 30 days for binge eating and poor mental health versus 12 months for persistent sadness or hopelessness and considering suicide) limit causal interpretation, including the direction and timing of the associations among these measures. Third, potential confounders not captured in YRBS, such as socioeconomic status, could independently influence social media use, mental health outcomes and suicide risk, and binge eating. Fourth, the social media measure captured frequency of use but did not assess duration, exposure to specific content, platform, or type of engagement, which might be more directly related to binge eating. Finally, measuring the complex psychological and behavioral aspects of binge eating with a single survey question is challenging. Some students might have confused occasional overeating with binge eating, which could have resulted in overestimates of prevalence. However, cognitive testing of the item suggested that most students understood the question and considered the loss-of-control component when responding.

Future Directions

The prevalence of binge eating, observed differences across demographic groups, and associations with social media use, mental health, and suicide risk highlight the potential importance of continued surveillance to monitor trends, identify disproportionately affected groups, and guide prevention efforts. Future research could examine the underlying mechanisms linking binge eating and social media use, mental health, and suicide risk by sex, race and ethnicity, and other demographic characteristics and assess whether existing evidence-based interventions require adaptation for specific populations.

These new representative data indicate that binge eating might be common among adolescents; however, translating these data into action might require addressing existing implementation gaps. Despite increasing awareness of disordered eating among youths, previous studies have noted limited public health engagement in eating disorder prevention and a potential need to broaden prevention approaches beyond individually focused interventions (21). Implementation of school-based interventions for eating disorder prevention and early identification might be supported by staff training, resource development, and planning (18). In addition, introducing weight-inclusive approaches within

school environments where weight-normative programs and practices remain common might create uncertainty for school staff members about how to apply weight-inclusive guidance, particularly when training and implementation resources are limited (22). Without such supports, school staff members might face barriers to addressing disordered eating among students. For example, a survey of school psychologists practicing in K–12 public schools across the United States found that respondents reported limited preparation and knowledge regarding supports for students with disordered eating, and many had sought additional training; however, these findings might not generalize to other school staff members or U.S. schools overall (23).

Conclusion

Binge eating was reported by a notable proportion of U.S. high school students, with higher prevalence among female than male students, Black and Hispanic students than White and ME/NA students, and multiracial students than ME/NA students. In addition, students who reported using social media hourly or more, poor mental health, persistent sadness or hopelessness, or having seriously considered attempting suicide had a higher prevalence of reporting binge eating behavior on ≥ 3 days. The findings suggest the importance of continued data collection and more comprehensive surveillance of disordered eating. Such efforts could include assessing behaviors beyond binge eating and monitoring associated factors and trends over time. Findings also might support continued attention to disordered eating prevention and intervention, including comprehensive approaches that address factors associated with disordered eating.

Acknowledgments

The authors acknowledge David Chyen, Joana Lively, Cecily K. Mbaka, and Zachary Myles, CDC.

During March–August 2026, authors used the U.S. Department of Health and Human Services instance of ChatGPT 5.3 through 5.6 (OpenAI, San Francisco, California) and Claude 4.6 Sonnet (Anthropic, San Francisco, California) to generate, debug, or edit analytic scripts or code and for limited editing of manuscript text for grammar and clarity. All outputs were reviewed and finalized by the authors.

Conflicts of Interest

All authors have completed and submitted the International Committee of Medical Journal Editors form for disclosure of potential conflicts of interest. Ariel Beccia reported grant support from the National Institute on Minority Health and Health Disparities (NIMHD), and S. Bryn Austin reported grant support

from NIMHD and the Maternal and Child Health Bureau, Health Resources and Services Administration. No other potential conflicts of interest were disclosed.

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TABLE 1. Questions, response options, and analytic coding for measures of binge eating, social media use, mental health, and suicide risk among high school students — Youth Risk Behavior Survey, United States, 2025

Variable	Question	Response option	Analytic coding
Binge eating in the past 30 days	During the past 30 days, on how many days did you eat an unusually large amount of food in a short period of time and experience a loss of control over how much you were eating or a feeling that you could not stop eating even when full?	0 days, 1 or 2 days, 3–5 days, 6–9 days, 10–19 days, 20–29 days, or all 30 days	≥3 days versus <3 days
Frequency of social media use	How often do you use social media?*	I do not use social media, a few times a month, about once a week, a few times a week, about once per day, several times per day, about once an hour, or more than once an hour	Hourly or more (about once an hour or more than once an hour) versus several times per day versus once per day or less (I do not use social media, a few times a month, about once a week, a few times a week, or about once per day)
Poor mental health	During the past 30 days, how often was your mental health not good? (Poor mental health includes stress, anxiety, and depression.)	Never, rarely, sometimes, most of the time, or always	Yes (most of the time or always) versus no (never, rarely, or sometimes)
Persistent feelings of sadness or hopelessness	During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?	Yes or no	Yes versus no
Seriously considered attempting suicide	During the past 12 months, did you ever seriously consider attempting suicide?	Yes or no	Yes versus no

* The 2025 National Youth Risk Behavior Survey questionnaire describes social media, “such as Instagram, TikTok, Snapchat, and X (formerly known as Twitter).”

TABLE 2. Prevalence of binge eating in the past 30 days among high school students, by number of days — Youth Risk Behavior Survey, United States, 2025*

Response option, no. of days	Unweighted no.	Weighted % (95% CI)
0 days	3,911	59.5 (57.5–61.5)
1 or 2 days	1,699	23.3 (21.9–24.7)
3–5 days	632	8.3 (7.4–9.3)
6–9 days	277	3.7 (3.1–4.4)
10–19 days	183	2.5 (2.1–3.1)
20–29 days	49	0.6 (0.4–0.9)
All 30 days	147	2.0 (1.6–2.5)
Missing	3,812	—

* N = 10,710 respondents. The total number (N) of students answering each question varied. Data might be missing because 1) students in schools selected for both national and site-specific YRBS samples completed only one questionnaire; therefore, when the site-specific questionnaire was administered, it might not have included all questions on the national YRBS; 2) the student did not answer the question; or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Prevalence estimates in each category are calculated based on nonmissing data.

TABLE 3. Prevalence of binge eating on ≥ 3 days in the past 30 days among high school students, by demographic characteristics — Youth Risk Behavior Survey, United States, 2025*

Characteristic	% (95% CI)
Overall	17.2 (15.8–18.7)
Sex[†]	
Female	18.6 (16.7–20.6)
Male	15.9 (14.4–17.6)
Grade	
9	16.7 (14.6–19.2)
10	17.3 (14.8–20.2)
11	16.8 (14.5–19.5)
12	17.6 (14.9–20.7)
Race and ethnicity^{§,¶}	
AI/AN	25.6 (11.5–47.5)
Asian	17.7 (13.8–22.3)
Black or African American**	18.7 (16.9–20.8)
Hispanic or Latino ^{††}	20.5 (18.2–23.1)
ME/NA ^{§§}	9.9 (4.7–19.7)
White	14.6 (12.9–16.6)
Multiracial	19.6 (14.9–25.4)

Abbreviations: AI/AN = American Indian or Alaska Native; ME/NA = Middle Eastern or North African.

* N = 6,898 respondents with valid responses for the binge eating item (of 10,710 participants in the 2025 national YRBS). The total number (N) of students answering each question varied. Data might be missing because 1) students in schools selected for both national and site-specific YRBS samples completed only one questionnaire; therefore, when the site-specific questionnaire was administered, it might not have included all questions on the national YRBS; 2) the student did not answer the question; or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Prevalence estimates in each category are calculated based on nonmissing data.

[†] Female students significantly differed from male students as determined by *t* test with Taylor series linearization ($p < 0.05$).

[§] Persons of Hispanic or Latino (Hispanic) origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.

[¶] Prevalence estimates with a denominator < 30 were considered statistically unreliable and were suppressed; therefore, estimates for Native Hawaiian or Pacific Islander students are not presented.

