Oregon Healthy Teens 2001
METHODOLOGY

The Oregon Department of Human Services and the Department of Education had several operational goals for the 2001 Oregon Healthy Teens (OHT) survey:

1) Ensure voluntary and confidential participation for students and parents;
2) Provide a single survey framework encompassing topics of risk behavior and influences on youth behavior for a comprehensive look at youth well-being;
3) Obtain a participation rate of at least 60 percent from the randomly selected statewide samples;
4) Meet the criteria of the National Cancer Institute grant through which the survey project was primarily funded;
5) Collect a general 9th-12th grade sample for comparison to national Youth Risk Behavior Survey data; and
6) Allow as many Oregon public high schools and middle schools as possible the opportunity to participate, ensuring our ability to provide localized reports to schools and counties.

Participation in the OHT was *voluntary* at every level. District school superintendents were initially contacted in the fall of 2000 to invite their participation and to request permission to contact their school principals. If district approval was obtained, the school's principal was contacted to obtain approval and the name of a survey contact. Schools and districts received a copy of the 2001 questionnaire.

Three weeks prior to the survey, parents/guardians receive a letter asking permission for their student to fill out the questionnaire. The mailings included pre-paid postcards to send back to Oregon Research Institute (ORI) if the parent or guardian wished to refuse consent. Copies of the survey were available at the school and on the Internet for parents who wished to have more information about survey content. In addition, surveys could be mailed on request.
Trained staff from the Oregon Research Institute administered the survey. Students were informed that the survey is anonymous and that they could choose to participate or not, and also that if they did participate, they could skip any question if they did not want to answer it.
All consent forms and survey sections have been approved by the Institutional Review Board (IRB) at Oregon Research Institute and meet the strict guidelines of the U.S. Department of Health and Human Services Office for Research Protections.

Study Design

The study design reflects the information needs of state agencies and local groups, SB555 planning goals, and the NCI-funded statewide tobacco prevention evaluation study, which provided the largest source of funding for the statewide survey. For these reasons, the OHT used a prospective, nested, three-year longitudinal study design, with a cluster sampling frame compatible with existing state and federal surveillance systems, and used a modular survey approach to incorporate a larger set of questions/data items.

Questionnaire Development
The topics and items in the questionnaire were chosen to collect information about a wide range of health risk behavior, and additional aspects of adolescent well-being, such as factors influencing student behavior. Aspects of youth functioning to be monitored were identified based on evidence about the most common and costly problems of youth (Biglan, Brennan et al., in press) and research on indicators of positive youth development (Benson, 1990; Benson, 1998, National Research Council & Institute of Medicine, 2002). Items came from the Youth Risk Behavior Survey (Kann et al., 2000), the Communities That Care assessment (Arthur, Hawkins, Pollard, Catalano, & Baglioni, Jr., 2002), and questionnaires developed at ORI in previous studies of tobacco use (Biglan, Ary, Smolkowski, Duncan, & Black, 2000) and other substance use (Metzler, Biglan, Ary, & Li, 1998).

Modular Survey Approach
Because of the number and variety of questions and topics that were required for measuring key indicators (Oregon Benchmarks, SB555, HP2010, state action plans), providing information for the NCI-funded tobacco evaluation grant, and providing comparison to past surveys, the working group decided to use a series of 6 modules, with students receiving a demographic section, plus three randomly assigned modules. Thus, the survey is constructed of approximately 20 alternate forms, and any given item is on half of the forms. These forms were provided to participating students, at random, in approximately equal numbers within a given classroom. As such, each item is completed by a simple random sample of (approximately) half the students in the total sample of 8^{th} and 11^{th} graders.

