

1988

**A STATEWIDE REPORT ON SUBSTANCE USE AMONG PUBLIC  
SCHOOL STUDENTS IN WASHINGTON  
MARCH 1989**

**THE STUDENT ALCOHOL AND DRUG USE SURVEY  
Prepared by the Northwest Regional Educational Laboratory  
Dennis Deck and Phil Nickel, researchers**

**for**

**Judith A. Billings, Superintendent of Public Instruction**

**Contact: Debbie Koss-Warner, Supervisor  
Drug and Alcohol Program  
Instructional Programs and Services  
Old Capitol Building  
Olympia, Washington 98504-3211  
(206)753-5595**



# Table of Contents

	Page
<b>Executive Summary</b> .....	1
<b>Introduction</b> .....	6
<b>Approach</b> .....	7
Design of the Survey .....	7
Development of Special Scales .....	7
Sampling Plan .....	9
Data Analysis .....	10
Administration .....	13
Quality Control Screening .....	14
Validity .....	14
Sources of Comparative Data .....	15
<b>Findings</b> .....	16
Lifetime Prevalence of Use .....	16
Regular Use .....	20
Substance Abuse .....	26
Patterns of Use .....	28
Factors Related to Use .....	38
Experience with Drug Education .....	45
<b>Conclusions</b> .....	51
<b>References</b> .....	52
<b>Appendix A Statewide Results by Grade</b> .....	A1
<b>Appendix B Sampling Error Estimates</b> .....	B1

## Figures

1. Lifetime prevalence of 15 substances by grade .....	18
2. Percent of students in Washington and in the nation having tried alcohol, marijuana, cocaine and inhalents by grade .....	19
3. Percent of students using various substances at least six times by grade.....	20
4. Percent of students with low, moderate, and high levels of alcohol use by grade .....	22
5. Percent of students with low, moderate, and high levels of drug use by grade.....	22
6. Percent of students in Washington and a national sample of eighth and tenth graders binge drinking at least once in the last two weeks .....	23
7. Percent of students reporting the quantity of alcohol usually consumed by grade.....	24
8. Percent of students reporting the number of drinks to become drunk by grade.....	24
9. Percent of students reporting the age of their first full drink by grade.....	25
10. Pie graphs illustrating the relationship between high drug and alcohol use.....	27
11. Sex differences by grade in lifetime prevalence of use a. alcohol use.....	29
b. drug use.....	29
12. Sex differences by grade in quantity of alcohol usually consumed.....	30

13.	Relationship between number of extra-curricular and after school activities and moderate to high substance use	
	a. alcohol use.....	31
	b. drug use.....	31
14.	Comparison of moderate to high substance use for college bound and non-college-bound students	
	a. alcohol use.....	33
	b. drug use.....	33
15.	Comparison of moderate to high substance use for tenth graders by ethnic group	
	a. alcohol use.....	35
	b. drug use.....	35
16.	Comparison of moderate to high substance use for tenth graders by region	
	a. alcohol use.....	36
	b. drug use.....	36
17.	Percent of students by grade from rural and non-rural schools reporting moderate to high substance use	
	a. alcohol use.....	37
	b. drug use.....	37
18.	Percent of students reporting how many of their closest friends use alcohol at least once a month by grade.....	38
19.	Percent of students by grade reporting that there is alcohol or drug use at most parties they attend.....	39
20.	Percent of students by grade perceiving an alcohol or drug problem by some or a lot of students attending the school.....	40
21.	Percent of students by grade perceiving alcohol use, drug use, or both during the school day.....	41
22.	Percent of students by grade perceiving their parents would greatly disapprove to drug use.....	42

23.	Percent of students by grade attributing great risk to six forms of substance use.....	43
24.	Percent of students by grade reporting marijuana, cocaine, or other drugs are easy or or very easy to obtain.....	44
25.	Percent of those students who drink by grade reporting the primary source for alcohol.....	44
26.	Percent of students suggesting the grade level that drug education should begin by grade level of respondent.....	45
27.	Percent of students learning the most about the dangers of alcohol or drugs from various sources by grade.....	46
28.	Percent of students learning some or learning a lot from drug education classes at school by grade.....	47
29.	Percent of eighth and tenth graders reporting moderate to high substance use by the amount learned from drug education classes	
	a. alcohol use.....	49
	b. drug use.....	49

## Tables

1. Results of sampling plan .....	10
2. Description of actual and weighted sample .....	11
3. Number and percent of surveys processed .....	13
4. Lifetime prevalence of drug use by grade .....	17
5. Use of substances at least six times in the last year by grade .....	21
6. Sex differences by grade on selected indicators of substance use.....	28





## **Executive Summary**

In the fall of 1988, the Office of the Superintendent of Public Instruction (OSPI) and the Northwest Regional Educational Laboratory (NWREL) collaborated in a study to determine the extent and nature of substance use among public school students in the state of Washington. A survey of alcohol and other drug use was administered to sixth, eighth, and tenth grade students in a sample of schools across the state in November. The statewide results of that study of substance use are described in this report.

### **Approach**

A survey that has been used throughout the Northwest states was modified slightly for use in this study. The survey included 67 questions on student background, use of legal (e.g., over-the-counter drugs) and illegal substances, attitudes toward use and harmfulness, use among peers, perceptions of parental attitudes, risk factors related to use, and experiences with drug education. A shorter version was used with sixth graders.

A stratified cluster sampling plan was developed by NWREL to ensure that results would be representative by region, school size, and rurality. OSPI staff contacted the superintendent and principal of each sample school by mail to ask for their participation in the survey and made a followup telephone call if no response was received. If the school did not agree to participate, the next school from the appropriate cell of the sampling plan was contacted. Although a higher number of schools refused to participate than expected, particularly among large schools at the tenth grade, an adequate sample was obtained to complete the study.

The survey was administered to 10,485 students in 125 public schools. All students at the appropriate grade who were in attendance on the day the survey was administered in that school were asked to complete the survey. Students were assured that their participation was entirely voluntary and that their responses would be anonymous. No name or other identifying information was collected.

Based on the work of other researchers, three scales were developed combining the results of individual items in the survey. The Alcohol Scale is a summary of the frequency of drinking and the quantity usually consumed when drinking. The Drug Scale is based on the addictiveness of the drug, frequency of use, and number of different drugs used. The Risk Scale is based in part upon the research of David Hawkins at the University of Washington, who identified factors related to abuse of alcohol and drugs. Factors such as friends use, alcohol or drug problems among friends or family, and perceptions of risk are included in this scale.

Completed answer sheets were carefully screened to remove the responses from students who admitted responding dishonestly, who faked high use, or who did not take the survey seriously. The results from each school were weighted to account for variation in school size and to adjust for under- or over-sampling of some cells.

Our screening procedures detect students faking high use (exaggerators) but not those faking low use (minimizers). Also, substance abuse is usually highest among students with high absenteeism, so use is likely to be higher among the students absent when the survey was administered. As a result, the survey findings reported here probably represent an underestimate of substance use by students in Washington.

## **Lifetime Prevalence of Use**

Results of this survey indicate that there is substantial experimentation with alcohol and drugs among students enrolled in Washington's public schools. Lifetime prevalence (i.e., percent of students who have ever tried a drug) allows us to examine when students begin to experiment with alcohol and other drugs.

Some of the highlights include:

- o Alcohol is by far the substance of choice for students at all grades. Beer and wine are preferred over hard liquor, but some form of alcohol has been tried by 51 percent of the sixth graders, 69 percent of the eighth graders, and 84 percent of the tenth graders.
- o A large number of students have tried illicit drugs at all grades, particularly marijuana, inhalants, and stimulants. The percent of students having tried some illicit drug at least once was 17 by sixth grade, 27 by eighth grade, and 44 by tenth grade.
- o By the sixth grade, many Washington students are beginning to experiment with the gateway drugs: alcohol (51%), tobacco (12% smoking, 9% chewing), and marijuana (4%). Inhalant use is particularly alarming due to the high prevalence of experimentation (13%), the severe health risks involved, and the ready access students have to aerosol cans and other sources.
- o By tenth grade, one third (33%) have tried marijuana, 20 percent have tried inhalants, 14 percent have tried stimulants, 12 percent have tried hallucinogens, and 8 percent have tried cocaine.
- o Compared to a national sample of eighth and tenth graders, fewer Washington students report having tried alcohol. Slightly fewer Washington eighth graders report having tried cocaine or inhalants. There was little difference for tenth graders or for marijuana at either grade.

## **Regular Use**

Lifetime prevalence tends to mask differences in the level of use and does not distinguish current users from those who are no longer using drugs. Washington students tend to progress toward higher levels of both alcohol and drug use. Specifically:

- o Regular use of alcohol increases dramatically by grade. Nearly 5 percent at sixth grade, 8 percent at eighth grade, and 18 percent at tenth grade report moderate to high use of alcohol. When tenth graders were asked if they used alcohol six or more times in the last year, 29 percent reported drinking beer, 27 percent reported drinking wine, and 18 percent hard liquor.
- o At each grade, more students have progressed to higher levels of drug use. Less than 5 percent at sixth grade, over 8 percent at eighth grade, and 18 percent at tenth grade reported moderate to high use of illicit drugs.
- o Other indicators of an increasing alcohol problem include early onset of use, high tolerance for alcohol, and binge drinking. When asked how many times they consumed five or more drinks in the past two weeks, 16 percent of the eighth graders and 24 percent of the tenth graders reported they had done this at least once. However, this is considerably less than a national sample of students.

## **Substance Abuse**

Students who have already reached a high level of alcohol or drug use require special attention. These students are at greatest risk of experiencing addiction or other health and safety problems. Schools must implement intervention strategies to reduce or stop substance use by these students.

- o Nearly 6 percent of the eighth graders reported high use of alcohol and by tenth grade 17 percent of the students report high use. More tenth graders report binge drinking and show a high tolerance for alcohol.
- o Over 3 percent of the eighth graders reported high use of drugs, while nearly 7 percent report high use by tenth grade. Tenth graders are more likely to smoke marijuana daily, use multiple drugs, or use cocaine monthly or more often.
- o A conservative estimate of over 51,000 Washington students (nearly 13%) in grades six through twelve can be considered heavy drinkers.
- o A conservative estimate of over 21,000 Washington students (over 5%) in grades six through twelve can be considered heavy drug users.
- o There is a strong relationship between alcohol abuse and abuse of other drugs. Of those tenth graders reporting a high level of drug use, 71 percent also reported a high level of alcohol use.

## **Patterns of Use**

The aggregate results presented above tend to mask sex differences, regional differences, and other patterns based on student characteristics. A few of the more interesting findings are:

- o Although there are only small sex differences in alcohol use before tenth grade, tenth grade boys are more likely to have tried alcohol, to have progressed to high use, and to binge drink.
- o Boys are more likely to have tried illicit drugs at sixth grade, but girls are more likely to have tried drugs at eighth and tenth grade. Slightly more boys report high drug use at each grade.
- o Students who are active in extra curricular or after school activities, are much less likely to report moderate to high drug use than students who do not participate in any activities. Active students were also less likely to report moderate to high alcohol use, but a substantial proportion still report alcohol use.
- o Students who anticipate going to college are much less likely to report moderate to high levels of drug use than those who do not plan to attend. A similar relationship, but not as strong, was also observed for alcohol.
- o Students with different ethnic backgrounds report varying patterns of alcohol and drug use. White and native American students tend to report high use of alcohol and drugs while Asian students report relatively low use.

- o There were only small differences between rural and non-rural schools. At tenth grade more rural students report moderate to high alcohol use. At eighth grade fewer rural students report moderate to high drug use, suggesting later onset.

## **Factors Related to Use**

Some items in the survey probed factors that are related to use such as peer influences, exposure to drugs, perceptions of risk, and access to drugs.

- o Peer influence is thought to be a major factor in initiating and maintaining use. By tenth grade, most students have friends who use tobacco (69%), alcohol (87%), or drugs (59%).
- o Tenth graders tend to perceive their parents as disapproving of drinking daily (93%), binge drinking (92%), and smoking marijuana (94%); but somewhat more tolerant of attending parties where alcohol is served (78% disapprove).
- o Students generally fail to recognize the risks of binge drinking and are split in their opinions about cigarettes, marijuana, and other drugs; but they do recognize the risks of sharing needles. Tenth graders are more likely than eighth graders to attribute great risk to all forms of use, except marijuana. Compared to a national sample of seniors, Washington tenth graders are less likely to perceive great risk in binge drinking or smoking, but more likely to perceive risk in marijuana and cocaine use.
- o By tenth grade, most students report not only that there is a drug or alcohol problem among some students attending their school (86%), but that there is also drug or alcohol use during the school day (80%).
- o Although few sixth graders would find it easy to obtain marijuana (16%) or cocaine (10%), most tenth graders report that it would be easy to get marijuana (71%) and, to a lesser extent, cocaine (41%). Sixth graders obtain alcohol from their parents (76% of those who drink) while tenth graders obtain alcohol from friends (56% of those who drink). By tenth grade, 69 percent attend parties where drugs or alcohol are served.

## **Experience with Drug Education**

The use of alcohol and other drugs by adolescents is a community problem, not a school problem. Yet, schools must play an active role in helping to deal with substance abuse through drug education, strong policies, and student assistance.

This study documented student perceptions of the drug education they have received and the student assistance opportunities available to them. Students in Washington are quite positive about the education they have received:

- o Most Washington students feel that drug education should begin in elementary school. Three out of four sixth graders (74%) feel that drug education should begin before sixth grade.
- o Two out of three Washington students feel that they have learned enough about the effects of drugs and alcohol.

- o Most students feel they have learned some or a lot about each of the major components of a good prevention curriculum: information about drugs and their effects, refusal skills, decision making, self esteem, and alternatives.
- o Tenth graders were less positive about how much they learned from each of the major components than sixth and eighth graders. This may reflect a greater cynicism among high school students, but it also suggests that these older students may have had less exposure to drug education in elementary or middle school.
- o Students who reported that they learned a lot from drug education were much less likely to report moderate to high drug or alcohol use.
- o Most students in eighth and tenth grade report that their school offers a counselor or other staff with whom they could discuss a drug or alcohol problem, but only one quarter (24%) of the eighth graders and one third (33%) of the tenth graders report that they are aware of student support groups in their school. Early intervention strategies may not be widely in place.

## **Conclusions**

The results of this survey confirm that a serious problem exists with substance use and abuse among public school students in Washington. This widespread problem is not confined to any region or group or age. Although education, health, and enforcement agencies in Washington have not ignored this problem, more must be done on all fronts.

The current study provides an empirical foundation for planning prevention and intervention programs and establishes a baseline for comparison to the results of future studies. In the coming years, periodic assessments of substance abuse will help local and state agencies evaluate the effects of the continuing statewide prevention effort.



## Introduction

The Superintendent of Public Instruction and the Substance Abuse Educational Advisory Committee determined that an assessment of student use of drugs and alcohol would aid in understanding both the nature and extent of substance use and abuse in Washington. The Superintendent contracted with the Northwest Regional Educational Laboratory (NWREL) to help conduct a student survey at three grade levels.

Support for such an assessment has grown with the concern that too many children and adolescents are experimenting and regularly using illegal substances. Recently, Congress passed the *Drug-Free Schools and Communities Act of 1986* which cited, among other things, that drug use and alcohol use are widespread among the nation's students. Interest was focused not only on secondary students, but elementary students as well. Data supporting these findings have come from national studies. Local or state studies, however, are spotty at best – particularly those that provide comparable results at the local level. The present study reports the first statewide survey of substance use in the state of Washington.

Parents, too, have expressed their concern over the problems of drug abuse. Last year, the Gallup poll of educational issues found that adults ranked student use of drugs in the schools as the greatest problem facing education.

The Student Alcohol and Drug Use Survey was developed by NWREL staff. The survey has evolved through reviews by district and state advisory committees throughout the northwest states.

The objectives of this study were:

1. To provide an understanding of the nature and extent of substance use and abuse in participating schools and the state.
2. To heighten awareness among students, faculty, parents, and the community of the issues surrounding substance use and abuse.
3. To provide a baseline against which the impact of the statewide prevention and intervention effort can be assessed.

School, district, and state staff will use these survey results with other data from the community as they consider the special programming needs of these students.





## Approach

In the fall of 1988, the Office of the Superintendent of Public Instruction (OSPI) and the Northwest Regional Educational Laboratory (NWREL) collaborated in a study to determine the extent and nature of substance use among public school students in the state of Washington. A survey of alcohol and other drug use was administered to sixth, eighth, and tenth grade students in a sample of schools across the state in November and early December. The development of the survey, the implementation of the sampling plan, and other methodological issues are discussed.

### Design of the Survey

The questions for the Student Alcohol and Drug Use Survey were drawn from a review of national and state student use surveys. Some of the questions were taken directly from the most comprehensive and continuing national survey, the University of Michigan's Monitoring the Future survey (Johnston, Bachman, and O'Malley, 1986). Areas of emphasis in the survey include basic student demographics, use of substances, risk factors predicting future use, perception of harmfulness of certain drugs, perceived parent attitudes, estimates of friends' use, and questions concerning drug and alcohol education. The questions were edited for clarity and readability by an editor of childrens material, elementary and secondary teachers, and substance abuse advisory committees.

Over the last three years the Student Alcohol and Use survey has been administered to about 80,000 students in the Northwest states. The survey has evolved slightly based on the review of and local advisory committee members. For the current study, more items on drug education and an item on sharing needles were added. Two versions of the survey were prepared: a standard form with 67 questions for eighth and tenth grade students and an elementary form with 49 questions for sixth grade students.

### Development of Special Scales

Since the survey asks students to indicate the frequency of their use of many substances, it is difficult to quickly determine the overall severity of abuse across all drugs. Are the same few students using many drugs or are different students using each drug? To facilitate interpretation, three summary scales were developed that combine the data from several items.

**Drug Use Scale.** The Drug Use scale is based on the type of drug used, the frequency of use, and the use of multiple drugs. Experimentation with marijuana is usually considered less harmful than experimentation with more powerful and addictive drugs like cocaine and heroin. Of course, frequent use of marijuana is also very harmful.

Tobacco, steroids, and over-the-counter drugs were not considered in computing the scale. Alcohol use was treated separately in an Alcohol Use scale.

The four levels of drug use were defined as follows:

1. **No use.** Student has never tried drugs in his or her lifetime.
2. **Low use.** Student has tried at least one drug but is not a frequent user and may not be currently using any drug. This may be considered experimental use.

3. **Moderate use.** Student is using one or more drugs more regularly (e.g., monthly or weekly use of marijuana) or is experimenting with very addictive drugs like cocaine or opiates.
4. **High use.** The student uses drugs frequently and risk of addiction is very high. Typically this implies daily use of marijuana or use of cocaine at least monthly. The level is defined by one or more of the following: a) daily use of marijuana, depressants, stimulants, tranquilizers, or inhalants; b) monthly or more frequent use of cocaine, opiates, or hallucinogens; or c) weekly use of two or more drugs.

**Alcohol Use Scale.** The Alcohol Use scale is based on both the quantity and frequency of alcohol consumption. This scale follows the concept used by others in rating drinking habits of adults (Jessor & Jessor, 1978), but modified for adolescents.

The four levels of alcohol use were defined as follows:

1. **No use.** Student has not tried beer, wine, wine coolers, or hard liquor in his or her lifetime.
2. **Low use.** Student has tried alcohol but is either an infrequent user or is no longer using alcohol.
3. **Moderate use.** Student drinks alcohol at least monthly or binge drinks occasionally.
4. **High use.** Student drinks daily or binge drinks (5 or more drinks consumed at one time) at least monthly. The risks of alcoholism, accidents due to drunk driving, or other problems are high.

These cutoff points may be considered by some as too conservative, i.e., labeling students heavy users when others might consider that drinking moderate. However, the research literature suggests that drinking has more damaging effects on adolescents. Regular use during this time of rapid physiological, social, and emotional development is considered by many to be particularly dangerous (Hawley, 1984).

**At-Risk Scale.** Prompted by the work of Hawkins, et al., (1986) at the University of Washington and others, the risk scale attempts to predict potential students at risk of alcohol and drug use by behavior rather than current drug usage. Items in the scale include such factors as friends' use of drugs, age of first use, absenteeism, arrests, family members with a problem, and attitudes toward use. These items represent only a sample of the many factors that might describe a student at risk. Some of the family and psychological factors that have been identified were not included.

For each risk item, a student is given one to five points depending upon their response. The answers to all risk questions are averaged for each student, providing a risk score between one and five. For ease of interpretation, cutoffs were established to divide the distribution of scores into *low*, *medium*, and *high* risk. Correlational studies were undertaken with the data from two other data sets (N=10,000) to confirm the inclusion of each item in the scale.

A student responding unfavorably to most of the items would be characterized as *high risk*. A student responding unfavorably to several items would be characterized as *moderate risk*. The *low risk* student responded unfavorably to only one or two factors.

Just as we can identify adults with highest risk of heart disease by looking at their behavior, heredity, and other factors, we can identify students who are most likely to use drugs or alcohol. However, there is no guarantee that a high risk student will actually use alcohol or other drugs in the future or that a low risk student will refrain.

**Interpretation.** These scales are intended to be used primarily for comparisons since the exact placement of the cutoffs for levels of use could be open for discussion. Thus, knowing that a given percentage of students are considered high users is more instructive if there is a comparison group, such as another grade level or the same grade level at a previous time.

## **Sampling Plan**

A sampling plan was prepared that would keep administrative costs to a minimum but maintain an accurate estimate of use statewide and by region. A target figure of 20,000 students across three grades was set. This represents 11 percent of all Washington public school students at grades six, eight and ten.

All students within each sample school at a selected grade were surveyed to minimize administrative burden and class disruption. This ensured that an accurate picture of substance use could be obtained for each participating school and prevented any chance of sampling bias within the school. The advantages of census sampling within schools outweigh any disadvantages.

In order to assure a representative statewide sample, schools were stratified by region, size, and rurality. A school was the sampling unit. This is called a *cluster sample*, since the students are clustered together in the school.

Educational Service District (ESD) service areas were combined to form five regions as close to the same size as possible. These regions were Northeast (ESD 101), Southeast (central and southeast area covered by ESDs 105, 123, and 171), Southwest (the Olympic Peninsula and southwest areas covered by ESDs 112, 113, and 114), Metropolitan Seattle and Tacoma within ESD 121), and Northwest (ESD 189).

The 1987 school enrollments were averaged for each grade. Schools were then identified as 'large' if their enrollment was higher than average and 'small' if lower than average.

Lastly, each school was labeled *rural* if the district it was in served a population which was at least 75 percent rural as defined by the 1980 U. S. Census of Population and Housing. *Nonrural* districts have less than 75 percent rural population. This is obviously a rough estimate of rurality, but one that helps to distinguish the economic and social characteristics of schools. Since there were few large rural high schools, the small- and large- rural schools were collapsed together.

Schools with at least ten students at the target grade were selected randomly within each cell of the sampling design. Alternative schools and certain other special schools were included.

The district superintendent for each school selected was sent a letter signed by the Superintendent of Public Instruction requesting their participation in the state survey and including information on the survey. They were asked to return a card indicating their willingness to participate and a contact person for the school. All schools which did not respond were given a followup call by OSPI staff. Whenever a school chose not to participate, NWREL staff randomly chose a replacement school from the same cell. Some of the reasons given for non-participation included recent participation in a local survey, concerns about press coverage of local results, and lack of time needed to secure the necessary approvals.

After six weeks, the followup for schools that had not responded was cut off in order to provide timely results. An unanticipated number of schools either refused to participate or never responded at all, particularly among the larger high schools.



Table 1 shows the number of students (N) and schools (a) targeted by strata aggregated across region. Initially 11 percent of schools and students were targeted to be surveyed by the sampling plan. Next is the number of schools ultimately contacted about participating and the students enrolled in those schools. Finally, the received column shows the number of schools which chose to participate and the number of edited answer sheets that were actually included in the analysis. The difference between the targeted and received columns of Table 1 is due in part to the non-participation of schools and, in part, to the screening of answer sheets.

**Table 1.  
Results of Sampling Plan.**

Strata	Grade	Targeted		Contacted		Received	
		N	(a)	N	(a)	N	(a)
Rural	6	1,135	(20)	1,923	(26)	1,138	(19)
	8	1,094	(16)	1,136	(18)	847	(14)
	10	1,113	(16)	1,252	(18)	735	(12)
Small- Not Rural	6	1,591	(32)	1,837	(38)	1,369	(29)
	8	226	(4)	701	(12)	531	(7)
	10	369	(8)	756	(14)	198	(8)
Large- Not Rural	6	3,234	(27)	2,775	(25)	1,558	(17)
	8	4,602	(20)	4,289	(20)	2,092	(16)
	10	4,851	(15)	3,942	(13)	1,041	(6)

NOTE - N is the number of students, (a) is the number of schools.

The obtained sample of schools was smaller than planned but was still representative of the state at sixth and eighth grades. A sufficient number of schools participated in each cell and the undersampling of large, non-rural schools was adjusted by weighting procedures described below.

At tenth grade only six large, non-rural schools participated, including only one from ESD 121. Within this strata, the schools which did agree to participate tended to be the smallest of those contacted. If the six participating schools had low drug use compared to the non-participating schools, the obtained results would underestimate drug use for this strata and to a lesser extent the statewide estimate. An adequate return was obtained from the rural and small, non-rural high schools.