** Black or African American students significantly differed from ME/NA and White students as determined by *t* test with Taylor series linearization ($p < 0.05$).

^{††} Hispanic students significantly differed from ME/NA and White students as determined by *t* test with Taylor series linearization ($p < 0.05$).

^{§§} ME/NA students significantly differed from multiracial students as determined by *t* test with Taylor series linearization ($p < 0.05$).

TABLE 4. Prevalence of binge eating on ≥ 3 days in the past 30 days among high school students, by measures of social media use, mental health, and suicide risk — Youth Risk Behavior Survey, United States, 2025*

Social media use, mental health, and suicide risk	Overall			Female			Male		
	% (95% CI)	aPR (95% CI) [†]	aPD [†]	% (95% CI)	aPR (95% CI) [§]	aPD [§]	% (95% CI)	aPR (95% CI) [§]	aPD [§]
Social media use[¶]									
Hourly or more	22.8 (20.1–25.7)	1.70 (1.34–2.16)	9.2**	24.9 (21.6–28.5)	1.67 (1.20–2.34)	9.9**	20.8 (17.4–24.7)	1.73 (1.31–2.27)	8.6**
Several times per day	14.4 (12.9–16.0)	1.09 (0.87–1.36)	1.2	15.0 (12.8–17.5)	1.02 (0.70–1.49)	0.3	13.6 (11.3–16.4)	1.16 (0.83–1.63)	1.9
Once per day or less	12.9 (10.6–15.6)	Ref	Ref	15.1 (11.1–20.3)	Ref	Ref	11.6 (9.1–14.7)	Ref	Ref
Poor mental health									
Yes (most of the time or always)	27.2 (23.8–30.9)	1.95 (1.68–2.27)	13.2**	26.8 (23.1–30.9)	1.87 (1.57–2.21)	12.6**	28.2 (23.3–33.6)	2.06 (1.66–2.56)	14.2**
No (never, rarely, or sometimes)	14.0 (12.7–15.3)	Ref	Ref	14.7 (12.9–16.7)	Ref	Ref	13.4 (11.8–15.1)	Ref	Ref
Persistent feelings of sadness or hopelessness									
Yes	25.4 (23.1–27.8)	1.91 (1.66–2.18)	11.8**	26.4 (24.0–29.0)	2.05 (1.75–2.39)	13.3**	23.6 (20.0–27.5)	1.75 (1.42–2.17)	9.9**
No	12.8 (11.4–14.4)	Ref	Ref	12.5 (10.7–14.7)	Ref	Ref	13.0 (11.3–15.0)	Ref	Ref
Seriously considered attempting suicide									
Yes	27.1 (23.0–31.6)	1.72 (1.45–2.05)	11.1**	27.5 (22.5–33.2)	1.64 (1.32–2.03)	10.6**	26.4 (21.0–32.6)	1.82 (1.43–2.32)	11.7**
No	15.3 (13.9–16.8)	Ref	Ref	16.6 (14.7–18.7)	Ref	Ref	14.2 (12.7–15.9)	Ref	Ref

Abbreviations: aPD = adjusted prevalence difference; aPR = adjusted prevalence ratio; Ref = referent.

* N = 6,898 respondents with valid responses for the binge eating item (of 10,710 participants in the 2025 national YRBS). The total number (N) of students answering each question varied. Data might be missing because 1) students in schools selected for both national and site-specific YRBS samples completed only one questionnaire; therefore, when the site-specific questionnaire was administered, it might not have included all questions on the national YRBS; 2) the student did not answer the question; or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Prevalence estimates and analyses in each category are calculated based on nonmissing data.

[†] Adjusted for sex, grade, and race and ethnicity.

[§] Adjusted for grade and race and ethnicity.

[¶] Once per day or less was the referent group for the primary comparisons shown. A secondary comparison (not shown) examined students reporting social media use hourly or more compared with several times per day, with several times per day as the referent group: overall aPR = 1.56 (95% CI = 1.33–1.84); overall aPD = 8.1 (p < 0.001); female students aPR = 1.64 (95% CI = 1.35–1.99); female students aPD = 9.6 (p < 0.001); male students aPR = 1.48 (95% CI = 1.11–1.99); male students aPD = 6.6 (p = 0.01).

** Statistically significant as determined by a pairwise difference from the adjusted logistic regression model with predicted marginal proportions (p < 0.05).

Urban-Rural and Demographic Differences in Substance Use Among High School Students — Youth Risk Behavior Survey, United States, 2025

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Abstract

Adolescent substance use remains a critical public health concern. Understanding patterns of substance use might guide prevention strategies and identify populations in need of focused, tailored interventions. This report links nationally representative 2025 Youth Risk Behavior Survey data with school characteristics data to describe substance use behaviors and differences by demographic characteristics and among students in public schools for whom locale information was available, by urban-rural classification. Current (i.e., past 30-day) measures included prescription opioid misuse and use of cigarettes, cigars, smokeless tobacco, electronic vapor products, alcohol, and marijuana. Lifetime measures included prescription opioid misuse and use of electronic vapor products, marijuana, cocaine, inhalants, heroin, methamphetamines, ecstasy, hallucinogenic drugs, a composite of selected illicit drugs, and injection of an illegal drug. Differences by sex, race and ethnicity, grade, and school urban-rural classification were analyzed. Adjusted prevalence ratios were used to assess urban-rural differences after controlling for sex, race and ethnicity, and grade. The most commonly reported substance use behaviors were lifetime use of electronic vapor products (30.2%), followed by marijuana (25.5%) and current use of alcohol (20.3%) and electronic vapor products (16.0%). Substance use varied by sex and race and ethnicity, with differences observed in patterns across behaviors. Most observed grade-related differences reflected a higher prevalence among students in higher grade levels. After adjustment, students in rural public schools had a higher prevalence of current smokeless tobacco and electronic vapor product use, as well as lifetime electronic vapor product use, than students in city and suburb or town public schools. In addition, students in rural public schools had a higher prevalence of current cigarette and cigar use than students in suburb or town public schools. These descriptive findings might guide comprehensive and multicomponent youth substance use prevention programs that engage schools, families, and communities, including tobacco and nicotine prevention strategies tailored to rural schools and communities.

Introduction

Substance use is a critical public health challenge (1). Data from the 2024 National Survey on Drug Use and Health found that among persons in the United States aged ≥12 years, 58.3% reported using tobacco products, nicotine vaping products, alcohol, or illicit drugs in the past month (2). Although substance use is an issue for both adolescents and adults, research has identified adolescent substance use as a key risk factor for continued substance use in adulthood (1). Adolescence is also a period of development during which the brain is particularly sensitive to the effects of drugs, and areas of the brain involved in impulse control, judgment,

and decision-making are not yet fully developed (3). Youths who engage in substance use during adolescence are at greater risk for substance use disorders, which are associated with increased mental health challenges and engagement in other risk behaviors (1,3).

Understanding patterns of substance use among adolescents is essential for planning and implementing effective public health responses. Demographic differences in substance use behaviors by sex, race and ethnicity, and grade have been previously identified (4) (<https://youthonline.cdc.gov>). Geographic differences have also been identified, including urban-rural differences in the prevalence of substance use (5). Among adolescents, social and environmental factors associated with substance use behaviors, including peer substance use and accessibility of prevention and treatment resources (1), might vary across geographic contexts. Data from the national Youth Risk Behavior Survey (YRBS) provide

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an important opportunity to understand adolescent substance use, including how patterns might differ based on specific substances (e.g., alcohol, tobacco, or other drugs) and to examine how patterns vary by demographic characteristics. YRBS has been used to monitor adolescent substance use for more than 3 decades. More recently, linkage of national YRBS data with school-level characteristics has expanded this surveillance capacity by enabling examination of substance use patterns by urban-rural school classification using nationally representative YRBS data. This report describes patterns of substance use among U.S. high school students and examines differences by sex, race and ethnicity, grade, and urban-rural classification. The findings in this report might guide policymakers, school administrators, and public health officials in the development and implementation of public health and education interventions to address youth substance use.

