Adult Admitted Patient Survey 2022

Technical Supplement

September 2023

bureau of health information

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Please note there is the potential for minor revisions of data in this report.
Please check the online version at bhi.nsw.gov.au for any amendments or errata.

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Introduction

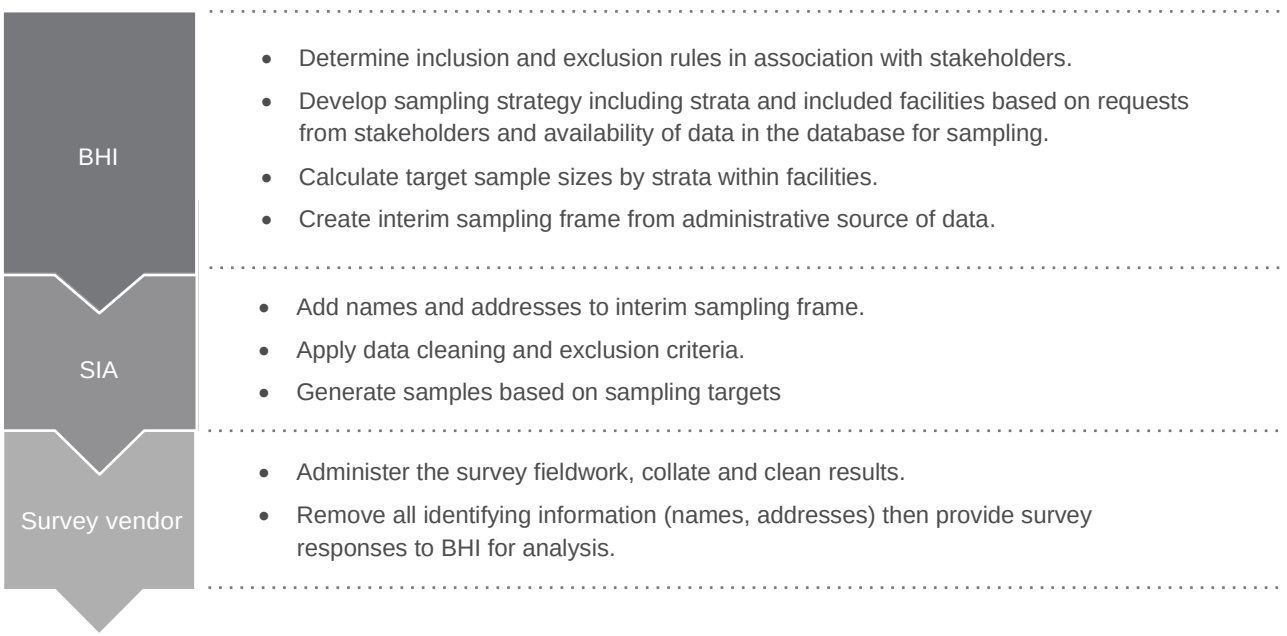
This technical supplement outlines the sampling methodology, data management and analysis of the results of the Adult Admitted Patient Survey 2022. Further supporting information is available in historical technical supplements for surveys in previous years, available at bhi.nsw.gov.au

The New South Wales (NSW) Patient Survey Program began sampling patients in NSW public health facilities from 2007. Up to mid-2012, the program was coordinated by the NSW Ministry of Health (Ministry). Responsibility for the NSW Patient Survey Program was transferred from the Ministry to the Bureau of Health Information (BHI) in 2012. BHI has a contract with a survey vendor to support data collection, while BHI conducts all survey analysis.

The aim of the NSW Patient Survey Program is to measure and report on patients' experiences in public healthcare facilities in NSW, on behalf of the Ministry and local health districts (LHDs). The survey program is guided by BHI's *Strategic Plan 2023–26*, which ensures all patient surveys maximise benefits to patients and deliver unique value for the NSW health system.

Data collection for the NSW Patient Survey Program is a collaboration between BHI, the survey vendor and the Ministry's Systems Information and Analytics (SIA) branch. Figure 1 shows the organisational responsibilities for the sampling design and data collection phases for patient survey projects.

Figure 1 Organisational responsibilities in sampling and data collection



Adult Admitted Patient Survey

The Adult Admitted Patient Survey 2022 was undertaken as part of the NSW Patient Survey Program. The survey has been conducted annually since 2013 and is mailed to adult patients who are admitted to a NSW public hospital between January and December on each year.

The survey questionnaire is reviewed each year. In response to the increased and ongoing use of virtual care, for the January to June 2022 patient cohort, a 13-question module about patients' experiences with virtual care outpatient and general practitioner (GP) appointments was sent to all eligible patients. For the August to October 2022 patient cohort who had eligible records in NSW Health's Waiting List Collection On-line System (WLCOS) a 13-question module was embedded to gain insights into patients' experiences of care with elective surgery. For January to December 2022 an additional 11 question module about Aboriginal patients' experiences with care was sent to those whose administrative clinical record indicates they are an Aboriginal and/or Torres Strait Islander person.

Content changes between the 2021 and 2022 questionnaires are available in a development report on BHI's website at bhi.nsw.gov.au/nsw_patient_survey_program/adult_admitted_patient_survey

Inclusion and exclusion criteria for admitted patients

The survey questionnaire was sent to eligible patients aged 18+ years who were discharged from a NSW public hospital between January and December 2022. Patients were eligible if the last 'episode of care' for their most recent hospital stay in a sampling month was for acute or rehabilitation care.

In Phase 1 screening, a series of exclusion criteria was applied to consider a range of factors including the potentially high vulnerability of particular patient groups and/ or patients with particularly sensitive reasons for admission; certain patients' ability to answer questions about their experiences; and the relevance of the survey questions to particular patient groups.

