Results from the National School-Based 1991 Youth Risk Behavior Survey and Progress Toward Achieving Related Health Objectives for the Nation

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NATIONAL HEALTH OBJECTIVES FOR THE YEAR 2000, presented in "Healthy People 2000" (1), represent an agenda for improving the nation's health. To achieve those goals, we as a nation must develop, implement, and sustain effective preventive interventions and share responsibility for reducing unnecessary mortality and morbidity. Families, educators, health professionals, the media, and government all have an important role.

Among the 300 objectives, 111 focus on adolescents or the school-based programs provided for adolescents (2). Those objectives are included in 19 of the 22 priority areas and in each of the 3 broad categories of preventive actions: health promotion, health protection, and preventive services.

The Youth Risk Behavior Surveillance System (YRBSS) was developed to focus national attention on priority health risk behaviors among adolescents that contribute to leading causes of mortality and morbidity among youth and adults. Selected data from the surveillance system can 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 YRBSS is the only ongoing surveillance system that can provide information about adolescent health on so many objectives. In this article we describe results from one component of the system, the national, school-based 1991 Youth Risk Behavior Survey, and document progress toward achieving 26 national health objectives. Results from the 1991 State and local Youth Risk Behavior Surveys have been published previously (3–6).

Method

Respondents. The national, school-based 1991 Youth Risk Behavior Survey used a three-stage cluster sample design. The sampling frame consisted of students in all public, parochial, and other private schools, in grades 9 through 12, in 50 States and the District of Columbia. Students in the trust territories, Virgin Islands, and Puerto Rico were excluded from the sampling frame. The first-stage sampling frame contained 2,094 primary sampling units (PSUs), consisting of large counties or groups of smaller, geographically proximate counties. The PSUs were grouped into 16 strata based on the extent of urbanization and the relative percentage of black and Hispanic students in the PSU. PSUs were classified as urban if they were among the 60 largest metropolitan statistical areas.

From those 16 strata, 50 PSUs were selected with probability proportional to the number of students in grades 9–12; from the 50 PSUs, 182 schools were selected with probability proportional to the number of students in grades 9–12. Schools with high percentages of black and Hispanic students were sampled at a relatively higher rate than other schools. Within sampled schools, at grades 9 through 12, one or two intact classes (depending on enrollment size and minority enrollment) of a required subject, such as English or social studies, were selected at random to participate in the survey. A sample size of about 18,000 students was chosen to allow for anticipated school and student nonresponse. The sample size was chosen as well to support national estimates for the overall population (± 0.05 percent at the 95 percent confidence level), subgroups of students defined by school grade and sex (± 0.05 percent at the 95 percent confidence level), and black or Hispanic students (± 0.05 percent at the 90 percent confidence level).

Questionnaire. The YRBSS questionnaire was developed by the Centers for Disease Control and Prevention (CDC), in collaboration with representatives of 19 other Federal agencies and 71 State and local Departments of Education, and with academics expert in the content

Table 1. Demographic characteristics of the 1991 Youth Risk Behavior Survey sample

Characteristic	Number	Percent
Sex:		
Female	6,283	48.9
Male	5,984	51.1
Grade:		
9	3,055	24.9
10	3,120	25.4
11	2,867	23.4
12	3,209	26.2
Missing	21	...
Race or ethnicity:		
White	5,385	70.0
Black	2,822	14.3
Hispanic	3,185	8.8
Other	857	6.9
Missing	23	...
Total	12,272	100

Table 2. Safety belt and helmet use among high school students, 1991 Youth Risk Behavior Survey

	Motor vehicle passengers always using safety belts		Motorcycle riders always using helmet		Bicycle riders always using helmet	
Category	Percent	CI	Percent	CI	Percent	CI
Sex:						
Female	29.5	± 4.7	41.3	± 6.6	0.9	± 0.5
Male	25.9	± 4.5	38.1	± 6.8	1.2	± 0.6
Grade:						
9	23.4	± 4.2	38.6	± 6.6	0.8	± 0.4
10	29.6	± 5.1	40.6	± 7.6	0.9	± 0.5
11	29.1	± 4.1	38.3	± 8.8	1.6	± 1.3
12	28.6	± 6.1	39.1	± 6.8	1.0	± 0.7
Race or ethnicity:						
White	30.5	± 5.4	40.1	± 6.5	1.2	± 0.5
Black	17.0	± 5.5	42.2	± 6.5	0.5	± 0.5
Hispanic	22.1	± 4.6	27.0	± 8.5	0.8	± 0.5
Total	27.7	± 4.4	39.2	± 5.8	1.1	± 0.4

