The BC Patient Centred Measurement Working Group

Acute Inpatient Survey 2016 -2017

Healthideas Toolkit for Data Users

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The BC Patient-Centred Measurement Working Group thanks those British Columbians who participated in this survey, providing valuable information about their lived experiences to support clinicians and policy makers in their efforts to provide the highest quality of care possible for all patients cared for in BC hospitals.

About the Toolkit: Acute Inpatient Survey 2016/17

This document contains information and supporting materials in order to provide users of the Acute Inpatient 2016/17 patient-reported experience and outcome survey results with sufficient context to make informed use of the data provided through Healthideas. This document does not replace any technical documents, rather serves as a complementary source of information.

The document will be revised as necessary should additional information and materials become available.

For details about the survey, Healthideas, or if you have any additional questions, please contact:

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About the BC Patient Centred Measurement Working Group

Since 2003, the BC Patient-Centred Measurement Working Group (BCPCMWG), which includes representation from the BC Ministry of Health, all seven of its Health Authorities, and their affiliate organizations, have implemented a program to measure the self-reported experience, satisfaction and health-related quality of life of the people who use a range of healthcare services in BC.

These surveys are provincially coordinated and conducted across all locations of service, i.e., province-wide. The survey instruments and the results are based on a scientifically rigorous process for learning from patients and improving the quality of the healthcare and services provided in BC. It also ensures that we avoid the use of "home grown" tools, which do not allow for comparison between facilities, health regions and provinces, and often have not been tested to ensure that the questions measure what is important to patients and that the questions are interpreted by patients as intended. Clinicians, leaders, policy makers, and, most importantly, patients are involved at every step of the planning of these surveys, including the development and testing of questions, the selection of survey instruments, and the validation of results.

"This initiative is about giving people who use British Columbia's (BC's) health services the opportunity to provide feedback about their experience and satisfaction with the care and services they receive, as well as providing information about their outcomes and health-related quality of life."

The results of surveys that ask users of the health care system in BC for feedback are intended to be used by Health Authority clinicians and leaders to improve the quality of the experience and the clinical outcomes of the patients, residents, and families at the point of care and to promote continuous organizational improvement. Additionally, Ministry of Health and Health Authority executives and policy makers are interested in survey results as an accountability measure to understand the performance of the health care system at individual and cross regional and provincial levels.

Province-wide surveys have been conducted in BC in the:

- Emergency Department sector (2003, 2007, 2009 to 2015)
- Long-term Residential care sector (2003/04 and 2016/17)
- Acute Inpatient sector (maternity, pediatrics, surgery (2005, 2008, all this plus rehabilitation in 2011/12, and again in 2016/17)
- Short stay Mental Health (inpatient psychiatric units) and Substance Use (detox, support recovery, and withdrawal management) sector (2010/11)
- Outpatient Cancer Care sector (2005/06, 2012/13); Cancer Transition to Survivorship (2016)

About Healthideas

In 2011, the Health Information Privacy and Security Council (HIPSC) agreed to the practice of returning raw survey data, including patient identifiers, back to each health authority or to the affiliate organization where the patient received care for purposes of secondary data analysis and to inform quality improvement. What was missing was the ability to link the survey data to other clinical and administrative data sets and to analyze the data beyond a single health authority (i.e., at a provincial level or across health authorities).

In July 2014, the HIPSC agreed that the BC Ministry of Health's Healthideas data warehouse could be used to centrally store patient self-reported survey data. Healthideas is a safe and secure source of information that was created and is managed by the BC Ministry of Health. Healthideas was designed to support decision making and contains information about hospital and physician services, population data, and other reference data.

Healthideas will act as the repository of all survey data collected from BC patients, clients, residents, and families. It will host all the records of patients with an encounter in any of the sectors surveyed, flagging those who were sampled and invited to participate in a survey, as well as all those who completed a survey. Each approved user will be provided with a specific level of access, based on need and authority.

Purpose of the Acute Inpatient 2016 /17 Survey

This survey asked patients about their health-related quality of life and their experiences with the quality of the care and services received as an inpatient in one of 78 acute care hospitals and two freestanding rehabilitation hospitals in British Columbia.

As with all provincially coordinated surveys conducted by the BC Office of Patient-Centred Measurement on behalf of the BCPCMWG, the Ministry of Health and health authorities are committed to use the survey results to:

- Enhance the performance of the Acute Inpatient sector in the province;
- Enhance public accountability;
- Support quality improvement initiatives; and
- Contribute information to support research and researchers.

Understanding the patient experience and self-reported health related quality of life is vital in ensuring BC's health care system is meeting the needs of patients – allowing them to become partners in their own health care.

The goal is that the results that reflect the "voices" of BC's patients will be used to improve the experience and outcomes of care for all patients in BC.

The 2016/17 Acute Inpatient Sector survey results have informed quality improvement initiatives, recognized the work of acute care professionals, and permitted leaders and direct care staff to hear from a representative sample of patients to understand priorities from patients perspectives over time.

The six health authorities strive to ensure patients receive timely access to appropriate care – and that there is the right mix and variety of services in each region. They will continue to use the results to enhance inpatient care and develop best practices within BC. Results have also been provided to the First Nations Health Authority, showing a comparison of the self-reported experiences and health related quality of life of patients who self-report their ethnicity as Aboriginal compared to all those in BC who self-report their ethnicity as non-Aboriginal. The aggregate results of the Acute Inpatient Sector survey 2016/17 were disseminated to staff and leaders working in the 80 hospitals in October 2017 and publicly released on the BC Ministry of Health's public website (see link below).

https://www2.gov.bc.ca/gov/content/health/about-bc-s-health-care-system/partners/health-authorities/patient-experience-survey-results/acute-inpatient-sector-survey-2016-17

Glossary of Terms

Dimensions or Domains of Patient Experience

From a psychometric point of view, the terms dimensions and domains of patient experience are interchangeable terms used to describe a group of items that are being evaluated in a survey. A summary score is often calculated to quantify the dimension, with the score being a composite score of the questions that make up of that dimension. Dimensions and domains of patient experience may be conceptually derived (individual items make intuitive sense to be grouped) or empirically derived (individual items have been shown to fit together statistically).

Factor

In the field of measurement and psychometrics, a factor is an indirect representation of the underlying dimension inferred from the question (item) responses. Mathematically, a factor is a weighted linear combination of items (e.g., survey questions) thought to summarize the variations observed in the item responses. Also known as 'latent variable' in statistics, a factor is considered to be unobservable but is inferred from items that are considered observable (i.e., directly measured).

Freedom of Information and Protection of Privacy Act

The BC Freedom of Information and Protection of Privacy Act (FOIPPA) protects the personal privacy of BC citizens by prohibiting the unauthorized collection, use, or disclosure of personal information by public bodies.

Item and Question

The words 'item' and 'question' are often use interchangeably; however, the term 'item' is more broadly defined as not all items are phrased as questions. In the field of measurement or psychometrics, survey questions are referred to as items. Items can refer to things such as multiple choices, statements, ratings assigned by an observer, and performance assessment. An item bank is a collection or repository of items.

