



**Washington State
Healthy Youth Survey**

Bias Analysis 2008

2008 Healthy Youth Survey Data

WASHINGTON STATE DEPARTMENT OF HEALTH

Healthy Youth Survey

Bias Analysis



Prepared by Washington State Department of Health

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Bias 2008

Overview

Overview Survey responses are often used to estimate the frequency of behaviors or other characteristics in a population larger than those who actually completed the survey. Thus, while only a portion of public school students took the Healthy Youth Survey (HYS) in 2008, we would like to use their responses to characterize all 6th, 8th, 10th and 12th graders in Washington. This is only possible if (a) participants and non-participants are similar in their behaviors, or (b) participation rates are sufficiently high that any differences between participants and non-participants do not affect the survey results (the overall prevalence estimates). If results are affected by non-participating students being different from participants, we say that the survey is biased and we are then limited in our ability to generalize the results to all students. Bias represents systematic error and is different from the random fluctuation that is measured by confidence intervals.

The analyses described below suggest that students who do not complete the questionnaire differ from those who complete the survey on several dimensions, but that rates of survey completion are sufficiently high that these differences do not appear to dramatically affect overall prevalence estimates. Additionally, we did not identify bias on the "tear-off" questions either from schools not administering these questions or from student non-completion of these items.

From our analyses of bias for the 2002 and 2004 HYS, which we did not repeat for the 2008 HYS, it is likely that the 2008 HYS cannot be generalized to students who attend alternative schools. Thus, we conclude that the results of the 2008 HYS can be generalized to all public school students in 6th, 8th, 10th and 12th grades **who do not attend alternative schools**.

Potential Sources of Bias in the 2008 Healthy Youth Survey

There are three potential sources of bias in the 2008 HYS, including differences between:

- Schools that participate in HYS and those that do not. In 2002 and 2004, we did extensive comparisons between participating and non-participating schools. We did not find differences between participating and non-participating schools, except alternative schools were less likely than other schools to participate, and they also generally serve higher risk students. Thus, the results did not appear to be representative of students in alternative schools. We did not redo these analyses in 2008; however, it is likely that this same caution applies to the 2008 HYS. School response rates were considerably higher (87 percent in grade 6, 88 percent in grade 8, 83 percent in grade 10, and 75 percent in grade 12) in 2008 than when the survey began in 2002, increasing the likelihood that results can be generalized to non-alternative public schools in Washington.
- Schools that complete the optional "tear-off" questions at the end of the survey and those that do not. Among participating schools, approximately 15-30 percent by grade did not complete the optional "tear-off" questions at the end of the survey, raising the potential for bias for these items.
- Students who complete the questionnaire in the time allotted and those who do not. Because students who complete the survey might differ from those who do not complete the survey on factors asked about in the survey, we assessed whether estimates from items at the end of the survey accurately reflect estimates for all public school students (not attending alternative schools) in grades 6, 8, 10, and 12.

Methods of Assessing Bias

In order to assess possible bias related to administration of the tear-off and non-completion of the main part of the questionnaire, we conducted statistical tests (chi-squares) comparing students who

- Completed the first item in the optional tear-off to those who did not among students who completed the last question on the main body of the survey, before the optional questions. The purpose was to examine whether students in schools that administered the optional tear-off differed from students in schools that did not.
- Completed all of the last 30 questions at the end of the main body of the Form B survey to those who omitted 3 or more items. The purpose was to examine whether students who did not complete the main body of the questionnaire differed from those who did complete it. We selected the last 30 questions because a student might try to finish by skipping items; we reasoned that missing 3 or more items would be more likely to reflect non-completion than missing 1 or 2 items, which might be skipped for other reasons such as unwillingness to report.
- Completed all of the last 20 questions at the end of the Form C survey to those who omitted 3 or more items. The purpose was to examine whether students who did not complete the main body of the questionnaire differed from those who did complete it. For Form C, we selected the last 20 questions instead of 30 questions because Form C is considerably shorter than Form B.

