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INTRODUCTION AND BACKGROUND



In the fall and winter of 2005 the Healthy Kids Colorado Survey (HKCS) was administered to a representative sample of ninth through twelfth grade public school students throughout Colorado.

The HKCS is composed of two modules. The first module is the Youth Risk Behavior Survey (YRBS) which was developed in 1990 by the United States

Centers for Disease Control and Prevention to monitor priority health risk behaviors that contribute markedly to the leading causes of death, disability, and social problems among youth and adults in the United States. These behaviors, often established during childhood and early adolescence, include

- Tobacco use
- Unhealthy dietary behaviors
- Inadequate physical activity
- Alcohol and other drug use
- Sexual behaviors that contribute to unintended pregnancy and sexually transmitted diseases, including HIV infection
- Behaviors that contribute to unintentional injuries and violence

The YRBS was designed to:

- Determine the prevalence of health risk behaviors
- Assess whether health risk behaviors increase, decrease, or stay the same over time
- Examine the co-occurrence of health risk behaviors
- Provide comparable national, state, and local data
- Provide comparable data among subpopulations of youth
- Monitor progress toward achieving the Healthy People 2010 objectives and other program indicators

The YRBS is conducted nationally, so in subsequent sections of this report the results from Colorado will be compared to national data.

The second module of the HKCS integrates items from the Youth Risk Behavior Survey (HKCS Module I) and the Colorado Youth Survey (CYS), which is based on the "risk and protective factor" framework that was developed by the Social Development Research Group and coordinated by OMNI Institute in Colorado; and additional items selected by Colorado state agencies, including asset and resiliency scales. The development of HKCS Module II was supported and approved by the Colorado State Departments of Education, Public Health and Environment, Human Services (Alcohol and Drug Abuse Division), and Public Safety (Division of Criminal Justice, Office of Adult and Juvenile Justice Assistance).

DATA: Explanation of Terms

DATA

Explanation of Terms

Throughout this report there are comparisons between different groups on various survey items. Unless it is otherwise noted, these differences have been tested and are statistically significant. The statistic used to measure these differences is called an independent-samples t-test. Essentially, this test compares the mean values of the respondents of the different groups on the given item. Researchers typically use terms such as "p-values" and "statistical significance" to describe their results, and these often lack meaning for the typical reader. While confusing, these are important concepts that should be understood to fully comprehend the meaning of presented results.

Statistical significance simply means that an observed difference is probably not a chance occurrence. That is, for a given item, if one group has a rate of 65.0% and a second group has a rate of 68.0%, this difference of three percentage points could be real or it could simply be an artifact of error in the data. For this reason, researchers report pvalues or probability values along with their results. These simply reflect how confident we can be that an observed difference is real and not due to chance error. By convention, researchers use a probability value of .05 or 5%. This means that we are willing to accept a 5% probability or chance (p=.05) that an observed difference is not real. It is important to note that there is nothing magical about 5%. A researcher may want to set a more stringent condition, and only accept a 1% chance that results are false. P-values of 1% or less are typically referenced as being highly significant. Importantly, if a generated p-value is greater than .05, researchers tend to accept the possibility that the difference could have been due to chance, and therefore do not deem the difference to be statistically significant. Unless otherwise noted, all differences between demographic groups discussed in this report are statistically significant with p-values of less than .05.

Finally, a frequently overlooked issue has to do with whether a difference is meaningful beyond being simply statistically significant. That is, a difference can be statistically significant (is determined to be a real difference) but be so small that it is of little practical significance. Therefore, we first assess whether a difference is statistically significant and, if so, examine how large the difference is to

decide whether it reflects a meaningful divergence between groups.

It is often informative to examine the association between two items to determine if a relationship exists, therefore correlation is another concept that will be used in this report.

Correlation is a way to statistically measure the linear association between two items by comparing data across

a group of respondents who provided responses to both items. This analysis results in a correlation coefficient, which is the degree and the direction of the association between the two items. This number can range from -1 (meaning the two items have a one-to-one inverse relationship) to +1 (meaning the two items have a one-to-one positive relationship), with a value of 0 meaning there is no statistical correlation between the two items. Correlations can also be examined for statistical significance (meaning they are not likely due to a chance occurrence) and unless otherwise noted, all correlations discussed in this report are statistically significant with p-values of less than .05.

When discussing correlation, it is exceedingly important to note that correlation is not the same as causation. If items X and Y have a correlation of 1, it does not necessarily mean that X causes Y or that Y causes X. Correlation can occur without causation and causation can occur without correlation.



Demographics

In the 2005-2006 school year there were 1,498 respondents to HKCS Module I and 1,466 respondents to HKCS Module II. The almost even gender distribution of survey respondents for both HKCS Modules (see table below) mirrors the gender distribution of overall Colorado school enrollment, where 51.3% of students are male and 48.7% are female.

	НКС	S Module I	HKCS Module II	
Sex	Ν	Weighted Percentage	Z	Weighted Percentage
Male 786		50.9	704	51.7
Female 700		49.1	753	48.3
Missing 12			9	

A large majority of the students who took both HKCS Modules were white (68.3% and 72.6%, respectively). The second most frequently reported ethnicity was Hispanic/Latino (23.1% and 18.9%, respectively). The racial distribution of survey respondents mirrors that of overall school enrollment in Colorado.

D /	HKCS Module I		HKCS Module II			
Race/ Ethnicity	N	Weighted Percentage	Z	Weighted Percentage		
Black*	49	5.8	74	3.7		
Hispanic/ Latino	308	23.1	233	18.9		
White*	1004	68.3	953	72.6		
All other races*	81	1.8	114	2.9		
Multiple races	49	1.0	75	1.9		
Missing	Missing 7		17			
*Not Hispani	*Not Hispanic					

The remainder of this report does not disaggregate data by race/ethnicity. The numbers (N) for all but white and Hispanic/Latino respondents are too low (below 100) to be reported without compromising confidentiality.

For both HKCS Modules the grade-level distribution skews young (there are more 9th-grade than 12th-grade respondents). This is reflective of statewide school enrollment, which has a 9th-12th grade-level distribution of 27.8%, 26.1%, 23.6% and 22.5%, respectively.

Grade	HKCS	Module I	HKCS Module II	
Level	Z	Weighted Percentage	Z	Weighted Percentage
9th	521	28.5	473	33.4
10th	479	25.5	381	27.2
11th	303	23.6	320	22.1
12th	183	22.4	241	16.8
Ungraded/ Other			7	0.5
Missing	12		44	

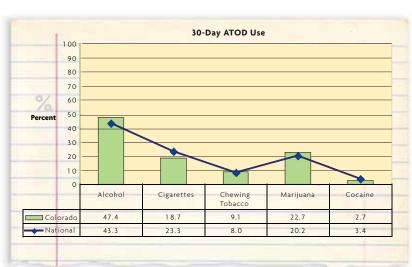




DATA: Alcohol, Tobacco, and Other Drugs

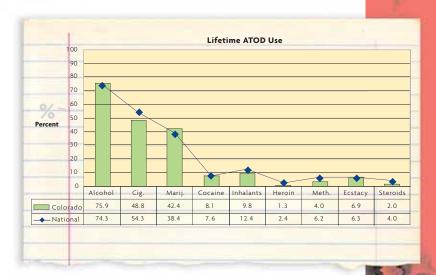
Alcohol, Tobacco and Other Drugs (ATOD)

For most substances, Colorado is similar to the nation as whole in terms of use by high school students. Notably, cigarette use is less prevalent while alcohol and marijuana use are more prevalent in Colorado. Nationally, 23.3% of high school students reported smoking cigarettes in the 30 days prior to the survey, while in Colorado 30-day use is 18.7%. However, in Colorado 30-day alcohol use is 47.4%, which is higher than the national rate of 43.3%. Similarly, 30-day marijuana use in Colorado is 22.7%, compared to 20.2% for the nation. The following chart and table compare the percentages of students who report using alcohol, tobacco and other drugs (ATOD) at least once in the previous 30 days in Colorado and the nation.