The following patients were excluded from the target population if they had:

- died during their hospital admission (mode of separation of '6' or '7')
- received Acute Post-Acute Care (APAC) hospital-in-the-home services
- been admitted for a termination of pregnancy procedure: procedure code 35643-03
- been admitted to a psychiatric unit during any hospital stay during the sampling month
- been treated for maltreatment syndromes, ICD-10 code = T74 in any diagnosis field, including neglect or abandonment, physical abuse, sexual abuse, psychological abuse, other maltreatment syndromes or 'unspecified'
- been treated for contraceptive management, ICD10 code = Z30 in any diagnosis field, including general counselling and advice on contraception, surveillance of contraceptive drugs, surveillance of contraceptive device, other contraceptive management, or 'unspecified'
- given birth in the target hospital during the sampling month, ICD-10 codes Z37.0, Z37.2, O80-O84, or procedure codes 90467, 90468, 90469, 90470 or 16520
- been admitted for pregnancy with an abortive outcome, ICD-10 code = O00-O08
- a diagnosis of stillborn baby, ICD-10 code = Z37 in any diagnosis field (including single stillbirth, twins (one liveborn and one stillborn), twins (both stillborn) and other multiple births (some liveborn)
- intentionally self-harmed, or presented with sequelae of intentional self-harm, ICD-10 code between X60 and X84 or ICD-10 code = Y87.0

- an unspecified event or undetermined intent, ICD-10 code commencing with Y34
- suicidal ideation, ICD-10 code = R45.81
- family history of other mental and behavioural disorders, ICD-10 code commencing with Z81.8
- a personal history of self-harm, ICD-10 code commencing with Z91.5
- been admitted for same-day haemodialysis, procedure code 13100-00 in any procedure field
- been same-day patients who stayed for less than three hours
- been same-day patients transferred to another hospital.

Many of these exclusions require knowledge of the diagnosis codes. Coding of admitted patient records should occur within six weeks of discharge but the timing can vary.

Records with incomplete diagnosis coding were not excluded because the exclusion of these records may have impacted the ability to meet the sample size required to ensure robust results at the hospital level.

The sampling frame then passed through a second phase of screening to exclude patients who had:

- an invalid address (including those with addresses listed as hotels, motels, nursing homes, community services, Mathew Talbot Hostel, 100 William Street, army quarters, jails and unknown)
- an invalid name (including 'twin', 'baby of')
- an invalid date of birth
- been included on the 'do not contact' list
- been sampled in the previous six months for any BHI patient survey
- a mode of separation of death for a subsequent admission to hospital
- been recorded as deceased according to the NSW Registry of Birth Deaths & Marriages and/or activity and performance reporting data collections, prior to the sample being provided to the survey vendor.

The remaining patients were considered to be the final sampling frame and those eligible to participate in the Adult Admitted Patient Survey 2022.

Inclusion and exclusion criteria for facilities

NSW public hospitals were included if they had a peer group classification of either:

- A1: Principal referral
- A3: Ungrouped acute – tertiary referral
- B1: Major hospitals group 1
- B2: Major hospitals group 2
- C1: District group 1
- C2: District group 2.

An additional 12 hospitals in peer groups D and F were included in the Adult Admitted Patient Survey 2022, because they are located in major cities and would otherwise not be included in patient surveys BHI conducts of hospitals in peer groups D and F in rural locations.

Sample design

Sample design is part of the mechanism that ensures the results of the survey are representative of the population. It does this by carefully selecting patients across hospitals and demographic characteristics.

BHI and the Centre for Aboriginal Health (CAH) are working together to collect the experiences and outcomes of care for Aboriginal people admitted to NSW public hospitals. In 2022, an oversample of adult patients who identified as Aboriginal using administrative data was invited to participate in the survey.

For non-Aboriginal patients, a stratified sample design was applied, with each hospital defined as a stratum. Within each hospital, patients were further stratified by the following variables:

- age group – 18–49 years or 50+ years, based on the age variable
- stay type – same-day or overnight admission, based on the start and end times of the last admitted patient stay in the month.

Simple random sampling without replacement was applied within each stratum to create a final sample of patients who were mailed a survey. The sampling frame for the Adult Admitted Patient Survey 2022 was based on data from NSW Health's Health Information Exchange (HIE) Admitted Patient Data Collection (APDC). Targets of monthly sampling (sample size) for each facility were calculated based on data from the previous year (after phase 1 screening) and the measurement frequency.

The measurement frequency equates to the periods for which results are reportable. For the Adult Admitted Patient Survey 2022, all hospitals were sampled with a semi-annual measurement frequency with the exception of A1–C2 hospitals in LHDs with fewer than three hospitals, which were sampled with a quarterly measurement frequency (Far West LHD, Central Coast LHD and St Vincent's Health Network). The additional 12 hospitals had an annual measurement frequency. Due to an estimated small number of eligible patients attending these hospitals, all eligible patients in some hospitals were invited to undertake the survey (census sampling).

The number of surveys mailed, responses, response rates and design effects (DEFF) by LHD and overall are provided in Appendix 1.

Data collection and analysis

Data collection

Selected patients were invited to complete the questionnaire by either returning the hard-copy questionnaire or by submitting an online response. Hard-copy questionnaires were scanned for fixed response options and responses in free-text fields were entered manually.

A first reminder was sent to all patients eight days after the initial survey pack, with a final reminder, containing the full survey pack, sent 15 days later to those who had not already responded. There was an exception for December patients, who only received the first reminder. The staged reminders were aimed at meeting or exceeding international best practice response rates, resulting in optimal precision in estimates.

The resultant survey data are anonymised and undergo quality assurance checks before secure transfer to BHI servers for processes which are password protected with access by authorised staff only.

Response rate and completion of questionnaires

The response rate is the percentage of people sampled who completed and returned or submitted their responses. The overall response rate, number of mailings, number of respondents and design effect overall and by LHD and hospital are provided in Appendix 1.