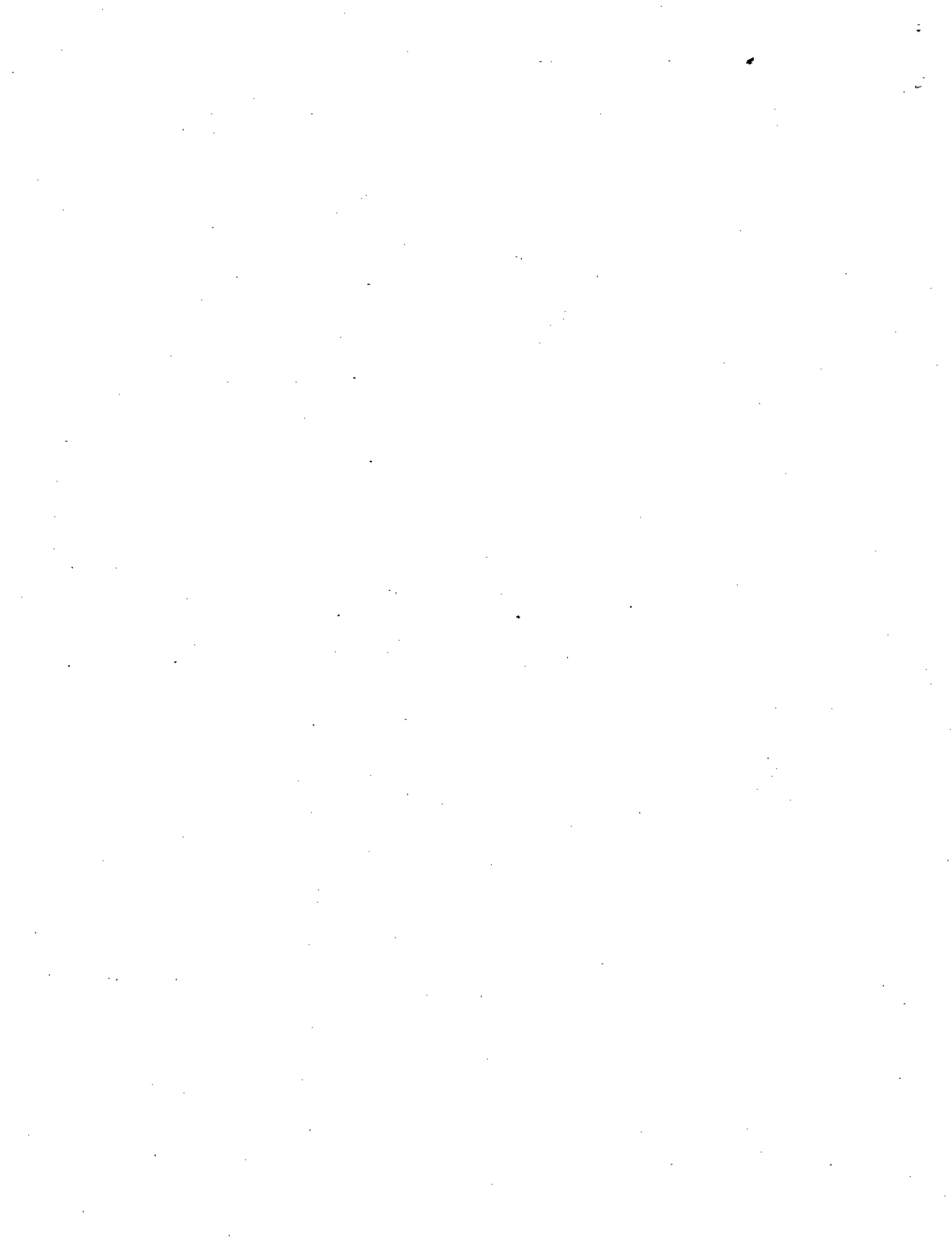
### Data Analysis

Any complex sampling design such as the stratified cluster sample used in this study requires that each student's responses be weighted in relation to the size of the school and the proportion of schools sampled from within the cell. This weighting scheme adjusts the impact of each student so the results are as close as possible to what would be gained from a statewide random sample. All percentages in this report are based on the weighted sample. Appendix B further discusses the effects of the design on sampling error and how sampling error influences the interpretation of the results.



**Table 2.  
Description of Actual and Weighted Sample.**

<b>Group</b>	<b>Percent of Public School Population</b>	<b>Percent of Actual Sample</b>	<b>Percent of Weighted Sample</b>
<b>Grade 6</b>			
<b>Region</b>			
Northeast	10	10	13
Southeast	15	14	14
Southwest	23	29	24
ESD 121	38	38	37
Northwest	14	16	12
<b>Size</b>			
Rural	19	28	23
Small-Not Rural	27	34	29
Large-Not Rural	54	38	48
<b>Ethnic Background</b>			
Asians	5	4	5
Blacks	4	4	4
Hispanics	5	5	5
Native Americans	2	12	10
Whites	84	75	76
<b>Grade 8</b>			
<b>Region</b>			
Northeast	10	12	13
Southeast	15	19	19
Southwest	22	18	23
ESD 121	39	30	33
Northwest	14	21	12
<b>Size</b>			
Rural	18	24	25
Small-Not Rural	4	15	8
Large-Not Rural	78	60	67
<b>Ethnic Background</b>			
Asians	5	5	5
Blacks	4	4	4
Hispanics	4	5	6
Native Americans	3	10	10
Whites	84	77	75





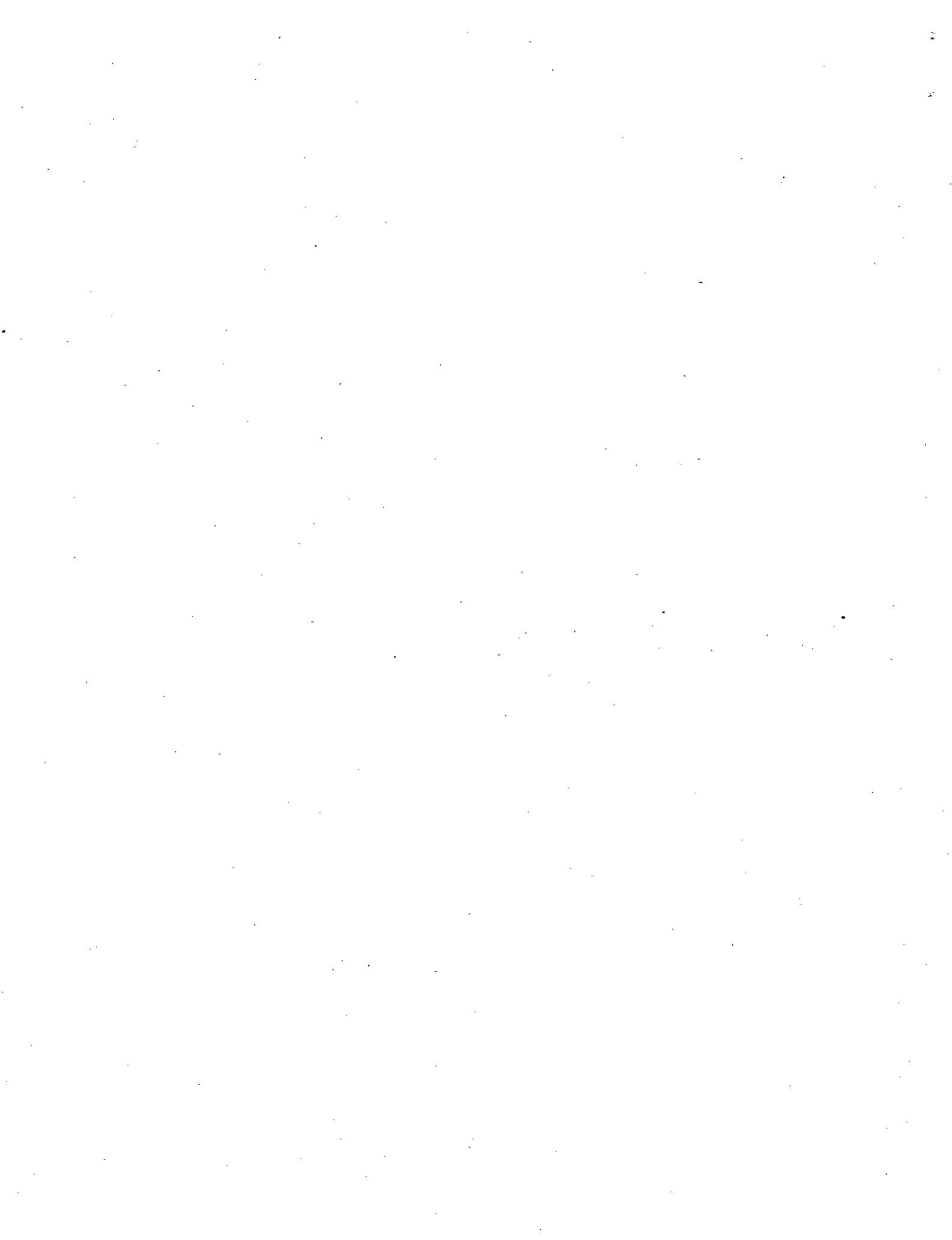
**Table 2 (cont').  
Description of actual and weighted sample.**

Group	Percent of Public School Population	Percent of Actual Sample	Percent of Weighted Sample
<b>Grade 10</b>			
<b>Region</b>			
Northeast	10	24	12
Southeast	14	21	19
Southwest	22	28	23
ESD 121	39	10	32
Northwest	14	18	13
<b>Size</b>			
Rural	18	37	24
Small-Not Rural	6	10	5
Large-Not Rural	77	53	70
<b>Ethnic Background</b>			
Asians	6	6	11
Blacks	4	4	10
Hispanics	4	4	4
Native Americans	2	9	7
Whites	84	77	67

Table 2 describes the distribution of the sample by size, geographic region, and ethnicity. The distribution from the total population is provided for comparison to the unweighted and weighted distribution obtained in the sample. At the sixth grade, for example, 10 percent of the state's sixth graders live in the northeast, and 10 percent of the actual sample was from the northeast. Weighting slightly increased the percent in the northeast.

On the whole the sixth grade data reflects well the state regional population, but over-emphasizes small and rural schools. The weighting scheme compensates by weighting those schools less to reduce their impact on the statewide estimates. The tenth grade sample was the most unlike the state population of the three grades. The distribution of weighted results is much closer to that of the state total.

Unfortunately, Native Americans stand out as being oversampled, probably due to the good response from rural schools. However, examination of the percentage of Native Americans by school led us to believe that there is some over-reporting of that category by students at each grade. This may be due in part to intentional misreporting and in part to confusion about the question. Students with Black and Asian background are slightly over-represented in the tenth grade sample.



## Administration

A survey instrument and answer sheet were distributed to each student. The teacher read the survey instructions aloud as the students followed along. Students were told that their responses were completely anonymous—they were not to write their names on the survey answer sheet. To enforce confidentiality, students were instructed to bring their completed answer sheet to the front of the class and place it in an envelope supervised by an appointed student. That appointed student sealed the envelope and took the materials to the office.

**Table 3. Number and Percent of Surveys Processed**

Condition	All Schools	Sampled Schools
1987 public school enrollment (grades 6, 8, 10) (Percent of all students)	165,639	12,874 (7.8)
Classroom enrollment reported by teachers (incomplete)		10,826
Absences reported by teachers (Percent of reported enrollment)		917 (8.5)
Students declining survey reported by teachers (Percent of reported enrollment)		354 (3.3)
Students otherwise not taking the survey (Percent of reported enrollment)		29 (.3)
Total number of answer sheets returned to NWREL		10,485
Sheets unusable if incomplete, if student was in wrong grade or the grade was left blank (Percent of sheets received)		563 (5.4)
Sheets discarded due to dishonesty, out of range answers, or impossible patterns (Percent of sheets received)		413 (3.9)
Total included in analysis		9,509

Students were told that the survey was completely voluntary. They did not have to participate, and they could leave unanswered any questions they thought too personal. Information was collected from the teachers administering the survey about absenteeism and refusal rates. These data are reported with the results of the quality control screening process.



## Quality Control Screening

Quality control procedures were developed with prior surveys to screen for incomplete, falsified, or otherwise unusable answer sheets. Information about student absenteeism and nonparticipation was collected from teachers. The effects of these factors on the obtained sample are described in Table 3.

Since students were allowed to decline and some students were absent on the day the survey was administered, less than 100 percent of the target students were surveyed. Table 3 reports the absentee and refusal rates. Data reported by teachers appear to under-represent enrollment, absences, and refusals, since teachers did not uniformly complete the class information on the envelopes in which the surveys were returned. Answer sheets were unusable if the student was in a grade not included in the survey or if the student took an answer sheet but did not answer any items. This accounted for about 5 percent of the sheets returned.

An extensive screening procedure was applied using a computer program. Additional sheets were discarded if the student admitted dishonesty on the last item, consistently marked items out of range (e.g., marked E on items with only two or three choices), or claimed an impossibly high level of use. Less than 4 percent were rejected for these reasons.

Substance use is probably higher among those students who were not included in the survey due to absenteeism, dishonesty, or inappropriate responses. Thus, the survey results reported here may be an underestimate of substance use in Washington (see also Johnston, et al., 1981).

## Validity

Questions are often raised as to whether students are honest in responding to a survey about such a sensitive issue as illicit drug use. Shocked by the high prevalence of substance abuse, some have argued that students are exaggerating their reports of drug use. All the evidence from this survey and similar national surveys clearly shows that all but a few students take the survey seriously and respond honestly. Some smoking research suggests, and certain drug treatment professionals feel, however, that some students may under-report their use. Thus, the survey may slightly underestimate the actual level of use.

The response patterns of students who fake high use, i.e., claim higher than actual use, or respond randomly were identified through a computer edit program. Only a small number of students falsely identified with use of a fake drug, marked high use of too many drugs, or reported lying on the survey. Surveys which match one of these patterns were eliminated from the analysis. About 2 percent were eliminated from analysis based on checks for dishonesty and another 2 percent were eliminated due to incomplete answer sheets. This is equivalent to the rejection rate observed in other studies.

It is more difficult to detect whether students are faking low use, i.e., understating their use. Keep in mind, however, that about 60 percent of seniors report some illicit drug use and over 80 to 90 percent report alcohol use. These high levels do not suggest under-reporting and are quite consistent with the results from national studies. More students could be expected to skip over sensitive items if they were concerned about reporting illicit drug use.

The internal consistency of answers to related questions provides further evidence of the validity of the survey responses. For example, responses across several items concerning drinking were compared and a little more than one percent of the students were found to be inconsistent in their responses. Thus a response of *Never drink* on the beer or wine and hard liquor items would be followed with *Never drink* on the quantity item. To take another example, the correlations among items were examined to determine the construct validity of the special scales. As expected, students scoring high on the drug and alcohol scales also score high on the risk scale, but some high risk students are not yet using drugs.

National studies of substance abuse also cite extensive evidence about the validity of these survey responses (Johnston, et al., 1986). Students have been highly reliable in their responses over a three-to-four year period. Responses between logically related items are very consistent. The observed trends and patterns of use have been consistent over time after nine years of research. The investigators concluded that properly administered self-reported surveys produce valid data.

### **Sources of Comparative Data**

The *Monitoring the Future* study is conducted by the Institute for Social Research at the University of Michigan (Johnston, O'Malley, Bachman, 1987; Johnston, O'Malley, Bachman, 1988; Bachman, Johnston, O'Malley, 1987) with funding from the National Institute on Drug Abuse. This major study began in 1975 to monitor attitudes and behaviors of our nation's seniors. A survey with many questions on substance abuse is administered each spring to a national sample of about 16,000 seniors, and results are now available for the class of 1975 through the class of 1987. Many of the questions used in the Washington survey are drawn from the national survey. Others were modified for simplicity and use with younger students. In these instances, major response categories were collapsed and items combined on the survey to obtain roughly comparable data.

The National Adolescent School Health Survey (National Institute on Drug Abuse, 1988) was administered in the fall of 1987 to 11,000 eighth and tenth graders from a national sample of public and private schools. Preliminary results from this study have been released to the press, but the full report is not yet available. The limited description of the survey and its administration suggest that the results should be comparable to the Washington survey, though the survey was administered a year earlier.

Similar studies of use have been conducted recently in four western states: Alaska, California, Hawaii, and Oregon. Although some mention of these studies was made, direct comparisons to Washington were not made because of differences in survey methodology and lack of comparability of these states. A series of surveys in eight school districts in Alaska was administered to students in grades seven through twelve during the 1987-88 school year (Segal, 1988). The results were aggregated across grade levels.

A survey was administered to a sample of 6,900 students in grades nine and eleven in California during the winter of 1987-88 (Skager, Frith, & Maddanian, 1988). Comparisons were made with a survey from 1986, based on schools that participated both years. The grade levels and indicators do not match the Washington survey.

The Student Alcohol and Drug Use Survey was administered at grades six, eight, ten and twelve in the state of Hawaii during the early fall of 1987 (Anderson & Deck, 1987). All students in attendance at these four grade levels were asked to participate in order that local reports could be distributed to every school in the state. A survey drawing directly from the *Monitoring the Future* study was administered to 4,200 students at grades eight and eleven in Oregon during the winter of 1987-88 (Egan & Hallan, 1988).

## Findings

This section describes the major findings from the November-December 1988 survey of Washington public school students in grades six, eight and ten. The responses to each item of the survey are listed by grade in Appendix A. Information about estimating the sampling error for percentages presented here is discussed in Appendix B. In general, the true value for a statewide group will be within 1-3 percentage points of the observed percent.

The findings are organized under six topics: the lifetime prevalence of alcohol and other drug use; the regular use of substances; the prevalence of substance abuse; patterns of use by gender, region, and other student characteristics; factors associated with use; and experiences with drug education.

### Lifetime Prevalence of Use

In *Schools Without Drugs*, the U.S. Education Department argues for a clear, strong "no use" message for all drugs including alcohol. Enforcement and treatment approaches have not proved very effective in eliminating substance abuse. The chance of breaking the grip of substance abuse is greatest if the onset of use can be delayed as long as possible.

The results of the Student Alcohol and Drug Survey indicate that a substantial number of Washington students have tried alcohol and other drugs. The prevalence of use and preferences for specific drugs vary by grade level.

Students were asked how often they had used several substances. Choices included never, seldom, monthly, weekly, and daily. The lifetime prevalence of substance use was determined from the total percent of students reporting seldom, monthly, weekly and daily, or conversely, 100 minus the percent never using. Similarly, *low to high* use on the Alcohol Use and Drug Use scales may be used to determine the lifetime prevalence of any form of alcohol or illicit drugs.

*Finding: Alcohol is by far the substance of choice for students at all grades.*

Figure 1 presents the lifetime prevalence (i.e., the percent of students ever having tried the drug) of several categories of substances by grade level. The percentages are also given in Table 2. The figure clearly shows that students at all three grade levels reported greater use of beer, wine, and hard liquor than all other substances. By sixth grade two out of five students have tried beer (39%) or wine (40%) and by tenth grade three out of four have tried beer (72%) or wine (78%).

Since some students use more than one form of alcohol, the Alcohol Use scale was used to determine the overall frequency and quantity consumed across beer, wine, and hard liquor. Some form of alcohol has been tried by 51 percent of the sixth graders, 69 percent of the eighth graders, and 84 percent of the tenth graders.





**Table 4. Lifetime prevalence of drug use by grade.**

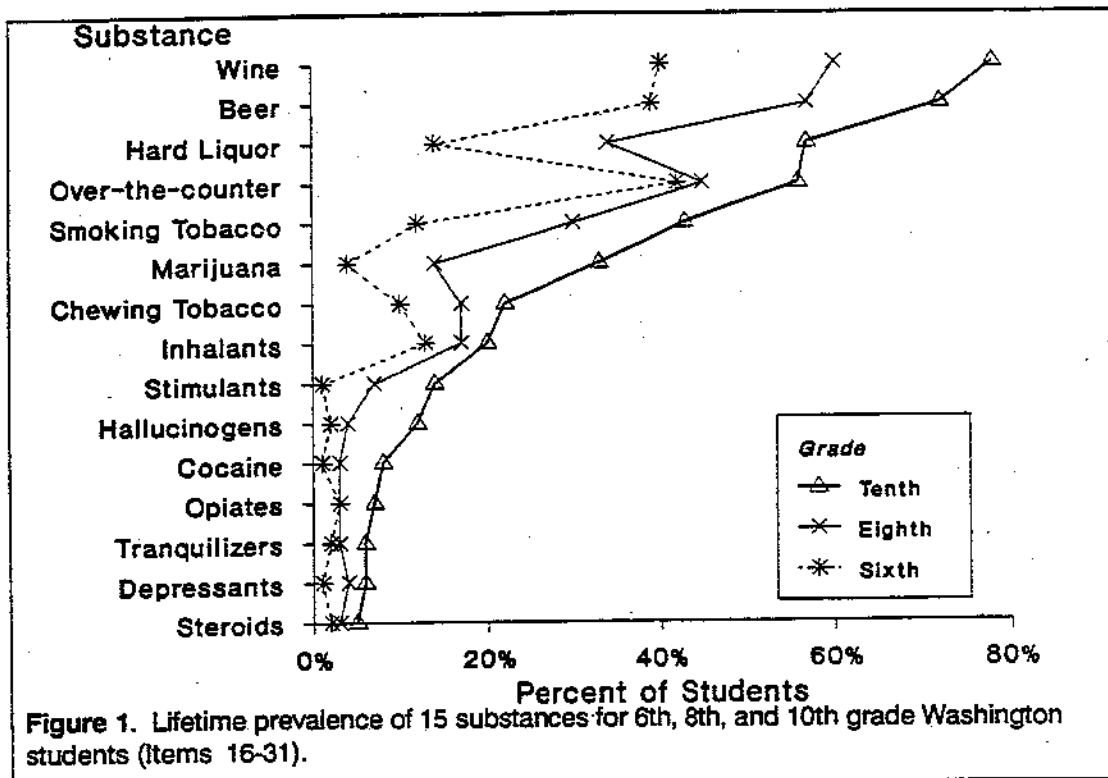
Category	Grade 6	Grade 8	Grade 10
Any alcohol	51.4%	68.9%	84.1%
Any illicit drug	17.0	26.9	44.1
Smoking tobacco	12.4	29.8	43.1
Chewing tobacco	9.5	16.6	21.5
Beer	38.5	56.5	71.6
Wine (incl. wine cooler)	39.9	60.0	77.6
Hard liquor	14.2	34.3	56.8
Marijuana (incl. hashish)	3.6	14.4	32.7
Cocaine (incl. crack)	0.8	2.8	8.1
Opiates	2.5	3.3	7.1
Depressants	1.1	4.5	6.5
Tranquilizers	1.9	3.4	6.4
Hallucinogens	1.5	4.1	12.1
Inhalants	13.0	17.3	19.5
Stimulants	1.3	6.8	14.2
Steroids	1.7	3.3	4.9
Over-the-counter	41.8	45.4	56.2

*Finding: A large number of students have tried illicit drugs at all grades. At sixth grade, the gateway drugs and inhalants have been tried most often. By tenth grade, many students have also tried marijuana, inhalants, stimulants, hallucinogens, or cocaine.*

Figure 1 shows that the pattern of use for drug categories other than alcohol varies somewhat by grade. This is due to differences in the typical age of onset. By the sixth grade, many Washington students are being to experiment with the gateway drugs: alcohol (51%), smoking tobacco (12%), chewing tobacco (9%), and marijuana (4%). Inhalant use is particularly alarming due to the high prevalence of experimentation (13%), the severe health risks involved, and the ready access students have to aerosol cans and other sources.

By tenth grade, one third (33%) have tried marijuana, 20 percent have tried inhalants, 14 percent have tried stimulants, 12 percent have tried hallucinogens, and 8 percent have tried cocaine. Although experimentation with cocaine (including a form known as *crack*) may seem low given the attention it has received in recent years, other studies have shown much increased use during the junior and senior years of high school.

The Drug Use scale was developed to determine the overall risk from the use of any illicit drug, including inhalants. Tobacco and alcohol users were not considered in the Drug Use scale. The percentage of students having tried some illicit drug at least once was 17 by sixth grade, 27 by eighth grade, and 44 by tenth grade.



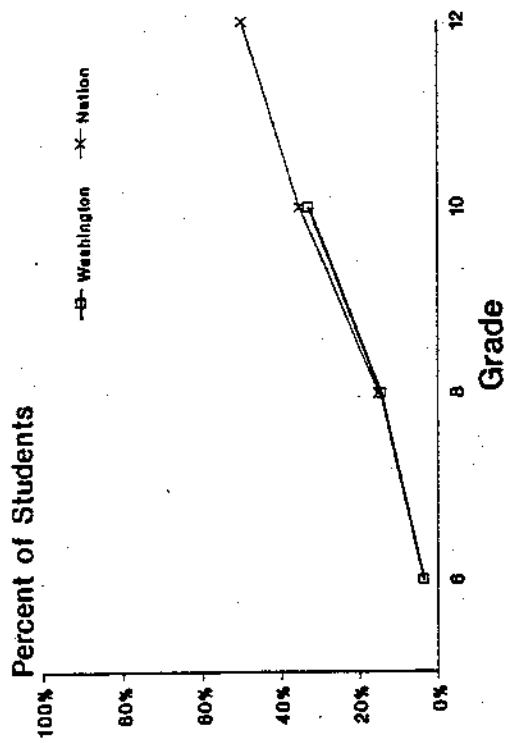
**Finding:** Compared to a national sample of eighth and tenth graders in 1987, fewer Washington students report having tried alcohol. Slightly fewer Washington students report having tried cocaine and inhalants at eighth grade, but there were no differences for marijuana.

