Overview of the Youth Risk Behavior Surveillance System

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THE CENTERS FOR DISEASE CONTROL AND PREVENTION (CDC) developed the Youth Risk Behavior Surveillance System (YRBSS) to focus attention on specific behaviors among youth that cause the most important health problems; to assess whether those behaviors are increasing, decreasing, or remaining unchanged; and to provide data that are comparable among national, State, and local samples of youth.

In this overview we describe the development and rationale of the surveillance system, discuss its components and characteristics, and show how the system is being used to improve health and education policies and programs for youth. In this supplemental issue of Public Health Reports, the authors of the seven categorical articles that follow this overview describe the rationale, development, and uses of the system. The last article describes data from the 1991 national Youth Risk Behavior Survey and national health objectives related to that data.

YRBSS Rationale

CDC began designing the surveillance system in 1988 by reviewing the leading causes of mortality and morbidity among youth and adults. Nearly 70 percent of all deaths among 1- to 24-year-olds are from only four causes. Motor vehicle crashes cause 31 percent, other unintentional injuries cause 14 percent, homicides cause 13 percent, and suicides cause 10 percent of all deaths in this age group (1). Considerable acute and chronic morbidity also results from those causes.

Alcohol and other drug use is associated with much of the mortality and morbidity among youth. Alcohol use is a factor in about half the deaths from motor vehicle crashes, homicides, and suicides (2). Alcohol and other drug use contributes also to important social problems not reflected in mortality and morbidity statistics, including family dysfunction, crime, school dropout, and lost economic productivity (3,4).

Significant morbidity and social problems result from the more than a million pregnancies that occur among adolescents each year in the United States. The high rate of teenage pregnancy in turn contributes substantially to the high rate of infant mortality and morbidity (5).

Significant morbidity results from the estimated 12 million cases of sexually transmitted disease (STD) that occur each year among 15- to 29-year-olds (6), and from the 20 percent of acquired immunodeficiency syndrome (AIDS) cases that are diagnosed among 20- to 29-year-olds (7). Because the median incubation period between infection with HIV and the onset of AIDS symptoms is estimated to be 10 years, we believe that many 20- to 29-year-olds with AIDS were infected during adolescence (8, 9). In 1989, AIDS ranked as the sixth leading cause of death among 15- to 24-year-olds (1).

The review of the leading causes of mortality, morbidity, and social problems among 1- to 24-year-olds suggested that the health problems of that age group are largely caused by a relatively small number of preventable behaviors, such as drinking alcohol and driving, failing to wear seat belts, and engaging in unprotected sexual intercourse. Those behaviors often are established during youth, extend into adulthood, and are interrelated.

A similar review of the leading causes of mortality among all age groups combined revealed that more than 60 percent of all deaths in the United States, and an enormous amount of acute and chronic morbidity, are from only three causes: heart disease (34 percent), cancer (23 percent), and stroke (7 percent) (1). A relatively small number of behaviors, including tobacco

Youth Risk Behavior Surveillance System Steering Committee

Agencies represented by panel chairpersons

Unintentional and intentional injuries
Centers for Disease Control and Prevention,
National Center for Injury Prevention and Control

Tobacco use
Centers for Disease Control and Prevention,
National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health

Alcohol and other drug use
National Institutes of Health,
National Institute on Drug Abuse, Division of Epidemiology and Prevention Research

Sexual behaviors
Centers for Disease Control and Prevention,
National Center for Chronic Disease Prevention and Health Promotion, Division of Reproductive Health

Dietary behaviors
Centers for Disease Control and Prevention,
National Center for Chronic Disease Prevention and Health Promotion, Division of Nutrition

Physical inactivity
Centers for Disease Control and Prevention,
National Center for Chronic Disease Prevention and Health Promotion, Division of Chronic Disease Control and Community Intervention

Other agencies represented

Department of Education
Department of Health and Human Services
Centers for Disease Control and Prevention,
National Center for Chronic Disease Prevention and Health Promotion
National Center for Health Statistics
Health Resources and Services Administration,
Maternal and Child Health Bureau
Office of the Assistant Secretary for Health,
Office of Disease Prevention and Health Promotion,
Office of the Assistant Secretary for Planning and Evaluation

National organization represented

Society of State Directors of Health, Physical Education, and Recreation

use, unhealthy dietary patterns, and physical inactivity, contribute greatly to mortality and morbidity from those three diseases. These behaviors often are established during youth, extend into adulthood, and are interrelated.

