

Tracking Adolescent Health Behaviors and Outcomes: Strengths and Weaknesses of the Youth Risk Behavior Surveillance System

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Introduction to the Youth Risk Behavior Surveillance System (YRBSS)

The Youth Risk Behavior Surveillance System (YRBSS) is the largest public health surveillance system in the United States dedicated to monitoring a broad range of health-related behaviors among high school students. The system tracks youth behaviors and experiences that inform stakeholders (e.g., parents, educators, public health practitioners) of disparities among demographic subgroups and provides three decades' worth of behavior trends.

The Centers for Disease Control and Prevention (CDC) Division of Adolescent and School Health (DASH) manages the YRBSS. The purpose of this paper is to discuss the strengths and weaknesses of the YRBSS as identified in a recent report titled *Promoting Positive Adolescent Health Behaviors and Outcomes: Thriving in the 21st Century*, published by the National Academies of Sciences, Engineering, and Medicine [1], and to provide additional information on the ways that DASH has and continues to update the surveillance system.

YRBSS Background

The YRBSS includes the national Youth Risk Behavior Survey (YRBS) as well as separate state, local school district, territorial, and tribal school-based surveys. The national YRBS collects data from a nationally representative sample of students in grades 9–12 who attend public and private schools, while each state, local, territorial, and tribal YRBS collects data from a representative sample of students in grades 9–12 within its

jurisdiction. Since 1991, approximately 4.9 million high school students across the country have participated in the YRBSS, and 49 states, 38 local school districts, 7 territories, and 5 tribes have conducted at least one YRBS. The YRBSS monitors emerging and prevailing health-risk behaviors including (1) behaviors that contribute to unintentional injuries and violence; (2) tobacco use; (3) alcohol and other drug use; (4) sexual behaviors related to unintended pregnancy and sexually transmitted infections, including human immunodeficiency virus infection; (5) unhealthy dietary behaviors; and (6) physical inactivity. In addition, YRBSS monitors the prevalence of obesity and other health-related outcomes [2].

For each YRBS (including national, state, district, territorial, and tribal surveys), high school students complete a self-administered questionnaire during a regular class period. Student participation is anonymous and voluntary, and local parental permission procedures are used. More information on YRBS technical details (including sampling, questionnaire development, psychometric properties, and data processing) has been published elsewhere (www.cdc.gov/yrbs).

National, state, and local YRBS data help guide school health policies and practices across the United States. Since its inception, data from the system have been used to (1) describe student health behaviors, risks, and experiences; (2) plan, monitor, and evaluate school-based health interventions; (3) inform school policies and practices; (4) support health-related policies, legislation, and laws; (5) provide information and

support for funding requests; and (6) inform teacher professional development.

Strengths of the YRBSS

YRBSS is a robust and comprehensive adolescent behavior surveillance system. A major strength is its ability to provide data that can be compared both across jurisdictions (e.g., between two states) and between individual jurisdictions and the nation. Timeliness is another strength of the system, as data and results are typically released within months of collection. Another strength is the longevity of the system, which has been collecting data for over 30 years and enables analyses of long-term trends for many behaviors, such as diet, physical activity, substance use, and sexual health. In addition, the system is flexible because the standard questionnaire is updated every other year, before each YRBS administration, to ensure that behaviors and experiences of current public health importance as well as emerging health concerns are being monitored. Further, states, districts, territories, and tribes can modify the standard questionnaire within certain parameters, which allows them to monitor the behaviors and experiences most relevant to their jurisdictions. CDC is also able to add questions of national public health importance to the version of the questionnaire used for the national YRBS.

YRBS data are used to track a variety of adolescent health goals and objectives, including the US Department of Health and Human Services *Healthy People 2030* (<https://health.gov/healthypeople>) national health objectives, the annual *Indicators of School Crime and Safety* (<https://nces.ed.gov/programs/crimeindicators/>) report issued by the National Center for Education Statistics, and the annual *America's Children in Brief: Key National Indicators of Well-Being* (<https://www.childstats.gov/americaschildren/index.asp>) report issued

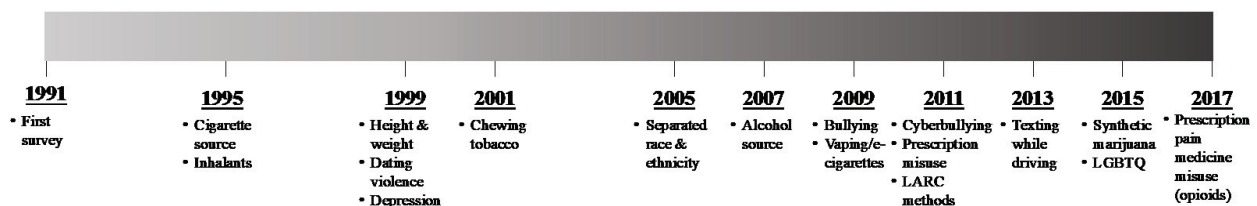
by the Federal Interagency Forum on Child and Family Statistics. YRBS data also are used extensively by a variety of national nongovernmental organizations.

The surveillance system's strengths led the committee for *Promoting Positive Adolescent Health Behaviors and Outcomes: Thriving in the 21st Century* [1] to use YRBS as its data source to evaluate demographic trends in adolescent risk behaviors. In selecting the YRBS, the committee also reviewed and deliberated about other nationally representative datasets, including Monitoring the Future (<http://www.monitoringthefuture.org/>), the National Youth Tobacco Survey (https://www.cdc.gov/tobacco/data_statistics/surveys/nyts/index.htm), the National Survey on Drug Use and Health (<https://www.samhsa.gov/data/data-we-collect/nsduh-national-survey-drug-use-and-health>), and the National Survey of Family Growth (NSFG) (https://www.cdc.gov/nchs/nsfg/about_nsfg.htm). The committee eventually selected the YRBS as the data source for multiple reasons [1]. First, the YRBS was the only dataset to provide indicators on all three of the behaviors described in the report: tobacco, alcohol, and sexual behavior. Second, the YRBS has been conducted consistently since 1991, while the other surveys on the list either lack similar longevity or presented results from aggregated time intervals (e.g., the NSFG). Finally, as described above, the committee felt that a major strength of the YRBS was the way that items have been updated or added to reflect changing behavioral trends and diverse populations over time (see *Figure 1*).

