

Interpretive Guide

*Making the Most of Your Survey Data:
A Guide for Exploring and Interpreting the Results of the
Washington State Healthy Youth Survey (2008)*

Sponsoring Washington State Agencies:

Department of Health
Office of Superintendent of Public Instruction
Department of Social and Health Services
Department of Community, Trade and Economic Development
Family Policy Council
Liquor Control Board

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Introduction

The Washington State Healthy Youth Survey (HYS) is an effort to measure health risk behaviors that contribute to morbidity, mortality, and social problems among youth in Washington State. These behaviors include alcohol, tobacco, and other drug use; behaviors that result in unintentional and intentional injuries (e.g., violence); dietary behaviors and physical activity; and related risk and protective factors.

Washington State conducted student surveys in 1988, 1990, 1992, 1995, 1998, 1999, 2000, 2002, 2004, and 2006 to better understand the nature and extent of adolescent health behaviors in Washington. The current survey, known as the Washington State Healthy Youth Survey (2008), was sponsored by the Department of Health (DOH); the Office of Superintendent of Public Instruction (OSPI); the Department of Social and Health Services' Division of Alcohol and Substance Abuse (DASA); the Department of Community, Trade and Economic Development (CTED); the Family Policy Council (FPC) and the Liquor Control Board (LCB). Representatives from each of these agencies worked together to develop, plan, and implement the survey. The survey was administered under contract with RMC Research Corporation.

The results of the Washington State Healthy Youth Survey (2008) meet a wide variety of state and local needs for:

- Empirical needs assessment data necessary for planning prevention and early intervention programs.
- Information on trends in student substance use and abuse and associated risk and protective factors.
- Information on the progress of drug education programs funded under the federal Safe and Drug-Free Schools and Communities Act and the state Omnibus Alcohol and Controlled Substances Act.
- Information on the progress of the state's attainment of the national public health objectives contained in Healthy People 2010 and the progress of state-funded programs.
- Data on risk and protective factors that can be used by state agency staff and local school and community members as they plan or refine school- and community-based prevention and intervention programs.

Participation in the Survey

All schools in Washington State with students in Grades 6, 8, 10, or 12 were invited to participate in the survey. Individual student participation was voluntary and anonymous, and participating schools provided alternative activities for students who chose not to participate. The statewide results presented in the local reports are based on a sample chosen to be representative of students statewide. A detailed description of the sampling plan and other sampling issues appears in the Healthy Youth Survey (2008) Analytic Report.

About the Interpretive Guide

Each school, district, county, and educational service district (ESD) with sufficient student participation in the Healthy Youth Survey (2008) had the option to receive survey results. These results, which are highly specific to the local area, can be of enormous value in planning, implementing, and evaluating programs to address adolescent behavior. Each year the survey has been administered, an Interpretive Guide has been distributed with the local data. The first version of this guide was prepared by Anderson and Deck (1987) with a major revision by Einspruch and Hyatt (2005). The current revision and update was prepared by Department of Health. This guide provides information that will help those involved in local program planning make the most of their survey results. Readers are encouraged to keep their survey results close at hand as they read this guide and to refer often to these results. As you review them, think about how the results can help inform decisions regarding local program planning, implementation, and evaluation.

Statistical Issues

Validity and Reliability

A survey item is *valid* if it accurately measures the concept it is intended to measure. A survey item is *reliable* if it consistently produces the same results under the same circumstances. We attempted to maximize the validity and reliability of the Healthy Youth Survey (2008) by using questions from established surveys, discarding answer sheets containing unlikely or impossible results, and ensuring standardized administration procedures.

