

Methodology



2013 BC ADOLESCENT HEALTH SURVEY

The BC Adolescent Health Survey, first conducted in 1992, was developed to monitor the health and risks facing BC youth, and to inform health care planning and health promotion with young people throughout the province. The survey has been repeated with new cohorts in 1998, 2003, and 2008. The latest, fifth cycle of the survey was conducted in 2013.

As with previous cycles, the survey was developed and implemented with consultation and support from government agencies and community partnerships throughout the province, and engaged youth, parents, schools, school districts, health care providers, and other professionals who work with youth in the process. This approach, a form of *participatory epidemiology*, helps ensure the survey is relevant and useful for a wide range of stakeholders.

Survey development

The questionnaire for the 2013 BC AHS includes most of the topics from previous cycles, to track trends among BC students, plus new questions on emerging health issues. The choice of topic areas was based on feedback from 22 forums held with community stakeholders, education, health or social service representatives, government branches, and young people throughout the province, as well as from adolescent health researchers from universities across Canada and internationally.

For a list of the rationale for questions on the survey, and sources of the questions, see the report, *Question Rationale & Sources* www.mcs.bc.ca/ahs.

Many of the questions on the survey were kept from previous versions to capture trends; a few were modified

slightly, based on experience from the previous cycles. Several new questions were added in response to the community forums, including questions about sleep, young carers, and concussions. New questions were primarily drawn from existing measures that had been validated in other youth surveys, but a few were created for this survey. These were tested for comprehension and clarity in focus groups with youth.

The full questionnaire was pilot-tested with more than 70 youth from a range of ages, backgrounds, and education experiences, to make sure it was clear, made sense, and could be completed in 45 minutes by most students.

More detailed information on the psychometric properties of the questions used in this and previous cycles of the survey is available on request.





Target population and sampling

The target population for the 2013 BC AHS included all 259,138 students who were enrolled in grades 7 through 12 in regular public schools during the 2012/13 school year. The sample design was similar in size and scope to that used for previous cycles. The sample frame was, in essence, a list of all classrooms in the province, stratified by geography and by grade (7 through 12). Independent random samples of classrooms were selected in each region/grade stratum. All students enrolled in each selected classroom fell into the sample.

The sampling frame used the BC Ministry of Education list of all schools, which included enrolment counts by grade for the 2012/13 school year. The BC AHS is designed to produce statistically reliable estimates at each grade level, for each of 16 Health Service Delivery Areas (HSDA), which aggregate to the larger Health Authority (HA) areas.

The frame was stratified geographically by these regions, and then by grade. Sample sizes were calculated for each of these strata to ensure that the resulting regional estimates by grade would have maximum standard errors averaging 3.5%. In sparsely populated HSDA, the maximum standard error allowed was 4%; in the denser areas, it was 3%.

Because of these very specific geographic requirements, the sampling rate was not constant for all areas of the province. It varied from 1 in 3 classrooms for HSDA with small student populations, up to 1 in 15 for those with large populations.

Within an HSDA, the required sample was allocated to each school district, in proportion to the district's enrolment. The sampling of classrooms from a district's schools was roughly proportional to the schools' enrolments. This meant that within an HSDA, all students had roughly the same probability of selection, regardless of their grade level, the size of the school they attend, or the size of the enrolment in their particular school district.

Participation by school districts was voluntary. The 2013 BC AHS was conducted in 56 of the 59 districts, which contain 98.48% of all students enrolled in grades 7 through 12 in public schools across the province.

In order to maintain the sample size required for each HSDA, classrooms selected for non-participating districts were reassigned to other randomly selected schools from participating districts in the same HSDA (maintaining the equal probability of selection for students). This sample re-allocation technique was used in all HSDA of the province. In total, 42,453 students from 1,645 different classrooms, in 443 different schools were selected for the BC AHS 2013 sample.

Survey administration and data collection

Data collection for 2013 was similar to that used for the previous cycles. Data collection occurred in schools between February and June 2013. Public health nurses, nursing students and other trained staff were responsible for the data collection. The survey procedures were approved by the Behavioural Research Ethics Board of the University of British Columbia (#H12-02630).

In classes selected for the survey, letters were sent home for students and their parents, describing the survey, topics covered, and the voluntary nature of student participation. In many districts, additional notice was sent via the school email system, on school newsletters, and mentioned in news stories or editorials in the local newspapers. Parents could review the survey questionnaire at the school office, or parents and students could see a detailed list of the topics and their rationale (without actual question wording), as well as background information on the history of the survey and the uses of the data on the McCreary website.



