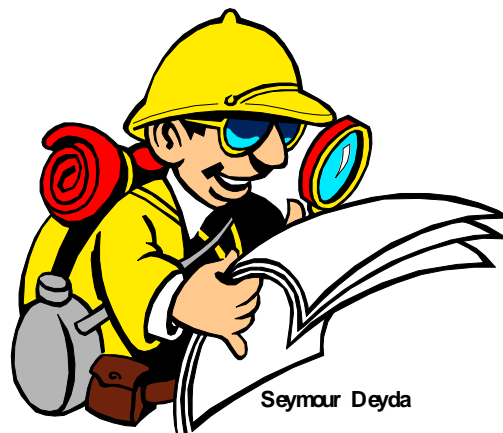


## Understanding, Analyzing, and Presenting Your YRBS Data

The Youth Risk Behavior Survey (YRBS) results in your report binder will be of great interest to many people in your state or district. Students, parents, school administrators, policymakers, and the general public will find the results relevant and useful. This brochure is designed to assist you in understanding, analyzing, and presenting the results of your YRBS. This brochure has three major sections:

- Understanding Your Data - This section describes the two major parts of your report binder – Survey Results and Survey Documentation. This section also describes additional data sources you can use to supplement your YRBS data.
- Analyzing Your Data - This section describes how to compare subgroup results and provides guidelines for doing further analysis of your data, including comparing data from two survey years.
- Presenting Your Data - This section includes guidelines for developing accurate and effective graphics and suggested methods of data presentation.



## Understanding Your Data

Effective reporting of your YRBS results enables you to provide a broad audience with factual information on the priority health-risk behaviors of students in your state or district. Concrete data-supported recommendations can be made to education agencies, public health officials, parents and those who assist in the development of your health education programs. This section of the booklet provides information to help you understand the two major parts of your YRBS results report binder – Survey Results and Survey Documentation. In addition, this section describes additional data sources to supplement your YRBS report.

### Youth Risk Behavior Survey Report Binder

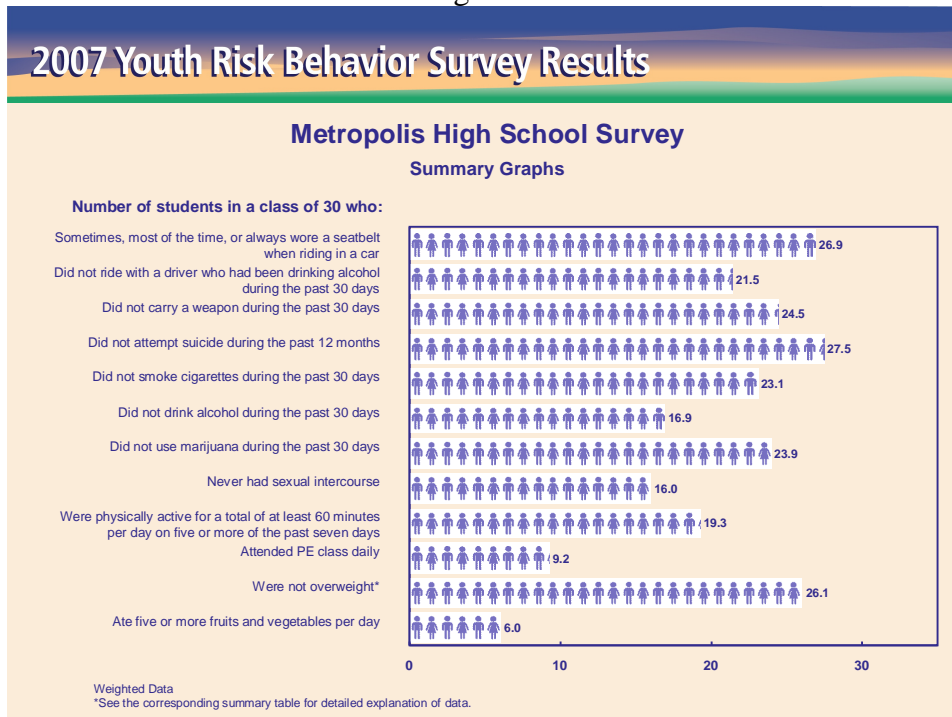
The section describes the information in your report binder:

- Survey Results
  - Summary Results
  - Demographic Tables
  - Summary Tables
  - Detail Tables
  - Graphs
  - Trend Report (if applicable)
- Survey Documentation
  - Questionnaire
  - Item Rationale
  - Using Your Data
  - Data User's Guide
  - Codebook
  - Sample and Weighting Information
  - Design Effect

## SURVEY RESULTS

**Summary Results:** The Summary Results includes both the Survey Summary and the Summary Graphs. The **Survey Summary** provides information on the number of students and the number of schools that participated in your survey, when the survey was administered, and the number of questions on your questionnaire. The school, student, and overall response rates are given, as well as a description of the sample by gender, grade, and race/ethnicity. Also included is a brief description of the Youth Risk Behavior Surveillance System. There are two sets of **Summary Graphs**. The first set shows the number of students in a class of 30 that participated in positive health-related behaviors and in health risk behaviors. The second set of graphs shows the percent of students who participated in health-related behaviors and in health risk behaviors. Figure 1 is the graph showing the number of students practicing health risk behaviors in a class of 30.

Figure 1.



While these summary graphs are a good place to begin looking at your data, the Demographic Tables, the Summary Tables, and the Detail Tables provide more information on all of the questions from your survey.

**Demographic Tables:** The Demographic Tables (Figure 2) presents the number and percentage of students by gender, age group, grade, and race/ethnicity. The footnote provides the number of students who did not report their gender. This demographic table also contains your total sample size. In the example below, the total sample size is 13,917 and is outlined in blue. The number of observations in each summary and detail table will add up to this number, if you include the number of missing observations reported in the footnote. The red outlined cell in Figure 2 shows that the number of 10<sup>th</sup> grade males, aged 15 or younger is 548 and that they represent 4.5% of the sample size.

The rows provide the number of observations and percentages for the overall sample, for males, and for females. Those three groups are subdivided to provide, in rows, the number of observations and percentages by grade and race/ethnicity. The columns provide the number of observations and percentages by age group. The ‘missing’ column represents the number of missing observations for all age groups.

Figure 2.

2007 YOUTH RISK BEHAVIOR SURVEY RESULTS										
Metropolis High School Survey										
Demographic Table										
		Overall		15 or younger		Age Group		18 or older		Missing
		N	Weighted percentage	N	Weighted percentage	N	Weighted percentage	N	Weighted percentage	
<b>Overall</b>	Total	13,917	100.0	4,387	37.0	7,208	49.3	2,272	13.6	50
<b>Grade</b>	9th	3,333	29.0	3,025	26.6	297	2.3	8	0.1	3
	10th	3,470	25.9	1,326	10.3	2,122	15.5	20	0.1	2
	11th	3,529	23.3	13	0.1	3,298	22.2	217	1.1	1
	12th	3,510	21.6	10	0.1	1,476	9.3	2,020	12.3	4
	Ungraded or other grade	16	0.1	6	0.1	6	0.0	4	0.0	0
	Missing	59		7		9		3		40
<b>Race/Ethnicity</b>	Black*	3,347	14.6	962	5.3	1,799	7.4	579	2.0	7
	Hispanic/ Latino	3,221	15.1	1,011	6.2	1,654	7.0	553	2.0	3
	White*	6,122	61.9	1,991	22.1	3,177	31.3	954	8.6	0
	All other races	605	5.2	201	1.9	305	2.6	99	0.8	0
	Multiple races	391	3.1	147	1.3	181	1.3	62	0.4	1
	Missing	231		75		92		25		39

N - Number of unweighted observations.  
 \*Non-Hispanic  
 Note: There were 60 students who did not provide data on gender.