When asked about lifetime use of alcohol, tobacco and other drugs, Colorado students were found to use these substances at levels similar to the national sample, with some small differences. As with the 30-day measures, Colorado students are less likely to have smoked cigarettes (48.8% compared to 54.3% nationally) and more likely to have used marijuana (42.4% compared to 38.4% nationally). A slightly higher percentage of Colorado students report lifetime alcohol use (75.9% compared to 74.3% nationally), but the difference is less pronounced than on the 30-day measure.



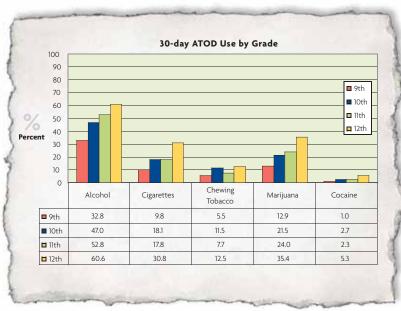
Grade-Level Differences

Looking separately at 30-day substance use by grade level confirms that the prevalence of substance abuse increases as students get older. In Colorado, the rate of 30-day alcohol use by 12th graders (60.6%) is nearly double that of 9th graders (32.8%); cigarette use is more than triple (30.8% compared to 9.8%); marijuana use is almost triple (35.4% compared to 12.9%); and cocaine use is quintuple (5.3% compared to 1.0%).

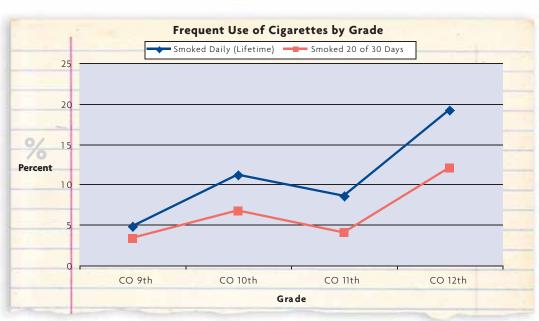
Older students are also much more likely to be frequent cigarette users, as measured by those who have ever smoked daily in their lifetimes and/or who

have smoked on 20 of the last 30 days. Twelfth graders are almost four times as likely as ninth graders both to have ever smoked daily (19.2% compared to 4.8%) and to have smoked on 20 of the previous 30 days (12.1% compared to 3.4%). Interestingly, neither measure displays a steady increase in prevalence for progressively higher grades. Rather, 12th graders report a much higher prevalence than any other grade (on both measures 10th graders report the second highest prevalence, but the rates for 12th graders are almost double). This would suggest that once students reach 12th grade, if they are smokers, they are much more likely to be frequent smokers, or, perhaps addicted. The following chart and table compare frequent cigarette use across grades.







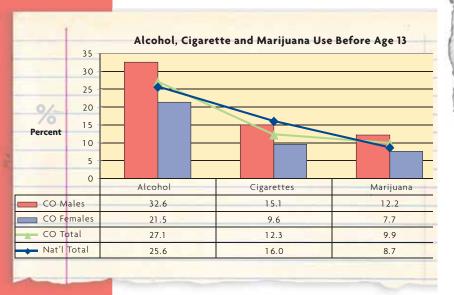


Frequent Use of Cigarettes by Grade					
Population	Population Smoked Daily (Lifetime)				
CO 9th	4.8	3.4			
CO 10th	11.2	6.8			
CO 11th	8.6	4.1			
CO 12th	19.2	12.1			
CO Total	10.6	6.4			
National Total	13.4	9.4			

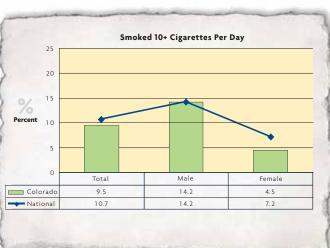
Gender Differences

With the exception of 30-day chewing tobacco use, which males (15.2%) are more than five times as likely to report as females (2.8%), males and females report very similar rates of both lifetime and 30-day substance use. However, there are large differences between males and females in the early onset of substance use. For alcohol, cigarettes and marijuana, males are far more likely than females to report having used before the age of the 13, despite similar male-female rates for 30-day and lifetime use of these substances. This gender difference occurs both in Colorado and at the national level, though for alcohol use the difference is more pronounced in Colorado.

The following chart and table illustrate the gender differences in Colorado for substance use before the age of 13, and compares the combined male-female figures for Colorado and the nation.



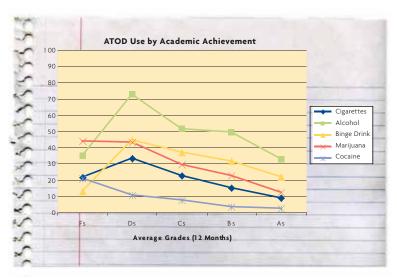
Males are also more likely than females to be heavy smokers. This is the case nationally and in Colorado, where the difference is even more pronounced. In Colorado, among students who report smoking in the previous 30 days, 9.5% report smoking 10 or more cigarettes per day. The prevalence for males (14.2%) is three times that of females (4.5%) in Colorado. Nationally, males (14.2%) are almost twice as likely as females (7.2%) to be heavy smokers. So while Colorado males are in line with males nationally, Colorado females are one-third as likely as females nationally to be heavy smokers. The following chart and table illustrate this phenomenon.



Among Colorado students who are current smokers, 51.8% have tried to quit smoking in the previous 12 months (males and females are within one percentage point). Nationally, a slightly higher percentage of student smokers (54.6%) have attempted to quit.

Differences by Level of Academic Achievement

On Module II of the Healthy Kids Colorado Survey, students are asked to describe their grades in school in the preceding 12 months, with responses ranging from "Mostly As" to "Mostly Fs". By comparing each student's responses to this question with his or her reported level of substance use it is possible to examine the relationship between academic achievement and substance use.



As would be expected, an inverse relationship exists between substance use and academic achievement, but the correlation is not as strong as some might suppose and substance use indeed occurs among students who report getting mostly As or Bs in school. The following chart and table show the prevalence of substance use by academic achievement groups.

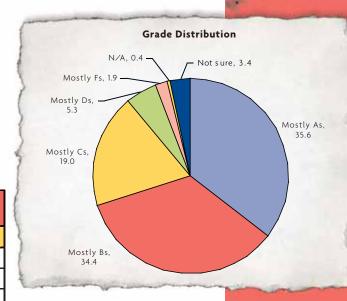
30-Day ATOD Use (at least once) by Academic Achievement							
Substance	Fs	Ds	Cs	Bs	As	Combined*	Correlation [*]
Cigarettes 21.7		33.3	22.5	15.2	8.8	15.2	-0.176
Alcohol	34.8	72.7	51.3	49.4	32.8	45.0	-0.137
Binge Drink 13.0 44.6		44.6	37.0	31.5	21.9	29.5	-0.109
Marijuana	44.0	43.3	29.5	22.7	12.2	21.7	-0.177
Cocaine	20.8	10.6	7.6	3.3	2.3	4.4	-0.156

Almost one-third (32.8%) of "Mostly A" students report drinking in the past month, and over one fifth (21.9%) report binge drinking (defined as having five or more drinks in a row). For no substance is the prevalence among "Mostly A" students less than half the statewide

rate. Further, the correlation coefficients for each substance are all below 0.2 (a coefficient can range from 0.0, meaning the variables have no statistical

relationship to ± 1.0 , meaning statistically the variables have a one-to-one relationship).

