Health survey of secondary school students in Nunavik – UVIKKAVUT QANUIPPAT? 2022

Survey methodology

Québec

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Warning

The estimated proportions provided in this report are rounded to the nearest decimal in the tables and to the nearest unit in the text, with the exception of those inferior to 5%, which include a decimal. Proportions with a decimal of .5 are rounded up or down, depending on the following decimal. Because of this rounding of decimals, the total of all proportions may be slightly superior or inferior to 100%.

Table of Contents

Introduction

The methodology used to perform a survey contributes to the production of reliable results. The survey design as well as the data gathering and data processing phases also influence survey results. An understanding of methodological elements allows for adequately interpreting results and estimating their quality, scope and limitations.

Survey objectives

While the overall goal of the survey was to measure the health status of secondary school students in the Nunavik region, it also specifically sought to:

- obtain a picture of the mental and physical health, lifestyle habits and social adaptation of secondary school students in Nunavik;

- gather data on secondary school students for the purpose of examining the links between their health status or lifestyle habits and their individual characteristics;

- produce estimates for the Hudson Coast and Ungava Coast sub-regions.

The survey aimed to generate quality data that will allow for supporting and enhancing the programs and action plans developed to improve the health of Nunavik youth.

Structure of the methodological report

The six sections of this document address the primary elements of the survey methodology. Section 1 presents the survey design and Section 2 describes the strategies adopted and the results obtained during the data gathering phase. Section 3 focuses on data processing, namely the validation and imputation process, the weighting method used so that results allow for drawing inferences about the targeted population, and the examination of the scope of the partial nonresponse. Section 4 addresses the methods used for data analysis, precision estimation and statistical tests. Section 5, in turn, specifies the standards for the presentation of results. Lastly, Section 6 offers an overview of the survey's scope and limitations.

This document goes hand in hand with the facts and figures and the microdata file submitted to partners.

1 Survey design

This section describes the targeted population and the survey frame. Given that the population in question is small, a census type survey was critical to obtaining reliable and precise results. All of the region's students were thus invited to take part in the survey.

1.1 Targeted population

The survey's targeted population consisted of all the students enrolled in the youth sector in the Kativik School Board's 14 secondary schools in the fall of 2022. This population thus included the students in Grade 7 (pre-secondary) and those in Secondary 1 to 5 at the secondary level, along with the students in the pre-work training programs offered at the upper secondary level. The persons enrolled in occupational training programs were not included, as these programs do not fall under the youth sector.

A list of enrolled students provided by the School Board allowed for estimating the size of the population, both globally and based on different characteristics. The targeted population was estimated as comprising around 1,359 students[1,2]. The primary sociodemographic characteristics of these students are included in the appendix section. It is important to note, however, that the students' answers cannot be linked to the list obtained, as all data gathering was done anonymously.

1.2 Survey frame

Because the process involved a census type survey, the ISQ needed, at the very least, the list of the 14 high schools to visit. In August 2022, the School Board sent out a preliminary list of classes for each school. The information provided with regard to each class included the level of education, the language of instruction and the expected number of students. This information was validated with school management at the time of the data gathering and any necessary corrections were made.

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1. This number excluded 88 youth who were on the list received but were not part of the targeted population. According to the information gathered by the interviewers or transmitted by the School Board, these youth had either not gone to the school to confirm their enrolment or were no longer living in the region.

2. As a reference, youth between the ages of 12 and 17 accounted for around 91% of the targeted population. This being said, not all of the youth in this age group were concerned by the survey. In fact, according to the ISQ's most recent population estimates, approximately 15% of the region's youth between 12 and 17 years of age are not enrolled in the youth sector at the secondary level.

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2 Data gathering

This section concerns the data gathering methods used and the results obtained. The instruments, the gathering process, and the response rates obtained are notably presented.

2.1 Pretest

In October 2021, a pretest was carried out in the village of Umiujaq[3]. This pretest made it possible to better understand the challenges and specific issues associated with gathering data in Nunavik. The survey was originally slated to take place in the months following the pretest, but was postponed due to the COVID-19 pandemic.

