

# Youth Risk Behavior

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## PUBLIC HEALTH IMPORTANCE

In the United States, almost 70% of all deaths among persons 1–24 years of age are the result of only four causes. Motor vehicle crashes cause 31% of all deaths in this age-group, other unintentional injuries cause 14%, homicides cause 13%, and suicides cause 10% (1). A considerable amount of acute and chronic morbidity also results from these causes.

The use of alcohol and other drugs is associated with much of this mortality and morbidity among youths. Alcohol use is a factor in about half of all deaths from motor vehicle crashes, homicides, and suicides (2). The use of alcohol and other drugs also contributes to many important social problems—including dysfunctional families, crime, school dropout, and lost economic productivity—that are not reflected in vital statistics (3,4).

Substantial morbidity and social problems result from the >1 million pregnancies that occur among adolescents each year in the United States. The high rate of teenage pregnancy in the United States, in turn, contributes to the nation's high rate of infant mortality and morbidity (5).

Finally, significant morbidity results from the estimated 12 million cases of sexually transmitted diseases (STDs) that occur each year among persons 15–29 years of age (6). Relatedly, 20% of AIDS cases are diagnosed among persons 20–29 years of age (7). Because the median incubation period between infection with human immunodeficiency virus (HIV) and onset of AIDS is estimated to be 10 years, we suspect that many persons aged 20–29 years with AIDS

were infected during adolescence (8). In 1989, AIDS ranked as the sixth leading cause of death among persons aged 15–24 years (1).

When we consider the leading causes of death among all age-groups combined, we find that >60% of all deaths in the United States, and an enormous amount of acute and chronic morbidity, are caused by only three conditions: heart disease (34%), cancer (23%), and stroke (7%) (1). A relatively small number of behaviors—including tobacco use, unhealthy dietary patterns, and physical inactivity—contribute greatly to mortality and morbidity from these three diseases.

In summary, many health problems among persons <24 years of age are caused by a relatively small number of preventable behaviors such as drinking and driving, failing to wear safety belts, and engaging in unprotected sexual intercourse. Also, other behavior often begun during adolescence, such as tobacco use, unhealthy dietary patterns, and physical inactivity, contributes to the leading causes of mortality and morbidity for persons >24 years of age. All of these behaviors often are established during youth, extend into adulthood, and are interrelated. For additional information about related topics and surveillance activities, see the Contraception, Sexually Transmitted Diseases, Human Immunodeficiency Virus, Legal Induced Abortion, Pregnancy in Adolescents, and Unintentional Injuries and Violence chapters.

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## HISTORY OF DATA COLLECTION

Since 1987, CDC's National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP) has provided fiscal and technical assistance to every state department of education and 16 of the nation's largest local departments of education in order to support school health education programs targeting the prevention of HIV infection and other important health problems (9).

In 1988, CDC began developing the Youth Risk Behavior Surveillance System (YRBSS) to 1) focus the nation on specific behavior that causes the most important health problems among youths; 2) assess whether this behavior increases, decreases, or remains the same over time; and 3) provide comparable data among national, state, and local samples of youths.

After reviewing the leading causes of mortality and morbidity among youths and persons in all age-groups, we realized that nearly all contributing behaviors could be categorized in six areas: 1) behavior that results in unintentional and intentional injuries; 2) tobacco use; 3) use of alcohol and other drugs; 4) sexual behavior that contributes to unintended pregnancy and STDs, including HIV infection; 5) dietary behavior that results in disease; and 6) physical inactivity.

A panel of experts was established for each of the six areas and was asked to identify the highest priority risk behaviors in each category and to develop survey questions to measure this behavior. These panels consisted of scientific experts from relevant federal agencies, scientists from outside the federal government, representatives of state and local education agencies, survey research specialists from CDC's National Center for Health Statistics (NCHS), and staff from NCCDPHP. Because students would have a class period of about 45 minutes to complete the questionnaire covering all six categories of behavior, each panel was asked to identify only the highest priority behaviors and to suggest a limited number of questions to measure the prevalence of these behaviors.

The first version of the YRBSS questionnaire was completed in October 1989 and was reviewed at a national conference by representatives of each state department of education and 16 local departments of education. Survey research specialists from NCHS also provided comments and suggestions on that version of the questionnaire. Following this conference, the questionnaire was revised, and a second version was completed in November 1989. This questionnaire was used the following spring to generate data from national, state, and local samples of students in grades 9–12. This questionnaire also was sent to the Questionnaire Design Research Laboratory at NCHS for four waves of laboratory and field-testing with high school students. A review of student responses led to the development of recommendations to improve the wording of questions, set recall periods, and identify response categories. The field tests sought to identify survey conditions that could be expected to encourage students to be honest in answering survey questions.