School districts opted for one or both of two forms of eliciting consent:

1. Parental notification and student consent, or
2. Parental and student consent.

In districts with parental and student consent, the letter home included a consent form for parents to sign; students in the sampled classrooms were only allowed to participate if they returned the signed form. In school districts with parental notification, parents were encouraged to talk with their students about their decision to participate, but unless the parent explicitly refused for the student to participate, students made the final choice. Two school districts chose parental notification for older students, and signed parental consent for younger (Grade 7) students.

Participation was completely voluntary, anonymous and confidential. Student names were not recorded, and students were instructed not to put their names on the questionnaires, which were sealed after completion. In school districts requiring parental consent, consent forms were kept separately from surveys. Students received a card at the end of the survey with information about health resources, including Kids Help Phone, and the McCreary website.

The survey was administered in school classrooms or lunchrooms during regular school hours. A public health nurse, nursing student, or other trained administrator was on hand to provide instructions for completing the questionnaire, to answer student questions, and to ensure response privacy. Survey administrators were given standardized instructions on how to administer the survey and answer questions. Administrators also collected information on classroom enrolment, absenteeism, and parent or student refusals, for use in calculating response rates and weighting the survey data. Surveys were returned sealed to McCreary, where they were checked individually before data entry.

Sample representation: coverage and response rates

The coverage rate is the proportion of the target population covered by participating school districts and so actually represented by the sample. The coverage of the 2013 BC AHS is excellent, with the survey conducted in 56 of 59 school districts containing, in total, 98.5% of public school students in grades 7 to 12. The 1.5% of the student population not covered by the survey is too small to have any appreciable effect on provincial estimates.

The three non-participating school districts were small, but two were in the same northern HSDA, resulting in a coverage rate of 76% in Northwest. Despite this, the aggregate coverage rate for the Northern Health Authority was a very respectable 94%. The third non-participating school district was located in the Fraser East HSDA, resulting in a coverage rate of 85% for this area. Still, the aggregate coverage rate for the whole Fraser Health Authority was an excellent 97%. Coverage rates were 100% for all other areas of the province.

For school surveys such as this, the target sample consists of all the students enrolled in the 1,643 classrooms that were randomly selected from among all of the classrooms in the participating school districts. The response rate represents the percentage of students enrolled in the selected classes that completed the survey and provided useable information. Where the response rate is less than 100%, the difference is usually accounted for by the proportion of enrolled students who did not take the survey for one of the following reasons:

1. They were absent on the day the survey was given (the most common reason);
2. Their parents either failed to provide a consent form or refused their consent; or
3. The students themselves refused consent (most often because they had already completed the survey in a previous class).

For the 2013 BC AHS, the overall response rate for the province was 70%. In school districts requiring signed parental consent, the resulting response rate was just 53%. On the other hand, in school districts that permitted parental notification, the response rate was 82%, and in the two school districts that required signed parental consent for 7th graders and parental notification for the older students, the response rate was 75%. These differences suggest that a significant portion of non-response occurred because students or parents failed to return consent forms. In fact, in districts requiring signed parental consent, nearly 1 in 3 students failed to return consent forms to the school by the survey day, while only 8% of parents actually refused their consent. Any differences between students who returned consent forms and those who did not may be a source of bias, but this bias cannot be accurately measured.

The vast majority of school districts opted for parental notification and student consent. In these, absenteeism is the largest source of non-response (14%), and any differences between students present or absent on the survey day may have a slight effect on the results. The incidence of other sources of non-response (student refusals, incomplete questionnaires, interviewer miscounts, etc.) was relatively low and is not likely to affect the estimates.

There was little variation in response rates by grade, indicating that the target population's grade structure is well represented by the overall sample. Response rates did vary among HSDAs, according to whether an area's school districts had opted for signed parent and student consent or parental notification and student consent. This was anticipated at the survey design stage and these areas were oversampled to ensure there would be adequate respondents. Two of the HSDAs had response rates of approximately 45%. In the remaining 14 HSDAs, the response rates were above 63%. Aggregation of HSDAs into Health Authority areas results in improvements in sample representation with respect to both survey coverage and response rates. Any regional or grade differences in coverage and response rates were accounted for in the weighting.



Response rates by consent type and reason for non-response

	2012-13 enrolment	Students in sampled classes	Absent	Parent refusals	Consent forms not returned	Student refusals	Response rate	Incomplete or Unusable	Usable
Participating school districts (SD)* (56/59)									
Combination (2/59)	13,320	1,483	12%	5%	5%	2%	75%	0%	1,101
Parental consent (11/59)	92,465	16,745	9%	8%	31%	1%	53%	0%	8,869
Parental notification (43/59)	150,940	24,225	14%	0%	0%	2%	82%	0%	19,862
Total participating SDs	256,707	42,453	8%	3%	12%	2%	70%	0%	29,832
Non-Participating SDs (3/59)	3,925								
Provincial total - All SDs	260,632								

*Other:= reason for not completing survey is unknown, i.e., consent form returned but student absent, student had unique educational needs (ESL, special needs) or surveyor miscounted

Data processing and weighting

Some of the students' data records were deleted from the final sample during the data cleaning stage. This was done to maximize the validity and accuracy of the survey estimates. Only 82 survey records were deleted based on one or more of the following criteria:

- Respondents who provided a number of inconsistent, contradictory or joking answers;
- Respondents who exhibited response set biases across one or more sections of the questionnaire.