Of the 30 youths eligible to participate in the pretest, 20 filled out the questionnaire (67%). Most of the non-respondent students were absent for an extended period at the time of the classroom visits.

Given the low number of respondents, it is unlikely that pretest results were representative of all the youth in the targeted population. The data gathered were nonetheless analyzed to check, where possible, the intelligibility or degree to which the answers could be understood. Subsequent to this analysis and based on the observations of the interviewers who took part in the pretest data gathering process, certain changes were brought to the questionnaire.

2.2 Data gathering methods

Gathering instruments

The questionnaire consisted of 96 questions, divided into 23 sections:

1. General information
2. About your health
3. About you and your school
4. Your work experience during the school year
5. Your eating habits
6. How you perceive yourself
7. About your family environment
8. About your sexual attraction to others and sexual relations (for youth aged 14 years or more)
9. Your experience with cigarettes
10. Your experience with alcohol
11. Your experience with cannabis
12. Your experience with drugs
13. More about you and your school

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3. A first pretest was held in February 2018 at the Akulivik secondary school; there were 23 participants. The survey was subsequently postponed, which is why a second pretest was conducted.

14. About you

15. About your friends and how you relate to others

16. About your love relationships

17. About your neighbourhood or community environment

18. About your sleeping habits

19. The last few questions

20. Physical activity during your leisure time[4]

21. About your behaviour and attitude

22. Your respiratory health

23. How you feel

Data gathering process

The participants completed a self-administered questionnaire using an electronic tablet (iPad or other). This method of gathering information offers countless advantages in terms of data quality. First, the language used in the questions, including first names, is automatically personalized based on factors such as the student's age and sex, and on the responses to previous questions. Secondly, this process is such that questions that do not concern the person completing the questionnaire are automatically skipped.

The students present were randomly provided a card with a secret code for authentication purposes. This strategy allowed for conserving information required to process the data, namely the respondents' class and school, while also ensuring that the data gathering was anonymous. Youth could opt to complete the questionnaire in French or English and were given the choice of listening to the recorded instructions and questions in Inuktitut, French or English.

Data gathering period

The gathering of data took place between September 12 and October 18, 2022. Table 2.1 provides details of the dates on which data were gathered in each village (community).

Table 2.1

Interview dates, by village - Nunavik, 2022

Village	Coast	Interview dates
Kangiqsualujjuaq		October 4 - 11, 2022
Kuujjuaq		September 12 - 21, 2022
Tasiujaq		September 21 - 27, 2022
Aupaluk	Ungava	October 18, 2022
Kangirsuk		September 26 - 28, 2022
Quaqtaq		October 24 - 26, 2022
Kangiqsujuaq		October 11 - 14, 2022
Salluit		September 26 - October 7, 2022
Ivujivik		October 11 - 14, 2022
Puvirnituq		September 19 - 27, 2022
Akulivik	Hudson	October 5 - 6, 2022
Inukjuak		October 4 - 14, 2022
Umiujaq		September 22 - 28, 2022
Kuujjuarapik		September 15 - 21, 2022

Source: Institute de la statistique du Québec, Health survey of secondary school students in Nunavik – UVIKKAVUT QANUIPPAT? 2022.

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4. Sections 20 to 23, which covered topics not as germane to the survey's purposes, were placed at the end of the questionnaire, as it was expected that some youth would not complete the entire survey.

2.3   Data gathering results

While 740 youth participated in the survey, 41 of them provided too few answers, which resulted in their respective questionnaires not being useful for analytical purposes. As such, only 699 students were deemed to be survey respondents; this corresponds to a response rate of 51% (699 divided by 1,359, i.e., the size of the targeted population). This rate varied between 12% and 74%, depending on the village, and between 21% and 63%, depending on the level of education or grade (Table 2.2 and Table 2.3). The lower response rates in certain villages were attributed to the shortage of teachers, which resulted in children not being enrolled in school, combined with one school being closed during the scheduled data gathering period due to an event. Otherwise, failure to complete the survey was mainly explained by the fact that students were regularly skipping classes and some had dropped out since the start of the school year.