It should also be noted that the grade distribution skews high, with 70.0% of students describing their grades for the previous year as "Mostly As" or "Mostly Bs" (see chart below).



 $[\]hbox{*While similar, these percentages from HKCS Module II will not match those reported on HKCS Module II}$

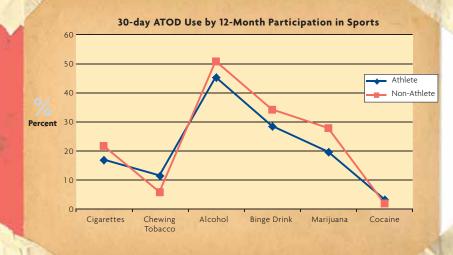
[^]All correlations are statistically significant (p< 0.01)

Differences by Participation in Sports

Almost two thirds (61.2%) of Colorado high school students participated in team sports in the 12 months preceding the survey. The differences in the prevalence of substance use for sports participants (henceforth referred to as "athletes") and non-participants ("non-athletes") vary by substance. For most substances, athletes are less likely to use than non-athletes. Notable exceptions are 30-day cocaine use (3.3% for athletes, 1.9% for non-athletes) and 30-day chewing tobacco use (11.3% for athletes, 5.6% for non-athletes). The differences in prevalence are relatively small for 30-day drinking (45.3% for athletes, 50.8% for non-athletes) and binge drinking (28.5% for athletes, 34.0% for non-athletes).

30-Day Use by 12-Month Participation in Sports						
Substance	Athlete	Non- Athlete	Correlation			
Cigarettes	16.8	21.5	-0.059			
Chewing Tobacco	11.3	5.6	0.097			
Alcohol	45.3	50.8	-0.053			
Binge Drink	28.5	34.0	-0.058			
Marijuana	19.6	27.7	-0.094			
Cocaine	3.3	1.9	0.042			

The correlations between use of all substances and participation in sports are statistically significant (p<0.01), but they are all close to zero, suggesting a weak relationship between participation in sports and substance use.





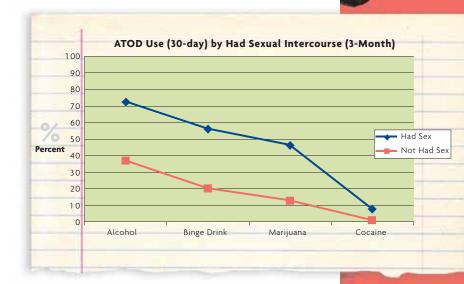
Differences by Sexual Activity

The percentage of Colorado students that report having had sexual intercourse at least once in their lifetime is 39.3%, and 29.5% report having had sexual intercourse at least once in the previous three months. There is a large divergence in the prevalence of substance use between students who are sexually active and those who are not. For every substance, sexually active students (those who report 3-month sexual activity) are far more likely to report 30-day use, and students who report lifetime activity are far more likely to report lifetime use.

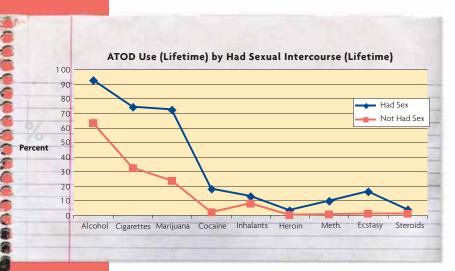
For 30-day use, sexually active students are almost twice as likely to drink alcohol; nearly three times as likely to engage in binge drinking and cigarette use; almost four times as likely to use marijuana and more than nine times as likely to have used cocaine (at 0.8%, cocaine use is rare among students who are not sexually active).

These trends are mirrored for lifetime substance use and sexual activity. In addition, because the survey asks about more substances for lifetime use, the trend extends to other substances. Those who report having had sex in their lifetime are more than 20 times as likely to have used ecstasy and more than 15 times as likely to have used heroin (in both cases the prevalence among those who have never had sex is negligible).

The following charts and tables outline these large differences in substance use between sexually active and inactive students.



ATOD Use (30-Day) by Had Sex (3-Month)					
Substance	Had Sex	Not Had Sex	Correlation		
Cigarettes	37.2	11.3	0.300		
Alcohol	72.3	36.6	0.324		
Binge Drink	56.1	19.9	0.357		
Marijuana	46.3	12.7	0.365		
Cocaine	7.7	0.8	0.188		



Had Sex (Lifetime) by ATOD Use (Lifetime)					
Substance	Had Sex	Not Had Sex	Correlation		
Alcohol	92.6	63.1	0.337		
Cigarettes	74.1	32.1	0.410		
Marijuana	72.4	23.3	0.485		
Cocaine	17.8	1.8	0.286		
Inhalants	13.0	7.8	0.084		
Heroin	3.1	0.2	0.124		
Meth	9.6	0.5	0.224		
Ecstasy	16.3	0.8	0.298		
Steroids	3.8	0.8	0.107		

The correlations between use of all substances and sexual activity are statistically significant (p<0.01), and in some cases the correlation coefficient approaches 0.5 (out of a maximum of 1.0), suggesting a strong relationship between sexual activity and substance use.

It is important to note that a high degree of correlation does not necessarily indicate causation. From these data conclusions cannot be drawn that substance use causes sexual activity or that sexual activity causes substance use.

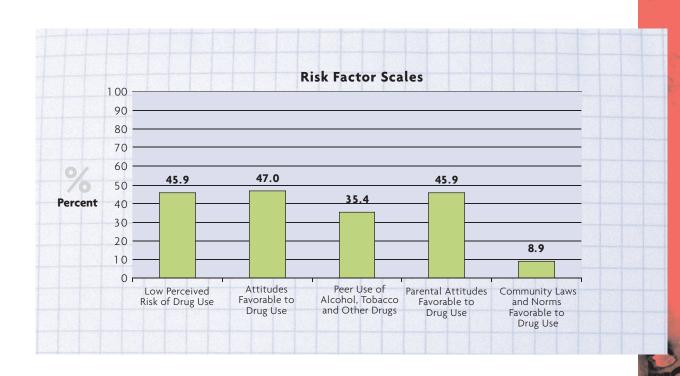
There is an additional question on the survey that helps to go somewhat further in understanding the relationship between substance use and sexual activity. Among respondents who reported having sexual intercourse in the last 3 months, 26.0% used drugs or alcohol before the most recent time they had sexual intercourse. Put another way, almost three quarters of sexually active students did not use drugs or alcohol before their last sexual encounter. Therefore, despite the large difference in substance use rates between sexually active and inactive students, it appears that a direct causal relationship does not exist. Most probably, the factors that lead students to become sexually active also lead them to become substance users. (It is worth noting that even if 100% of sexually active students had used drugs or alcohol before their last sexual encounter it would still not be enough to prove a causal relationship, and the relationship would still be indeterminate.)



