Adult Admitted Patient Survey 2019

Technical Supplement

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Table of contents

NSW Patient Survey Program

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 the *NSW Patient Survey Program Strategy 2019–2022*, which ensures that all patient surveys maximise benefits to patients and deliver unique value for the NSW health system.

This document outlines the sampling methodology, data management and analysis of the results of the Adult Admitted Patient Survey (AAPS) 2019.

For more information on how to interpret results and statistical analysis of differences between hospitals and NSW, please refer to the Guide to Interpreting Differences on BHI's website at **bhi.nsw.gov.au/ nsw_patient_survey_program**

Adult Admitted Patient Survey

AAPS was the first survey sent to patients as part of the revised NSW Patient Survey Program in 2013. This survey was mailed to adult patients who attended a NSW public hospital between January and December 2013. Subsequent cycles of the survey were conducted from 2014 to 2019.

For changes in the questionnaire content between AAPS 2018 and AAPS 2019, please refer to the development report on BHI's website.
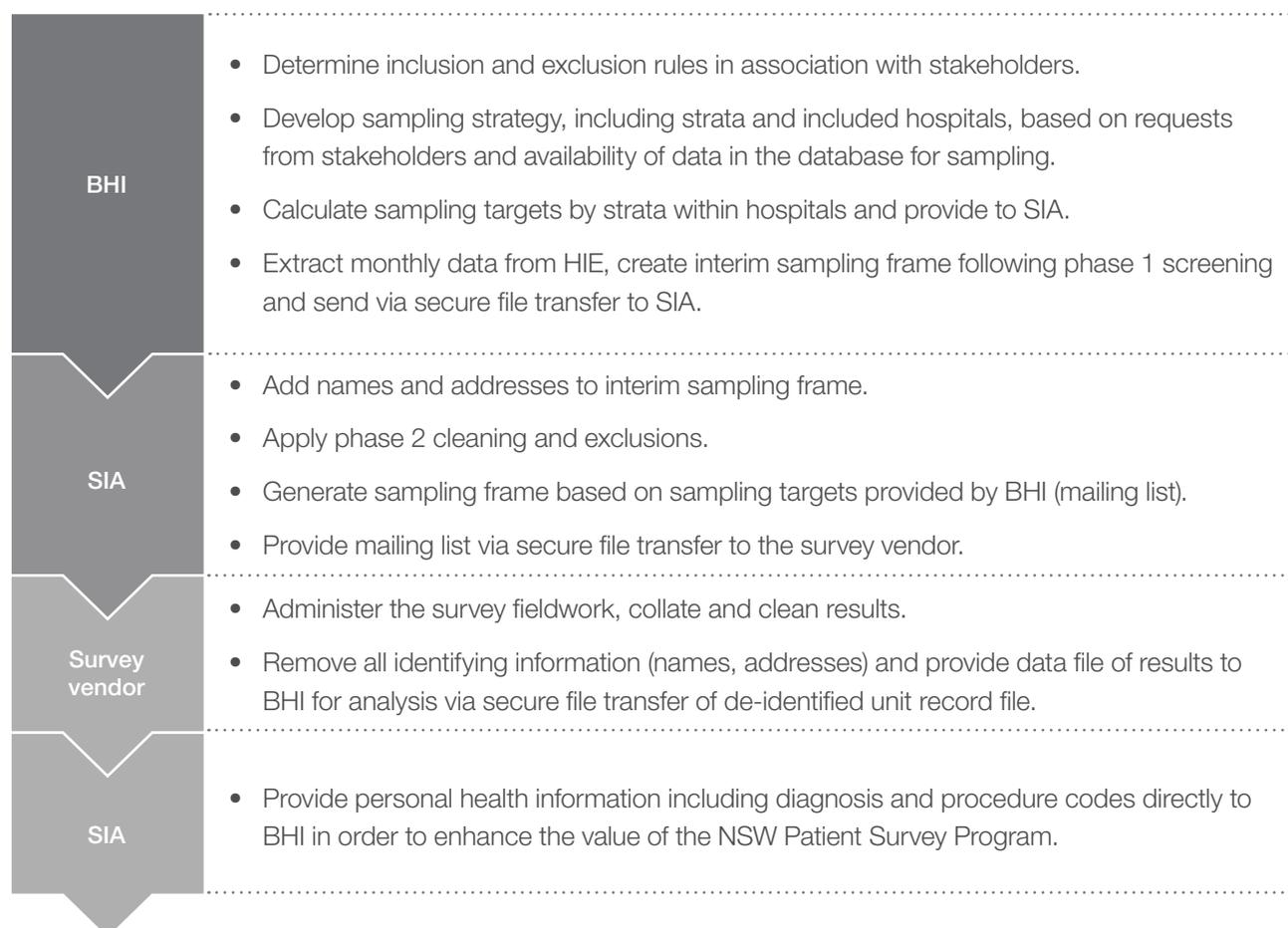
Producing survey samples

The NSW Patient Survey Program assures patients that their responses will be confidential and no identifying information will be given to the hospitals they attended. BHI does this through a number of mechanisms, including:

- data suppression (results for LHDs and hospitals with fewer than 30 responses are suppressed)

- reporting aggregated results

- anonymisation of patient comments

- segregation of roles when constructing the survey samples (Figure 1).

The sampling method for the NSW Patient Survey Program is a collaboration between BHI, the survey vendor and the Ministry's Systems Information and Analytics (SIA) branch (see Figure 1). NSW Health's Health Information Exchange (HIE) is the main source of data for the sampling frame.

BHI has access to de-identified unit record hospital data from selected tables of the HIE database. Use of an encrypted patient number allows de-duplication of patients within a hospital. For AAPS, sampling frames are extracted on a monthly basis, with the date at discharge used to define eligible patients. Sampling targets for each hospital are calculated in advance, as explained later in this report.

Figure 1   Organisational responsibilities in sampling and survey processing, AAPS 2019

BHI

- Determine inclusion and exclusion rules in association with stakeholders.

- Develop sampling strategy, including strata and included hospitals, based on requests from stakeholders and availability of data in the database for sampling.

- Calculate sampling targets by strata within hospitals and provide to SIA.

- Extract monthly data from HIE, create interim sampling frame following phase 1 screening and send via secure file transfer to SIA.

SIA

- Add names and addresses to interim sampling frame.

- Apply phase 2 cleaning and exclusions.

- Generate sampling frame based on sampling targets provided by BHI (mailing list).

- Provide mailing list via secure file transfer to the survey vendor.

Survey vendor

- Administer the survey fieldwork, collate and clean results.

- Remove all identifying information (names, addresses) and provide data file of results to BHI for analysis via secure file transfer of de-identified unit record file.

SIA

- Provide personal health information including diagnosis and procedure codes directly to BHI in order to enhance the value of the NSW Patient Survey Program.

Inclusion criteria

Admitted patient data were passed through two phases of screening to create a frame of patients eligible to participate in AAPS 2019. BHI conducted phase 1 screening, and SIA conducted phase 2 screening. Many of the inclusion and exclusion criteria were developed in response to stakeholder advice.

Phase 1 screening

Inclusions

Admitted patients aged 18+ years, who received either acute or rehabilitation care in hospital (episode of care types 1 and 2), and had an admission to a hospital with a peer group classification of:

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

Exclusions

Patients who died during their hospital admission – mode of separation of 6 (death with autopsy) or 7 (death without autopsy).