The results from two national studies of substance abuse were used to determine how lifetime prevalence in Washington compared to use nationwide. The National Adolescent School Health Survey was administered during the fall of 1987 at grades eight and ten (National Institute on Drug Abuse 1988) while the Monitoring the Future Survey was administered during the spring of 1987 at grade twelve only (Johnston, O'Malley, & Bachman, 1988). The limited information currently available on the methodology used with the National Adolescent School Health Survey suggests that the results should be comparable to those of the current study.

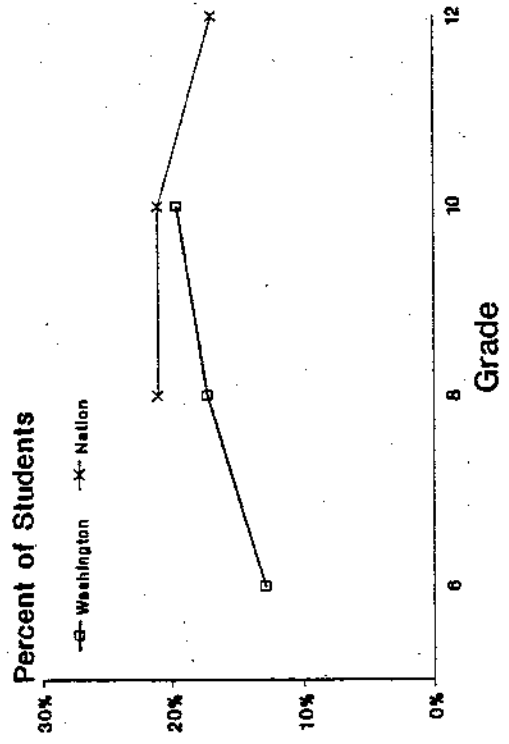
Figure 2 compares the percent of students ever having tried alcohol, marijuana, cocaine, and inhalants at grades eight and ten. Results for grade six in Washington and grade twelve nationally were included to show the progression of use for each drug. The lifetime prevalence for alcohol is less for eighth and tenth graders in Washington than for a national sample. Slightly fewer eighth graders in Washington reported having tried cocaine and inhalants. By the tenth grade, there was no difference in the percent having tried marijuana.

The results for cocaine are particularly interesting since the *Monitoring the Future* study has shown much higher cocaine use by seniors in the western states than in other regions. Preliminary results that have recently been released to the press by the National Institute on Drug Abuse suggest that lifetime prevalence among seniors continues to decline nationally on most indicators. Spring results from the *Monitoring the Future* study for the senior class of 1988 show small declines for each of the drugs displayed in Figure 2.

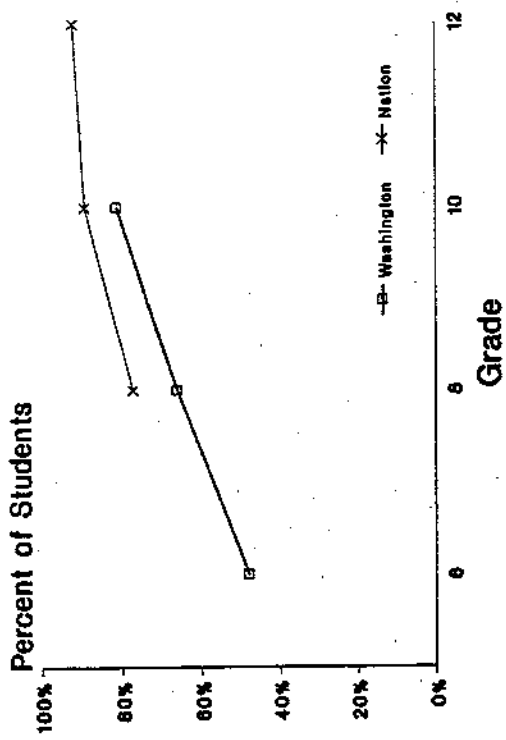
## Marijuana



## Inhalants



## Alcohol



## Cocaine

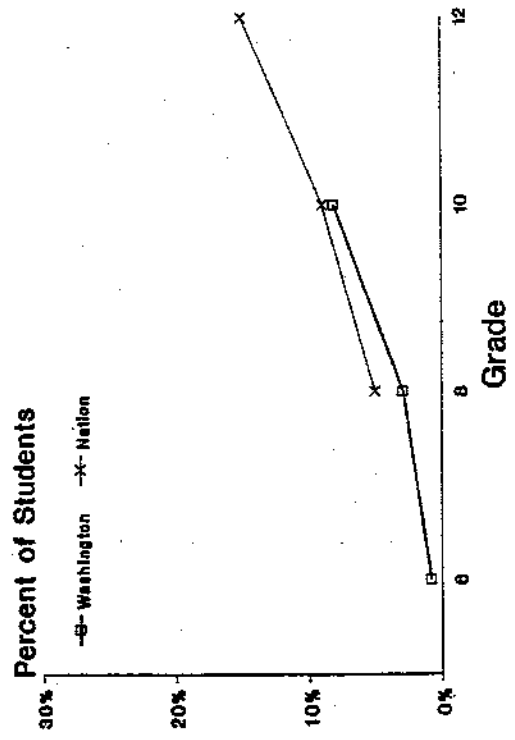


Figure 2. Percent of students in Washington and in the nation having tried alcohol, marijuana, cocaine, and inhalants by grade (Alcohol Use scale, items 21, 22, and 28).

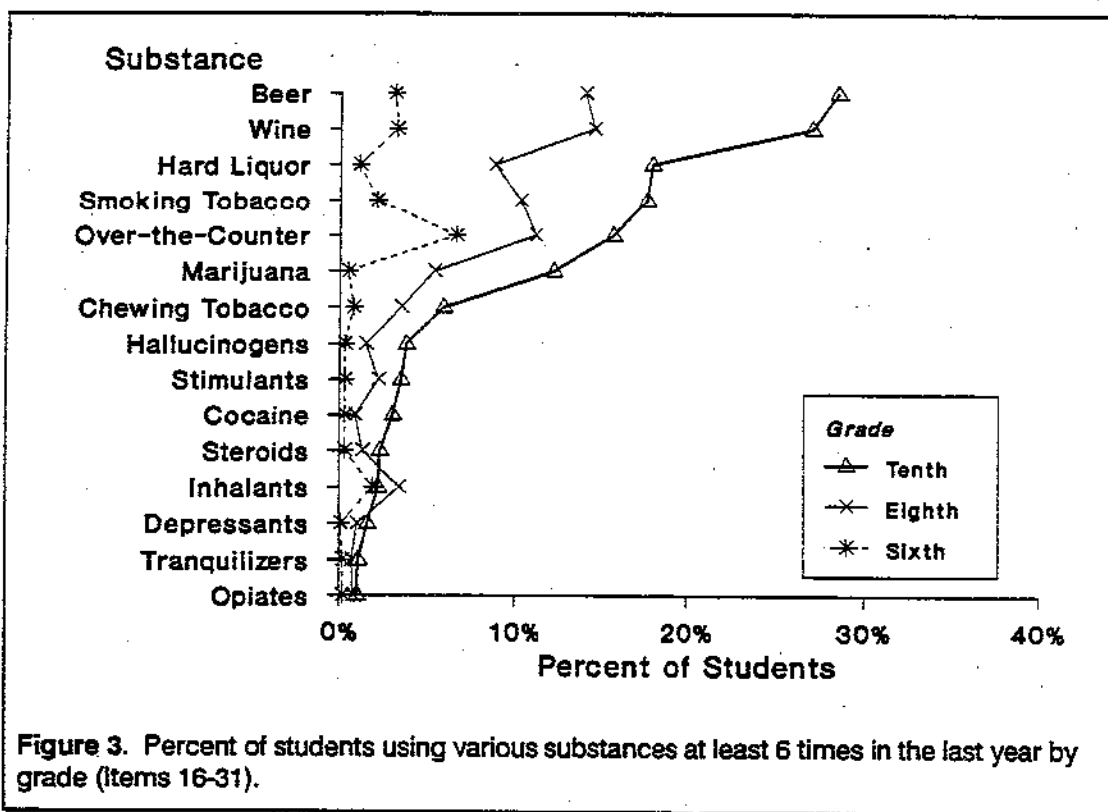
## Regular Use

Lifetime prevalence is an important indicator of the initiation of use but other indicators are needed to explore the level of use and the recency of use. Current use that goes beyond experimentation may be examined for each substance by determining the percent who report using a substance six or more times in the last year summing the responses for *monthly*, *weekly*, and *daily* use.

Since a student may use more than one drug, it is helpful to determine regular use across all forms of alcohol and across all illicit drugs, combine the *moderate* and *high* levels of the Alcohol Use and Drug Use scales. The derivation of the use levels is discussed in the Approach under Development of Special Scales.

Figure 3 charts the percent of students reporting using each substance at least six times in the last year. These percentages are presented in Table 3.

The pattern for regular use of substances is very similar to that of lifetime use, but the overall prevalence is much reduced. More students report use of beer, wine, and hard liquor than other drugs. Many students also report using smoking tobacco and over-the-counter drugs.



Regular use of alcohol, tobacco, and over-the-counter drugs continues to increase systematically through grade ten. Marijuana use increases most between grades eight and ten. The regular use of most drugs continues to increase, although the rates are rather low compared to the standard errors for each drug, so it is difficult to be certain about these trends.

Regular cocaine use might appear low given the attention this drug has received in the media, but other studies have shown the biggest increase in cocaine use occurs after tenth grade and thus would not show up in this study.

**Table 5. Use of substances at least 6 times in the last year by grade.**

Category	Grade 6	Grade 8	Grade 10
Smoking tobacco	2.1	10.3	17.6
Chewing tobacco	0.8	3.5	5.9
Beer	3.1	14.1	28.5
Wine (incl. wine cooler)	3.2	14.6	27.1
Hard liquor	1.1	8.8	17.9
Marijuana (incl. hashish)	0.5	5.4	12.3
Cocaine (incl. crack)	0.3	0.9	3.0
Opiates	0.2	0.8	1.0
Depressants	0.1	1.0	1.6
Tranquilizers	0.2	0.7	1.1
Hallucinogens	0.3	1.5	3.8
Inhalants	0.3	1.9	2.2
Stimulants	1.9	2.2	3.5
Steroids	0.3	1.3	2.3
Over-the-counter	0.3	11.2	15.7

The pattern for regular inhalant use deserves special attention. Inhalants are available to sixth graders and 2 percent report regular use. Tenth graders actually report less regular use of inhalants than eighth graders, probably since they have more access to marijuana and other illicit drugs.

*Finding: Moderate to high use of alcohol and drugs increases systematically by grade.*

Figures 4 and 5 below complement Figure 3 above by showing the rising percent of students reporting medium to high levels of alcohol or drug use by grade (see also Appendix A). There is a clear progression across grades toward higher levels of alcohol use. Nearly 3 percent at sixth grade, 18 percent at eighth grade, and 41 percent at tenth grade report moderate to high use of alcohol. While it is not possible to track individual students in a confidential survey, presumably many of those who use alcohol infrequently as sixth graders have progressed to higher levels of use by eighth or tenth grade.

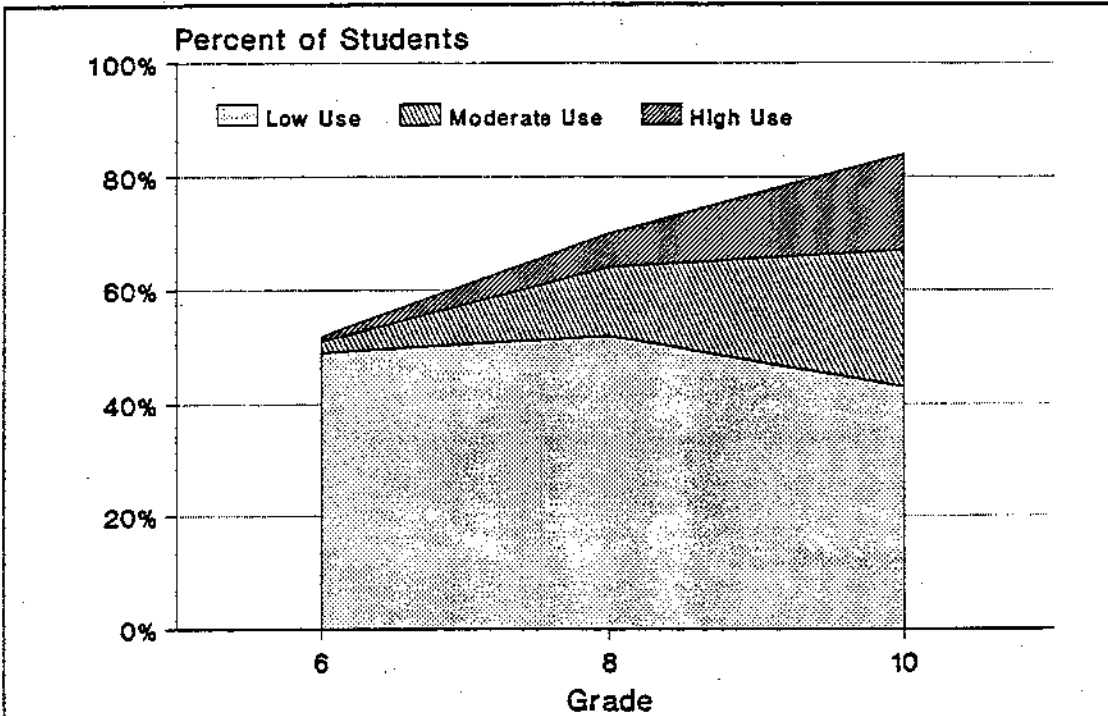


Figure 4. Percent of students with low, moderate, and high levels of alcohol use by grade (Alcohol Use scale).

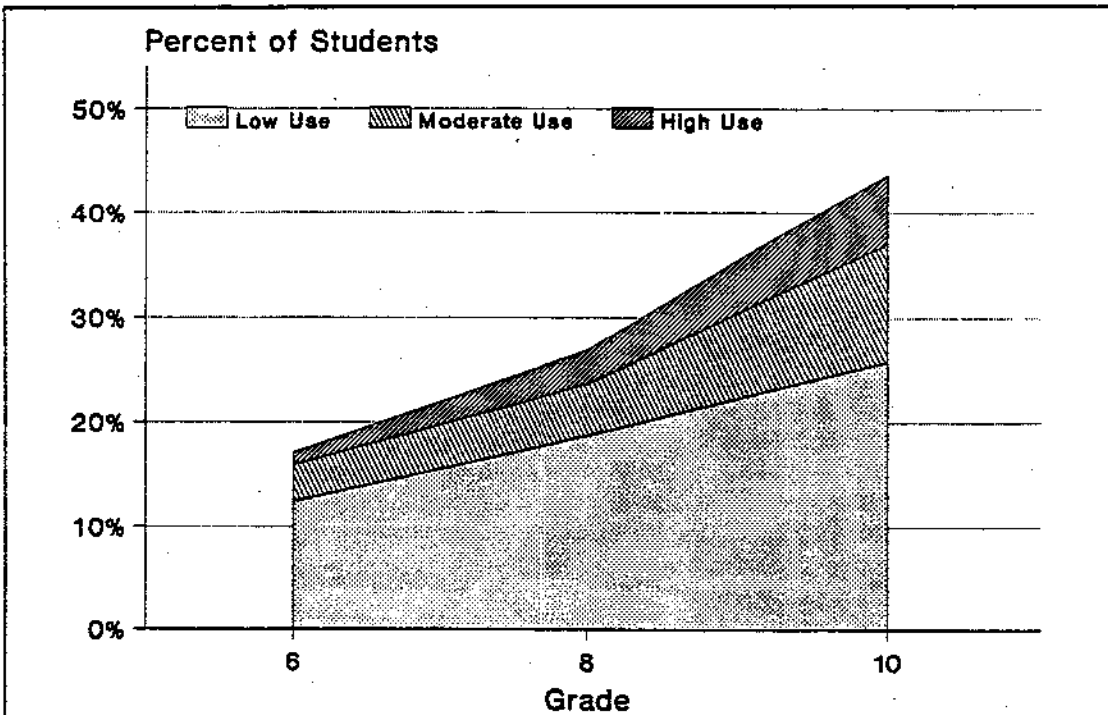


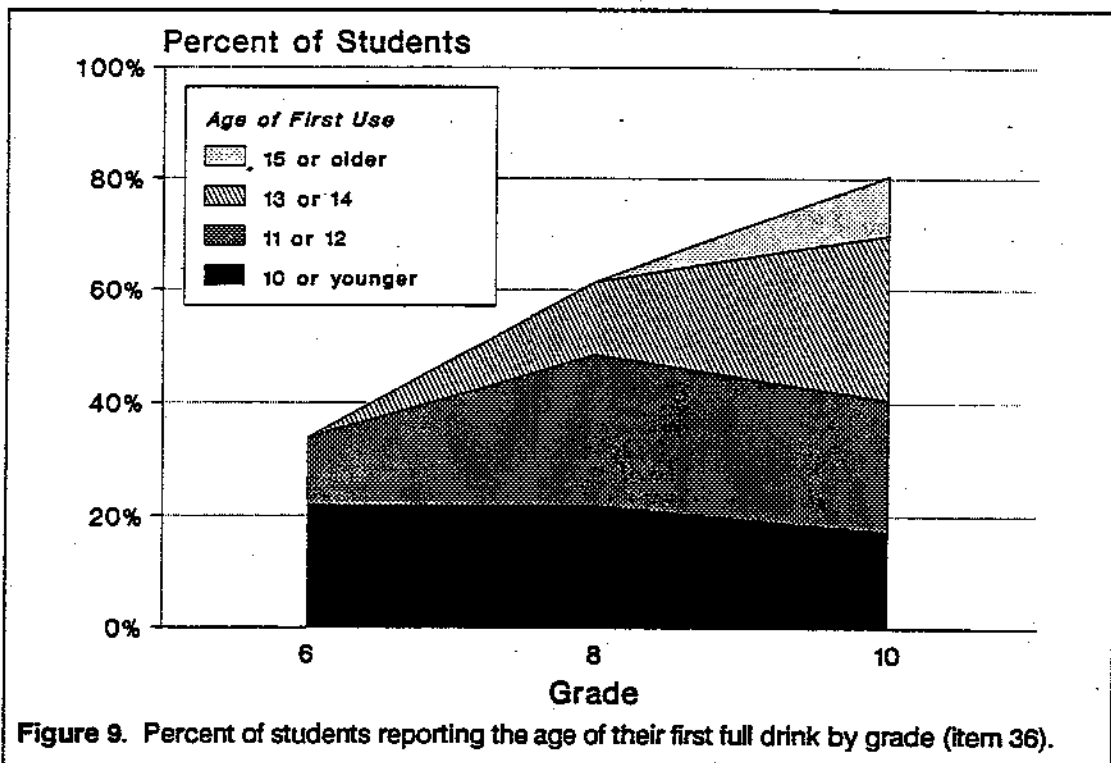
Figure 5. Percent of students with low, moderate, and high levels of drug use by grade (Drug Use scale).

Figure 7 illustrates the percent of students who report drinking various quantities when they drink. Compared to eighth grade, twice as many tenth graders report drinking two to four drinks while over three times as many typically consume five or more drinks at a time. In fact, of those who drink at tenth grade, three out of ten (29%) report binge drinking. This increase in quantity consumed is associated with an increase in the number of students reporting a high tolerance for alcohol by tenth grade. Figure 8 portrays the percent of students reporting different levels of tolerance for alcohol by grade.

Students were asked when they had their first full drink of an alcoholic beverage including a can of beer, a glass of wine, or a mixed drink. Figure 9 shows the percentages by grade of the age at which students remember their first full drink.

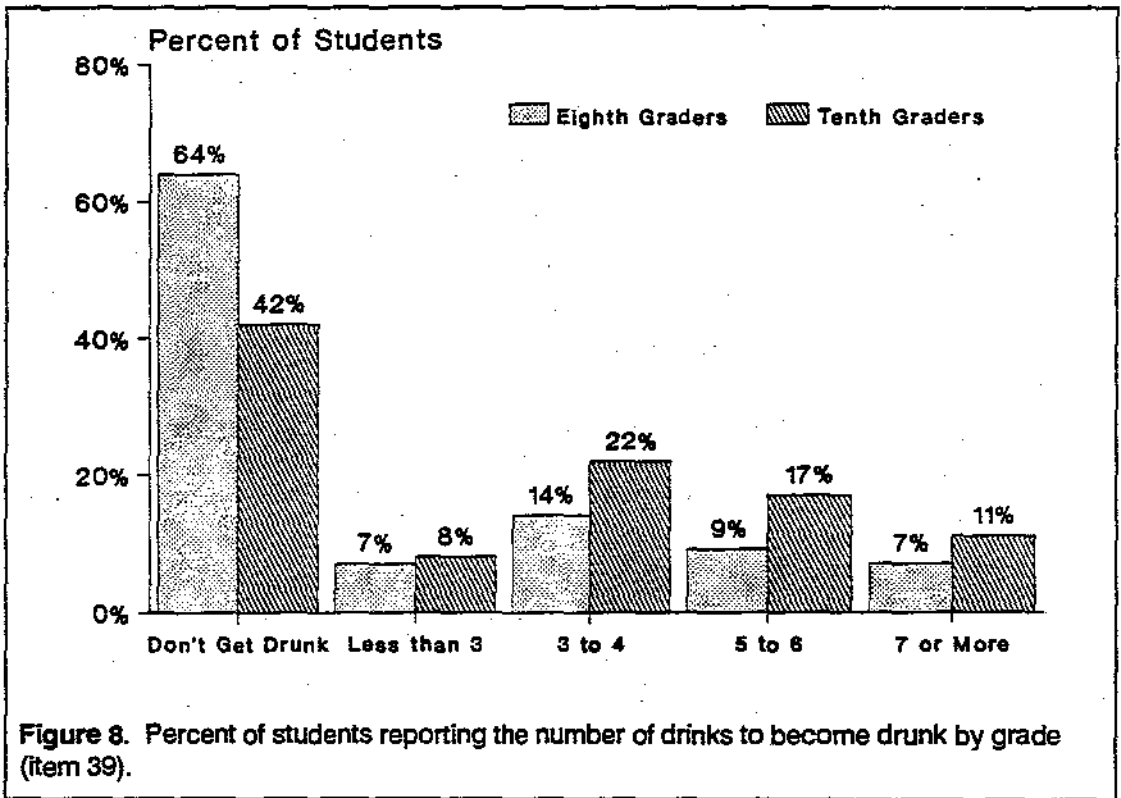
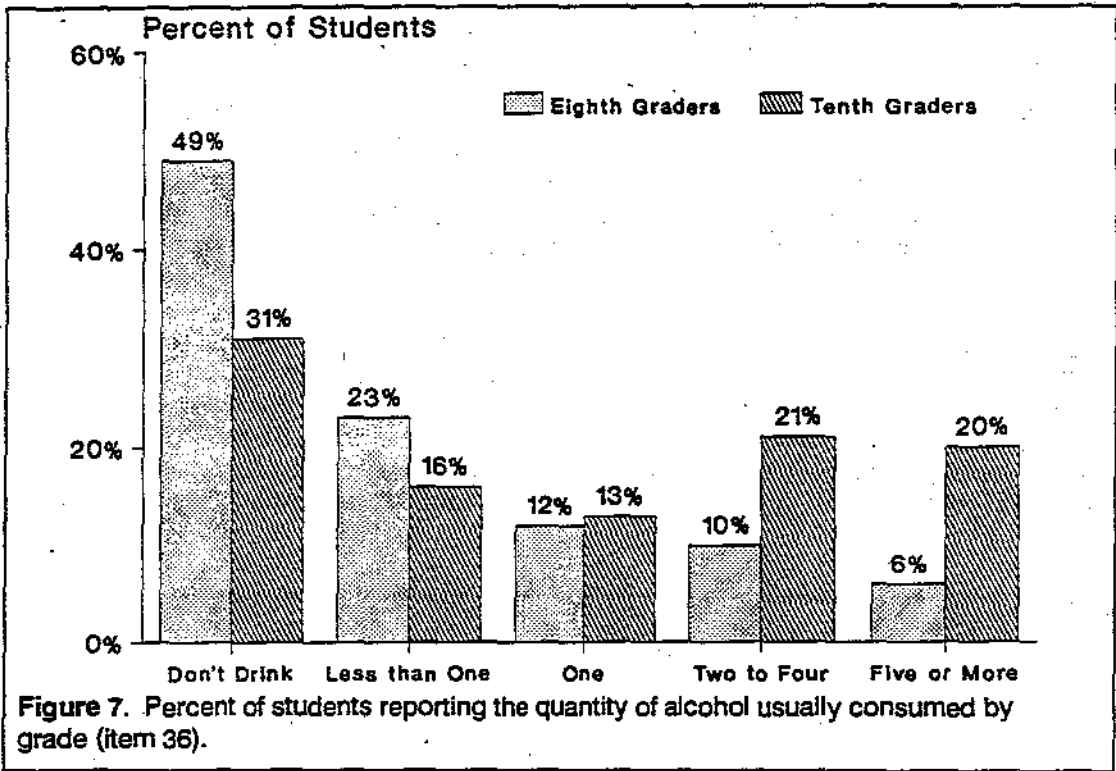
By the age of ten about one in five students have tried their first full drink of alcohol and by the age of twelve two in five have tried a full drink. Since early onset of use is a good predictor of abuse later in life, schools should examine their prevention goals for the elementary grades and parents should consider the consequences of allowing their children to drink.