Substance Use Risk Factor Scales (HKCS Module II)

Research done by J. David Hawkins and Richard F. Catalano of the Social Development Research Group at the University of Washington has led to what has become commonly referred to as the Risk and Protective Factor model. In the model, various survey questions, combined to form Risk Factor scales, can be used to predict adolescent delinquency. Based on a student's responses to the component questions, s/he receives a scale score, which is then compared to a cut-point derived from historical survey data. If a student's score is above the cut point then s/he is defined as "at-risk." Certain of these scales are composed of questions relating to substance use and were included on HKCS Module II. The following chart displays the percentages of Colorado students who are rated "at-risk" on various substance-use related Risk Factor scales.





Mental Health

Depression

Twenty-five percent of Colorado high school students report experiencing depression in the 12 months preceding the survey, as defined as having felt sad or hopeless almost every day for more than 2 weeks in a row such that they stopped doing some usual activities. This is lower than the national rate of 28.5%. In Colorado, females (36.4%) are more likely than males (14.4%) to report depression. This male-female divergence in prevalence is also true nationally, but it is much larger in Colorado, as Colorado males (14.4%) are less likely than males nationally (20.4%) to report depression, while the rates are similar for females in Colorado (36.4%) and the nation (36.7%).

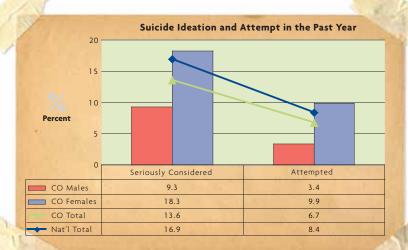


Depression 50 40 30 Percent 20 10 0 Male Female Colorado 25.0 14.4 36.4 National 28.5 20.4 36.7

Suicide

Colorado high school students are less likely than students nationally to have seriously considered suicide in the 12 months preceding the survey (13.6%, compared to 16.9% nationally) and to have attempted suicide in that same time period (6.7%, compared to 8.4% nationally). Colorado males (9.3%) are almost half as likely as females (18.3%) to have considered suicide, and males (3.4%) are almost one-third as likely as females (9.9%) to have attempted suicide. Similar to depression rates, the discrepancy of the suicidal ideation and suicidal attempt rates between males and females are proportionally larger in Colorado than in the nation.

DATA: Mental Health



Depression and ATOD Use

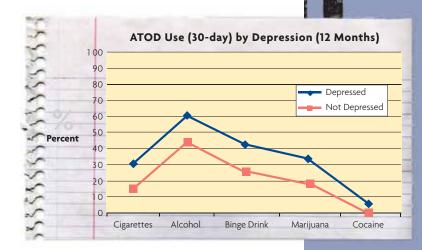
Depression is also associated with an elevated level of ATOD use. Students who report depression are more likely to report substance use for all substances, for both lifetime and 30-day use. The group differences and the correlation coefficients are statistically significant for all substances.

ATOD Use (Lifetime) by Depression (12 Months)							
Substance	Depressed	Not Depressed	Correlation [*]				
Cigarettes	62.8	44.1	0.161				
Alcohol	90.6	71.1	0.199				
Marijuana	54.9	38.3	0.145				
Cocaine	13.0	6.4	0.104				
Inhalants	18.7	6.7	.0175				
Heroin	1.7	1.2	0.019				
Meth.	6.9	3.0	0.085				
Ecstacy	13.5	4.7	0.151				
Steriods	4.1	1.3	0.087				

The largest absolute difference by depression category in lifetime ATOD use is alcohol use; 90.6% of depressed students report lifetime alcohol use, compared to 71.1% of non-depressed students, which is a difference of 19.5 percentage points. Alcohol is also the most highly correlated with depression of all the substances for lifetime use (0.199).

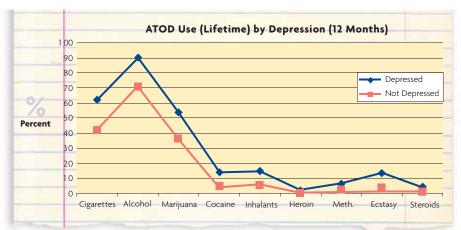
ATOD Use (30-day) by Depression (12 Months)						
Substance	Depressed	Not Depressed				
Cigarettes	302	15.0	0.168			
Alcohol	60.3	43.3	0.146			
Binge Drink	42.2	26.8	0.144			
Marijuana	33.3	19.2	0.145			
Cocaine	5.2	1.9	0.086			

The largest absolute difference by depression category in 30-day ATOD use is also alcohol use. However, for 30-day use, the substance most high correlated with depression is cigarettes (0.168).



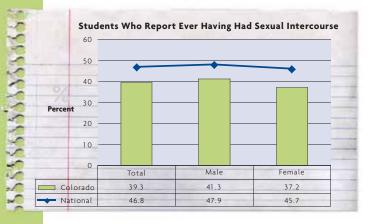
These analyses do not determine causation. Therefore, it is not possible from these figures to conclude that depression leads to substance use, that substance use

leads to depression, or that some third factors lead to both. It is clear, however, that depression and substance use are correlated phenomena.



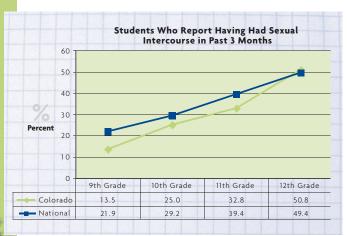
Sexual Behavior

Colorado high school students are less likely than students nationally to have ever had sexual intercourse in their lifetime (39.3% in Colorado compared to 46.8% nationally). Both nationally and in Colorado, males are slightly more likely than females to have had sexual intercourse in their lifetime. The following chart and table illustrate the prevalence of lifetime sexual intercourse for males and females in Colorado and the nation.



Currently Sexually Active

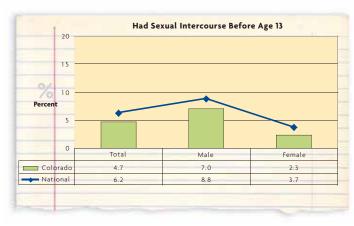
Almost one-third (29.5%) of Colorado high school students are currently sexually active, as defined as having had sexual intercourse at least once in the three months preceding the survey. The prevalence is the same for males and females, the difference being statistically insignificant (p=0.675). Colorado students are slightly less likely to be sexually active than students nationally (33.9%). The similarity in prevalence for males and females also occurs at the national level.



Older students are far more likely to be sexually active, both nationally and in Colorado. The divergence in prevalence between Colorado and the nation becomes smaller for older students, with the percentage of sexually active 12th graders in Colorado (50.8%) essentially the same as 12th graders nationally (49.4%).

Sexual Intercourse Before the Age of Thirteen

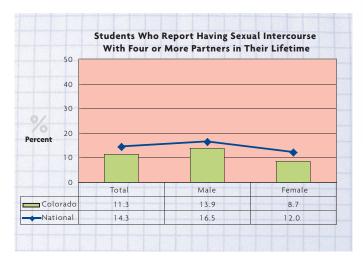
There is a much larger divergence between males and females in the prevalence of having had sexual intercourse before the age of thirteen, which is far more prevalent for males than females. Overall, 4.7% of Colorado high school students report having had sexual intercourse before they reached age 13, which is lower than the national rate of 6.2%. In Colorado, the prevalence for males (7.0%) is more than three times as high as for females (2.3%) and this difference is statistically significant (p<0.01). The male-female divergence in Colorado is proportionally larger than at the national level, where the prevalence for males (8.8%) is more than twice that for females (3.7%).