Methods

Data Source

This report includes data from the 2025 YRBS (N = 10,710), a cross-sectional, school-based survey conducted biennially since 1991. Each survey year, CDC collects data from a nationally representative sample of students from public and private schools, including parochial schools, in grades 9–12 in the 50 U.S. states and the District of Columbia. Additional information about YRBS sampling, data collection, response rates, and processing is available in the overview report of this supplement (6). The prevalence estimates for all YRBS variables among U.S. high school students overall and stratified by demographic characteristics are available at <https://youthonline.cdc.gov>. The full YRBS questionnaire, datasets, and documentation are available at <https://www.cdc.gov/yrbs/index.html>. This study was approved by institutional review boards at CDC and ICF, the survey contractor, and was conducted consistent with applicable federal law and CDC policy.*

YRBS data were linked to 2024–2025 school characteristics data from the National Center for Education Statistics (NCES) Education Demographic and Geographic Estimates Program (<https://nces.ed.gov/programs/edge/Geographic/SchoolLocations>) to obtain a school-level measure of urban-rural classification. Linkage was based on the NCES school ID, a unique identification number assigned to schools. These data are used and maintained internally by CDC to protect the confidentiality of school-identifying information.

* 45 C.F.R. part 46.114; 21 C.F.R. part 56.114.

Measures

Questions, response options, and analytic coding for all substance use behaviors are provided (Table 1). The seven current substance use behaviors, defined as using the substance at least once during the 30 days before the survey, included prescription opioid misuse and use of cigarettes, cigars, smokeless tobacco, electronic vapor products, alcohol, and marijuana. The 11 lifetime substance use behaviors, defined as ever using the substance at least once, included prescription opioid misuse, injection of an illegal drug, and use of electronic vapor products, marijuana, cocaine, inhalants, heroin, methamphetamines, ecstasy, hallucinogenic drugs, and a composite of selected illicit drugs (i.e., cocaine, inhalants, heroin, methamphetamines, ecstasy, and hallucinogenic drugs).

Demographic variables included sex (female or male), race and ethnicity (American Indian or Alaska Native [AI/AN], Asian, Black or African American [Black], Hispanic or Latino [Hispanic], Middle Eastern or North African [ME/NA], Native Hawaiian or Pacific Islander, White, or multiracial [selected more than one racial category]), and grade (9, 10, 11, or 12). Persons of Hispanic origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.

The percent of missing responses for substance use behaviors varied by survey item, ranging from 1.6% (current cigarette use) to 37.3% (lifetime use of selected illicit drugs), with 12 of 18 behaviors having <15% missing data. To reduce respondent effort, students in schools selected for both the national and site-level YRBS samples were administered only one questionnaire: either the national or site-specific questionnaire. Because site-specific questionnaires might not include all questions on the national YRBS questionnaire, some students included in the national sample were not asked certain substance use questions. These procedures contributed to the higher levels of missing responses for some measures. Demographic variables had low levels of missing responses, with the percent of missing responses ranging from 0.4% (sex and grade) to 0.9% (race and ethnicity). Estimates for each substance use behavior were calculated among students with valid responses to that specific behavior; therefore, analytic denominators varied across substance use behaviors.

School-level urban-rural classification was based on the NCES locale classification scheme, which describes the type of area in which a school is located based on population size or proximity to populated areas (<https://nces.ed.gov/programs/edge/Geographic/LocaleBoundaries>). Additional technical details about the NCES locale framework are available (https://nces.ed.gov/programs/edge/docs/EDGE_LOCALE_TECHDOC.pdf). School-level urban-rural classification included three levels: city, suburb or town, and rural. Urban

locale subtypes included city, suburbs, and town. NCES locale linkage was not conducted for students who attended private schools (approximately 5%); therefore, findings on urban-rural differences in substance use behaviors are only representative of U.S. public high school students.

Analysis

Weighted prevalence and 95% CIs for substance use behaviors were calculated overall and by demographic characteristics and school urban-rural classification. Prevalence estimates with a denominator <30 were considered statistically unreliable and suppressed (6); estimates for Native Hawaiian or Pacific Islander students are not presented because the denominator was <30 for several substance use behaviors. Differences in prevalence of substance use behaviors by demographic characteristics and urban-rural classification were assessed using design-adjusted *t* tests for pairwise comparisons. Logistic regression analyses were used to examine associations between urban-rural classification and substance use behaviors. Because the demographic composition of students might differ across urban-rural classifications and these characteristics might also be associated with substance use, adjusted prevalence ratios (aPRs) were estimated using predicted marginals from models adjusted for sex, race and ethnicity, and grade. All estimates were calculated using Taylor series linearization. Pairwise *t* tests were considered statistically significant at $p < 0.05$, and prevalence ratios were considered statistically significant when the 95% CIs did not cross the null hypothesis value of 1.0. Given the descriptive and hypothesis-generating nature of this study, adjustments were not made for multiple comparisons. Each statistical test addressed a distinct research question and was interpreted independently. All analyses were conducted using SAS-callable SUDAAN (version 11.0.4; RTI International) to account for the complex sampling design and weighting.

Results

Among U.S. high school students in 2025, the most commonly reported substance use behaviors were lifetime use of electronic vapor products (30.2%) and marijuana (25.5%) and current use of alcohol (20.3%) and electronic vapor products (16.0%) (Table 2).

Substance use behaviors varied by sex, race and ethnicity, and grade. Male students had a higher prevalence than female students of current use of cigarettes (4.2% versus 2.7%), cigars (4.5% versus 1.8%), and smokeless tobacco (6.2% versus 1.8%), as well as lifetime use of cocaine (2.5% versus 1.5%), heroin (1.5% versus 0.7%), hallucinogenic drugs (6.3% versus

4.1%), and injection of illegal drugs (1.6% versus 0.4%). In contrast, female students had a higher prevalence than male students of current use of electronic vapor products (18.0% versus 14.2%) and prescription opioid misuse (6.0% versus 4.1%), as well as lifetime electronic vapor product use (33.3% versus 27.4%), marijuana use (27.4% versus 23.8%), and prescription opioid misuse (12.3% versus 9.1%). Differences by race and ethnicity were identified for 15 of 18 substance use behaviors. For nine substance use behaviors, Asian students had a lower prevalence than at least one other racial or ethnic group. For example, Asian students had a lower prevalence of current use of electronic vapor products (4.7%) than AI/AN (19.0%), multiracial (17.5%), White (16.9%), Black (16.7%), and Hispanic (16.4%) students. AI/AN and Hispanic students had a higher prevalence than at least one other racial or ethnic group for five and 13 substance use behaviors, respectively. Among Black, White, multiracial, and ME/NA students, race and ethnicity patterns varied by substance use behavior. Nine of 18 substance use behaviors varied by grade, with substance use behaviors being more common among students in higher grade levels for most behaviors.

Five substance use behaviors varied by urban-rural classification among public high school students (Table 3). Students in rural public schools consistently reported a higher prevalence of tobacco use and electronic vapor product use than students in city and suburb or town public schools. Compared with students in city public schools, students in rural public schools had a higher prevalence of current cigarette (5.8% versus 3.0%), smokeless tobacco (6.4% versus 2.8%), and electronic vapor product use (21.7% versus 15.3%), as well as lifetime electronic vapor product use (38.9% versus 29.3%). Students in rural public schools also had a higher prevalence than students in suburb or town public schools of current use of cigarettes (5.8% versus 3.2%), cigars (4.4% versus 3.1%), smokeless tobacco (6.4% versus 3.1%), and electronic vapor products (21.7% versus 15.2%), as well as lifetime use of electronic vapor products (38.9% versus 28.5%).