A series of further exclusion criteria were applied to take into account a range of factors including:

- the potentially high vulnerability of patient groups and/or patients with particularly sensitive reasons for admission
- certain patients' ability to answer questions about their experiences
- the relevance of the survey questions to particular patient groups including:
  - patients receiving Acute and Post-Acute Care (APAC) services
  - patients who were admitted to a psychiatric unit during any hospital stay during the sampling month

- patients with a personal history of self-harm (ICD-10 Z91.5) or who have intentionally self-harmed (ICD-10 X60-X84, Y87.0, Y34)

- patients with a family history of mental or behavioural disorders (ICD-10 Z81.8) and patients who have expressed suicidal ideation (ICD-10 R45.81)

- patients recorded with maltreatment syndromes (ICD-10 T74) in any diagnosis field, including neglect or abandonment, physical abuse, sexual abuse, psychological abuse, other maltreatment syndromes and maltreatment syndrome, unspecified

- patients who gave birth during their admission (ICD-10 Z37.0, Z37.2, O80-O84, or procedure codes of 90467, 90468, 90469, 90470 or 16520)

- patients who experienced a stillbirth (ICD-10 Z37.1, Z37.3, Z37.4, Z37.6, Z37.7)

- patients who experienced pregnancy with an abortive outcome (ICD-10 O00-O08)

- patients admitted for a termination of pregnancy procedure (ICD-10 35643-03, 35640-03)

- patients admitted for same-day haemodialysis – code 13100-00 in any procedure fields

- same-day patients who stayed for less than three hours

- same-day patients transferred to another hospital

- patients recorded as receiving contraceptive management (ICD-10 Z30) in any diagnosis field, including general counselling and advice on contraception, surveillance of contraceptive drugs, surveillance of contraceptive device, other contraceptive management and contraceptive management, unspecified

- records that did not include a date of birth.

Where patients had multiple admitted patient stays within the sampling month, their most recent stay was retained for sampling. The questionnaire instructed patients to reflect on their most recent admission in a particular month.

If the diagnosis code was known, patients with 'sensitive conditions' as referred to on page 3, were excluded. Patients with incomplete diagnosis coding were not excluded. In NSW in 2019, 5% of patients had a diagnosis code that was incomplete. At the hospital level, between one and five hospitals had more than 70% incompletely coded records in at least one sampling month.

Phase 2 screening

BHI provided the interim sampling frame to SIA, who added patient name and address information. Data then underwent a second phase of screening. This resulted in exclusions for administrative/logistical reasons, or where death had been recorded after discharge, but before the final sampling frame was prepared.

Exclusions

Patients meeting the following exclusion criteria were removed in this phase:

- invalid address (including those with addresses listed as hotels, motels, nursing homes, community services, Mathew Talbot Hostel, 100 William Street, army quarters, jails, unknown)

- invalid name (including twin, baby of)

- invalid date of birth

- on the 'do not contact' list

- sampled in the previous six months for any BHI patient survey

- recorded as deceased according to the NSW Registry of Birth Deaths and Marriages and/or Agency Performance and Data Collection, prior to the sample being provided to the survey vendor.

The remaining patients were considered to be the final AAPS 2019 sampling frame.

Drawing the sample

Survey design

Survey design is part of the mechanism that ensures that 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 2019, every adult patient who identified as Aboriginal was invited to participate in AAPS 2019.

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 groups: 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 non-Aboriginal patients who were mailed a survey.

Calculation of sample sizes and reporting frequency

Sample size calculation ensures that the sufficient number of patients are receiving the questionnaire to ensure that the level of accuracy of the results is sufficient for the purpose.

Monthly sample sizes were determined prior to the commencement of the survey cycle. Although sampling was undertaken monthly, sample size calculations were based on the reporting frequency. All hospitals in peer groups C1 and C2 (with the

exception of Broken Hill Health Service*) were sampled for semi-annual reporting, whereas hospitals in peer groups A1, A3 and B were sampled for quarterly reporting.

Patients were selected within strata using simple random sampling without replacement. Sample sizes were defined at the hospital level, with proportional sampling of strata within hospitals.

The monthly targets, by strata, for AAPS 2019 were based on data extracted from the HIE for the previous year (after Phase 1 of the screening process).

The sample size calculation aimed for a confidence interval around an expected proportion of 0.8 of ±0.07 at the hospital level. Sample sizes were then allocated proportionately across strata internal to the hospital.

The required sample size for each hospital (i) was estimated using the following equation:

$$S_i = \frac{x^2 N_i P(1-P)}{d^2(N_i-1)+x^2 P(1-P)}$$

(1)[†]

Where:

S_i = desired sample size for reporting based on sampling for 12 months, for hospital i

x^2 = tabulated value of chi-squared with one degree of freedom at 5% level of significance (3.841)

N_i = patient population of hospital i per reporting period

P = expected proportion giving positive responses to the question on satisfaction with overall care (0.8), based on previous levels of response to patient surveys

d = degree of accuracy of the 95% confidence interval expressed as a proportion (±0.07).

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* To ensure sufficient respondents for reporting of Far West LHD results, Broken Hill Health Service was sampled for quarterly reporting as it was the only eligible hospital for this survey in Far West LHD.
† The sample size calculation based on equation 1 assumes simple random sampling, whereas a stratified survey design was used. This, and differences in the response rate between strata, may result in some estimates having wider confidence intervals than expected, even when the prevalence was 80%.

Finally, cell sample sizes were inflated to account for non-responses to the survey. This was done by dividing the expected sample size by the expected response rate. Response rates for each stratum are presented in Table 1.

In addition, a minimum monthly target of six patients was applied to all strata (e.g. if calculations required fewer than six patients in any stratum, this was increased to six patients).

The adjusted cell sample sizes were provided to SIA as the monthly targets for the AAPS 2019 survey. For each month of sampling, SIA randomly selected patients within each stratum, according to these targets. Targets for Aboriginal patients were set at 1000 for each hospital, age group and stay type, ensuring all eligible patients were included.

Table 1   Response rates used when calculating the targets for mailing, AAPS 2019

Stratum	Response rate (%)
18–49 years	30
50+ years	60

Data collection and analysis

Data collection

Patients sampled received a paper questionnaire and were given the option to complete the questionnaire online. Respondents were asked to return (for paper questionnaire) or submit (for electronic questionnaire) their completed questionnaire to the survey vendor. Paper questionnaires were scanned for fixed response options and manually entered in the case of free text fields.

All text entry fields were checked for potential identifiers (e.g. mention of patient or staff names and contact details, day of week, gender of clinician), and to remove offensive language, and any that were found were replaced with 'XXXX'. However, on rare occasions, details may not be detected by coders, and these comments should be anonymised on detection by LHDs, who are provided comments for their facilities.

Following this, each record was checked for any completion errors. Reasonable adjustments were made, such as removing responses where the respondent did not correctly follow the instructions or where the respondent provided multiple answers to a single response question.

At the end of this process, the survey vendor transferred the prepared de-identified records securely to BHI's servers, all of which are password protected with limited staff access.

The process of data collection ensures that BHI does not have access to patient names and contact details to ensure respondent confidentiality. This process also ensures that, in the context of BHI's reporting function, identifying information can never be reported to LHDs or publicly released.

For AAPS 2019, the data was collected from patients aged 18+ years who attended a NSW public hospital from January to December 2019. There were 228 respondents who returned the questionnaire after cut-off dates for processing. Their responses were not included in the analyses.

Data analysis

For AAPS 2019, there were 84,432 questionnaires mailed and 21,900 responses received.

Completeness of questionnaires

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 an average of 80 of the 98 non-text questions (this includes questions that were correctly skipped).

Weighted response rate

The response rate is the percentage of people sampled who actually completed and returned or submitted their responses.