2007 YOUTH RISK BEHAVIOR SURVEY RESULTS

Metropolis High School Survey  
Demographic Table

		Overall		15 or younger		16 or 17		18 or older		Missing
		N	Weighted percentage	N	Weighted percentage	N	Weighted percentage	N	Weighted percentage	
<b>Male</b>	<b>Total</b>	6,664	50.5	1,961	17.7	3,498	25.3	1,196	7.6	9
	<b>Grade</b>									
	9th	1,583	14.8	1,388	13.1	187	1.6	7	0.0	1
	10th	1,680	13.3	548	4.5	1,114	8.7	16	0.1	2
	11th	1,696	11.6	9	0.0	1,551	10.7	135	0.8	1
	12th	1,680	10.8	6	0.0	639	4.2	1,032	6.6	3
	Ungraded or other grade	12	0.1	4	0.0	4	0.0	4	0.0	0
	Missing	13		6		3		2		2
	<b>Race/Ethnicity</b>									
	Black*	1,575	7.2	410	2.4	857	3.7	303	1.0	5
	Hispanic/ Latino	1,469	7.7	449	3.0	753	3.6	265	1.1	2
	White*	3,015	31.4	902	10.6	1,591	16.0	522	4.8	0
	All other races	317	2.7	96	0.9	164	1.4	57	0.4	0
	Multiple races	179	1.5	69	0.7	77	0.6	33	0.2	0
	Missing	109		35		56		16		2

N - Number of unweighted observations.

\*Non-Hispanic

Note: There were 60 students who did not provide data on gender.

2

2007 YOUTH RISK BEHAVIOR SURVEY RESULTS

Metropolis High School Survey  
Demographic Table

		Overall		15 or younger		16 or 17		18 or older		Missing
		N	Weighted percentage	N	Weighted percentage	N	Weighted percentage	N	Weighted percentage	
<b>Female</b>	<b>Total</b>	7,193	49.5	2,416	19.3	3,698	24.1	1,074	6.1	5
	<b>Grade</b>									
	9th	1,744	14.3	1,632	13.5	109	0.7	1	0.0	2
	10th	1,785	12.6	774	5.8	1,007	6.9	4	0.0	0
	11th	1,828	11.8	4	0.0	1,742	11.4	82	0.3	0
	12th	1,824	10.8	3	0.0	834	5.1	986	5.7	1
	Ungraded or other grade	4	0.0	2	0.0	2	0.0	0	0.0	0
	Missing	8		1		4		1		2
	<b>Race/Ethnicity</b>									
	Black*	1,768	7.5	550	2.8	940	3.7	276	0.9	2
	Hispanic/ Latino	1,744	7.4	561	3.2	896	3.3	287	0.9	0
	White*	3,102	30.6	1,087	11.5	1,583	15.3	432	3.8	0
	All other races	283	2.5	101	1.0	140	1.2	42	0.4	0
	Multiple races	211	1.5	77	0.7	104	0.7	29	0.2	1
	Missing	85		40		35		8		2

N - Number of unweighted observations.

\*Non-Hispanic

Note: There were 60 students who did not provide data on gender.

3

**Summary Tables:** Each Summary Table (Figure 3) represents one survey question or supplemental variable and provides data for the ‘response of interest’ for that question. The ‘response of interest’ is generally the percentage of students who engaged in a given behavior. Specific information on the ‘response of interest’ is in the Data User’s Guide in the Survey Documentation section of the report binder. The question number is either a QNxx or a QNword. The QNxx corresponds to the standard YRBS question number. Site added questions begin with QN88. The QNword corresponds to supplemental variables. The Map Form in Survey Documentation provides a cross-walk between your questionnaire and the standard YRBS question number if you modified the core YRBS questionnaire.

There are three columns of data in each summary table: one for the total sample, one for males, one for females. In the Summary Table in Figure 3, the set of columns for the total sample is outlined in purple. The first column in each set contains the weighted or unweighted percentages. If your data are weighted, the percentages can be used to describe the entire high school or middle school population of your district or state (or any other population from which you selected your sample). If your data are unweighted, the Summary Tables provide unweighted percentages. These refer only to students who participated in your survey.

The next column in each set contains the 95% confidence intervals. If your data are not weighted, this column is not included in your report. A **confidence interval** is a range of values within which the “true” percentage lies. A 95% confidence interval means that if a survey were repeated many times, the “true” value would fall within the interval 95% of the time. The confidence interval is related to the number of observations and the survey design. Beginning with the 2007 YRBS reports, confidence intervals may be asymmetric.

Be cautious about reporting results with a “wide” confidence interval. For the YRBS, wide confidence intervals are common for the “Hispanic/Latino,” “Multiple races,” and “All other races” race/ethnicity categories and for the “18 or older” age category, because many sites have a small number of students in these categories.

Under the column heading “N” is the number of students responding to each response category.

The first row of each Summary Table contains overall percentages, confidence intervals, and “N” for the whole sample and separate results by gender. Subsequent rows contain results by age group, grade, and race/ethnicity for the total sample and by gender.

Footnotes provide the following information:

- the number of observations with missing data, that is, the number of students who did not respond or whose response was deleted during the data editing process
- an explanation of the symbol (N), which is used as a column heading to indicate the number of responses
- an explanation of the symbol (-), which is used if there are fewer than 100 observations in a cell

Figure 3.

2007 YOUTH RISK BEHAVIOR SURVEY RESULTS										
Metropolis High School Survey										
Summary Table - Weighted Data										
QNS: Among students who rode a bicycle during the past 12 months, the percentage who never or rarely wore a bicycle helmet										
	Percentage	Total 95% confidence interval	N	Percentage	Males 95% confidence interval	N	Percentage	Females 95% confidence interval	N	
Total	83.4	( 79.8 - 86.5 )	8,893	86.1	( 83.0 - 88.8 )	4,810	79.9	( 75.4 - 83.7 )	4,038	
<b>Age</b>										
15 or younger	82.5	( 78.7 - 85.8 )	3,302	86.9	( 82.8 - 90.2 )	1,626	77.8	( 73.2 - 81.8 )	1,668	
16 or 17	84.2	( 80.6 - 87.2 )	4,363	85.7	( 82.6 - 88.2 )	2,446	82.0	( 77.4 - 85.8 )	1,908	
18 or older	83.7	( 78.6 - 87.8 )	1,194	85.3	( 81.1 - 88.7 )	734	80.9	( 71.9 - 87.6 )	459	
<b>Grade</b>										
9th	83.0	( 79.0 - 86.3 )	2,572	86.7	( 82.6 - 89.9 )	1,323	78.6	( 73.3 - 83.0 )	1,243	
10th	84.3	( 81.2 - 86.9 )	2,341	87.1	( 84.0 - 89.6 )	1,282	80.4	( 76.0 - 84.2 )	1,056	
11th	82.2	( 76.5 - 86.7 )	2,094	85.1	( 80.2 - 89.0 )	1,158	78.4	( 71.3 - 84.1 )	933	
12th	84.0	( 79.5 - 87.7 )	1,832	84.5	( 80.1 - 88.1 )	1,030	83.3	( 77.0 - 88.2 )	797	
<b>Race/Ethnicity</b>										
Black	92.0	( 89.9 - 93.7 )	2,041	93.5	( 91.1 - 95.3 )	1,125	90.1	( 85.6 - 93.2 )	912	
Hispanic/ Latino	86.5	( 82.9 - 89.4 )	2,049	88.6	( 85.1 - 91.4 )	1,069	83.4	( 78.2 - 87.6 )	974	
White	81.5	( 77.2 - 85.1 )	4,052	84.4	( 80.7 - 87.5 )	2,209	77.9	( 72.5 - 82.5 )	1,840	
All other races	75.5	( 65.1 - 83.5 )	349	78.3	( 64.5 - 87.7 )	202	72.0	( 60.6 - 81.1 )	143	
Multiple races	78.7	( 66.8 - 87.2 )	250	83.5	( 68.8 - 92.1 )	126	73.5	( 59.3 - 84.1 )	123	

Note: There were 5024 students who were excluded from this analysis or who did not provide usable data for QNS.  
N = Number of unweighted observations.