In October 1990, the core questionnaire was completed. It reflected the national health objectives (4), a review of data collected during spring 1990, information from NCHS's laboratory and field tests, and input from the panel members and the representatives of each state and the 16 local departments of education. The core questionnaire is self-administered, contains 84 multiple-choice questions, and has about a grade-7 reading level. A standard computer scannable **bubble sheet** or questionnaire booklet can be used to record responses. Skip patterns are not included in the questionnaire to help ensure that students do not lose their place on the answer sheet when recording responses and to prevent students from looking at other youths' answer sheets or questionnaire booklets to detect a pattern of blank responses that might identify the risk behavior of those students.

## CDC SURVEILLANCE ACTIVITIES

The YRBSS currently has three complementary components: national school-based surveys,

state and local school-based surveys, and a national household-based survey. Each of these components provides unique information about different subpopulations of adolescents in the United States.

### **National School-Based Surveys**

In spring 1990, CDC conducted the first national school-based Youth Risk Behavior Survey. Results from this survey were published in the *Morbidity and Mortality Weekly Report* in 1991 and 1992 (10).

In spring 1991, CDC conducted the second national school-based Youth Risk Behavior Survey, using the core questionnaire that was revised and completed in October 1990. Results from this survey are described elsewhere (10,11). The survey will be conducted biennially during odd-numbered years throughout the decade and will involve national probability samples of students in grades 9–12 from public and private schools.

### **State and Local School-Based Surveys**

In 1990, CDC began offering each state and the 16 funded local departments of education the YRBSS questionnaire as well as fiscal and technical assistance to conduct the Youth Risk Behavior Survey. During 1990, 24 states and 8 cities conducted surveys, sometimes with the assistance of area departments of health. In 1991, 29 states and 10 cities conducted surveys. In 1993, 43 states and 13 cities conducted surveys. Results from the 1991 surveys are described elsewhere (10). Each state and the 16 local departments of education will be able to conduct Youth Risk Behavior Surveys biennially throughout the decade.

Although use of the same questionnaire allows better comparability across sites, each department of education determines which questions will be asked. Questions may be added, deleted, or modified. Each survey year, however, more and more sites are using the questionnaire unchanged.

To help improve the quality of the surveys and increase the usefulness of the data, CDC provides several types of technical assistance to interested departments of education. For example, CDC has developed a *Handbook for Conducting Youth Risk Behavior Surveys* (12) to help state and local departments of education plan surveys; obtain clearance; select schools, classes, and students; contact or notify parents about the surveys; conduct surveys; prepare data for analysis; and report survey results. CDC has also developed *PCSample* (13), personal computer-based software that helps program directors in departments of education draw probability samples of schools and students.

CDC offers data analysis services that include scanning answer sheets and cleaning, editing, weighting, and analyzing data. Standard procedures are used to help make results comparable across sites. CDC provides a detailed technical report to each site and can help departments of education interpret, apply, and disseminate results. The data generated from these surveys remain the property of the respective state or local department of education.

### **National Household-Based Survey**

CDC included the Youth Risk Behavior Survey as a supplement in the 1992 National Health Interview Survey (NHIS). This supplemental survey was conducted among persons 12–21 years of age from a national probability sample of households. Data were obtained from youths attending school, youths who had dropped out of school, and college-age youths, including those who had not completed high school, those who had completed high school but were not attending college, and those attending college. School-age youths not attending school were oversampled.

Field staff administered the questionnaire using individual portable cassette players with earphones; respondents listened to the questions and marked their answers on a standardized answer sheet. This method helped to compensate for reading problems among respondents,

helped to ensure confidentiality during household surveys, and allowed youths to avoid disclosing their responses to interviewers.

## GENERAL FINDINGS

General results from the 1991 national Youth Risk Behavior Survey are described for each of the six categories (see the tables in reference 11 for detailed findings).

### Unintentional and Intentional Injuries

Slightly more than one quarter (27.7%) of all students reported “always” using safety belts when riding in a car or truck driven by someone else. Among students who rode motorcycles, 39.2% “always” wore a motorcycle helmet. Among students who rode a bicycle, 1.1% “always” wore a bicycle helmet.

Among all students, 42.5% were in at least one physical fight during the 12 months preceding the survey. Male students (50.2%) were significantly more likely than female students (34.4%) to have been in a physical fight. Fighting decreased as the grade increased. An estimated 137 physical fights occurred per 100 students per year.

Among all students, 26.1% carried a weapon at least 1 day during the 30 days preceding the survey. Male students (40.6%) were significantly more likely than female students (10.9%) to have carried a weapon. Students in grade 12 (21.3%) were significantly less likely than those in grades 9 (27.5%) or 11 (29.0%) to have carried a weapon. An estimated 107 weapon-carrying incidents occurred per 100 students per month.