In analyses adjusted for sex, race and ethnicity, and grade, students in rural public schools compared with city public schools had a higher prevalence of current use of smokeless tobacco (aPR = 1.84; 95% CI = 1.08–3.13) and electronic vapor products (aPR = 1.37; 95% CI = 1.08–1.74), as well as lifetime use of electronic vapor products (aPR = 1.34; 95% CI = 1.11–1.62) (Table 4). Students in rural public schools compared with suburb or town public schools also had a higher prevalence of current use of cigarettes (aPR = 1.62; 95% CI = 1.04–2.50), cigars (aPR = 1.42; 95% CI = 1.04–1.92), smokeless tobacco (aPR = 1.74; 95% CI = 1.10–2.74), and electronic vapor products (aPR = 1.40; 95% CI = 1.13–1.73), as well as lifetime use of electronic vapor products (aPR = 1.37; 95% CI = 1.17–1.59).

Discussion

From 2013 to 2023, high school students' use of several substances, including alcohol, marijuana, prescription opioids not prescribed to them, and other illicit drugs, declined (4). However, data from the 2025 YRBS indicate that adolescent substance use remains a substantial public health concern, as use of certain substances remains prevalent. Nearly one in three high school students reported lifetime use of electronic vapor products, and approximately one in four reported lifetime marijuana use, making these the most commonly reported lifetime substance use behaviors in this survey cycle. Current alcohol and electronic vapor product use were also commonly reported behaviors, suggesting that a substantial proportion of adolescents are actively engaging in substance use during a critical period of physical and neurologic development (3).

This report uses data from the national YRBS to describe urban-rural differences in a range of substance use behaviors. Students attending rural public schools had a higher prevalence of use of several tobacco-related products, including current use of cigarettes, cigars, smokeless tobacco, and electronic vapor products, as well as lifetime use of electronic vapor products. Differences observed in patterns of current and lifetime use might reflect variations in initiation, continued use, and cessation by urban-rural classification, as current use captures recent substance use behaviors, whereas lifetime use captures any past use, including experimentation. In addition, unadjusted and adjusted findings related to urban-rural differences were largely consistent. However, the difference in current cigarette use between students in rural and city public schools was not statistically significant after adjusting for sex, race and ethnicity, and grade, suggesting that observed differences in the demographic composition of students across rural and city schools might partly explain the unadjusted association. These findings are consistent with findings from the National Youth Tobacco Survey, which indicated that rural high school students are more likely to smoke cigarettes and use smokeless tobacco than urban students (7). Similarly, findings from the Monitoring the Future survey also demonstrated that high school students in rural settings were more likely to report use of several tobacco-related products than students in city or suburban settings (8).

Multiple contextual factors might contribute to these observed differences. Social norms and community-level exposure to tobacco use might influence patterns of use (7). Rural communities often have reduced access to substance use prevention and treatment services, with barriers including longer travel distances and limited provider availability (1). Reducing tobacco use among adolescents likely requires expanding access to evidence-based tobacco prevention

interventions. Schools are essential in these efforts, as they are both a venue where substances are accessed and an ideal setting for the provision of evidence-based prevention programs and services. These efforts might be particularly important in rural schools, because some rural communities experience a shortage of primary care and mental health providers and services (<https://data.hrsa.gov/topics/health-workforce/shortage-areas>).

In contrast, no statistically significant differences by urban-rural classification were observed for alcohol, marijuana, and selected illicit drug use, consistent with data from the National Survey on Drug Use and Health showing generally comparable prevalence estimates for most past-year illicit drug use between metropolitan and nonmetropolitan youths aged 12–17 years (2). Collectively, these findings suggest that urban-rural differences in adolescent substance use might be concentrated in tobacco-related behaviors rather than observed across all substances. One possible explanation is that alcohol, marijuana, and other drug use among adolescents might be more closely related to risk and protective factors that span both urban and rural settings, such as peer substance use, perceived risk, parental monitoring, school connectedness, and the broader environment, than to rurality alone (1,3,9). Previous research suggests that urban-rural differences in tobacco-related product use might be associated with tobacco norms, product availability, and local tobacco control environments (7).

In addition to observed urban-rural differences, substance use behaviors differed by demographic characteristics, highlighting potential opportunities for evidence-based prevention strategies tailored to the needs of different adolescent populations and communities. Males reported higher prevalence of cigarette, cigar, and smokeless tobacco use than females. Females reported higher prevalence of electronic vapor product use than males, consistent with previously reported changes in sex-specific patterns of youth electronic cigarette use (10).

Observed racial and ethnic differences in substance use varied based on the specific substance used. For example, use of several substances was less common among Asian students. A previous study had a similar finding of lower marijuana use among Asian adolescents, which has been attributed to factors such as higher perceived risk and greater disapproval from parents, peers, and close friends (11). Although higher alcohol use was observed among AI/AN students compared with certain racial and ethnic groups, the factors underlying these differences were not examined in this study. Previous research has identified broader societal and contextual factors that might influence substance use risk, including access to prevention and treatment services and community norms (12). Several substance use behaviors were more common among students in higher grade levels, suggesting potential value in early, developmentally appropriate prevention programming

that begins before initiation of use. However, grade-related patterns were not consistent across all substances, which might reflect variations in the popularity or availability of specific substances among different grades.

Schools might be well positioned to address adolescent substance use. A 2019 study found that young people in states with requirements for alcohol use prevention programs in high schools had lower risk for alcohol dependence and abuse than those in states with no requirement (13). Characteristics of effective school-based substance use prevention programs for older adolescents might include those focused on building skills such as refusal techniques, self-control, and decision-making, as well as programs aligning instruction with adolescents' individual future goals (14).

CDC, in collaboration with the CDC Foundation and the Conrad Hilton Foundation, developed and implemented the Teens Linked to Care pilot program, a school-based framework to address substance use and related risky behaviors among youths in rural communities involving health education, primary prevention, and referrals to treatment and services (<https://www.cdc.gov/youth-behavior/risk-behaviors/teens-linked-to-care.html>).

CDC also supports local education agencies to implement evidence-based strategies to strengthen health education, increase access to health services, and foster safe and supportive school environments. The program has been associated with significant decreases in multiple adolescent health risk behaviors, including reductions in marijuana use (15). Additionally, the Drug-Free Communities (DFC) Support Program, administered by the Office of National Drug Control Policy and managed through a partnership with CDC, supports multisector community coalitions, consisting of members from schools, businesses, parents, law enforcement, and community organizations, and works to increase local capacity to prevent and reduce youth substance use. DFC was associated with decreases in past 30-day prescription drug misuse and use of alcohol, tobacco, and marijuana among middle school-aged and high school-aged youths when comparing their first and most recent report (<https://www.cdc.gov/overdose-prevention/php/drug-free-communities/program-success.html>). Although multiple factors might have influenced these decreases, the findings suggest potential value in long-term community-based youth substance use prevention efforts.

Finally, school-based efforts are one component of a broader, comprehensive approach to addressing youth substance use. CDC's Evidence-Based Strategies to Prevent Youth Substance Use (ENGAGE) program (<https://www.cdc.gov/overdose-prevention/php/interventions/youth-substance-use-prevention.html>) includes evidence-based strategies that local,

community, state, or other organizations can use to prevent youth substance use. These strategies can be implemented in schools, early childhood home visitation programs, after-school programs, youth substance use treatment services, and primary care visits.