NOTE: CI = 95 percent confidence interval.

areas. The questionnaire was designed for self-administration in a classroom setting, had a 7th grade reading level, and contained 75 multiple-choice questions. The questionnaire measured priority health risk behaviors related to unintentional and intentional injury; tobacco use; alcohol and other drug use; sexual behavior that contributes to unintended pregnancies and sexually transmitted diseases, including HIV infection; dietary behavior; and physical activity.

Professionally trained data collectors administered the questionnaire in each school March through May 1991. Parents and students were asked to consent to participation in the survey. Students who did not participate received an alternative activity to complete. To help protect their anonymity, students were seated as far apart as possible within the classrooms and were provided envelopes in which to enclose completed computer-scannable answer sheets and a large box in which to deposit their sealed envelopes. Teachers remained outside the classroom whenever possible. As part of the standardized survey administration procedure, students were assured that their responses could not be linked to them and that completing the questionnaire would not affect their grade in the class.

Data analysis. Data were edited for inconsistency and a weighting factor was applied to each student record to adjust for nonresponse and oversampling of black and Hispanic students. The weights were scaled so that the weighted count of students per grade was equal to the number of students for that grade. Univariate analyses with priority health risk behaviors as dependent variables and demographic characteristics as independent variables were conducted with the weighted data. Ninety-five percent confidence intervals were calculated for each estimate and used to determine differences among subgroups. SESUDAAN, which takes into account the complex sample design, was used to calculate the confidence intervals (7).

Results

Seventy-five percent (137) of the schools that were asked to participate agreed. Within those schools, 13,568 students were eligible for the survey. Twenty-eight percent of schools required active parental permission for students to participate and 48 percent required passive permission. Two percent of the students did not receive the required parental permission. Another 8 percent of students were absent the day the survey was administered and on scheduled make-up days. Usable questionnaires were received from 90 percent (12,272) of the eligible students in the participating schools. Results may be generalized to all 9th through 12th grade students in the United States.

Students were distributed evenly among grades 9 through 12 and between sexes (table 1). After weighting, white students were 70.0 percent of the sample, black students were 14.3 percent, and Hispanic students were 8.8 percent. The actual distribution of 9th through 12th grade students in the United States in 1988 was 70.8 percent white, 15.5 percent black, and 8.9 percent Hispanic (8).

Unintentional and intentional injury. More than a quarter of all students (27.7 percent) always used a safety belt when riding in a car or truck driven by someone else (table 2). Among students who always used a safety belt,

Table 3. Physical fighting and weapon carrying among high school students, 1991 Youth Risk Behavior Survey

Category	Physical fighting [1]		12-month incidence of physical fighting [2]	Weapon carrying [3]		30-day incidence of weapon carrying [4]
	Percent	CI		Percent	CI	
Sex:						
Female	34.4	± 3.2	103	10.9	± 1.7	40
Male	50.2	± 2.5	170	40.6	± 2.7	172
Grade:						
9	50.5	± 3.2	176	27.5	± 3.4	107
10	43.1	± 4.2	137	26.8	± 3.0	109
11	43.0	± 3.3	141	29.0	± 2.4	122
12	33.9	± 3.8	98	21.3	± 2.5	94
Race or ethnicity:						
White	41.0	± 2.6	131	25.1	± 2.6	104
Black	50.6	± 4.5	164	32.7	± 3.1	134
Hispanic	41.3	± 4.8	127	25.8	± 4.6	100
Total	42.5	± 2.3	137	26.1	± 2.1	107

[1] At least 1 fight during the 12 months preceding the survey.

[2] Students who reported fighting 2 or 3 times were assigned a fighting frequency of 2.5; 4 or 5 times, 4.5; 6 or 7 times, 6.5; 8 or 9 times, 8.5; 10 or 11 times, 10.5; and 12 or more times, 12.

[3] At least 1 day during the 30 days preceding the survey.

[4] Students who reported that they carried a weapon on 2 or 3 days were assigned a weapon carrying frequency of 2.5; 4 or 5 days, 4.5; and 6 or more days, 6.