As a result of the oversampling of younger patients and Aboriginal patients, the distribution of patients in the sample (patients who responded to the questionnaire) did not match the distribution of patients in the population in term of age groups and Aboriginal status. Therefore, response rates were adjusted to ensure the overall survey response rate reflected what would be observed if patients were sampled proportional to the patient mix, creating the 'weighted response rate'.

The overall weighted response rate for AAPS 2019 was 35%. The weighted response rate for Aboriginal patients was 17% and the weighted response rate for non-Aboriginal patients was 36%.

Across LHDs, the weighted response rate ranged from 25% to 43%. Across hospitals, it ranged from 20% to 59%. Weighted response rates are provided in Table 2 (LHD level) and Table 3 (hospital level) on pages 10–13.

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 hospital level were accounted for, so that LHD results were not unduly influenced by small hospitals that had larger sampling proportions.

Weights were calculated in two stages:

- for each quarter of data as they became available

- once 12 months of data were available.

For each quarter of data, responses were weighted at hospital level, where possible, to match the population by age (18–49 years or 50+ years), stay type (same-day or overnight stay) and Aboriginal status (Aboriginal or non-Aboriginal). This was completed for hospitals that were sampled for quarterly reporting (peer groups A1, A3 and B, and Broken Hill Health Service*) and at LHD level for hospitals that were sampled for semi-annual reporting (peer groups C1 and C2).

A weight was calculated for respondents in each stratum (hospital) using the following equation:

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

(2)

where:

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

n_i = number of respondents in the ith stratum.

If the stratum cell size within a hospital was five or fewer, and the weight was greater than the median weight, then cells within that hospital were aggregated for weighting purposes by grouping across age groups, service categories or Aboriginal status, unless this increased the weight of the small cell. Decisions on aggregation were agreed by two analysts.

The interim quarterly weights were then passed through the generalised regression weights (GREGWT) macro, a survey-specific SAS program developed by the Australian Bureau of Statistics (ABS) to assist with weighting of complex survey data. It 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 marginal totals specified were: hospital (hospitals within the same LHD that were reported semi-annually were combined into one entity), service category, age group, and Aboriginal status (combined when necessary). The GREGWT macro was run with hospital, service category, age group and Aboriginal status as benchmarks for quarterly weights, with a lower bound of one specified in the macro.

Each quarter of data was weighted separately using this process. These weights were used for results based on data combined over less than 12 months.

Once the four quarters of data were available, they were aggregated. The weights for hospitals sampled on the basis of semi-annual reporting were recalculated at the hospital level. The adjusted (annual) weights were used to report results based on the full 12 months of data. For annual weighting, the GREGWT macro was used, in two stages, to ensure weights were equal to populations at the margins.

The GREGWT macro was run with the following benchmarks for annual weighting:

- benchmark 1: hospital

- benchmark 2: quarter x LHD

- benchmark 3: hospital, service category, age group and Aboriginal status.

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* To ensure sufficient respondents for reporting of Far West LHD results, Broken Hill Health Service was sampled for quarterly reporting as it was the only eligible hospital for this survey in Far West LHD.

The interim quarterly weights were used as initial response weights, with a lower bound of one specified in the macro. Weights generated using the GREGWT macro were trimmed to 500 to avoid extreme weights. The sampling weights resulted in appropriate weights by Aboriginal status at annual level, but not at quarterly level. Therefore, results were representative of Aboriginal status only at annual level, and not quarterly level.

Assessment of weights

Weights were assessed to ensure that undue emphasis was not applied to individual responses. The ratio of the maximum to median weight at the hospital level was reviewed. For this survey, this ranged from 1.3 to 33.9. The large ratio is a result of there being no respondents in some stratum (e.g. Aboriginal patients) at some hospitals. This led to the combining of cells across strata for these hospitals.

The design effect (DEFF) estimates the increase in variance of estimates due to the complex sample design over that of a simple random sample. It is estimated as (1+coefficient of variance [weights] by the power of 2). The DEFF was calculated for each LHD and overall, for each quarter and for the four quarters combined. Across hospitals, the maximum DEFF was 4.7 and across LHDs, it was 3.7. A DEFF of two indicates that the variance of estimates will be double the sample variance that would have been obtained if simple random sampling had been done.

Generally speaking, LHDs with the largest DEFFs are those that have the greatest range in patient volumes across the hospitals within the LHD. The standard errors at the LHD level are fairly small because of the sample sizes at that level. Therefore, the increase in standard errors caused by the survey design (and leading to a larger DEFF at LHD level) is more than offset by the fact that each hospital that is sampled has sufficient sample size to allow hospital-level reporting. In addition, the estimates at the LHD level have appropriate distribution of respondents between large and small hospitals.

Sample sizes, DEFF and weighted response rates based on the full year of data are shown in Table 2 (by LHD and NSW) and Table 3 (by hospital) on pages 10–13.

Table 2   Number of surveys mailed, responses, weighted response rates and design effects (DEFF) by LHD and overall, AAPS 2019

LHD	Surveys mailed	Survey responses	Weighted response rate (%)	DEFF
Central Coast	3,650	1,006	39	2.8
Far West	1,082	238	31	1.3
Hunter New England	14,957	4,165	37	3.7
Illawarra Shoalhaven	3,930	1,240	43	3.1
Mid North Coast	4,454	1,379	43	1.6
Murrumbidgee	3,645	956	36	2.0
Nepean Blue Mountains	4,295	1,047	33	3.3
Northern NSW	6,252	1,802	40	1.9
Northern Sydney	3,659	995	34	2.1
South Eastern Sydney	7,373	1,916	35	2.7
South Western Sydney	7,345	1,561	28	2.2
Southern NSW	3,945	1,283	40	1.7
St Vincent's Health Network	1,650	354	29	2.2
Sydney	5,177	1,159	29	1.7
Western NSW	6,680	1,642	35	2.0
Western Sydney	6,338	1,157	25	1.9
NSW	**84,432**	**21,900**	**35**	**2.8**

Table 3   Reporting period, number of surveys mailed, responses, weighted response rates and design effects (DEFF) by hospital, AAPS 2019

Hospital	Reporting period	Surveys mailed	Survey responses	Weighted response rate (%)	DEFF
Armidale Hospital	Semi-annual	826	242	44	1.4
Auburn Hospital	Quarterly	1,652	275	20	1.2
Ballina District Hospital	Semi-annual	477	180	42	1.6
Bankstown-Lidcombe Hospital	Quarterly	1,427	295	26	1.3
Batemans Bay District Hospital	Semi-annual	586	198	41	1.3
Bathurst Health Service	Semi-annual	940	192	31	1.5
Belmont Hospital	Semi-annual	873	262	40	2.4
Blacktown Hospital	Quarterly	1,926	353	28	1.9
Blue Mountains District Anzac Memorial Hospital	Semi-annual	643	240	44	2.0
Bowral and District Hospital	Semi-annual	615	213	43	1.3
Broken Hill Health Service	Quarterly	1,082	238	31	1.3
Byron Central Hospital	Semi-annual	174	42	34	1.2
Calvary Mater Newcastle	Quarterly	1,392	407	42	1.7
Campbelltown Hospital	Quarterly	1,961	411	31	1.5
Canterbury Hospital	Quarterly	1,470	283	23	1.5
Casino & District Memorial Hospital	Semi-annual	452	160	42	1.3
Cessnock Hospital	Semi-annual	668	175	37	1.2
Coffs Harbour Health Campus	Quarterly	1,731	478	42	1.4
Concord Repatriation General Hospital	Quarterly	1,458	383	33	1.4
Cooma Hospital and Health Service	Semi-annual	571	187	40	1.2
Cowra Health Service	Semi-annual	525	182	41	1.2
Deniliquin Hospital and Health Services	Semi-annual	455	131	37	1.4
Dubbo Base Hospital	Quarterly	2,605	493	32	1.6
Fairfield Hospital	Quarterly	1,564	309	24	1.7
Gosford Hospital	Quarterly	1,951	521	38	3.2
Goulburn Base Hospital and Health Service	Semi-annual	713	227	39	1.4
Grafton Base Hospital	Semi-annual	755	226	42	1.3
Griffith Base Hospital	Semi-annual	791	176	34	1.6
Gunnedah Hospital	Semi-annual	432	150	42	1.2
Hawkesbury District Health Services	Semi-annual	853	209	32	1.5
Hornsby Ku-ring-gai Hospital	Quarterly	1,416	405	35	1.5
Inverell Hospital	Semi-annual	602	187	41	1.2