Although slightly fewer tenth graders report such early initiation of alcohol use, it is not clear whether this indicates that today's elementary students start drinking earlier or that seniors tend to forget how young they actually were when they started.





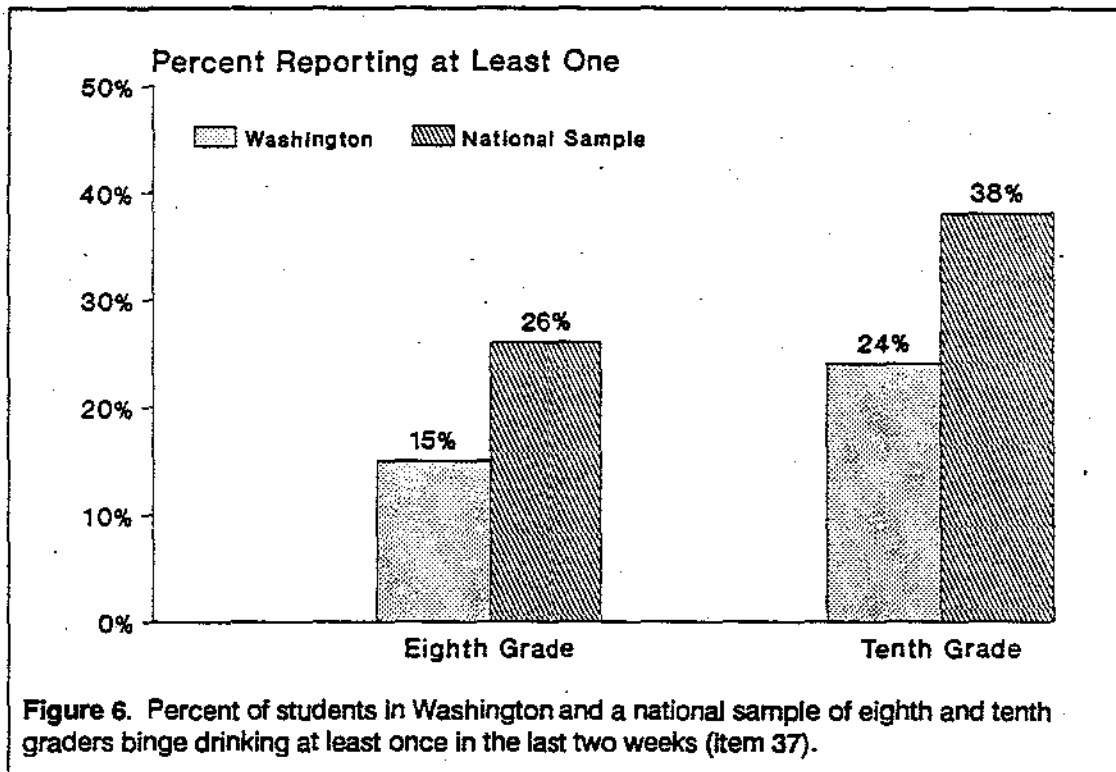




**Finding:** *Associated with the increased frequency of alcohol use are changes in drinking behavior. More students report weekly binge drinking and a high tolerance for alcohol. Students at all grades report an early onset for drinking.*

To describe changes in drinking behavior more fully, items asking about the quantity usually consumed, frequency of binge drinking, tolerance to alcohol, and age of first drink were examined. The health and safety risks of alcohol use depend as much on these factors as the frequency of drinking.

Figure 6 compares binge drinking among eighth and tenth graders in Washington and a national sample from the National Adolescent Health survey. One in four (24%) tenth graders in Washington reported drinking five or more drinks at a time in the last two weeks. This is a serious finding given the hazards of binge drinking, especially when combined with driving. However, binge drinking appears to be less common in Washington than it is nationally, as 24 percent reported binge drinking in the last two weeks compared to 38 percent in the national sample.



## Substance Abuse

Students who have already reached a high level of alcohol or drug use require special attention. These students are at greatest risk of experiencing addiction or other health and safety problems from their substance abuse. Typical prevention programs are ineffective with students that have reached this level of use. Schools must implement early intervention strategies to reduce or stop substance use by these students.

Specific criteria as to what level of use constitutes abuse for any particular drug are lacking. For the purposes of this study, *high use* on the Alcohol Use or Drug Use scales will be considered abuse. The decision rules for placing students on these scales were derived based on the literature and review by advisory committees as discussed in the Approach section.

*Finding: Nearly 6 percent of the eighth graders reported high use of alcohol and by tenth grade 17 percent of the students report high use. A conservative estimate of over 51,000 Washington students (nearly 13%) in grades six through twelve can be considered heavy drinkers.*

Figure 4 above shows that at each grade more students have reached a high level of alcohol use. At sixth grade less than 1 percent and at eighth grade nearly 6 percent are drinking daily or binge drinking weekly, but by tenth grade one in six (17%) report high use.

The number of students statewide that are heavy drinkers can be estimated from the percent of students with high alcohol use at grades six, eight and ten. The estimated rates for grades seven and nine are simply the average of the grades immediately above and below. Assuming that the high use increases the same between tenth and twelfth grade as between eighth and tenth, a rate can be extrapolated to grades eleven and twelve. The percentages at each grade are multiplied by the statewide 1988 public school fall enrollment. Over 51,000 Washington students (nearly 13 percent) in grades six through twelve can be considered heavy drinkers.

This is a conservative estimate since the results we have obtained in other states show a larger increase between tenth and twelfth grade than between eighth and tenth grade. In addition, we feel that the survey underestimates use at each grade level since absent students tend to have higher rates of use and since some students may under-represent their use. However, the reader must accept the definitions of high use for the Alcohol Use scale described in the Approach section.

*Finding: Over 3 percent of the eighth graders reported high use of drugs, while nearly 7 percent report high use by tenth grade. Over 21,000 Washington students (over 5%) in grades six through twelve can be considered heavy drug users.*

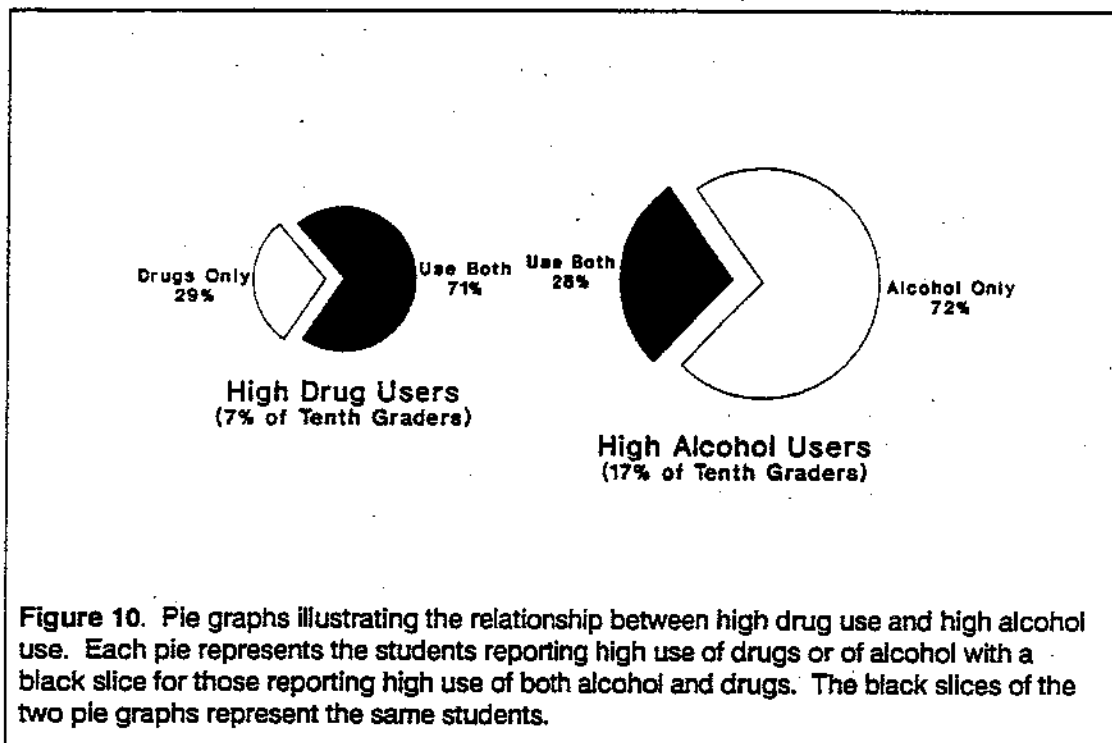
Figure 5 above shows the increase in students reporting high drug use, especially between eighth and tenth grade. At sixth grade about 1 percent report high drug use and at eighth grade over 3 percent report high drug use. Marijuana and inhalant use account for the most serious use at these grades. At tenth grade, one in fifteen or nearly 7 percent report smoking marijuana daily, using cocaine monthly or more often, using multiple drugs, or other signs of abuse.

By interpolating and extrapolating from those grades surveyed, a conservative estimate of heavy drug users can be calculated. The procedures are the same as those discussed for alcohol use. Over 21,000 Washington students (over 5%) in grades six through twelve can be considered heavy drug users.

As discussed above, this is a conservative estimate since the survey underestimates use at each grade level due to the effects of absenteeism and underreporting.

**Finding:** *There is a strong relationship between drug abuse and alcohol abuse.*

Figure 10 illustrates the relationship between high drug use and high alcohol use for tenth grade students. Of those tenth graders reporting a high level of drug use, 71 percent also reported a high level of alcohol use. Since there are many more students with high alcohol than high drug use, this represents only 28 percent of these students



## Patterns of Use

The aggregate results presented above tend to mask sex differences, regional differences, and other patterns based on student characteristics.

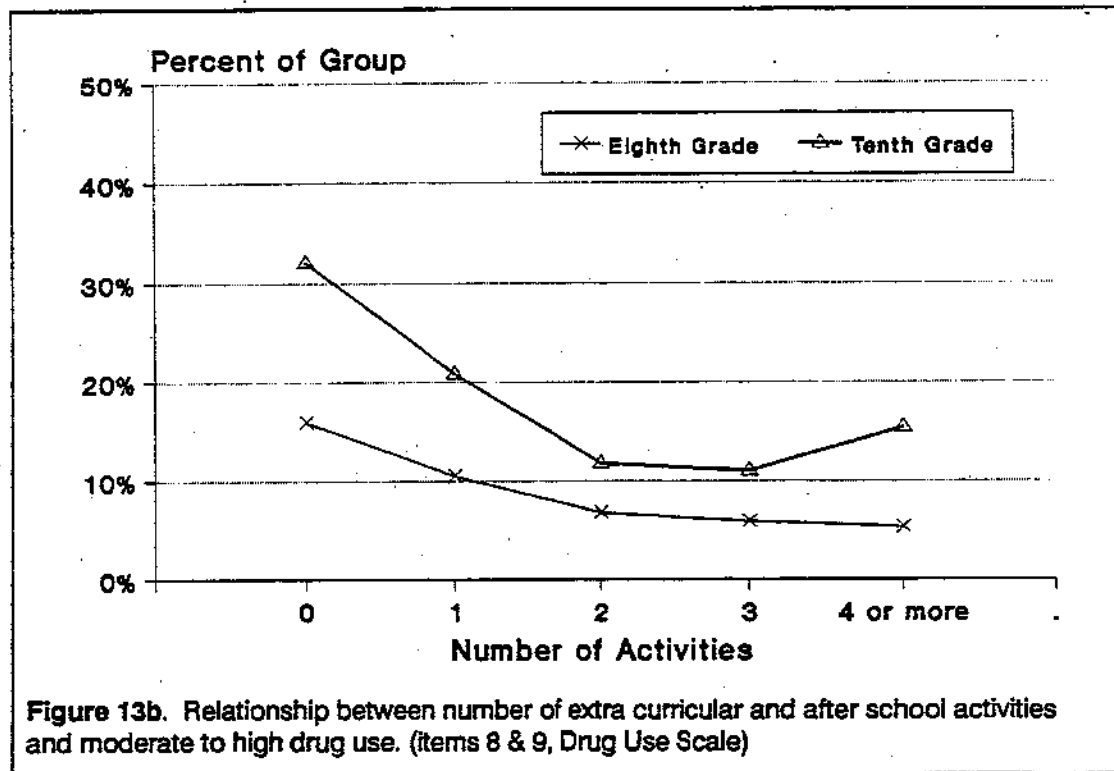
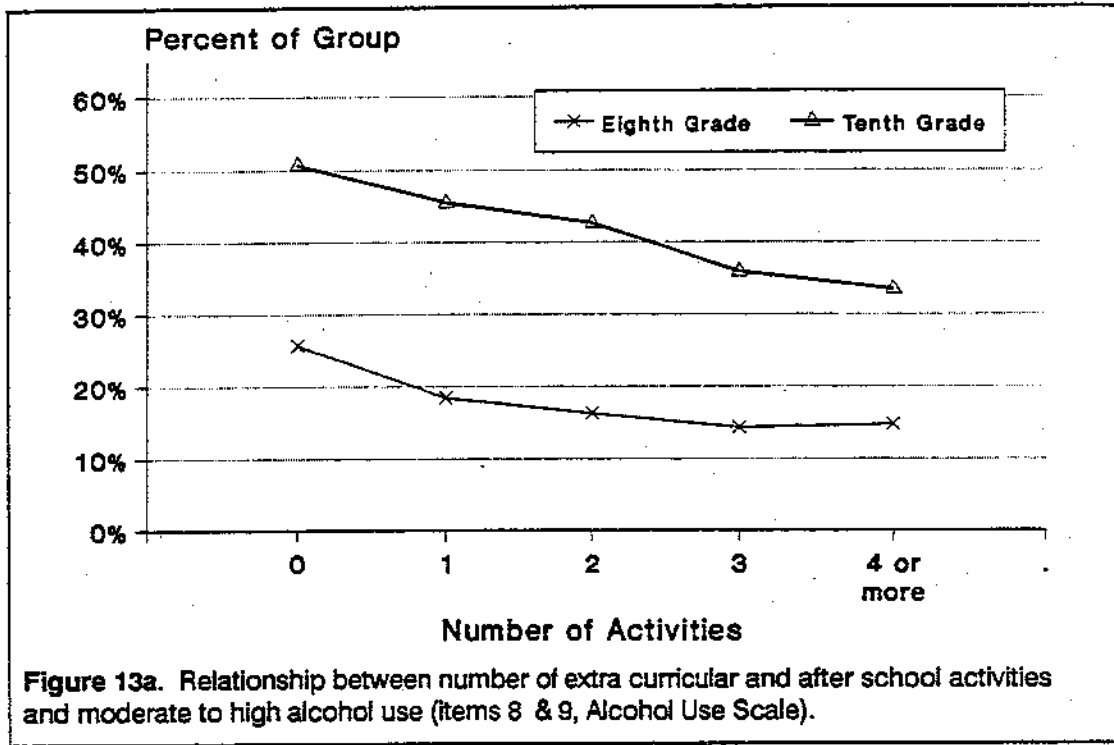
*Finding: Sixth grade boys are more likely than girls to have tried alcohol, while tenth grade boys are more likely to binge drink. There are few sex differences in the use of other drugs.*

National studies have reported that sex differences in alcohol and drug use among seniors largely disappeared during the late 1970's and early 1980's. More recently, however, sex differences are appearing again since there have been greater reductions in use for girls.

Table 4 presents the percent of Washington girls and boys by grade reporting substance use on selected indicators. Percentages have been rounded to whole numbers. Figure 11 plots sex differences in lifetime prevalence by grade for alcohol and other drugs.

**Table 6.**  
**Sex differences by grade on**  
**selected indicators of substance use.**

Indicator	Grade 6		Grade 8		Grade 10	
	Girls	Boys	Girls	Boys	Girls	Boys
<b>Alcohol Use Scale</b>						
Low use	44	54	53	49	45	41
Moderate use	2	3	12	11	26	22
High use	<1	1	5	6	12	22
Lifetime use	46	57	70	68	83	85
Usually drink five or more	<1	1	6	6	15	25
<b>Drug Use Scale</b>						
Low use	10	15	21	16	27	24
Moderate use	3	4	5	5	11	11
High use	1	2	3	4	6	7
Lifetime use	13	21	29	25	45	42
<b>Lifetime use</b>						
Smoking tobacco	10	15	30	29	44	42
Chewing tobacco	3	16	7	27	7	35
Steroids	1	2	1	5	3	7



*Finding: Students active in extra-curricular or after school activities are less likely to use drugs or alcohol.*

Students reported the number of extra-curricular and number of non-school activities in which they participate. Students were grouped by the total number of activities in which they participate. Then the alcohol and drug use reported by each group was computed. Figure 13 reports the percent of students by grade and level of activity who report moderate to high use on the Alcohol Use or Drug Use scales.

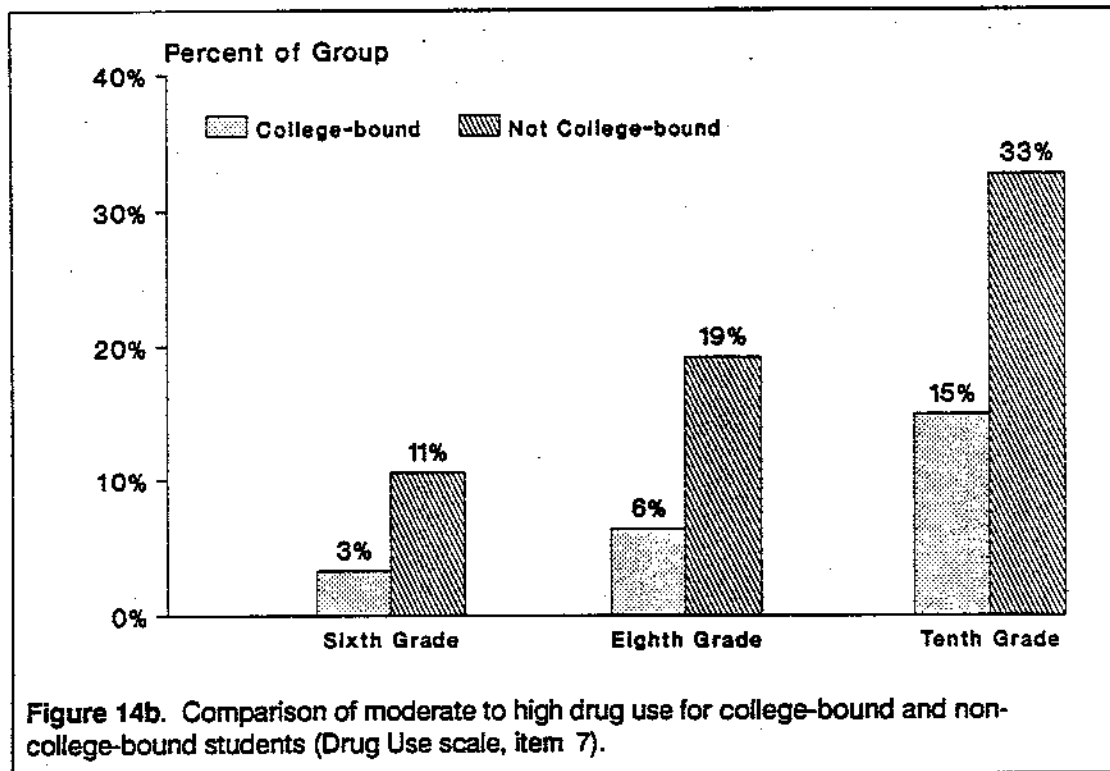
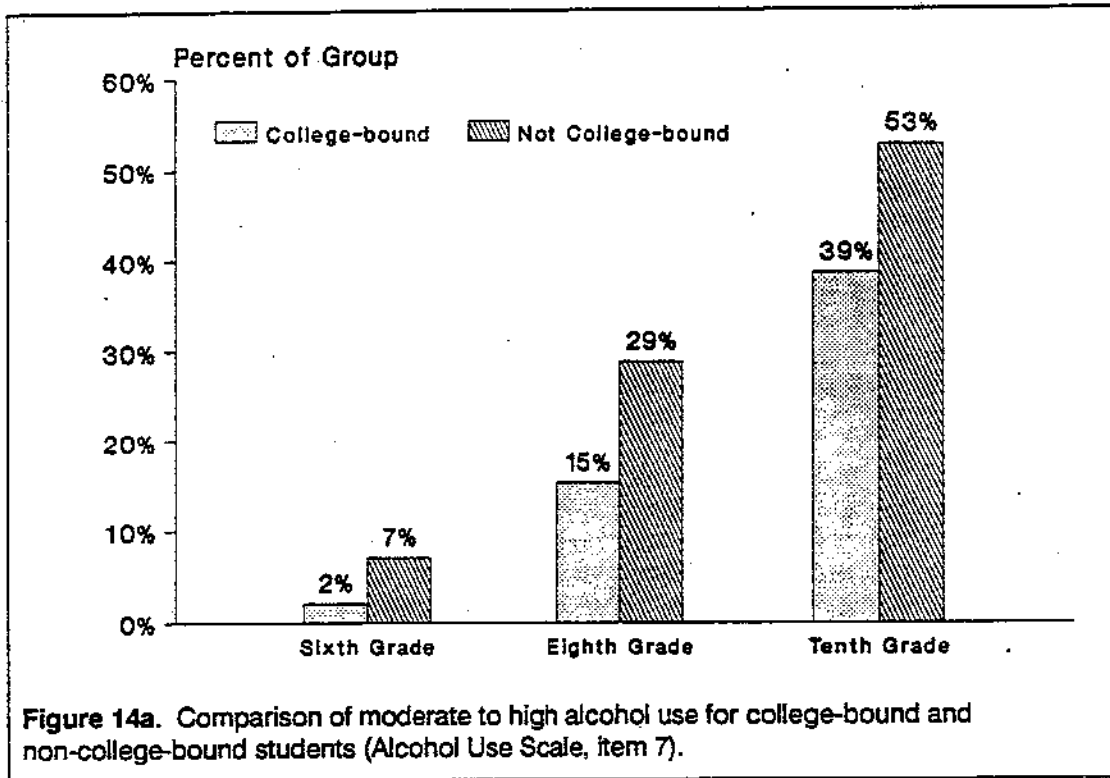
Students active in extra-curricular or after school activities are much less likely to report moderate to high drug use than students who do not participate in any activities. Active students were also less likely to report moderate to high alcohol use, but a substantial proportion still report some alcohol use.

Providing alternative drug-free activities is a popular prevention strategy, particularly in rural areas where students frequently report that there is nothing for them to do. This study supports the notion that active students are less likely to use alcohol and other drugs, but more research would be needed to determine whether increasing participation in school activities would result in a decrease in drug use.

*Finding: College-bound students are less likely to use drugs or alcohol.*

Students at each grade were grouped by whether or not they anticipated graduating from a four year college. Figure 14 compares the drug and alcohol use for the college-bound and non-college-bound groups.

Students who anticipate going to college are much less likely to report moderate to high levels of drug use than those who do not plan to attend. A similar relationship, but not as strong, was also observed for alcohol. Surprisingly few students, however, reported that they did not anticipate graduating from a four year college.





*Finding: Students with different ethnic backgrounds tend to exhibit different patterns of alcohol and drug use.*

Other studies have shown that students with different ethnic backgrounds exhibit different patterns of drug use. In Hawaii, white and native Hawaiian students reported high use of alcohol and drugs while students with Asian background reported relatively low use (Anderson & Deck, 1987). In California, white and American Indian eleventh graders drank and used marijuana more frequently than other groups, while Asians reported the least use of both substances (Skager, Fisher & Maddahian, 1986).

Figure 15 displays the percent of students in each group of tenth graders reporting moderate to high alcohol or drug use. A high proportion of native American and white students reported moderate to high alcohol use and drug use, while relatively few students from each of the other groups reported moderate to high use. The standard errors for percentages from each ethnic group except white are quite large, so small differences among ethnic groups should be ignored.

*Finding: The differences between regions were very small.*

When drug and alcohol use was examined by region, only small differences were observed relative to the size of the standard errors for the regions. Figure 16 compares the percent of tenth graders reporting moderate to high alcohol and drug use in each of the regions. Half of the tenth graders from the Northeast region (51%) and Southwest region (49%) reported moderate to high alcohol use. Nearly a quarter of the tenth graders from the Northwest region (24%) reported moderate to high drug use.

