

2023 BC Adolescent Health Survey: Methodology



The BC Adolescent Health Survey (BC AHS) is an anonymous, comprehensive youth health survey of students in BC public schools. The survey monitors the health-promoting and health risk behaviours of youth in Grades 7–12 (aged 12 to 19 years old), and is used to inform policies and programs for young people.

The BC AHS has been conducted approximately every 5 years since 1992. The seventh wave was administered in 2023. Over the past 30 years, more than 207,500 BC youth have participated in the survey.

Survey development

The 2023 survey instrument contains questions on a wide range of topics including physical health, mental health, substance use, sexual health, school experiences, relationships, experiences of violence, nutrition, leisure activities, and material deprivation. The majority of items were based on earlier cycles of the BC AHS, in order to capture trends over time. The 2023 survey also included new items on emerging health issues which were identified in partnership with youth, parents, schools, health care providers, and other experts in youth health. These new questions addressed issues such as housing instability, food security, cultural pride, impacts of the COVID-19 pandemic, life skills, sleep hygiene, and sources of information about mental health and sexual health. The survey questions were drawn primarily from existing validated measures with youth, and are described in a fact sheet entitled *2023 BC Adolescent Health Survey: Question topics and sources* available at mcs.bc.ca/about_bcahs.

The 2023 BC AHS marked the first time the survey was available in French, and in an online format, as well as in English and pencil-and-paper format. Before survey administration began, the questionnaire was pilot-tested in all formats. The pilots included about 600 youth from diverse communities across BC with a range of backgrounds, ages, and life experiences. Piloting ensured the survey could be completed in a single 45-minute class period, that the online format was accessible to students in a classroom setting, and that questions were clear and understandable to young people.

Target population and sample allocation

The sample design for the 2023 BC AHS was similar in scope to that used for previous waves of the survey. The sampling frame was essentially the 2022/23 BC Ministry of Education’s list of all BC public school classrooms stratified by geography and by grade. The target population for the 2023 BC AHS consisted of 1,039 public schools and included all 272,865 students enrolled in Grades 7–12 in the 2022/23 school year. It excluded students enrolled in private schools, alternative education programs, custody centres, provincial resource centres, distance education, continuing education, electronic delivery schools, and those being home schooled. As in previous cycles, ungraded students (1.3% of the population) were prorated across the graded enrolments to produce the final target population numbers.

Target population: Mainstream public schools—September 2022 enrolment (ungraded prorated)	
Grade	Population
Grade 7	42,552
Grade 8	45,349
Grade 9	45,865
Grade 10	47,431
Grade 11	45,871
Grade 12	45,797
Total	272,865

The 2023 BC AHS was designed to produce statistically reliable estimates at each grade level, for each of the province’s 16 Health Service Delivery Areas (HSDAs). Sample sizes were calculated to ensure these grade-level regional estimates would have maximum standard errors ranging from 3% in larger HSDA/grades to around 4% for smaller ones. It was determined that an approximate overall sample of 28,700 would meet the precision requirements. This included a separate allocation for Conseil scolaire francophone (SD 93) which has schools distributed throughout the province.

For each HSDA and grade, the required sample size (number of respondents) was allocated proportionately to the school districts in that HSDA. Three school districts were split across HSDA boundaries and this was accounted for in the calculations. The required number of respondents in each region/grade was then increased to account for expected non-response based on the 2018 BC AHS response rates for the school district's chosen consent procedure. The resulting sample of students was translated into classes to be sampled. A maximum sampling rate of approximately every third class was used for operational reasons. This had to be relaxed in the case of very small SDs.

All but one of BC's 60 school districts chose to participate in the 2023 BC AHS, and some school districts elected not to have students from selected grades participate (see "Coverage rates" for more details). The target sample for the 2023 BC AHS consisted of all the students enrolled in the 2,316 classrooms that were randomly selected from among all of the classrooms in the participating school districts and grades. Several school districts across the province opted for an oversample or census of students, which essentially constituted 'extra' sample beyond that allocated to the district.