On average, completing the survey took around 34 minutes. Over 25% of the students, however, took 40 minutes or more, which is likely a sign that the questionnaire was too lengthy for youth in secondary school. Incidentally, 51 of the 699 respondent students abandoned before having answered all of the questions; their responses were nonetheless used for the analyses.

Table 2.3

Number of respondent students and response rate according to grade (level of education) - Nunavik, 2022)

Grade	Number of respondent students	Response rate
	n	%
Grade 7	145	48
Secondary 1	146	62
Secondary 2	121	52
Secondary 3	105	52
Secondary 4	86	59
Secondary 5	68	63
Pre-work training program	28	21
Total	**699**	**51**

Source: Institut de la statistique du Québec, Health survey of secondary school students in Nunavik – UVIKKAVUT QANUIPPAT? 2002).

Table 2.2

Number of respondent students and response rate according to village - Nunavik, 2022

Village	Number of respondent students	Response rate
	n	%
Kangiqsualujjuaq	50	64
Kuujjuaq	132	61
Tasiujaq	15	60
Aupaluk	17	71
Kangirsuk	20	37
Quaqtaq	34	68
Kangiqsujuaq	51	59
Salluit	102	54
Ivujivik	28	55
Puvirnituq	96	51
Akulivik	11	12
Inukjuak	79	41
Umiujaq	25	40
Kuujjuarapik	39	74
Total	**699**	**51**

Source: Institut de la statistique du Québec, Health survey of secondary school students in Nunavik – UVIKKAVUT QANUIPPAT? 2002.

3 Data processing

This section discusses the steps involved in the processing of gathered data. It addresses the validation of the data quality, the weighting required to draw inferences about the targeted population and the examination of the total and partial nonresponse as well as of the imputation measures carried out.

3.1 Validation and imputation

A validation of the response status of students (respondent or non-respondent) was first performed. As mentioned in section 2.3, 41 students who began the survey were subsequently classified as non-respondent. This latter group either submitted a questionnaire with enough blank sections[5] that their responses could not be used and/or knowingly wrote down absurd answers[6] to numerous questions, leading us to believe that these responses were false. In fact, some participants specifically mentioned, in their comments, that they were not "serious" while completing the questionnaire.

Use of a computer-accessed questionnaire made it possible to limit input errors, as nearly all of the questions provided a choice of answers, with the student having to select a response. And while the questionnaire included several skip questions (when questions did not concern a certain subgroup of students), it was nonetheless easy to complete since the skips were automated and validated. Furthermore, the computer-accessed questionnaire allowed for ensuring

consistency regarding the age at which youth first experienced certain behaviours by allowing possible answers based on the age declared by the student. An a-posteriori validation revealed certain inconsistent responses (e.g., when students went back to a prior section of the questionnaire) or absurd responses (e.g., when students only answered the first subquestion of a group), which were corrected or eliminated when considered to be false or invalid.

The grade or level of education declared by students was carefully verified, given its importance in terms of both adjusting the weighting to draw inferences about the population (see section 3.2) and the actual analysis plan. Particular attention was paid to those students who declared a grade that did not match the one assigned to their class. Moreover, three respondents did not make any selection with regard to grade or level of education. A choice was randomly attributed based on the level of education of the class. Sex and age were also attributed based on other available information, and this for 11 students regarding sex and one student regarding age.

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5. A youth's questionnaire is considered overly incomplete in the presence of one of the following scenarios: 1) the youth abandoned the process before reaching section 13, which is the midway point of the questionnaire; 2) the youth abandoned the process between sections 13 and 18 and failed to respond to at least one question out of every two; 3) the youth minimally completed the first 18 sections, but did not respond to at least one question out of every four.

6. For example, some youth only answered the first subquestion in several cases, either to avoid giving a response or to speed up the process and finish earlier. Others gave the same answer for all of the subquestions in numerous cases or provided absurd responses (e.g., having used or tried all of the drugs listed in the past 12 months, having been subject to all types of intimidation on a frequent basis, having begun using all of the substances mentioned at a very young age).