The Survey items fall into 6 interest domains:

A. Alcohol and Other Drug use (35 questions)
B. Sexual Risk Behaviors/Body Image/Nutrition/Exercise and other activities (49 questions)
C. Risk/Protective Factors I (community/school/family) (65 questions)
D. Risk/Protective Factors II (peer/individual) (68 questions)
E. Tobacco Program—Access and Prevention issues (~90 questions)
F. Violence/Anti-social behavior/harassment/unintentional injury (60 questions)

Cross tabulations within a domain are computable on half the sample. Demographic items are gathered on the entire sample; therefore, cross tabulations of responses with demographics is also always possible for any given item. Cross-tabulations (correlations) can be computed between any two of even three domains (in addition to demographics). Although it is not possible to simultaneously compute multi-way cross tabulations across more than 3 domains at the individual level, analytical models with all items from all 6 domains are computable at an aggregate level, or by using a combined pair-wise correlation matrix and generalized inverse at the individual level.

Pilot tests of the surveys were conducted in August 2000. Results indicated that students in 6^{th}-12^{th} grades would be able to complete the Demographics plus three randomly assigned modules without difficulty in almost all cases.

However, a few alternate format surveys were also created to provide the opportunity for participation to those with reading and/or vision difficulties; one is a shortened version, and the other is a large print version. In addition, a Spanish language version was administered to approximately 160 students in 2001.

Sampling Plan

The overall 2001 OHT survey sample design was the combination of two parallel, but distinct studies. The NCI-funded study proposed taking a representative random probability sample of public schools in the state and assessing the 8th and 11th grade students in school with tobacco prevention programs, and schools without these programs. This group is referred to as the OSAS (Oregon Student Assessment Survey) sample.

The second sample of 9th-12th grade classes was designed for comparison to national Youth Risk Behavior Survey data, and therefore followed national YRBS protocol. The goal of the overall sampling plan was to conduct the two studies in the same set of schools during the 2000-2001 year, and maximize usefulness to the schools. Drawing the statewide YRBS high school sample first, and then extending the sample within each funding strata up to the required numbers and grades for the OSAS study accomplished this.

8th and 11th grade OSAS sample

Sampling

For the representative random sample of 8th and 11th grade students attending public schools, 91 high schools and their associated 'feeder' middle schools were randomly selected. Eleventh grade was selected because it fit with the prior Student Use survey design, and because a single grade of either 10th or 11th was considered a more feasible measure, operationally, than total high school enrollment. Selection of middle schools was based on the "school cluster" concept; the goal was to focus on 8th graders attending middle schools from which most students eventually would attend the selected high schools of the same district.

The NCI-funded tobacco evaluation plan called for schools in the sample to be surveyed for three consecutive years. Schools that committed to the three-year participation received a $500 incentive from the Oregon Research Institute.

Stratified Sampling

A multi-stage, stratified cluster sample design was used. The sampling strategy was similar to that used in previous statewide surveys in Oregon schools (the *Oregon Public School Drug Use Survey* from the state's Alcohol and Drug Prevention program and the *Youth Risk Behavior Survey* from the Centers for Disease Prevention and Control), at least for the second and third stages of stratification. First, however, Oregon public schools were stratified into two sub-groups of interest, those in districts receiving school program tobacco funding from the state of Oregon, and those schools that didn't receive funding. Stages of stratification and clustering are listed below.

Stage 1:
Sampling Frame. School clusters (the primary sampling unit) were defined as a High School (any school with 11th grade enrollment) and its associated 8th grade feeder schools. The potential sampling frame consisted of all 304 public school clusters with an eleventh grade enrollment as listed in the Oregon Department of Education's 1999-2000 school directory. Seventy-eight Alternative/special education schools (with a total of 1,554 11th graders) were eliminated as ineligible for the study due to scheduling and other issues. An additional 5 schools with 8th or 11th grade enrollment less than 10 students were also eliminated from the frame because of small size. The 5 schools included a total of 37 11th graders. Therefore, there were 221 school clusters within the final sampling frame, representing a total 11th grade enrollment of 38,402 students and associated 8th grade enrollment of 41,572 students.

Stratification. These clusters were stratified into two groups, based on the district's 2000-2001 funding status as listed by OHD Tobacco Prevention and Education. There were 55 clusters with active tobacco funding and 166 without.