DATA: Sexual Behavior

Multiple Sexual Partners

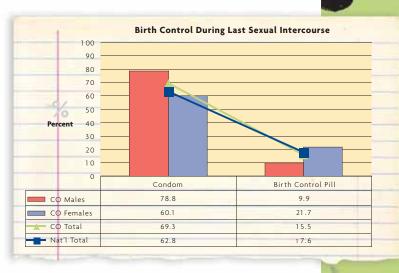
Colorado high school students are less likely than students nationally to have had four or more sexual partners in their lifetime (11.3% in Colorado compared to 14.3% in the nation). As with sex before the age of 13, males in Colorado (13.9%) are more likely than females (8.7%) to have had sexual intercourse with four or more partners in their lifetime. The gender divergence in Colorado is proportionally larger than that of the nation, where 16.5% of males and 12.0% of females report having had four or more sexual partners.



Birth Control

Among the 29.5% of Colorado high school students who are sexually active, a large majority (69.3%) report that they or their partners used a condom the last time they had sexual intercourse. Colorado students are more likely than students nationally to report condom use (69.3% in Colorado compared to 62.8% nationally), but less likely to report that they or their partner used birth control pills (15.5% in Colorado compared to 17.6% nationally) the last time they had sexual intercourse. Both nationally and in Colorado, more males than females report condom use and more females than males report birth control pill use (the latter discrepancy is much more pronounced in Colorado). This, however, may be an issue of either interpretation or knowledge,

as respondents might not know what birth control methods their partners used or may have misinterpreted the survey question to be asking only about their practices and not that of their partner as well.

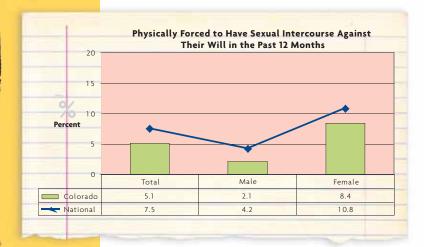


Birth Control (with national ger	nder disagg	regation)	
Method	Population	All	Male	Female
Condom Colorado		69.3	78.8	60.1
	National	62.8	70.0	55.9
Birth Control	Colorado	15.5	9.9	21.7
Pill	National	17.6	14.6	20.6

Safety and Violence

Sexual Victimization

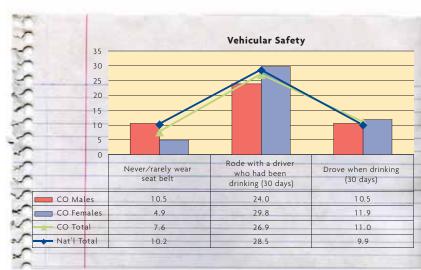
The number of Colorado high school students that report being physically forced to have sexual intercourse in the 12 months preceding the survey (5.1%) is lower than the national rate (7.5%). In Colorado, females (8.4%) are more than four times as likely as males (2.1%) to report such victimization, while nationally the prevalence for females (10.8%) is slightly more than double that for males (4.2%).



Vehicular Safety

Compared to students nationally, Colorado high school students are less likely to never or rarely wear a seat belt (7.6% compared to 10.2% nationally) and slightly less likely to have ridden with a driver who had been drinking in the past 30 days (26.9% compared to 28.5% nationally), but they are slightly more likely to report driving when they had been drinking in the past 30 days (11.0% compared to 9.9% nationally). In Colorado, males (10.5%) are more than twice as likely as females (4.9%) to never or rarely wear a seat belt. This gender difference also occurs at the national level (12.5% of males, 7.8% of females) but it is more pronounced in Colorado. Females (29.8% in Colorado, 29.6% nationally) are more likely than males (24.0% in Colorado, 27.2% nationally) to report riding with a driver who had been drinking and again the gender gap is larger in Colorado. On the measure of drinking and driving, the gender difference in Colorado is the opposite of the nation. In Colorado, more females (11.9%) than males (10.5%) report this behavior, whereas nationally males (11.7%) are more likely than females (8.1%) to report drinking and driving.

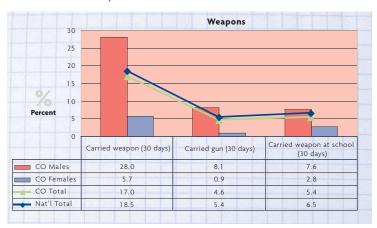




DATA: Safety and Violence

Weapons

Colorado students are slightly less likely than students nationally to have carried a weapon (17.0% in Colorado, 18.5% nationally); to have carried a gun (4.6% in Colorado, 5.4% nationally); and to have carried a weapon on school property (5.4% in Colorado, 6.5% nationally), all in the 30 days preceding the survey. On all of the measures, males are far more likely than females to have carried a weapon, both nationally and in Colorado.



Personal Safety

Colorado students are less likely than students nationally to have been in a physical fight (32.2% in Colorado, 35.9% nationally) and less likely to have been physically abused by a boyfriend/girlfriend (6.0% in Colorado, 9.2% nationally) in the 12 months preceding the survey. In Colorado, males (40.0%) are almost twice as likely as females (24.5%) to have been in a physical fight, while females (6.4%) are slightly more likely than males (5.8%) to have been abused by a boyfriend/girlfriend.



Personal Safety at School

Colorado high school students report levels of personal safety at school that are very similar to national rates. Almost one-third (30.6%) of Colorado high school students report having

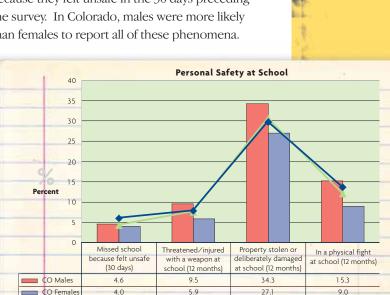
CO Total

Nat'l Total

4.3

6.0

had their personal property deliberately damaged or stolen at school in the 12 months preceding the survey; 12.1% had been in a physical fight at school in the preceding 12 months; 7.6% were threatened with a weapon on school property in the preceding 12 months; and 4.3% missed school because they felt unsafe in the 30 days preceding the survey. In Colorado, males were more likely than females to report all of these phenomena.



7.6

7.9

30.6

29.8

1 2.1

13.6

Physical Activity, Weight and Nutrition

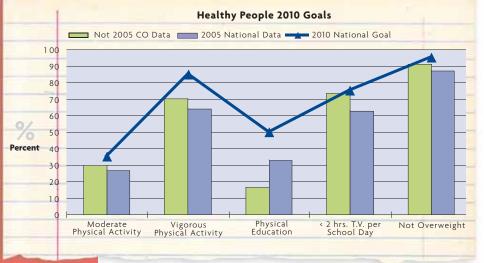
Overall, Colorado high school students are healthier than the national average on measures of exercise and body-mass index (BMI) . The Centers for Disease Control and Prevention's Healthy People 2010 (HP 2010) initiative has set goals to be reached by the year 2010 for the nation's youth, and on most measures Colorado students are near these goals.