It was also noted that many students would provide a partial answer when they were asked to reply with "Yes" or "No" to a list of subquestions. In fact, these same students only checked off positive responses, which led us to believe that their answers to the subquestions left blank would likely have been negative. This was worrisome, especially for questions SD12_4, SD10_8X and HV5_10, which respectively concerned the language most often spoken at home, the teaching of traditional skills, and work and odd jobs. These three questions respectively concerned 47%, 25% and 19% of respondent students. To establish correction criteria designed to minimize the risk of bias, comparable estimates were produced by considering only those respondents who answered correctly, i.e., by excluding, for every question, those youth who submitted only positive answers without completing all of the subquestions. Weighting specific to this subgroup of respondent students was used to produce these estimates, and this so that these youth would represent the entire targeted population, including the students who did not respond correctly. It was thus possible to make corrections that allowed for minimizing the difference between the estimates obtained based on the corrected data from all of the respondents and those obtained solely from the students who responded correctly. The corrections made were the following:

- For questions HV7_22, HV_J_9_9X, HV_J_12 and HV2_1X, negative responses were assigned to all subquestions left blank by students having only provided positive answers;

- For questions SD12_4, SD10_8X, SM_G_1X, HV7_17B and SM_I_1X, negative responses were assigned to all subquestions left blank by students having only provided a positive answer to at least 2 subquestions and no negative answers;

- For questions HV5_10 and SM_G2X, negative responses were assigned to all subquestions left blank by students having only provided a positive answer, as long as these same students had only given positive responses to more than one question.

Had these corrections not been brought, the proportion of positive responses for the questions concerned would have been overestimated. Alternatively, for questions HV4_12X, SM_H_1 and SM_I_2X, no corrections were applied, seeing as the analysis suggested that the missing answers appeared to be partial nonresponse instances rather than negative responses, and that in such a case, a correction would have led to an underestimation of the proportion of positive responses.

3.2 Weighting

Weighting is a critical element for generating survey results, as it allows for drawing appropriate inferences about the targeted population, even though the latter is not involved in its entirety. It consists of assigning a statistical weight to each respondent; this weight corresponds to the number of persons a given respondent represents in the targeted population. It must also consider the nonresponse element, as the probability of responding to a survey varies depending on numerous sociodemographic characteristics.

Propensity scores were used to adjust the weighting to consider the total nonresponse (Haziza & Beaumont, 2007; Etlinge & Yansaneh, 1997). This method consists of modelling the fact of having responded or not according to the information available in the survey frame, namely the student's village and type of education (general or pre-work training), as well as the level of education or grade of a student's class (Gamache et al., 2017)[7]. This allowed for forming subgroups comprised of students with comparable characteristics and a similar probability of responding. Within each subgroup, the weight of respondents was adjusted by considered the inverse of the response rate during the survey.

We then proceeded to make sure that no student had an extremely high weight compared to that of other students, and this to ensure that no respondent would have an undue influence on the resulting statistics.

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7. We had no other information on non-respondent students, the survey being anonymous.

The sigma gap method was used to achieve this (Bernier & Nobrega, 1998). No adjustment was required subsequent to this verification.

The last step, calibration, involved adjusting the weighting to ensure that the total weight of all the students accurately reflected the survey's targeted population, and this to account for:

- the grade or level of education;

- the age group (6 categories: 12 and under, 13, 14, 15, 16 and 17 and over);

- the 4 villages with a sufficient number of respondent students (Kuujjuaq, Salluit, Puvirnituq and Inukjuak);

- a variable indicating the slow progress of students, based on age and grade or level of education[8];

- the overlap between coast (Hudson Bay and Ungava Bay) and sex;

- the overlap between coast and age (2 categories: 15 or under, 16 or over).