Stage2:
School cluster selection. The sampling strategy in OSAS study was different in the two strata. Tobacco funded schools were requested to allow their 8th and 11th graders the opportunity to participate in the OSAS survey as a condition of funding. Therefore, in the tobacco-funded strata, all schools with grades 8 and/or 11 were targeted for collection, that is, a census of the schools, with the exception of the Portland Public Schools. In that district, because of its relatively large size and administrative structure, 4 of the 10 eligible clusters were selected at random, with probability proportional to size. In addition, one very small second High School (n=12) in the Hood River County District was not targeted. The resulting target sample for student data collection was 48 clusters.

For un-funded schools, the sampling procedure was designed to allow equal probability, or the same chance of selection, for each high school student in the listed Oregon schools of the sampling frame, but schools were selected with a probability proportional to their enrollment size. Therefore, larger schools were more likely to be in the sample, because they have a greater number of students. 30 clusters were initially selected at random as part of the Oregon YRBS sample (see below). The SAS statistical package Proc SurveySelect was used to select an additional 13 clusters, again with probability proportional to enrollment, from those remaining in un-funded strata. The resulting target sample for un-funded schools was 43 clusters.

Replacement. If the school administrators of any school in a selected cluster declined participation, the entire cluster was replaced with a randomly selected cluster from the same county, if one was available, or with a cluster from a similar sized county if not.

Stage 3:
Student selection within schools. At each selected school cluster, the entire 8th and 11th grade cohort was asked to participate in the survey.

Participation
Some school districts or individual schools declined to participate in the Oregon Healthy Teens survey. Reasons for not participating included general competition for classroom time,

operational stresses related to the "Oregon Certificate of Mastery (CIM)" testing, an evaluation of both students and the school system, scheduling, anticipated controversy over specific questions or topics, and anticipated or actual local school board concerns or opposition.

Within the funded strata, 42 of the 48 target school clusters completed the survey at Time 1 (2000-2001 school year) for a school cluster participation rate of 87%. Three of the participating clusters agreed only to a single year of survey administration.

Within the un-funded strata, 24 of the original 43 selected clusters participated (56%). In the replacement round of recruitment, 13 of 24 selected replacement clusters (54%) participated, for a total of 37 participating clusters out of 67 selected (55%).

Nine additional clusters or partial clusters volunteered for participation. In general, these volunteer participants were additional schools in districts with randomly selected clusters for whom district administrators wanted additional local data. Data from partial and volunteer school clusters were not counted as part of the 8^{th} and 11^{th} grade study sample, and therefore their data are not included in the reporting of weighted data for the state.

The school cluster sample participation rate in 2000-2001 was 79 of 115 selected, or 69%. Student participation was 85.6%, with 12.8% of students absent on the day of the survey. An additional 1.6% did not participate because either they or their parents declined the survey.

Weighting

Base Weight. Each student's data was weighted to reflect his or her deferential selection probability within strata. These are termed the base, or design, weights and are simply the inverse of the selection probability. Within the tobacco-funded strata, with the exception of Portland public, the selection probability of the clusters was 1.0, so clusters in that stratum received a weight of 1. (In Portland, the selection was 4 of 10, so the weight for those PSU's is 10/4=2.5.)

With in the un-funded strata, the selection probability in terms of PSU's (clusters) was 67/166 or .403, which includes the 43 initial and 24 replacement randomly selected clusters. The strata weight is then 166/67=2.48.

Within the funded Portland district, and for the entire un-funded strata, clusters were sampled proportional to size, and as such are self weighting. No additional design weight for schools is necessary as long as a constant fraction of students within a cluster is selected. In both strata, half the students are selected to answer any given item, so an addition weight of 2 could be applied to each student, as a product with the strata weight. However, because this is a constant for all students, doing so has no impact.