Limitations

General limitations for YRBS are available in the overview report of this supplement (6). The findings in this report are subject to at least five additional limitations. First, substance use behaviors are based on self-report and might be subject to reporting bias and misclassification. Students might not accurately distinguish between substances, particularly across substances with overlapping effects (e.g., stimulants) or appearance. Survey items on prescription opioid misuse refer broadly to prescription pain medications, although examples focused on opioid-containing medications, which might have resulted in overestimates if respondents included nonopioid pain medications. In addition, substance use measures captured any use within the specified reference period and did not include frequency of use, which could be considered for future studies. Second, analytic denominators varied across substance use measures because of missing data for specific items. Missing data resulted from student nonresponse, invalid responses, and survey design procedures used to reduce respondent effort when schools were selected for both national and site-level YRBS samples, in which some students were not asked all national YRBS questions. If responders and nonresponders systematically differed, this could affect the generalizability of estimates. Third, because these analyses were exploratory and included numerous statistical comparisons without adjustment for multiple testing, statistically significant findings, particularly isolated subgroup differences, should be interpreted cautiously. Fourth, some illegal drug products contain adulterants or other drugs unknown to the person using them (e.g., fentanyl), which might have resulted in discrepancies between reported and actual substance use. Finally, urban-rural classification was based on school-level data, and a student's residence might have differed from the school-level urban-rural classification used in this analysis. Although school-level urban-rural data were available for approximately 95% of students, NCES locale linkage was not conducted for students who attended private schools. Patterns of substance use behaviors might differ systematically between students attending public and private schools; therefore, the findings related to urban-rural differences might not be representative of all U.S. high school students.

Future Directions

Additional research might be needed to identify structural and contextual factors associated with adolescent substance use and to improve access to local data needed for public health action. Because rural communities are heterogeneous, substance use patterns, prevention resources, and cultural norms might vary significantly across states and local jurisdictions. Future studies could use state and local YRBS data to examine how urban-rural differences vary across regional substance use profiles. Analyses using pooled years of national data could also examine urban-rural differences by demographic characteristics to help identify populations at increased risk for substance use and guide prevention and intervention efforts. To understand the specific contextual factors (e.g., health care access and cultural norms) that might underlie these observed urban-rural differences, linking YRBS data to other area-level indicators might be an important next step. For example, future studies could examine how structural factors, such as retail access to tobacco and alcohol and prevailing community norms, might contribute to the higher prevalences of cigarette, smokeless tobacco, and electronic vapor product use observed among students in rural schools. In addition, assessing differences in the availability, accessibility, and funding of school-based prevention programs and community-level treatment resources could help identify critical gaps in underserved areas. Collectively, this work might enable public health practitioners to design geographically tailored, multicomponent prevention and treatment initiatives to address youth substance use.

Conclusion

Findings from this report indicate that alcohol, marijuana, and electronic vapor product use remain common among U.S. high school students. Demographic differences in substance use by sex, race and ethnicity, and grade were observed. Students attending rural public high schools had a higher prevalence of several tobacco-related behaviors than students in city and suburb or town public schools. These findings might be used to guide comprehensive and multicomponent programs involving schools, families, and communities to support youth substance use prevention efforts.

Acknowledgments

The authors acknowledge David Chyen, Joana Lively, Cecily K. Mbaka, and Zachary Myles, CDC.

During March–September 2026, authors used the U.S. Department of Health and Human Services instance of ChatGPT 5.3 through 5.6 (OpenAI, San Francisco, California) and the Copilot environment (GPT-5, Microsoft, Redmond, Washington)

to generate, debug, or edit analytic scripts or code and for limited editing of manuscript text for grammar and clarity. All outputs were reviewed and finalized by authors.

Conflicts of Interest

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.

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TABLE 1. Questions, response options, and analytic coding for current and lifetime use of specific substances among high school students — Youth Risk Behavior Survey, United States, 2025

Variable	Question	Response option	Analytic coding
Current use			
Cigarettes	During the past 30 days, on how many days did you smoke cigarettes?	0 days, 1 or 2 days, 3–5 days, 6–9 days, 10–19 days, 20–29 days, or all 30 days	Yes: 1 or 2 days, 3–5 days, 6–9 days, 10–19 days, 20–29 days, or all 30 days No: 0 days
Cigars	During the past 30 days, on how many days did you smoke cigars, cigarillos, or little cigars, such as Swisher Sweets, Middleton's (including Black and Mild), or Backwoods?	0 days, 1 or 2 days, 3–5 days, 6–9 days, 10–19 days, 20–29 days, or all 30 days	Yes: 1 or 2 days, 3–5 days, 6–9 days, 10–19 days, 20–29 days, or all 30 days No: 0 days
Smokeless tobacco	During the past 30 days, on how many days did you use chewing tobacco, snuff, dip, snus, dissolvable tobacco products, or nicotine pouches such as Copenhagen, Grizzly, Skoal, Camel Snus, on!, ZYN, or Velo? (Do not count any electronic vapor products.)	0 days, 1 or 2 days, 3–5 days, 6–9 days, 10–19 days, 20–29 days, or all 30 days	Yes: 1 or 2 days, 3–5 days, 6–9 days, 10–19 days, 20–29 days, or all 30 days No: 0 days
Electronic vapor products	During the past 30 days, on how many days did you use an electronic vapor product?	0 days, 1 or 2 days, 3–5 days, 6–9 days, 10–19 days, 20–29 days, or all 30 days	Yes: 1 or 2 days, 3–5 days, 6–9 days, 10–19 days, 20–29 days, or all 30 days No: 0 days
Alcohol	During the past 30 days, on how many days did you have at least one drink of alcohol?	0 days, 1 or 2 days, 3–5 days, 6–9 days, 10–19 days, 20–29 days, or all 30 days	Yes: 1 or 2 days, 3–5 days, 6–9 days, 10–19 days, 20–29 days, or all 30 days No: 0 days
Marijuana	During the past 30 days, how many times did you use marijuana?	0 times, 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times	Yes: 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times No: 0 times
Prescription opioid misuse*	During the past 30 days, how many times did you take prescription pain medicine without a doctor's prescription or differently than how a doctor told you to use it?	0 times, 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times	Yes: 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times No: 0 times
Lifetime use			
Electronic vapor products	Have you ever used an electronic vapor product?	Yes or no	Yes: Yes No: No
Marijuana	During your life, how many times have you used marijuana?	0 times, 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, 40–99 times, or ≥100 times	Yes: 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, 40–99 times, or ≥100 times No: 0 times
Prescription opioid misuse*	During your life, how many times have you taken prescription pain medicine without a doctor's prescription or differently than how a doctor told you to use it?	0 times, 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times	Yes: 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times No: 0 times
Cocaine	During your life, how many times have you used any form of cocaine, including powder, crack, or freebase?	0 times, 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times	Yes: 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times No: 0 times
Inhalants	During your life, how many times have you sniffed glue, breathed the contents of aerosol spray cans, or inhaled any paints or sprays to get high?	0 times, 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times	Yes: 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times No: 0 times
Heroin	During your life, how many times have you used heroin (also called smack, junk, or China White)?	0 times, 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times	Yes: 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times No: 0 times
Methamphetamines	During your life, how many times have you used methamphetamines (also called speed, crystal meth, crank, ice, or meth)?	0 times, 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times	Yes: 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times No: 0 times

See table footnotes on the next page.

TABLE 1. (Continued) Questions, response options, and analytic coding for current and lifetime use of specific substances among high school students — Youth Risk Behavior Survey, United States, 2025

Variable	Question	Response option	Analytic coding
Ecstasy	During your life, how many times have you used ecstasy (also called MDMA or Molly)?	0 times, 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times	Yes: 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times No: 0 times
Hallucinogenic drugs	During your life, how many times have you used hallucinogenic drugs, such as LSD, acid, PCP, angel dust, mescaline, or mushrooms?	0 times, 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times	Yes: 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times No: 0 times
Selected illicit drugs	During your life, how many times have you • used any form of cocaine, including powder, crack, or freebase? • sniffed glue, breathed the contents of aerosol spray cans, or inhaled any paints or sprays to get high? • used heroin (also called smack, junk, or China White)? • used methamphetamines (also called speed, crystal meth, crank, ice, or meth)? • used ecstasy (also called MDMA or Molly)? • used hallucinogenic drugs, such as LSD, acid, PCP, angel dust, mescaline, or mushrooms?	0 times, 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times	Yes: 1 or 2 times, 3–9 times, 10–19 times, 20–39 times, or ≥40 times for any included substance No: 0 times for all included substances
Injection of illegal drug	During your life, how many times have you used a needle to inject any illegal drug into your body?	0 times, 1 time, or ≥2 times	Yes: 1 time or ≥2 times No: 0 times

* Questions on current and lifetime prescription opioid misuse are preceded with the following description, “The next 2 questions ask about the use of prescription pain medicine without a doctor’s prescription or differently than how a doctor told you to use it. For these questions, count drugs such as codeine, Vicodin, OxyContin, hydrocodone, and Percocet.”