Key Driver

A key driver is a survey question that reflects aspects of care and service shown to statistically have the greatest influence on the global rating indicator questions. Ratings of overall experience and likelihood to recommend are examples of global ratings.

Margin of Error

The margin of error is an indicator of survey accuracy that measures the imprecision inherent in survey data. Margin of error is inversely related to the sample size used to draw inferences about the larger population. A margin of error of ± 5% is considered good while ± 8% is acceptable.

Norm-Referenced Score

A score is norm-referenced if it is interpreted with regard to the performance of a peer group, a reference population, or benchmark. Percentile rank is an example of a norm-referenced score.

Psychometrics

Psychometrics is a scientific field of study concerns with the theory, practice, and techniques of psychological and behavioural measurement. This includes improving the measurement of knowledge, abilities, attitudes, opinions, and personality traits via the development of assessment tools, statistical methods, and mathematical techniques.

Patient-Reported Experience Measures

Patient-reported experience measures (PREMs) are measurement instruments that patients complete to self-report their global ratings of overall satisfaction with the care and services received and their experiences with the processes of their care.

Patients-Reported Outcomes Measures

Patient-reported outcome measures (PROMs) are measurement instruments that patients complete to self-report information on aspects of their health status that are relevant to their quality of life, including symptoms, functional, physical, mental and social health.

Privacy Impact Assessment

A Privacy Impact Assessment (PIA) is a process used to evaluate potential impacts of a study or program on participants' privacy rights and to ensure compliance with privacy protection rules and responsibilities. Completing a PIA is a legislative requirement when developing or changing a system, project, program, or activity. A PIA is conducted for all BC PCM Working Group initiatives, projects, and surveys; each PIA is reviewed by the Health Information Privacy and Security Operations Committee (HIPSOC), which is a sub-committee of the Information Privacy and Security Standing Committee at the Ministry of Health, and the Office of the Information and Privacy Commissioner.

Questionnaire

A questionnaire is a form of data collection, asking an individual to respond to a set of printed or written questions with a choice of answers to gather information from respondents. Questionnaires can be administered in-person, online, by phone or mail.

Reliability

Reliability is a measure of the repeatability or consistency of results obtained from a standardized survey instrument. A survey instrument itself is neither reliable nor unreliable; it is the responses that can be consistent or repeatable. In addition, just because a response to a scale is reliable does not mean that it is valid, that is, it measures what it is supposed to measure (see Validity).

Response Rate

Response rate is the number of people who answered ("completed") the survey divided by the number of people in the sample. It is usually expressed as a percentage and is one of the most commonly used indicators to gauge the quality and accuracy of survey data. There are different response rate calculation standards, with varying definitions of "answered survey" or "complete" and who to include in the sample.

Scale and Sub-Scale

In the field of measurement or psychometrics, a scale is a collection of items (e.g., survey questions) designed to measure one dimension. Similarly, a sub-scale is a subset of items from that same item collection use to measure a particular aspect or component of that dimension (sub-dimension). A standardized survey instrument is often designed with items that form a scale.

Statistical Significance

A statistically significant result (that represents a difference between two groups of scores) is a result that is unlikely to have occurred due to chance if there really was no difference between the two groups of scores. In other words, a statistically significant result occurs when the difference between two groups of scores is large enough that we can say that the probability of this difference occurring is very small if there really is no difference in scores between groups. A statistically significant result may or may not be relevant (i.e., "practically significant") in a clinical context.

Survey

A survey is a process for gathering information that could involve a wide variety of data collection methods, including a questionnaire. It could also involve observing or measuring things that go beyond questions, including physical measurements or judgments made by an observer. A survey typically includes questions from one or more questionnaires or instruments that address specific objectives and may also be used to collect demographic information.

Survey Instrument

A survey instrument is a tool that follows scientific protocols for obtaining information from respondents. For survey research, the survey instrument often involves a questionnaire that provides a script for presenting a standard set of questions and response choices.

Survey Vendor

To carry out the work of the BC Office of Patient Centred Measurement, contracts with external research companies are negotiated on behalf of the health authorities. Depending on the size of the contract, the provincial group will go through a procurement process facilitated by BC Clinical and Support Services (BCCSS). All survey vendors are required to adhere to strict privacy and information security requirements, as specified by applicable BC legislation.

Survey Weights

Survey weights are used to make the sample representative of the target population on key characteristics such as organization level attributes or demographic characteristics during analysis. Survey weights, or the inverse probabilities of selection for each observation, allow users to reconfigure the sample as if it was a simple random draw of patients that is representative of the total patient population to yield accurate estimates.

Top-Box Score

The top-box scores is the percentage of respondents who selected the most positive response category to a survey question (e.g., the 'Always' response option from the choices Never, Rarely, Sometimes, Usually, Always).

Total Valid

The Total Valid number is the number of respondents who reported a valid answer (i.e., excluding missing and not applicable responses) for the question.

Valid Percent

The percentage of responses based on the Total Valid number (i.e., excluding missing and not applicable responses).

Validity

Validity typically speaks to the accuracy of an assessment tool in terms of, whether or not it measures what it is supposed to measure. A survey instrument or item may be reliable but may not necessarily be a valid measure.

Validity must be formally established by empirical studies as well as sound psychometric and test development practices. The definition of validity itself has been subjected to debate. In particular, the current Standards for Educational and Psychological Testing (developed jointly by the American Educational Research Association, American Psychological Association, and the National Council on Measurement in Education) champions the view that a survey instrument is neither valid or invalid (i.e., validity is not a property of the test). Instead, validity is defined as the degree to which ongoing empirical evidence and theory support the conclusions drawn from the survey instrument for its intended purposes.

Selected Survey Tools: the CPES-IC, the VR-12 and EQ-5D-5L

This is the fourth province-wide acute inpatient experience of care survey; however, this is the first time the BC PCM Working Group used the new Canadian Patient Experiences Survey for Inpatient Care (CPES-IC) two generic PROMS instruments, the Veteran's Rand 12 Item Survey (VR-12) and the EQ-5D-5L, as well as BC's "made-in-BC" modules.

The CPES-IC has been validated in Canada and includes the HCAHPS Acute Inpatient survey (see below for more information), which has been used extensively in Canada and the United States. This means that comparative data for similar acute care inpatient populations is possible, allowing BC to establish targets for performance that includes information on best practices from other regions in BC, nationally and internationally.

The Canadian Patient Experiences Survey for Inpatient Care

The CPES-IC is a patient reported experience measure (PREM) that was developed in Canada and tested in BC. The CPES-IC focuses on experiences and satisfaction with care and services and is comprised of two sets of questions:

- The Hospital Consumer assessment of Healthcare Providers and Systems (HCAHPS) questionnaire from the US Centre for Medicare & Medicaid Services. This survey was developed and validated by the US Agency for Healthcare Research and Quality (AHRQ) and, as of July 2015, has had 3.1 million completed surveys from 2005 to 2015.
- Canadian content developed by the Canadian Institute for Health Information (CIHI) and a pan-Canadian Patient Experience Committee, which included representation from Accreditation Canada, the Canadian Patient Safety Institute, the Change Foundation, and each province in Canada, including BC.