Survey data from the 29,832 students who provided valid data have been weighted so that they provide an accurate representation of all 260,632 public school students in grades 7 through 12 in all regions of the province, including those attending schools in non-participating school districts. The weight attached to each respondent ensures his or her appropriate representation, and can be thought of as the number of students in the population that the respondent represents. The weight is the product of three broad factors:

- The probability of selection (i.e., being in a classroom randomly selected for inclusion);
- The non-response adjustment;
- Population readjustments, used to ensure population representation according to provincial region and grade level.

Just as the sampling rates and school district coverage rates vary geographically, so do the weights. As a consequence, accurate results can only be produced from the 2013 BC AHS sample if the weights are used.

Missing data


As in all surveys, respondents occasionally refuse, or are just unable to provide a valid response to every question. Examples include 'don't know', 'not sure' or 'does not apply' responses, as well as instances of not providing any answer at all (e.g., leaving it blank). Levels of this type of non-response to individual questions on the BC AHS are very low, in general about 1% to 3% of the sample. Unless such non-responses are greater than 10%, they are usually not mentioned in reports and fact sheets from the survey. But where 'don't know' or 'not sure' is an informative response, such as with knowledge questions, this response option is routinely reported.

Release criteria and significance testing

Survey estimates from the 2013 BC AHS, in the form of proportions or percentages, are based on a sample of students who were randomly selected. Somewhat different figures might have been obtained if a complete census of the target population had been conducted. The difference between an estimate based on a sample and the value obtained from a census taken under similar conditions (i.e., same questionnaires, administration procedures and data processing methods) is called the sampling error. An indication of the size of the sampling error, or the relative precision of an estimate, can be estimated from the sample itself, using a measure called the standard error (SE).

The complex design of the BC AHS sample makes it inappropriate to calculate standard errors based on simple random sampling theory. The exact standard errors for BC AHS estimates for all cycles of the survey have been calculated using SPSS Complex Samples software. For the majority of analyses, Complex Samples software is also required for statistical testing.





The publication or release of estimates from the BC AHS is governed by the size of their standard errors:

- Survey estimates with SE's less than 5.00 are published without qualification.
- Survey estimates with SE's between 5.00 and 12.49 are published with reservation because of potentially high sampling variability (indicated by a * to denote the estimate should be used with caution).
- Survey estimates with SE's exceeding 12.50 are suppressed (indicated by a #) to denote that they are not releasable.

Survey estimates may also be suppressed to guard the anonymity of respondents. This may occur in lower levels of geography (e.g., HSDA or school district) and for rare events or characteristics. For instance, in a table of ethnic origin for a small HSDA, a particular ethnic origin might be so rare (i.e., the percentage estimate so small) that releasing it would increase the chances of identifying particular respondents. In this instance, the estimate would be suppressed, as would the estimate for another ethnic origin, so that the data could not be derived by subtraction.

Differences in proportions or percentages between groups are tested for statistical significance before they are noted in the text of reports or fact sheets. These include comparisons of subgroups within the survey (e.g., comparisons by gender or by grade), as well as comparisons between the 2013 BC AHS and previous cycles of the survey.

Because of the large sample for the BC AHS in each of its cycles, many of the differences observed may well be statistically significant, but have no program or policy importance. There is also the risk, when multiple analyses are done, that a few will be significant through random chance. The best way to avoid this is to ensure that there is a theoretically sound hypothesis for any differences tested. Therefore, among the various reports and fact sheets produced from the BC AHS, not all statistically significant differences are reported; however, any differences that are noted in the text have been tested for statistical significance.

Finally, all survey estimates published from the BC AHS in fact sheets and community reports have been rounded to whole numbers, as this aids readability and provides an appropriate level of precision. Due to rounding, however, the percentages shown in some figures and tables may not always sum to exactly 100%. Papers published in professional journals will usually include more precise numbers, with two decimal places, as well as test statistics, confidence intervals, and where relevant, effect sizes.

Comparability of the 2013 BC AHS to previous cycles

From a methodological perspective, there are two aspects of the 2013 BC AHS where differences from previous cycles could affect comparisons:

- Differences in the coverage of the population of students in grades 7 through 12 in public schools.
- Differences in response rates (and potential non-response bias) caused by the number of school districts requiring signed parental consent, coupled with the high rate of consent forms not returned.