3.3   Total nonresponse

Definition

Total nonresponse is when an eligible person does not complete a survey questionnaire for any one of a number of reasons. This nonresponse can generate estimation biases if persons who responded have different characteristics than those who failed to do so, and these characteristics are linked to the survey topics. Weighting is adjusted to compensate for survey nonresponse (section 3.2), which has the effect of reducing the risk of bias. This being said, only the information known for the entire population can be taken into consideration in conjunction with this adjustment. Hence, despite resorting to weighting, survey results could still be biased if the total nonresponse is associated with one or more unknown characteristics that are closely correlated to certain indicators.

3.4   Partial nonresponse

Definition

Partial nonresponse refers to the absence of an answer to a question for some of the persons who completed the questionnaire. It is known that a significant partial nonresponse can generate some estimation biases, much like total nonresponse, if non-respondent and respondent persons have different characteristics that are linked to the topics being examined. Weighting does not take into consideration partial nonresponse like it does total nonresponse.

Partial nonresponse rate

The weighted partial nonresponse rate for a question is defined as the ratio between the weighted number of persons who failed to respond and the weighted number of persons eligible to do so. The greater this rate, the greater the risk of bias resulting from partial nonresponse. It is generally assumed that a partial nonresponse of less than 5% has little impact on the estimates.

Partial nonresponse is an important element of this survey, notably due to the 51 students, out of a total of 699 respondent students, who abandoned before completing the survey. As a result, most of the questions have a partial nonresponse of over 5%. These questions were further analyzed with regard to the partial nonresponse in an effort to determine, as much as possible, whether the students who failed to answer had different characteristics than the respondents and if so, to identify the extent of the potential bias. Table A2, appended, lists the questions with a high risk of bias. These were primarily the questions in the section on sexuality. Otherwise, nothing points to partial nonresponse associated with students who abandoned the survey leading to significant bias. Those students who abandoned, in fact, had characteristics quite similar to those of the other respondents.

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8.   This adjustment aims to reduce the risk of bias engendered by a lower response rate among students with a significantly slow progress at school.

4 Data analysis, precision and statistical tests

This section bears on certain aspects of the analysis, among them precision estimation and statistical tests.

4.1 Precision of estimates and statistical tests

In the Health survey of secondary school students in Nunavik – UVIKKAVUT QANUIPPAT? 2022, the variance estimates and statistical tests were carried out with the help of self-weighting. A series of 500 self-weighting instances were created in order to appropriately consider all of the calibration and nonresponse adjustments during the variance estimation and statistical tests. This was done by first selecting, according to a survey design without replacement[9], 500 self-weighting samples from among the survey respondents (Beaumont & Émond, 2022). The calibration step outlined in section 3.2 was then carried out for each of the samples, which produced 500 self-weighting instances (Rust & Rao, 1996)[10]. These weights must be used when estimating variances and conducting statistical tests using software applications such as SAS and SUDAAN. It was confirmed that the variance estimates generated with the resampling method selected for the survey were similar to those obtained using Taylor linearization with a correction for a variance estimation for a finite population.

The coefficient of variation (CV)[11] was selected by the ISQ as an indicator of relative precision for the generation of results; estimates where the coefficient of variation is greater than 15% are noted in the tables and figures, as specified in section 5, as well as in the text when appropriate.

A statistical chi-square test of independence[12] can be used to obtain a global comparison of the proportions between different subgroups (e.g., age categories). In the event of a significant variation at the 5% threshold, and when the analysis or overlap variable includes more than two categories, tests to compare proportions can be carried out to identify the largest variations. These tests are based on a statistic by Wald developed from the difference in logit transformation of proportions (Korn & Graubard, 1999).

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9. Given that this is a census type survey involving a targeted population of small size, the standard method with replacement considerably overestimates the variances associated with the estimates.

10. Self-weighting instances are already adjusted for total nonresponse, since the self-weighting samples were selected from among the respondent students.

11. The coefficient of variation is obtained by dividing the standard error of estimate (SEE) by the estimate itself.

12. A modified version of the usual chi-square test that considers the survey design was used; this version is Satterthwaite's formula. More specifically, the analysis uses the F statistic corresponding to this modified chi-square test.