We compared student responses to five questions that appear relatively early in Form B. These questions include:

- Language spoken in home (English or another language)
- Average grades (an average of B or higher or lower than B)
- Smoked cigarettes in the past 30 days (yes or no)
- Drank alcohol in the past 30 days (yes or no)
- Feel safe at school (mostly/definitely true or mostly/definitely not true)

We selected the questions on language and grades, because they are potentially linked to the ability to complete the survey. The questions on cigarettes, alcohol, and feeling safe at school were selected because they occur relatively early in the study, have high completion rates, and are among the most frequently used survey measures. The questions about smoking cigarettes, drinking alcohol, and feeling safe at school were completed by 99-100 percent of the students receiving Form B in grades 8, 10 and 12; the questions about language spoken at home and grades were completed by 91-95 percent. The questions about smoking cigarettes, drinking alcohol, and feeling safe at school were completed by 99 percent, 96 percent and 88 percent of the students receiving Form C, respectively. The question about language spoken at home was completed by 83 percent and the question about grades was completed by 81 percent of students receiving Form C.

Differences were considered statistically significant if the probability of finding a difference as large as the one measured would be expected to occur fewer than five times out of 100 (i.e. $p < 0.05$) by chance alone. We conducted

- 20 analyses for the assessment of possible bias related to administration of the tear-off: one for each of the five items listed above, assessed separately for grades 6, 8, 10, and 12.

- 20 analyses for the assessment of possible bias due to non-completion of the main part of the questionnaire: one for each of the five items listed above, assessed separately for grades 6, 8, 10, and 12.

Consideration of chance findings due to multiple comparisons is discussed, when needed, below. These analyses included students who took Form B of the survey (to maximize comparability with previous years) and Form C (because this form now had the most non-completion). We expect that Form A would have similar bias to Forms B and C.

Results and Conclusions

Optional "tear-off" questions

None of the 20 comparisons achieved significance, suggesting that responses to the optional questions were not biased by differences between schools that tore off and schools that administered these questions. The form B tear-off contained 11 questions and the Form C tear-off contained 8 questions. Almost all (97 percent in grade 6, 94 percent in grade 8, 97 percent in grade 10 and 98 percent in grade 12) of students who began the "tear-off" questions completed the last three items on the tear-off, so that individual non-completion of the tear-off questions does not appear to contribute significant bias.

Failure to Complete Survey

Ten out of the 20 comparisons achieved statistical significance, which is more than would be expected by chance. Significant differences were:

- 6th graders completing Form C were more likely to speak English in the home, have grade averages of B or higher, and feel safe in school compared to non-completers
- 8th graders completing Form B were more likely to speak English in the home, have grade averages of B or higher, be non-smokers, and feel safe in school compared to non-completers
- 10th graders completing Form B were more likely to have grade averages of B or higher, and feel safe in school compared to non-completers
- 12th graders completing Form B were more likely to feel safe in school compared to non-completers

Even though we identified several significant differences between survey completers and non-completers, because the rate of survey completion was high, these did not dramatically affect the prevalence estimates for any of the 5 items examined (none of the prevalence estimates for any of the 5 items for any grade changed by more than 1-2 percent when non-completers were excluded). Thus, it appears that likely that the overall prevalence estimates results for the items at the end of the survey are generalizable, despite differences between completers and non-completers.

Due to concerns about survey length in previous administrations, the questionnaires for grades 8/10/12 (particularly Form B) were shortened in 2008. In 2008, at least 85 percent of 8th graders, 89 percent of 10th graders, and 92 percent of 12th graders completed each of the last 30 items on Form B and at least 86 percent of 6th graders completed each of the last 20 items on Form C. Shortening the surveys improved the completion rates compared to previous years, and strengthens our conclusion that the results of the survey can be generalized to public school students in Washington state.