The QNword variables are supplemental variables that are calculated based on results from one or more than one question. The following is a list of those variables and where their summary table appears in your report. You will not have these supplemental variables if you modified or deleted any of the questions needed to generate those variables.

### High School Supplemental Variables

- qnfr cig - Percentage of students who smoked cigarettes on 20 or more of the past 30 days. This variable is based on responses to standard question 30 and appears after question 30.
- qnanytob - Percentage of students who smoked cigarettes or cigars or used chewing tobacco, snuff, or dip on one or more of the past 30 days. This variable is based on responses to standard questions 30, 36, and 38, and appears after question 38.
- qnrovwgt - Percentage of students who were at risk for becoming overweight (i.e., at or above the 85<sup>th</sup> percentile but below the 95<sup>th</sup> percentile for body mass index, by age and sex.) This variable is based on responses to standard questions 1, 2, 6, and 7 and appears after question 64.
- qnovwgt - Percentage of students who were overweight (i.e., at or above the 95<sup>th</sup> percentile for body mass index, by age and sex.) This variable is based on responses to standard questions 1, 2, 6, and 7, and appears after qnrovwgt.
- qnfrvg - Percentage of students who ate fruits and vegetables five or more times per day during the past seven days. This variable is based on standard questions 72, 73, 74, 75, 76, and 77, and appears after question 77.
- qndlype - Percentage of students who attended physical education (PE) classes daily in an average week when they were in school. This variable is based on responses to standard question 83 and appears after question 83.



### Middle School Supplemental Variables

- qnfrcig - Percentage of students who smoked cigarettes on 20 or more of the past 30 days. This variable is based on responses to standard question 18 and appears after question 18.
- qnanytob - Percentage of students who smoked cigarettes or cigars or used chewing tobacco, snuff, or dip on one or more of the past 30 days. This variable is based on responses to standard questions 18, 22, and 23 and appears after question 23.
- qndlype - Percentage of students who attended physical education (PE) classes daily in an average week when they were in school. This variable is based on responses to standard question 45 and appears after question 45.

**Detail Tables:** Detail Tables provide results for every response option for every question in separate rows. Each question has three Detail Tables: results for the entire sample (Figure 4), for all males, and for all females. The Detail Tables consist of a column for the overall sample and columns for each of the respondent categories of age group, grade, and race/ethnicity. The first row of each response option contains the weighted or unweighted percentages. The next row contains the “N” (the number of responses for that category). Question numbers match the Summary Table numbers. Figure 4 shows results for the overall sample.

Footnotes provide the following information:

- the number of observations with missing data, that is, the number of students who did not respond or whose response was deleted during the data editing process
- an explanation of the symbol (N), which is used as a column heading to indicate the number of responses
- an explanation of the symbol (-), which is used if there are fewer than 100 observation in a cell

Figure 4.

**2007 YOUTH RISK BEHAVIOR SURVEY RESULTS**

**Metropolis High School Survey**  
**Detail Table - Weighted Data**

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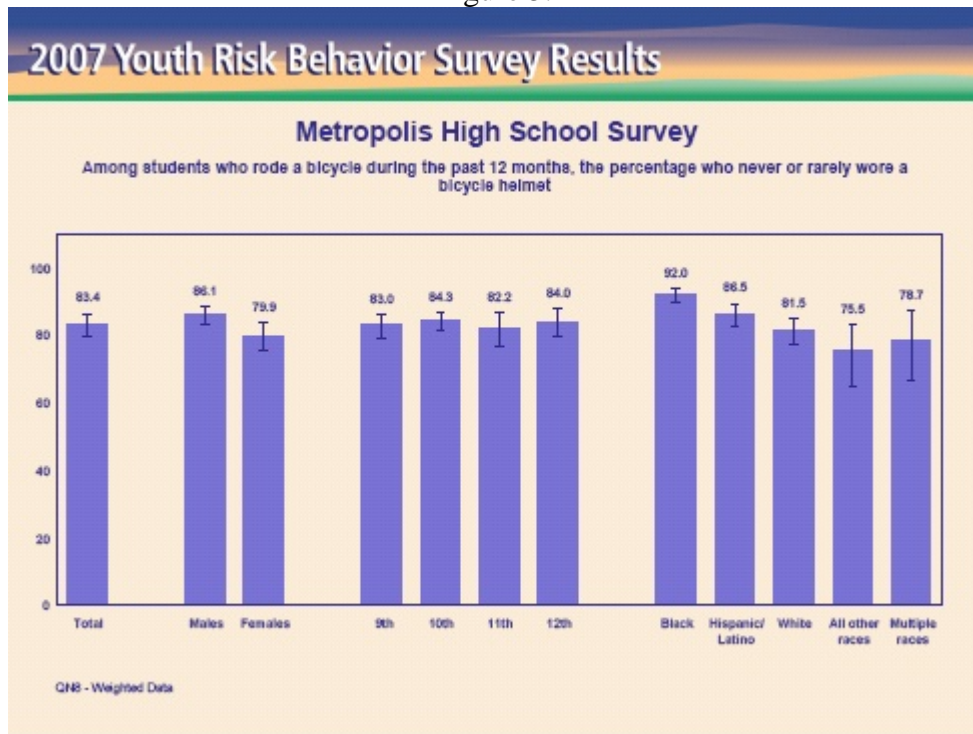
Q8. When you rode a bicycle during the past 12 months, how often did you wear a helmet?

Overall	Age				Grade				Race/Ethnicity				
	Overall	15 or younger	16 or 17	18 or older	9th	10th	11th	12th	Black	Hispanic/Latino	White	All other races	Multiple races
Did not ride a bicycle	% 32.1	22.8	36.2	42.9	20.8	30.9	37.0	43.7	34.7	32.2	30.9	40.5	28.8
	N 4,979	1,078	2,822	1,069	756	1,116	1,421	1,671	1,290	1,160	2,063	253	141
Never wore a helmet	% 51.1	55.8	49.2	45.3	57.8	52.2	47.6	44.2	56.1	53.7	50.4	38.2	50.0
	N 6,969	2,480	3,498	962	1,943	1,849	1,664	1,464	1,765	1,653	2,998	238	189
Rarely wore a helmet	% 5.5	7.9	4.5	2.5	7.8	6.0	4.2	3.1	4.0	4.9	5.9	6.6	6.0
	N 669	314	285	67	247	172	132	113	121	141	344	36	20
Sometimes wore a helmet	% 3.4	3.9	3.1	2.5	3.9	3.6	3.5	2.4	1.5	3.7	3.5	4.8	6.4
	N 403	169	184	49	123	106	99	75	49	108	198	25	17
Most of the time wore a helmet	% 3.8	4.9	3.2	2.8	4.9	3.7	3.6	2.8	1.9	2.9	4.4	3.4	6.2
	N 375	162	164	49	120	99	83	73	39	72	232	14	13
Always wore a helmet	% 4.1	4.6	3.7	4.0	4.7	3.7	4.1	3.8	1.8	2.5	4.9	6.5	2.6
	N 477	177	232	67	139	115	116	107	67	75	280	36	11
Total	% 100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	N 13,872	4,380	7,185	2,263	3,328	3,457	3,515	3,503	3,331	3,209	6,115	602	391

Note: There were 45 students who did not provide usable data for Q8.  
N = Number of unweighted observations.