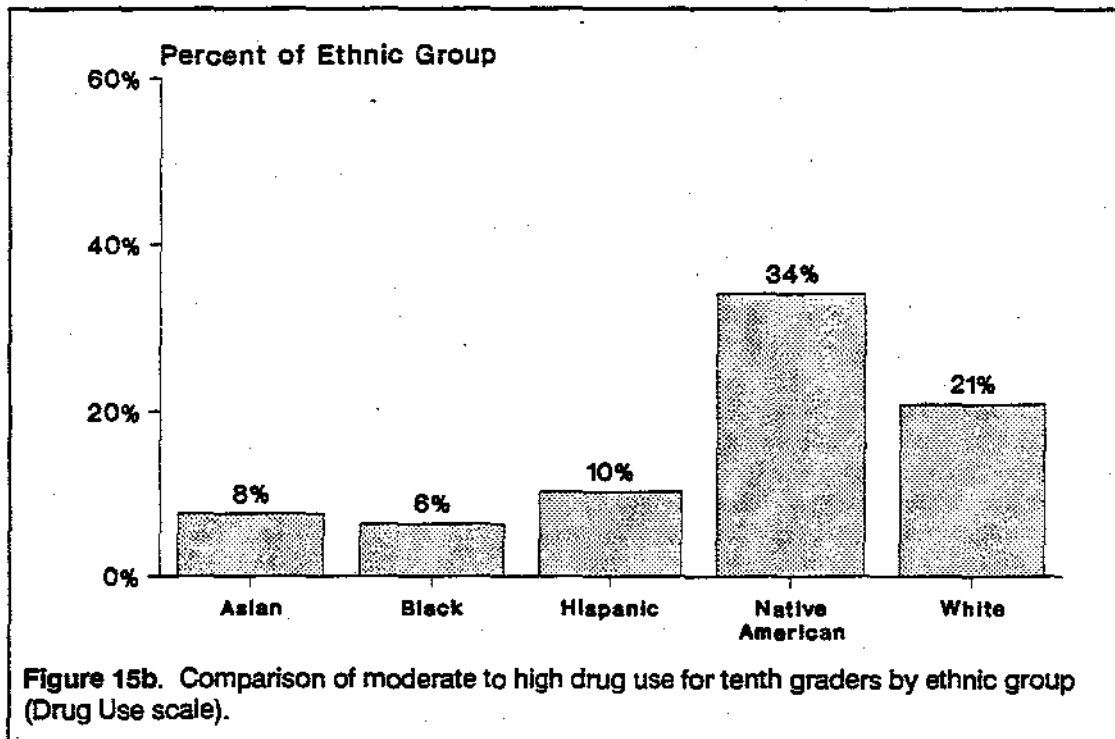
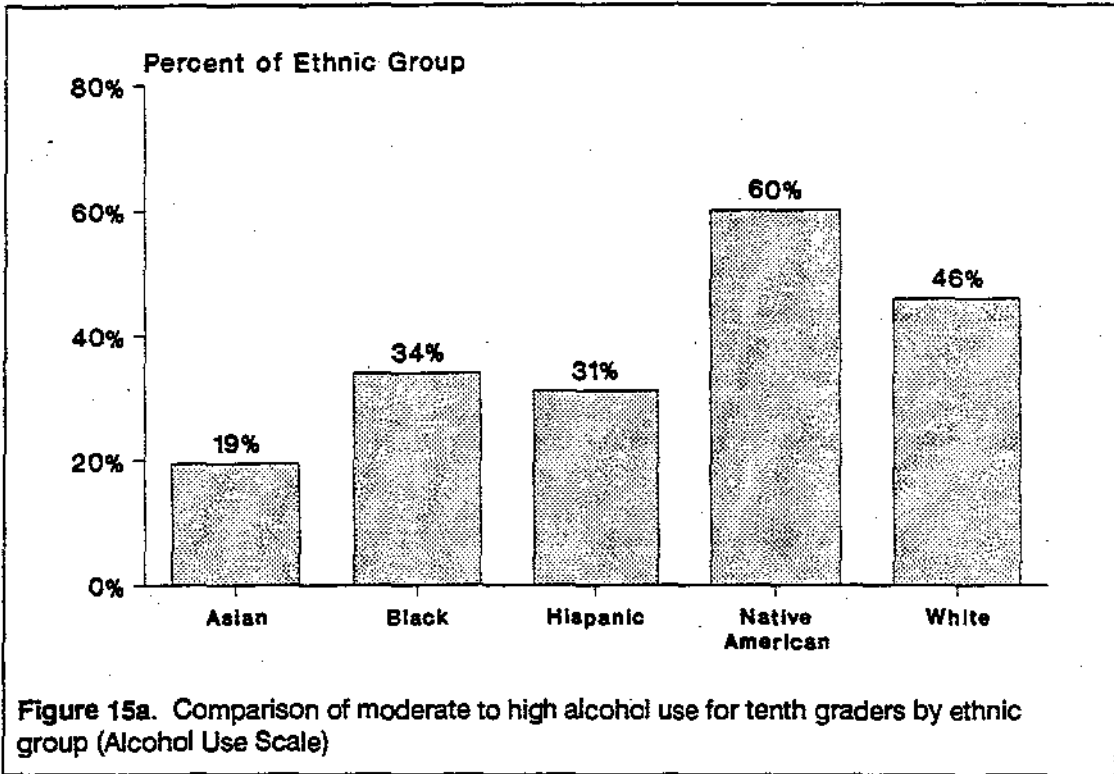
The estimates for ESD 121 at tenth grade have a high standard error because of the small number of schools which agreed to participate. Large high schools from the Seattle/Tacoma area were particularly reluctant to participate, and this may have biased the results somewhat. If drug use was higher in those large schools compared to those that did participate from ESD 121, the obtained results would under-represent the actual drug use from this area. The estimates from ESD 121 should be interpreted cautiously.

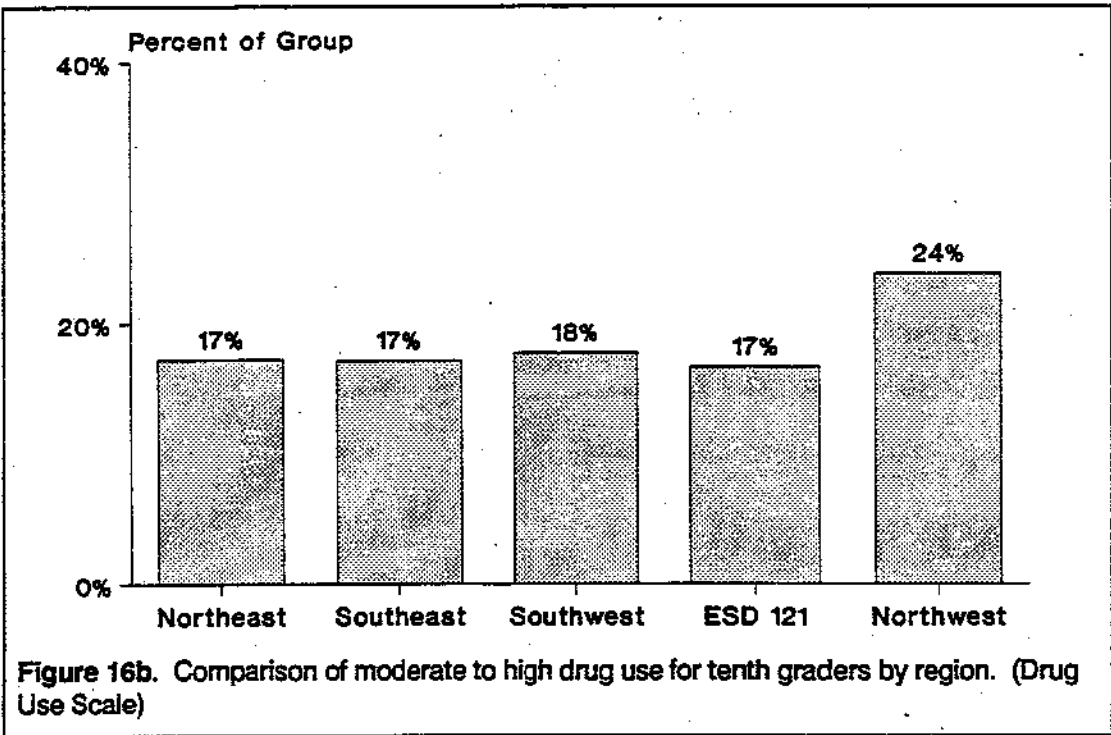
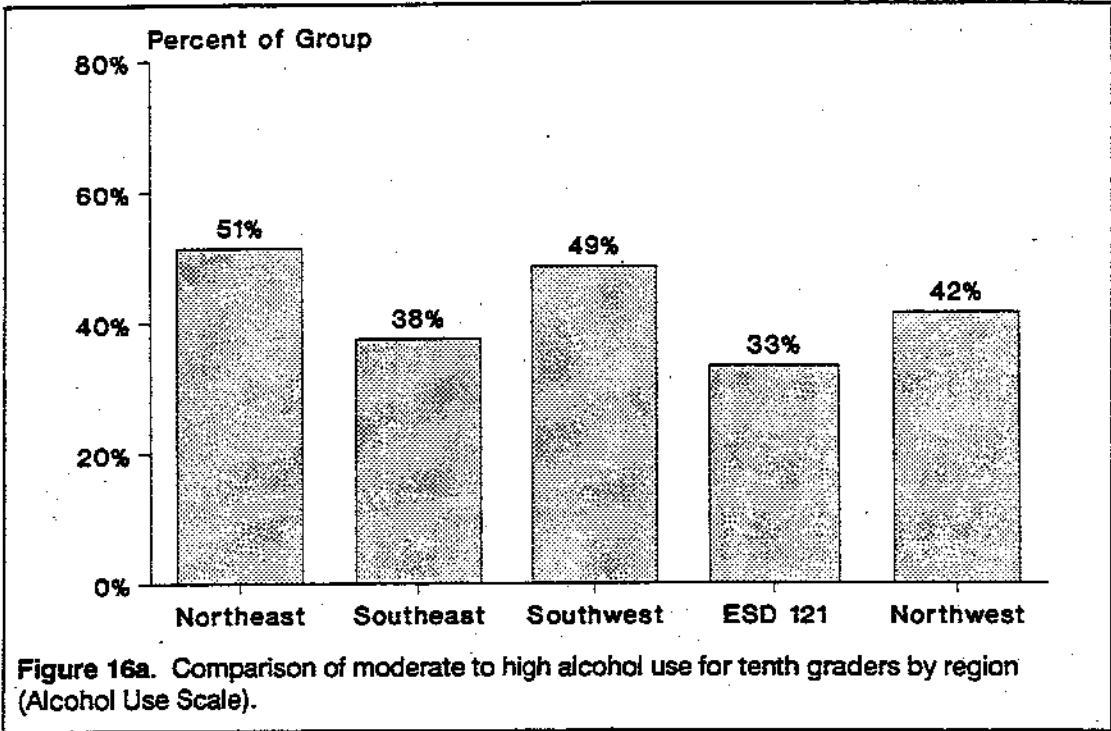
*Finding: Substance abuse is not confined to urban areas.*

From the news media one might get the impression that substance use by adolescents is primarily a phenomenon in the large urban areas with gang problems. Yet many rural areas report problems with drinking and drug use.

Figure 17 compares the percent of students by grade from rural and non-rural schools reporting moderate to high alcohol or drug use. The differences between rural and non-rural schools were very small. By tenth grade, slightly more rural students are regular users of alcohol. Fewer rural students reported moderate or high drug use, suggesting that the rural students may progress to higher levels of use later than non-rural students.

For the current study, the sampling of schools was stratified by size, rurality, and region. The only indicators available to distinguish between urban and rural schools were at a district level rather than at a school level. School districts with less than 75 percent residents based on the 1980 census were classified as non-rural.





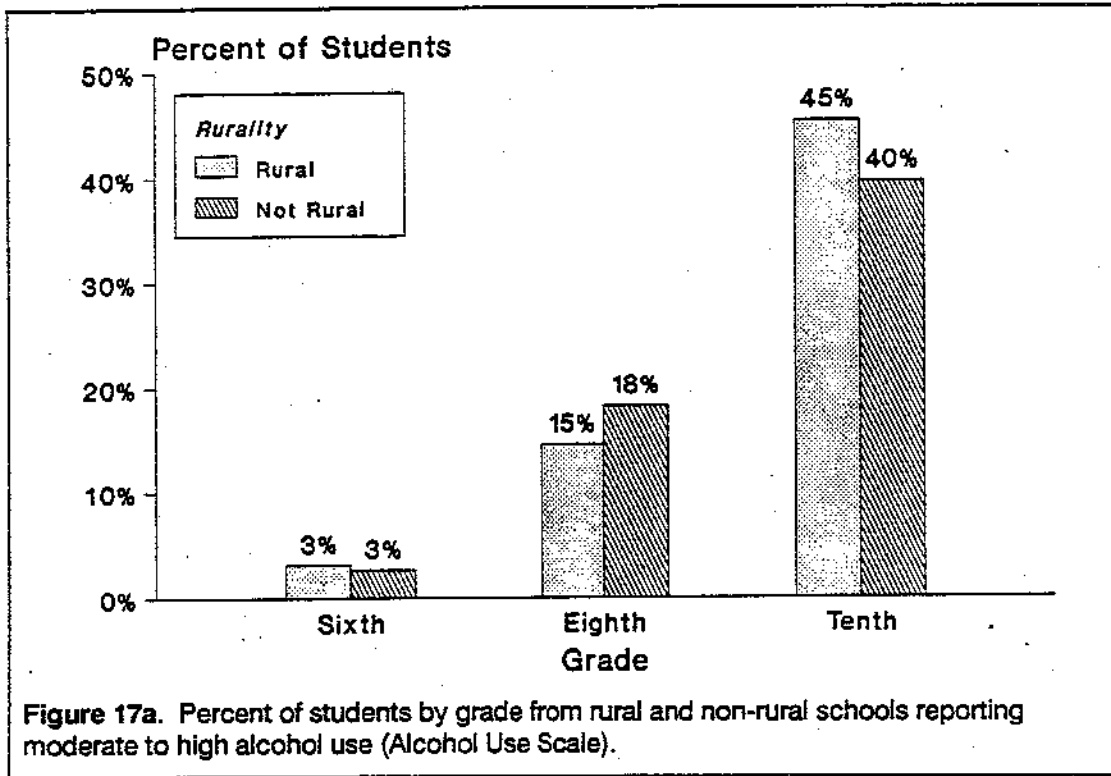


Figure 17a. Percent of students by grade from rural and non-rural schools reporting moderate to high alcohol use (Alcohol Use Scale).

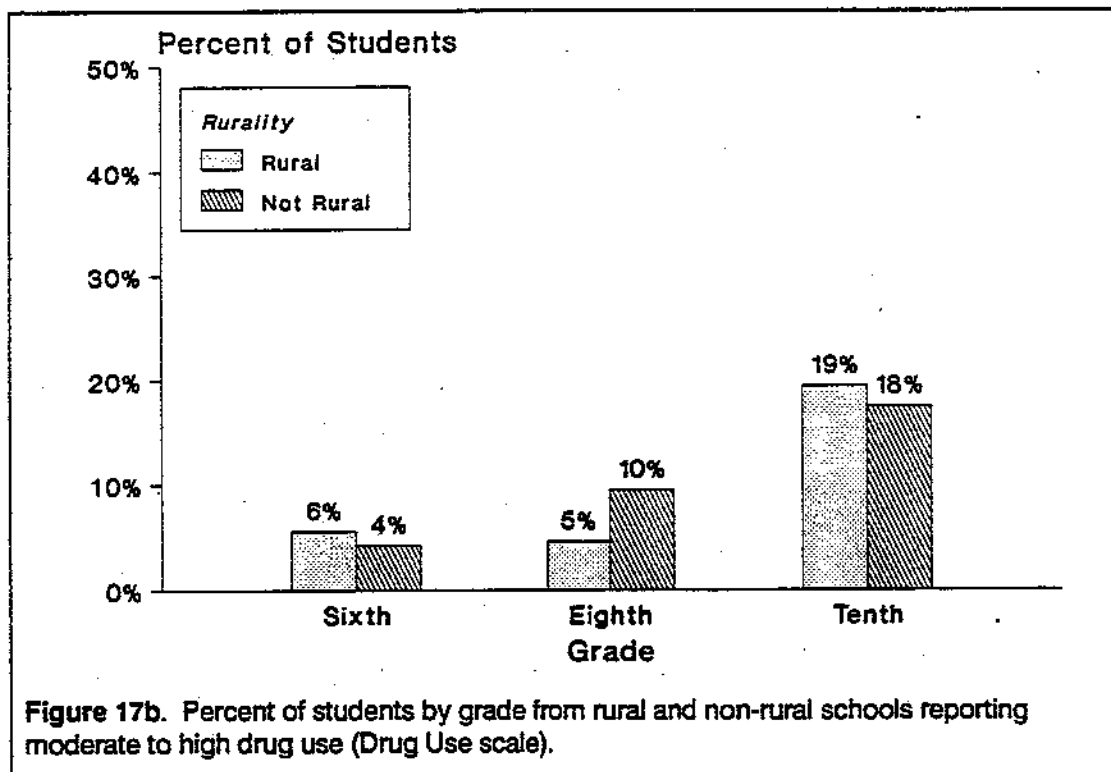


Figure 17b. Percent of students by grade from rural and non-rural schools reporting moderate to high drug use (Drug Use scale).

## Factors Related to Use

Some items in the survey probed factors that are related to substance use such as peer influences, exposure to drugs, perceptions of risk, perceptions of parental attitudes, and access to drugs.

**Finding:** *There is increasing exposure to alcohol and drug use among peers with each grade.*

Peer influence is thought to be a major factor in initiating and maintaining use of most drugs. This influence may be subtle and students may not admit to it, although a *Weekly Reader* survey of fourth and fifth graders revealed that many elementary students are already feeling pressure to use alcohol and marijuana. In the present study, students were asked about peer use of drugs and attendance at parties where alcohol or other drugs are served.

Figure 18 shows the increase by grade in the proportion of students' best friends who use alcohol at least once a month. Note that by tenth grade only 29 percent report that none of their closest friends use alcohol monthly. Items 32 to 34 also asked about friends who use drugs. By tenth grade, most students have friends who have used tobacco (69%), alcohol (87%), or other drugs (59%).

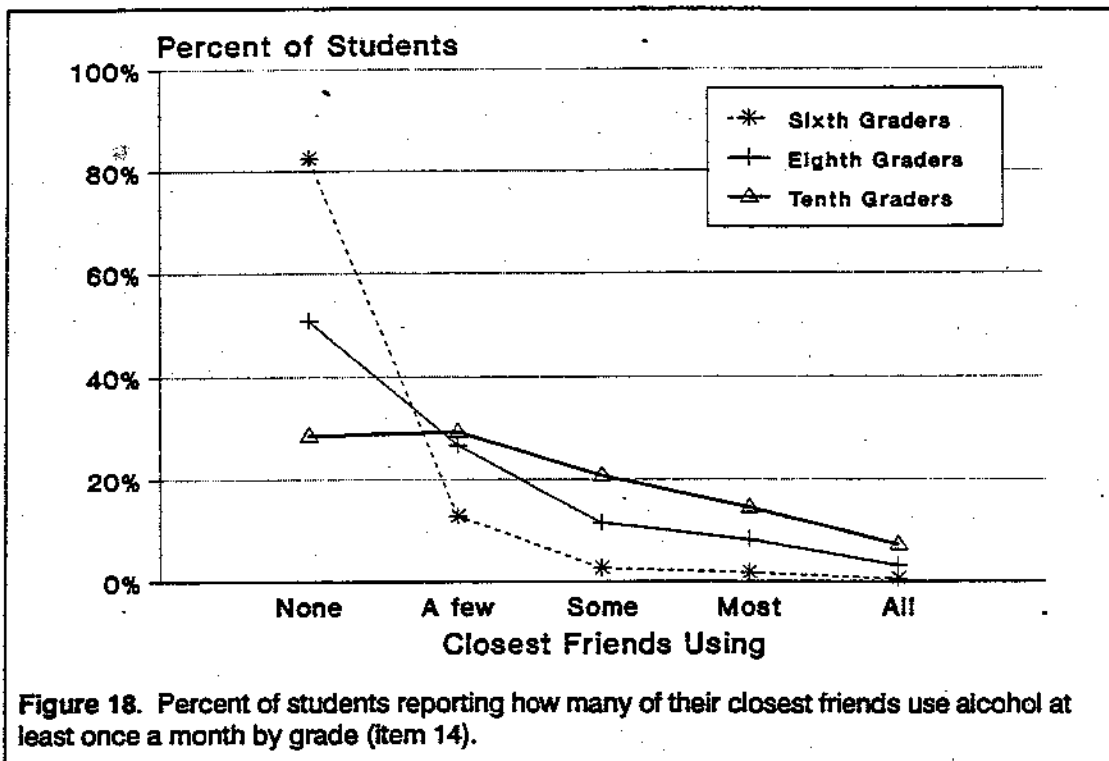
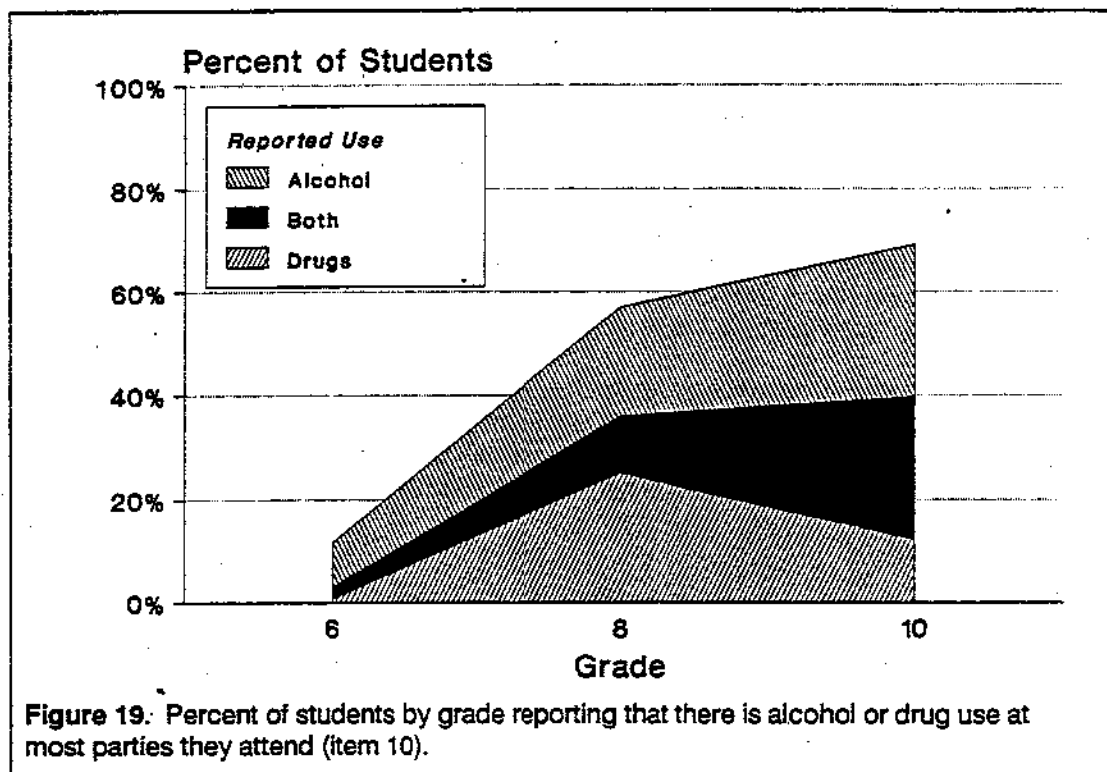


Figure 19 charts the increase in attendance at parties where alcohol, drugs, or both are used. Students were asked whether these substances were used at most parties they attended. By sixth grade about one in ten (12%) responded yes. By eighth grade over half (57%) and by tenth grade seven in ten students (69%) responded yes. The percent who reported drug use increased from 3 percent at sixth grade to 40 percent at tenth.

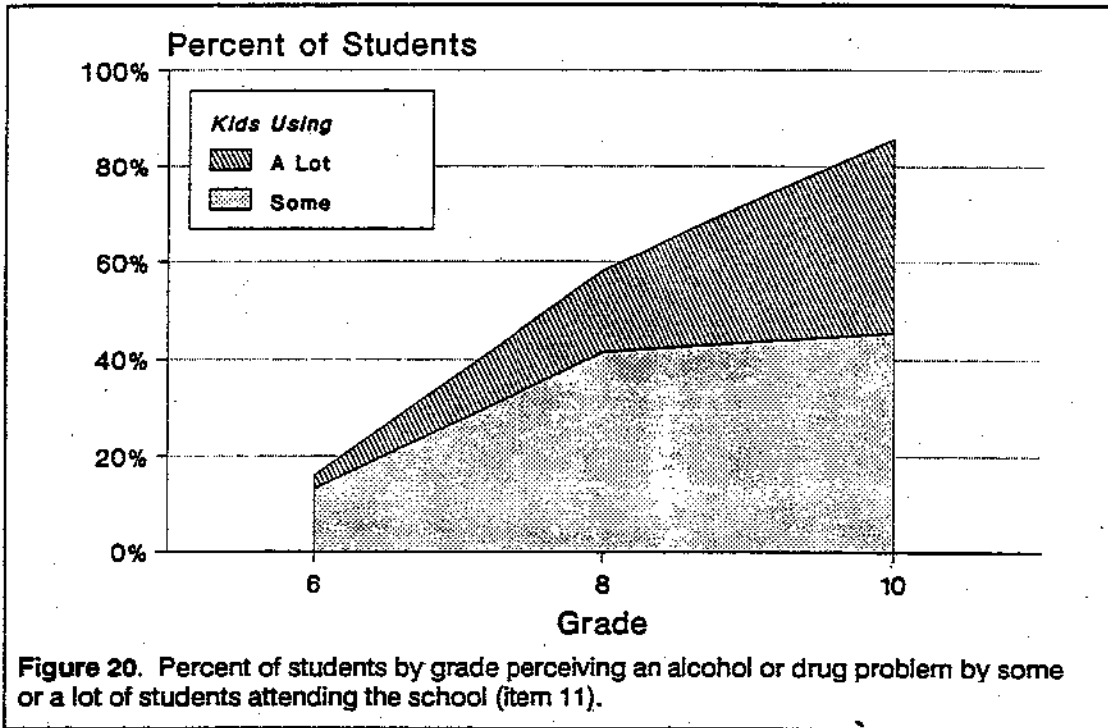


Together, these findings suggest increasing exposure to alcohol and drug use among ones peers and closest friends. Presumably this exposure is also associated with pressures to use. The current emphasis on teaching refusal skills in prevention curriculum attempts to combat the effects of peer pressure. Other peer oriented approaches include peer counseling and teen leadership strategies.