Response Adjustment. While the design weights represent the design, adjustment for PSU non-response is necessary to reflect the difference between the planned and actual sampling probabilities. In general, this adjustment is calculated as the inverse of the participation probability among those selected, which is the ratio of the number selected to the number participating. In the funded strata, 6 of 48 PSU's did not participate, including 3 of the 4 selected in Portland. The PSU response adjustment is then 4/3 in Portland PSU's, and 38/35 in the remaining funded PSU's. Within the un-funded strata, the PSU adjustment is 67/37.

In each school, all the students within the target grades 8 and 11 were invited to participate in the survey. The majority of those who did not participate were absent from class, and in some cases either the student or parent declined participation. A non-response adjustment was calculated as the ratio of the number enrolled to the number surveyed, which varied in each school and grade. The number surveyed was counted as those students receiving a survey and having a valid response for the question about grade. Cases for which the number of surveys collected in the grade within a school was less than 5 had their weights set to zero (missing). Cases with other item missing, inconsistent or outrageous response patterns were not eliminated from weight calculations.

Post Stratification Adjustment. Sampling in both design strata was done without regard to county. In order to accurately reflect the relative distribution of students across counties, a post stratification weight using the ratio of the number of students within a county to the number collected in that county, at each grade, was applied. This adjustment factor varied for each county. There were three counties where no data was collected: Malheur, Josephine, and Lake.

Relative Weight. The final weight is the product of the base weight, the non-response adjustments, and the county post stratification, divided by the mean of those weights. The final division makes the weights relative or normed weights, the sum of which adds to the actual sample size. Weights were normed within grade.

High school (9-12th grade) YRBS comparison sample

Sampling

Using PCSample, a Westat software tool provided by the Division of Adolescent and Student Health at CDC, forty high schools were randomly selected with probability proportional to enrollment size. The sampling procedure was designed to allow equal probability, or the same chance of selection for each high school student in the listed Oregon schools of the sampling frame, but schools were selected with a probability proportional to their enrollment size. Therefore, larger schools were more likely to be in the sample, because they have a greater number of students. Most of these schools were also part of the 8th and 11th grade sample. With respect to the NCI-related study, thirty of the selected high schools were in the un-funded strata, and 10 were in the funded strata.

Following national YRBS protocol, each of the forty high schools who agreed to participate was asked to provide a list of all classes either during the same class time, or for a subject required for all students, so that each student would have an equal probability of being selected. This list was used to randomly select between one to four classes for participation from each school, depending on school size.

For the 9th-12th grade sample, a slightly different approach was needed in order to comply with national YRBS protocol. All students in this group received one survey version only, which included the A, B, and F modules.

Participation

Of the 40 randomly selected schools, 18 chose to participate following the national YRBS protocol. The school participation rate was therefore 45 percent. Another three schools from this YRBS sample agreed to participated for the 11th grade sample, and so a subset of their 11th graders also received the A, B, and F modules. In addition, eight other schools requested to participate in the survey for grades 9-12.

Thus "the 9-12th grade sample" describes the group of 29 schools who participated in this YRBS comparison. This sample is not a statistically random sample of Oregon high schools, but rather a mix of 18 randomly selected and 10 volunteer Oregon high schools. The student participation rate in the 29 schools was 83.9%, with 14.7% absent for the sampled classes, and an additional 1.4% who declined or whose parents declined.

Weighting

Base Weight. YRBS-sampled high schools were sampled proportional to size, and therefore are self-weighting, with respect to enrollment size. For the purposes of High School Sample weight calculations, the volunteer schools were considered as random with regard to school enrollment size, and were included as simple self-weighting replacements. However, within each school the number of students (classrooms) selected varied, so a base weight for selection probability within a school was calculated using the ratio of the number of students enrolled to the number of students selected. The base weight varied for each selected school.

Response Adjustment. Not all selected schools and/or students participated. Response adjustments to the base weights were calculated as the reciprocal of the ratio of the number of participating schools to the number selected plus volunteered, and the number of participating students per school/grade to the number enrolled.