Survey Tool	Details
Hospital Consumer Assessment of Healthcare Providers and Systems Survey (HCAHPS)	7 Composite Measures: Communication with nurses Communication with doctors Responsiveness of hospital staff Pain management Communication about medicines Discharge information Care Transition
	2 Individual Items Cleanliness of hospital Quietness of hospital

Survey Tool	Details
	2 Global Items Likelihood to Recommend Overall hospital rating (best to worst)
Canadian Content of CPES-IC	Canadian-specific Dimensions Direct admission: Enough info given about admission process, prior to arrival Admission into the hospital organized Admission through ED: Waiting too long in the ED for a hospital bed Transfer from ED to hospital bed organized Information shared with patients in the ED Internal coordination Received info about condition and treatment Emotional support Involvement in decision-making
	7 Canadian Demographic Items, including self-reported ethnicity
	2 Global Items Overall quality of care rating Overall 'helped by hospital stay' rating
BC Content of the CPES-IC	Maternity Module Developed and tested in 2005; fielded in BC in 2005, 2008, 2011/12 Further tested by the Ontario Hospital Association in 2015; will now be used in both provinces with OHA changes.
	Surgical Module Developed and tested in 2005; fielded in BC in 2005, 2008, 2011/12 Endorsed by the BC Provincial Surgical Executive Council in October 2015
	Pediatrics Module Developed and tested in 2005; fielded in BC in 2005, 2008, 2011/12 Sent to parents/guardians of those <13; sent to youth between ages 13 and <18
	Rehabilitation Module Developed and tested in 2011; fielded in BC in 2011/12 Sent to patients discharged from a freestanding rehab hospital or designed rehab unit
	Continuity Across Transitions Module Developed and tested between 2014-16 Fielded for the first time with the CPES-IC in 2016 and with the Emergency survey in the Winter/Spring of 2018
	Patient Safety Module Hand hygiene and med reconciliation modules Developed and tested in 2008 and have been fielded in BC in

Survey Tool	Details
	2008, and 2011/12 Developed with Dr. Doug Cochrane; revalidated in 2015 with input from BC's HH Working Group and BC's Medication Reconciliation Clinical Expert Group

The Veteran's Rand 12 Item Health Survey and EQ-5D-5L:

The VR-12 is a generic (i.e. not condition specific) patient reported outcomes measure (PROM) that focuses on self-ratings of health-related quality of life. It is an abridged version of the Veterans RAND 36-item Health Survey (VR-36). The VR-12 includes questions that will produce scores for the following:

- Overall health status
- Physical health status
- Mental health status
- 7 health domains including:
    - physical functioning, social functioning, energy-fatigue, bodily pain, role limitation, perceived general health, and perceived mental health

The EQ-5D-5L is a generic PROM developed by the EuroQol (EQ) Group that measures self-reported health-related quality of life. The original descriptive system measures five dimensions (5D) using five response levels (5L: no problem, slight problems, moderate problems, severe problems and extreme problems):

- Mobility,
- Self-care,
- Usual activities,
- Pain / discomfort,
- Anxiety/depression)

The VR-12 and EQ-5D-5L results were not publicly reported, as the data was used to inform decisions about a generic PROM instrument for use in BC and nationally in Canada. While other studies have examined the psychometric properties and validity evidence pertaining to the use of these two PROMS measures in various settings and populations, the inclusion of the PROMS in the BC Acute Inpatient survey was motivated by the questions "What kinds of information do these PROMs provide? What 'stories' do they tell?". The overall goal was to help inform the selection a generic PROM for use in BC and in Canada to measure the self-reported health-related quality of life and health status of individuals who use healthcare services.

Data from the 2016/17 province-wide survey implemented in the Acute Inpatient Hospital sector in British Columbia was used to compare the scores produced by each PROM across different patient groups and hospital settings to determine whether the

two measures would lead to different conclusions. The associations of PROM scores with other measures of health status were also compared to see if these differed, and considered whether characteristics of the score distributions (e.g., skewness, ceiling effects) might lead to different conclusions about the sample. The results of these analyses suggest that the EQ-5D-5L and VR-12 would lead to similar conclusions about the magnitudes of differences in scores between groups of patients and the associations of PROMs with other measures of health status and experience. The real differences lie in the content of the PROM items and the often distinct ways in which they characterise and measure self-reported health status (e.g., domains covered, timeframe referenced, focus on intensity vs. interference in activities). This is where different 'stories' emerge, and so content – in the context of the purpose of measurement - is an important consideration in choosing between these PROMs. The VEST (VR-12 EQ-5D-5L Study Team) included Lena Cuthbertson (BC Ministry of Health), Rick Sawatzky (Trinity Western University), and Bryan Stirling (Centre for Clinical Epidemiology and Evaluation); analyzes were conducted by Lara Russel (CHEOS).

Sample Plan for the Acute Inpatient 2016/17 Survey

Patients who were discharged from inpatient acute hospital care between September 1st, 2016 and March 31st, 2017 from one of 78 acute care hospitals and 2 rehab hospitals in BC were eligible to receive a survey.

The following patients are excluded from receiving a survey:

- Patients who received Day Surgery services in an Acute Care Hospital (no overnight stay) - excluded at file submission from health authorities
- Patients deceased in an Acute Care Hospital
- Patients who received care in designated psychiatric units and/or designated psychiatric beds (surveyed in 2010/11 as a part of the provincial Mental Health & Substance Use sector survey)
- Infants who at the time of discharge were less than or equal to 10 days old
- Patients with no fixed address or no valid phone number
- Mothers whose admission was related to a stillbirth or miscarriage

Where possible, the following patients presenting with sensitive issues were also excluded:

- Patients who presented with confirmed or suspected sexual assault/abuse, elder abuse, or domestic violence
- Patients who underwent a therapeutic abortion
- Patients deceased after discharge
- Patients flagged as "do not announce"

The initial sample plan targeted 30,202 patients to be sampled over 6 months with an expectation of 14,950 completed surveys for a target response rate of 55 per cent; as this is a large survey, the results were expected to have low margins of error at provincial and health authority levels, meaning the results would be considered to be very accurate at these levels.

See also FAQs on Sampling and Survey Weighting

The Data Collection Process

For the Acute Inpatient 2016/17 survey, data was collected via the following process:

1 **Data Submission:** Every 2 weeks, the hospitals securely sent the selected survey vendor of the records of patients discharged from each hospital. The sample data elements included with every patient record is included in the Data file Submission Manual. The survey vendor generated a random sample of patients from the "universe" of eligible patient records submitted. Eligibility required that the records included valid mailing addresses and phone numbers.

2 **Patient Notification:** Prior to being contacted, patients were notified by mail within two weeks of discharge that they had been selected to receive a survey. The cover letter also provided a unique access code and URL for those who preferred to complete the survey online.