Nearly all the questions included in the 2002, 2004, 2006, and 2008 versions of the Healthy Youth Survey originated from 4 established surveys that have been used throughout the United States, some for more than 25 years: the Monitoring the Future survey sponsored by National Institute on Drug Abuse (2008), the University of Washington Social Development Research Group's Risk and Protective Factor Assessment instrument (Arthur, Hawkins, Catalano, & Pollard, 1998), the Centers for Disease Control and Prevention's Youth Risk Behavior Survey (2008), and the Centers for Disease Control and Prevention's Youth Tobacco Survey (2009). Each of these surveys has been subjected to scientific research regarding reliability and validity and has been field tested extensively. This field testing generally addressed such issues as the content and structure of the questions, the ordering of the questions, the types and ordering of the response options, and the survey length. In addition, a pilot version of Washington's Healthy Youth Survey was field tested during fall 2001, and information from this effort was used to refine and improve the survey. Most of the items on the 2008 edition appeared on previous versions of the statewide survey, although some were added or modified for the current administration.

The validity of self-report student surveys often comes under question, especially when reported rates of behavior seem higher than might be expected. Convincing evidence suggests, however, that when students are provided with a safe and confidential environment in which to respond, they take the survey questions seriously and answer

them honestly. Several steps were taken in the administration of the Healthy Youth Survey (2008) to ensure the validity of the student answers:

- The survey was administered during a single class period of the school day to eliminate the effects of discussion among students. No attempt was made to have absent students complete the survey at a later time.
- Students were informed of the importance of the survey and the adults administering the survey were instructed not to wander around the room as students marked their answers.
- Nowhere on the survey were students asked for their name or any other identifying information.
- Students placed their own completed answer sheets in an envelope that was then sealed.

During data processing and analysis further steps were taken to ensure the validity of the data. Student responses were carefully screened for evidence of falsifying a high level of substance use, answering dishonestly, or answering inconsistently.

How Can the Data be Used?

Schools can use the data from the Healthy Youth Survey (2008) to:

- learn the prevalence of health-related behaviors among youth;
- identify changes over time; and
- compare groups, such as youth in a school to youth in the state as a whole.

However, the usefulness of the data depends on several factors, described below.

What are confidence intervals?

Responses to the Healthy Youth Survey (2008) are displayed as a percentage of the students who gave an answer and a *margin of error* for the percentage (e.g., 83% plus or minus 5%), which can be used to form a *confidence interval*. Briefly, use of a confidence interval acknowledges that the percentage may be considered an estimate, and we can be reasonably certain (95% confidence intervals are used throughout the report) that the true percentage falls within the range defined by the confidence interval. Thus for a result of 83% plus or minus 5%, we can be 95% certain that the true percentage falls somewhere between 78% and 88%.

Confidence intervals give an estimate of how variable the results are. Specifically, the 95% confidence interval gives the range that contains the true value 95% of the time. The size of the confidence intervals in the Healthy Youth survey will be smaller when

- there are more students taking the survey and
- the prevalence rates are farther from a 50%/50% split.

For example, if 200 students take the survey and 30% report smoking (a core item on both Forms A and B), the 95% confidence interval will be around 24%–36% [that is, about \pm (plus or minus) 6%]. However, only half of the 200 students will answer the question on bicycle helmets, as this question is only on one of the forms. If 30% of the 100 students report wearing bicycle helmets, the 95% confidence interval will be around 21%–39% (that is, \pm 9%).

Why conduct significance tests?

Sometimes, people look at **trends** over time or **compare two groups**. A statistical test can tell you whether the difference between groups or over time is greater than would be expected by chance. Commonly, if a difference as large as the one we see occurs only 5% of the time by chance, we say that the difference is statistically significant. As the number of students taking the survey gets smaller, you need larger differences to rule out chance. For example, using a common statistical test, a statistically significant difference can be found comparing 30% to about:

- 21% if there are 200 students per group;
- 17% if there are 100 students per group; and
- 7% if there are 30 only students per group.

If a difference is not statistically significant it may be due to chance, making it more difficult to interpret.