The review of the leading causes of mortality and morbidity among youth and among persons in all age groups combined showed that nearly all contributing behaviors could be categorized within six areas: behaviors that result in unintentional and intentional injuries; tobacco use; alcohol and other drug use; sexual behaviors that contribute to unintended pregnancy and STD, including HIV infection; dietary behaviors that result in disease; and physical inactivity.

YRBSS Development

Federal agencies with responsibilities for improving or monitoring the incidence and prevalence of behavioral risks within each of the six categories of behavior were asked to appoint a panel chairperson to a YRBSS steering committee. Each chairperson assisted in coordinating the process of identifying those risk behaviors with highest priority within each category and in developing survey questions to measure those behaviors.

The steering committee was comprised of representatives of CDC, four other Federal agencies, and the Society of State Directors of Health, Physical Education, and Recreation (SSDHPER), a national professional organization of directors of health education in State departments of education. The steering committee membership is listed in the first accompanying box on this page.

In August 1989, CDC and steering committee members convened a 2-day workshop to begin the process of delineating and measuring priority behaviors and devising questions to measure those behaviors. A panel was set up for each categorical area with scientific experts of other Federal agencies, non-Federal scientists, survey research specialists from CDC's National Center for Health Statistics (NCHS), and staff members of CDC's Division of Adolescent and School Health. Because the system was to be implemented primarily through school-based surveys, a representative of SSDHPER was included on each panel. Appendix I lists the panel participants and organizations.

Because students would have a single class period of about 45 minutes to complete a proposed questionnaire covering all six categories of behavior, each panel was asked to identify only the highest priority behaviors from its area and to suggest a limited number of questions to measure the prevalence of those behaviors.

Each panel chairperson prepared a paper to document the reasons for selecting each priority behavior. Their

papers comprise the following seven articles in this supplement. Each panel chairperson addressed the following four questions.

1. What are the most important health outcomes that result from risk behaviors in your categorical area?

2. What national health objectives for the year 2000, presented in "Healthy People 2000" (4), are relevant to your categorical area?

3. What are the highest priority health behaviors established during youth that should be addressed to help reduce the most important health outcomes?

4. What questions should be used to measure each priority behavior most effectively?

One article was developed for each categorical area, except for the injury area, for which separate articles were prepared for unintentional and intentional injury.

The first version of the questionnaire was completed in October 1989 and was reviewed at a national conference by representatives of each State's department of education, as well as representatives of American Samoa, the District of Columbia, Guam, Puerto Rico, and the U.S. Virgin Islands. Other reviewers represented 16 local departments of education funded by CDC, which were Baltimore, MD; Boston, MA; Broward County, FL; Chicago, IL; Dade County, FL; Dallas, TX; Denver, CO; Jersey City, NJ; Los Angeles, CA; Newark, NJ; New York, NY; New Orleans, LA; Philadelphia, PA; San Diego, CA; San Francisco, CA; and Seattle, WA. Survey research specialists from NCHS provided comments and suggestions on the first version of the questionnaire.

The second version was completed in November 1989 and was used the following spring to generate data from national, State, and local samples of students in grades 9 through 12. That version of the questionnaire 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 recommendations for improving the wording of questions, setting recall periods, and identifying response categories. The field testing sought to identify survey conditions that could be expected to encourage honesty in answering survey questions.

In October 1990, the core questionnaire (Appendix II) was completed. It reflected the national health objectives (4), a review of data collected during the spring of 1990, information from NCHS's laboratory and field tests, and input from steering committee members and representatives of each State and the 16 local departments of education. The core questionnaire is self-administered, contains 75 multiple-choice questions, and has about a 7th grade 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 detecting on other answer sheets or booklets a pattern of blank responses that might identify the risk behaviors of those students.

YRBSS Components

The system 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. National probability samples of high-school students can be used efficiently to describe trends in the national incidence and prevalence of priority risk behaviors among adolescents in school. In the spring of 1990, CDC conducted the first national school-based Youth Risk Behavior Survey. Results from this survey were published in 12 articles in "Morbidity and Mortality Weekly Report" (MMWR) from September 1991 through April 1992 (10–21).

In the spring of 1991, CDC conducted the national school-based Youth Risk Behavior Survey, using the core questionnaire completed in October 1990. Results from the survey are described in the article "Results from the National School-Based 1991 Youth Risk Behavior Survey and Progress Toward Achieving Related Health Objectives for the Nation," in this supplement. The survey will be conducted biennially during odd-numbered years throughout the decade among national probability samples of 9th through 12th grade students from public and private schools. Schools with a large proportion of black and Hispanic students will be oversampled to provide stable estimates for these subgroups. Macro International Inc., of Silver Spring, MD, is to conduct the survey through 1995 under CDC contract no. 200-88-0682.