Hospital	Reporting period	Surveys mailed	Survey responses	Weighted response rate (%)	DEFF
John Hunter Hospital	Quarterly	2,318	508	30	3.1
Kempsey District Hospital	Semi-annual	679	189	41	1.2
Kurri Kurri Hospital	Semi-annual	519	221	55	2.8
Lachlan Health Service – Forbes	Semi-annual	417	147	41	1.3
Lismore Base Hospital	Quarterly	1,894	454	40	1.2
Lithgow Hospital	Semi-annual	548	185	41	1.2
Liverpool Hospital	Quarterly	1,778	333	24	2.2
Macksville District Hospital	Semi-annual	494	200	50	1.2
Maclean District Hospital	Semi-annual	232	80	46	1.6
Maitland Hospital	Quarterly	1,526	449	36	4.7
Manning Hospital	Quarterly	1,362	466	44	1.7
Milton Ulladulla Hospital	Semi-annual	140	68	59	1.3
Moree Hospital	Semi-annual	528	126	29	2.0
Moruya District Hospital	Semi-annual	650	207	36	3.0
Mount Druitt Hospital	Semi-annual	968	178	28	1.3
Mudgee Health Service	Semi-annual	546	186	43	1.1
Murwillumbah District Hospital	Semi-annual	565	209	46	1.1
Muswellbrook Hospital	Semi-annual	552	164	39	1.2
Narrabri Hospital	Semi-annual	427	109	32	2.4
Nepean Hospital	Quarterly	2,251	413	29	2.5
Orange Health Service	Quarterly	1,647	442	39	1.8
Port Macquarie Base Hospital	Quarterly	1,550	512	49	1.5
Prince of Wales Hospital	Quarterly	1,678	340	28	1.9
Queanbeyan Hospital and Health Service	Semi-annual	757	223	37	1.1
Royal Hospital for Women	Quarterly	1,596	443	32	1.0
Royal North Shore Hospital	Quarterly	1,561	404	32	1.9
Royal Prince Alfred Hospital	Quarterly	2,249	493	31	1.9
Ryde Hospital	Semi-annual	682	186	36	1.2
Shellharbour Hospital	Semi-annual	617	231	46	1.4
Shoalhaven District Memorial Hospital	Quarterly	1,427	486	45	2.0
Singleton Hospital	Semi-annual	701	176	33	1.2
South East Regional Hospital	Semi-annual	668	241	47	1.5
St George Hospital	Quarterly	1,396	388	39	2.0
St Vincent's Hospital Sydney	Quarterly	1,650	354	29	2.2
Sutherland Hospital	Quarterly	1,372	372	34	2.1

Hospital	Reporting period	Surveys mailed	Survey responses	Weighted response rate (%)	DEFF
Sydney Hospital and Sydney Eye Hospital	Quarterly	1,331	373	35	1.2
Tamworth Hospital	Quarterly	2,231	523	40	1.4
The Tweed Hospital	Quarterly	1,703	451	37	1.9
Wagga Wagga Rural Referral Hospital	Quarterly	1,879	460	36	1.6
Westmead Hospital	Quarterly	1,792	351	27	1.6
Wollongong Hospital	Quarterly	1,746	455	37	2.4
Wyong Hospital	Quarterly	1,699	485	41	1.8
Young Health Service	Semi-annual	520	189	44	1.1

Note: On 30 October 2018, all services at Manly Hospital and acute care services at Mona Vale Hospital were transferred to Northern Beaches Hospital. Manly and Mona Vale hospitals are therefore not included in AAPS 2019. Previous years' results for these two hospitals are available on BHI's interactive data portal, Healthcare Observer.

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 patient population.

Table 4 shows demographic characteristics of respondents to AAPS 2019 against the patient population.

The four columns denote:

1. percentage in patient population – the patient population prior to the phase 2 screening process

2. percentage in eligible population – the final sampling frame from which the sample was drawn. Limited demographic variables are available at this level

3. percentage in respondents (unweighted) – respondents to the survey, not adjusted for unequal sampling

4. percentage in respondents (weighted) – respondents to the survey, adjusted by weighting to be representative of the patient population.

Table 4   Demographic characteristics of patient population and respondents, AAPS 2019

Demographic variable	Sub-group	% in patient population	% in eligible population	% in respondents (unweighted)	% in respondents (weighted)
LHD	Central Coast	5	5	5	5
	Far West	0	0	1	0
	Hunter New England	13	12	19	12
	Illawarra Shoalhaven	5	5	6	5
	Mid North Coast	4	4	6	4
	Murrumbidgee	3	3	4	3
	Nepean Blue Mountains	5	5	5	5
	Northern NSW	6	6	8	6
	Northern Sydney	7	8	5	8
	South Eastern Sydney	10	11	9	11
	South Western Sydney	12	13	7	13
	Southern NSW	3	3	6	3
	St Vincent's Health Network	2	2	2	2
	Sydney	9	9	5	9
	Western NSW	4	4	7	4
	Western Sydney	10	10	5	10
Peer group	A1	47	47	24	47
	A3	3	3	6	3
	B	34	34	37	34
	C1	10	10	14	10
	C2	6	6	20	6
Age stratum	18–49 years	31	32	27	33
	50+ years	69	68	73	67
Stay type	Overnight	66	63	41	61
	Same day	34	37	59	39
Aboriginal status	Non-Aboriginal	96	97	83	96
	Aboriginal	4	3	17	4
Sex	Male	49	#	46	47
	Female	51	#	54	53

Information is not available.

Reporting

Confidentiality

BHI does not receive any confidential patient information and only publishes aggregated data and statistics. Any question must have a minimum of 30 respondents at 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. For AAPS 2019, all hospitals had more than 30 respondents and were therefore eligible for public reporting.

Suppression rules

For suppression at the hospital or LHD level, if the number of respondents was between 30 and 49 with at least a 20% response rate, or more than 49 with less than a 20% response rate, results were checked for representativeness of the NSW patient population for key patient characteristics (age, sex, stay type, Aboriginal status). If these results were found to be representative of the NSW population, they were publicly released and accompanied by an 'interpret with caution' note. If found not to be representative of the NSW population, results were suppressed for that hospital or LHD. For AAPS 2019, there was one reportable hospital that had between 30 and 49 respondents with at least a 20% response rate, and no hospitals with less than a 20% response rate.

For questions asking about types of complications (i.e. experienced an infection, uncontrolled bleeding, a negative reaction to medication, complications as a result of surgery), results are reported at NSW level because of low prevalence at the hospital and LHD levels. However, the combined complication prevalence (i.e. had any complication) is reported at all levels. No statistical comparison was done for these questions, as the survey data currently do not capture information on patient clinical conditions that might influence results for these questions.

Interpret with caution

All sample surveys are subject to sampling error (i.e. the difference between results based on surveying a selection of respondents, and the results if all people who received care were surveyed). The true result is expected to fall within the 95% confidence interval 19 times out of 20.