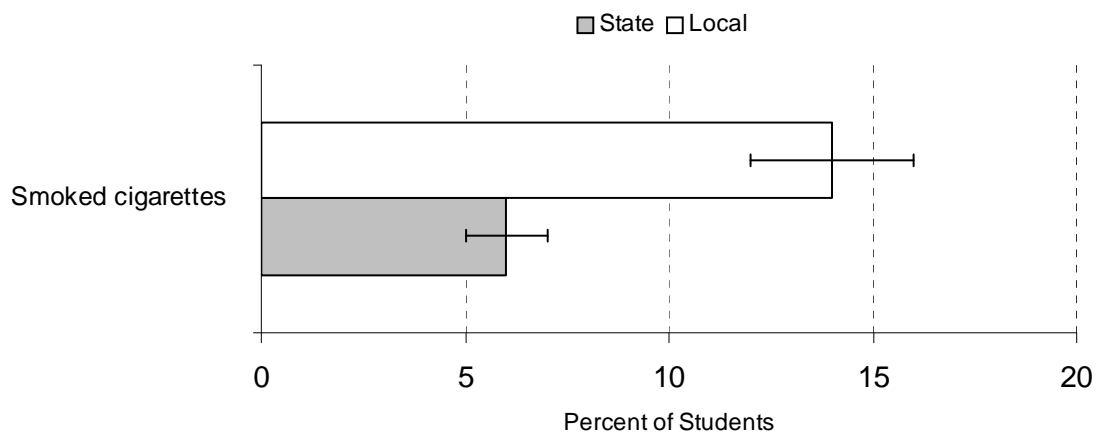
In some cases, we can also use confidence intervals to determine whether the difference between a local rate and the state sample is *statistically significant*—that is, whether the county truly has a different rate of a particular behavior from the state sample or the apparent difference was likely to have resulted by chance.

Using this approach, we examine whether the confidence intervals overlap each other, and whether either of them overlaps the point estimate (rate) of the other group. If the confidence intervals do NOT overlap each other, the difference is statistically significant, that is, it is probably not due to chance. If a confidence interval DOES overlap the point estimate (the rate) in the other group, there is not a significant difference. If the two confidence intervals overlap each other, but do not overlap the other point estimate, then it is necessary to do a statistical test to determine whether the two groups are different. (See <http://www.doh.wa.gov/Data/Guidelines/ConfIntguide.htm> for more information). An excel spreadsheet entitled “How to Determine if your Local Result is Different from the State Result” an “[Excel Tool for Determining Statistical Significance](#)” is posted at <http://www.hys.wa.gov/Reporting/Default.aspx#InformationTools> for this purpose.

Example 1

Suppose the percentage of students who smoked cigarettes in the past 30 days is $14\% \pm 2\%$ (between 12% and 16%) at Washington Middle School and $6\% \pm 1\%$ (between 5% and 7%) in the statewide sample (see Exhibit 1). Because the statewide smoking rate is unlikely to be more than 7% and the school smoking rate is unlikely to be less than 12%, we can reasonably certain that smoking rates at the school are greater than those statewide. Note that in Exhibit 1 the error bars at the end of each bar of the graph *do not* overlap, and the difference is considered statistically significant.

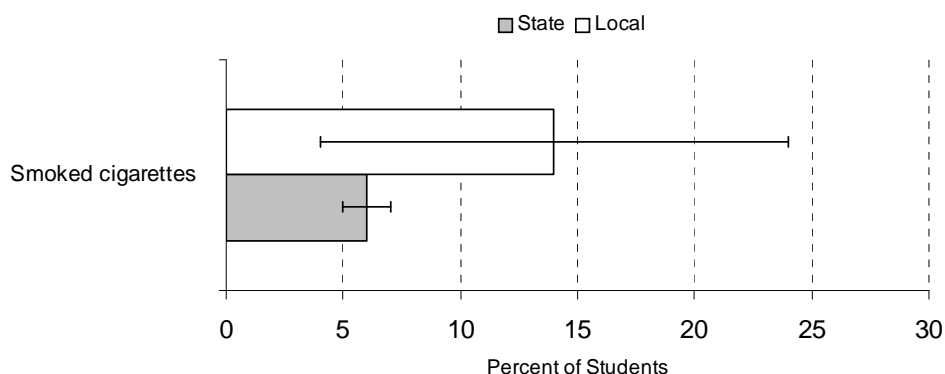
Exhibit 1



Example 2

If the margin of error for Washington Middle School in Example 1 were 10% rather than 2%, then the true smoking rate could fall anywhere between 4% to 24% (see Exhibit 2). Thus the school rate could be less than the statewide rate (e.g., 5% compared to a statewide rate of 7%), more than the statewide rate (e.g., 20% compared to a statewide rate of 7%), or the same as the statewide rate (e.g., both 7%). Note that in Exhibit 2 the error bar at the end of the bar for the local sample *does* overlap the point estimate for the state sample, and the difference is not considered statistically significant. As noted earlier, if the confidence intervals overlap each other but not the point estimates, it is necessary to do a statistical test to determine whether the difference is statistically significant.