Survey completeness is a measure of how many questions each respondent answered as a proportion of all questions. The completeness of responses was high overall, with respondents answering, on average, 52 of the 59 non-text questions (this includes questions that were correctly skipped, but not questions in the module). Appendix 2 presents the rates of missing or 'Don't know'/'Can't remember' responses for all questions.

Weighting of data

Survey responses were weighted to optimise the degree to which results were representative of the experiences and outcomes of the overall patient population. At the NSW and LHD levels, weights also ensured that the different sampling proportions used at the facility level were accounted for, so that LHD results were not unduly influenced by small facilities that had larger sampling proportions.

Weights were calculated for all hospitals once 12 months of data were available. An initial weight was calculated for respondents in each hospital using the following equation:

$$w_i = \frac{N_i}{n_i}$$

Where:

N_i = total number of patients eligible for the survey in the ith hospital.

n_i = number of respondents in the i^{th} hospital.

Within each hospital, sampling and weighting were stratified into eight strata, comprising two age groups (18–49 years and 50+ years), two separation groups (admitted same day and overnight) and two Aboriginality groups (Aboriginal/Torres Strait Islander, and non-Aboriginal). Prior to weighting, stratum cells with no respondents were combined with adjoining strata.

The weights were then adjusted to marginal benchmarks through the generalised regression weighting macro (GREGWT), a survey-specific SAS program developed by the Australian Bureau of Statistics (ABS) to assist with weighting of complex survey data. This program uses iterative proportional fitting to ensure that the weights at the margins equal the population totals even though it is often impossible for the weights to equal the population at the individual cell level (i.e., within each hospital and stratum).

The following benchmarks were applied:

- peer group x peer group 2 x peer group 3 x LHD x LHD/hospital
- LHD x LHD/hospital x service category
- LHD x age group x composite (age and service category)
- peer group 2 x service category x Aboriginality
- hospital
- Aboriginality x composite (age and service category)
- Aboriginality x LHD
- Quarter x LHD
- Quarter x peer group
- LHD x composite 2 (Aboriginality and service category) x composite 3 (Aboriginality and age).

Additional explanations for the benchmarks:

- peer group 2: 1=peer group A; 2=peer group B; 3=peer group C1; 4=peer groups C2 or D or F
- peer group 3: 1 = peer groups A or B or C; 2 = other peer groups
- LHD/hospital is either LHD or hospital name as follows: LHD/hospital = hospital code (for LHDs in SVHN, CCLHD, FWLHD); LHD (for other LHDs)
- composite (age and service category): 1=age 18-49; 2=age 50+, same day; 3=age 50+, overnight
- composite 2 (Aboriginality and service category): 1=Aboriginal; 2=non-Aboriginal, overnight; 3=non-Aboriginal, same day
- composite 3 (Aboriginal and age): 1=Aboriginal; 2=non-Aboriginal, 18-49; 3=non-Aboriginal, 50+.

After the first cycle through the GREGWT macro, a process was undertaken that identified strata with low numbers of responses and high weights. Following further aggregation, the GREGWT macro was run again, creating the final weights. Quality assessment included looking at the agreement between the eligible population and sum of weights at the hospital-stratum-level, the overall distribution of weights (to avoid outliers), number of hospitals with a design effect greater than two, and the ratio of maximum to median weight at the hospital level. The maximum weight was 424.

For the Adult Admitted Patient Survey 2022, BHI has improved the benchmarks in weighting the data to ensure results are more representative of the eligible population across peer groups, hospitals and strata of sampling within hospitals. An analysis of historical data suggests that changes in results over time are not materially affected by the change in weighting methodology, therefore temporal analyses remain valid despite enhancement of weighting methodology.

Weighted percentages

All the results in the report were weighted. The weighted percentage of patients selecting each response option in the questionnaire was determined using the SURVEYFREQ procedure with a finite population correction factor and the Clopper-Pearson method adjusting for the sampling weights. Weighted percentages were calculated as follows:

- **numerator** – the (weighted) number of survey respondents who selected a specific response option to a certain question
- **denominator** – the (weighted) number of survey respondents who selected any of the response options to a certain question, minus exclusions
- **calculation** – the numerator/denominator x 100.

When reporting on questions used to identify sub-cohorts, the 'Don't know'/'Can't remember' option and missing responses were also reported. Appendix 2 presents the rates of missing or 'Don't know'/'Can't remember' responses for all questions.

It is assumed that no bias is introduced by the way patients who did not respond to the whole survey, or did not respond to specific questions, were handled. This is because it is also assumed these patients did so randomly and therefore any missing responses do not relate to the experience of care.

For some questions, the results from several responses were combined to form a 'derived measure'. For information about how these measures were developed, please see Appendix 3.

Comparing weighted and unweighted patient characteristics

One of the aims of sample weights is to ensure that, after weighting, the characteristics of the respondents closely reflect the characteristics of the eligible population.

Table 1 shows demographic characteristics of respondents against the eligible population. The four columns denote:

1. percentage of target population – the patient population prior to the phase 2 screening process
2. percentage of eligible population – the final sampling frame from which the sample was drawn (limited demographic variables are available at this level)
3. percentage of respondents (unweighted) – respondents to the survey, not adjusted for unequal sampling
4. percentage of respondents (weighted) – respondents to the survey, adjusted by weighting to be representative of the eligible population.