3 **Survey Administration:** The surveys were then conducted by phone as an interview or self-completed online. All phone-based surveys were completed using computer-assisted telephone interview (CATI) and used standardized interview scripts and prompts (see survey next page).

Sampling Level	Data Collection Method
Units with response rates > 65% (up to 10% higher than the average)	• Eligible patients received two calls • Even after completion targets were met, the survey vendor will continue to accept completions via calls to their 1-800 number and online
Units with response rates between 45-64.9% (within ±10% of the average)	• Eligible patients received a minimum of three calls • Even after completion targets were met, Malatest will continue to accept completions via calls to their 1-800 number and online
Units with response rates <45% (more than 10% below the average)	• Eligible patients received a minimum of five calls • Even after completion targets have been met, Malatest will continue to accept survey completions via calls to their 1-800 number and online
Census Sites	• All eligible patients discharged from units with less than 125 unique discharges over a 6 month period were provided the opportunity to participate in the survey; each patient will receive a minimum of five calls

All surveys, both online and phone, were available in the following languages:

English	Chinese	Punjabi	Korean
French	Spanish	German	Vietnamese

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Data Collation: Patients' survey responses were entered into a secure database and collated by the survey vendor. As noted, aggregated results and reports were provided to individual hospitals, health authorities and the province in October 2017.

Privacy Considerations

The information collected from patients on admission and given to the survey vendor for the purposes of conducting the survey included personal information required to conduct the survey (e.g., discharge date, phone number, and mailing address. Patient information that is used, disclosed, and retained for purposes of conducting Patient Experience of Care Surveys are statistical in nature; this means that results cannot be directly used to affect the treatment of a specific patient.

The survey vendor was required to demonstrate compliance with the BC Freedom of Information and Protection of Privacy Act and continues to be subject to the independent oversight of the BC Information and Privacy Commissioner. A Privacy Impact Assessment (PIA) for the project was completed and approved by the Health Information and Privacy Operations Committee of BC (HIPSOC) on August 12th, 2016, and an onsite audit of the survey vendor's operations is conducted annually to review the way personal health information of BC patients is managed in each survey project. In addition, the survey vendor is contractually obligated to fulfill its obligations under BC's Privacy Protection Schedule.

In accordance with BCFOIPPA, which is a notification regime, throughout the time that the survey was being conducted, signs were posted in each of the 80 hospitals to advise patients that they may be selected to complete a survey. These posters fulfilled four purposes:

- Informing patients about the survey and the timeframe;
- Providing contact information, if patients have questions;
- Providing a mechanism for patients to "opt out"; and
- Providing information about the use and protection of the personal information of patients under BC's Freedom of Information and Protection of Privacy Act (BC FOIPPA).

In addition, a letter was mailed to each patient who was randomly selected from all hospital discharges that included specific information about the protection of personal information under BC FOIPPA, as well as contact information, if patients had questions about the survey, or wished to be removed from the survey contact list (see above for sample letter).

Response Rate for the Acute Inpatient 2016/17 Survey

Response rate, along with the margin of error, is one of the most commonly used indicators to gauge the quality and accuracy of survey data.

The Acute 2016/17 Survey was a mixed mode survey. Unlike previous acute inpatient surveys, patients completed the questionnaire over the phone or online instead of by mail. In total, 50% of respondents completed the questionnaire by phone and 30% completed it online. Approximately 20% of respondents completed the questionnaire using both survey modes over multiple sessions.

The table below shows the response rate for each health authority. Response rates were calculated by dividing the number of completions over the valid sample (excluded ineligible patients).

The overall response rate for the Acute Inpatient 2016/17 was 46.9%

Health Authority	Response Rate
Fraser	37.6%
Interior	52.2%
PHSA	45.7%
Providence	47.8%
Island	51.1%
Vancouver Coastal	46.6%
Northern	47.9%

See Appendix G: SURVEY DISPOSITION RESULTS in the Technical Report for response rates at the facility and unit levels

Survey Accuracy

An estimate of survey accuracy is the margin of error. The margin of error indicates the imprecision inherent in survey data. Margin of error is inversely related to the sample size used to draw inferences about the larger population. In general, larger sample sizes result in lower margin of errors and a smaller margin of error indicates the survey results were more precisely measured. A margin of error of ± 5% or ± 8% is considered good and acceptable, respectively.

The target survey completions and sampling methodology for the Acute Inpatient survey were designed to achieve a good to acceptable margin of error at the unit level. The Acute Inpatient survey had a ± 0.5% margin of error at the 95 per cent confidence level at the provincial level. The margin of error at the health authority level ranges from ± 1.0% to ± 2.7% (see table below).

Health Authority	Margin of Error
Fraser	± 1.4%
Interior	± 1.0%
PHSA	± 2.7%
Providence	± 2.4%
Island	± 1.2%
Vancouver Coastal	± 1.3%
Northern	± 1.8%

See Appendix G: SURVEY DISPOSITION RESULTS in the Technical Report for margin of error at the facility and unit levels

The margin of error of the top-box score at the 95% confidence level is obtained by multiplying the standard error of the estimate by the critical value, 1.96. For example, if the reported top-box score is 50%, with a margin of error of ± 5%, the true score is captured within the range of 45% and 55% 19 out of 20 times. The standard error of a reported percentage, such as the top-box score, measures its variability and is calculated as follows:

The finite population correction factor was applied to margin of error calculations. In general, as the sampling proportion increases, the correction factor will reduce the margin of error because more of the population is included in the sample.

See also FAQs on Survey Accuracy and Response Rates

Reporting & Analysis: General

Throughout the duration of the survey period and at the close of collection, aggregate data at the unit, hospital, health authority, and provincial level was provided to respective audiences to provide interim results and summarize the final results of the Acute Inpatient Sector Survey 2016/17.

Results were presented in a series of different reports, including the following:

Report Type	Function
Dynamic Reports	All anonymized survey results are available to approved Health Authority users through the DART, the BC PCM Working Group's Dynamic Analysis and Reporting Tool. Data is unweighted Data was updated as survey results were collected in "real time"
Monthly Reports	Quantitative: Run charts of scores for key questions (up to nine) along with analysis to trend developments and to include excerpted comments from patients to illustrate the trends in the quantitative data Qualitative: Verbatim comments organized into themes as instructed by the Organizational Representative and grouped by valence (i.e., positive, negative, neutral, or both)
Storyboards	Summary reports with qualitative comments embedded Final results were adjusted for disproportionate sampling, where applicable
Detailed Graphical and Narrative Reports	Detailed graphical and narrative reports for all items and domains that include driver analysis, peer group comparisons, and data for all facilities in a health authority Final results were adjusted for disproportionate sampling, where applicable

Provincial Level Static Reports:

To view Provincial-level storyboards and detailed reports please download the embedded reports below. For all other Health Authority, Hospital, or Unit Level reports, please contact your Health Authority representative or Lena Cuthbertson.