Exhibit 2



Readers should note that differences in results may be considered from either a statistical or a practical point of view. *Statistical significance* is influenced by several factors including the number of students who participated in the survey and how similar or different the answers the students gave were. *Practical significance* is a judgment of whether differences are programmatically meaningful. For instance, the difference between a school smoking rate of 11% and a statewide rate of 10% could, depending on the margins of error, be statistically significant. From a practical point of view, however, this difference is probably not large enough to justify programmatic changes at the school. Readers are encouraged to consider both the practical and statistical significance of their results and not to focus on small differences that may be statistically, but not practically, significant.

Summary

To help interpret data, reports of the Healthy Youth Survey 2008 include 95% confidence intervals. As long as there are not a lot of missing data (such as non-participating classrooms) and there are at least 15 valid surveys per grade, the Healthy Youth Survey 2008 can provide **prevalence** estimates of behaviors among students at your school. Generally, larger schools will have smaller confidence intervals, indicating more precise estimates. In looking at **trends** over time or **comparing two groups**, confidence intervals will give an idea of how much difference is needed to detect a difference, but more formal statistical tests may be needed.

Reading Your Local Reports

The following topics are covered in the local report, as detailed in its Table of Contents:

- General information.
- Alcohol, tobacco, and other drug use.
- Other health concerns.
- School climate.
- Quality of life.
- Risk and protective factors.

Additional information about each topic area appears in the Healthy Youth Survey (2008) Analytic Report of the statewide survey results. For general information about these topics, readers are encouraged to contact the sponsoring agencies or to visit the websites of relevant federal and state agencies.

Survey Versions

The survey was administered in 3 versions, as Exhibit 3 details.

Exhibit 3

Form	Level	Content
A	Secondary (Grades 8, 10, and 12)	Core items Risk and protective factor items
B	Secondary (Grades 8, 10, and 12)	Core items Health behavior items
C	Elementary (Grade 6)	Subset of the core items Subset of the noncore items from both Forms A and B

Two secondary versions were administered to allow for a greater number of questions to be asked in the limited time allotted (one class period). Certain *core* items were

included on both versions. Both versions were administered in every participating secondary classroom, with alternating students receiving Form A or Form B. The elementary version was shorter and less detailed. All 3 versions had a tear-off page with optional questions.

Items from all 3 survey versions were combined and presented by topic in the local report. Although no version of the survey included more than 149 items (Form A had 149, Form B had 125, and Form C had 97), a total of 265 items were administered and are included in the local report.

Number of Respondents

The “Number of students surveyed” on page 1 of the local report refers to the total number of survey forms that were submitted and scanned. The “Number of valid surveys” refers to those surveys retained after the data were run through a variety of validity checks and surveys found to be invalid were removed. Only the results of the valid surveys are presented in your report. The estimated participation rate is also reported. This rate compares the number of valid surveys to the number of students enrolled, based on the most recent enrollment figures available at the time the sample was drawn. This means that for the 2008 survey, the participation rates in the reports are based on October 2007 enrollment figures. If your enrollments have changed since 2007, you can obtain more exact response rates by comparing the number of valid surveys to the October 2008 enrollment figures.

The number of respondents is also listed for each survey item. The number of respondents to a specific item is usually fewer than the number of valid surveys and differs between items for several reasons:

- In Grades 8, 10, and 12, only core items were included on both versions of the survey; consequently, items included on only one version could be completed by, at most, half of the students.
- Some optional items were presented on a tear-off page, which could be removed from the survey at the discretion of the school or district. Some students were presented with these items to complete whereas others were not. These items are marked with a dagger symbol (†) throughout the report.