5 Presentation of results

As regards this survey, the proportion estimates generated by the ISQ are rounded to the nearest decimal in the tables and figures, and to the nearest unit in the text, with the exception of proportions inferior to 5%, which have kept a decimal. Because of this rounding of decimals, the total of all proportions indicated in certain tables or figures may be slightly superior or inferior to 100%. Moreover, estimates where the coefficient of variation is less than or equal to 15%, deemed sufficiently precise, are presented with no mention in this regard. Estimates where the coefficient of variation is higher than 15% but less than or equal to 25% are marked with an asterisk (*) in the tables and figures as well as in the text; this indicates that their precision is only average and that they should be interpreted with caution. Estimates where the coefficient of variation is higher than 25% are marked with a double asterisk (**) in the tables and figures; this indicates that their precision is low and that they are being provided solely for information purposes. These are generally not interpreted in the text. Moreover, appropriate formulations are used to emphasize that the statistics provided are not exact values but rather, estimates based on the responses of the students who agreed to participate.

In the tables and figures referring to bivariate analyses, and where the chi-square test points to a significant association, letters in superscript added to the statistics presented indicate the category pairs of an overlap variable for which the analysis variable differs significantly at a threshold of 5%. A same letter indicates a significant variation between two categories.

Generally, only significant variations beyond the threshold of 5% are noted in the text, which allows for shining a light on the primary results. In some cases, two proportions that appear different will not be so from a statistical point of view. Such cases are described by mentioning that there is no statistically significant difference or that the survey did not reveal any difference between the proportions in question. Non-significant results can nonetheless be flagged if they are of particular interest or if they are the exception in a series of significant results. They can notably be presented as a trend.

6   Survey scope and limitations

Despite a low response rate (51%, Table 2.2), the data obtained from the 699 respondents represent an interesting potential for analysis. They meet a need for further information on Nunavik's adolescents. Nevertheless, given this low response rate and the significant partial nonresponse with regard to several questions, we recommend interpreting the slight gaps between two proportions appearing statistically significant with caution. Moreover, considering that many students were absent at the time of the survey, there is a possibility that some participating students' answers to certain topics may not exactly reflect the reality of all enrolled students, particularly drop-outs.

Lastly, it is important to note that observation data such as those gathered through this survey do not allow for establishing any type of causal link. Significant differences or associations noted only allow for presuming that there is a link, but not to confirm it.

Appendix

Table A1

Distribution of the targeted population by village, sex, age and grade (level of education) - Nunavik, 2022

	%
Village	
Kangiqsualujjuaq	5.7
Kuujjuaq	15.8
Tasiujaq	1.8
Aupaluk	1.8
Kangirsuk	4.0
Quaqtaq	3.7
Kangiqsujuaq	6.4
Salluit	13.9
Ivujivik	3.8
Puvirnituq	13.8
Akulivik	6.7
Inukjuak	14.1
Umiujaq	4.6
Kuujjuarapik	3.9
Sex	
Male	49.0
Female	51.0
Age	
12 years old or younger	18.5
13 years old	20.3
14 years old	17.4
15 years old	15.7
16 years old	13.2
17 years old or older	14.9
Grade (level of education)	
Grade 7	22.0
Secondary 1	17.4
Secondary 2	17.1
Secondary 3	14.9
Secondary 4	10.7
Secondary 5	7.9
Pre-work training program	10.0