Areas for Improvement for the YRBSS

Despite these strengths, the YRBSS is not without limitations, several of which were noted in the National Academies report [1]. First, because YRBSS uses school-based surveys, population coverage is limited to adolescents who attend school. While roughly 95

Figure 1 | Changes to Items on the YRBS



SOURCE: Used with permission from the National Academies of Sciences, Engineering, and Medicine report based on public information from the CDC [1].

percent of 14- to 17-year-olds are enrolled in school [3], out-of-school youth are excluded from the surveys. Research shows that youth who are not in school have the highest incidence of risk behaviors and related adverse health outcomes [4]. The reasons they are not in school may actually be related to these risk behaviors; for example, pregnant or parenting teens are more likely to drop out of school, and substance use or violence in or around school can lead to suspension, expulsion, and/or involvement with the juvenile justice system [4]. In 1992, CDC/DASH received additional support to conduct a one-time, special survey of out-of-school youth as part of the National Health Interview Survey. The results indicated that out-of-school adolescents were more likely to engage in behaviors with potentially severe adverse health outcomes than were adolescents in school [5]. Although the YRBS is a school-based survey, it is important that youth who are not in school are included in such surveys to present nationally representative estimates of adolescent behavior [1]. To the knowledge of the authors, no ongoing nationally representative dataset captures both in-school and out-of-school youth, which means that most research, practice, and policy decisions are made based on data that do not include the most vulnerable youth.

Another potential limitation of the YRBSS is that, because it is a school-based survey, it may exclude youth who are experiencing homelessness [1]. However, a recent report found that many homeless youth (nearly 1.4 million) are attending school in the United States [6]. While this finding does not mean that all homeless youth attend school, those who do are assumed to be represented in YRBSS. Additionally, in 2019, thirty-one state and local education agencies included questions on homelessness in their YRBS, and the data are widely available (see, for example, <https://www.icphusa.org/no-longer-hidden/>). In 2021, a question on homelessness will be added to the national YRBS, providing the first nationally representative assessment of high school students experiencing homelessness.

Another limitation of the YRBSS is that the question assessing sexual intercourse does not provide a definition of that behavior. Research shows that adolescents conceptualize sex and sexual activity in different ways, including interpreting having sex or “sexual intercourse” to mean any type of sex (vaginal, oral, or anal) and/or to include only consensual sexual activity, which can lead to biased estimates of the behavior [7]. Because the YRBSS includes both a nationally administered school-based survey as well as surveys admin-

istered in states and local school districts, to maintain broad survey participation CDC must balance varying degrees of acceptability for explicit definitions of sexual intercourse among stakeholders, including educators, parents, and students. Additionally, independent of how students define sexual activity, YRBSS analyses have shown an association between sexual activity and risk behaviors including substance use [8].

One final limitation of the YRBSS is the use of a paper-and-pencil survey administration mode. For the past 15 years, CDC has investigated the feasibility and acceptability of web-based administration, and its effects on participation, data quality, and perceived privacy and anonymity [9,10]. The technological landscape over the last decade has changed significantly, especially for teens. CDC has started pilot testing for web-based survey administration. In addition, several YRBSS sites used web-based administration for their 2019 YRBS. CDC plans to analyze those data to examine data quality and mode effects. CDC also has been working with staff from other nationwide surveys that have successfully used tablets to administer surveys in schools. Based on their successes and the other information gathered, CDC’s current plan is to conduct the national YRBS using tablets in future cycles.

Future Priorities for the YRBSS

In addition to addressing the limitations in the National Academies report [1], CDC has plans that will further strengthen the YRBSS. In 2019, CDC launched the Public Health Data Modernization Initiative (<https://www.cdc.gov/surveillance/improving-surveillance/>) to ensure that data drives real-time public health responses. YRBSS has several long-standing features that align with the modernization initiative, and DASH scientists are continually working to adapt innovative features to strengthen the system. In August 2020, CDC released 2019 YRBSS data, including updates to *Youth Online*, the data dissemination platform. For the first time, CDC produced a *YRBSS Surveillance Supplement* for publication in *Morbidity and Mortality Weekly Report*. The nine-part supplement features articles by subject matter experts from several CDC programs that highlight prevalent and emerging public health issues among US high school students. Also new this cycle is YRBS Explorer, a user-friendly data application featuring national, state, and local YRBS data via tables and graphs, which is available at www.cdc.gov/yrbs. As adolescents and their health risks continue to change, surveillance systems should continually advance to meet public health needs. Ongoing surveillance modernization ef-

forts will ensure YRBSS remains the best source for high-quality national, state, and local data to monitor health trends and among high school students.

Conclusion

CDC's YRBSS is one of the most comprehensive sources for adolescent health data at the national, state, territorial, tribal, and local school district levels. Data are used to track national health goals, inform stakeholders, and guide decision-making. CDC continually works to modernize YRBS by improving data collection, utilization, and dissemination. In addition, the agency is working to address limitations by expanding information on vulnerable youth and incorporating new technology for safe, secure data collection. Understanding the behaviors of our nation's adolescents is critical to ensuring their health as they grow, and the YRBSS is continuously evolving to meet that goal.

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None to disclose.

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