Nearly three quarters (70.1%) of Colorado adolescents engage in vigorous physical activity, which is slightly higher than the national average of 64.1%. HP 2010

has set the goal for this measure as 85%, so Colorado is at 82% of the goal. Colorado is notably close to achieving the HP 2010 goals of increasing the percentage of students who spend less than two hours per school day watching television (73.0%, which is 98% of the goal), and increasing the percentage of adolescents who are not overweight (91.2%, which is 96% of the goal). The one measure where Colorado lags behind the nation and has only reached 33% of the HP 2010 goal is the percentage of students who report

participating in daily physical education at school. Only 16.6% of Colorado adolescents report this activity, compared to 33.0% nationally and well below the HP 2010 goal of 50%.

The following chart and table illustrate where Colorado stands on these measures in relation to the national average and the HP 2010 goals.



Healthy People 2010 Goals						
Measure	2005 CO Data	2005 National Data	2010 National Goal	CO Percentage of Goal		
Moderate Physical Activity	29.6	26.5	35.0	84.6		
Vigorous Physical Activity	70.1	64.1	85.0	82.5		
Physical Education	16.6	33.0	50.0	33.2		
< 2hrs. T.V. per School Day	73.2	62.8	75.0	97.6		
Not Overweight	91.2	86.9	95.0	96.0		

DATA: Physical Activity, Weight and Nutrition

Weight

Looking specifically at measures of weight, Colorado is again healthier than the nation as a whole. Colorado has a smaller proportion of high school students who are overweight (9.8% compared to 13.1%), who are at-risk for becoming overweight (10.3% compared to 15.7%), who describe themselves as overweight (24.0% compared to 31.5%) and who are trying to lose weight (41.0% compared to 45.6%). In making judgments about the true health of students it is important to note that the first two measures (those based on BMI) are limited by the fact that the BMI does not consider bodyframe type, nor does it differentiate between weight that comes from muscle and that which comes from fat. Also, the last two measures have as much to do with self-image as with actual physical weight. By all four measures, however, Colorado students have healthier weights than the national average.

The following chart and table compare the measures of weight for Colorado and the nation as well as males and females within Colorado.

The weight measures for Colorado show large differences between males and females that reveal as much about body-image as body mass. Almost twice as many males (12.8%) than females (6.6%) are overweight, yet more than twice as many females (58.6%) than males (25.0%) are trying to lose weight and almost 50% more females (29.1%) than males (19.5%) describe themselves as being overweight.

The differences in Colorado between males and females are mirrored at the national level, where 16.0% of males and 10.0% of females are overweight while 25.1% of males and 38.1% of females describe themselves as being overweight.



Weight Loss

HKCS Module I asks students about specific methods that they have employed in the 30 days preceding the survey to lose weight or maintain their current weight, both healthy (exercising and eating less) and unhealthy (fasting; using diet pills, powders or liquids; and using laxatives).

More Colorado high school students (64.5%) than students nationally (60.0%) exercised to lose weight, while fewer ate less to lose weight (37.0% in Colorado compared to 40.7% nationally). Similar to national data, females in Colorado (75.1%) are more likely than males (54.8%) to exercise as a means to lose weight, and females (50.7%) are more than twice as likely as males (23.9%) to eat less as a means to lose weight.





Fewer Colorado high school students than students nationally engage in unhealthy methods to lose weight. For all three unhealthy weight-loss methods, females report a higher prevalence than males, with the exception of diet pill/powder/liquid use in Colorado, where, counter to national data, the rate for males is higher than for females.

Healthy Weight Loss (with national gender disaggregation)					
Healthy Weight Loss Method (30-day)	Population	Total	Male	Female	
Exercised	Colorado	64.5	54.8	75.1	
	National	60.0	52.9	67.4	
Ate less food, fewer calories or foods low in fat	Colorado	37.0	23.9	50.7	
	National	40.7	26.8	54.8	

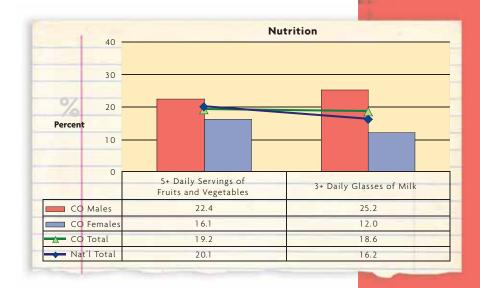




Unhealthy Weight Loss (with national gender disaggregation)						
Unhealthy Weight Loss Method (30-day)	Population	Total	Male	Female		
Went without eating for 24+ hours	Colorado	8.9	5.9	12.0		
	National	12.3	7.6	17.0		
= 1 10 0 11 10 10 11	Colorado	4.7	4.9	4.5		
Took diet pills, powders or liquids	National	6.3	4.6	8.1		
Vomited or took laxatives	Colorado	3.6	2.0	5.2		
	National	4.5	2.8	6.2		

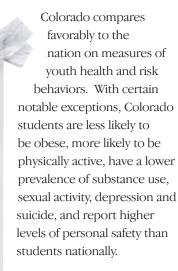
Nutrition

HKCS Module I asks students about their nutritional habits in the seven days preceding the survey. Similar to national data, only about one fifth (19.2%) of Colorado high school students report eating five or more daily servings of fruits and vegetables, as defined as 100% fruit juices, fruit, green salad, potatoes (excluding french fries, fried potatoes or potato chips), carrots or other vegetables. In Colorado, females (16.1%) are less likely than males (22.4%) to eat five or more daily servings of fruits and vegetables. This discrepancy exists at the national level but it is larger in Colorado. Less than one fifth of students in Colorado (18.6%) report drinking three or more glasses of milk per day, but this is slightly higher than the national rate of 16.2%. Similar to the national data, females in Colorado (12.0%) are less than half as likely as males (25.2%) to drink three or more glasses of milk per day.



Nutrition (with national gender disaggregation)					
Nutrition Measure (7-day)	Population	Total	Male	Female	
5+ Daily Servings of Fruits and Vegetables	Colorado	19.2	22.4	16.1	
	National	20.1	21.4	18.7	
3+ Daily Glasses of Milk	Colorado	18.6	25.2	12.0	
	National	16.2	20.8	11.6	

CONCLUSIONS AND RECOMMENDATIONS



Recommendations

It is the recommendation of the Colorado Department of Education that schools utilize this data to inform the

programs, strategies and curricula used to effectively address and reduce these behaviors. It has been shown that Coordinated School Health can create the district and school level infrastructure by connecting all health and prevention staff to plan and work together to deliver common messages and consistent programming, combine funding, and monitor data and outcomes on a regular basis.

School health teams made up of representatives from comprehensive health education, school-based health services, physical education, nutrition services, counseling and mental health services, a healthy school environment, staff wellness, and parental and community involvement all work together to provide prevention information and activities that impact educational outcomes. The implementation of such programs has been proven to improve test performance, attendance, and school connectedness.

The data from the Healthy Kids Colorado Survey can help inform schools on a local level about the programs and options that are needed to assist in improving the well-being of all students. Schools should utilize these data to make a case for creating a school health team in every school building, coordinating messages, activities, programs and funding for healthy students and safe schools, implementing the district wellness policy, and enforcing tobacco-free and drug-free school policies, implementing their Wellness Policies and collecting their own data to compare with this picture of the health and well being of students across Colorado.

Future Survey Plans

Conducting the Healthy Kids Colorado Survey on a regular basis will provide valuable information on the health and behavior of Colorado students. The statewide survey administration process will continue in the fall of the 2007-08 school year. With this additional year of statewide data, we can begin to assess the variation of certain behaviors over time and analyze changes among subgroups of high school students. Successful collaboration between the Healthy Kids Colorado survey team and school administration will result in a productive survey administration process. Additionally, schools that participate in the Healthy Kids Colorado Survey will be able to compare local data to state and national findings.