Source: Institut de la statistique du Québec, Health survey of secondary
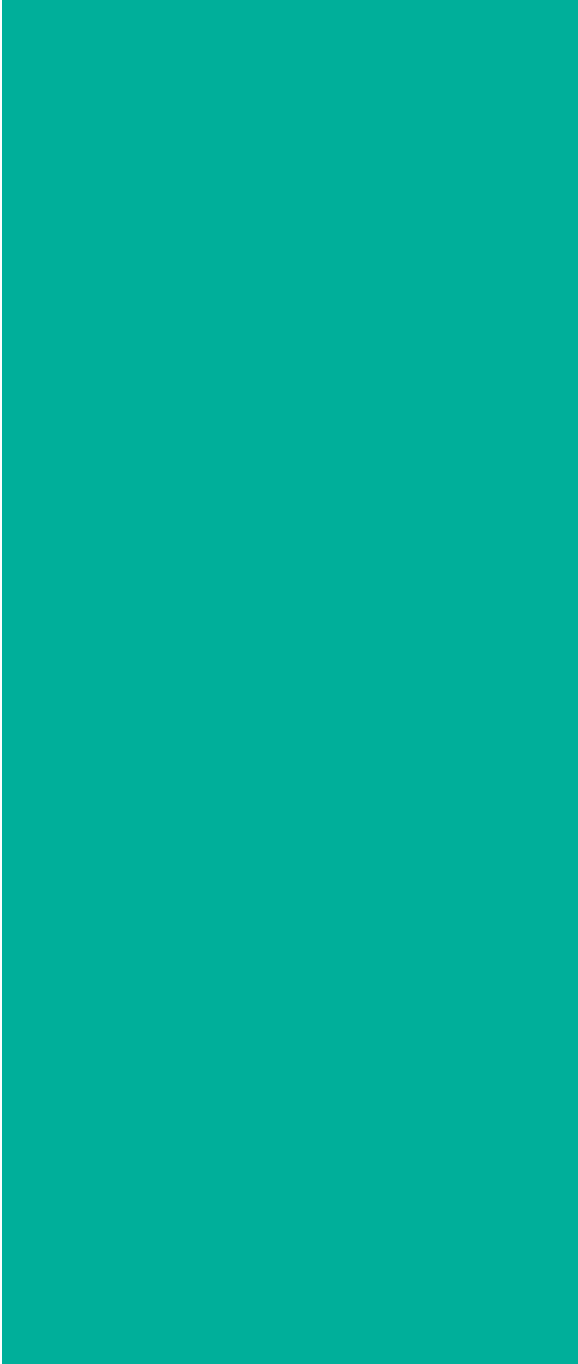school students in Nunavik – UVIKKAVUT QANUIPPAT? *2022.*

18

Table A2

Questions with a high risk of bias due to partial nonresponse - Nunavik, 2022

Question no.	Question	Weighted partial nonresponse rate	Possible impact on the analysis
HV7_15X	People are different in their sexual attraction to others. Which statement best describes how you feel?	8.7%	Overestimation of the proportion of youth attracted only to persons of the opposite sex. Underestimation of the proportion of youth who are uncertain.
HV7_0	Have you ever had sexual relations (oral, vaginal or anal) with your consent?	10.2%	Overestimation of the proportion of youth having had sexual relations.
HV7_0A	How old were you the first time you had sexual relations (with your consent)?	15.0%	Overestimation of the average age the first time.
HV7_0B	With how many different people have you had sexual relations (oral, vaginal or anal) with your consent?	15.0%	Overestimation of the proportion of youth having had 2 partners. Overestimation of the proportion of youth having had 3 partners or more.
HV7_1X	Have you ever given or received oral sex (contact of the mouth with the vulva or penis) with your consent?	46.6%	Overestimation of the proportion of youth having given or received oral sex.
HV7_17A	Were you ever taught about using condoms?	18.3%	Overestimation of the proportion of youth who were taught about using condoms.
HV7_17B_6	Who taught you about using condoms? A nurse or doctor	31.3%	Overestimation of the proportion of youth who were taught this by the resource in question.
HV7_22_1 to HV7_22_4	Have you ever heard about the following sexually transmitted infections (STIs)?	Between 23.9% and 24.9%	Overestimation of the proportion of youth who heard about STIs.
HV_J_12	Experience with drugs In the past 12 months, have you ever been in any of the following situations?	Between 6.9% and 8.7%	Overestimation of the proportion of youth who experienced such a situation.

Source: Institut de la statistique du Québec, Health survey of secondary school students in Nunavik – UVIKKAVUT QANUIPPAT? *2022.*

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