State and local school-based surveys. Decision makers and the public need information on the prevalence of priority health risk behaviors among youth in their States and cities, as well as results at the national level. The prevalence of particular risk behaviors sometimes varies among students in different States and cities. State and local data can be more useful than national

data to help decision makers assess risks among their student populations and in subsequent planning and evaluation of State and local efforts to reduce risks.

In 1990, CDC began offering each State and the 16 funded local departments of education the YRBSS questionnaire and 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. The participating jurisdictions are shown in the second accompanying box, page 6. Results from the surveys and the 1991 national school-based Youth Risk Behavior Survey were published in five MMWR articles between August 1992 and December 1992 (22—26). CDC will provide fiscal and technical assistance to each State and the 18 local departments of education that it currently funds to conduct Youth Risk Behavior Surveys biennially during odd-numbered years throughout the decade.

Although use of the same questionnaire enhances comparability across sites, each department of education determines which questions will be asked. Questions may be added, deleted, or modified, but during each survey year fewer sites are making modifications to the questionnaire.

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 developed a handbook for conducting Youth Risk Behavior Surveys to help State and local departments of education plan surveys; obtain clearance; select schools, classes, and students; notify parents; administer surveys; prepare data for analysis; and report survey results.

CDC developed PCSample, a PC-based computer program to help program directors in departments of education to draw probability samples of schools and students. The computer program identifies schools for participation in the survey using information about expected school and student response rates, absenteeism, desired sample size, and school enrollment. The program generates worksheets that can be used in selecting classes in participating schools. Westat, Inc., of Rockville, MD, through CDC contract no. 200-93-0618, is making technical assistance available for Youth Risk Behavior Surveys through September 1998 to the States and 18 cities currently funded.

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

Letters of support for national, State, and local school-based surveys have been provided by the following organizations.

- American Association of School Administrators
- American Federation of Teachers
- American Medical Association
- American School Health Association
- Association for the Advancement of Health Education
- Association of State and Territorial Directors of Public Health Education
- Council of Chief State School Officers
- National Association of State Boards of Education
- National Catholic Educational Association
- National Education Association
- National Education Goals Panel
- National Parent Teacher Association
- National School Boards Association
- Society of State Directors of Health, Physical Education, and Recreation

National household-based surveys. School-based surveys provide an efficient and relatively inexpensive means to collect anonymous data about risk behaviors among high school students. However, such surveys only provide information about those youth who attend school, and they may not be good sources of accurate information about the demographic characteristics of the households in which they reside. For these reasons, CDC and the Bureau of the Census incorporated a Youth Risk Behavior Supplement in the 1992 National Health Interview Survey (NHIS).

The supplement was conducted among 12- to 21-year-olds from a national probability sample of households. Data were obtained from youth attending school; not attending school, such as dropouts; and college-aged youth, including those who had not completed high school, those who had completed high school but were not attending college, and those attending college. School-aged youth not attending school were oversampled.

The supplement is a follow-back survey to NHIS. When one or more persons ages 12—21 years were identified in a household, at least one youth was administered the supplement about 4 to 6 weeks after the initial NHIS interview. The selected respondents did not have to be living in that household; for example, Bureau of the Census staff members sought the participation of respondents who were away from the household at college. The questionnaire was administered through individual portable cassette players with earphones; respondents listened to the questions and marked their

answers on a standardized answer sheet. This method helps to compensate for reading problems among respondents, helps ensure confidentiality during household administration, and allows youth to avoid disclosing their responses to an interviewer.

The questionnaire was modified for this expanded survey population. For example, questions regarding school physical education classes were replaced with items that were relevant to both inschool and out-of-school populations. The U.S. Department of Health and Human Services' Administration on Children, Youth, and Families added nine questions that identify instances of homelessness among respondents. Data from the supplement is being linked to other NHIS data (including extensive demographic information) collected from adult members of the household. Results from the supplement will be available in 1994.

YRBSS Characteristics

The YRBSS is an epidemiologic surveillance system (27) that shares some of the strengths and limitations of other health-related surveys of youth. Some characteristics of the system are as follows.

• Measuring six categories of priority health risk behaviors allows examination of interrelationships among categorical risk behaviors 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 those risk behaviors, but such surveys do not provide information for developing the more comprehensive interventions that might address simultaneously the multiple and interrelated risk behaviors practiced by many youth (28, 29).