*Finding: Students not only perceive a drug or alcohol problem among students attending their school, but report drug or alcohol use during the school day.*

To determine the effects of substance abuse in the school setting, respondents were asked whether students attending the school had a drug or alcohol problem and whether there was alcohol or drug use during the school day.

Figure 20 shows a dramatic increase from sixth to tenth grade in the percent of students who perceive an alcohol or drug problem among students attending the school. By tenth grade, 86 percent say that some or a lot of kids have a problem with substance use.



When asked whether there was use during the school day, a surprising number admitted that there was. Figure 21 plots the percent reporting substance use during the school day at their school. Even at sixth grade 14 percent report some use at school and by tenth grade 80 percent see use at school.

**Finding:** *Students perceive their parents as disapproving of drug use but more tolerant of a situation that might expose them to alcohol.*

To determine what kind of message students receive at home, a series of questions probed student perceptions of their parents attitudes about different forms of substance use. In general, students indicated that their parents either *disapproved* or *greatly disapproved* of all forms of substance use. Tenth graders tend to perceive their parents as disapproving of their drinking one or two drinks a day (93%), drinking five or more drinks once or twice a weekend (92%), and smoking marijuana occasionally (94%), but somewhat more tolerant of attending a party in a private home where alcohol is served (78% disapprove).

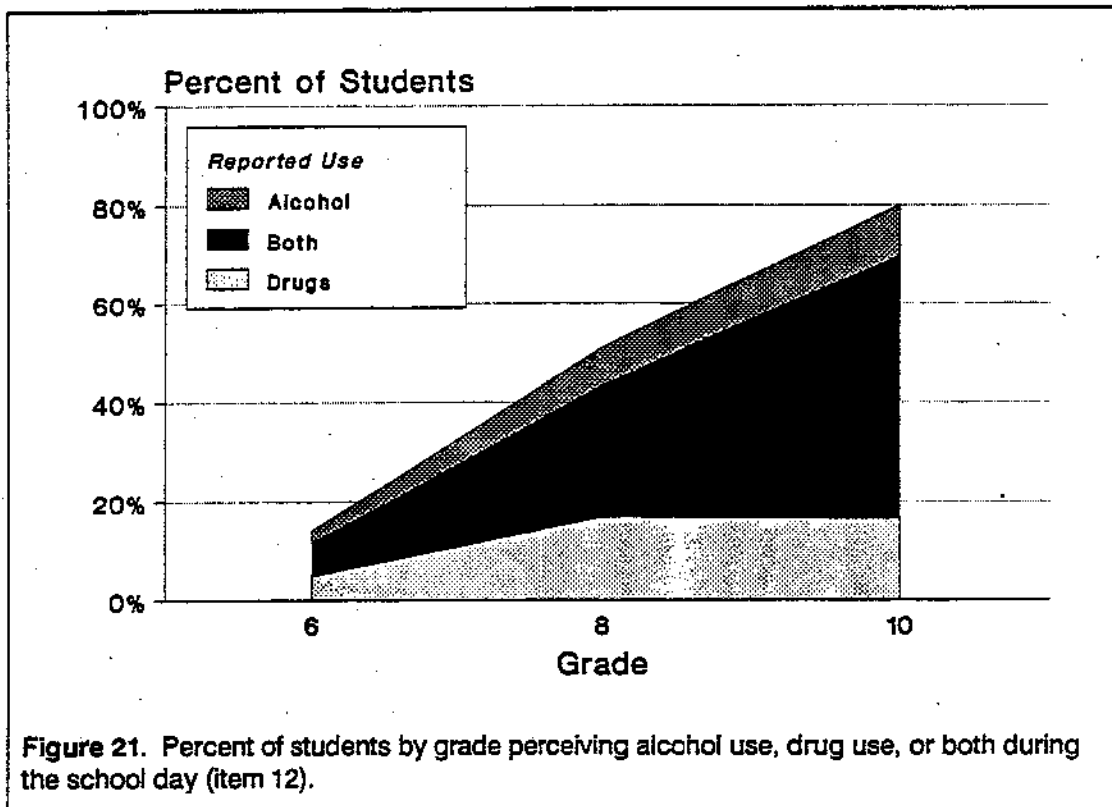
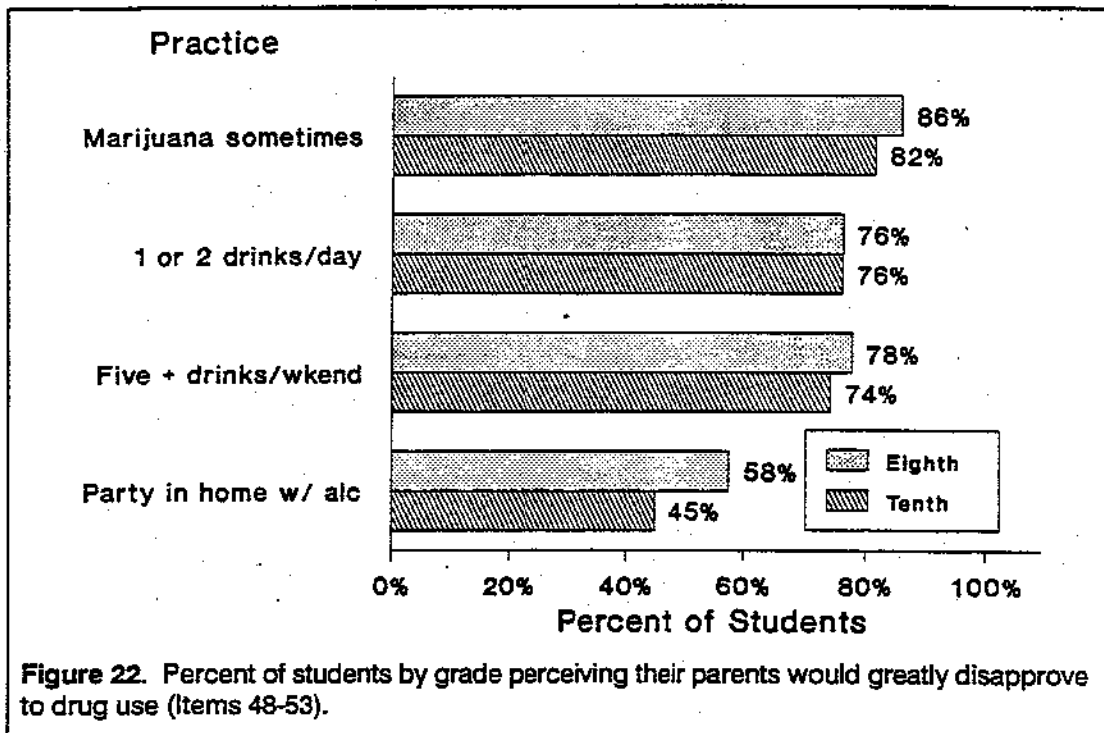


Figure 22 presents the percent of eighth and tenth graders reporting that their parents would *greatly disapprove* of each behavior. The differences between the grades are small except for attendance at parties in a private home where alcohol is available, as only 45 percent of the tenth graders feel that their parents would greatly disapprove. Students seem to perceive more lenience by parents where there may be exposure to alcohol.

It is also interesting to note that students perceive slightly more tolerance of daily drinking and weekly binge drinking than occasional marijuana use. Followup interviews with students in Hawaii, where family luaus are common, suggest that a few students misunderstood the question to include family parties where alcohol was available to adults only, but this interpretation would seem less likely in Washington.

These findings, the strength of perceived parental disapproval and the consistency across most behaviors, are very encouraging. However, students perceive more leniency where alcohol or exposure to alcohol is involved, reflecting a double standard that is common in our society.



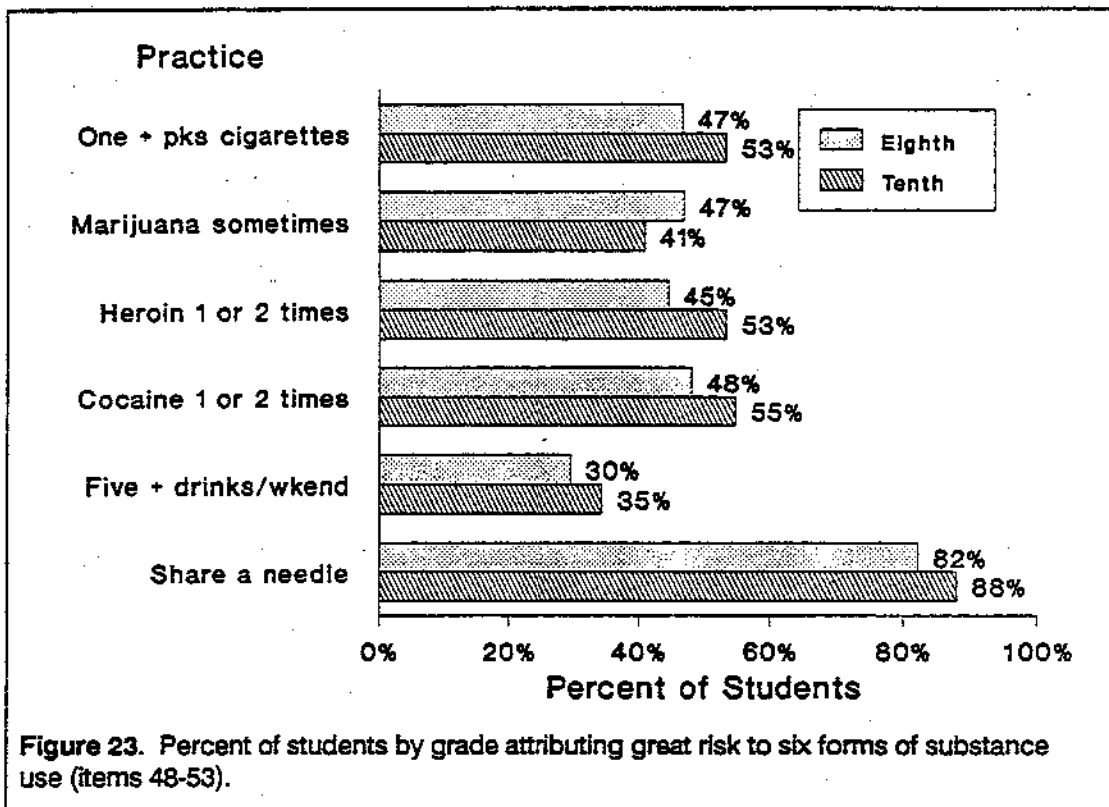


*Finding: Students perceive great risk in some behaviors such as sharing needles but much less in others such as binge drinking.*

Eighth and tenth graders were asked if people risk harming themselves by various forms of substance use. The differences in their responses to each item as shown in Figure 23 are illuminating.

Students generally fail to recognize the health and safety risks of weekly binge drinking. Only a 30 percent of the eighth graders see great risk in drinking five or more drinks once or twice a weekend. More students see risk in smoking one or more packs of cigarettes a day, smoking marijuana occasionally, and trying heroin or cocaine once or twice. Without question, though, students do recognize the risks of sharing needles to inject drugs; 88 percent of the tenth graders attribute great risk to it. While students may recognize that needles reflect a serious stage of drug use, the strength of their conviction also suggests that AIDS education has been quite effective in alerting students that this is one means of transmitting AIDS.

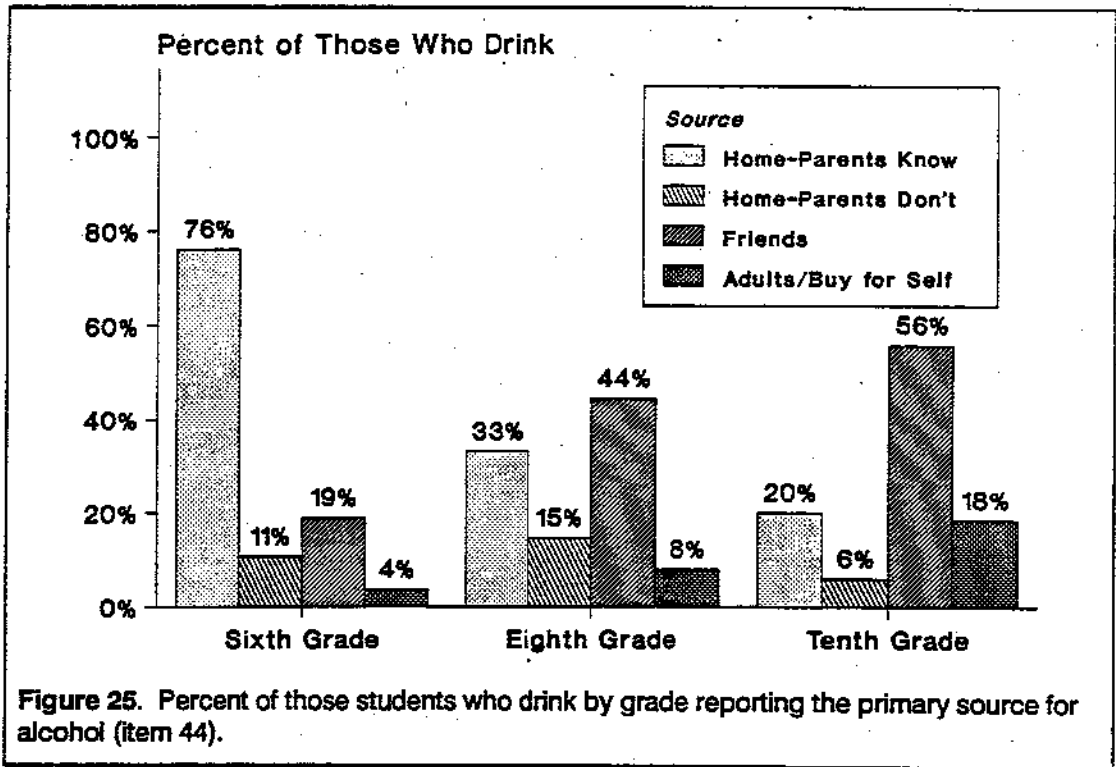
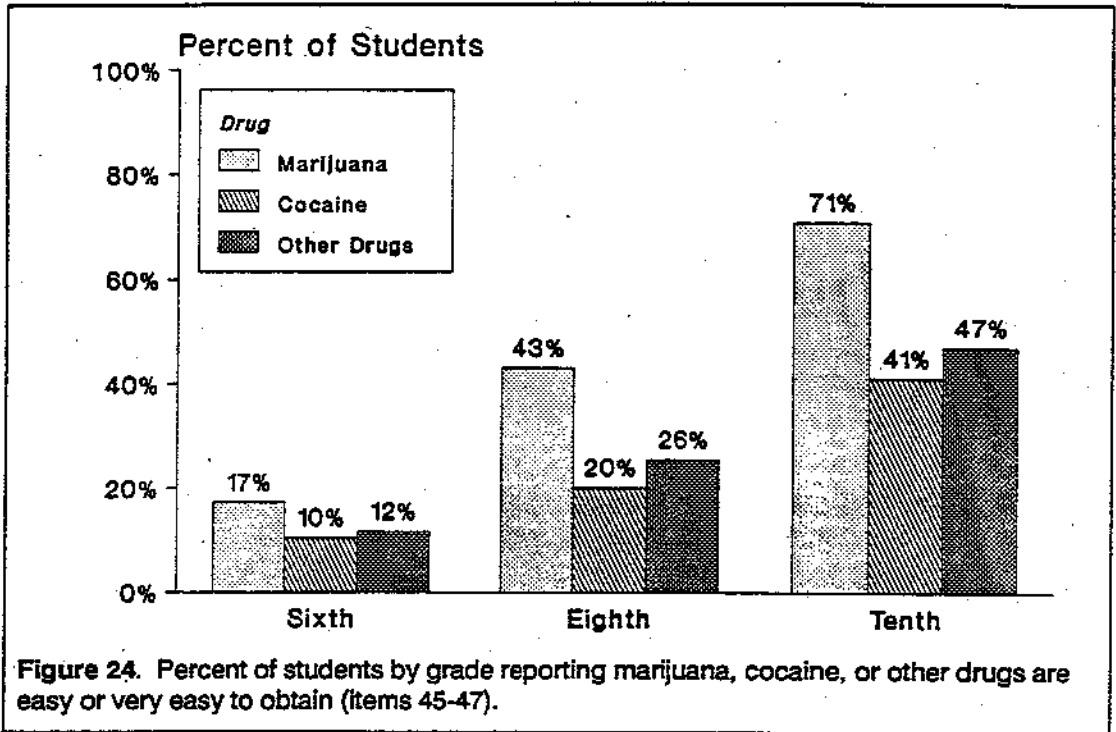
Tenth graders are more likely than eighth graders to attribute great risk to all forms of use except marijuana. Compared to a national sample of seniors, Washington tenth graders are less likely to perceive great risk in binge drinking or smoking, but more likely to perceive risk in marijuana and cocaine use.



*Finding: By tenth grade, students find it easy to obtain illicit drugs.*

Figure 24 shows that students perceive that drugs are increasingly *fairly easy* or *very easy* to get. Although few sixth graders would find it easy to obtain marijuana (17%) or cocaine (10%), most tenth graders report that it would be easy to get marijuana (71%) and, to a lesser extent, cocaine (41%).

Students were also asked where they usually obtain alcohol if they drink. Figure 25 reveals a shifting pattern from the home to friends as the primary source of alcohol. Most sixth graders obtain alcohol from home with their parents' knowledge (76% of those who drink), but drinking is still infrequent at this age. By tenth grade, most students who drink obtain alcohol from friends (56% of those who drink) or adults or they purchase it themselves (18% of those who drink).



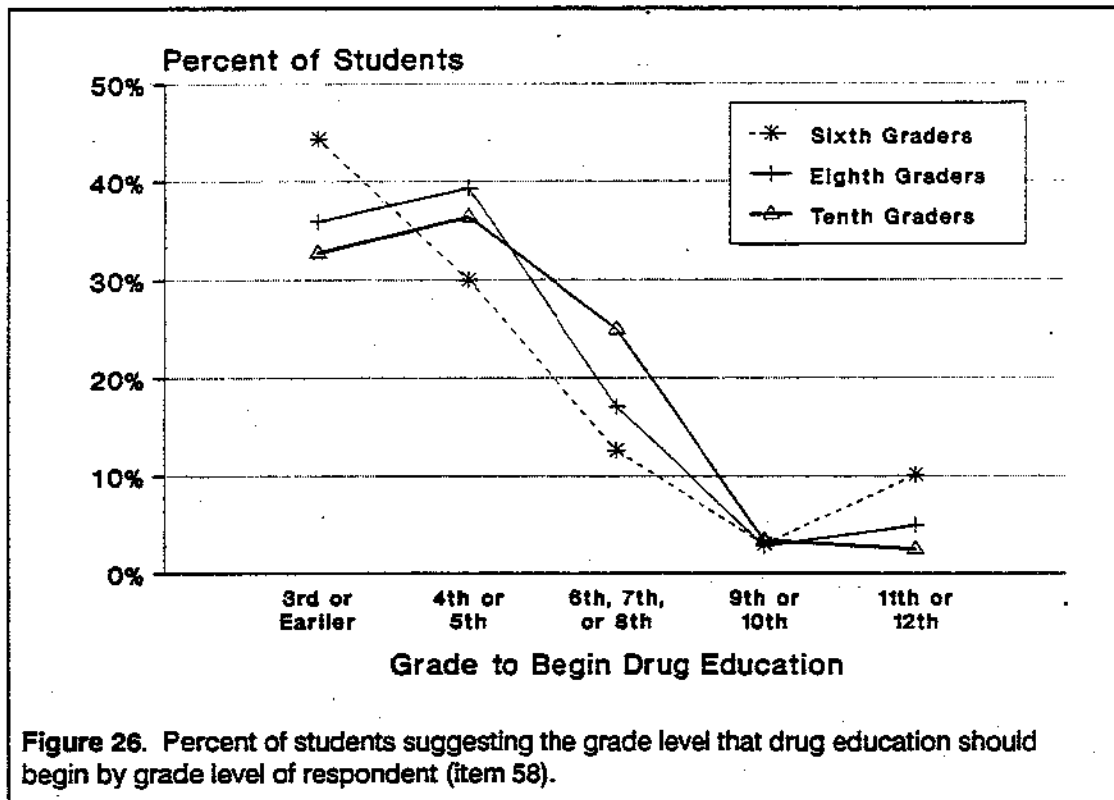
## Experience with Drug Education

Clearly, the use of alcohol and other drugs by adolescents is a community problem, not a school problem. Yet, schools must play an active role in helping to prevent substance abuse through drug education, strong policies, and early intervention. Recent Gallup polls on education have shown that the public views drug abuse as the most serious problem facing schools today.

The last ten years have seen great strides in the implementation of school-based prevention and intervention programs nationwide. *The Drug-Free Schools and Communities Act of 1986*, in particular, has promoted more activity from the educational community. A recent study (Johnson, 1989) sponsored by OSPI describes school-based programs in Washington funded under the Act. This study documented student perceptions of the drug education they have received and the student assistance opportunities available to them.

*Finding: Most Washington students feel that drug education should begin in elementary school.*

Students were asked when they felt that alcohol and drug education should begin. Figure 26 displays the distribution of grades recommended by sixth, eighth, and tenth graders. Note that three out of four sixth graders (74%) feel that drug education should begin before sixth grade. Over 44 percent of the sixth graders felt drug education should start in the third grade or even earlier.



This concern for early initiation of drug education is consistent with the thinking of leading educators in the field. In *Schools without Drugs* the U.S. Education Department argues for a prevention curriculum that is well articulated from kindergarten through grade twelve.

**Finding:** *Washington students find school the most important source of information about the dangers of alcohol and drugs.*

When asked where they have learned the most about the dangers of alcohol and drugs, more students selected school over other sources. Family was next in importance for sixth graders but the media was next in importance for tenth graders. Figure 27 shows the percent of students by grade selecting family, school, peers, church, or the media as the most important source. Compared to students in Hawaii responding to a similar survey, the family was a more important source for Washington sixth graders and school was a more important source for Washington eighth and tenth graders.

It is interesting that more high school students do not select "other kids". Perhaps as peer leaders begin to speak out against drugs and more school support groups become available, this percentage will increase. However, when the alcohol and drug use rates were examined for students selecting each source, it was discovered that students learning from their peers were more likely to report moderate to high drug use than students in the other groups.

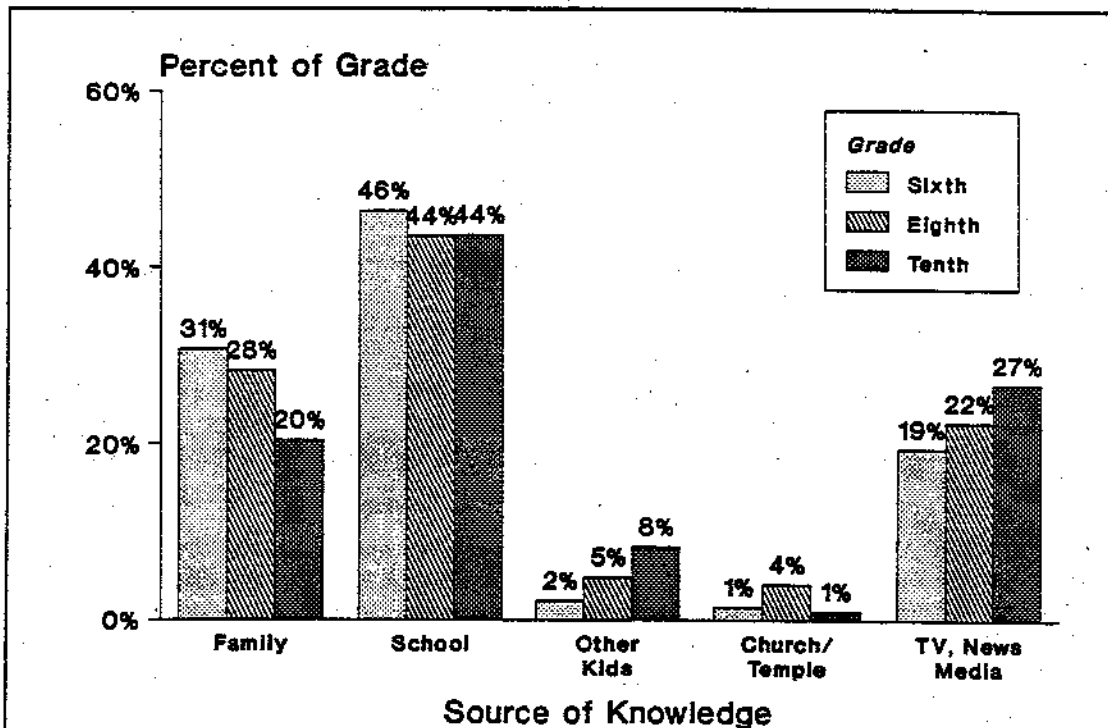


Figure 27. Percent of students learning the most about the dangers of alcohol or drugs from various sources by grade (Item 15).