NOTE: CI = 95 percent confidence interval.

Table 4. Behavior related to attempted suicide among high school students during the 12 months preceding the survey, 1991 Youth Risk Behavior Survey

Category	Thought seriously about suicide		Made suicide plans		Attempted suicide		Suicide attempt required medical attention [1]	
	Percent	CI	Percent	CI	Percent	CI	Percent	CI
Sex:								
Female	37.2	± 1.9	24.9	± 2.0	10.7	± 1.5	2.5	± 0.6
Male	20.8	± 1.8	12.5	± 1.6	3.9	± 0.9	1.0	± 0.4
Grade:								
9	29.1	± 4.0	19.4	± 3.4	9.1	± 2.7	1.9	± 0.5
10	29.5	± 3.2	18.6	± 2.6	7.6	± 1.6	1.6	± 0.7
11	31.6	± 2.7	20.7	± 2.3	6.3	± 1.8	1.8	± 0.9
12	25.8	± 3.0	15.9	± 2.4	5.8	± 1.3	1.7	± 0.6
Race or ethnicity:								
White	29.9	± 1.9	19.0	± 1.8	6.7	± 1.2	1.6	± 0.5
Black	22.2	± 2.0	14.8	± 2.4	6.6	± 2.0	1.8	± 0.8
Hispanic	26.8	± 3.7	15.9	± 2.5	7.9	± 1.8	1.7	± 0.5
Total	29.0	± 1.6	18.6	± 1.6	7.3	± 1.1	1.7	± 0.3

[1] Resulted in an injury, poisoning, or overdose that was treated by a doctor or a nurse.

NOTE: CI = 95 percent confidence interval.

white students were significantly more likely to have done so than black students. Safety belt use did not vary by sex or grade in school.

Among students who rode a motorcycle, 39.2 percent always wore a motorcycle helmet (table 2). Among those who always wore a motorcycle helmet, black students were significantly more likely to do so than Hispanic students. Among students who rode a bicycle, 1.1 percent always wore a bicycle helmet. Motorcycle helmet use did not vary significantly by sex or grade; bicycle helmet use did not vary significantly by sex, grade, or race or ethnicity.

Among all students, 42.5 percent were in at least one physical fight during the 12 months preceding the survey (table 3). Male students were significantly more likely to have been in a physical fight during the preceding 12 months than female students; black students were significantly more likely to have been in a physical fight during the preceding 12 months than white students. Prevalence of fighting decreased as grade in

Table 5. Use of tobacco among high school students, 1991 Youth Risk Behavior Survey

Category	Cigarette use ever [1]		Regular cigarette use [2]		Current cigarette use [3]		Frequent cigarette use [4]		Smokeless tobacco use [5]	
	Percent	CI	Percent	CI	Percent	CI	Percent	CI	Percent	CI
Sex:										
Female	69.5	± 2.8	22.1	± 2.9	27.3	± 3.2	12.4	± 2.6	1.3	± 0.6
Male	70.6	± 2.4	20.2	± 2.1	27.6	± 3.3	13.0	± 2.0	19.2	± 2.7
Grade:										
9	64.8	± 3.1	17.3	± 3.5	23.2	± 3.6	8.4	± 2.1	9.0	± 2.4
10	68.3	± 3.4	19.1	± 1.9	25.2	± 3.0	11.3	± 2.6	10.1	± 2.3
11	72.8	± 3.3	24.3	± 3.0	31.6	± 4.0	15.6	± 2.9	12.1	± 2.4
12	74.5	± 3.1	24.0	± 3.7	30.1	± 4.3	15.6	± 3.3	10.7	± 2.3
Race or ethnicity:										
White	70.4	± 2.6	24.9	± 2.7	30.9	± 3.1	15.4	± 2.5	13.0	± 2.1
Black	67.2	± 3.2	6.7	± 1.6	12.6	± 2.5	3.1	± 1.1	2.1	± 0.5
Hispanic	75.3	± 4.7	16.1	± 2.1	25.3	± 2.8	6.8	± 1.6	5.5	± 2.8
Total	70.1	± 2.2	21.2	± 2.3	27.5	± 2.7	12.7	± 2.2	10.5	± 1.7

[1] Ever had tried cigarette use, smoking as little as 1 or 2 puffs.
[2] Ever had been a regular user, smoking at least 1 cigarette a day for 30 days.
[3] Current user, smoking cigarettes on 1 or more of the 30 days preceding the survey.
[4] Frequent user, smoking cigarettes on 20 or more of the 30 days preceding the survey.
[5] Used chewing tobacco or snuff on 1 or more of the 30 days preceding the survey.
NOTE: CI = 95 percent confidence interval.