Survey administration

As in previous waves of the BC AHS, data collection occurred in schools between February and June 2023. The survey procedures were approved by the Behavioural Research Ethics Board of the University of British Columbia (#H22-03063).

Participating school districts opted for either parental notification and student consent, or signed parental consent and student consent procedures for student participation. In districts with signed parental consent, students in the sampled classrooms were only eligible to participate if they returned a consent form signed by their parent/guardian. In school districts with parental notification, students exclusively made the decision to participate, unless the parent explicitly refused for the student to participate. Of the 59 participating school districts, 55 chose parental notification and student consent; three chose signed parental consent and student consent; and one district chose parental notification for secondary students, and signed parental consent for middle school students.

School districts also had the choice of having the survey administered to students using a pencil-and-paper format or an online format. Seventeen districts chose a paper administration, 41 chose an online administration, and one district opted for a mixed format with both paper and online administrations. Among school districts that chose an online administration, 7% of students completed the survey on paper due to technical difficulties or a preference for doing so.

In classes selected for the survey, letters were sent home for parents/guardians describing the survey, topics covered, and the voluntary nature of student participation. In many districts, additional notices were sent via the school email system and school newsletters. Parents and students were invited to view 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. Parents could also review the survey questionnaire at the school office or with McCreary staff online.

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 the case of paper administrations and submitted electronically to a secure server for online administrations. In school districts requiring parental consent, consent forms were kept separate from surveys. Students received a card at the end of the survey with information about helplines and other resources, including Kids Help Phone and the McCreary website.

The survey was administered during regular school hours by a public health nurse, nursing student, or other trained administrator, who was also available 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.

Sample representation

Coverage rates

The coverage rate is the proportion of the target population covered by participating school districts and that is actually represented by the sample. The overall coverage of the 2023 BC AHS is considered to be excellent at 97.6% of public school students in Grades 7–12.

Of the 60 school districts in BC, one school district chose not to participate. In addition, five school districts chose not to have Grade 7 students participate and one school district did not have their Grade 8 students participate. The resulting non-participation undercoverage rate was 2.3%. For operational reasons, the minimum class size for sampling was generally set at 10. The elimination of very small classes added slightly to the undercoverage rate and was distributed widely across the province.

With respect to HSDAs, the non-participation of Grade 7 students in five school districts resulted in undercoverage rates for Grade 7 students in these HSDAs ranging from 5% to 21%. The non-participation of Grade 8 students had a small impact on the undercoverage rate for the individual HSDAs (up to 0.4%). The overall coverage rates for all but one of the 16 HSDAs were approximately 97% or greater. One HSDA had a coverage rate of 42% (and a coverage rate of 36% among Grade 7s) due in large part to the non-participation of a single school district in that region.

Response rates

The response rate represents the percentage of students enrolled in the selected classes that completed the survey and provided useable information. The 2023 BC AHS was completed by 38,740 students, with 53% doing so online and the remainder on paper. Therefore, about 1 in 7 public school students in Grades 7 to 12 participated in the survey. All paper surveys were screened individually before data entry; while online surveys were screened from the online database. During the data cleaning process 252 surveys (0.5% of students enrolled in the selected classes) were removed due to limited, unusable, or joking responses. This left a final sample of 38,488, resulting in an overall response rate for the 2023 BC AHS of 71%.

Where the response rate is less than 100%, the difference is generally accounted for by the proportion of enrolled students who did not take the survey because they were absent that day (16%), they did not provide written parental consent to participate (where this was required; 8%), their parents did not want them to participate (2%), or the student themselves did not wish to participate (2%).