BC Patient-Centred Measurement Working Group Contacts January 2019		
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Response Categories

Response categories are the choices provided to respondents when asked a close-ended question. The choice of response categories and the number of scale points can affect how precise respondents rate their opinions and experiences. In general, more ordered response categories or a higher number of scale points allow finer distinctions to be made between patients' reported experiences and outcomes (i.e., higher degree of measurement precision). The associated increase in response variations also allows relationships between questions or dimensions to be examined to a greater extent. In doing so, results provide a better opportunity to detect changes and differences. However, if patients cannot reliably decide between two scale-points or the differences are not clinically meaningful, having additional response categories increases respondent burden and can add noise to the data, thereby increasing the amount of measurement errors.

The Acute Inpatient survey mostly adapted four-point scales without a neutral category (e.g., neither agree or disagree), with a mix of dichotomous questions and a 10-points rating scale for outcome related questions. Responses categories and number of scale points for the Acute IP survey were determined using rigorous testing and validation processes, including cognitive interview and pilot studies that examined the scale reliability and validity of responses.

Valid and Non-Valid Responses

A response is considered "valid" when respondents select a response category that clearly states or reflects their opinion on a question (e.g., Never, Usually, Sometimes, Always). Valid response refer to the number of patients who provided a valid answer for the question and are used to calculate the valid percent. Responses such as "don't know" and "not applicable" and missing responses due to skip patterns are considered non-valid responses. "Don't know" is considered a non-valid response when calculating top-box scores as a "don't know" response cannot be classified as a positive or non-positive opinion or experience.

A Non-Valid response count refers to number of patients who did not provide a valid response (i.e., select from the valid response options) and answered "don't know", "not applicable", "prefer not to answer" to the question.

From the valid responses, a valid percentage is the percentage of responses (%) based on the total valid responses for a question or dimension. The valid percent column is arguably the best statistic for reporting purposes as it excludes those for whom the question was not applicable, and those who weren't sure of or didn't know the answer to the question.

See *Appendix C 2016/17 Acute Inpatient Sector Survey Codebook* to determine which response categories are valid responses and which are non-valid responses

Data File Submission to Healthideas

The vendor prepared 30 individual data files based on 9 survey types. Separate files for each health authority and subsector were submitted, because patients from Vancouver Coastal, Island Health, and Northern Health were asked two additional questions on spirituality and for Northern Health, patients were asked four additional questions about their Aboriginal Patient Liaison Worker.

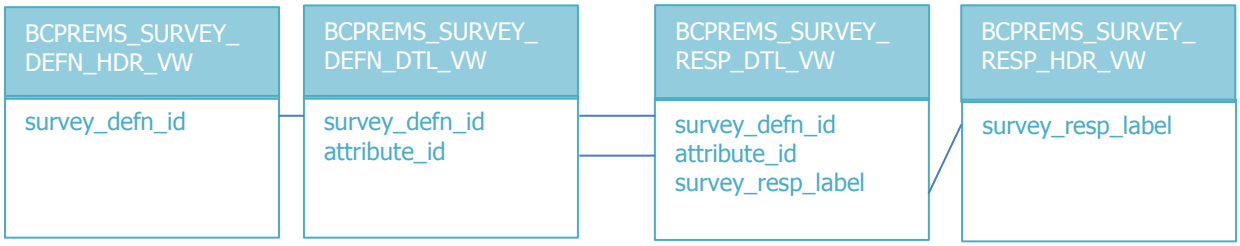
Survey Type	Survey Type Description	Health Authority	Number of Data Files
1	(PREMS + CONT + SURG + SAFETY + DEMOGRAPHICS)	FHA, INTERIOR, PHSA	3
2	(PREMS + CONT + SURG + SAFETY + DEMOGRAPHICS) + PROMS	FHA, INTERIOR, PHSA	3
3	(PREMS + CONT + SURG + SAFETY + DEMOGRAPHICS) + SPIRITUALITY	VCHA, VIHA,	2
4	(PREMS + CONT + SURG + SAFETY + DEMOGRAPHICS) + SPIRITUALITY + PROMS	VCHA, VIHA,	2
5	(PREMS + CONT + SURG + SAFETY + DEMOGRAPHICS) + SPIRITUALITY + APL	NORTHERN	1
6	(PREMS + CONT + SURG + SAFETY + DEMOGRAPHICS) + SPIRITUALITY + APL + PROMS	NORTHERN	1
7	MATERNITY SUBSECTOR	ALL	6
8	PEDIATRIC SUBSECTOR	ALL	6
9	REHAB SUBSECTOR	ALL	5 (NO REHAB FOR PHSA)
		TOTAL # OF FILES:	**30**

Database Views in Healthideas

Healthideas normalized the vendor supplied individual data files into database objects designed for data security, storage efficiency, and scalability. Four database views were created from these objects for analysis purposes.

Database View	Description
BCPREMS_SURVEY_DEFN_HDR_VW	Contain information about the survey such as the survey sector and survey version.
BCPREMS_SURVEY_DEFN_DTL_VW	Contain information about the survey question such as the question unique identifier, question label, and the dimension the question belongs to.
BCPREMS_SURVEY_RESP_HDR_VW	Contain information about the respondents.
BCPREMS_SURVEY_RESP_DTL_VW	Contain response to a given question in the survey.

The four database views can be linked to each other with the following key columns.



Data Dictionary

There are two data dictionaries for this sector survey:

1) the data dictionary in Healthideas WIKI; and

2) the survey vendor supplied codebook.

The Healthideas data dictionary can be used as the primary data dictionary and describes the columns in the four database views developed for analysts. Users can then query the database view SURVEY_DEFN_DTL_VW to identify the labels for the survey questions and their response categories. The database views also contain information on which response categories are valid responses and which are non-valid responses.

See Data Dictionary in Healthideas WIKI for detailed survey metadata.

See Appendix C 2016/17 Acute Inpatient Sector Survey Codebook

The survey vendor supplied codebook provided the same information but there are some important differences between the two. Survey descriptors such as survey sections and variable names for each sector survey have been standardized into a common format when they were transferred to Healthideas. These meta data are standardized to facilitate the secure and efficient storage of multiple sector surveys. The codebook and questionnaire prepared by the survey vendors use the original variable names, instead of the standardized variable names. To find out the original variable names, a survey layout mapping document is available to map the Healthideas labels back to the original survey descriptors used by the survey vendor.

Missing Values for Dates

Missing values can be denoted implicitly as NULL values or explicitly with a special response value (code). In the Healthideas databases, all dates have been standardized into MMDDYYYY format. Dates that do not conform to this format, such as patients where no information on admission date exists or patients with incomplete dates, (e.g., only the month or year of admission is available) are shown as NULL values in the database.

"Partial" and "Complete" Surveys

While the exact definition of a complete survey varies depending on the sector and survey tool used, generally speaking, a partial survey means the respondent did not answer all questions. For example, if there were 100 questions, the patient only answered 75.

The Acute Inpatient reports include responses from partially complete surveys. From the perspective that every patient's voice counts, each response, including answers from patients who completed only one question should be included.