Coverage of the student population in grades 7 through 12 increased steadily in the first three cycles of the BC AHS, to a high of 72% in the 2003 survey. Coverage improved dramatically to 92% in the 2008 survey due to the participation of two larger school districts (Surrey and Delta) for the first time. Coverage for the 2013 BC AHS is nearly 100%, with the addition of Abbotsford and five other school districts throughout the province. This strong improvement over the last two cycles raises a concern of whether the 'covered population' is essentially the same for all five cycles, and thus, whether trends can be tracked with accuracy.

Prior to the release of the provincial highlights report in both 2008 and again in 2013, analyses were undertaken to see whether this coverage improvement had a large enough impact on the estimates to warrant a caution about comparability. We compared key outcomes both with the new school districts in the calculations and without, to see if there were any significant shifts in the estimates. The estimates were not significantly different in any of the analyses, and usually did not differ by even 1%.

The shifts in some districts to signed parental consent, with its lower response rates, raises a different concern. Studies over the past two decades have shown that student reporting of some risk behaviours, such as alcohol or drug use, and some risk exposures, like physical or sexual abuse, may be lower in school surveys that require signed parental consent compared to the same surveys that allow parental notification. For example, youth with higher risk profiles may have difficulty getting parental signatures, and therefore would not have the opportunity to respond to the survey. Additionally, students may have lost or forgotten the consent form. While only about a third of students were from school districts with signed consent in 1992, 1998, 2003, and 2013, in the 2008 survey, fully half of the students were from school districts requiring signed parental consent.

There is also the issue of school districts changing the consent type across the cycles. While many school districts kept the same consent procedures from prior cycles, several school districts shifted from parental notification to signed parental consent, and some shifted from signed consent to parental notification. This raises concerns about being able to test trends over time at the Provincial, Health Authority, or HSDA level.

In order to test whether changes in consent procedures between 2003, 2008 and 2013 would affect trends at the Provincial, Health Authority, or HSDA level, we conducted further tests around sensitive items, comparing the direction of trends in school districts whose type of consent did not change, compared to those who shifted to the other form of consent, and those who were new to the survey. As expected, those from signed parental consent districts had slightly different percent estimates than those from parental notification districts in some items, but the trends remained the same direction (increasing, decreasing, or unchanged) for all outcomes we tested.

Unfortunately, we cannot report trends for some HSDAs where there were large scale changes in consent procedures. This is because we cannot be sure whether any differences in proportions between the years represent true population changes or are due to the change in the type of students who completed surveys. Thus, only some of the regional reports can include trends.

1992 1998 2003
2008 2013

PARTICIPATING SCHOOL DISTRICTS

Northern Health Authority

28 Quesnel
50 Haida Gwaii
52 Prince Rupert
57 Prince George
59 Peace River South
60 Peace River North
81 Fort Nelson
82 Coast Mountains
91 Nechako Lakes
92 Nisga'a

Fraser Health Authority

33 Chilliwack
34 Abbotsford
35 Langley
36 Surrey
37 Delta
40 New Westminster
41 Burnaby
42 Maple Ridge-Pitt Meadows
43 Coquitlam
78 Fraser-Cascade

Vancouver Coastal Health Authority

38 Richmond
39 Vancouver
44 North Vancouver
45 West Vancouver
46 Sunshine Coast
47 Powell River
48 Sea To Sky
49 Central Coast

Vancouver Island Health Authority

61 Greater Victoria
62 Sooke
63 Saanich
64 Gulf Islands
68 Nanaimo-Ladysmith
69 Qualicum
70 Alberni
71 Comox Valley
72 Campbell River
79 Cowichan Valley
84 Vancouver Island West
85 Vancouver Island North

Interior Health Authority

05 Southeast Kootenay
06 Rocky Mountain
08 Kootenay Lake
10 Arrow Lakes
19 Revelstoke
20 Kootenay-Columbia
22 Vernon
23 Central Okanagan
27 Cariboo-Chilcotin
51 Boundary
53 Okanagan Similkameen
58 Nicola-Similkameen
67 Okanagan Skaha
73 Kamloops/Thompson
74 Gold Trail
83 North Okanagan-Shuswap

FOR FURTHER INFORMATION

In-depth analyses and psychometric testing of measures in the 2013 BC AHS are ongoing. If you have additional questions about some aspect of the survey results, please contact the McCreary Centre Society:



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DOWNLOAD THE REPORT

From Hastings Street to Haida Gwaii: Provincial results of the 2013 BC Adolescent Health Survey and other McCreary resources are available free for download on our website:



www.mcs.bc.ca

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