Response rates and reasons for non-response by school district’s chosen consent procedure

	2022–2023 enrolment	Students in sampled classes	Absent	Parent refusals	Consent forms not returned	Student refusals	Incomplete or unusable	Usable	Response rate*
Participating school districts (59/60)									
Parental consent (4/60) [†]	50,425	13,496	12%	8%	33%	1%	0.2%	7,103	53%
Parental notification (56/60) ^{†‡}	219,763	40,660	18%	1%	NA	3%	0.6%	31,385	77%
Total participating school districts (59/60)	270,188	54,156	16%	2%	8%	2%	0.5%	38,488	71%
Non-participating school districts (1/60)									
	2,677								
Provincial total— all school districts									
	272,865								

*Other reasons for not completing the survey were unknown and may have included consent form returned but student absent, student had unique educational needs (ELL, special needs), or surveyor miscounted.

[†]One school district used a combination of both signed parental consent and parental notification procedures; this district elected not to have Grade 7 students participate in the survey.

[‡]Four additional school districts elected not to have Grade 7 students participate; and one school district elected not to have Grade 8 students participate in the survey. NA: Not applicable as forms did not need to be returned in the case of parental notification.

Response rates for the BC AHS had been steadily improving up until 2018. However, the provincial response rate for 2023 was lower than the 2018 cycle. This difference can be partially accounted for by the increase in absenteeism reported in classrooms. As well, the percentage of student refusals increased in 2023, which supports anecdotal comments from survey and school administrators related to 'survey fatigue' (i.e., students being asked to participate in a number of different surveys). Response rates generally decreased for older grades, more so with parental notification than parental consent. There was little variation within consent types by whether surveys were completed on paper or online. Response rates varied among HSDAs (from 57% to 88%, with four HSDAs falling below 70%).

As with previous versions of the BC AHS, analyses are undertaken to see whether changes in consent procedures and school district participation had a large enough impact on the estimates to warrant a caution about comparability. These analyses are completed at the provincial, Health Authority, and Health Service Delivery Area level as appropriate, and any concerns are noted with reported results, where necessary.

Weighting

Data from each of the 38,488 valid student surveys was weighted and scaled to provide an accurate representation of the 272,865 students in BC's 60 school districts. The weight indicates how many students in the population each respondent represents, and must be applied to the BC AHS sample to ensure accurate results. As has been the case in previous cycles, the BC AHS data was weighted based on the probability of selection, non-response adjustment, and population readjustments. Thus, any regional or grade differences in coverage and response rates were accounted for in the weighting.

For the 2023 BC AHS, as much as possible, respondents within a particular grade and HSDA were given the same weight based on the assumption that all respondents within a school district/grade would have approximately the same weight, and that weight would be approximately equal to the overall weight at the HSDA/grade level. However, special weighting was used in some HSDAs to correct for imbalances in over-/under-representation, usually due to some school districts within an HSDA opting for a census or oversample of their students. In addition, separate weighting was applied to respondents in Conseil scolaire francophone (SD 93). The weights ranged from 1.1 to 26.0 with a mean weight of 7.1. One weight of 26.0 occurred in an HSDA where a grade did not participate; otherwise, the remainder of the weights did not exceed 14.2.

Release criteria and statistical testing

The release of percentage estimates from the BC AHS is governed by the size of their standard errors (SEs). Generally, percentage estimates with SEs less than 5.00 are published without qualification, those with SEs of 5.00–12.49 are published with caution because of potentially high sampling variability (indicated by a * in community-friendly publications), and those with SEs exceeding 12.50 are suppressed.

Estimates may also be suppressed to guard the anonymity of respondents (e.g., if the number of respondents in a category is so low that deductive disclosure is possible).

Differences in proportions or percentages between groups are tested for statistical significance before they are released.

Because of the large sample for the BC AHS, observed differences between estimates may well be statistically significant, or may even be significant through random chance, but have no program or policy importance. Some significant findings may therefore not be reported if there is no theoretically sound hypothesis for their occurrence. However, any differences that are noted in the reported results have been tested for statistical significance.

In contrast to simple random sampling, the complex sample design of the BC AHS requires that statistical software take factors such as the stratification, cluster sampling, and weighting into account in order to produce accurate standard error estimates and statistical testing. Statistical analyses of the BC AHS are performed using SPSS Complex Samples software.

For enquiries about the methodology or the BC AHS, please email: mccreary@mcs.bc.ca.

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