Table 1 Demographic characteristics of target population and respondents, Adult Admitted Patient Survey 2022

Demographic variable	Sub-group	% of target population	% of eligible population	% of respondents (unweighted)	% of respondents (weighted)
LHD	Central Coast	5	5	6	5
	Far West	0	0	2	0
	Hunter New England	13	12	18	12
	Illawarra Shoalhaven	5	5	6	5
	Mid North Coast	5	4	6	4
	Murrumbidgee	3	3	5	3
	Nepean Blue Mountains	5	5	6	5
	Northern NSW	6	6	10	6
	Northern Sydney	8	8	4	8
	South Eastern Sydney	11	11	6	11
	South Western Sydney	13	13	6	13
	Southern NSW	3	2	8	2
	St Vincent's Health Network	2	2	2	2
	Sydney	9	9	3	9
	Western NSW	4	4	7	4
	Western Sydney	9	10	4	10
Peer group	A1	46	47	18	47
	A3	3	3	3	3
	B	35	35	28	35
	C1	10	10	19	10
	C2	6	5	28	5
	D	0	0	1	0
	F (F4 and F6)	0	0	2	0
Age stratum	18-49 years	29	31	11	31
	50+ years	71	69	89	69
Stay type	Overnight	66	63	59	63
	Same day	34	37	41	37

Demographic variable	Sub-group	% of target population	% of eligible population	% of respondents (unweighted)	% of respondents (weighted)
Aboriginal status	Non Aboriginal	96	#	87	96
	Aboriginal	4	#	13	4
Sex*	Male	50	#	48	47
	Female	50	#	52	53

* Information on sex is drawn from administrative data.

Data not available.

Standardised comparisons between hospitals and the NSW result

Overview

In 2023, BHI introduced a new statistical approach for the Adult Admitted Patient Survey 2022 results to support fairer assessment of hospital performance based on patient experience measures. This new approach aimed to improve precision when flagging hospital performance as significantly higher (green) or significantly lower (red) than the NSW result in the Snapshot report and supplementary data tables. For comparison purposes, a version of the supplementary data tables for the 2021 survey showing how results flag as green or red under both the previous and the new methodology for standardised comparisons is available from BHI on request.

When looking at performance over time, the focus should be on the changes in percentage results rather than on whether those results are flagged as green or red, noting that year-on-year differences may not reflect clinically or statistically significant differences, and that changes in a hospital's patient mix may contribute to changes in results.

Some patient groups tend to respond more positively to surveys. This means that hospitals with higher proportions of patients with these socio-demographic characteristics tend to have higher patient experience ratings and vice versa. Before identifying a hospital's result as significantly higher or lower than NSW, the statistical model accounts for the characteristics of its patients (i.e., age, gender, education level and language spoken at home). Therefore, green and red flags are more likely to reflect actual differences in experiences rather than a difference in the socio-demographic mix of patients.

This approach is only applied to hospital results and not at the LHD level.

The statistical model

Across survey information products, BHI reports on the weighted percentage of patients selecting a particular survey response option (i.e., the actual result). These percentages do not change when standardised comparisons are applied (i.e., green and red flags are overlaid on the actual results).

This new statistical approach, introduced for the first time in the series of Adult Admitted Patient Surveys, involves two stages. BHI already uses similar statistical methods to assess hospital performance in its mortality and readmissions reporting. This two-stage process enables the assignment of green and red flags to outlier hospitals after consideration is given to each facility's actual result, socio-demographic mix of patients, sample size, and the NSW result. Outlier flags should be used to compare a hospital's performance to the NSW result each year, recognising that the NSW result also changes each year.

Stage 1 – Calculating risk-adjusted results for each hospital

This stage involves calculating risk-adjusted results by accounting for the socio-demographic characteristics of patients at each hospital, specifically those that can influence self-reported patient experience ratings (age, gender, education level and language spoken at home). The risk-adjusted percentages are not reported but used to determine whether a green or red flag is applied to the actual result. Selection of the patient characteristics used in these calculations is based on a thorough study BHI conducted in 2018.

The statistical program used to conduct the analysis in stage 1 is PROC SURVEYLOGISTIC. The dependent variable used in the statistical model is the binary version of a given performance question, usually based on the percentage of patients who selected the most positive response option. The model derives a predicted probability of respondents selecting the most positive response option based on the socio-demographic mix of the respective hospital's patients. The predicted probabilities are multiplied by the survey weights to give a predicted number of patients in the eligible population that would have the same response (i.e., the expected result).

The risk-adjusted ratio (aR) is calculated by taking the ratio of the weighted number of respondents who selected the most positive response option (numerator or actual result) to the number of respondents in the population predicted to also respond the same way according to the model (denominator or expected result).

The risk-adjusted percentage is calculated for each hospital by scaling to the question-specific NSW result using the following formula:

$$Adjusted\ percentage = aR \times weighted\ NSW\ percentage.$$

The adjusted percentage can be interpreted as how the hospital would perform if the socio-demographic mix was the same as the reference population (NSW results). This adjusted percentage can therefore be used to report fairer comparisons of self-reported experiences between hospitals and the NSW results, when it is compared to the NSW results after considering the effective size of each hospital.

Stage 2 – Comparing each hospital's risk-adjusted result with the NSW result

This stage involves comparing a hospital's risk-adjusted result with the NSW result after considering the effective sample size for each hospital.

To identify outlier hospital results, funnel plots with control limits at a 99% confidence level were created for self-reported experience questions to compare each hospital's risk-adjusted result with the NSW result. This process uses the exact binomial method described by Spiegelhalter[1] and the effective sample size.

The effective sample size is the number of respondents for each hospital divided by the hospital-level design effect. Therefore, the control limits take into account the sampling method. Hospitals that fall outside the control limits are considered outliers and flagged as significantly higher or lower than the NSW result, after taking into account differences in the socio-demographic mix of a hospital's patients. To reduce the likelihood of identifying outliers due to chance, 99% control limits were used.

Standardised comparisons are not applied:

- when results are flagged as 'interpret with caution' (see page 14), due to reduced precision of the actual result
- for all questions regarding problems, because patients who have more complex conditions are more likely to experience problems or clinical complications, and comparisons have not been adjusted for patient complexity.