**Finding:** Most students feel they have learned from their exposure to each component of a prevention curriculum.

Students were asked how much they learned from classes at school about each major component of a good prevention curriculum: information about the effects of alcohol and other drugs, refusal skills for saying "no" constructively when pressured to take drugs, decision making skills, positive self esteem, and alternative activities to taking drugs. A positive response to an item should signal both that the student was exposed to such lessons and that something of value was learned during those lessons.

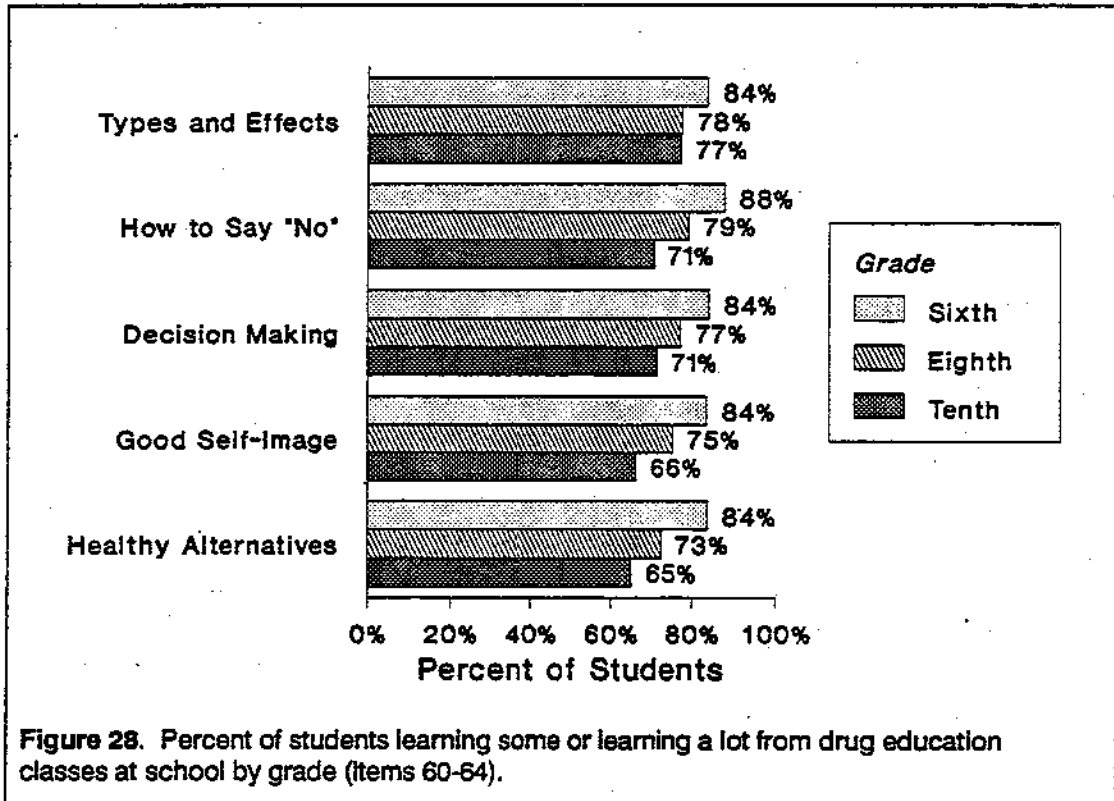


Figure 28 shows that most students at each grade reported learning *some* or *a lot* from each component. The prevalence of *Here's Looking at You* and other comprehensive curricula in the state probably accounts for the fact that so many students reported learning from each of these components.

Tenth graders were less positive about how much they learned from each of the major components than sixth and eighth graders. This may reflect a greater cynicism among high school students, but it also suggests that these older students may have had less exposure to drug education in elementary or middle school. There is some evidence to suggest that there has been a recent upsurge in the number and quality of prevention programs (Deck, 1987).

It was particularly interesting to note that nearly twice as many of the sixth graders (70%) as tenth graders (39%) report learning "a lot" about refusal skills. Based on the effectiveness of refusal skills training in curbing smoking among youth, this important component has recently been added to the curriculum of many prevention programs. This component seems to have made a particularly strong impression on sixth graders compared to the other items.

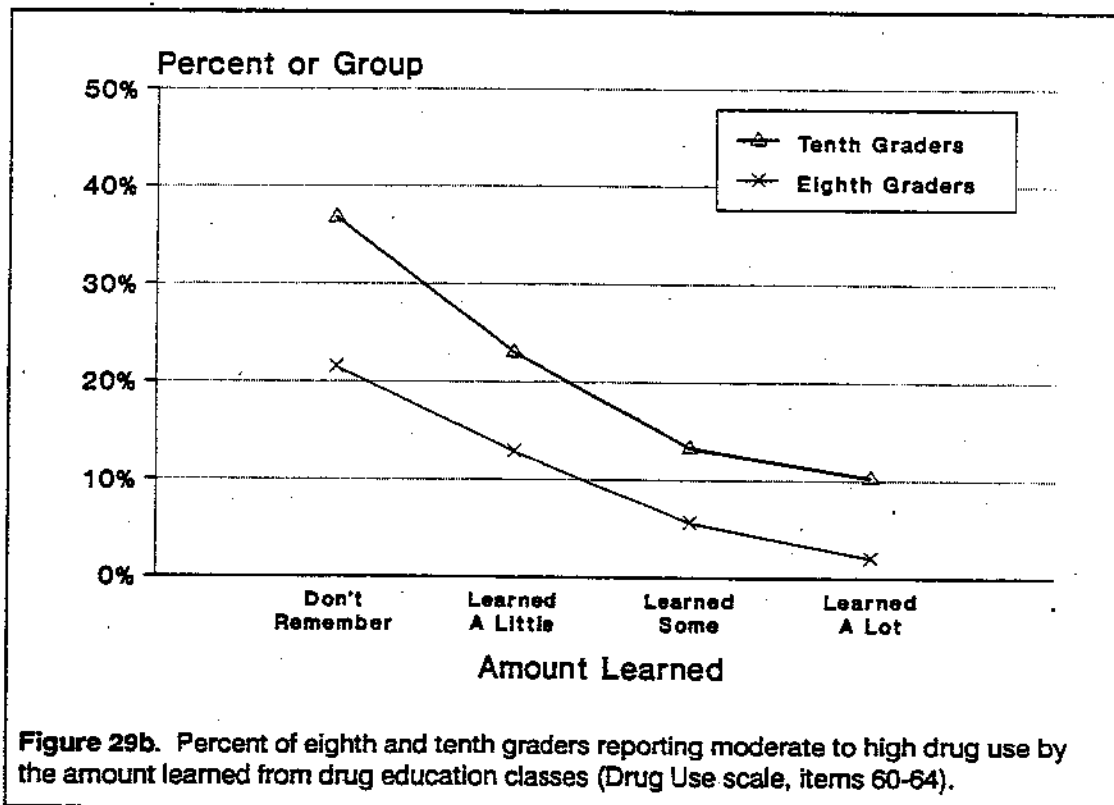
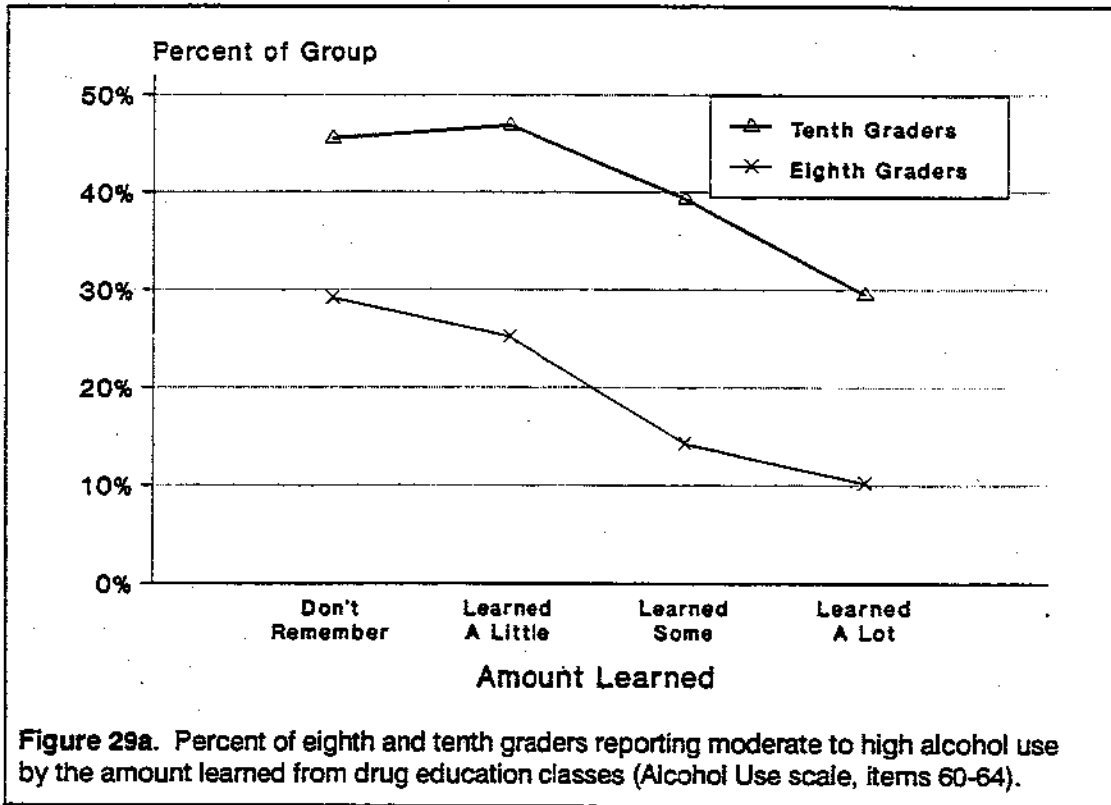
Two thirds or more students at each grade feel that they have learned enough about drugs and their effects. In part, this reflects that most students have had instruction on the effects of drugs.

*Finding: Students who reported that they learned a lot from drug education were much less likely to report moderate to high drug or alcohol use.*

To study the relationship between experiences with drug education and drug or alcohol use, a scale was constructed by calculating each student's average response to items 60 to 64. Students were then grouped by amount learned using their average response. Figure 29 presents the percent of students reporting moderate to high use of alcohol or drugs for each group.

There is a strong relationship between experience with drug education and alcohol or drug use, particularly for tenth grade. Students reporting that they have learned a lot are much less likely to use alcohol or other drugs than students who did not remember or learned little. The differences between grades simply reflect the overall increase in use from eighth to tenth grade.

Some caution must be exercised in attributing causality from this relationship. Students who learned more from drug education may use less as a consequence. On the other hand, students who use drugs may simply deny that they learned anything.





*Finding: Students report access to a counselor but not school support groups for early intervention.*

Most students in eighth (68%) and tenth (60%) grade report that their school offers a counselor or other staff with whom they could discuss a drug or alcohol problem, but only one quarter (24%) of the eighth graders and one third (33%) of the tenth graders report that they are aware of student support groups in their school. This suggests that early intervention strategies which include support groups may not be widely implemented yet.

For both items, a rather large percent of students were not sure. When the responses within schools were examined, there were often widely disparate views about the opportunities available. This suggests that even when help is available, many students have not been made aware of it.



## References

- Anderson, P. S., & Deck, D. D. (1987). *Student substance use and abuse in Hawaii*. Portland, OR: Northwest Regional Educational Laboratory.
- Bachman, J. G., Johnston, L. D., & O'Malley, P. (1987). *Monitoring the future: Questionnaire responses from the nation's high school seniors--1986*. Ann Arbor: University of Michigan Survey Research Center.
- Catalano, R. F., Brattesani, K., and Hawkins, J. D. (1987). *Final report: King County drug survey results*. Seattle, WA: Center for Social Welfare Research, University of Washington.
- Deck, D. D. (1987). *Assessing the needs of drug and alcohol prevention programs in the western states*. Portland, OR: Northwest Regional Educational Laboratory.
- Egan, D. M., and Hallan, J. B. (1988). *Drug use by Oregon public school students: Preliminary report*. Hallprin, Inc.
- Hawkins, J. D., Lishner, D. M., Jenson, J. M., and Catalano, R. F. (1987). Delinquents and drugs: What the evidence suggests about prevention and treatment programming. In B. S. Brown and A. M. Miles, (Eds.), *Youth at high risk for substance abuse*. Washington, D. C.: National Institute on Drug Abuse.
- Hawley, R. A. (1984). *A school answers back: Responding to student drug use*. Washington, D.C.: American Council for Drug Education.
- Jessor, R. & Jessor, S. L. (1978). *Problem behavior and psychosocial development: A longitudinal study of youth*. New York: Academic Press.
- Johnson, M. J. (1989). *Drug free schools and community act of 1986: Program report fiscal year 1987-1988*. Olympia, WA: Office of the Superintendent of Public Instruction, Instructional Programs and Services, Basic Education and Curriculum Section.
- Johnston, J. D., & O'Malley, P. M. (1985). Issues of validity and population coverage in student surveys of drug use. In B. A. Rouse, N. J. Kozel, & L. G. Richards (Eds.), *Self-report methods of estimating drug use: Meeting current challenges to validity*. Washington D.C.: National Institute on Drug Abuse, Monograph 57.
- Johnston, L. D., O'Malley, P. & Bachman, J. (1986). *Drug use among American high school students, college students, and other young adults--national trends through 1985*. Rockville, MD: National Institute on Drug Abuse.
- Johnston, L. D., O'Malley, P. & Bachman, J. (1987). *National trends in drug use among American high school students young adults--1975-1986*. Rockville, MD: National Institute on Drug Abuse.

- Johnston, L. D., O'Malley, P. & Bachman, J. (1988). *Illicit drug use, smoking, and drinking by America's high school students, college students, and young adults—1975-1987*. Rockville, MD: National Institute on Drug Abuse.
- National Institute on Drug Abuse (1988). *Highlights of the National Adolescent School Health Survey*. Washington, D.C.: U.S. Department of Health and Human Services.
- McLaughlin, D. G., Raymond, J. S., Murakami, S. R. Goebert, D. (1987). *Journal of Psychoactive Drugs*, 19(1), Jan-Mar, 85-94.
- Skager, R., Frith, S. L., and Maddahian, E. (1988). *A second statewide survey of drug and alcohol use among California students in 7, 9, and 11*. Sacramento, CA: California Department of Justice.
- Sudman, Seymour, (1976). *Applied Sampling*. New York: Academic Press, Inc.
- U.S. Department of Education (1986). *What works: Schools without drugs*. Washington D. C.

## Conclusions

The results of this survey confirm that a serious problem exists with substance use and abuse among public school students in Washington. This problem is not confined to the urban centers nor to high school students nor to any other specific group.

Although sixth graders report little use of most drugs, many do admit experimentation with the gateway drugs, i.e., alcohol, tobacco, and marijuana, and with inhalants. The stage is being set during the elementary grades for more serious use in junior high and high school. Students themselves agree that drug education must start early.

Student responses to questions on drug education provide some assurance that drug education programs are now widely distributed in the state and that students are having positive experiences in these classes. Still, many of these programs are in their infancy and the prevalence of use in Washington remains about the same or slightly below that for the nation as a whole. Clearly, more must be done to solve this problem.

Recent studies give some hope that we are beginning to gain on the war against drugs in some areas. The *Monitoring the Future* study, an annual national survey by researchers at the University of Michigan, has shown declines of 1-3 percentage points a year in drug use among seniors since about 1980. A recent survey in California has shown very encouraging reductions in the use of drugs between 1986 and 1988, but a similar survey in Oregon showed little change over the same period. In all cases, however, the prevalence of substance use remains at an unacceptable level.

The current study provides an empirical foundation for planning prevention and intervention programs and establishes a baseline for comparison to the results of future studies. In the coming years, periodic assessments of substance abuse will help local and state agencies evaluate the effects of the continuing statewide prevention effort.



## APPENDIX A.

### Statewide Results by Grade Washington Drug and Alcohol Survey

This Appendix presents the statewide results for students in grades 6, 8, and 10 attending public schools in Washington. For each grade, the the percent of students selecting each answer is listed, as in the example below:

	Grade 6	Grade 8	Grade 10
4. What is your sex?			
a. Female	51.0%	52.4%	49.9%
b. Male	49.0	47.6	50.1

In this example, 49 percent of the sixth graders are male. The percentages at a grade for an item should add to 100 but may not due to rounding.

**Drug Use**      Levels are based on the frequency of drug use, the type of drug consumed, and the number of drugs consumed. High use includes daily use of marijuana and weekly use of cocaine.

	Grade 6 (n=4253)	Grade 8 (n=3570)	Grade 10 (n=2471)
No Use	83.0%	73.1%	55.9%
Low Use	12.4	18.7	26.1
Moderate use	3.5	4.9	11.3
High use	1.2	3.4	6.7

**Alcohol Use**      Levels are based on the frequency of drinking and the amount typically consumed. High use implies daily drinking or regular binge drinking (5 or more drinks at one time).

	Grade 6 (n=4228)	Grade 8 (n=3550)	Grade 10 (n=2449)
No Use	48.6%	31.1%	15.9%
Low Use	48.7	51.7	43.1
Moderate use	2.1	11.7	23.9
High use	0.6	5.5	17.1

**At Risk**      Levels are based on the degree to which a student reports experiences or characteristics that predict adolescent drug or alcohol abuse.

	Grade 6 (n=4259)	Grade 8 (n=3580)	Grade 10 (n=2476)
Low risk	74.9%	46.1%	26.5%
Moderate risk	21.3	40.9	54.0
High risk	3.7	12.9	19.5

	Grade 6	Grade 8	Grade 10
Total weighted number of students	(n=4263)	(n=3582)	(n=2476)
2. Which of the following best describes your background? Choose only one answer. (For example, if your background is part Asian, but mostly White, mark E.)			
a. Asian	5.0%	5.3%	11.3%
b. Black, not Hispanic	4.6	4.4	10.4
c. Hispanic	4.6	5.5	4.1
d. Native American	9.9	9.7	7.3
e. White, not Hispanic	76.0	75.1	66.9
4. What is your sex?			
a. Female	51.0%	52.4%	49.9%
b. Male	49.0	47.6	50.1
5. Have you ever had to repeat a grade in school?			
a. Yes	14.6%	15.5%	13.7%
b. No	85.4	84.5	86.3
6. How much school do you miss?			
a. I never miss school.	9.1%	7.8%	6.5%
b. I hardly ever miss school.	54.8	41.0	29.8
c. I miss 2 or 3 days a semester.	28.3	36.4	38.8
d. I miss some school every month.	6.8	13.0	21.5
e. I miss some school every week.	1.0	1.8	3.6
7. How likely is it that you will graduate from a four-year college after high school?			
a. Definitely won't	2.6%	3.3%	4.2%
b. Probably won't	7.7	10.8	13.7
c. Probably will	57.0	50.1	44.4
d. Definitely will	32.7	35.8	37.8
8. How many extra school activities (sports, music, student government, clubs) do you participate in regularly?			
a. None	25.1%	25.2%	25.7%
b. 1	30.1	28.1	26.1
c. 2	24.7	22.9	22.8
d. 3	10.5	13.6	15.8
e. 4 or more	9.6	10.2	9.7
9. How many non-school activities (Little League, Scouts, Church youth) do you participate in regularly?			
a. None	33.9%	39.7%	47.2%
b. 1	29.6	33.6	30.3
c. 2	19.1	14.5	15.1
d. 3	8.8	6.1	4.2
e. 4 or more	8.5	6.0	3.2



	Grade 6	Grade 8	Grade 10
10. Is there drinking or drug use at most parties you attend?			
a. Yes, alcohol	8.6%	21.1%	29.5%
b. Yes, drugs	0.8	25.0	12.2
c. Yes, both	2.2	10.9	27.5
d. No	73.2	24.8	11.5
e. I don't attend parties	15.2	18.3	19.3
11. Do you think there is a drug or alcohol problem among kids attending your school?			
a. Yes, a lot of kids are	2.8%	16.8%	40.3%
b. Yes, some kids are using	13.3	41.5	45.5
c. No, only a few kids are	35.4	35.3	12.8
d. No, no one	48.4	6.5	1.5
12. Do you think there is drug or alcohol use during the school day at your school?			
a. Yes, alcohol	2.5%	7.5%	10.4%
b. Yes, drugs	4.9	16.8	16.7
c. Yes, both	6.8	26.6	53.4
d. No	85.8	49.0	19.7
13. Are you aware of someone close to you (those you live with or a friend) who has a drinking or drug problem?			
a. Yes, someone I live with	9.2%	8.7%	7.9%
b. Yes, friend	15.8	31.0	42.5
c. Yes, both	3.7	7.7	9.9
d. No, no one	71.4	52.6	39.8
14. Of your closest friends, how many use alcohol once a month or more often?			
a. None	82.5%	50.8%	28.5%
b. A few	12.8	26.7	29.2
c. Some	2.5	11.4	20.7
d. Most	1.7	8.1	14.5
e. All	0.5	3.0	7.1
15. Where have you learned the most about the dangers of drugs and drinking?			
a. Family or those I live with	30.7%	28.3%	20.4%
b. School	46.4	43.5	43.7
c. Other kids	2.1	4.8	8.2
d. Church or temple	1.4	1.0	1.0
e. TV, movies and newspaper	19.4	22.4	26.7

For each of the next 16 questions, please mark how often you use each type of drug. Examples of each type are given in parentheses. Select one of the following answers for each question:

- a. NEVER                      never used in my lifetime
- b. SOME                        used at least once in my lifetime
- c. MONTHLY                  used about once a month (or at least 6 times) in the last 12 months
- d. WEEKLY                    used about once a week (or at least 3 times) in the last 30 days
- e. DAILY                        used about every day (or at least 5 times a week) in the last 30 days

	Grade 6	Grade 8	Grade 10
16. Smoking tobacco			
a. Never	87.6%	70.2%	56.9%
b. Some	10.3	19.5	25.5
c. Monthly	0.7	2.2	3.4
d. Weekly	0.5	1.8	2.2
e. Daily	0.8	6.3	12.1
17. Chewing tobacco			
a. Never	90.5%	83.4%	78.5%
b. Some	8.8	13.1	15.7
c. Monthly	0.3	1.5	1.9
d. Weekly	0.4	0.9	1.2
e. Daily	0.1	1.1	2.8
18. Beer			
a. Never	61.5%	43.5%	28.4%
b. Some	35.4	42.4	43.1
c. Monthly	2.2	9.2	17.8
d. Weekly	0.7	4.0	9.5
e. Daily	0.2	0.9	1.2
19. Wine or wine coolers			
a. Never	60.1%	40.0%	22.4%
b. Some	36.7	45.4	50.5
c. Monthly	2.4	9.9	20.0
d. Weekly	0.6	3.9	6.6
e. Daily	0.2	0.8	0.4
20. Hard liquor (whiskey, gin, vodka, mixed drinks)			
a. Never	85.8%	65.7%	43.2%
b. Some	13.1	25.6	38.9
c. Monthly	0.8	5.9	11.7
d. Weekly	0.2	2.4	5.4
e. Daily	0.1	0.5	0.9
21. Marijuana (pot, grass, hash, hashish, pakalolo)			
a. Never	96.4%	85.6%	67.3%
b. Some	3.1	9.0	20.4
c. Monthly	0.3	2.5	5.3
d. Weekly	0.1	1.7	4.1
e. Daily	0.2	1.2	3.0

	Grade 6	Grade 8	Grade 10
22. Cocaine (snow, coke, crack)			
a. Never	99.2%	97.2%	91.9%
b. Some	0.5	2.0	5.1
c. Monthly	0.1	0.6	1.6
d. Weekly	0.1	0.2	0.9
e. Daily	0.0	0.1	0.5
23. Responses to this item were used in screening for honesty.			
24. Opiates (heroin, morphine, codeine)			
a. Never	97.5%	96.7%	92.9%
b. Some	2.3	2.5	6.1
c. Monthly	0.0	0.6	0.3
d. Weekly	0.0	0.2	0.4
e. Daily	0.1	0.0	0.3
25. Depressants (downers, ludes, quaaludes, reds)			
a. Never	98.9%	95.5%	93.5%
b. Some	1.0	3.5	4.9
c. Monthly	0.1	0.6	1.2
d. Weekly	0.0	0.2	0.1
e. Daily	0.0	0.3	0.2
26. Tranquilizers (Valium, Librium)			
a. Never	98.1%	96.6%	93.6%
b. Some	1.6	2.7	5.3
c. Monthly	0.1	0.3	0.5
d. Weekly	0.0	0.2	0.4
e. Daily	0.1	0.2	0.2
27. Hallucinogens (angel dust, LSD, PCP, magic mushrooms)			
a. Never	98.5%	95.9%	87.9%
b. Some	1.2	2.6	8.3
c. Monthly	0.2	0.7	2.4
d. Weekly	0.0	0.6	1.1
e. Daily	0.1	0.2	0.3
28. Inhaled substances to get high (glue, gasoline, paint thinner, spray cans, white-out)			
a. Never	87.0%	82.7%	80.5%
b. Some	11.1	13.9	17.4
c. Monthly	1.1	1.7	1.3
d. Weekly	0.4	0.6	0.4
e. Daily	0.4	1.1	0.5
29. Stimulants (amphetamines, crank, crystal meth, dexedrine, speed, uppers)			
a. Never	98.7%	93.2%	85.8%
b. Some	1.0	4.6	10.7
c. Monthly	0.1	1.2	2.3
d. Weekly	0.0	0.6	0.5
e. Daily	0.2	0.4	0.6

	Grade 6	Grade 8	Grade 10
30. Steroids (muscle builders)			
a. Never	98.3%	96.7%	95.1%
b. Some	1.4	2.0	2.6
c. Monthly	0.2	0.5	1.0
d. Weekly	0.1	0.3	0.1
e. Daily	0.1	0.6	1.3
31. Over the counter drugs (Dexatrim and other diet pills, NoDoz, Nyquil)			
a. Never	58.2%	54.6%	43.8%
b. Some	35.2	34.2	40.5
c. Monthly	4.8	7.4	10.2
d. Weekly	0.9	2.3	3.6
e. Daily	1.0	1.5	1.8

Mark how often you think your FRIENDS use each of the following substances:

32. Tobacco (chewing or smoking)			
a. Never	75.5%	46.6%	31.4%
b. Some	16.8	25.4	23.6
c. Monthly	2.6	6.6	6.1
d. Weekly	1.7	6.1	7.6
e. Daily	3.4	15.4	31.3
33. Beer, wine, or hard liquor			
a. Never	61.4%	31.4%	13.0%
b. Some	31.4	38.2	33.8
c. Monthly	4.1	14.9	25.7
d. Weekly	1.9	11.9	23.4
e. Daily	1.2	3.5	4.2
34. Drugs (any from items 21 to 30)			
a. Never	85.3%	64.1%	41.5%
b. Some	10.8	22.9	30.9
c. Monthly	2.0	5.8	13.3
d. Weekly	0.9	4.8	9.2
e. Daily	1.1	2.3	5.1

The following questions ask about alcohol use.