APPENDICES

Appendix I – Survey Administration

In the fall and winter of 2005 the Healthy Kids Colorado Survey (HKCS) was administered to a representative sample of ninth through twelfth grade public school students throughout Colorado (see Appendix II for more information on sample selection).

After the sample of schools was selected, a process was begun to recruit the selected schools to participate in the survey. This effort was coordinated by OMNI Institute and was facilitated by staff at the Colorado Department of Education and Department of Public Health and Environment. Of the 38 schools selected for the sample, 29 schools (76%) agreed to participate. Out of the 2,115 students across the 38 selected schools, 1,499 ultimately took the survey, providing 1,498 usable questionnaires for an overall response rate of 60%.

Participating schools then worked closely with the staff at OMNI Institute to prepare for the administration of the survey at their school. School staff chose a date to administer the survey at their school. Classes selected either by required subject or time of class period, depending on the school, were included in the sampling frame.

Systematic equal probability sampling with a random start was used to select classes from each school that participated in the survey. OMNI Institute provided the schools with a template form for either active or passive parental consent, dependent on the school district requirements, for which the schools were responsible for distributing and collecting from students' parents. Prior to their administration dates, OMNI Institute sent each school survey booklets and survey summary forms to be completed by survey administrators at each school (typically teachers or other school personnel).

The HKCS is composed of two modules. There were an equal number of students who received each module, as half of the classrooms in each school were given the first module and the other half was given the second module. The first module (HKCS Module

I) is the Youth Risk Behavior Survey (YRBS). The YRBS is one component of the Youth Risk Behavior Surveillance System (YRBSS), which was developed in 1990 by the United States Centers for Disease Control and Prevention to monitor priority health risk behaviors that contribute markedly to the leading causes of death, disability, and social problems among youth and adults in the United States. The second module (Module II) of the HKCS integrates items from the

Youth Risk Behavior Survey (HKCS Module I) and the Colorado Youth Survey (CYS), which is based on the "risk and protective factor" framework that was developed by the Social Development Research Group and coordinated by OMNI Institute in Colorado; and additional items selected by Colorado state agencies, including asset and resiliency scales. The development of HKCS Module II was supported and approved by the Colorado Departments of Education, Public Health and Environment, Human Services (Alcohol and Drug Abuse Division), and Public Safety (Division of Criminal Justice, Office of Adult and Juvenile Justice Assistance).

Schools that participated in the statewide sample were also given the option to survey their entire school to obtain school-level data. Eight high schools elected to survey full-census to receive school-level data. These schools were given a third module (Module III) to be administered to the remaining, non-sampled, classrooms in the school. OMNI Institute then provided local, school-level data to these eight high schools.

Once students completed their surveys, they were collected by school staff that anonymously placed them in envelopes and completed survey summary forms for each classroom. All the surveys were then mailed to OMNI Institute in Denver, Colorado.



Upon receipt of completed survey materials, OMNI sent the Module I surveys to Westat for cleaning, weighting, and analysis. After completed, Westat produced a data file and report that was given to OMNI Institute. OMNI Institute conducted additional analyses of these data, which were used in creating this report. The surveys collected from Module II and Module III were scanned by OMNI. Data from Module II were cleaned, weighted and analyzed by OMNI and were also used to create this report. Data from Module III were cleaned and analyzed by OMNI and provided to individual schools and districts for local school and districtlevel reports. These local reports were designed and delivered by OMNI Institute to the schools and districts who participated in Module III.

In addition to the schools selected for the statewide sample, HKCS Module III was made available to all schools throughout Colorado interested in surveying their students. In the 2005-2006 school year, over 60 individual schools conducted the HKCS Module III survey and have been provided with local reports by OMNI Institute.

Appendix II – Sample Selection

Sample Description

School Level—All regular public schools containing grades 9, 10, 11, or 12 were included in the sampling frame. Schools were selected systematically with probability proportional to enrollment in grades 9 through 12 using a random start. Thirty eight schools were sampled.

Class Level—All classes in a required subject or all classes meeting during a particular period of the day, depending on the school, were included in the sampling frame.

Systematic equal probability sampling with a random start was used to select classes from each school that participated in the survey.

Response Rates

Schools—76% (29 of the 38 sampled schools participated).

Students—71% 1,499 of the 2,115 sampled students submitted questionnaires.

1,498 questionnaires were usable after data editing.

Overall response rate—60% (The overall response rate is computed as the product of the weighted school response rate and the weighted student response rate.)

Weighting

A weight has been associated with each questionnaire to reflect the likelihood of sampling each student and to reduce bias by compensating for differing patterns of nonresponse. The weight used for estimation is given by:

$$W = W1 * W2 * f1 * f2 * f3$$

W1 = the inverse of the probability of selecting the school;

W2 = the inverse of the probability of selecting the classroom within the school;

f1 = a school-level non-response adjustment factor calculated by school size category (small, medium, large). The factor was calculated in terms of school enrollment instead of number of schools.

f2 = a student-level non-response adjustment factor calculated by class.

f3 = a post-stratification adjustment factor calculated by gender within grade and by race/ethnicity.

Use of the Weighted Results

The weighted results can be used to make important inferences concerning the priority health-risk behaviors of all regular public school students in grades 9 through 12.

Appendix III – Weighting Procedures

Module I

This document summarizes the procedures that are applied for weighting data from state and local Youth Risk Behavior Surveys (YRBS). The summary describes, in general, the weighting procedures that are applied in surveys for which the YRBS sampling software, PCSample, is used to select a sample. Weighting procedures for surveys that use other sample designs may differ from those described in this document. Questions regarding weighting procedures should be addressed to the statistician weighting the data for your state or local agency.

Weighting in General

For most YRBS sites, it is impractical and unnecessary to administer the YRBS to every student in the population. PCSample selects representative samples of schools and classes within selected schools. The sample is designed so that every eligible student has an equal chance of selection.

The sample is selected in two steps. In the first step, schools are selected with probability proportional to the enrollment of the school. In the second step, classes are selected within schools with equal probability. The questionnaire is administered to all students in sampled classes in the sampled schools.

The objective of the weighting process is to develop sample weights so that the weighted sample estimates accurately represent the entire student population in the state or city. Non-response or poor sampling procedures can result in a sample that is not a representative subset of the population. Unweighted results from these samples may not accurately reflect student behaviors and therefore may be misleading.

Figure 1 shows the steps that are used in Westat's weighting adjustments. Each of these steps is described in more detail in the following sections. The boxes in Figure 1 are numbered to correspond to the section numbers.

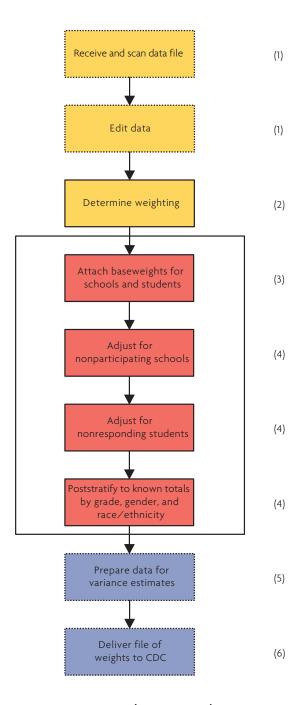


Figure 1: YRBS Weighting Procedures

1. Prepare the Data

Completed questionnaires from a survey are scanned at Westat, a data file is created, and the file is sent to CDC to be edited. CDC edits the data to identify responses that are inconsistent or otherwise questionable. The edited data are returned to Westat for weighting.