• The surveillance system was designed to focus primarily on health risk behaviors, rather than related knowledge, attitudes, or beliefs. Behaviors were chosen for emphasis because they are the best predictors of related health outcomes and because there are so many knowledge, attitude, and belief variables with unknown or tenuous association with related risk behaviors. To reduce health risks and improve health status among youth and the adults that they will become, interventions need to be focused on behaviors as well as on those other variables (30, 31).

• Some behaviors may be controversial to measure, such as sexual intercourse and attempted suicide. All behaviors measured in the survey, however, are critical to the nation's health. There is no evidence that voluntarily responding to questions about any health risk behavior will encourage or discourage a respondent with regard to practicing 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 behaviors measured in the questionnaire.

• YRBSS results are based on self-reported data that appear valid for estimating the prevalence of health behaviors within adolescent populations (32—34). 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 (32, 35—38). Establishing criterion-related validity for responses to most of the

State and City Departments of Education Conducting Youth Risk Behavior Surveys

States, 1990
Alabama
California
Colorado
District of Columbia
Georgia
Iowa
Kansas
Kentucky
Massachusetts
Mississippi
Nebraska
New Hampshire
New Mexico
New York
North Carolina
Oklahoma
Oregon
Pennsylvania
South Carolina
South Dakota
Tennessee
Utah
West Virginia
Wisconsin

States, 1991
Alabama
Arizona
California
Colorado
District of Columbia
Florida
Georgia
Hawaii
Idaho
Iowa
Maryland
Montana
Nebraska
New Hampshire
New Jersey
New Mexico
New York
Oregon
Pennsylvania
Puerto Rico
South Carolina
South Dakota
Tennessee
Texas
Utah
Virgin Islands
Washington
Wisconsin
Wyoming

Cities, 1990
Dallas, TX
Ft. Lauderdale, FL
Jersey City, NJ
Miami, FL
Philadelphia, PA
San Diego, CA
San Francisco, CA
Seattle, WA

Cities, 1991
Boston, MA
Chicago, IL
Dallas, TX
Ft. Lauderdale, FL
Jersey City, NJ
Miami, FL
New York, NY
Philadelphia, PA
San Diego, CA
San Francisco, CA

Youth Risk Behavior Surveillance System Questions to Measure National Education Goal 6 (46)

1. During the past 30 days, on how many days did you smoke cigarettes **on school property**?

a. 0 days
b. 1 or 2 days
c. 3 to 5 days
d. 6 to 9 days
e. 10 to 19 days
f. 20 to 29 days
g. All 30 days

2. During the past 30 days, did you use **chewing tobacco**, such as Redman, Levi Garrett, or Beechnut, or **snuff**, such as Skoal, Skoal Bandits, or Copenhagen, **on school property**?

a. No, I did not use chewing tobacco or snuff
b. Yes, chewing tobacco only
c. Yes, snuff only
d. Yes, chewing tobacco and snuff

3. During the past 30 days, on how many days did you have at least one drink of alcohol **on school property**?

a. 0 days
b. 1 or 2 days
c. 3 to 5 days
d. 6 to 9 days
e. 10 to 19 days
f. 20 to 29 days
g. All 30 days

4. During the past 30 days, how many times did you use marijuana **on school property**?

a. 0 times
b. 1 or 2 times
c. 3 to 9 times
d. 10 to 19 times
e. 20 to 39 times
f. 40 or more times

5. During the past 30 days, on how many days did you carry a weapon, such as a gun, knife, or club, **on school property**?

a. 0 days
b. 1 day
c. 2 or 3 days
d. 4 or 5 days
e. 6 or more days

6. During the past 12 months, has anyone offered, sold, or given you an illegal drug **on school property**?

a. Yes
b. No

7. During the past 30 days, how many days did you **not** go to school because you felt you would be unsafe at school or on your way to or from school?

a. 0 days
b. 1 day
c. 2 or 3 days
d. 4 or 5 days
e. 6 or more days

8. During the past 12 months, how many times has someone stolen or deliberately damaged your property, such as your car, clothing, or books, **on school property**?

a. 0 times
b. 1 time
c. 2 or 3 times
d. 4 or 5 times
e. 6 or 7 times
f. 8 or 9 times
g. 10 or 11 times
h. 12 or more times

9. During the past 12 months, how many times has someone threatened or injured you with a weapon, such as a gun, knife, or club, **on school property**?

a. 0 times
b. 1 time
c. 2 or 3 times
d. 4 or 5 times
e. 6 or 7 times
f. 8 or 9 times
g. 10 or 11 times
h. 12 or more times

10. During the past 12 months, how many times were you in a physical fight **on school property**?

a. 0 times
b. 1 time
c. 2 or 3 times
d. 4 or 5 times
e. 6 or 7 times
f. 8 or 9 times
g. 10 or 11 times
h. 12 or more times

questions on the questionnaire may be impractical, if not impossible. Survey administration procedures were constructed carefully to protect confidentiality and, in the school-based surveys, to allow youth 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 of youth (39—41).