Where the confidence interval was wider than 20 percentage points, results are noted with a '*' 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.

Statistical analysis

Data were analysed for the period January to December 2019 combined, as well as by quarter. Analysis was undertaken in SAS V9.4 using the SURVEYFREQ procedure with hospital, service category, age group and Aboriginal status as strata variables. Results were obtained for each individual survey question, and also aggregated across surveys where questions were considered sufficiently similar. Results were weighted for all questions, with the exception of questions related to socio-demographic characteristics and self-reported health status.

The result (percentage) for each response option in the questionnaire was determined using the following method:

Numerator – the (weighted) number of survey respondents who selected a specific response option to a certain question, minus exclusions.

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.

Unless otherwise specified, missing responses and those who responded 'don't know/can't remember' to questions were excluded from analysis. The exception is 'don't know/can't remember' responses for questions that ask about a third party (e.g. if family had enough opportunity to talk to a doctor) or when the percentage responding with this option was greater than 10%.

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, are 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.

When reporting on questions used to filter respondents through the questionnaire rather than asking about hospital performance, the 'don't know/

can't remember' option and missing responses were also reported. Appendix 1 presents the rates of missing or 'don't know' responses.

In some cases, the results from several responses were combined to form a 'derived measure'. For information about how these measures were developed, please see Appendix 2.

Reporting by population group

Results were generated for each question in the survey at the NSW, LHD and hospital levels. In addition, results were reported for the groups, levels and at the indicated reporting frequency outlined in Table 5.

Table 5   Levels of reporting, AAPS 2019

Grouping	Reporting frequency	NSW	Peer group	LHD	Hospital
All patients	Annually	✓	✓	✓	✓
	Quarterly	✓	✓	✓	✓
Age group: self-reported – administrative data used where question on year of birth was missing or invalid	Annually	✓	✓	✓	✓
Sex: self-reported – administrative data used where question on sex was missing or invalid		✓	✓	✓	✓
Education: response 'Still at secondary school' was combined with 'Less than Year 12'		✓	✓	✓	✓
Main language spoken at home		✓	✓	✓	✓
Longstanding health conditions		✓	✓	✓	✓
Self-reported health status		✓	✓	✓	✓
Quintile of disadvantage: based on the Australian Bureau of Statistics Index of Relative Socio-demographic Disadvantage		✓	✓	✓	✓
Rurality of patient residence: based on ARIA+* category of postcode of respondent residence – outer regional, remote and very remote combined		✓	✓	✓	✓
Aboriginal status		✓			
Stay type		✓	✓	✓	✓

*Accessibility and Remoteness Index of Australia (ARIA+) is the standard Australian Bureau of Statistics measure of remoteness.
For more information, refer to **www.abs.gov.au/websitedbs/d3310114.nsf/home/remoteness+structure**

Reporting on Aboriginal census sample data

All BHI patient survey questionnaires ask about Aboriginality as part of the demographic group of questions ('About you'). This question is used to group respondents as Aboriginal, Torres Strait Islander or both (self-reported Aboriginality). Aboriginal status is also provided via the administrative dataset. There is evidence that the administrative data may underrepresent the number of Aboriginal people who use health services. This may be because Aboriginal people might not want to be identified, or staff have not asked all patients if they are Aboriginal, although asking this question is mandatory.[1] In AAPS 2019, the administrative data identified 172 more Aboriginal patients than the survey data alone. BHI uses information from the survey questionnaire to identify Aboriginality. This is consistent with other BHI reports.

Among the 21,900 respondents to AAPS 2019, 3454 patients said they were either Aboriginal, Torres Strait Islander or both. Of these patients, 3336 (97%) were also identified as Aboriginal in the administrative data (Table 6). For this survey, the results for Aboriginal patients are based on those respondents who self-identified as Aboriginal.

Table 6   Number of survey respondents based on self-identified and administrative data measures, AAPS 2019

Survey question	Administrative data identifier		
	Aboriginal	Non-Aboriginal	Total
Aboriginal	3,336	118	3,454
Non-Aboriginal	201	17,440	17,641
Unknown/Decline to answer	89	716	805
Total	3,626	18,274	21,900

The Aboriginal identifier in the hospital administrative data was used to create a profile of characteristics of the Aboriginal people admitted to NSW public hospitals who were eligible to be surveyed. This was compared with the characteristics of the Aboriginal people who responded to the survey, to assess the representativeness of the sample (Table 7). The characteristics of the Aboriginal people in the survey cohort were broadly similar to those in the NSW eligible population.

Table 7 Characteristics of Aboriginal people in the eligible population and the survey respondent cohort, AAPS 2019

		Characteristics of the 35,476 Aboriginal respondents in the eligible population (%)	Characteristics of the 3626 Aboriginal respondents in the survey cohort (%)
Age group	18–34	29	18
	35–54	32	30
	55–74	31	41
	75+	8	11
Sex	Female	56	58
	Male	44	42
LHD	Central Coast	6	6
	Far West	1	1
	Hunter New England	24	36
	Illawarra Shoalhaven	5	4
	Mid North Coast	6	5
	Murrumbidgee	5	4
	Nepean Blue Mountains	5	5
	Northern NSW	8	6
	Northern Sydney	2	1
	South Eastern Sydney	4	3
	South Western Sydney	6	5
	Southern NSW	3	2
	St Vincent's Health Network	2	1
	Sydney	5	4
	Western NSW	12	11
	Western Sydney	6	5
Rurality of facility	Major cities	53	60
	Inner regional	41	35
	Outer regional, remote or very remote	6	5

Standardised comparisons

Previously, BHI's approach to comparisons between hospital and NSW results in BHI reports relied on a basic method (overlapping confidence intervals) to determine if the experiences reported for each hospital differed significantly from the NSW result. While this method is commonly used to highlight differences in survey results, it cannot account for differences in the mix of patient characteristics across hospitals.

To enable fairer comparisons across hospitals and as part of the implementation of standardised comparisons, BHI reporting now takes the mix of patient characteristics at each hospital (including age, sex, education level, and language) into account. Therefore, when a hospital is flagged as having a significantly higher or lower result than NSW, this reflects differences in patient experiences rather than differences that can be explained by the mix of characteristics among a hospital's patients.

The difference between the former and new methods might not be entirely due to adjustment for patient characteristics. The difference could also be partly due to the different method used for identifying the outliers (i.e. overlapping confidence intervals vs. significance testing).

The standardised comparison is currently only applied at the hospital level and not at LHD level.

Methodology

The survey asks patients questions about different aspects of their care, such as accessibility and timeliness, the physical environment of the hospital, safety and hygiene, communication and information, and whether they were treated with respect and dignity.

For survey questions related to aspects of care, the percentage of respondents who selected the most positive response was compared between each hospital and NSW. For example, one question asked patients: Were you given enough privacy when being examined or treated? It had the following response options:

- Yes, always

- Yes, sometimes

- No.

In this case, the most positive response is "Yes, always" (i.e. the event), and the other two responses are grouped together for the analyses (i.e. the reference group).

Logistic regression mixed models were used for all analyses, with hospitals as random intercept terms. Patient characteristics were fixed covariates in the model.

For each performance question in the survey, the most positive response option was treated as the 'event' and the other response options were grouped to create a binary dependent variable.

The general formula for the logistic mixed model is:

$$g\big(E(Y_i)\big) = \boldsymbol{\beta} \boldsymbol{X_i} + b_i Z_i$$
$$b_i \sim N(0; D) \qquad (3)$$

where:

- the link function $g(\cdot)$ is the logistic function $g\big(\pi_{ij}\big) = \log\big(\frac{\pi_{ij}}{1-\pi_{ij}}\big)$

- $\boldsymbol{X_i}$ is the design matrix for fixed effect covariates

- $\boldsymbol{\beta}$ is the vector containing estimates for fixed effect covariates

- Z_i is the design matrix for random effects, i=1 to number of hospitals

- b_i is the vector of random intercepts (hospitals), i=1 to number of hospitals.