From an analytical standpoint, there are methodological challenges as to whether to include or exclude partially completed surveys. The challenge stems from the unknown (unobserved) systematic differences between patients who completed the entire questionnaire versus those who answered only some of the questions. The extent to which these differences cannot be adjusted or accounted for can bias the estimates. The number of non-missing responses within a survey instrument is also important when calculating summary scores of standardized instruments such as the VR-12. Standardized instruments often have strict guidelines on the minimum number or percentage of answered questions for a scale before summary scores can be calculated.

While there is no right or wrong approach on how to handle partial completes, here are some guidelines:

- To replicate the numbers in the published reports, include partially completed surveys

- To examine potential differences between wholly complete and partially complete surveys, include partially completed surveys by treating them as a separate sub-group in the analysis
- To replicate the summary scores for a standardized instrument, consult the instrument developer's scoring manual and follow the recommended scoring algorithm and procedure

Reporting & Analysis: Scoring

Top Box Scoring

A Top-box score is the percentage of respondents who selected the most positive response category to a survey question. To facilitate interpretation of survey results and comparison across questions, survey responses are often standardized as a percentage of the most positive answers.

For individual questions, "Top-box" answers are defined as the most positive response category to a survey question regardless of the response categories. Results are easier to compare when they are all scored in this way, since there is less variation in interpretation of what constitutes a "good score."

Top-box score is calculated by dividing the sum of the most positive response over the sum of all valid response. The result is multiplied by 100 to transform it into a percentage.

$$\text{Top} - \text{box Score} = \frac{\sum \text{most positive response}}{\sum \text{valid response}} \times 100$$

For dimension and sub-dimension scores, the percentage of top-box responses for each question is first calculated separately and then averaged for dimensions/sub-dimensions that make up of multiple questions. In other words, dimension scores are calculated using an "average of the average" approach.

$$\text{Dimension Score} = \text{Average}(\text{top} - \text{box score for all questions})$$

An alternate method can be used, as in other sector surveys (e.g., Mental Health and Substance Use survey 2010/11), where the top-box dimension or sub-dimension score is calculated by treating all top-box responses and all valid responses for all the questions as one combined question (i.e., the "grand average" approach). The top-box scores are then calculated in two steps. First, the two total scores are calculated for each survey respondent. The first total score (top-box totals) consists of the sum of all "top-box" values for questions corresponding to each dimension. The second total score (valid response totals) consists of the sum of all valid responses for questions corresponding to the same dimension. Depending on the particular grouping or aggregation that was required, the top-box totals are divided by the valid response totals to obtain a top-box dimension score. The result is multiplied by 100 to transform it into a percentage.

$$\text{Dimension Score} = \frac{\sum \text{topbox response for all question}}{\sum \text{valid response for all question}} \times 100$$

Computationally, the "grand average" approach is more intensive when data is weighted. Conceptually, the two methods are different ways of calculating the same thing. In practice, unless the number of valid responses for each question varies significantly, the final dimension scores estimates are close enough that it does not make any practical differences in which approach to use.

Dimension Scores

A dimension score is a composite score based on an unweighted sum of all items that make up a given dimension or sub-dimension. The Acute Inpatient survey consists of questions designed to measure different dimensions and sub-dimensions of PREMS and PROMS. It includes items from the Canadian Patient Experiences Survey for Inpatient Care (CPES-IC) and additional made-in-BC items.

Dimension	Sub-Dimension
CPES-IC Dimension	
Continuity of Care (CPES-IC)	Access to Care
	Coordination of Care
	Discharge Transition Planning and Management
Communication, Participation, and Partnership (CPES-IC)	Respect and Dignity
	Information Sharing
Physical Comfort (CPES-IC)	Responsiveness
	Physical Environment
Made-in-BC Dimension	
Continuity across Transitions in Care (BC)	Continuity across Transitions in Care (BC)
Made-In-BC Modules	Patient Safety
	Hand Hygiene
	Medication Reconciliation

Key Driver Analysis

Questions that reflect aspects of care and service shown to statistically have the strongest relationship with the global rating indicator questions were considered key drivers of patient global rating or satisfaction for the Acute IP 2016/17 Survey. Correlational analyses or more advanced techniques, such as general linear models, that control for other potential factors can be used to examine the associations between patient ratings and overall experience of care.

In the reports, determination of key driver questions involved analyses of survey results from over 18,800 patients who experienced care in BC hospitals between September 1, 2016 and January 15, 2017. Only PREMS (not PROMS) questions were eligible for key driver analyses. Driver selection was based on two criteria:

See Technical Report for the complete list of drivers.

1. Whether the question has at least a moderate association with at least two of the four global rating questions (a Pearson correlation higher than .3) and;

2. Whether the question has Top-2 box scores lower than 70%.

Global Rating Questions

Four global rating questions were included in the CPES-IC:

1. Using any number from 0 to 10, where 0 is the worst hospital possible and 10 is the best hospital possible, what number would you use to rate this hospital during your stay?
2. Would you recommend the hospital you stayed at to your friends and family?
3. Overall, on a scale of 0 to 10, do you feel you were helped by your hospital stay? Please answer on a scale where 0 is "not helped at all" and 10 is "helped completely."
4. On a scale of 0 to 10, what was your overall experience with your hospital stay? Please answer on a scale where 0 is "I had a poor experience" and 10 is "I had a very good experience."

In the correlation analyses for the Acute Inpatient 2016/17 survey, a question that is positively correlated with the global ratings meant patients who reported higher scores for the key driver questions were also more likely to rate their overall experience of care more positively.

The key driver analysis was conducted separately on each of the five main subsectors to determine if they differ across subsectors, resulting in three distinct key driver list.

- Medical, Surgical, or Maternity
- Pediatric / Youth
- Rehabilitation

Reporting & Analysis: Qualitative Comments

In addition to the close-ended questions, Patients were asked to provide narrative comments at the end of the questionnaire in response to the question, **"What is the most important change we could make on this hospital unit? We welcome your additional comments."**

For the purposes of the Acute Inpatient 2016/17 survey, open-text comments were transcribed verbatim if the survey was completed over the phone and are written exactly as entered if the survey was completed online. All comments appear verbatim in the data set, with no corrections for grammar or content, although an personal identifiers are masked (XXXX). The survey vendor then coded each comment into 6 predefined themes (General, Treatment, Communication, Staff, Procedures, and Miscellaneous) and 38 individual themes. For each theme, valence codes were assigned depending on whether the theme-specific comment was positive, negative, neutral, or positive and negative. Prior to being included in the unit level reports and the data sets for Healthideas, the survey vendor reviewed all comments to remove identifiers that could reveal the identity of the patient, doctors, nurses, or other staff. Also, comments that were insensitive to specific racial or ethnic groups were adjusted so that the group was no longer identifiable. Narrative comments are included at the record level in Healthideas.

See Technical Report for additional details on coding themes and categories.

Open-text comments serve as a rich source of qualitative data to compliment the quantitative results of the survey. Open-text comments can be used to illustrate the human face of the data, to provide additional insight into what the survey results are demonstrating, and to point to areas not addressed in the survey that may be important to patients.