During the 12 months preceding the survey, 29.0% of students had thought seriously about attempting suicide; 8.6% had made a specific plan to attempt suicide; 7.3% had actually attempted suicide; and 1.7% had made a suicide attempt that resulted in an injury, poisoning, or overdose that required treatment by a physician

or nurse. Female students were significantly more likely than male students to have thought about attempting suicide, to have made a specific plan to attempt suicide, to have actually attempted suicide, and to have made a suicide attempt requiring medical attention.

### Tobacco Use

Among all students, 70.1% had ever tried cigarette smoking, 27.5% had smoked cigarettes on 1 or more of the 30 days preceding the survey (currently smoking), 12.7% had smoked cigarettes on 20 or more of the 30 days preceding the survey (frequent smoking), and 21.2% had ever smoked at least one cigarette every day for 30 days (regular smoking). Among all students, 10.5% had used smokeless tobacco (chewing tobacco or snuff) on 1 or more of the 30 days preceding the survey. Male students (19.2%) were significantly more likely than female students (1.3%) to use smokeless tobacco.

### Alcohol and Other Drugs

Among all students, 81.6% had ever consumed alcohol during their lifetime, and 50.8% had consumed alcohol during the 30 days preceding the survey. Lifetime and current alcohol use increased significantly as the grade increased.

Among all students, 31.3% reported consuming five or more drinks of alcohol on at least one occasion during the 30 days preceding the survey (episodic heavy drinking). Episodic heavy drinking occurred significantly more often among male students (36.5%) than among female students (25.9%); it was also more common among students in grades 11 (36.3%) and 12 (39.3%) than among students in grade 9 (22.6%).

Among all students, 31.3% had ever used marijuana during their lifetime, 14.7% had used marijuana during the 30 days preceding the survey (current marijuana use), 5.9% had ever used cocaine during their lifetime, and 1.7% had used cocaine during the 30 days preceding the

survey (current cocaine use). Lifetime and current marijuana use and lifetime cocaine use increased significantly as the grade increased.

Among all students, 2.7% had ever used steroids. Male students (4.1%) were significantly more likely than female students (1.2%) to use steroids.

### Sexual Behavior

Among all students, 54.1% had ever had sexual intercourse, and 18.7% had had sexual intercourse with four or more sex partners during their lifetime. Among students who had had sexual intercourse, 69.3% had sexual intercourse during the 3 months preceding the survey (current sexual activity). Male students (23.4%) were significantly more likely than female students (13.8%) to have had sexual intercourse with four or more sex partners, whereas female students (75.3%) were significantly more likely than male students (64.1%) to be currently sexually active.

Among sexually active students, 81.8% used contraception (birth control pills, condoms, or withdrawal), and 46.2% used condoms during the last sexual intercourse. Contraceptive use increased significantly as the grade increased; 72.9% of students in grade 9, 81.8% of students in grade 10, 82.9% of students in grade 11, and 84.9% of students in grade 12 used contraceptives. Male students (54.6%) were significantly more likely than female students (38.0%) to have used condoms during the last sexual intercourse.

### Dietary Behavior

Among all students, 12.9% consumed five or more servings of fruits and vegetables (fruit, fruit juice, green salads, and cooked vegetables) during the day preceding the survey. Male students (15.2%) were significantly more likely than female students (10.5%) to consume five or more servings per day of fruits and vegetables.

Among all students, 64.9% ate no more than two servings of foods typically high in fat content (hamburger, hot dogs, or sausage; french

fries or potato chips; and cookies, doughnuts, pie, or cake) during the day preceding the survey. Female students (72.9%) were significantly more likely than male students (57.2%) to eat no more than two servings per day of foods typically high in fat content.

### Physical Activity

Among all students, 48.9% were enrolled in physical education (PE) class, and 41.6% attended PE class daily. Enrollment and daily attendance in PE class decreased significantly from grade 9 to grade 12. Among students enrolled in PE class, 49.4% exercised or played sports >30 minutes during an average PE class. Male students (56.5%) were significantly more likely than female students (40.7%) to exercise >30 minutes during an average PE class.

Among all students, 40.9% reported walking or bicycling for at least 30 minutes at a time during the day preceding the survey (moderate physical activity). Moderate physical activity decreased significantly from grade 9 (49.3%) to grade 12 (32.4%). Among all students, 43.0% performed stretching exercises (including toe touches, knee bending, or leg stretching) and 36.6% performed strengthening exercises (including push-ups, sit-ups, or weight lifting to tone or strengthen muscles) during 4 or more of the 7 days preceding the survey. Male students (43.9%) were significantly more likely than female students (28.9%) to perform strengthening exercises.