Covariate selection

Differences in patient experiences between groups may reflect differences in experiences of care. However, they may also reflect differences in expectations or the way various groups tend to respond to surveys. To enable fairer comparisons across hospitals, the enhanced reporting method considers which patient characteristics may be consistently associated with more positive or less positive reported experiences.

Information regarding rurality of patients and socioeconomic status (SES) was also considered as these factors may relate to response tendency. However, BHI chose not to include factors such as rurality or SES as they may reflect differences in care. Instead, analyses of results by these patient groups are presented in BHI's interactive data portal, Healthcare Observer, to allow hospitals to see which patient groups reported more or less positive experiences of care.

A list of all patient characteristics considered for inclusion in the model for standardised comparisons and how they were sourced is included in Table 8.

Information on patient health status such as self-reported overall health or mental health status could also influence both experiences of care and responding tendency, but were not considered for inclusion in the model. Currently BHI only standardises comparisons for experience of care questions by adjusting patient, not clinical or health, characteristics.

For age and sex, missing values were filled in using administrative data. Following this, there was no missing data for age and sex. Missing data for other patient characteristics were included in all analyses as an extra category in the model. Missing data in performance-related questions were excluded from all analyses.

Table 8   Patient characteristics considered for adjustment, AAPS 2019

Variable	Source	Categories
Age	Survey question, or using administrative data if missing	18–34, 35–54, 55–74, 75+
Sex	Survey question, or using administrative data if missing	Male, Female
Education	Survey question	Completed year 12, trade/technical certificate/diploma, university degree, postgraduate degree, missing
Language mainly spoken at home	Survey question	English, language other than English, missing
Stay type	Administrative data	Same-day admission, overnight admission
ED on arrival	Survey question	Yes, no, missing
Proxy response	Survey question	The patient, the patient with help, other people on patient's behalf, missing
Mode of response	Response data	Paper, online

Table 9 presents a list of covariates considered for adjustment by selection stage. These patient characteristics were then passed through two selection stages, as follows:

1. Univariate models were fitted for each patient characteristic (covariate) for all performance-related questions in the survey. Covariates with $p<0.1$ in the univariate models for at least 50% of the questions were considered for inclusion in the multivariate model.

2. Multivariate logistic mixed models were fitted across all performance-related questions in the survey using the covariates selected from stage one, with age and sex included in all models. Forward stepwise modelling was used based on the equation above, including age, sex and all additional covariates added appropriately following a forward stepwise approach. Selected interaction terms were also tested.

Within each outcome (i.e. performance-related survey question) the models were ranked by the Akaike Information Criterion (AIC) – the model with the smallest AIC value was assigned the highest rank of 1. The AIC was recommended as an appropriate method for selecting models where different fixed effects are included as it applies a penalty for the number of covariates in order to protect against model overfitting.[2]

The following values were obtained:

• number of questions for which the model was ranked first

• mean rank across all questions

• mean AIC value across all questions.

These values were used to identify the optimal model to create adjusted comparisons for the survey results, with each survey from the NSW Patient Survey Program assessed independently. That is, the optimal model had a high count of 1st ranking, a low mean rank, and a low mean AIC relative to other models, across all performance-related questions in the survey.

Table 9   Covariates considered for adjustment for comparisons at each selection stage, AAPS 2019

	Available for adjustment	Passed univariate model selection threshold (stage 1)	Passed multivariate model selection threshold (stage 2)	After consultation with expert panel and confirmed by sensitivity analyses
Age	✓	✓	✓	✓
Sex	✓	✓	✓	✓
Education	✓	✓	✓	✓
Language mainly spoken at home	✓	✓	✓	✓
Stay type	✓	✓	✓	
ED on arrival	✓	✓	✓	
Proxy response	✓	✓	✓	
Mode of response	✓	✓	✓	

Finally, covariates that marginally improved the model were excluded by comparing the models' AIC values, to define a parsimonious number of patient-related covariates to use in standardised comparisons. Covariates that were not part of patient characteristics (e.g. whether patients were staying overnight or had a same-day admission) were not included in the testing. This is because standardised comparisons are intended to control for differences in patient characteristics only, and some of these factors were considered to be under the control of hospital management rather than patients.

In all cases, further assessments of the AIC summary values indicated that the smaller model had results very similar to those with the hospital factors included (e.g. stay type, admission type). The remaining covariates were then used in the final model to adjust for each performance-related question to create the standardised comparisons.

Age, sex, education and language spoken were chosen for adjustment for the comparison model.

Model-based comparisons

The model calculates an estimate for each hospital's random intercept, and produces a p-value to indicate how likely these estimates are different from the average, or NSW value.

The exponential values of the estimated hospital random intercepts based on the random intercept logistic regression model can be used to estimate the odds of a positive experience (e.g. 'very good' for overall care question) for the hospital with reference to an 'average' hospital. The p-value for each hospital intercept estimate was used to determine if the hospital was significantly different from NSW, when adjusted for patient characteristics, using the following guidelines:

- If the p-value was less than the significance level (0.01) and the solution for the hospital random intercept was greater than 0, the hospital was flagged as having a more positive result than NSW.

- If the p-value was less than the significance level and the random effect solution was less than 0, the hospital was flagged as having a less positive result than NSW.

- If the p-value was greater than the significance level, the hospital was flagged grey as not significantly different to NSW.

- For results flagged as 'interpret with caution', comparisons are not highlighted due to the lack of precision in the result.

When making multiple comparisons there is an increased likelihood of flagging a difference that is not 'real', but due to chance. To mitigate this issue, a p-value of 0.01 was used to reduce the likelihood of identifying differences due to chance to one comparison in 100 (from one in 20, with the more commonly used p-value of 0.05). Sampling weights were used in all models to ensure the comparisons were representative of the NSW patient population.

Statistical software

SAS software version 9.4 was used for all statistical analyses. The PROC SURVEYFREQ procedure was used to adjust for the sampling weights when calculating the percentages and related confidence intervals.

The PROC GIMMIX procedure and 'weight statement' was used for performing logistic mixed models[3] to compare hospital results with NSW, adjusting for covariates and sampling weights.

The calculation of percentages and standardised comparisons were adjusted for sampling weights using these SAS procedures.