**Graphs:** There is a graph for every question and supplemental variable. The graphs correspond to the results presented in the Summary Tables, providing a graphical representation of the percentages for the total population, for males and females, for each grade, and for race/ethnicity. If your data are weighted, there is an I-bar that shows the confidence interval. An example of a graph with weighted data is shown in Figure 5. The graphs are on the CD ROM as a PowerPoint presentation.

Figure 5.



## SUPPLEMENTAL DATA SOURCES

Combining data from your YRBS and other sources will present a clearer and more complete picture of what your results tell you about your state or district. Information from other sources is readily available.

### Health Outcome Data

**Morbidity and Mortality Data:** The CDC publishes annual mortality data on the 10 leading causes of death in the United States by age, sex, race, and ethnicity in National Vital Statistics Reports. This report is available at [www.cdc.gov/nchs](http://www.cdc.gov/nchs). The most current version of this report can be found at [http://www.cdc.gov/nchs/data/dvs/nvsr53\\_17tableE2002.pdf](http://www.cdc.gov/nchs/data/dvs/nvsr53_17tableE2002.pdf).

**HIV and AIDS Data:** The CDC publishes the HIV/AIDS Surveillance Report that provides information on the prevalence and incidence of HIV and AIDS for each state and the District of Columbia. This report is available at <http://www.cdc.gov/hiv/topics/surveillance/resources/reports/2005report/pdf/2005SurveillanceReport.pdf>.

**Other Health Outcome Data:** State and local health departments can provide data on a variety of health outcomes, such as HIV infection, teen pregnancies, sexually transmitted diseases, and leading causes of death. Including this kind of information in a YRBS report will highlight the relationship between health risk behaviors and health outcomes.

### National Risk Behavior Data

**National Youth Risk Behavior Survey:** The CDC conducts biennially a YRBS on the prevalence of risk behaviors including unintentional injuries and violence, suicide ideation and attempts, tobacco use, alcohol and other drug use, sexual behaviors, dietary behaviors, and physical inactivity plus overweight and asthma among a nationally representative sample of high school students. The data are published in a Morbidity and Mortality Weekly Report Surveillance Summary. The reports are available at [www.cdc.gov/yrbs](http://www.cdc.gov/yrbs).

**National Youth Tobacco Survey (NYTS):** The CDC conducted a NYTS among a nationally representative sample of high school students in Spring 2006. Prior to 2004, the American Legacy Foundation conducted the survey. The reports are available at [http://www.cdc.gov/tobacco/data\\_statistics/surveys/NYTS/index.htm](http://www.cdc.gov/tobacco/data_statistics/surveys/NYTS/index.htm).

**National Survey on Drug Use and Health (NSDUH) (formerly the National Household Survey on Drug Abuse (NHSDA)):** The Substance Abuse and Mental Health Services Administration (SAMHSA) conducts annually the NSDUH on the prevalence, patterns, and consequences of drug and alcohol use in the general U.S. civilian non-institutionalized population, age 12 and older. Information is available at <http://oas.samhsa.gov/nhsda.htm>.

**Monitoring the Future (MTF):** The Survey Research Center in the Institute for Social Research at the University of Michigan, through a research grant from the National Institutes of Health, conducts annually the MTF on the prevalence of tobacco, alcohol, and drug use behaviors, attitudes, and values of 8<sup>th</sup>, 10<sup>th</sup>, and 12<sup>th</sup> grade students. The reports are available at [www.monitoringthefuture.org](http://www.monitoringthefuture.org).

### **School Policy and Program Data**

**School Health Policies and Programs Study (SHPPS):** The CDC conducts SHPPS every 6 years among all states and the District of Columbia, and among a representative sample of school districts and schools. SHPPS provides information about health education, physical education and activity, health services, mental health and social services, food service, healthy and safe school environment, faculty and staff health promotion, and family and community involvement. The reports are available at [www.cdc.gov/healthyyouth/shpps](http://www.cdc.gov/healthyyouth/shpps).

**School Health Profiles (Profiles):** State and local education and health departments conduct biennially a School Health Profiles among a representative sample of middle schools and senior high schools. Profiles provides information about the provision of health education; the content of health education courses; school health policies related to HIV infection/AIDS, tobacco use prevention, unintentional injuries and violence, physical activity, and nutrition; physical education; asthma management activities; and family and community involvement. The reports are available at [www.cdc.gov/healthyyouth/profiles](http://www.cdc.gov/healthyyouth/profiles).

## Analyzing Your YRBS Data

You can use the data in your YRBS report to prepare state- or district-level reports and presentations. This section describes how you can use data in this report to compare subgroups from one survey year and how you can compare results across two survey years.

The CD-ROM contains the data from your 2007 YRBS in SAS, SPSS (syntax file), MS Access, and ASCII formats. Those data files can be used along with the documentation to conduct additional analyses of the current year data. They also can be used with data from a previous YRBS. Given the complex sample design, you need to use a statistical software package, such as SUDAAN<sup>1</sup> or STATA<sup>2</sup>, which accounts for the clustered sample. A sample SAS and SUDAAN program is located in the Data User's Guide.

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<sup>1</sup> Documentation for SUDAAN is available from Research Triangle Institute, 3040 Cornwallis Road, Research Triangle Park, NC 27709.

<sup>2</sup> Documentation for STATA is available from STATA Corporation, 4905 Lakeway Drive, College Station, TX 77845.

## Comparing Subgroup Results from Any One Survey Year

Follow these guidelines to determine if you can compare subgroup results from any one survey year: Use the results reported in the Summary Tables

1. Are the data weighted?
  - a. No - STOP! The comparison should not be made.
  - b. Yes - Continue.
2. Write in the question for which subgroups are being compared.

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3. Write in the subgroups of interest (e.g., males and females or 9<sup>th</sup>, 10<sup>th</sup>, 11<sup>th</sup>, and 12<sup>th</sup> grade students) on the chart below.
4. Write in the confidence intervals for each estimate on the chart below.

**Subgroups of Interest**

**Confidence Intervals**

_____	_____
_____	_____

5. Do the confidence intervals overlap?

No: then it is likely that the estimates are significantly different.  
Example of non-overlapping confidence intervals: (42.0 - 52.0) and (55.0 - 65.0).

Yes: then it is likely that there is no significant difference between the estimates.

Example of overlapping confidence intervals: (42.0 - 52.0) and (45.0 - 55.0)

## Comparing Results from Multiple Survey Years

The Trend Report is based on logistic regression analysis and provides trends based on all years with weighted YRBS data for the overall population, for males and females, and for race/ethnicity. If you want to compare results between two years for subgroups, follow these guidelines. The first step is to determine if you can compare results from two survey years:

1. Write in the survey years being compared. \_\_\_\_\_  
Survey Year 1                      Survey Year 2

2. Are the data from both years weighted?

a. No - STOP! The comparison should not be made.

b. Yes - Continue.