TABLE 2. Prevalence of current and lifetime use of specific substances among high school students, by demographic characteristics — Youth Risk Behavior Survey, United States, 2025*

Variable	Sex		Race and ethnicity ^{†,§}								Grade			
	Overall	Female	Male	AI/AN	Asian	Black or African American	Hispanic or Latino	ME/NA	White	Multiracial	9	10	11	12
		%	%	%	%	%	%	%	%	%	%	%	%	%
		(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)
Current use[¶]														
Cigarettes**	3.5 (2.7–4.5)	2.7 (1.8–4.1)	4.2 (3.4–5.1)	8.5 (3.1–20.9)	2.1 (1.1–4.1)	1.4 (0.9–2.1)	3.4 (2.6–4.6)	6.1 (1.8–18.6)	4.2 (3.0–6.0)	2.6 (1.3–5.3)	2.1 (1.1–3.8)	2.8 (1.9–4.2)	4.2 (2.9–5.9)	5.1 (4.0–6.5)
Cigars ^{††}	3.2 (2.6–3.9)	1.8 (1.2–2.7)	4.5 (3.8–5.3)	13.0 (3.4–38.8)	1.0 (0.4–2.5)	4.8 (3.1–7.3)	3.3 (2.5–4.4)	7.7 (2.5–21.3)	2.8 (2.1–3.8)	2.7 (1.4–5.1)	2.1 (1.4–3.2)	3.0 (2.1–4.3)	3.5 (2.5–4.9)	4.2 (2.9–6.0)
Smokeless tobacco ^{§§}	4.1 (3.0–5.5)	1.8 (1.3–2.4)	6.2 (4.5–8.7)	5.5 (1.1–24.3)	3.4 (1.6–6.8)	2.0 (1.2–3.2)	2.8 (1.8–4.3)	6.9 (2.1–19.8)	5.4 (3.8–7.5)	2.3 (1.3–4.0)	3.3 (1.9–5.7)	3.5 (2.3–5.5)	4.8 (3.4–6.7)	4.6 (3.3–6.5)
Electronic vapor products ^{¶¶}	16.0 (14.3–17.9)	18.0 (15.9–20.4)	14.2 (12.5–16.1)	19.0 (11.8–29.3)	4.7 (2.8–7.7)	16.7 (14.6–19.2)	16.4 (13.7–19.5)	6.1 (2.8–12.6)	16.9 (14.4–19.8)	17.5 (13.8–22.0)	11.1 (9.0–13.7)	16.0 (13.1–19.2)	18.3 (14.9–22.3)	19.5 (16.5–22.9)
Alcohol***	20.3 (18.1–22.6)	20.9 (18.2–23.9)	19.8 (17.1–22.7)	24.8 (15.1–37.9)	12.7 (9.0–17.7)	10.7 (9.1–12.5)	18.8 (16.6–21.2)	19.9 (10.2–35.0)	23.7 (20.4–27.3)	24.1 (18.0–31.4)	11.5 (9.3–14.1)	16.8 (14.1–19.7)	23.5 (19.4–28.2)	30.9 (27.4–34.7)
Marijuana ^{†††}	12.9 (11.2–14.8)	13.4 (11.5–15.6)	12.5 (10.6–14.7)	12.1 (5.9–23.3)	2.9 (1.6–5.4)	15.4 (12.7–18.5)	12.7 (10.4–15.3)	12.7 (5.8–25.6)	13.4 (11.0–16.3)	13.4 (10.1–17.6)	7.4 (5.9–9.4)	11.9 (9.9–14.3)	15.2 (11.5–19.8)	18.1 (15.2–21.5)
Prescription opioid misuse ^{§§§}	5.0 (4.3–5.8)	6.0 (4.8–7.4)	4.1 (3.3–5.2)	4.3 (1.8–10.1)	7.2 (4.9–10.5)	7.5 (6.2–9.0)	6.4 (5.2–8.0)	4.0 (1.5–9.9)	3.6 (2.8–4.5)	4.5 (2.6–7.9)	5.6 (4.3–7.2)	4.6 (3.3–6.3)	5.2 (4.2–6.5)	4.5 (3.4–5.9)
Lifetime use														
Electronic vapor products ^{¶¶¶}	30.2 (27.5–33.1)	33.3 (30.3–36.4)	27.4 (24.5–30.4)	32.1 (18.9–48.9)	11.7 (8.7–15.6)	31.3 (27.3–35.5)	33.6 (30.1–37.2)	21.2 (15.1–29.1)	30.1 (26.6–33.9)	30.5 (25.1–36.5)	23.5 (19.6–28.0)	28.6 (25.0–32.5)	33.1 (29.1–37.4)	36.8 (33.3–40.4)
Marijuana****	25.5 (22.5–28.7)	27.4 (23.8–31.3)	23.8 (20.9–27.0)	30.9 (17.2–49.0)	6.8 (4.1–11.1)	25.7 (22.1–29.7)	29.1 (25.7–32.7)	23.5 (9.8–46.7)	25.4 (21.8–29.5)	26.7 (20.0–34.7)	14.7 (12.0–17.8)	23.4 (20.0–27.2)	29.7 (24.4–35.6)	36.3 (32.3–40.4)
Prescription opioid misuse ^{††††}	10.6 (9.5–11.9)	12.3 (10.5–14.4)	9.1 (7.9–10.4)	12.8 (4.6–30.7)	10.9 (8.2–14.3)	13.4 (11.6–15.4)	11.9 (9.8–14.3)	8.7 (3.5–20.0)	9.5 (8.1–11.0)	10.5 (7.8–13.9)	11.0 (9.1–13.2)	10.9 (9.0–13.2)	11.1 (9.7–12.7)	9.4 (7.8–11.4)
Cocaine ^{§§§§}	2.0 (1.4–2.8)	1.5 (0.9–2.3)	2.5 (1.7–3.6)	2.5 (1.0–6.5)	1.7 (0.7–4.1)	2.5 (1.5–4.0)	2.4 (1.5–3.9)	4.0 (1.5–10.2)	1.6 (1.0–2.7)	1.9 (0.9–3.9)	2.3 (1.2–4.5)	1.5 (0.9–2.3)	1.8 (1.2–2.7)	2.2 (1.3–3.7)
Inhalants ^{¶¶¶¶}	5.0 (4.2–5.9)	5.1 (3.9–6.5)	5.0 (4.1–6.0)	8.5 (2.2–27.3)	3.6 (1.8–7.1)	5.6 (4.0–7.9)	5.0 (3.7–6.7)	6.6 (1.7–22.8)	5.0 (4.0–6.3)	4.9 (2.4–9.9)	6.9 (5.6–8.5)	4.5 (3.4–5.9)	4.6 (3.3–6.4)	3.5 (2.4–5.0)

See table footnotes on the next page.