Appendix 1

Unweighted percentage of missing and 'Don't know' responses

Table 10   Percentage of 'Don't know' and/or missing responses by question, AAPS 2019

Question number	Question text	Missing %	Don't know %	Missing + Don't know %*
1	Was your stay in hospital planned in advance or an emergency?	2.84		2.84
2	When you arrived in hospital did you spend time in the emergency department?	3.78	1.76	5.54
3	Were the emergency department staff polite and courteous?	2.39	1.23	3.62
4	Do you think the amount of time you spent in the emergency department was…?	3.48	4.37	7.85
5	Were the staff you met on your arrival to hospital polite and courteous?	1.63		1.63
6	Do you think the time you had to wait from arrival at hospital until you were taken to your room or ward was…?	2.62	2.62	5.24
7	How clean were the wards or rooms you stayed in while in hospital?	2.96		2.96
8	How clean were the toilets and bathrooms that you used while in hospital?	3.96		3.96
9	Did you see nurses wash their hands, or use hand gel to clean their hands, before touching you?	2.73	13.25	15.98
10	Did you see doctors wash their hands, or use hand gel to clean their hands, before touching you?	3.37	18.46	21.84
11	Were you given enough privacy when being examined or treated?	2.63		2.63
12	Were you given enough privacy when discussing your condition or treatment?	2.92		2.92
13	If you needed to talk to a doctor, did you get the opportunity to do so?	3.24		3.24
14	When you had important questions to ask a doctor, did they answer in a way you could understand?	3.77		3.77
15	In your opinion, did the doctors who treated you know enough about your medical history?	4.11		4.11
16	Did you have confidence and trust in the doctors treating you?	3.41		3.41
17	Were the doctors kind and caring towards you?	3.54		3.54
18	Overall, how would you rate the doctors who treated you?	3.29		3.29
19	If you needed to talk to a nurse, did you get the opportunity to do so?	3.53		3.53
20	When you had important questions to ask a nurse, did they answer in a way you could understand?	3.76		3.76
21	In your opinion, did the nurses who treated you know enough about your care and treatment?	3.96		3.96
22	Did nurses ask your name or check your identification band before giving you any medications, treatments or tests?	3.70	3.24	6.94
23	Did you have confidence and trust in the nurses treating you?	3.67		3.67
24	Were the nurses kind and caring towards you?	3.58		3.58
25	Overall, how would you rate the nurses who treated you?	3.57		3.57
26	Did you have any hospital food during this stay?	3.36		3.36
27	How would you rate the hospital food?	1.92		1.92
28	Did you have any special dietary needs (e.g. vegetarian, diabetic, food allergies, religious, cultural, or related to your treatment)?	2.57		2.57
29	Was the hospital food suitable for your dietary needs?	1.68	1.63	3.31

Question number	Question text	Missing %	Don't know %	Missing + Don't know %*
30	Did the health professionals introduce themselves to you?	3.29		3.29
31	Did the health professionals explain things in a way you could understand?	3.44		3.44
32	During your stay in hospital, how much information about your condition or treatment was given to you?	3.56		3.56
33	Did you have worries or fears about your condition or treatment while in hospital?	3.82		3.82
34	Did a health professional discuss your worries or fears with you?	2.58		2.58
35	I was involved as much as I wanted in making decisions about my treatment and care...	4.72		4.72
36	How much information about your condition or treatment was given to your family, carer or someone close to you?	3.89	4.07	7.97
37	Did you ever receive contradictory information about your condition or treatment from the health professionals?	4.87		4.87
38_01	During your stay in this hospital, did staff assist you when you needed help for eating or drinking?	5.69		5.69
38_02	During your stay in this hospital, did staff assist you when you needed help for taking medication?	5.62		5.62
38_03	During your stay in this hospital, did staff assist you when you needed help for going to the toilet?	5.11		5.11
38_04	During your stay in this hospital, did staff assist you when you needed help for adjusting your position in bed?	4.97		4.97
38_05	During your stay in this hospital, did staff assist you when you needed help for standing up or walking?	4.95		4.95
38_06	During your stay in this hospital, did staff assist you when you needed help for getting dressed?	5.43		5.43
38_07	During your stay in this hospital, did staff assist you when you needed help for getting in or out of a wheelchair or chair?	6.89		6.89
38_08	During your stay in this hospital, did staff assist you when you needed help for using the telephone or television?	6.93		6.93
39	Did you feel you were treated with respect and dignity while you were in the hospital?	2.87		2.87
40	Were your cultural or religious beliefs respected by the hospital staff?	4.17		4.17
41	Were you ever treated unfairly for any of the reasons below?	10.13		10.13
42	How would you rate how well the health professionals worked together?	3.69		3.69
43	Was a call button placed within easy reach?	3.98	5.54	9.52
44	Was your sleep ever disturbed due to noise at night?	12.80		12.80
45	Not including the reason you went to hospital, during your hospital stay, or soon afterwards, did you experience any of the following complications or problems?	7.46		7.46
46	Was the impact of this complication or problem...?	3.74		3.74
47	In your opinion, were the health professionals open with you about this complication or problem [that you experienced during or soon after your visit]?	3.63		3.63
48	Were you ever in any pain while in hospital?	3.26		3.26

Question number	Question text	Missing %	Don't know %	Missing + Don't know %*
49	When you had pain, was it usually severe, moderate or mild?	3.37		3.37
50	Do you think the hospital staff did everything they could to help manage your pain?	2.53		2.53
51	During your stay in hospital, did you have any tests, X-rays or scans?	3.75		3.75
52	Did a health professional discuss the purpose of these tests, X-rays or scans with you?	2.88		2.88
53	Did you receive test, X-ray or scan results while you were still in hospital?	3.70		3.70
54	Did a health professional explain the test, X-ray or scan results in a way that you could understand?	1.69		1.69
55	During your stay in hospital, did you have an operation or surgical procedure?	3.53		3.53
56	Was your operation or surgical procedure planned before you went to hospital?	2.87		2.87
57	Thinking back to when you first tried to book an appointment with a specialist, how long did you have to wait to see that specialist?	4.20	11.25	15.44
58	From the time a specialist said you needed the operation or surgical procedure, how long did you have to wait to be admitted to hospital?	3.66	3.98	7.64
59	Do you think the total time between when you first tried to book an appointment with a specialist and when you were admitted to hospital was...?	3.60	3.50	7.09
60	Before your arrival, how much information about your operation or surgical procedure was given to you by the hospital?	3.70	3.64	7.34
61	Before your operation or surgical procedure began, did a health professional explain what would be done in a way you could understand?	3.53		3.53
62	After the operation or procedure, did a health professional explain how the operation or surgical procedure had gone in a way you could understand?	3.45	2.24	5.69
63	Did you feel involved in decisions about your discharge from hospital?	3.63		3.63
64	At the time you were discharged, did you feel that you were well enough to leave the hospital?	3.62		3.62
65	Thinking about when you left hospital, were you given enough information about how to manage your care at home?	3.27		3.27
66	Did hospital staff take your family and home situation into account when planning your discharge?	3.62	2.60	6.21
67	Thinking about when you left hospital, were adequate arrangements made by the hospital for any services you needed?	3.78		3.78
68	Did hospital staff tell you who to contact if you were worried about your condition or treatment after you left hospital?	3.78	9.07	12.85
69	Were you given or prescribed any new medication to take at home?	3.87		3.87
70	Did a health professional in the hospital explain the purpose of this medication in a way you could understand?	3.76		3.76
71	Did a health professional in the hospital tell you about medication side effects to watch for?	4.29		4.29
72	Did you feel involved in the decision to use this medication in your ongoing treatment?	4.42		4.42
73	Did the hospital provide you with a document summarising the care you received in hospital (e.g. a copy of the letter to your GP, a discharge summary)?	4.76	11.36	16.11