Reporting & Analysis: Peer Groups

Peer groups are useful for the assessment of survey results, particularly when it comes to performance improvement, as they allow comparison between similar facilities/reporting levels. Properly constructed, they convey the range of scores for similar units and facilities and serve as benchmark scores for comparing units or facilities results with their provincial and national peers.

In the Acute IP sector, the following peer groups were used:

Type of Facility	Subsector
Tertiary Community Small Freestanding Rehabilitation	Inpatient Maternity Pediatrics / Youth Rehab

Type of Facility

The facility is classified into one of three type based on their size, primary function, patients volume, and referral population.

Peer Group	Definition
Tertiary Hospital	An acute hospital that functions as a tertiary provincial or regional referral facility (e.g., provides specialized pediatrics care, neurosciences, cardiac care, trauma care, perinatal care).
Small Hospital	An acute hospital that admits fewer than 3500 patients annually, has a referral population of fewer than 20,000 people, AND is the only hospital in their community.
Community Hospital	An acute hospital that does not fit the definition of Small Hospital or Tertiary Hospital.
Freestanding Rehabilitation Hospital	An hospital that function as a specialized rehabilitation facilities.

Type of Subsector

A patient can be classified into the four following groups:

Peer Group	Definition
Inpatient	Any patient who is not in the maternity, pediatrics/youth, or rehabilitation peer group.
Maternity	Any patient who stayed in a maternity unit or flagged by the health authority representative as being discharged from a maternity unit.
Pediatrics/Youth	All BC Children Hospital patients and any patients who is less than 17 years of age or younger. For patients from BCCH, there is no ceiling on age – responses for anyone discharged there are considered in the Pediatrics/Youth peer group.
Rehabilitation	Any patient who stayed in a rehabilitation unit or flagged by the health authority representative as being discharged from a rehabilitation unit or freestanding rehabilitation facility.

Type of Unit

Units are classified into one of 16 peer groups designed to take into account both the size of the facility as well as the type of service provided.

Unit Peer Group			
Tertiary Hospital	Community Hospital	Small Hospital	Freestanding Rehabilitation Hospital
Tertiary Medical	Community Medical	Small Medical	Rehab
Tertiary Surgical	Community Surgical	Small Surgical	
Tertiary Medical/Surgical	Community Medical/Surgical	Small Medical/Surgical	
Tertiary Maternity	Community Maternity	Small Maternity	
Tertiary Pediatrics	Community Pediatrics	Small Pediatrics	

FAQs: Sampling and Survey Weighting

How were patients chosen to participate in the survey?

The Acute IP 2016/17 survey used a disproportionate stratified random sampling design to select patients. Patients were randomly selected from the 80 participated facilities at the unit level to complete the survey voluntarily. Patients were only contacted and invited to participate once during the surveying period (deduplication was carried out to ensure that patients would not be invited to participate more than once during the survey period). Since response rates and valid study universes were unknown at the beginning of the survey, a conservative approach was taken whereby a census was taken in all units for the first two cohorts of data collection. For the remaining cohorts, for units with less than 125 unique discharges over a 6 month period, all patients were invited to participate in the survey (i.e., a census approach). All other units were sampled twice a month (patients discharges from 1st to 15th and 16th to the end of each month) for total of 12 times over a 6 month period. Completion targets were set to ensure the unit margin of errors to be within ± 15% and the facility margin of errors to be within ± 9%.

See Technical Report for additional information on how the sample was selected and prepared (e.g., de-duplication).

In stratified random sampling, the patient population is divided into two or more groups (strata) according to one or more common characteristics before randomly selecting patients from each stratum. For this survey, the strata is the unit or facility. In disproportionate stratified random sampling, the numbers of patients recruited from each stratum is not proportionate to the total size of the patients population. The sampling plan was designed to obtain more precise information on the smaller subgroups by over sampling smaller units and under sampling larger units (i.e., disproportionate stratified random sampling). Compared to simple random sampling, stratifying tends to reduce sampling error and ensures a greater representation from subgroups. When members within the strata are more similar (homogeneity) than members between strata (heterogeneity), survey estimates can be as precise (or even more precise) as simple random sampling.

What are survey weights?

Survey weights are used to make the analysis sample representative of the target population on key characteristics. Key characteristics may include organization level attributes such as discharge volume and facility type or demographic characteristics such as age group and gender. Survey weights, or the inverse probabilities of selection for each observation, allow us to reconfigure the sample as if it was a simple random draw of patients that is representative of the total patient population to yield accurate estimates.

Why does the BCPCM Working Group use survey weights?

Survey weights are used to make the analysis sample representative of the target population on key characteristics. Surveys are often designed to obtain more precise information on smaller subgroups by over sampling smaller units and under sampling

larger units. As a result, the way key characteristics, such as discharge volume, are distributed may differ at the sample level from the way they are distributed in the population. For example, a sample at the facility-level may consist of 50% patients from unit A and 50% from unit B, when, in actuality, unit B makes up of 75% of the facility's discharge volume in the population. This disproportionate sampling introduces bias into the population estimate you may obtain from your sample because statistical procedures will give greater weight to people you over-sampled and less weight to those you under-sampled.

The BC Patient-Centred Measurement Working Group corrects for these biases with post-stratification survey weights. Survey weights, or the inverse probabilities of selection for each observation, allow us to reconfigure the sample as if it was a simple random draw of patients that is representative of the total patient population. Without weighting the data, patients' responses from over or under-sampled units will be given more or less weight in their answers than they should, resulting in biased population estimates.

The survey weights available for the Acute Inpatient 2016/17 survey are post-stratification weights that reweight the sample responses to match the population distribution in terms of **discharge volume.**

When does the BCPCM WG apply survey weights?

Depending on the level of analyses and research questions, the BC Patient-Centred Measurement Working Group applies weights so responses are to be representative of the patient population in terms of discharge volume at the unit, facility, and health authority levels.

When working with the PCM sector surveys, if the analytic questions involve comparing results across organizational units (e.g., unit, facility, & peer group), survey weights are recommended to ensure the analyses yield estimates that are less likely to be biased. If the analysis focuses on findings from only a single organizational unit (i.e., the unit level), consider applying additional individual level weights to account for demographic differences due to sampling as the supplied survey weights for PCM data often only account for differences at the organizational level. If the goal is to estimate causal effects and examine relationships between variables, then there are situations that call for the use of weights and situations that don't. Consult with a statistician for recommendations.

What are post-stratification weights?

Post-stratification weights are survey weights that are computed after you have collected all your data. The stratification part occurs when the patient population is first divided into two or more groups (strata) according to one or more common characteristics before randomly selecting patients from each stratum. For the Acute IP 2016/17 survey, strata were determined based on patient discharge volume at the unit and facility levels.

Do survey weights handle non-response?

Non-response occurs when a patient invited to participate in a survey does not answer one or all survey questions irrespective. Non-response bias is the difference in the results for those who responded versus those who did not respond (e.g., they are unwilling or they are unable to) for a survey.