• Information generated by the household-based NHIS Youth Risk Behavior Supplement may not be entirely comparable to the same information generated by the school-based Youth Risk Behavior Surveys. Previous research suggested that youth may be more likely to respond candidly to school-based surveys than to nonschool-based surveys because they may consider school-based surveys as a common school practice, they may be reassured by responding as a part of a group, and they may have more confidence in the anonymity of school-based surveys (35—38).

• Many of the behaviors measured, such as alcohol and other drug use, sexual intercourse, and physical fighting, are associated not only with health outcomes but with educational and social outcomes, including absenteeism, low school achievement levels, and dropping out (28, 29).

• Although the system can provide information to help assess the impact of broad national, State, or local policies and programs (42), the system was not designed to evaluate the effectiveness of specific interventions, such as a teacher training program, school curriculum, or a media campaign. Other instruments and protocols can measure more precisely the intended outcomes of such interventions.

YRBSS Use

The system is being used in monitoring progress toward 26 of the national health objectives for the Year 2000 (5). Those objectives are listed in Appendix III and referenced in the articles in this supplement.

The system is being used to monitor progress in achieving the following.

• Five specific student-related objectives in CDC's "Strategic Plan for Preventing Human Immunodeficiency Virus (HIV) Infection" (43);
• 27 model standards, presented in "Healthy Communities 2000" (44);
• Four primary goals for the American Cancer Society's comprehensive school health education initiative (22, 45); and
• National Education Goal 6, "by the year 2000, every school in America will be free of drugs and violence and will offer a disciplined environment conducive to learning" (13, 46). At the request of the National Education Goals Panel, 10 questions were added to the national, State, and local questionnaires in 1993 to provide more information for measuring progress toward goal 6 (see the third accompanying box, page 7).

The system increasingly is used to support State and local policies and programs to reduce health risk behaviors among youth (13, 47—60). For example, Youth Risk Behavior Survey data have been used to

• Inform the public of the need for effective health education programs,
• Provide State boards of education and State legislatures with information supporting comprehensive school health policies and programs,
• Support stricter enforcement of policies on access by minors to cigarette vending machines and alcohol,
• Update and improve teacher training and instructional materials,
• Direct interventions to special populations that are at increased risk,
• Promote collaboration with institutions of higher education that are responsible for preparing teachers, and
• Help health agencies and community organizations develop effective community-based programs to reduce health risk behaviors.

CDC is modifying the questionnaire for use with college populations by working with funded universities and relevant national organizations. A national college survey will be conducted in 1995.

Conclusion

A relatively small number of risk behaviors established during youth contribute to the major health problems affecting the country. To monitor the incidence and prevalence of those behaviors, CDC has established the YRBSS. Articles in this supplement describe the rationale for selecting behaviors to be measured and items to measure them in the YRBSS questionnaire. The articles are provided to stimulate discussion about youth risk behavior priorities and measurement.

Data presented in the article "Results from the National School-Based 1991 Youth Risk Behavior Survey and Progress Toward Achieving Related Health Objectives for the Nation" summarize the nationwide need to reduce those health risk behaviors systematically. Societal efforts to reduce youth risk behaviors should consider

'Societal efforts to reduce risk behaviors should address social, cultural, and environmental circumstances that influence those behaviors. Success in reducing health risks will require a focused, sustained, concerted campaign that integrates the efforts of parents, families, schools, health and social service agencies, religious organizations, media, and young people themselves.'

relationships among many of those behaviors and help young people at developmentally appropriate ages to build the cognitive, emotional, and social skills they will need to avoid risk behaviors throughout their youth and adulthood. Societal efforts to reduce risk behaviors should address social, cultural, and environmental circumstances that influence those behaviors. Success in reducing health risks will require a focused, sustained, concerted campaign that integrates the efforts of parents, families, schools, health and social service agencies, religious organizations, media, and young people themselves.

The long-range expectation for the system is to serve as an evolving tool for planning, implementing, and evaluating efforts to reduce health risk behaviors among the nation's youth and the extraordinary and unnecessary suffering that those behaviors inflict.

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