Analyses of differences in experiences between patient groups

To examine differences in experiences between any two patient groups in the Adult Admitted Patient Survey 2022, a logistic regression model was used with adjustment for confounders and sampling using the SURVEYLOGISTIC procedure. A p-value of 0.05 was used to determine if the differences were statistically significant.

For each question, the pre-defined, most positive response option was used to create a dichotomised variable such that the most positive response was coded as 1, and all other responses, excluding invalid and missing responses, were coded as 0. Logistic regression was used to fit these binary variables as outcomes and 'rurality of hospital' (urban versus large rural hospitals) as the explanatory variable after accounting for differences in patient characteristics between these two groups on the basis of age, gender, education level and language spoken at home. Responses with a missing value were excluded from the analysis. When comparing the results of experiences with care in urban and large rural hospitals, results are presented across the most positive response option.

SAS software version 9.4 was used for all statistical analyses, and facility and sampling variables were included as strata variables.

Reporting

Confidentiality and suppression rules

BHI does not receive any confidential patient information and only publishes aggregated data and statistics. Each question must have a minimum of 30 respondents at the reporting level (hospital, LHD or NSW) for results to be reported. This ensures there are enough respondents for reliable estimates to be calculated, and that patient confidentiality and privacy are protected.

When the number of respondents for a hospital or LHD was fewer than 30, results were suppressed. The suppressed results still contribute to NSW-level results and/ or LHD level results.

Interpret with caution

All data collected using surveys are subject to sampling error (i.e. the difference between results based on a sample of a target population, and the results if all people who received care were surveyed). The 95% confidence interval of the average is expected to contain the true result 19 times out of 20.

Where the confidence interval was wider than 20 percentage points, results for individual questions are noted with an asterisk '*' to indicate 'interpret with caution'. In addition, percentages of 0 or 100, which do not have confidence intervals, are also noted as 'interpret with caution' where the number of respondents was fewer than 200.

Where the number of respondents was between 30 and 49 with a response rate at or above 20%, or the number of respondents more than 49 with a response rate less than 20%, results are publicly reported and an 'interpret with caution' note appended to the hospital to indicate uncertainty about the representativeness of the result.

Reporting by population groups

In addition to reporting results for all respondents, BHI also reports the results by specific groups, as follows:

- age group
- gender
- education level
- language spoken at home
- longstanding health condition: ‘had condition/s’, ‘none reported’
- rurality of facility: ‘urban, ‘rural’
- self-reported Aboriginality: ‘Aboriginal, ‘non-Aboriginal’.

The above results, where they satisfy BHI’s suppression rules, are available on the BHI Data Portal at bhi.nsw.gov.au/data-portal

Hospitals are classified as ‘urban’ and ‘rural’ using the Accessibility and Remoteness Index of Australia (ARIA+), the Australian Bureau of Statistics’ measure of remoteness. Urban facilities include those classified as being located in ‘Major Cities of Australia’ according to ARIA+. Rural facilities include those classified as being located in ‘Inner Regional Australia’, ‘Outer Regional Australia’, ‘Remote Australia’ and ‘Very Remote Australia’.

The Accessibility and Remoteness Index of Australia (ARIA+) is the standard Australian Bureau of Statistics measure of remoteness. For more information, see abs.gov.au

Appendix 1

Survey response summary

Table 2 Number of surveys mailed, responses, response rates and design effects (DEFF) by LHD and overall, Adult Admitted Patient Survey 2022

	Questionnaires mailed	Responses	Adjusted response rate (%)	DEFF
NSW	70804	19797	31	3.3
Local health district				
Central Coast	4090	1241	35	2.0
Far West	1465	406	29	1.9
Hunter New England	11808	3589	32	3.0
Illawarra Shoalhaven	3588	1136	36	2.9
Mid North Coast	3833	1235	37	2.5
Murrumbidgee	3357	898	29	3.0
Nepean Blue Mountains	4117	1172	31	3.6
Northern NSW	6044	1928	36	3.1
Northern Sydney	2917	847	31	2.0
South Eastern Sydney	4818	1265	29	2.1
South Western Sydney	5292	1200	25	2.3
Southern NSW	4597	1607	37	1.5
St Vincent's Health Network	1780	417	26	1.6
Sydney	3081	669	25	1.8
Western NSW	6093	1477	29	2.3
Western Sydney	3924	710	21	2.1

Table 3 Number of surveys mailed, responses, response rates and design effects (DEFF) by hospital, Adult Admitted Patient Survey 2022

Hospital name	LHD name	Questionnaires mailed	Responses	Adjusted response rate (%)	DEFF
Central Coast	Gosford Hospital	2028	597	35	2.0
	Woy Woy Hospital	134	49	37	1.0
	Wyong Hospital	1928	595	35	1.6
Far West	Broken Hill Health Service	1465	406	29	1.9
Hunter New England	Armidale Hospital	856	258	33	1.3
	Belmont Hospital	878	279	35	1.4
	Calvary Mater Newcastle	877	262	33	1.3
	Cessnock Hospital	770	240	33	1.4
	Gunnedah Hospital	437	163	37	1.4
	Inverell Hospital	655	192	30	1.3
	John Hunter Hospital	1315	310	31	1.6
	Kurri Kurri Hospital	759	380	52	1
	Maitland Hospital	933	261	31	1.6
	Manning Hospital	867	303	38	1.3
	Moree Hospital	445	128	28	1.1
	Muswellbrook Hospital	652	203	32	1.3
	Narrabri Hospital	434	105	24	1.5
	Singleton Hospital	742	204	29	1.4
	Tamworth Hospital	1188	301	32	1.3
Illawarra Shoalhaven	Coledale Hospital	47	17	35	1.1
	Milton Ulladulla Hospital	351	154	43	1.1
	Port Kembla Hospital	115	46	40	1.4
	Shellharbour Hospital	821	326	45	1.4
	Shoalhaven District Memorial Hospital	1067	319	36	1.6
	Wollongong Hospital	1187	274	30	1.7
Mid North Coast	Coffs Harbour Health Campus	1163	291	31	1.8
	Kempsey District Hospital	806	301	40	1.5