- Any student may have chosen to skip any item. Further, any student may have made a mark on the answer sheet that was too light for the scanner to read or marked more than one answer; in both cases the response was treated as if the item had been left blank.
- The survey was lengthy and students may not have reached the end, so that items near the end of the survey were generally completed by fewer students. Because the survey was given in 3 versions (and the items were ordered differently in each), questions near the end of the local report may or may not have been near the end of the survey completed by the students (e.g., the last item on Form A of the survey is numbered 177 on the local report, the last item on Form B is numbered 96, and the last item on Form C is numbered 70.)

Highlights of the Local Results

The Highlights section provides a summary for quick reference. The sponsoring agencies chose to highlight items they felt would be of interest to the majority of readers. The same items are highlighted in all reports and were not specifically chosen for your school, district, county, or ESD.

Selected Results by Gender

Selected items are presented by gender to highlight any differences between females and males. The p -values reported after each item can be used to examine whether differences in the local data between females and males are statistically significant (see the Healthy Youth Survey [2008] Analytic Report for more details). To ensure student anonymity, local results are suppressed in cases where any cell (e.g., females who reported smoking) represents fewer than 10 students.

Item Results

As Exhibit 4 demonstrates, each question in the report is reprinted as it appeared in the survey booklet along with the corresponding answer choices.

**Exhibit 4
Sample Item**

5. What language is usually spoken at home?	Local		State	
	<i>(n = 511)</i>		<i>(n = 8,543)</i>	
a. English	87.9%	(± 4.9%)	83.6%	(± 3.5%)
b. Spanish	2.3	(± 2.2)	6.9	(± 2.7)
c. Russian	1.7	(± 2.0)	1.3	(± 0.4)
d. Ukrainian	1.7	(± 2.0)	0.6	(± 0.2)
e. Vietnamese	0.6	(± 1.2)	1.2	(± 0.6)
f. Chinese	0.6	(± 1.2)	1.3	(± 0.4)
g. Korean	0.0	(± 0.0)	1.0	(± 0.6)
h. Japanese	0.6	(± 1.2)	0.4	(± 0.2)
i. Other	4.6	(± 3.1)	3.6	(± 1.0)

To the right of each question are 4 columns showing local and statewide results. (Results for a school, district, county, or ESD are referred to as *local* results. This term is used to differentiate these results from the *statewide* results.) The first column displays the percentage of local students who selected each answer choice. The second column displays the margin of error for the percentage. In Exhibit 4, for example, 87.9% plus or minus 4.9% of the local students spoke English in the home. The third and fourth columns contain comparative statewide results and margins of error based only on the results of those students from the schools drawn for the statewide sample. Note that 511 local students and 8,543 students in the state sample responded to this item.

Item results may be presented with asterisks (*) replacing the numbers for 3 reasons:

1. No students responded to the item. The item may have been on the optional tear-off sheet, near the end of the survey, or simply skipped by all of the students.

2. Item 68 (Overweight): This item poses a challenge to student anonymity because being overweight is a visibly identifiable trait. Consequently, local results were suppressed at the building level. These results are provided at the district, county, and ESD levels.
3. Select results by gender: Breaking down the students' responses by gender poses a challenge to student anonymity. If, for example, only one girl in a building at a certain grade took the survey, she would be uniquely identified in this section. Consequently, local results were suppressed for these items if any cell (i.e., item in the results table) represented fewer than 10 students.

Readers are advised that item wording may have changed over time and results may not be comparable across survey administrations. For example, the item regarding 30-day alcohol use changed wording in 1998 and 2000; and the items regarding turning to someone when sad or hopeless, and attempting suicide, changed wording in 2006.

Risk and Protective Factors

The risk and protective factor model of prevention, pioneered by Drs. Hawkins and Catalano (Hawkins, Catalano, & Miller, 1992), has been applied to the prevention of alcohol, tobacco, and other drug use and other problem behaviors. Several risk and protective factors have been identified and grouped into 4 domains: community, family, school, and peer-individual. The University of Washington's Social Development Research Group developed questions used in the Healthy Youth Survey (2008) to examine the students' levels of risk and protection. More information about the risk and protective factors is available at <http://www.hys.wa.gov> "Reports of State and Local Results."