Module Adjustment. The weights for the High School Sample are also adjusted to account for the number of modules (forms) distributed per school. In general, one form, with modules A, B, and F was used in the subset of selected grade 9, 10, 11 and 12 YRBS-sampled classrooms. For the remaining 11th grade students in the YRBS-sampled schools, all classrooms participated and all 20 forms were used. The volunteer schools also tended to use all 20 forms in all grades, and survey the entire grade level rather than selected classrooms.

In order to make use of all the collected data, weight adjustments were used on those students that received modules A, B, or F to account for the different number of forms distributed at the different schools and grade levels. This was done by calculating a separate weight adjustment for each module, A, B, F, and M (demographics) per grade within a school as the ratio of the number of modules distributed to the number of students enrolled. The number surveyed was counted as those students receiving a survey and having a valid response for the grade question, which in some cases was imputed from the student's classroom grade. Cases where the number of students taking a module within a school/grade level was less than 5 were not counted and their weighs were set to zero (missing), unless the total grade enrollment for the school was less than 25, in which case weights were calculated. Cases with other item missing, inconsistent or outrageous response patterns were not eliminated from weight calculations.

Post Stratification Adjustment. Because not all grades were assessed in all schools, and because sampling was done without regard to relative grade sizes, post stratification on grade size (9-12) was done to accurately reflect the actual grade distribution in the state. This was done by calculating a post stratification adjustment as the ratio of total number enrolled per grade, statewide, to the number collected.

Relative weight. The final weights are the product of school/classroom design weights, the response and module adjustments, and the grade enrollment post stratification. The final weights yield state population totals (counts) per grade. There is a weight for each module, A,B,F and M (demos). The sample weighted consists of all surveys from 29 selected/assessed high schools that had grade 9-12 data collected.

Editing Plan

Did Oregon Teens Tell the Truth?
Studies indicate that most young people are truthful in answering anonymous health surveys. Most of the Oregon Healthy Teens survey questions come from studies that have demonstrated good test-retest reliability in prior research, so we expect that the majority of students understand the questions and have the ability to recall the information requested (Brener et al., 1995; Metzler et al., 1998; O'Mally, Bachman, & Johnston, 1983).

In addition, the Oregon Healthy Teens project follows research recommendations to identify and eliminate the invalid records (generally a very small group) before using the information for analysis and prevalence reporting (Pokorny et al., 2001). Although a small number of participants may have misunderstood questions or deliberately misrepresented their true behavior, edits have removed the most egregious cases. Specific computer syntax was created to verify the validity of responses. Out of the 24,582 surveys from participating 8th – 12th graders, 502 (2.1%) were excluded based on validity criteria relating to inconsistent response patterns among related items, and/or dubious responses. The threshold for inconsistencies was 10% of the total possible inconsistencies by survey version.

Inconsistencies and Dubious Responses
'Dubious response' describes the total excessive risk behavior reported by a student. While it can be expected that highest risk students report multiple risk behaviors, we can also weed out students who did not take the survey seriously by looking at how many extreme answers in a row were chosen. Because of the modular design, outlier/dubious response analysis grouped items within a topic area. Within the A, B, and F modules, variables were created to count outlier answers within a topic area (e.g., lifetime drug use, initiation of risk behaviors). The threshold for dubious response items was 20% of the total possible outlier/dubious responses by survey version.

Table 1 shows the number of records eliminated by Editing Criteria, in the OSAS 8th and 11th grades, and the YRBS-related sample, respectively.

	8th Grade		**11th Grade**		**9th-12th Sample**	
Editing Criteria	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Total Scanned Surveys	**11260**	**100.00**	**7636**	**100.00**	**7895**	**100.00**
Eliminated due to:						
Inconsistent response pattern	121	1.12	51	0.68	49	0.48
Dubious responses	106	0.92	66	0.78	81	1.31
Both Inconsistent and Dubious	17	0.20	7	0.04	11	0.09
Total Eliminated Surveys	**244**	**2.23**	**124**	**1.50**	**141**	**1.88**
Total Usable Surveys	**11016**	**97.77**	**7512**	**98.50**	**7754**	**98.12**

Among valid records, inconsistencies within a topic area were resolved by setting to missing the inconsistent items in the edits process. In general, the first item in of the related set was used as the standard (i.e., no change was made to the answer in the standard, or key indicator, but if student had inconsistent answers in related questions, and their survey was still within the validity threshhold, the inconsistent answers in the set of related questions were changed to missing). There was no recoding or setting to missing of potential ‘dubious responses’ among valid records, since these already fell within an acceptable threshold.