3. Describe the population surveyed each year (e.g., public schools, grades 9-12).

Survey year 1: \_\_\_\_\_

Survey year 2: \_\_\_\_\_

4. Was the same population surveyed each year?

a. No - STOP! The comparison should not be made.

b. Yes - Continue.

5. Write in the question and response category to be compared from Survey Year 1.

\_\_\_\_\_  
\_\_\_\_\_

Write in the question and response category to be compared from Survey Year 2.

\_\_\_\_\_  
\_\_\_\_\_



6. Are the questions and response categories from each survey worded identically?

a. No - STOP! The comparison should not be made.

b. Yes - Continue.

7. Write in the confidence intervals for each estimate.

Survey Year 1: \_\_\_\_\_

Survey Year 2: \_\_\_\_\_

8. Do the confidence intervals overlap:

a. No: then it is likely that the estimates are significantly different.

Example of non-overlapping confidence intervals: (42.0 - 52.0) and (55.0 - 65.0)

b. Yes: then it is likely that there is no significant difference between the estimates.

Example of overlapping confidence intervals: (42.0 - 52.0) and (45.0 - 55.0)

## Presenting Your YRBS Data

In reporting statistical data, graphic representation can be extremely useful in displaying results in an easy-to-understand manner. Graphics are charts, graphs, and other visual forms for presenting information. Graphic presentation of data is a powerful tool when effectively used. Graphic enhancements are often the sparks that bring life, attention, and interest to a report or presentation. Graphic images help demonstrate group differences and aid in the explanation of survey findings.

This section has been developed to help you prepare accurate and effective graphics. The guidelines are not intended to constrain creativity, but rather to encourage and support accuracy and consistency in the display of information. Your YRBS report CD-ROM contains graphs for all of your questions in a PowerPoint presentation format. If you want to add additional “slides” or modify this presentation, you can make these changes yourself or find out about services available in your education or health agency.

Graphics help you communicate your YRBS results better by allowing you to:

- Disseminate information
- Increase the audience's retention of information
- Streamline presentations and meetings
- Establish relationships between data and ideas
- Emphasize important ideas or findings
- Prevent misinterpretation of your data or message
- Project a professional image of yourself and your agency
- Add credibility to your presentation

### Planning Your Graphic Presentation

The first step to preparing effective graphic presentations is to ensure that they have a clear purpose. Think about what you are trying to say with the graphic. Keep your message simple and straightforward. Remember that your graphic presentation should highlight your major findings.

Graphic presentations provide an opportunity for you to acquaint various audiences with your program. You must know your audience members so you can design a presentation to best fit their needs. For example, knowing whether your graphics will be viewed by policy makers, such as district superintendents, or by parent groups will help you decide what information to present.

A graphic's primary function is to inform. This can best be done when data are presented clearly and simply. Simple graphics that are easy to understand will communicate your survey findings much more effectively than tables of raw data. Ideally, your graphics should be both accurate and visually appealing.

Graphics within a presentation should have a consistent style and format. Although many type or font styles are available, using too many different styles can add an inconsistent, cluttered, unprofessional look to an otherwise clean and simple presentation. If you add “slides” to your YRBS report presentation, limit your choices to one or two fonts, and use boldface or italics for emphasis.

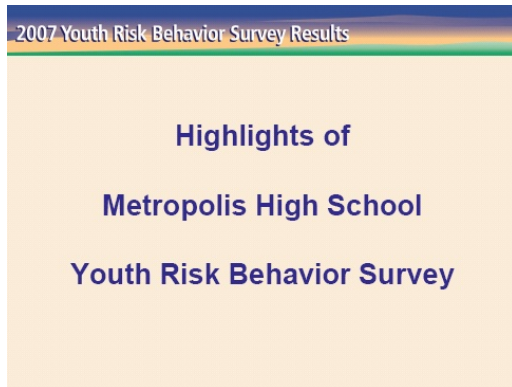
Another key factor to consider is the amount of information to convey in a single graphic. Too much information makes a graphic difficult to comprehend, which in turn detracts from your ability to demonstrate important programmatic needs. A series of simple graphics may be far more effective than a single complicated graph. However, be careful not to summarize the information to the point that it misrepresents the actual data.

Keeping presentation graphics as simple as possible forces you to interpret and discuss them in a conversational tone rather than reading them verbatim to your audience. Reading your slides and overhead transparencies is boring for both you and your audience. Your graphics should contain the framework rather than all the details of your presentation.

### Selecting Chart Types

Several types of charts can be used to display your data. Choose the one that will best highlight the point you want to make.

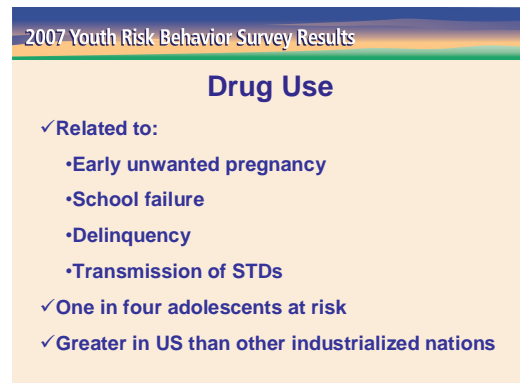
## Text Charts



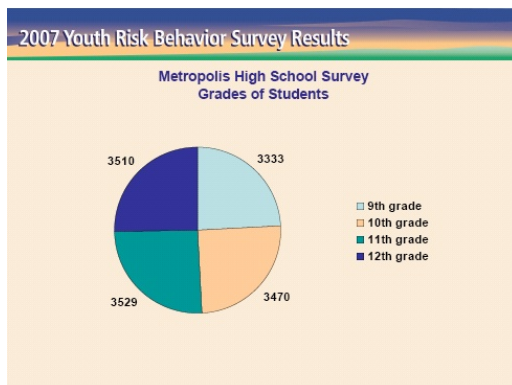
Use text charts to introduce nonnumeric data in a presentation, for example, to introduce or summarize your findings. Text charts should be short and precise in meaning, using the minimum number of short keywords needed to convey your message. Keep lines short by highlighting only the main idea. Limit text charts to 8 lines, with no more than 8 to 10 words on a line. Paraphrase rather than use complete sentences. Use initial capital letters and lowercase (as in the example shown) for the rest of the text. USING ALL UPPERCASE LETTERS MAKES TEXT DIFFICULT TO READ.

Avoid jargon. Be careful when using abbreviations or acronyms. For example, be sure your audience knows that YRBS stands for Youth Risk Behavior Survey.

Use bulleted lists to group and emphasize related ideas. If you have more than one bulleted list in your report or presentation, the symbol you choose for the bullets should be consistent for all of your graphics. Use a minimum number of indent levels, providing more detail verbally. To avoid monotonous presentations, be careful not to overuse bulleted lists.



## Pie Charts



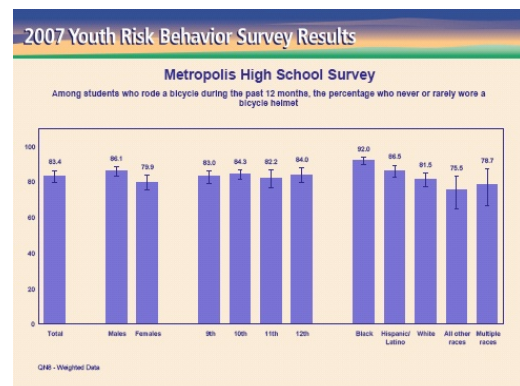
A pie chart is the graphic that answers simple questions about proportions. Each slice represents an individual part of a particular group. “Cutting” (separating) one of the slices emphasizes an element that is part of the whole. For clarity, place labels next to the slices, not in a legend. Include percentages or values in the labels to add detail to the interpretation. Pie charts should

contain eight slices at most. When you have more than eight data values, use a bar chart. Use multiple pie charts cautiously; bar charts are more effective in comparing proportions between groups.