Hospital name	LHD name	Questionnaires mailed	Responses	Adjusted response rate (%)	DEFF
	Macksville District Hospital	724	283	39	1.8
	Port Macquarie Base Hospital	1140	360	39	1.7
Murrumbidgee	Deniliquin Health Service	440	154	36	1.1
	Griffith Base Hospital	855	201	25	1.6
	Wagga Wagga Base Hospital	1428	328	30	1.7
	Young Health Service	634	215	37	1.2
Nepean Blue Mountains	Blue Mountains District Anzac Memorial Hospital	771	269	36	1.8
	Hawkesbury District Health Service	816	225	29	1.6
	Lithgow Hospital	680	248	39	1.3
	Nepean Hospital	1524	297	29	1.9
	Springwood Hospital	326	133	43	1.2
Northern NSW	Ballina District Hospital	661	257	40	1.7
	Byron Central Hospital	411	122	30	1.2
	Casino & District Memorial Hospital	433	158	36	2.4
	Grafton Base Hospital	900	297	38	1.3
	Lismore Base Hospital	1487	380	38	1.9
	Maclean District Hospital	370	151	41	1.1
	Murwillumbah District Hospital	681	286	43	1.8
	The Tweed Hospital	1101	277	29	1.5
Northern Sydney	Greenwich Hospital	160	62	37	1
	Hornsby Ku-ring-gai Hospital	763	220	31	1.2
	Mona Vale Hospital	261	94	36	1
	Royal North Shore Hospital	978	238	30	1.3
	Ryde Hospital	755	233	33	1.3
South Eastern Sydney	Calvary Health Care Kogarah	337	128	36	1
	Prince of Wales Hospital	1089	242	26	1.5
	Royal Hospital for Women	762	170	24	1.5

Hospital name	LHD name	Questionnaires mailed	Responses	Adjusted response rate (%)	DEFF
	St George Hospital	833	195	25	1.4
	Sutherland Hospital	815	239	32	1.3
	Sydney Hospital and Sydney Eye Hospital	834	235	31	1.3
	Uniting War Memorial Hospital - Waverley	148	56	38	1
South Western Sydney	Bankstown-Lidcombe Hospital	814	165	22	1.4
	Bowral and District Hospital	779	274	36	1.2
	Braeside Hospital - Fairfield	216	61	28	1
	Camden Hospital	233	79	33	1.1
	Campbelltown Hospital	1298	272	26	1.6
	Fairfield Hospital	802	147	19	1.5
	Liverpool Hospital	1150	202	21	1.6
Southern NSW	Batemans Bay District Hospital	703	270	43	1.1
	Cooma Hospital and Health Service	685	263	39	1.3
	Goulburn Base Hospital	792	262	35	1.3
	Moruya Hospital	806	277	37	1.2
	Queanbeyan Hospital and Health Service	758	231	32	1.6
	South East Regional Hospital	853	304	40	1.2
St Vincent's Health Network	St Joseph's Hospital - Auburn	84	24	29	1.1
	St Vincent's Hospital Sydney	1696	393	26	1.5
Sydney	Balmain Hospital	183	42	23	1.1
	Canterbury Hospital	754	180	25	1.4
	Concord Repatriation General Hospital	841	208	27	1.3
	Royal Prince Alfred Hospital	1303	239	23	1.7
	Western NS Bathurst Health Service	954	234	27	1.8

Hospital name	LHD name	Questionnaires mailed	Responses	Adjusted response rate (%)	DEFF
	Cowra Health Service	629	209	35	1.5
	Dubbo Hospital	2099	354	27	1.6
	Lachlan Health Service - Forbes	443	156	35	1.5
	Mudgee Health Service	704	221	33	1.4
	Orange Health Service	1264	303	31	1.7
Western Sydney	Auburn Hospital	811	130	16	1.5
	Blacktown Hospital	1160	212	23	1.4
	Mount Druitt Hospital	857	182	23	1.4
	Westmead Hospital	1096	186	20	1.6

Appendix 2

Rates of missing or ‘Don’t know’/‘Can’t remember’ responses

Table 4 Unweighted percentage of missing and ‘Don’t know’/‘Can’t remember’ responses, by question, Adult Admitted Patient Survey 2022

Number	Question	Missing (%)	‘Don’t know’/‘Can’t remember’ (%)	Missing + ‘Don’t know’/‘Can’t remember’ (%)*
1	Were the staff you met on your arrival to hospital polite and welcoming?	2.47	2.1	4.57
2	How well organised was the admission process?	3.06		3.06
3	How clean were the areas of the hospital you used during your stay?	2.45		2.45
4	How would you rate the food you were served while in hospital?	2.96		2.96
5	Were you given enough privacy during your stay at the hospital?	3.2		3.2
6	Did you stay for one or more nights in a room or ward which was only for patients of the same gender as you?	4.48		4.48
7	Did the health professionals who treated you introduce themselves to you?	2.57	1.33	3.9
8	Did the health professionals ask your name or check your identification band before giving you any medications, treatments or tests?	2.55	2.26	4.81
9	Did you have enough time to discuss your health or medical problem with the health professionals?	2.82	1.84	4.67
10	Did the health professionals explain things in a way you could understand?	3.15		3.15
11	Did you have confidence and trust in the health professionals treating you?	2.97		2.97
12	Were the health professionals kind and caring towards you?	2.77		2.77
13	Overall, how would you rate the doctors who treated you?	2.99		2.99
14	Overall, how would you rate the nurses who treated you?	2.93		2.93
15	During your stay in hospital, how much information about your condition or treatment was given to you?	3.24		3.24