35. How old were you when you had your first full drink (a can of beer, a full glass of wine, or a mixed drink)?			
a. I have never had a drink	65.5%	38.2%	19.5%
b. 10 or younger	22.0	22.0	17.2
c. 11 or 12	11.9	26.5	23.2
d. 13 or 14	0.1	13.0	29.4
e. 15 or older	0.4	0.2	10.6

	Grade 6	Grade 8	Grade 10
36. How much do you usually drink at one time?			
a. I don't drink	70.1%	49.3%	30.9%
b. Less than one drink	23.4	22.9	15.6
c. One drink	4.1	11.8	12.8
d. 2-4 drinks	1.5	9.8	20.6
e. 5 or more drinks	0.8	6.1	20.2
37. Think back over the last two weeks. How many times have you had five or more drinks in a row? (A drink is a glass of wine, a bottle of beer, a shot glass of liquor, or a mixed drink.)			
a. None		85.0%	75.5%
b. Once		7.7	9.8
c. Twice		3.4	6.6
d. 3 to 5 times		2.8	6.0
e. 6 or more times		1.1	2.1
38. Have you ever had a period in your life where you drank more than you do now?			
a. Yes		23.3%	37.3%
b. No		76.7	62.7
39. How many drinks does it take for you to get drunk when you drink?			
a. I don't get drunk.		64.3%	42.1%
b. 2 or less		6.6	8.1
c. 3 or 4		13.7	21.8
d. 5 or 6		8.8	17.4
e. 7 or more		6.5	10.8
40. Have you ever used drugs and alcohol together?			
a. I don't drink or use drugs.		55.5%	33.4%
b. No, never		34.3	40.7
c. Once or twice		6.5	15.2
d. Many times		2.5	7.8
e. Usually		1.2	2.8
41. Have you ever gotten into trouble at home or at school because of your drinking or drug use?			
a. I don't drink or use drugs.	74.2%	55.1%	34.3%
b. No, never	22.2	36.9	47.0
c. Once or twice	3.1	7.2	16.2
d. Many times	0.4	0.8	2.5
42. Have you ever been arrested because of drinking or using drugs?			
a. I don't drink or use drugs.		54.4%	34.0%
b. No, never		44.1	61.9
c. Once or twice		1.0	3.7
d. Many times		0.5	0.4

	Grade 6	Grade 8	Grade 10
43. Have you ever been in treatment for use of alcohol or drugs?			
a. Yes		7.6%	6.3%
b. No		92.4	93.7
44. How do you usually get the alcoholic beverages you drink?			
a. I don't drink	72.5%	53.4%	31.7%
b. From home, parents know	19.1	15.4	13.7
c. From home, parents don't know	2.7	6.8	4.0
d. From friends	4.7	20.7	38.0
e. Ask adults to purchase/buy it myself	0.9	3.7	12.6

**How difficult do you think it would be for you to get each of the following types of drugs?**

45. Marijuana (pot, grass, hash, hashish, pakalolo)			
a. Probably impossible	53.6	28.5	11.4
b. Very difficult	18.9	13.6	6.5
c. Fairly difficult	10.3	14.7	11.3
d. Fairly easy	11.0	25.8	35.1
e. Very easy	6.2	17.3	35.8
46. Cocaine (crack, snow)			
a. Probably impossible	60.0%	40.5%	18.4%
b. Very difficult	21.0	20.4	15.1
c. Fairly difficult	8.7	18.9	25.3
d. Fairly easy	7.1	13.6	27.9
e. Very easy	3.3	6.6	13.3
47. Other illegal drugs			
a. Probably impossible	57.6%	37.6%	17.5%
b. Very difficult	20.1	18.6	16.2
c. Fairly difficult	10.7	18.3	19.3
d. Fairly easy	7.8	17.7	33.9
e. Very easy	3.8	7.8	13.2

**How much do you think people risk harming themselves if they:**

48. Smoke one or more packs of cigarettes a day			
a. No risk		5.2%	1.6%
b. Slight risk		7.9	6.6
c. Moderate risk		28.0	29.8
d. Great risk		46.8	53.4
e. Not sure		12.2	8.6
49. Smoke marijuana occasionally			
a. No risk		5.9%	3.0%
b. Slight risk		10.1	13.2
c. Moderate risk		27.1	36.7
d. Great risk		47.0	40.9
e. Not sure		10.0	6.2

	Grade 6	Grade 8	Grade 10
50. Try heroin once or twice			
a. No risk		6.1%	2.6%
b. Slight risk		13.5	11.8
c. Moderate risk		23.6	21.5
d. Great risk		44.5	53.4
e. Not sure		12.4	10.8
51. Try cocaine once or twice			
a. No risk		6.1%	3.4%
b. Slight risk		12.0	10.2
c. Moderate risk		23.5	24.2
d. Great risk		48.3	54.8
e. Not sure		10.2	7.5
52. Have five or more drinks once or twice each weekend			
a. No risk		8.4%	5.0%
b. Slight risk		18.7	15.6
c. Moderate risk		34.1	38.9
d. Great risk		29.7	34.5
e. Not sure		9.1	6.0
53. Use a needle that a friend gave them to inject drugs			
a. No risk		4.5%	1.3%
b. Slight risk		1.7	1.2
c. Moderate risk		4.5	4.2
d. Great risk		82.1	88.1
e. Not sure		7.1	5.2
<b>How would your parents feel about your doing each of the following:</b>			
54. Smoking marijuana occasionally			
a. Approve		1.5%	1.7%
b. Not disapprove		3.1	4.5
c. Disapprove		9.5	12.3
d. Greatly disapprove		85.9	81.4
55. Having one or two drinks nearly every day			
a. Approve		2.1%	2.3%
b. Not disapprove		4.0	4.4
c. Disapprove		17.6	17.2
d. Greatly disapprove		76.2	76.1

	Grade 6	Grade 8	Grade 10
56. Having five or more drinks once or twice each weekend			
a. Approve		2.4%	3.0%
b. Not disapprove		4.1	5.3
c. Disapprove		15.7	17.6
d. Greatly disapprove		77.7	74.2
57. Attending a party in a private home where alcoholic beverages were available			
a. Approve		5.0%	7.0%
b. Not disapprove		10.4	15.5
c. Disapprove		26.9	32.7
d. Greatly disapprove		57.6	44.8

The next questions ask about drug education.

58. At what grade level do you think alcohol and drug education should begin?			
a. 3rd or less	44.3%	35.9%	32.7%
b. 4th or 5th	30.0	39.3	36.4
c. 6th, 7th, 8th	12.5	17.0	25.0
d. 9th or 10th	3.0	2.8	3.4
e. 11th or 12th	10.1	5.0	2.5
59. Do you think you know enough about the effects of drugs and alcohol?			
a. Yes	70.2%	66.4%	67.4%
b. No	29.8	33.6	32.6

How much have you learned in classes at school about each of the following:

60. Types of drugs and what drugs do to people			
a. Don't remember	6.9%	8.0%	6.2%
b. Learned a little	10.4	14.3	16.5
c. Learned some	27.1	35.8	42.1
d. Learned a lot	55.7	41.9	35.2
61. How to say "no" to kids who want you to use drugs or alcohol			
a. Don't remember	4.7%	7.1%	7.8%
b. Learned a little	7.5	13.7	21.7
c. Learned some	17.5	27.4	31.9
d. Learned a lot	70.3	51.8	38.6
62. How to make good decisions in life			
a. Don't remember	5.6%	8.5%	8.6%
b. Learned a little	10.3	14.2	20.0
c. Learned some	28.6	32.9	35.7
d. Learned a lot	55.5	44.4	35.6



	Grade 6	Grade 8	Grade 10
63. How to feel good about yourself			
a. Don't remember	6.5%	9.2%	8.8%
b. Learned a little	10.0	15.5	25.2
c. Learned some	25.1	32.1	31.1
d. Learned a lot	58.4	43.3	35.0
64. Healthy things to do rather than take drugs or drink alcohol			
a. Don't remember	7.1%	11.3%	13.0%
b. Learned a little	9.2	16.2	22.1
c. Learned some	21.4	27.6	30.4
d. Learned a lot	62.3	44.9	34.5
<b>If you or a friend had a problem with alcohol or drugs, does your school provide:</b>			
65. A counselor or other school staff to discuss the problem			
a. Yes		67.5%	59.5%
b. No		10.1	8.6
c. I'm not sure		22.4	31.8
66. A support group of students with similar concerns			
a. Yes		24.2%	32.9%
b. No		32.4	24.8
c. I'm not sure		43.5	42.3
67. How honestly did you answer this questionnaire?			
a. Very honestly	92.9%	91.8%	93.9%
b. Somewhat honestly	7.1	8.2	6.1
c. Dishonestly		(Eliminated from analysis)	



## APPENDIX B

### Estimating Confidence Intervals and the Significance of Differences

The reader should be aware that since this study was conducted on a *sample* of students, the percentages given are estimates of the figures that would have been obtained if all students in grades 6, 8, and 10 had been surveyed. If the study were to be repeated, slightly different figures would be obtained. It is important to know how much the figures reported in this study may vary from any other study which could be conducted.

#### Factors Influencing Accuracy of Results

In order to estimate how accurate the reported percentages are to the *true* population, *confidence intervals* can be computed. A confidence interval is the range in which we can be fairly confident that the true population figure would be found. Confidence intervals are usually labeled with the degree of confidence held in them. If we repeated the study 100 times, 95 of the obtained results would fall within the 95% confidence interval (the level generally used).

This study employed a stratified random sample of clusters. Within each cluster all students were surveyed. In a simple random sample only two factors affect the size of a confidence interval: the number sampled and the size of the percentage. The formula for such a 95% confidence interval is: 1.96 times the square root of  $(p \times q / n)$ , where  $p$  is the percentage,  $q$  is  $1-p$  and  $n$  is the number answering the question. In a cluster sample a third factor must be included. This additional factor is the tendency of students with similar attributes to attend the same school. This tends to cause the cluster sample to deviate from a purely random sample. The degree to which the sample deviates from a random sample is called the *design effect*. The design effect is less as the number of clusters increases and as the clusters tend to be the same size. Unfortunately, schools, especially high schools, vary greatly in size.

Once the design effect is known, further estimates of the confidence interval can be made. One simple approach to estimating a confidence interval is to replace the number surveyed with the *effective n* in the formula. The effective  $n$  is the number of students which would have to be surveyed in a random survey to equal the number surveyed in a cluster survey. The effective  $n$  is calculated by dividing the number surveyed by the design effect.

#### Design Effects

Knowing the design effect is thus highly important to estimating the accuracy of survey results. Design effects vary between the attributes being measured. If a behavior is highly social it will tend to be found in clusters. Alcohol consumption is such a behavior. Gender is obviously not such an attribute. One approach suggested by Bachman, O'Malley, and Johnston (1987) is to determine the design effect for a large number of questions using unweighted data and compute the average.

In order to provide a moderately conservative estimate of design effect we chose 17 items from all parts of the survey, plus the three scales, choosing all the drug use items and items more likely to show differences between schools, while representing all parts of the survey. The design effect was calculated for each response option for each of the 20 measures at each grade level.

Following the suggestion of Bachman, O'Malley, and Johnston (1987), we averaged the square root of each design effect and then squared the average to determine our best estimate of the design effect for each grade.

The sixth grade sample, with more schools which were roughly equal in size had the lowest design effect, 1.77. The tenth grade sample had the least number of schools with the greatest variety of school size and thus the highest design effect at 2.23. The eighth grade sample was nearly as high at 2.2. For the sake of simplicity these three figures were averaged for use in the tables included in this Appendix. The average design effect was determined to be 2.06.

This figure of 2.06 should be considered to be a conservative estimate. The items chosen, though representing close to one-third of the questions, were often chosen because they were expected to have the greatest design effect. Most items concerning alcohol use and abuse were included. Bachman, O'Malley, and Johnston (1987) state that questions on alcohol and marijuana use generally have the highest design effect. Sudman (1976) notes that percentages have design effects at least twice as great as any other statistic. Additionally, a stratified sample has smaller design effects. Though size strata were incorporated into the weighting scheme, stratification was not accounted for in estimating the design effect. We expect that had it been, the design effect, and thus the reported confidence intervals, would have been smaller.

## Confidence Intervals

Table B1 provides confidence intervals for selected percentages and group sizes. This table can be used to estimate within what range the "true" population value may be for any reported result. The greatest variability is in the tenth grade sample at percentages close to 50%. At that point the results have a 95% confidence interval of  $\pm 3.1\%$ . Thus we can say: "The percent of all sophomores in Washington who say there is *great risk* in smoking one or more packs a day is between 50.3 and 56.5." and know that there is only a 1 in 20 chance that we are wrong. For information about confidence intervals for differences between percentiles, see the discussion and tables in Bachman, O'Malley, and Johnston (1987).

To use the table, first find the percent who gave a specific answer in the left column under the heading *Observed Percentage*. For each percentage there are two rows of numbers. The top row, marked with a +, represents the upper limit of the 95% confidence interval. The bottom row, -, is the lower limit. Follow to the right until you are under the heading closest to the number of students in the group. Add the percent responding to the number in the + row to obtain the high end of the confidence interval. Subtract the number in the - row to estimate the lower limit.

Table B2 provides the weighted and unweighted numbers for each grade by race, by region, and by size. When using Table B1, first look up in Table B2 the unweighted n for the group in question and use that number. In most cases, though, the difference is small and may not change the column of table B1 that you will use.

Table B2 is most useful for evaluating percents reported by subgroups. For instance, 12.2% of tenth grade girls rated *high* on the alcohol use scale. What is the 95% confidence interval for this figure? Look down the *Observed Percentage* column to 10, then move to the right to under 1000. (There were 985 girls in the tenth grade sample.) Add  $12.2 + 3.2$  to get an upper limit of 15.4 and subtract  $12.2 - 2.4$  to get a lower limit of 9.8. The 95% confidence interval for this figure is between 9.8 and 15.4. This means that of the 56,037 sophomores statewide, about 27,960 are girls and 2,740 to 4,306 are heavy drinkers.

**Table B1.  
Confidence Intervals (95% Level).**

Observed %age	Number in Group																		
	50	100	150	200	300	400	500	600	700	800	900	1000	1500	2000	2500	3000	3500	4000	
99	+	0.9	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.4
	-	14.3	8.1	5.8	4.6	3.3	2.6	2.2	1.9	1.7	1.6	1.4	1.3	1.0	0.8	0.7	0.7	0.6	0.5
97	+	2.6	2.3	2.1	2.0	1.8	1.6	1.5	1.4	1.4	1.3	1.2	1.2	1.0	0.9	0.8	0.8	0.7	0.7
	-	15.4	9.2	6.8	5.6	4.2	3.5	3.0	2.7	2.4	2.2	2.1	1.9	1.5	1.3	1.1	1.0	0.9	0.9
95	+	4.0	3.5	3.1	2.9	2.5	2.3	2.1	2.0	1.9	1.8	1.7	1.6	1.4	1.2	1.1	1.0	0.9	0.9
	-	16.3	10.1	7.6	6.3	4.8	4.0	3.5	3.1	2.9	2.6	2.5	2.3	1.8	1.6	1.4	1.2	1.1	1.1
90	+	6.9	5.7	5.0	4.5	3.9	3.5	3.2	2.9	2.8	2.6	2.5	2.4	2.0	1.7	1.6	1.4	1.3	1.3
	-	17.8	11.6	9.0	7.6	5.9	5.0	4.4	4.0	3.7	3.4	3.2	3.0	2.4	2.0	1.8	1.6	1.5	1.4
85	+	9.3	7.4	6.4	5.8	4.9	4.3	3.9	3.6	3.4	3.2	3.0	2.9	2.4	2.1	1.9	1.7	1.6	1.5
	-	18.8	12.6	9.9	8.4	6.7	5.7	5.0	4.6	4.2	3.9	3.7	3.5	2.8	2.4	2.1	1.9	1.8	1.7
80	+	11.2	8.9	7.6	6.7	5.7	5.0	4.5	4.2	3.9	3.7	3.5	3.3	2.7	2.4	2.2	2.0	1.8	1.7
	-	19.4	13.3	10.6	9.0	7.2	6.2	5.5	5.0	4.6	4.3	4.0	3.8	3.1	2.6	2.3	2.1	2.0	1.8
70	+	14.4	11.0	9.3	8.2	6.9	6.0	5.4	5.0	4.6	4.3	4.1	3.9	3.2	2.8	2.5	2.3	2.1	2.0
	-	19.9	14.0	11.3	9.7	7.9	6.8	6.0	5.5	5.1	4.7	4.5	4.2	3.4	3.0	2.6	2.4	2.2	2.1
60	+	16.8	12.6	10.5	9.2	7.6	6.6	6.0	5.5	5.1	4.8	4.5	4.3	3.5	3.0	2.7	2.5	2.3	2.2
	-	19.5	14.0	11.5	9.9	8.1	7.0	6.3	5.7	5.3	4.9	4.7	4.4	3.6	3.1	2.8	2.5	2.3	2.2
50	+	18.5	13.5	11.2	9.8	8.0	7.0	6.2	5.7	5.3	4.9	4.7	4.4	3.6	3.1	2.8	2.6	2.4	2.2
	-	18.5	13.5	11.2	9.8	8.0	7.0	6.2	5.7	5.3	4.9	4.7	4.4	3.6	3.1	2.8	2.6	2.4	2.2
40	+	19.5	14.0	11.5	9.9	8.1	7.0	6.3	5.7	5.3	4.9	4.7	4.4	3.6	3.1	2.8	2.5	2.3	2.2
	-	16.8	12.6	10.5	9.2	7.6	6.6	6.0	5.5	5.1	4.8	4.5	4.3	3.5	3.0	2.7	2.5	2.3	2.2
30	+	19.9	14.0	11.3	9.7	7.9	6.8	6.0	5.5	5.1	4.7	4.5	4.2	3.4	3.0	2.6	2.4	2.2	2.1
	-	14.4	11.0	9.3	8.2	6.9	6.0	5.4	5.0	4.6	4.3	4.1	3.9	3.2	2.8	2.5	2.3	2.1	2.0
20	+	19.4	13.3	10.6	9.0	7.2	6.2	5.5	5.0	4.6	4.3	4.0	3.8	3.1	2.6	2.3	2.1	2.0	1.8
	-	11.2	8.9	7.6	6.7	5.7	5.0	4.5	4.2	3.9	3.7	3.5	3.3	2.7	2.4	2.2	2.0	1.8	1.7
15	+	18.8	12.6	9.9	8.4	6.7	5.7	5.0	4.6	4.2	3.9	3.7	3.5	2.8	2.4	2.1	1.9	1.8	1.7
	-	9.3	7.4	6.4	5.8	4.9	4.3	3.9	3.6	3.4	3.2	3.0	2.9	2.4	2.1	1.9	1.7	1.6	1.5
10	+	17.8	11.6	9.0	7.6	5.9	5.0	4.4	4.0	3.7	3.4	3.2	3.0	2.4	2.0	1.8	1.6	1.5	1.4
	-	6.9	5.7	5.0	4.5	3.9	3.5	3.2	2.9	2.8	2.6	2.5	2.4	2.0	1.7	1.6	1.4	1.3	1.3
5	+	16.3	10.1	7.6	6.3	4.8	4.0	3.5	3.1	2.9	2.6	2.5	2.3	1.8	1.6	1.4	1.2	1.1	1.1
	-	4.0	3.5	3.1	2.9	2.5	2.3	2.1	2.0	1.9	1.8	1.7	1.6	1.4	1.2	1.1	1.0	0.9	0.9
3	+	15.4	9.2	6.8	5.6	4.2	3.5	3.0	2.7	2.4	2.2	2.1	1.9	1.5	1.3	1.1	1.0	0.9	0.9
	-	2.6	2.3	2.1	2.0	1.8	1.6	1.5	1.4	1.4	1.3	1.2	1.2	1.0	0.9	0.8	0.8	0.7	0.7
1	+	14.3	8.1	5.8	4.6	3.3	2.6	2.2	1.9	1.7	1.6	1.4	1.3	1.0	0.8	0.7	0.7	0.6	0.5
	-	0.9	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.4

## The Weighting Process

In order to properly use Table B1, one should use unweighted n's. Most numbers in the report are based on weighted n's. This is because every school was weighted such that all schools in a given size strata (rural, small-not rural, large-not rural) had the same influence. The percentages reported are, in effect, the average of all schools. This is a more accurate estimate of the population mean than using the average of all students. Responses were further weighted to account for over- and undersampling in some cells.

There appears to have been a relationship between school size and the sampling rate within cells. Where we had the lowest response rate, the schools that did participate tended to be smaller. Smaller schools were given a greater weight and schools in undersampled cells were weighted more. The relationship between school size and response rate worked to cause the weighted total at each grade to be greater than the raw number of cases.

For those wishing to directly apply the formula above for confidence intervals or to compute variances or other statistics, we have included the effective n for each group by grade in Table B2. This effective n is based on the estimated design effect of 2.06 and can be used with standard statistical formula in place of n without having to apply the more complex formula needed for cluster samples.

**Table B2.  
Comparison of Weighted N,  
Unweighted N, and Effective N**

Group	Unweighted N	Weighted N	Effective N
Grade 6			
<b>Region</b>			
Northeast	397	532	193
Southeast	541	591	263
Southwest	1,183	1,040	574
ESD 121	1,288	1,594	625
Northwest	656	504	318
<b>Size</b>			
Rural	1,138	982	552
Small-Not Rural	1,369	1,238	665
Large-Not Rural	1,558	2,043	756
<b>Ethnic Group</b>			
Asians	163	199	79
Blacks	158	183	77
Hispanics	174	181	84
Native Americans	436	392	212
Whites	2,845	3,023	1,381

**Table B2 (Cont').  
Comparison of Weighted N,  
Unweighted N, and Effective N**

Group	Unweighted N	Weighted N	Effective N
<b>Grade 8</b>			
<b>Region</b>			
Northeast	415	451	201
Southeast	651	690	316
Southwest	622	842	302
ESD 121	1,055	1,187	512
Northwest	727	413	353
<b>Size</b>			
Rural	847	898	411
Small-Not Rural	531	302	258
Large-Not Rural	2,092	2,382	1016
<b>Ethnic Group</b>			
Asians	166	182	81
Blacks	129	152	63
Hispanics	162	189	79
Native Americans	329	337	160
Whites	2,573	2,598	1,249
<b>Grade 10</b>			
<b>Region</b>			
Northeast	474	310	230
Southeast	404	474	196
Southwest	547	573	266
ESD 121	199	786	97
Northwest	350	332	170
<b>Size</b>			
Rural	735	603	357
Small-Not Rural	198	130	96
Large-Not Rural	1,041	1,743	505
<b>Ethnic Group</b>			
Asians	116	273	56
Blacks	75	252	36
Hispanics	86	98	42
Native Americans	178	177	86
Whites	1,494	1,615	725

Note—Effective N was computed by dividing the unweighted number of cases by the average design effect of 2.05.



— JUDITH A. BILLINGS —

Superintendent of Public Instruction

Old Capitol Building, FG-11, Olympia, WA 98504-3211