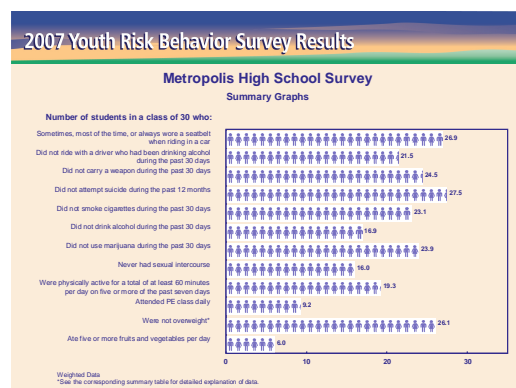
Arrange your data from the largest element to the smallest, unless you want to emphasize a particular element, or there is a logical order to your categories or elements. Your most important element should start at the 3 o'clock position on the pie. The other elements should progress in importance in a counterclockwise direction, with each slice being a lighter color or shading. For the best color or pattern effects, work from dark to light. Fluctuating between dark and light makes it difficult to see pie shading differences.

### Vertical Bar or Column Charts

Vertical bars are used to present trends in data such as changes over time or differences among groups. Use bar charts for a relatively small number of discrete data points or groups. Use a clustered bar chart to compare data in more than one category. However, keep the number of clusters small, and limit the number of bars in each cluster to three or fewer. Results for each of your YRBS questions are reported in this format.



### Horizontal Bar Chart

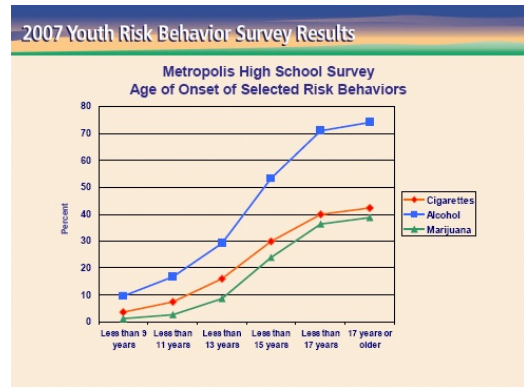


Horizontal bar charts are used to show comparisons between parts, groups, or categories. This type of chart will accommodate many values without visual clutter and can indicate exact quantities as well as proportions. Arrange the bars from largest to smallest to emphasize extremity. Use the same color or fill pattern for all bars. To emphasize one bar, select a contrasting fill pattern or color.

Your YRBS summary charts are in this format.

## Line Charts

Line charts are used to show changes in data over time or to represent continuous measurements. Like bar charts, line charts answer questions about trends, and they can support an almost unlimited number of data points.



## Titles and Labels

Graphics should have clear, concise titles and subtitles. Both axes of a graph should be labeled with the names of the variables, and the scales should be indicated. Titles should be centered at the top or bottom of the graphic. All information necessary to understand the graphic should be included.

## Production

Graphics produced for paper copies and those created for computerized digital display require different design formats. It is important to consider the purpose and presentation medium when choosing among pattern, shading, and color options. Computer presentations benefit from use of color. Photocopying printed graphics (unless using a color copier) will obscure color or shading patterns.

## Electronic Presentation

You can present your results in the PowerPoint presentation format without any modification, or you can tailor the report to meet more specific needs. The PowerPoint presentation allows you to add transitions between slides, text builds, and even animation and sound. Transitions are special visual effects that appear when moving from slide to slide. Text builds allow you to show main bullet points on a slide one at a time. These special effects should be used sparingly. You need to preview your presentation to be sure that everything looks good. Another advantage of this type of presentation is the room lights do not need to be dimmed allowing your audience to take notes more easily.

When doing an electronic presentation, you will need a computer, a diskette or CD with your “slides,” and an LCD projector. Hopefully in the future, LCD projects connected to computers will become as commonplace as slide and overhead projectors. We are not, however, there yet, so be prepared and bring your equipment. You may want to bring overheads or a printed version as a backup in case of equipment problems.

### **Overhead Transparencies**

An alternative to a computer presentation is overhead transparencies. You can print each of the “slides” in your YRBS report on overhead transparency film. Transparencies are shown in normal or slightly reduced lighting. You may remain in the front of the room, maintain eye contact with the audience, and more easily respond to their questions. The audience can take notes easily or follow along on any handouts you may use to supplement your overhead transparencies. Overhead transparencies are lightweight and easy to carry. They allow you to change the order of your presentation just before or even during the presentation. You can remove or rearrange your graphics, and even write on them before or during your presentation. You can point to, circle, or underline text to emphasize important points.

Several overheads can be “hinged” together to create a building effect. Begin with the first page and “build” by laying down the others as you discuss additional points. You can create a similar effect by listing several points on a single overhead transparency and covering all but the first with a board. Then move the board down to introduce the others as you discuss them.

Black-and-white overhead transparencies are the easiest to produce. You can simply make a photocopy of the paper-printed version. Some laser printers will allow you to print directly onto transparency film. Color printers have become more readily available and can be used to add color to your presentation.

### **Internet Website**

Presenting data on the Internet has become more commonplace. This format makes it readily available to many audiences. Having data available on the World Wide Web emphasizes the

importance of the data and encourages an exchange of information to enhance analysis and presentation.

Preparing data for an Internet site is not difficult. Software packages are available to convert your paper presentation text and graphics into HTML (hypertext markup language) or PDF (portable document file), so it can be viewed on the Internet. Like your paper presentation, you will want to keep it simple and easy to read. Some formats will change in the HTML conversion, so take the time to adjust the format the way you like. Highlight important headings and keep basic facts bulleted. Converting to HTML will allow you to draw attention to links including appendices, tables, graphs, and pie charts, if you chose. By using hyperlinks, you can allow the user to move within your report or to jump to supplemental information available elsewhere on the Internet. Converting to PDF format will keep your document true to the original format.

Several agencies have websites that include reports of YRBS data. As of May 2007, the following URLs were active:

<b>State or District Name</b>	<b>Year</b>	<b>URL</b>
Alabama	2003	<b>Alabama School Board publication:</b> <a href="http://www.theaasb.org/asb.cfm?DocID=1703">http://www.theaasb.org/asb.cfm?DocID=1703</a>
Alaska	2003	<a href="http://www.hss.state.ak.us/dph/chronic/school/pubs/YRBSreport2003.pdf">http://www.hss.state.ak.us/dph/chronic/school/pubs/YRBSreport2003.pdf</a>
Arizona	2005	<b>Arizona Coalition on Adolescent Pregnancy &amp; Parenting:</b> <a href="http://www.azteenpregnancy.org/data/data/YRBS/arizona%20yrb%20detailed%202005.pdf">http://www.azteenpregnancy.org/data/data/YRBS/arizona%20yrb%20detailed%202005.pdf</a>
Arkansas	2001	<a href="http://arkedu.state.ar.us/publications/pdf/2001arh_codebook.pdf">http://arkedu.state.ar.us/publications/pdf/2001arh_codebook.pdf</a>
California – San Diego	2005	<a href="http://www.sandi.net/depts/sex_ed/YRBS/Revised%20YRBS%20exec.pdf">http://www.sandi.net/depts/sex_ed/YRBS/Revised%20YRBS%20exec.pdf</a>
California – San Francisco	2005 Middle School	<a href="http://portal.sfusd.edu/data/school_health/YRBS%20MS%20Executive%20Summary%202004%20FINAL.pdf">http://portal.sfusd.edu/data/school_health/YRBS%20MS%20Executive%20Summary%202004%20FINAL.pdf</a>
California – San Francisco	2003 Middle School	<a href="http://portal.sfusd.edu/data/school_health/pdf/YRBS%20SFUSD%20MS%20Executive%20Summary%202003.pdf">http://portal.sfusd.edu/data/school_health/pdf/YRBS%20SFUSD%20MS%20Executive%20Summary%202003.pdf</a>
Colorado	2005, 2003, 2001	<a href="http://www.cdphe.state.co.us/hs/yrbs/yrbs.html">http://www.cdphe.state.co.us/hs/yrbs/yrbs.html</a>
Connecticut	2005, 2003	<a href="http://www.dph.state.ct.us/PB/HISR/CSHS.htm">http://www.dph.state.ct.us/PB/HISR/CSHS.htm</a>
Delaware	2003, 2001, 1999	<a href="http://www.state.de.us/drugfree/dfd_data.html">http://www.state.de.us/drugfree/dfd_data.html</a>
Florida	2005, 2003, 2001	<a href="http://www.doh.state.fl.us/disease_ctrl/epi/Chronic_Disease/YRBS/Intro.htm">http://www.doh.state.fl.us/disease_ctrl/epi/Chronic_Disease/YRBS/Intro.htm</a>



Florida	2003, 2001	<a href="http://www.doh.state.fl.us/Family/obesity/documents/YRBS2003.pdf">http://www.doh.state.fl.us/Family/obesity/documents/YRBS2003.pdf</a>
Florida – Miami-Dade County	2003	<a href="http://www.dadehealth.org/downloads/YRBS_HS%202003%20(injury%20only).pdf">http://www.dadehealth.org/downloads/YRBS_HS%202003%20(injury%20only).pdf</a>
Florida – Miami-Dade County	2003 Middle School	<a href="http://www.dadehealth.org/downloads/YRBS_MS%202003%20(injury%20only).pdf">http://www.dadehealth.org/downloads/YRBS_MS%202003%20(injury%20only).pdf</a>
Florida – Miami-Dade County	2003	<b>Press release:</b> <a href="http://www.dadehealth.org/public/PUBLICnewsarticle.asp?newsID=321&amp;typeID=1&amp;news_type=Press+Releases">http://www.dadehealth.org/public/PUBLICnewsarticle.asp?newsID=321&amp;typeID=1&amp;news_type=Press+Releases</a>
Georgia	2005, 2003	<a href="http://health.state.ga.us/epi/cdiee/studenthealth.asp">http://health.state.ga.us/epi/cdiee/studenthealth.asp</a>
Hawaii	2003	<a href="http://www.hawaii.gov/health/statistics/other-reports/2003-yrbs-rpt.pdf">http://www.hawaii.gov/health/statistics/other-reports/2003-yrbs-rpt.pdf</a>
Idaho	2003	<a href="http://www.sde.state.id.us/admin/docs/YRBS2003.pdf">http://www.sde.state.id.us/admin/docs/YRBS2003.pdf</a>
Indiana	2005, 2003	<a href="http://www.in.gov/isdh/dataandstats/yrbs/">http://www.in.gov/isdh/dataandstats/yrbs/</a>
Kentucky	2003	<b>Press Release:</b> <a href="http://news.uky.edu/news/display_article.php?category=0&amp;articleid=1449&amp;type=1">http://news.uky.edu/news/display_article.php?category=0&amp;articleid=1449&amp;type=1</a>
Maine	1997, 1999, 2003	<a href="http://www.state.me.us/education/hiv/yrbs.htm">http://www.state.me.us/education/hiv/yrbs.htm</a>
Massachusetts	1995 – 2005	<a href="http://www.doe.mass.edu/cnp/hprograms/yrbs/">http://www.doe.mass.edu/cnp/hprograms/yrbs/</a>
Michigan	1997 – 2005	<a href="http://www.emc.cmich.edu/YRBS/">http://www.emc.cmich.edu/YRBS/</a>
Mississippi	2003	<a href="http://www.msdh.state.ms.us/msdhsite/_static/31,0,110,228.html">http://www.msdh.state.ms.us/msdhsite/_static/31,0,110,228.html</a>
Missouri	1999 – 2005	<b>Online Analysis:</b> <a href="http://www.dhss.mo.gov/YRBSSMICA/">http://www.dhss.mo.gov/YRBSSMICA/</a>
Missouri	1995 – 2003	<a href="http://www.healthykidsmo.org/resources/youth_risk_behavior_survey_1995%20_2003.pdf">http://www.healthykidsmo.org/resources/youth_risk_behavior_survey_1995%20_2003.pdf</a>
Montana	1993 – 2005	<a href="http://www.opi.state.mt.us/YRBS/">http://www.opi.state.mt.us/YRBS/</a>
Nebraska	2003	<b>Press Release:</b> <a href="http://www.hhs.state.ne.us/new/1204nr/risky.htm">http://www.hhs.state.ne.us/new/1204nr/risky.htm</a>
Nevada	2001 – 2003	<a href="http://health2k.state.nv.us/nihds/yrbs/">http://health2k.state.nv.us/nihds/yrbs/</a>
New Hampshire	2005	<a href="http://www.ed.state.nh.us/education/doe/organization/instruction/HealthHIVAIDS/youthrisk.htm">http://www.ed.state.nh.us/education/doe/organization/instruction/HealthHIVAIDS/youthrisk.htm</a>
New Hampshire	2001 – 2003	<a href="http://www.dhhs.nh.gov/DHHS/ATOD/LIBRARY/Data-Statistical+Report/yrbs.htm">http://www.dhhs.nh.gov/DHHS/ATOD/LIBRARY/Data-Statistical+Report/yrbs.htm</a>
New Jersey	2005	<a href="http://www.state.nj.us/njded/students/yrbs/2005/">http://www.state.nj.us/njded/students/yrbs/2005/</a>
New Jersey	2003	<a href="http://www.state.nj.us/njded/students/yrbs/2003/">http://www.state.nj.us/njded/students/yrbs/2003/</a>
New Mexico	2005	<a href="http://www.health.state.nm.us/pdf/2005YRRSStatewideReport.pdf">http://www.health.state.nm.us/pdf/2005YRRSStatewideReport.pdf</a>
New Mexico	2003	<a href="http://www.ped.state.nm.us/div/sipds/health/dl/yrrs.2003.final.report.pdf">http://www.ped.state.nm.us/div/sipds/health/dl/yrrs.2003.final.report.pdf</a>
New York City	1997 – 2005 Smoking	<a href="http://home2.nyc.gov/html/doh/downloads/pdf/survey/survey-2006teensmoking.pdf">http://home2.nyc.gov/html/doh/downloads/pdf/survey/survey-2006teensmoking.pdf</a>
New York City	2003	<a href="http://home2.nyc.gov/html/doh/downloads/pdf/survey/survey-2003high.pdf">http://home2.nyc.gov/html/doh/downloads/pdf/survey/survey-2003high.pdf</a>
North Dakota	1999 – 2005	<a href="http://www.dpi.state.nd.us/health/YRBS/index.shtm">http://www.dpi.state.nd.us/health/YRBS/index.shtm</a>
North Dakota	2003	<a href="http://www.dpi.state.nd.us/health/YRBS/2003/index.shtm">http://www.dpi.state.nd.us/health/YRBS/2003/index.shtm</a>
Ohio	2005	<a href="http://www.odh.ohio.gov/ASSETS/B6B647F323F74737A1CD4F1651F5AFA1/YRBSsum.pdf">http://www.odh.ohio.gov/ASSETS/B6B647F323F74737A1CD4F1651F5AFA1/YRBSsum.pdf</a>
Ohio	2003	<a href="http://www.odh.ohio.gov/pdf/youthsurvey/trends.pdf">http://www.odh.ohio.gov/pdf/youthsurvey/trends.pdf</a>