'The survey results indicate that many high school students are establishing patterns of behaviors that place them at risk for motor vehicle crash injury, other unintentional injury, homicide, suicide, heart disease, and cancer. Those health problems represent the leading causes of death among youth and adults in the United States.'

school increased. Twelfth grade students were significantly less likely to have been in a physical fight during the preceding 12 months than 9th grade students, 10th grade students, or 11th grade students. An estimated 137 incidents of physical fighting occurred per 100 students per year.

Among all students, 26.1 percent had carried a weapon, such as a gun, knife, or club, at least 1 day during the 30 days preceding the survey (table 3). Male students were significantly more likely to have carried a weapon than female students; black students were significantly more likely to have carried a weapon than white students. Twelfth grade students were significantly less likely to have carried a weapon than 9th grade students or 11th grade students. The estimated incidence of weapon-carrying during the 30 days preceding the survey was 107 per 100 students.

Students were asked about attempted suicide during the 12 months preceding the survey. Among all students, 29.0 percent had thought seriously about attempting suicide, 18.6 percent had made a specific plan to attempt suicide, 7.3 percent actually had attempted suicide, and 1.7 percent had made a suicide attempt that resulted in an injury, a poisoning, or an overdose that had to be treated by a doctor or nurse (table 4).

Female students were significantly more likely to have thought about attempting suicide during the preceding 12 months than male students; female students were significantly more likely to have made a specific plan to attempt suicide than male students; female students were significantly more likely to have attempted suicide than male students; and female students were significantly more likely to have made a suicide attempt requiring medical attention than male students.

White students were significantly more likely to have thought about attempting suicide during the preceding 12 months than black students; 11th grade students were significantly more likely to have made a specific plan to attempt suicide than 12th grade students.

Tobacco use. Among all students, 70.1 percent had tried cigarette smoking, 21.2 percent had smoked cigarettes regularly (had at any time smoked at least one cigarette every day for 30 days), 27.5 percent were current smokers (had smoked cigarettes on one or more of the 30 days preceding the survey), and 12.7 percent had smoked cigarettes frequently (on 20 or more of the 30 days preceding the survey) (table 5).

White students were significantly more likely than black students to have smoked cigarettes regularly, currently, and frequently; white students were signifi-

cantly more likely than Hispanic students to have smoked cigarettes regularly and frequently; and Hispanic students were significantly more likely than black students to have smoked cigarettes ever, regularly, currently, and frequently.

Ninth grade students were significantly less likely than 11th grade students to have smoked cigarettes ever, regularly, currently, or frequently. Ninth grade students were significantly less likely than 12th grade students to have smoked cigarettes ever or frequently. Ever, regular, current, or frequent cigarette use did not vary by sex. Among students who had smoked a whole cigarette, the average age at first use was 12.6 years.

Among all students, 10.5 percent had used smokeless tobacco (chewing tobacco or snuff) on one or more of the 30 days preceding the survey (table 5). Male students were significantly more likely to have used smokeless tobacco than female students. White students were significantly more likely to have used smokeless tobacco than black students or Hispanic students. Hispanic students were significantly more likely than black students to have done so. Smokeless tobacco use did not vary by grade in school.

Alcohol and other drug use. Among all students, 81.6 percent had consumed alcohol during their lifetime, and 50.8 percent did so during the 30 days preceding the survey (table 6). White students were significantly more likely to have used alcohol during the 30 days preceding the survey than black students. Lifetime and current alcohol use increased significantly with increasing grade in school, but did not vary by sex. Among students who had drunk alcohol, the average age at first use was 12.5 years.

Among all students, 31.3 percent reported episodic heavy drinking (consuming five or more drinks of alcohol on at least one occasion during the 30 days preceding the survey) (table 6). Episodic heavy drinking had occurred significantly more often among male students than among female students, and among white and Hispanic students than among black students. Episodic heavy drinking increased significantly with increasing grade in school.