TABLE 2. (Continued) Prevalence of current and lifetime use of specific substances among high school students, by demographic characteristics — Youth Risk Behavior Survey, United States, 2025*

Variable	Overall	Sex		Race and ethnicity ^{†,§}							Grade				
		Female	Male	AI/AN	Asian	Black or African American		Hispanic or Latino	ME/NA	White	Multiracial	9	10	11	12
%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	
(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)	(95% CI)
Heroin ^{*****}	1.1 (0.8–1.4)	0.7 (0.4–1.0)	1.5 (1.0–2.1)	0.7 (0.1–4.1)	1.0 (0.3–2.7)	1.9 (1.1–3.3)	1.2 (0.8–1.7)	5.3 (2.0–13.2)	0.7 (0.4–1.2)	0.8 (0.3–2.2)	1.4 (0.7–2.8)	0.8 (0.5–1.3)	1.1 (0.7–1.8)	0.7 (0.4–1.2)	
Metham- phetamines ^{††††}	1.3 (0.9–2.0)	1.1 (0.7–1.8)	1.5 (1.0–2.2)	0.1 (0.0–1.2)	1.0 (0.4–2.8)	1.8 (1.0–3.1)	1.4 (1.0–2.0)	4.4 (1.4–12.9)	1.1 (0.6–2.1)	0.9 (0.4–2.5)	1.8 (0.8–3.7)	0.9 (0.5–1.4)	1.4 (0.9–2.3)	1.0 (0.7–1.6)	
Ecstasy ^{§§§§§}	1.8 (1.3–2.6)	1.5 (0.9–2.4)	2.1 (1.5–3.0)	1.2 (0.2–5.5)	0.8 (0.3–2.7)	2.4 (1.4–3.9)	2.2 (1.6–3.0)	5.7 (1.5–18.7)	1.5 (0.8–2.5)	1.7 (0.8–3.7)	1.8 (0.8–3.8)	1.3 (0.9–2.0)	1.8 (1.1–2.8)	2.3 (1.6–3.4)	
Hallucinogenic drugs ^{¶¶¶¶¶}	5.2 (4.1–6.6)	4.1 (2.7–6.2)	6.3 (5.2–7.7)	2.1 (0.7–6.2)	2.9 (1.1–7.2)	3.4 (2.1–5.5)	6.8 (5.1–9.1)	3.3 (1.1–9.3)	5.0 (3.5–7.1)	5.4 (2.9–10.1)	3.1 (2.2–4.2)	5.3 (3.7–7.7)	4.8 (3.4–6.8)	8.1 (6.0–10.8)	
Selected illicit drugs ^{*****}	9.7 (8.3–11.3)	9.1 (7.1–11.6)	10.3 (8.8–12.0)	10.9 (3.5–29.4)	6.8 (3.4–12.9)	9.1 (6.6–12.6)	11.3 (9.1–14.0)	6.6 (2.1–18.9)	9.2 (7.3–11.5)	10.0 (6.0–16.4)	9.5 (7.7–11.6)	8.6 (6.7–11.1)	9.7 (7.6–12.4)	11.0 (8.5–14.2)	
Injection of illegal drug ^{†††††}	1.0 (0.7–1.6)	0.4 (0.2–0.8)	1.6 (1.0–2.6)	0.7 (0.1–4.1)	0.9 (0.3–2.8)	1.8 (1.0–3.1)	1.2 (0.8–2.1)	3.9 (1.2–12.3)	0.6 (0.3–1.1)	1.6 (0.5–5.3)	1.8 (0.9–3.5)	0.6 (0.4–1.0)	0.8 (0.4–1.4)	0.8 (0.5–1.3)	

Abbreviations: AI/AN = American Indian or Alaska Native; ME/NA = Middle Eastern or North African.

* N = 10,710. The total number (N) of students answering each question varied. Data might be missing because 1) students in schools selected for both national and site-specific YRBS samples completed only one questionnaire; therefore, when the site-specific questionnaire was administered, it might not have included all questions on the national YRBS; 2) the student did not answer the question; or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Prevalence estimates in each category are calculated based on nonmissing data.

† Persons of Hispanic or Latino (Hispanic) origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.

§ Prevalence estimates with a denominator <30 were considered statistically unreliable and therefore were suppressed; estimates for Native Hawaiian or Pacific Islander students are not presented because the denominator was <30 for several substance use behaviors.

¶ Previous 30 days before the survey.

** As determined by *t* test analysis with Taylor series linearization ($p < 0.05$), female students significantly differed from male students, Asian students significantly differed from White students, Black or African American (Black) students significantly differed from Hispanic and White students, grade 9 students significantly differed from grade 11 and 12 students, and grade 10 students significantly differed from grade 12 students.

†† As determined by *t* test analysis with Taylor series linearization ($p < 0.05$), female students significantly differed from male students; Asian students significantly differed from Black, Hispanic, and White students; Black students significantly differed from White and multiracial students; and grade 9 students significantly differed from grade 12 students.

§§ As determined by *t* test analysis with Taylor series linearization ($p < 0.05$), female students significantly differed from male students, and White students significantly differed from Black, Hispanic, and multiracial students.

¶¶ As determined by *t* test analysis with Taylor series linearization ($p < 0.05$), female students significantly differed from male students; Asian students significantly differed from AI/AN, Black, Hispanic, White, and multiracial students; ME/NA students significantly differed from AI/AN, Black, Hispanic, White, and multiracial students; grade 9 students significantly differed from grade 10, 11, and 12 students; and grade 10 students significantly differed from grade 12 students.

*** As determined by *t* test analysis with Taylor series linearization ($p < 0.05$), Asian students significantly differed from AI/AN, Hispanic, White, and multiracial students; Black students significantly differed from AI/AN, Hispanic, White, and multiracial students; Hispanic students significantly differed from White students; grade 9 students significantly differed from grade 10, 11, and 12 students; grade 10 students significantly differed from grade 11 and 12 students; and grade 11 students significantly differed from grade 12 students.

††† As determined by *t* test analysis with Taylor series linearization ($p < 0.05$), Asian students significantly differed from AI/AN, Black, Hispanic, ME/NA, White, and multiracial students; grade 9 students significantly differed from grade 10, 11, and 12 students; and grade 10 students significantly differed from grade 12 students.

§§§ As determined by *t* test analysis with Taylor series linearization ($p < 0.05$), female students significantly differed from male students; Asian students significantly differed from ME/NA, White, and multiracial students; Black students significantly differed from White and multiracial students; and Hispanic students significantly differed from White students.

¶¶¶ As determined by *t* test analysis with Taylor series linearization ($p < 0.05$), female students significantly differed from male students; Asian students significantly differed from AI/AN, Black, Hispanic, ME/NA, White, and multiracial students; ME/NA students significantly differed from Black, Hispanic, and White students; grade 9 students significantly differed from grade 10, 11, and 12 students; and grade 10 students significantly differed from grade 11 and 12 students.

**** As determined by *t* test analysis with Taylor series linearization ($p < 0.05$), female students significantly differed from male students; Asian students significantly differed from AI/AN, Black, Hispanic, White, and multiracial students; grade 9 students significantly differed from grade 10, 11, and 12 students; grade 10 students significantly differed from grade 11 and 12 students; and grade 11 students significantly differed from grade 12 students.

†††† As determined by *t* test analysis with Taylor series linearization ($p < 0.05$), female students significantly differed from male students, and Black students significantly differed from White students.

§§§§ As determined by *t* test analysis with Taylor series linearization ($p < 0.05$), female students significantly differed from male students.

¶¶¶¶ As determined by *t* test analysis with Taylor series linearization ($p < 0.05$), grade 9 students significantly differed from grade 10, 11, and 12 students.

***** As determined by *t* test analysis with Taylor series linearization ($p < 0.05$), female students significantly differed from male students, and White students significantly differed from Black and Hispanic students.

††††† As determined by *t* test analysis with Taylor series linearization ($p < 0.05$), AI/AN students significantly differed from Black, Hispanic, and White students.

§§§§§ As determined by *t* test analysis with Taylor series linearization ($p < 0.05$), Hispanic students significantly differed from Asian and White students.