Ohio	2003	<a href="http://www.odh.ohio.gov/pdf/YouthSurvey/yrbs1.pdf">http://www.odh.ohio.gov/pdf/YouthSurvey/yrbs1.pdf</a>
Oklahoma	2003	<a href="http://www.health.state.ok.us/program/yrbs/">http://www.health.state.ok.us/program/yrbs/</a>
Rhode Island	1997 – 2005	<a href="http://www.health.ri.gov/chic/statistics/yrbs.php">http://www.health.ri.gov/chic/statistics/yrbs.php</a>
South Dakota	2005	<a href="http://doe.sd.gov/oess/schoolhealth/yrbs/">http://doe.sd.gov/oess/schoolhealth/yrbs/</a>
Tennessee	1999 – 2005	<a href="http://www.k-12.state.tn.us/yrbs/">http://www.k-12.state.tn.us/yrbs/</a>
Tennessee – Memphis	2003	<a href="http://memphisdemo2.extranet.urbanplanet.com/sites/974cdc6f-b867-4129-8e23-506fae79343/uploads/Final_Report_2003_YRBS_Memphis.pdf">http://memphisdemo2.extranet.urbanplanet.com/sites/974cdc6f-b867-4129-8e23-506fae79343/uploads/Final_Report_2003_YRBS_Memphis.pdf</a>
Tennessee – Memphis	2003	<a href="http://www.memphis-schools.k12.tn.us/admin/communications/YOUTH-RISK-BHV-SURVEY.pdf">http://www.memphis-schools.k12.tn.us/admin/communications/YOUTH-RISK-BHV-SURVEY.pdf</a>
Texas – Dallas	2003	<a href="http://www.dshs.state.tx.us/phn/pdf/Dallas%202003%20YRBS.pdf">http://www.dshs.state.tx.us/phn/pdf/Dallas%202003%20YRBS.pdf</a>
Vermont	2005	<a href="http://healthvermont.gov/pubs/yrbs2005/2005yrbs.aspx">http://healthvermont.gov/pubs/yrbs2005/2005yrbs.aspx</a>
Vermont	2003	<a href="http://healthvermont.gov/adap/clearinghouse/yrbs_2003_report.pdf">http://healthvermont.gov/adap/clearinghouse/yrbs_2003_report.pdf</a>
West Virginia	2005	<b>Power Point Presentation:</b> <a href="http://wvde.state.wv.us/osshp/section6/documents/2005WVHG_raphs_000.ppt">http://wvde.state.wv.us/osshp/section6/documents/2005WVHG_raphs_000.ppt</a>
West Virginia	2005	<a href="http://wvde.state.wv.us/osshp/section6/documents/2005WVHSurveySummary.pdf">http://wvde.state.wv.us/osshp/section6/documents/2005WVHSurveySummary.pdf</a>
West Virginia	2003	<b>PowerPoint Presentation:</b> <a href="http://wvde.state.wv.us/data/yrbs/2003/2003YRBS.ppt">http://wvde.state.wv.us/data/yrbs/2003/2003YRBS.ppt</a>
Wisconsin	2005 – 2001	<a href="http://dpi.wi.gov/sspw/yrbsindx.html">http://dpi.wi.gov/sspw/yrbsindx.html</a>
Wyoming	2005 – 2001	<a href="http://www.k12.wy.us/HS/yrbs/yrbs.asp">http://www.k12.wy.us/HS/yrbs/yrbs.asp</a>
Wyoming	2003	<a href="http://www.k12.wy.us/HS/yrbs/yrbs_2003/RptFinalCoverRev.pdf">http://www.k12.wy.us/HS/yrbs/yrbs_2003/RptFinalCoverRev.pdf</a>
Wyoming	2003	<a href="http://www.k12.wy.us/HS/yrbs/yrbs_2003/ExecSumCoverRev.pdf">http://www.k12.wy.us/HS/yrbs/yrbs_2003/ExecSumCoverRev.pdf</a>
Wyoming	2001 – 1991	<a href="http://www.k12.wy.us/HS/yrbs/yrbs_10year.pdf">http://www.k12.wy.us/HS/yrbs/yrbs_10year.pdf</a>

In addition to web sites that are devoted to YRBS data, references to information collected through the YRBS can be found in many reports available on the Internet and elsewhere.

## Quality Assurance

Quality assurance is the time and effort spent by the graphics developer to ensure that the message conveyed by the graphic is true to the data it represents. Adequate quality assurance ensures that a graphic represents data in a manner that is easily viewed and understood by the observer and is not in any way misleading or incorrect. If the graphic presentation is incorrect, the viewer will have a false sense of the data and their implications.

Proofread your charts. If possible, enlist one or more of your co-workers who are familiar with your YRBS to help with the proofing. Also, check that percentages sum to 100%, when applicable, and that counts sum to the total. If percentages do not sum to 100 due to rounding, be sure to document that in a footnote.

Make sure the numbers on your chart match the numbers in the original data and that they are presented in the correct category. Within a presentation, scale changes should be avoided whenever possible so that between-chart comparisons can be made. For example, you may have two charts side by side showing response rates. One may use a scale of 0 to 100. The second chart may zoom in on a scale of 60 to 100. A person comparing these two charts will probably get a distorted view of the data. If you need to enlarge a selected portion of a scale, be sure it is clearly labeled as such. The vertical scale of bar and line charts should include zero.

Answer the following questions when proofreading your charts:

- Is all the text there? (Did the computer truncate text on long lines?)
- Is the spelling correct? (If your graphics package has one, use the built-in spell checker.)
- Is your message clear?
- Is the chart simple and easy to understand?
- Are the data accurate?
- Would color enhance the presentation of the data?

Whether you are compiling a written report or preparing visuals for a presentation, graphics can be used to add emphasis to your message. Graphics can help make sure your readers or audience leave with the message you want to convey. Effective use of graphics may help you generate interest in your program, gain support for conducting the YRBS, and enhance your report or presentation.

## Checklist for Effective Graphics

### Purpose

- Identify your audience(s).
- Specify your objectives.
- Ensure presentation methods match purpose and audience.

### Planning

- Create rough drafts first.
- Plan on making several drafts of all graphs.
- Remember that producing graphics sometimes takes longer than expected, so plan time accordingly.

### Appropriate Use

- Use graphics to highlight the intended material.
- Use the correct type of chart for your data.
- Be sure the chart demonstrates the comparisons you planned.

### Clarity

- Avoid unnecessary shadowing, 3D effects, and coloring.
- Minimize the number of fonts.
- Use bold and italic versions of fonts for highlighting.
- Avoid red and green adjacent to each other.
- Use accurate and complete labels.

### Simplicity

- Present the data without extraneous material.
- Avoid elaborate fill patterns.
- Avoid too many different patterns.
- Avoid overly decorative backgrounds.

### Consistency

- Use a similar style across all graphics.
- Use comparable scales for accurate comparison.

### Accuracy

- Check that data are correct.
- Check that spelling is correct.
- Double-check everything!