Among all students, 31.3 percent had used marijuana during their lifetime, 14.7 percent had used marijuana during the 30 days preceding the survey (current marijuana use), 5.9 percent had used cocaine during their lifetime, and 1.7 percent had used cocaine during the 30 days preceding the survey (current cocaine use) (table 7). Although lifetime and current marijuana use did not vary by sex, lifetime and current cocaine use occurred significantly more often among male than female students. Lifetime and current marijuana use and lifetime cocaine use increased significantly with increasing grade in school. The prevalence of lifetime and current cocaine use was significantly greater among white and Hispanic students than among black students. Marijuana use did not vary by race or ethnicity. Among students who had used marijuana, the average age at first use was 13.7 years.

Table 6. Use of alcohol among high school students, 1991 Youth Risk Behavior Survey

Category	Use ever		Current use 1		Episodic heavy use 2	
	Percent	CI	Percent	CI	Percent	CI
Sex:						
Female	80.9	± 2.7	48.8	± 3.2	25.9	± 2.5
Male	82.3	± 2.9	52.7	± 3.8	36.5	± 4.2
Grade:						
9	71.8	± 4.3	40.9	± 5.1	22.6	± 3.9
10	80.4	± 3.7	47.8	± 3.3	27.1	± 3.4
11	86.9	± 2.7	54.5	± 3.9	36.3	± 4.9
12	86.8	± 2.2	59.9	± 4.3	39.3	± 5.3
Race or ethnicity:						
White	83.0	± 2.9	52.9	± 3.5	34.9	± 3.2
Black	78.2	± 3.4	42.0	± 4.8	16.8	± 3.8
Hispanic	85.0	± 3.5	54.3	± 5.4	32.2	± 5.8
Total	81.6	± 2.6	50.8	± 3.4	31.3	± 3.3

[1] Consumed at least 1 drink of alcohol during the 30 days preceding the survey.

[2] Consumed 5 or more drinks of alcohol on at least 1 occasion during the 30 days preceding the survey.

NOTE: CI = 95 percent confidence interval.

Among all students, 2.7 percent had used steroids during their lifetime (table 7). Male students were significantly more likely than female students to have used steroids. Steroid use did not vary by grade, or by race or ethnicity.

Sexual behaviors. Among all students, 54.1 percent had participated in sexual intercourse and 18.7 percent had four or more sex partners during their lifetime (table 8). Among students who engaged in sexual intercourse, 69.3 percent had done so during the 3 months preceding the survey (currently sexually active). Female students were significantly more likely to be currently sexually active than male students. Male students were significantly more likely to have had four or more sex partners than female students. Black students were significantly more likely than white or Hispanic students to have had sexual intercourse and to have had four or more sex partners. The prevalence of having had sexual intercourse, having had four or more sex partners, and being currently sexually active increased significantly with increasing grade in school.

Among currently sexually active students, 81.8 percent had used a contraceptive method (birth control pill, condom, or withdrawal) during their most recent sexual intercourse; 46.2 percent had used a condom on that occasion (table 9). Contraceptive use did not vary signifi-

Table 7. Drug use among high school students, 1991 Youth Risk Behavior Survey

Category	Marijuana use ever [1]		Current marijuana use [2]		Cocaine use ever [1]		Current cocaine use [2]		Steroid use ever [1]	
	Percent	CI	Percent	CI	Percent	CI	Percent	CI	Percent	CI
Sex:										
Female	29.8	± 3.2	12.5	± 1.7	4.4	± 0.9	1.0	± 0.5	1.2	± 0.3
Male	32.8	± 3.8	16.7	± 2.9	7.3	± 1.3	2.4	± 0.6	4.1	± 0.8
Grade:										
9	20.5	± 2.7	10.1	± 1.6	3.9	± 1.1	1.5	± 1.0	2.4	± 1.0
10	27.1	± 4.1	12.8	± 2.7	4.0	± 1.2	1.1	± 0.5	2.9	± 0.9
11	36.8	± 3.6	17.5	± 3.7	8.1	± 1.6	2.0	± 0.6	2.6	± 0.7
12	40.8	± 4.1	18.2	± 3.0	7.7	± 1.5	2.2	± 0.8	2.6	± 1.0
Race or ethnicity:										
White	31.8	± 4.0	15.2	± 2.8	6.3	± 1.1	1.7	± 0.6	2.7	± 0.6
Black	31.2	± 4.9	13.5	± 3.3	2.2	± 0.9	0.6	± 0.3	2.1	± 0.8
Hispanic	32.2	± 6.8	14.4	± 4.8	8.9	± 3.7	3.1	± 1.7	2.6	± 0.7
Total	31.3	± 3.1	14.7	± 2.2	5.9	± 1.0	1.7	± 0.5	2.7	± 0.4

[1] Any use.