Number	Question	Missing (%)	'Don't know'/'Can't remember' (%)	Missing + 'Don't know'/'Can't remember' (%)*
16	How much information about your condition or treatment was given to your family, carer or someone close to you?	3.44	5.63	9.07
17	Did you ever receive contradictory information about your condition or treatment from the health professionals?	4.35		4.35
18	In your opinion, did the health professionals who treated you know enough about your care and treatment?	3.34		3.34
19	Did the health professionals give you the support you needed to help with any worries or fears related to your care and treatment?	3.23		3.23
20	Were you involved, as much as you wanted to be, in decisions about your care and treatment?	3.07		3.07
21	When the health professionals spoke about your care in front of you, were included in the conversation?	3.02		3.02
22	Did the health professionals listen carefully to any views and concerns you had?	3.15		3.15
23	How would you rate how well the health professionals worked together as a team?	3.03		3.03
24	Were you treated with respect and dignity while in hospital?	2.89		2.89
25	Were your cultural or religious beliefs respected by the hospital staff?	3.42		3.42
26	If you needed help with personal care (e.g. eating and drinking, moving around or going to the bathroom), did hospital staff help you within a reasonable timeframe?	3.04		3.04
27	Were you ever in any pain while in hospital?	4.22		4.22
28	Do you think the health professionals did everything they could to help manage your pain? [if patient experienced pain while in hospital]	5.42		5.42
29	Did health professionals explain what would happen during your tests, operations or procedures in a way you could understand?	3.12	2.16	5.28
30	Did health professionals explain the results or outcome of your tests, operations or procedures in a way you could understand?	3.23	2.41	5.64

Number	Question	Missing (%)	'Don't know'/'Can't remember' (%)	Missing + 'Don't know'/'Can't remember' (%)*
31	During your hospital stay or soon after, did you experience any problem related to your care and treatment?	4.05		4.05
32	Was the impact of this problem...? [if patient experienced a problem or clinical complication during or shortly after stay]	4.72		4.72
33	Were the health professionals open with you about this problem?	4.65		4.65
34	Were the health professionals responsive in addressing this problem? [if patient experienced problem or clinical complication during or shortly after stay]	5.29		5.29
35	Did you feel involved in decisions about your discharge from hospital?	3.42		3.42
36	At the time you were discharged, did you feel that you were well enough to leave the hospital?	3.46		3.46
37	Thinking about when you left hospital, were you given enough information about how to manage your care at home?	3.13		3.13
38	Was your family and home situation taken into account when you were discharged?	3.18	2.38	5.56
39	Thinking about when you left hospital, were adequate arrangements made for any services you needed? (e.g. equipment, home care, community care, follow-up appointments)?	3.61		3.61
40	Were you told who to contact if you were worried about your condition or treatment after you left hospital?	3.62	9.22	12.84
41	Were you given or prescribed any new medication to take at home?	4.24		4.24
42	Did a health professional in the hospital tell you about medication side effects to watch for? [if patient was given or prescribed new medication to take at home]	7.87		7.87
43	Did you receive a document summarising your hospital care (e.g. a digital or physical copy of the letter to your GP or a discharge summary)?	4.15	10.74	14.9
44	On the day you left hospital, was your discharge delayed?	3.88		3.88

Number	Question	Missing (%)	'Don't know'/'Can't remember' (%)	Missing + 'Don't know'/'Can't remember' (%)*
45	Did hospital staff explain the reason for the delay? [if patient's discharge was delayed]	3.69		3.69
46	Overall, how would you rate the care you received while in hospital?	1.71		1.71
47	How well organised was the care you received in hospital?	1.72		1.72
48	If asked about your hospital experience by friends and family, how would you respond?	1.84		1.84
49	Did the care and treatment received in hospital help you?	1.82		1.82
50	In the month following your discharge, were you re-admitted to any hospital or did you go to an emergency department because of complications related to the care you received?	1.94	1.3	3.24
51	In the three months following your discharge, were you re-admitted to any hospital or did you go to an emergency department because of complications related to the care you received?	2.77	1.55	4.31
65	What year were you born?	2.23		2.23
66	How do you describe your gender?	2.01		2.01
67	What is the highest level of education you have completed?	3.73		3.73
68	Language mainly spoken at home	1.85		1.85
69	Aboriginal and/or Torres Strait Islander origin	2.93		2.93
70	Which, if any, of the following longstanding conditions do you have (including age-related conditions)?	5.66		5.66
72	Do you give permission for the Bureau of Health Information to link your answers from this survey to health records related to you (the patient)?	3.66		3.66
952	In the three months after your discharge from the hospital, how many in-person appointments have you had with a hospital outpatient clinic?	3.25	2.14	5.4
953	In the three months after your discharge from the hospital, how many virtual care appointments have you had with a hospital outpatient clinic?	4.24	1.82	6.06
954	Overall, how would you rate the virtual care you received?	2.84		2.84

Number	Question	Missing (%)	'Don't know'/'Can't remember' (%)	Missing + 'Don't know'/'Can't remember' (%)*
955	Did the care and treatment received through virtual care help you?	5.35		5.35
956	Compared with in-person appointments, was your virtual care experience…?	7.54		7.54
957	If given the choice, would you use virtual care again?	7.46	10.37	17.83
958	Thinking about your experiences of virtual care, what have been the benefits for you?	14.75		14.75
959	How did you access your most recent virtual care appointment?	17.5		17.5
960	In the three months after your discharge from the hospital, how many in-person appointments have you had with a general practitioner (GP)?	4.37	1.98	6.35
961	In the three months after your discharge from the hospital, how many virtual care appointments have you had with a general practitioner (GP)?	7.19	2.42	9.61
962	Overall, how would you rate the virtual care you received?	4.02		4.02
963	Did the care and treatment received through virtual care help you?	5.85		5.85
964	Did the opportunity to use virtual care help ensure that your care was well coordinated between the hospital and the GP?	5.21	6.46	11.67

* Percentages for this column may not equal the sum of the 'Missing (%)' and 'Don't know (%)' columns because they were calculated using unrounded figures.