### INTERPRETATION ISSUES

The YRBSS is an epidemiologic surveillance system that shares some of the strengths and limitations of other health-related surveys of youths:

- The surveillance system was designed to focus primarily on health risk behavior—rather than related knowledge, attitudes, or beliefs—for two reasons: behavior is the best predictor of related health outcomes, and so many knowledge, attitude, and

belief variables have an unknown or tenuous association with related risk behavior. To improve the health status of youths and the adults that they will become, interventions must focus primarily on reducing risk behavior (14,15).

- By measuring six categories of priority health risk behavior, the questionnaire allows users to examine interrelationships among categories of risk behavior and reduces the burden on schools posed by multiple categorical surveys. Surveys that focus on one or two high-risk behaviors may provide more information about that behavior, but such surveys do not provide information for developing the more comprehensive interventions that might address simultaneously the multiple and interrelated risk behaviors exhibited by many youths (16,17).
- Collection of data from out-of-school adolescents is limited to the 1992 NHIS Youth Risk Behavior Supplement. In 1991, 98.8% of adolescents 14–15 years old, 93.3% of adolescents 16–17 years old, and 59.6% of adults 18–19 years old were enrolled in school (18). The 1992 supplement helps to determine the extent to which the risk behavior of out-of-school youths differ from the behavior of youths who remain in school.
- Some behavior, such as sexual intercourse and attempted suicide, may be controversial to measure. All behavior measured in the survey, however, is critical to the nation's health (4). We have no evidence that voluntarily responding to questions about any health risk behavior will encourage or discourage a respondent to practice that behavior. Schools that administer the survey may provide resource information, such as hot line numbers, to students who may have questions about any of the behavior measured in the questionnaire.
- YRBSS results are based on self-reported data that appear valid for estimating the prevalence of health risk behavior (19–21).

However, a respondent may underreport or overreport a behavior, depending in part on the perceived social stigma or support for that behavior and the perceived confidentiality of responses (19,22–25). Establishing criterion-related validity for responses to most of the questions on the questionnaire may be impractical, if not impossible. Survey administration procedures were developed carefully to protect confidentiality and, in the school-based surveys, to allow youths to respond anonymously. Data collected to date are similar to data from categorical school-based surveys and demonstrate subgroup trends consistent with data from other surveys (26–28).

- Information generated by the household-based NHIS Youth Risk Behavior Supplement may not be entirely comparable with information generated by the school-based Youth Risk Behavior Surveys. Previous research suggests that youths may be more likely to respond candidly to school-based surveys than to household-based surveys because they may consider school-based surveys a common school practice; they may be reassured by responding as a part of a large group; and they may have more confidence in the anonymity of school-based surveys.
- Although the YRBSS can provide information to help assess the effects of broad national, state, or local policies and programs, the system was not designed to evaluate the effectiveness of specific interventions, such as a teacher training program, school curriculum, or media campaign. Other instruments and protocols can measure more precisely the intended outcomes of such interventions.

## EXAMPLES OF USING DATA

The YRBSS is the only ongoing surveillance system that provides national, state, and local information on such a broad range of health objectives. The YRBSS is being used to help

monitor our progress in achieving the following objectives:

- Twenty-six of the national health objectives for the year 2000 (4).
- Five student-related objectives in CDC's *Strategic Plan for Preventing Human Immunodeficiency Virus (HIV) Infection* (29).
- Twenty-eight model standards presented in *Healthy Communities 2000* (30).
- Four primary goals in the American Cancer Society's comprehensive school health education initiative (31,32).
- The National Education Goal 6 that states "by the year 2000, every school in America will be free of drugs and violence and will offer a disciplined environment conducive to learning" (33,34). (At the request of the National Education Goals Panel, 10 questions were added to the national, state, and local YRBSS questionnaire in 1993 to provide even more information to measure Goal 6.)

The YRBSS also is being used increasingly to support state and local policies and programs that help to reduce health risk behavior among youths (33,35–43). For example, Youth Risk Behavior Survey data have been used in the following ways:

- To inform the public of the need for effective health education programs.
- To provide state boards of education and state legislatures with information supporting comprehensive school health policies and programs.
- To support stricter enforcement of policies on minors' access to cigarette vending machines and alcohol.
- To update and improve teacher training and instructional materials.
- To target interventions to special populations that are at increased risk.
- To promote collaboration with institutions of higher education that are responsible for preparing teachers.
- To help health agencies and community organizations develop effective community-based programs to reduce health risk behavior.

## FUTURE ISSUES

Data from the YRBSS will continue to be used to help measure progress, particularly among high school students, toward achieving 26 of the 111 national health objectives that focus on adolescents. The national data collected in 1991 suggest that, among high school students, few of these 26 national health objectives have been met. In the future, CDC plans to expand the surveillance system to include components that focus on college students at the national and state levels and middle school students at the state and local levels. In addition, we will continue our efforts to increase the quantity and quality of the state and local school-based surveys among high school students.

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