Question number	Question text	Missing %	Don't know %	Missing + Don't know %*
74	On the day you left hospital, was your discharge delayed?	3.68		3.68
75	How long was the delay? [in discharge]	2.86	5.73	8.59
76	Did a member of staff explain the reason for the delay? [in discharge]	3.69		3.69
77	What were the main reasons for the delay? [in discharge]	4.12	6.16	10.28
78	Overall, how would you rate the care you received while in hospital?	1.46		1.46
79	How well organised was the care you received in hospital?	1.65		1.65
80	If asked about your hospital experience by friends and family how would you respond?	1.99		1.99
81	Did you want to make a complaint about something that happened in hospital?	3.57		3.57
82	Did the care and treatment received in hospital help you?	2.74		2.74
83	Is the problem you went to hospital for...?	4.27		4.27
84	In the week before your hospital stay, how difficult was it for you to carry out your normal daily activities (e.g. physical activity, going to work, caring for children)?	5.24		5.24
85	About one month after your discharge from hospital, how difficult was it for you to carry out your normal daily activities?	4.68		4.68
86	In the month following your discharge, did you go to an emergency department because of complications related to the care you received?	4.08	1.53	5.61
87	In the month following your discharge, were you re-admitted to any hospital because of complications related to the care you received?	4.02	1.37	5.38
88	What year were you born?	2.43		2.43
89	What is your gender?	1.54		1.54
90	Language mainly spoken at home	1.92		1.92
91	Did you need, or would you have liked, to use an interpreter at any stage while you were at the hospital?	1.56		1.56
92	Did the hospital provide an interpreter when you needed one?	2.44		2.44
93	Aboriginal and/or Torres Strait Islander origin	3.68		3.68
94	Did you receive support, or the offer of support, from an Aboriginal Health Worker while you were in hospital?	3.42	6.66	10.08
95	Highest level of education completed	4.17		4.17
96	In general, how would you rate your health?	2.42		2.42
97	Which, if any, of the following longstanding conditions do you have (including age-related conditions)?	5.17		5.17
98	Does this condition(s) cause you difficulties with your day-to-day activities?	3.87		3.87
99	Are you a participant of the National Disability Insurance Scheme (NDIS)?	4.60	7.40	12.00
100	Who completed this survey?	2.48		2.48
101	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)?	13.05		13.05

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

Appendix 2

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/ nsw_patient_survey_program**

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 are usually excluded:

- response: 'don't know/can't remember' or similar non-committal response

- response: invalid (i.e. respondent was meant to skip a question but did not)

- response: missing (with the exception of questions that allow multiple responses or a 'none of these' option, to 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 following questions and responses were used in the construction of the derived measures.

Table 11   Derived measures for the AAPS 2019 questionnaire

Derived measure	Original question	Derived measure categories	Original question responses
Needed to talk to a doctor	Q13. If you needed to talk to a doctor, did you get the opportunity to do so?	Needed to talk to doctor	Yes, always
			Yes, sometimes
			No, I did not get the opportunity
		No need to talk to doctor	I had no need to talk to a doctor
Had important questions to ask a doctor	Q14. When you had important questions to ask a doctor, did they answer in a way you could understand?	Asked doctor questions	Yes, always
			Yes, sometimes
			No, I did not get answers I could understand
		Didn't ask any questions	I did not ask any questions
Needed to talk to a nurse	Q19. If you needed to talk to a nurse, did you get the opportunity to do so?	Needed to talk to nurse	Yes, always
			Yes, sometimes
			No, I did not get the opportunity
		No need to talk to nurse	I had no need to talk to a nurse
Had important questions to ask a nurse	Q20. When you had important questions to ask a nurse, did they answer in a way you could understand?	Asked nurse questions	Yes, always
			Yes, sometimes
			No, I did not get answers I could understand
		Didn't ask any questions	I did not ask any questions
Wanted information about condition or treatment during stay	Q32. During your stay in hospital, how much information about your condition or treatment was given to you?	Wanted information	Not enough
			The right amount
			Too much
		Not applicable	Not applicable to my situation
Had family/someone close who wanted information about condition or treatment	Q36. How much information about your condition or treatment was given to your family, carer or someone close to you?	Wanted information	Not enough
			Right amount
			Too much
		Not applicable	It was not necessary to provide information to any family or friends
Had religious or cultural beliefs to consider	Q40. Were your cultural or religious beliefs respected by the hospital staff?	Had beliefs to consider	Yes, always
			Yes, sometimes
			No, my beliefs were not respected
		Beliefs not an issue	My beliefs were not an issue

Derived measure	Original question	Derived measure categories	Original question responses
Treated unfairly	Q41. Were you ever treated unfairly for any of the reasons below?	Treated unfairly	Age
			Sex
			Aboriginal background
			Ethnic background
			Religion
			Sexual orientation
			A disability that you have
			Marital status
			Something else
		Not treated unfairly	I was not treated unfairly
Experienced a complication	Q45. Not including the reason you went to hospital, during your hospital stay, or soon afterwards, did you experience any of the following complications or problems?	Experienced complication	An infection
			Uncontrolled bleeding
			A negative reaction to medication
			A complication as a result of an operation or surgical procedure
			A complication as a result of tests, X-rays or scans
			A blood clot
			A pressure wound or bed sore
			A fall
			Any other complication or problem
		None reported	None of these
			Missing
Complication or problem occurred during hospital admission	Q47. In your opinion, were the health professionals open with you about this complication or problem [that you experienced during or soon after your visit]?	Occurred in hospital	Yes, completely
			Yes, to some extent
			No
		Occurred after left	Not applicable, as it happened after I left
Wanted explanation of what would be done before operation or procedure	Q61. Before your operation or surgical procedure began, did a health professional explain what would be done in a way you could understand?	Wanted explanation	Yes, completely
			Yes, to some extent
			No
		Didn't want explanation	I did not want or need an explanation

Derived measure	Original question	Derived measure categories	Original question responses
Wanted to be involved in decisions about their discharge	Q63. Did you feel involved in decisions about your discharge from hospital?	Wanted involvement	Yes, definitely
			Yes, to some extent
			No, I did not feel involved
		Didn't want involvement	I did not want or need to be involved
Needed information on how to manage care at home	Q65. Thinking about when you left hospital, were you given enough information about how to manage your care at home?	Needed information	Yes, completely
			Yes, to some extent
			No, I was not given enough
		Didn't need information	I did not need this type of information
Needed family and home situation taken into account when planning discharge	Q66. Did hospital staff take your family and home situation into account when planning your discharge?	Had situation to consider	Yes, completely
			Yes, to some extent
			No, staff did not take my situation into account
		Not necessary	It was not necessary
Needed services after discharge	Q67. Thinking about when you left hospital, were adequate arrangements made by the hospital for any services you needed?	Needed services	Yes, completely
			Yes, to some extent
			No, arrangements were not adequate
		Didn't need services	It was not necessary
Wanted to be involved in decision to use medication in ongoing treatment	Q72. Did you feel involved in the decision to use this medication in your ongoing treatment?	Wanted involvement	Yes, completely
			Yes, to some extent
			No, I did not feel involved
		Didn't want involvement	I did not want or need to be involved

References

1. NSW Ministry of Health, Aboriginal and Torres Strait Islander Origin – Recording of Information of Patients and Clients. Policy Directive. Sydney, Australia.

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3. SAS Documentation: Example Weighted Multilevel Model for Survey Data. [online] Available from: **https://documentation.sas. com/?docsetId=statug&docsetTarget=stat ug_glimmix_examples23.htm&docsetVersion =15.1&locale=en**

bureau of
health
information

About the Bureau of Health Information

The Bureau of Health Information (BHI) is a board-governed organisation that provides independent information about the performance of the NSW healthcare system.

BHI was established in 2009 and supports the accountability of the healthcare system by providing regular and detailed information to the community, government and healthcare professionals. This in turn supports quality improvement by highlighting how well the healthcare system is functioning and where there are opportunities to improve.

BHI manages the NSW Patient Survey Program, gathering information from patients about their experiences and outcomes of care in public hospitals and other healthcare facilities.

BHI publishes a range of reports and information products, including interactive tools, that provide objective, accurate and meaningful information about how the health system is performing.

BHI's work relies on the efforts of a wide range of healthcare, data and policy experts. All of our assessment efforts leverage the work of hospital coders, analysts, technicians and healthcare providers who gather, codify and supply data. Our public reporting of performance information is enabled and enhanced by the infrastructure, expertise and stewardship provided by colleagues from NSW Health and its pillar organisations.

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