Appendix 3

Derived measures

Definition

Derived measures are those for which results are calculated indirectly from respondents' answers to a survey question. These tend to be from questions that contain a 'not applicable' type response option and are used to gather information about patients' needs.

Derived measures involve the grouping together of more than one response option to a question. The derived measure 'Quintile of disadvantage' is an exception to this rule. For more information on this, please refer to the Data Dictionary: Quintile of disadvantage on BHI's website at bhi.nsw.gov.au/__data/assets/pdf_file/0016/300616/Quintile_of_Disadvantage.pdf

Statistical methods

Results are expressed as the percentage of respondents who chose a specific response option or options for a question. The reported percentage is calculated as the numerator divided by the denominator (see definitions below). Results are weighted as described in this report.

Numerator

The number of survey respondents who selected a specific response option/s to a certain question, minus exclusions.

Denominator

The number of survey respondents who selected any of the response options to a certain question, minus exclusions.

Exclusions

For derived measures, the following responses are usually excluded:

- 'Don't know'/'Can't remember' or similar non-committal response
- invalid (i.e. respondent was meant to skip a question but did not)
- missing (with the exception of questions that allow multiple responses or a 'none of these' option, for which the missing responses are combined to create a 'none reported' variable).

Interpretation of indicator

The higher the percentage, the more respondents fall into that response category.

The table below shows the questions and responses used in the construction of the derived measures.

Table 5 Derived measures for the Adult Admitted Patient Survey 2022

Derived measure	Question	Derived measure categories	Original question responses
Went through the admission process	Q2. How well organised was the admission process?	Did not go through the admissions process	Not applicable
		Went through the admissions process	Very well organised
			Fairly well organised
			Not well organised
Interacted with health professionals before receiving medications, treatments or tests	Q8. Did the health professionals ask your name or check your identification band before giving you any medications, treatments or tests?	Not applicable/don't know/can't remember	Not applicable
			Don't know/can't remember
		Interacted with health professionals before receiving medications, treatment or tests	Yes, always
			Yes, sometimes
			No
Received information about condition or treatment during stay	Q15. During your stay in hospital, how much information about your condition or treatment was given to you?	Received information	Not enough
			The right amount
			Too much
		Not applicable	Not applicable
Had worries or fears related to care and treatment	Q19. Did the health professionals give you the support you needed to help with any worries or fears related to your care and treatment?	Didn't have worries or fears	I didn't have any worries or fears
		Had worries or fears	Yes, definitely
			Yes, to some extent
			No
Health professionals spoke about care in front of them	Q21. When the health professionals spoke about your care in front of you, were included in the conversation?	Not applicable	Not applicable
		Had health professionals speak about their care in front of them	Yes, definitely
			Yes, to some extent
			No
Had views and concerns	Q22. Did the health professionals listen carefully to any views and concerns you had?	Not applicable	I didn't have any views or concerns
		Had views or concerns	Yes, definitely
			Yes, to some extent
			No
Had religious or cultural beliefs to consider		Had beliefs to consider	Yes, always
			Yes, sometimes

Derived measure	Question	Derived measure categories	Original question responses
	Q25. Were your cultural or religious beliefs respected by the hospital staff?		No
		Beliefs not an issue	Not applicable
Needed help with personal care	Q26. If you needed help with personal care (e.g. eating and drinking, moving around or going to the bathroom), did hospital staff help you within a reasonable timeframe?	Not applicable	I didn't need help with personal care
		Needed help with personal care	Yes, always
			Yes, sometimes
			No
Had tests, operations or procedures (derived measure from explanation)	Q29. Did health professionals explain what would happen during your tests, operations or procedures in a way you could understand?	Not applicable/don't know/can't remember	Don't know/can't remember
			Not applicable
		Had tests, operations or procedures	Yes, always
			Yes, sometimes
			No
Had tests, operations or procedures (derived measure from outcomes)	Q30. Did health professionals explain the results or outcome of your tests, operations or procedures in a way you could understand?	Not applicable/don't know/can't remember	Don't know/can't remember
			Not applicable
		Had tests, operations or procedures	Yes, always
			Yes, sometimes
			No
Needed information about how to manage care at home	Q37. Thinking about when you left hospital, were you given enough information about how to manage your care at home?	Not applicable	Not applicable
		Needed information on how to manage care at home	Yes, definitely
			Yes, to some extent
			No
Needed family and home situation taken into account at discharge	Q38. Was your family and home situation taken into account when you were discharged?	Not applicable	Don't know/can't remember
			Not applicable
		Needed family and home situation taken into account when planning discharge	Yes, definitely
			Yes, to some extent
			No
Needed services after discharge		Not applicable	I didn't need any services
			Yes, definitely

Derived measure	Question	Derived measure categories	Original question responses
	Q39. Thinking about when you left hospital, were adequate arrangements made for any services you needed? (e.g. equipment, home care, community care, follow-up appointments)?	Needed services after discharge	Yes, to some extent
			No
Have a longstanding health condition	Which, if any, of the following longstanding health conditions do you have (including age-related conditions)?	Has longstanding health condition	Deafness or severe hearing impairment
			Blindness or severe vision impairment
			A longstanding illness (e.g. cancer, HIV, diabetes, chronic heart disease)
			A longstanding physical condition (e.g. arthritis, spinal injury or multiple sclerosis)
			An intellectual disability
			A mental health condition (e.g. depression)
			A neurological condition (e.g. Alzheimer's, Parkinson's)
		Doesn't have longstanding health condition	None of these
			Missing

References

1. Spiegelhalter DJ, Funnel plots for comparing institutional performance, Stat Med 2005, 24(8): 1185-202.