Post-stratification weights can indirectly adjust imbalances with respect to discharge volume in the sample due to non-response. Survey data can be re-weighted to bring the sample discharge volume more closely into line with the population discharge volume. This approach is known as non-response weighting and post-stratification weights are one such method that takes into account non-response indirectly. Another approach to survey non-response is data imputation and a model-based approach.

What survey weights are available?

The Acute Inpatient 2016/17 survey dataset contains two post-stratification survey weights – expansion weights and normalized weights. Expansion weights are weights that sum up to the number of patients discharges at the population. Normalized weights are rescaled expansion weights wherein the weights sum to the sample size. Both set of weights reweight the sample to match the population distribution of discharge at the unit, facility, health authority, and provincial levels.

Survey Weight	Description
WEIGHTS	The weights were calculated in two steps. First, an initial weight that reweighted the sample to match the population discharge volumes at the unit level. This weight included discharge volumes from units that did not receive their unit level report due to various reasons, such as no patients completing a survey from that unit (i.e., miscellaneous units). For facility with no reporting unit level report, their weights were set to one to distinguish these facilities from facilities with at least one reporting unit (self-weighting). In the second step, the initial weights were adjusted so that the sample match the population discharge volume at the facility level to account for any remaining differences between the sum of all weighted units and that facility total discharge volume. This adjustment only affects facilities where there was no survey completion from the miscellaneous units but in the population, we have identified at least one miscellaneous unit, and therefore the initial weight cannot account for these discharges because we do not have any completion for them. Since all facilities were accounted for within health authorities, no further adjustments/weight calculations were necessary. The final survey weight was used in the production of the annual reports and storyboards.
WEIGHTS_NORMAL	The normalized version of WEIGHTS so that the weights sum up to the sample. When running statistical procedures and comparisons, the normalized weight should be used when the software does not consider the survey sampling design information.

How were the survey weights calculated?

The survey post-stratification weights were calculated in two stages using R *survey* package. First, to account for the population discharge volume of the participated units, and second, to account for units not in the final sample due to non-completions or other reasons so that the unit totals sum up to the total number of patients in each facility. For the purposes of weighting, discharges include all patients in the population frame regardless of their eligible status. To calculate the weights needed to adjust the sampling distribution to match the population discharge volumes, control tables with the discharge volume by units and facilities within each health authority were used. As provincial discharge volume is composed of the sum of all health authorities discharge volumes, and the health authority discharge volumes are in turn composed of the sum of all facility discharges, weighting at the unit and facility levels were sufficient to account for the distribution of discharges at the health authority and provincial level, therefore no further weighting is necessary.

What is an expansion weight?

Expansion weights are survey weights where the sum of weights adds up to the population count. A weight is a value assigned to each case in the data. The value indicates how much each case will count in a statistical procedure. For example, a weight of 10 means that the case counts in the dataset as 10 identical cases whereas a weight of 1 means that the case only counts as one case in the dataset. Survey weights can be and often are fractions, but are always positive and non-zero. Please note that software that does not consider survey sampling design often equates the sum of weights with the number of observations.

In general, using the expansion weights available in such software results in the underestimation of variance and in too many results being declared as significant when conducting statistical testing.

What is a normalized weight?

Normalized weights are rescaled weights where the sum of weights equals the sample size. It considers the survey weights, but not other aspects of the sampling design such as stratification, clustering, or calibration. When the weighted number of patients is very different from the unweighted number of cases, software that does not account for the survey sampling design will not be valid because it over-estimates the number of cases used in the tests as the software associates the sum of the weights with the number of observations (or the effective sample size). This generally results in an underestimation of variance and in too many results being declared as significant. Normalized weights partially address the problem with expansion weights by keeping the sum of weights the same as the sample size.

Are weighted results rounded?

Survey weights are often fractional numbers and some degree of rounding is involved in the estimates. The statistical programming language R was used to

compute the survey weights. R uses un-biased rounding (rounding half to even) where real numbers are rounded to the nearest integer, except where the decimal places are exactly 5. In these cases, the statistical programming language R rounds to the even integer by default (e.g., 82.65% is rounded to 82.6%). For weighted frequency count, it is customary to round them to the nearest whole number when reporting. As a result, small discrepancy of .1 percentage point is to be expected when comparing the percentage of combined individual response categories against the sum percentage of multiple categories.

FAQs: Response Rate and Survey Accuracy

How precise are the survey estimates?

Numbers are rounded to avoid reporting insignificant figures. For example, it would create false precision to express a top-box score as 90.60000 % (which has seven significant figures) because the questions were never designed or validated to measure patients reported experience and opinion to that degree of precision.

For the purpose of reporting, most survey results, including top-box scores or subgroup averages are considered to have a level of precision of up to one decimal place and are stored internally up to the precision allowed by the software. Given the measurement precision of the survey question, reporting more than two decimals of precision is not recommended as the original survey questions are unlikely to measure patients' experience and opinions accurately to two or more decimal points.

What is non-response bias?

Non-response bias is the bias that results when non-respondents differ systematically in meaningful ways from respondents. The result is that the survey sample often doesn't reflect the population they are meant to represent very well.

Most surveys suffer from non-response bias that may affect the quality of a survey and how accurate its estimates are. When patients who were selected in the random sample are unwilling or unable to participate in the survey, they are said to provide a non-response to the questionnaire (i.e., are non-respondents). When patients decline to answer a particular question, they provided "a non-response", resulting in missing data at the question level.

What does response rate tell us about non-response bias?

It is important to note that response rate is not necessarily a good indicator for non-response bias. A higher response rate, while desirable, does not mean the survey has smaller bias. Conversely, a low response rate does not by itself imply that survey estimates are biased. Instead, knowing whether responses from respondents and non-respondents differ in some systematic way is the best indicator of non-response bias. One way to assess the impact of non-response is to compare known characteristics known to be related to survey responses between these two groups to see if they differ. Information on non-respondents might come from previous sector surveys or external administrative data sources (e.g., health records or para-data files). The degree of non-response bias may also differ depending on the reasons of non-response (e.g., refusal, non-contact, technical problem). Non-respondent bias is often difficult to assess because of a lack of information from external sources to compare their characteristics against those of the respondents.

What is method bias?

Systematic differences in survey responses obtained from respondents who completed the survey in different survey modes are part of a class of bias called method bias. Method bias is broadly defined as any bias that results from the choice of survey method. Method bias happens when variations in responses are associated with the method (or survey instruments) rather than the actual opinions or reported experience of the respondents that the survey attempts to measure. The bias can occur because of the way the items or questions are phrased, the way in which they're asked, or the audience to which they're asked (e.g., self-report versus proxy respondents). This may include differences related to survey mode (e.g., phone, mail, or online survey), response format (Likert-scale versus multiple responses), scale range (3-point vs. 5-point scale), positive or negative item wording, or the language in which the survey is conducted.

Method bias is one of the main sources of measurement error in mixed-mode surveys. The method introduces "noise" variations in responses that contaminate actual differences and variations in patient's opinions or experiences.

For standardized instruments, method bias and method variance can be accessed via psychometric techniques such as confirmatory factor analyses or item response theory.