Using Your Data

Readers are encouraged to consider the following approach to reviewing their report prior to delving into the details of individual survey items.

Implement a Review Team

Using a team approach to reviewing your report can help you make the greatest use of your results. Ideally, the team will include representatives of many segments of the community such as district staff, school staff, community service agencies, law enforcement, parents, and students themselves. There are many advantages to using a team approach, one of which is that each member of the team can contribute his or her own perspective on problems and their solutions. In addition, a broad-based team conveys the message that the entire community is responsible for promoting adolescent health rather than it being the sole responsibility of a single institution (e.g., schools or school districts). Some common steps in the team approach include the following:

- **Create a core leadership group.** This group is made up of key persons who are knowledgeable about or interested in student health risk behaviors and will respond to the challenge of addressing the identified health risk behaviors.
- **Assess needs and resources.** The core leadership group will need to determine which student behaviors are of concern due to the severity and frequency of those behaviors. In addition, the group will want to identify the services that are available to help youth live free of alcohol, tobacco, and other drugs.
- **Develop a prevention and intervention plan.** After determining needs and resources, the core leadership group will want to develop a plan that addresses behaviors of concern. This plan should address stated goals and measurable objectives related to the behaviors identified as highest priority.
- **Implement the plan.** The first step in implementation is to gain key leader and community support for the plan. The plan can be implemented once support has been obtained.

- **Evaluate the plan.** The core leadership team should conduct ongoing evaluation of the programs implemented to fulfill the prevention and intervention plan. Key elements of the evaluation include (a) identifying those with an interest in the program (i.e., the stakeholders) and involving them in the evaluation, (b) posing evaluation questions related to the program's goals and objectives, (c) deciding what data to collect and how to collect those data, (d) analyzing the data that have been collected, and (e) preparing and disseminating reports.

Look at the Survey Results as a Whole

Because the survey covers a variety of topics, you should familiarize yourself with the report in question before reading it in detail. First, look at the cover and the top of the first page of the report to determine whether you are looking at an ESD, county, district, or school report. Next, look at the Table of Contents to see the major groupings of questions.

Become Familiar with the Survey Questions

Once you have identified the major survey topics, you can become better acquainted with the individual survey questions. At this point you should go directly to the topic area that is of greatest interest to you and read each of the questions in that area. Notice that the questions are grouped within the topic areas. This organization helps make the large number of questions more manageable. Because many items address more than one topic, you should also consult the index on the last page of the report to locate additional items related to your topic of interest.

Find Questions of Interest

You may make decisions about which questions are of greatest interest once you are familiar with the content of the survey and have a sense about where in the report each content area is covered. Any local prevention or intervention program will be able to address only a limited number of concerns. In addition, when speaking before a group or preparing a written report, you are encouraged to limit the presentation to those few results of the most immediate interest. Items may be selected for further presentation

and discussion because of program-related interests, special concerns or interests, or noticeable differences in comparison to other data.

Communicate the Results

A wide variety of audiences may be interested in learning about the survey results, and different audiences will be interested in different topics. Nelson, Brownson, Remington, and Parvanta (2002, pp. 213–215) outlined a 9-step planning guide for communicating public health information:

- What is the scientific evidence (i.e., describe the problem to be addressed, the strength of the scientific evidence, and the extent of the scientific consensus behind the communication activity)?
- Why is the communication necessary (what is the purpose of the communication)?
- Who is the audience (primary, secondary, and tertiary)?
- What is the message (the main idea condensed into 1 or 2 sentences)?
- How and where should the message be delivered?
- When should the message be delivered?
- Implement the communication plan.
- Did the audience receive the information and was it effective?
- Other considerations (e.g., resources, other priorities, barriers).

You may also wish to consider the Single Overriding Communication Objectives approach to communicating information (Howard, 2000). This approach involves identifying the key point of the message, the 3 facts you would like the audience to remember, who the main audience is, the single message the audience needs to take away from the communication, and a primary point of contact for further information.

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