[2] Used during the 30 days preceding the survey.

NOTE: CI = 95 percent confidence interval.

Table 8. Sexual intercourse among high school students, 1991 Youth Risk Behavior Survey

Category	Ever had sexual intercourse		Have had 4 or more sex partners		Currently sexually active [1]	
	Percent	CI	Percent	CI	Percent	CI
Sex:						
Female	50.8	± 3.4	13.8	± 1.6	75.3	± 3.1
Male	57.4	± 3.6	23.4	± 2.8	64.1	± 2.6
Grade:						
9	39.0	± 3.5	12.5	± 2.8	57.5	± 3.9
10	48.2	± 5.4	15.1	± 2.7	68.9	± 3.0
11	62.4	± 3.4	22.1	± 3.2	69.4	± 3.9
12	66.7	± 4.0	25.1	± 3.9	75.9	± 3.4
Race or ethnicity:						
White	50.0	± 3.2	14.7	± 1.7	67.9	± 2.3
Black	81.5	± 3.0	43.1	± 3.5	72.9	± 3.1
Hispanic	53.1	± 4.4	16.8	± 3.3	69.6	± 3.8
Total	54.1	± 3.0	18.7	± 1.9	69.3	± 2.1

[1] Among those who had ever had sexual intercourse, and who had had intercourse during the 3 months preceding the survey.

NOTE: CI = 95 percent confidence interval.

cantly by sex among currently sexually active students, but increased significantly from 9th grade to 12th grade. White students had used a contraceptive method during their most recent sexual intercourse significantly more often than black students or Hispanic students. Male students were significantly more likely to have used a condom during their most recent act of sexual intercourse than female students; 9th grade students were significantly more likely than 12th grade students to have done so; black students were significantly more likely than Hispanic students to have done so.

Dietary behaviors. Among all students, 12.9 percent had consumed five or more servings of fruits and vegetables (fruit, fruit juice, green salads, or cooked vegetables) during the day preceding the survey (table 10). Male students were significantly more likely to have consumed five or more servings of fruits and vegetables than female students; white students were significantly more likely to have done so than Hispanic students or black students; and 10th grade students were significantly more likely to have done so than 12th grade students.

Among all students, 64.9 percent during the day preceding the survey had eaten 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) (table 10). Female students were significantly more likely to have eaten no more than two servings of foods typically high in fat content than were male students; Hispanic students were significantly more likely to have done so than white students or black students. Consumption of foods typically high in fat content did not vary by grade.

Physical activity. Among all students, 48.9 percent were enrolled in physical education (PE) class and 41.6 percent attended PE daily (table 11). Enrollment and daily attendance in PE decreased significantly from the 9th to the 12th grade. Among 12th grade students, only 27.4 percent were enrolled in PE and only 21.2 percent attended PE daily. Black students were significantly more likely than white students to be enrolled in PE and to attend PE daily. Enrollment and daily attendance did not vary significantly by sex. Among students enrolled in PE, 49.4 percent exercised or played sports more than

30 minutes during an average PE class. Male students were significantly more likely than female students to have done so. The amount of exercise reported per class did not vary by grade or by race or ethnicity.

Among all students, 40.9 percent reported having walked or bicycled for at least 30 minutes (moderate physical activity) during the day preceding the survey (table 12). Moderate physical activity decreased significantly with higher grade level. Black students were significantly more likely to report moderate physical activity than white students. Participation in moderate physical activity during the day preceding the survey did not vary by sex.

Among all students, during 4 or more of the 7 days preceding the survey, 43.0 percent had done stretching exercises (such as toe touches, knee bending, or leg stretching), and 36.6 percent had done strengthening exercises (such as push-ups, sit-ups, or weight lifting) to tone or strengthen muscles (table 12). Male students were significantly more likely to have done strengthening exercises than female students; Hispanic students were significantly more likely to have done so than black students. The percent of students doing stretching exercises decreased significantly with higher grade level.