¶¶¶¶¶ As determined by *t* test analysis with Taylor series linearization ($p < 0.05$), female students significantly differed from male students; Hispanic students significantly differed from AI/AN, Asian, and Black students; grade 9 students significantly differed from grade 10, 11, and 12 students; and grade 11 students significantly differed from grade 12 students.

***** No statistically significant differences were observed.

†††††† As determined by *t* test analysis with Taylor series linearization ($p < 0.05$), female students significantly differed from male students, and White students significantly differed from Black and Hispanic students.

TABLE 3. Prevalence of current and lifetime use of specific substances among public high school students, by urban-rural classification — Youth Risk Behavior Survey, United States, 2025*

Variable	School-level urban-rural classification [†]		
	City	Suburb or town	Rural
	% (95% CI)	% (95% CI)	% (95% CI)
Current use[§]			
Cigarettes	3.0 (1.9–4.8) [¶]	3.2 (2.3–4.3)**	5.8 (4.0–8.2)
Cigars	2.8 (1.7–4.3)	3.1 (2.4–4.2)**	4.4 (3.2–6.0)
Smokeless tobacco	2.8 (1.8–4.4) [¶]	3.1 (2.3–4.2)**	6.4 (4.1–9.8)
Electronic vapor products	15.3 (12.9–18.1) [¶]	15.2 (12.7–18.0)**	21.7 (18.3–25.5)
Alcohol	18.8 (16.0–22.0)	18.6 (16.0–21.7)	23.2 (18.3–29.0)
Marijuana	13.0 (10.3–16.4)	12.9 (10.7–15.6)	14.3 (10.3–19.5)
Prescription opioid misuse	5.6 (4.1–7.6)	5.0 (4.1–6.2)	5.2 (3.8–7.0)
Lifetime use			
Electronic vapor products	29.3 (25.2–33.7) [¶]	28.5 (25.1–32.1)**	38.9 (33.7–44.3)
Marijuana	25.5 (21.2–30.3)	25.9 (21.4–30.9)	25.5 (21.5–30.0)
Prescription opioid misuse	10.6 (8.9–12.7)	10.9 (9.2–12.9)	11.9 (9.6–14.6)
Cocaine	2.5 (1.6–3.8)	2.0 (1.3–3.0)	1.9 (0.9–4.4)
Inhalants	4.2 (2.9–6.1)	5.0 (4.0–6.1)	5.4 (4.0–7.2)
Heroin	1.1 (0.8–1.7)	1.0 (0.7–1.4)	1.4 (0.6–2.9)
Methamphetamines	1.3 (0.8–2.3)	1.4 (0.8–2.2)	1.5 (0.6–3.4)
Ecstasy	2.3 (1.3–3.9)	1.6 (1.1–2.3)	2.0 (0.8–5.0)
Hallucinogenic drugs	6.1 (3.9–9.3)	5.2 (3.9–6.9)	4.8 (2.6–8.4)
Selected illicit drugs	9.9 (7.0–13.8)	9.6 (7.9–11.8)	9.1 (7.0–11.8)
Injection of illegal drug	1.3 (0.7–2.1)	1.0 (0.5–1.9)	1.0 (0.4–2.4)

* N = 10,161. Data on urban-rural classification was missing for 549 students. School-level urban-rural classification included three levels: city (n = 4,367), suburb or town (n = 4,461), and rural (n = 1,333). The total number of students answering each question varied. Data might be missing because 1) students in schools selected for both national and site-specific YRBS samples completed only one questionnaire; therefore, when the site-specific questionnaire was administered, it might not have included all questions on the national YRBS; 2) the student did not answer the question; or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Prevalence estimates in each category are calculated based on nonmissing data.

[†] School urban-rural classification was based on the National Center for Education Statistics locale classification scheme. The three-level urban-rural classification scheme comprised city, a combined suburb and town category, and rural. <https://nces.ed.gov/programs/edge/Geographic/LocaleBoundaries>

[§] Previous 30 days before the survey.

[¶] Students in city schools significantly differed from students in rural schools, as determined by *t* test analysis with Taylor series linearization (*p* < 0.05).

** Students in suburb or town schools significantly differed from students in rural schools, as determined by *t* test analysis with Taylor series linearization (*p* < 0.05).

TABLE 4. Associations between school-level urban-rural classification and current and lifetime use of specific substances among public high school students — Youth Risk Behavior Survey, United States, 2025*

Variable	School-level urban-rural classification [†]		
	Rural versus city	Rural versus suburb or town	City versus suburb or town
	aPR [§] (95% CI)	aPR [§] (95% CI)	aPR [§] (95% CI)
Current use[¶]			
Cigarettes	1.71 (0.92–3.17)	1.62 (1.04–2.50)**	0.95 (0.57–1.57)
Cigars	1.61 (0.91–2.84)	1.42 (1.04–1.92)**	0.88 (0.49–1.56)
Smokeless tobacco	1.84 (1.08–3.13)**	1.74 (1.10–2.74)**	0.94 (0.68–1.31)
Electronic vapor products	1.37 (1.08–1.74)**	1.40 (1.13–1.73)**	1.02 (0.80–1.30)
Alcohol	1.15 (0.89–1.49)	1.14 (0.88–1.47)	0.99 (0.84–1.17)
Marijuana	1.05 (0.69–1.60)	1.06 (0.78–1.45)	1.01 (0.76–1.35)
Prescription opioid misuse	1.14 (0.72–1.80)	1.16 (0.81–1.65)	1.02 (0.69–1.50)
Lifetime use			
Electronic vapor products	1.34 (1.11–1.62)**	1.37 (1.17–1.59)**	1.02 (0.86–1.21)
Marijuana	0.99 (0.78–1.26)	0.97 (0.78–1.22)	0.98 (0.79–1.22)
Prescription opioid misuse	1.23 (0.93–1.63)	1.16 (0.90–1.49)	0.94 (0.74–1.18)
Cocaine	0.84 (0.35–2.02)	0.99 (0.41–2.36)	1.18 (0.75–1.86)
Inhalants	1.21 (0.71–2.08)	1.04 (0.72–1.50)	0.86 (0.56–1.31)
Heroin	1.41 (0.64–3.10)	1.39 (0.64–3.05)	0.99 (0.65–1.51)
Methamphetamines	1.24 (0.48–3.20)	1.13 (0.48–2.67)	0.91 (0.60–1.37)
Ecstasy	0.98 (0.33–2.92)	1.25 (0.47–3.30)	1.27 (0.82–1.97)
Hallucinogenic drugs	0.75 (0.38–1.50)	0.88 (0.47–1.64)	1.17 (0.73–1.87)
Selected illicit drugs	0.93 (0.61–1.43)	0.94 (0.70–1.27)	1.01 (0.71–1.45)
Injection of illegal drug	1.00 (0.42–2.41)	1.18 (0.43–3.23)	1.18 (0.68–2.04)

Abbreviation: aPR = adjusted prevalence ratio.

* N = 10,161. Data on urban-rural classification was missing for 549 students. School-level urban-rural classification included three levels: city (n = 4,367), suburb or town (n = 4,461), and rural (n = 1,333). The total number of students answering each question varied. Data might be missing because 1) students in schools selected for both national and site-specific YRBS samples completed only one questionnaire; therefore, when the site-specific questionnaire was administered, it might not have included all questions on the national YRBS; 2) the student did not answer the question; or 3) the response was set to missing because of an out-of-range response or logical inconsistency. Analyses for each behavior were based on nonmissing data.

[†] School urban-rural classification was based on the National Center for Education Statistics locale classification scheme. The three-level urban-rural classification scheme comprised city, a combined suburb and town category, and rural. <https://nces.ed.gov/programs/edge/Geographic/LocaleBoundaries>

[§] Adjusted for sex, race and ethnicity, and grade.

[¶] Previous 30 days before the survey.

** Statistically significant; 95% CIs do not cross the null hypothesis value of 1.0.

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ISSN: 2380-8950 (Print)