Editing and prior youth surveys

In both the OSAS (8^{th} and 11^{th} grade) and YRBS-based 9^{th}-12^{th} grade samples, about 2% of the surveys were eliminated during the editing process. Editing criteria changed from the 1999 YRBS survey and 1998 Oregon Public School Drug Use Survey from which 9% and 6% of surveys were excluded, respectively. However, one of the major changes in editing criteria in 2001 was that surveys where students had neglected to answer the questions about gender or grade were kept as valid records.

Gender unknown accounted for 7.4% or 2,074 of the total records. The high missingness in this item was believed to be related primarily to question placement rather than student intention to leave the item blank. Therefore, data includes male, female, and a ‘gender unknown’ group, all of which are included in total prevalence estimates.

Where possible, missing grade information was imputed, or filled in, from the classroom administration information. Therefore, grade unknown accounts for 0.49% or 136 of the total records. Only 10 records had both gender and grade items missing. Because all general reporting was done by grade within weighted sets (the OSAS--8^{th} and 11^{th} grade dataset, and the YRBS-related 9^{th}-12^{th} grade dataset), records with missing grade are not included in calculating total prevalence estimates.

References

Arthur, M.W., Hawkins, J.D., Pollard, J.A., Catalano, R.F., & Baglioni, A.J., Jr. (2002). Measuring risk and protective factors for substance use, delinquency, and other adolescent problem behaviors: The Communities that care youth survey. *Evaluation Review, 26*(6), 355-381.

Benson, P. L. (1990). Help-seeking for alcohol and drug problems: To whom do adolescents turn? *Journal of Adolescent Chemical Dependency, 1*(1), 83-94.

Benson, P.L. (1998). Mobilizing communities to promote developmental assets: A promising strategy for the prevention of high-risk behaviors. *Family Science Review, 11*(3), 220-38.

Biglan, A., Ary, D.V., Smolkowski, K., Duncan, T.E., & Black, C. (2000). A randomized control trial of a community intervention to prevent adolescent tobacco use. *Tobacco Control, 9*, 24-32.

Biglan, A., Brennan, P., Foster, S., Holder, H., Miller, T., Cunningham, P., et al. (In press). *The problems of multiple-problem youth*. New York: Guilford.

Brener, N.D., Collins, J.L., Kann, L., Warren, C.W., Williams, B.I. (1995). Reliability of the Youth Risk Behavior Survey Questionnaire. *American Journal of Epidemiology*, 141:575-580.

Kann, L., Kinchen, S.A., Williams, B.I., Ross, J.G., Lowry, R., Grunbaum, J.A. et al. (2000). Youth Risk Behavior Surveillance - United States, 1999. *Morbidity and Mortality Weekly Report, 49*(SS-5), 1-94.

Metzler, C.W., Biglan, A., Ary, D.V., & Li, F. (1998). The stability and validity of early adolescents' reports of parenting constructs. *Journal of Family Psychology, 12*(4), 600-19.

National Research Council & Institute of Medicine (2002). *Community programs to promote youth development*. Washington, DC: National Academy Press.

O'Mally, P.M., Bachman, J.G., & Johnston, L.D. (1983). Reliability and consistency in self-reports of drug use. *The International Journal of the Addictions*, 18:805-824.

Pokorny, S.B., Jason, L.A., Shoeny, M., Curie, C.J., Townsend, S.M. (2001). Eliminating invalid self-report survey data. *Psychological Reports*, 89:166-168.