2. Determine if Data can be Weighted

Statisticians at Westat receive the data for a site in the form of initial "unweighted" frequencies. At this point, the statistician determines whether the data can be weighted. To determine if a YRBS data set can be weighted, all of the following conditions must be met:

- Legitimate sampling methods were used (i.e., every student has a known chance of selection and the probabilities of selection can be defined and computed for each sampled student);
- There is enough documentation available to calculate and attach weights (i.e., probabilities of selection can be defined and computed for each sampled student); and
- The overall response rate is at least 60 percent.

The first two conditions are basic requirements for computing the correct probabilities of selection and initial weights. Without this information, weighting is not possible regardless of the response rate. If the sample was selected using PCSample, and if the school and classroom selection procedures were applied properly, and if all work is well documented, these conditions are satisfied. Otherwise, the procedures used to select the sample must be documented completely and carefully.

There are two components to the overall response rate: a school response rate, and a student response rate. Each of these response rates is calculated as follows:

School Response Rate = Number of Schools that Participated

Number of Eligible Students Sampled in Participating Schools

Student Response Rate = Number of Completed Questionnaires

Number of Eligible Students Sampled in Participating Schools

The overall response rate is calculated as:

Overall Response Rate = School Response Rate * Student Response Rate.

The number of completed questionnaires is determined after data have been edited¹. Only eligible schools and students are counted for determining response rates.

3. Attach Baseweights

PCSample assigns base weights to each sampled student. The weight is equal to the inverse of the probability that the student is selected for the survey. This weight can be thought of as the number of students in the population that are represented by each sampled student.

The weight for each sampled student is computed as follows:

Student weight = School weight * Within - school weight.

The school weight is based on the probability of selection for the school; and the within-school weight is based on the probability of selection for classes within each sampled school². Samples that are selected by PCSample have the additional property that each sampled student has the same weight, i.e., the sample is "self-weighting."

When the questionnaire contains more than 54 total questions, a questionnaire is complete if a student answers at least 21 questions and the student answers with b, c, d, e, f, g, or h less than 15 times in a row. When the questionnaire contains 54 or fewer total questions, a questionnaire is complete if a student answers at least 16 questions and the student answers with b, c, d, e, f, g, or h less than 12 times in a row.

² Detailed documentation of YRBS sampling procedures is provided in "PCSample Description and Operation." This document is available on request from Westat or CDC.

4. Adjust the Weights

Adjustments are made to the initial weights to remove bias from the estimates and reduce the variability of the estimate. Westat's standard weighting process for the YRBS involves three adjustments to the weights. Two adjustments are made to account for nonresponse in the sample and one adjustment is made to fine tune the weighted sample estimates to known population characteristics that can affect responses to survey questions. Each of these adjustments is summarized below.

The first adjustment accounts for nonparticipating schools that were sampled. This adjustment is made at the school level and accounts for entire schools that are sampled but are unable, or refuse, to participate. For this adjustment, schools are grouped into three categories based on school enrollment. Within each category, weights of refusing schools are distributed to the participating schools.

The second adjustment is made at the student-level and accounts for eligible students enrolled in sampled classes who fail to complete a questionnaire (e.g., students who are absent on the day the survey is administered, students who do not receive parental permission, students who refuse to participate, or questionnaires that fail the edit and quality control checks). Weights of these nonresponding students in sampled classes are given to responding students in the same class or in classes of similar grade in the same school.

The final weighting step is to adjust weighted sample totals to known population totals for variables that can affect response to survey questions. Raking ratio estimation, also known as iterative poststratification or raking is used to adjust the weights to two sets of population totals simultaneously. The raking variables used are: (1) grade by gender and (2) race-ethnicity.

Weighted sample frequencies in each raking variable are adjusted so that the weighted sample totals of grade by gender and race-ethnicity agree with the true population totals for the state or city.

Additional technical details for these weighting steps are provided in Appendix A to this summary.

5. Attach Variables for Variance Estimates

Weighted estimates and standard errors are calculated at CDC using SUDAAN. This is a special purpose computer application that calculates estimates and standard errors for data from complex surveys. To use this program, two variables must be defined for calculating standard errors.

These variables identify the variance strata and the primary sampling units (PSUs). Variables identifying variance stratum and PSU are created at Westat following weighting.

Values of these variables are based on the procedures that were used to select the sample. In PCSample, schools are selected using implicit stratification that is based on school enrollment.

Sampling strata for SUDAAN are defined to consist of either a single certainty school or pairs (or triplets) of noncertainty schools. Pairs (or triplets) of noncertainty schools are grouped according to the order of sample selection. PSU's are comprised of classes within schools for certainty strata and schools within groups for noncertainty strata. More detail regarding the definition of these variables is provided in Appendix A.

6. Create Final Files

For surveys that are weighted, Westat creates a file for CDC that includes the record ID, the final weights, the variance stratum, and the PSU. The weight file contains all scanned records, including records that CDC subverted due to inconsistent responses and records that Westat deleted due to sampling error. These ineligible records have zero weights, missing variance stratum, and missing PSU on the file.

For surveys that are unweighted, Westat sends a file to CDC containing the record ID and an eligibility variable for identifying the eligible records.

7. Use Nonstandard Sample Designs

In general, weighting adjustments should be based on procedures used to select the sample.

When nonstandard procedures are used to select a YRBS sample, the weighting procedures are tailored to the sample design that was used. Weighting procedures for these surveys are modified as necessary to account for specific sample designs.

Module II

Data from Module II are weighted by gender and ethnicity within schools and within grades using enrollment data from the Colorado Department of Education October 2005 Pupil Count. Every student in the sample is assigned to one of six combinations of gender (male/female) and ethnicity (Caucasian/Hispanic/Other). For each school and each grade, the proportion of each race-ethnicity combination in the sample is compared to the proportion

enrolled. Each student's survey record is assigned a weight that is the ratio of the proportion of his/her race-ethnicity in his/her grade in the population (enrollment) to the proportion of his/her race-ethnicity in his/her grade in the sample. A student whose race-ethnicity was underrepresented in the sample would receive a weight greater than one (1), while a student whose race-ethnicity was overrepresented in the sample would receive a weight less than one (1).

ACKNOWLEDGEMENTS

Healthy Kids Colorado Survey was a collaborative effort to collect state-level health behavior and risk and protective factor data on a regular basis, and was funded by the Colorado Department of Education and the Colorado Department of Human Services Alcohol and Drug Abuse Division. This work was led by the State Survey Coordination Work Group, a committee of the Prevention Leadership Council at the Colorado Department of Public Health and Environment.

The State Survey Coordination collaborative effort included:

- Centers for Disease Control and Prevention, Division of Adolescent and School Health
- Colorado Department of Education
- Colorado Department of Human Services Alcohol and Drug Abuse Division
- Colorado Department of Public Health and Environment
- Colorado Department of Public Safety
- Colorado Department of Transportation
- Colorado State University Cooperative Extension
- Creative Media Solutions
- Levinson Associates
- Local State Survey Participating Schools and Districts
- OMNI Institute
- Rocky Mountain Center for Health Promotion and Education
- Westat, Inc.

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