Discussion

The survey results indicate that many high school students are establishing patterns of behaviors that place them at risk for motor vehicle crash injury, other unintentional injury, homicide, suicide, heart disease, and cancer. Those health problems represent the leading causes of death among youth and adults in the United States (9). Many high school students also engage in sexual behaviors that place them at risk for unintended pregnancy and infection with sexually transmitted disease, including HIV infection. Alcohol and other drug use is associated with much of the mortality and morbidity among youth (1). The health risk behaviors that contribute to the leading causes of mortality and morbidity contribute simultaneously to lower educational achievement, to rising health care costs, and to decreased economic productivity (10).

Of the 26 national health objectives related to adolescents and measured by the 1991 Youth Risk Behavior Survey (Appendix III, National Health Objectives Measured by the YRBSS, page 67), only 3 objectives, 1.3, 15.11, and 17.13, had been met among high school students in 1991. Achievement of most of the remaining objectives will require significant progress. The gap between the 1991 data and the goals established for the year 2000, although perhaps not surprising early in the decade, illustrates the scope of the task ahead and should generate concern about the health related needs of all adolescents. Sustained, coordinated efforts are needed to implement quality health promotion programs nationwide to attain those objectives.

The nation's 100,000 schools offer the most system-

Table 9. Contraception and condom use among currently sexually active high school students, 1991 Youth Risk Behavior Survey

Category	Used a contraceptive method		Used a condom	
	Percent	CI	Percent	CI
Sex:				
Female	80.8	± 2.6	38.0	± 4.2
Male	83.0	± 2.9	54.6	± 3.5
Grade:				
9	72.9	± 8.1	53.3	± 6.0
10	81.8	± 3.4	46.3	± 4.5
11	82.9	± 3.8	48.7	± 5.8
12	84.9	± 2.6	41.6	± 3.7
Race or ethnicity;				
White	86.2	± 1.9	46.6	± 4.4
Black	74.2	± 4.9	48.0	± 4.0
Hispanic	71.4	± 5.5	37.6	± 5.5
Total	81.8	± 2.1	46.2	± 3.1

NOTE: Percentages shown are of currently sexually active students who used a contraceptive method, and those who used a condom, during their most recent sexual intercourse.

Sexually active is defined as those students reporting sexual intercourse during the 3 months preceding the survey, among students who had ever had sexual intercourse.

Contraception is use of the birth control pill, condom, withdrawal, or another method.

CI = 95 percent confidence interval.

Table 10. Dietary behaviors among high school students, 1991 Youth Risk Behavior Survey

Category	Ate 5 or more servings of fruits and vegetables		Ate no more than 2 servings of foods typically high in fat content	
	Percent	CI	Percent	CI
Sex:				
Female	10.5	± 1.4	72.9	± 1.6
Male	15.2	± 1.6	57.2	± 3.3
Grade:				
9	14.7	± 3.3	63.5	± 2.4
10	14.0	± 1.8	62.1	± 4.3
11	12.2	± 1.4	66.0	± 2.5
12	10.3	± 1.6	68.1	± 2.7
Race or ethnicity:				
White	13.9	± 1.4	64.4	± 2.7
Black	6.8	± 1.4	61.3	± 3.5
Hispanic	9.7	± 2.0	72.0	± 2.4
Total	12.9	± 1.2	64.9	± 2.2

NOTE: Students who replied that they did not consume a particular type of food were assigned a frequency of 0; students who replied that they consumed a particular type of food "once only" were assigned a frequency of 1; and students who replied that they consumed a particular type of food "twice or more" were assigned a frequency of 2. The number of servings of fruits and vegetables ranged from 0 through 8. The number of servings of foods typically high in fat content ranged from 0 through 6.

CI = 95 percent confidence interval.

Table 11. Participation in physical education (PE) among high school students, 1991 Youth Risk Behavior Survey

Category	Enrolled in PE		Attended PE daily		Exercised more than 30 minutes per class [1]	
	Percent	CI	Percent	CI	Percent	CI
Sex:						
Female	45.0	± 6.6	37.4	± 4.9	40.7	± 3.9
Male	52.8	± 6.7	45.6	± 6.2	56.5	± 4.1
Grade:						
9	75.8	± 4.7	65.8	± 6.2	48.9	± 4.8
10	59.9	± 9.0	51.8	± 8.4	49.0	± 4.8
11	32.4	± 8.7	27.4	± 8.0	52.9	± 8.0
12	27.4	± 7.9	21.2	± 6.0	47.3	± 8.9
Race or ethnicity:						
White	45.5	± 6.7	38.6	± 6.5	49.4	± 5.2
Black	60.7	± 7.5	51.9	± 5.9	48.2	± 4.7
Hispanic	54.3	±10.9	46.6	± 6.9	53.0	± 8.4
Total	48.9	± 6.1	41.6	± 5.3	49.4	± 4.1

[1] Percentages of those enrolled in PE who exercised or played sports for more than 30 minutes during the average PE class.
NOTE: CI = 95 percent confidence interval.

Table 12. Types of physical activity among high school students, 1991 Youth Risk Behavior Survey

Category	Moderate physical activity [1]		Stretching exercises [2]		Strengthening exercises [3]	
	Percent	CI	Percent	CI	Percent	CI
Sex:						
Female	41.2	± 4.2	41.2	± 4.1	28.9	± 3.9
Male	40.7	± 3.3	44.8	± 4.0	43.9	± 3.2
Grade:						
9	49.3	± 3.2	50.5	± 8.6	39.7	± 7.9
10	42.9	± 4.8	48.8	± 4.0	40.5	± 4.0
11	39.4	± 3.3	39.1	± 3.5	35.8	± 3.2
12	32.4	± 3.8	33.8	± 4.2	30.7	± 3.7
Race or ethnicity:						
White	37.6	± 4.2	45.1	± 5.0	38.0	± 4.0
Black	49.4	± 5.7	36.4	± 3.8	29.8	± 4.4
Hispanic	49.6	± 8.1	41.1	± 3.7	36.7	± 2.1
Total	40.9	± 3.5	43.0	± 3.7	36.6	± 3.2

[1] Moderate physical activity included walking or bicycling for at least 30 minutes during the day preceding the survey.
[2] Stretching exercises included toe touching, knee bending, or leg stretching during 4 or more of the 7 days preceding the survey.
[3] Strengthening exercises included exercises to strengthen or tone muscles, such as push-ups, sit-ups, or weight lifting during 4 or more of the 7 days preceding the survey.
NOTE: CI = 95 percent confidence interval.

atic and efficient means to help our young people develop the skills they need to avoid health-risk behaviors during adolescence and adulthood. The important role of schools in helping to attain those objectives is illustrated by other national health objectives that call for increases in nutrition education (Objective 2.19), tobacco-use prevention education (Objective 3.10), alcohol and other drug-use prevention education (Objective 4.13), education that teaches nonviolent conflict resolution skills (Objective 7.16), education on injury prevention and control (Objective 9.18), HIV prevention education (Objective 18.10), and sexually transmitted disease prevention education (Objective 19.12) (1). Categorical programs designed to meet those objectives could be provided within the framework of planned, sequential, comprehensive school health education from kindergarten through 12th grade, as called for by National Health Objective 8.4.

Aside from those national health objectives, at least 22 major reports published in the past 5 years have called for establishing or improving effective school health programs (11–33). Because of the importance of such programs in achieving numerous national health objectives, CDC is designing a surveillance system to examine school health policies and programs at the school, district, and State levels to reduce health risk behaviors in each of the six categorical areas measured by the YRBSS. The system will provide base line data on 17 national health objectives that can be attained directly through health and physical education, food service, and health service in the schools, and through the school environment.

One component of the surveillance system will be a national survey of programs and policies among a representative sample of public and private middle and senior high schools. That survey will include onsite, structured interviews with school principals, health education teachers, physical education teachers, school food service directors, school nurses, and other appropriate persons. CDC also will review policies related to school health in all State Departments of Education and in a nationally representative sample of local school districts. Information from that surveillance system will help Federal, State, and local agencies in planning and implementing strategies to improve school health programs collaboratively and with relevant private organizations, universities, and philanthropies.

A coordinated effort and commitment can improve greatly our chances of achieving Year 2000 national health objectives that are related to the health behaviors of adolescents.

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