Emergency Department Patient Survey 2019–20

Technical Supplement

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The conclusions in this report are those of BHI and no official endorsement by the NSW
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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 Strategy 2019–22*, 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 Emergency Department Patient Survey 2019–20.

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 in the supplementary documents section attached to each patient survey results report on BHI's website at **bhi.nsw.gov.au/nsw_patient_survey_program**

Emergency Department Patient Survey

The Emergency Department Patient Survey (EDPS) asks people who visited a NSW public hospital emergency department (ED) to provide feedback about the care they received. The EDPS 2019–20 was mailed to people who visited an ED between July 2019 and June 2020.

The first EDPS was conducted from April 2013 to March 2014. Subsequent cycles of the survey were conducted from April 2014 to March 2015 (EDPS 2014–15), April 2015 to June 2016 (EDPS 2015–16), and by financial year since July 2016.

No changes were made to the questionnaire content between EDPS 2018–19 and EDPS 2019–20, as documented in the Development Report on BHI's website.
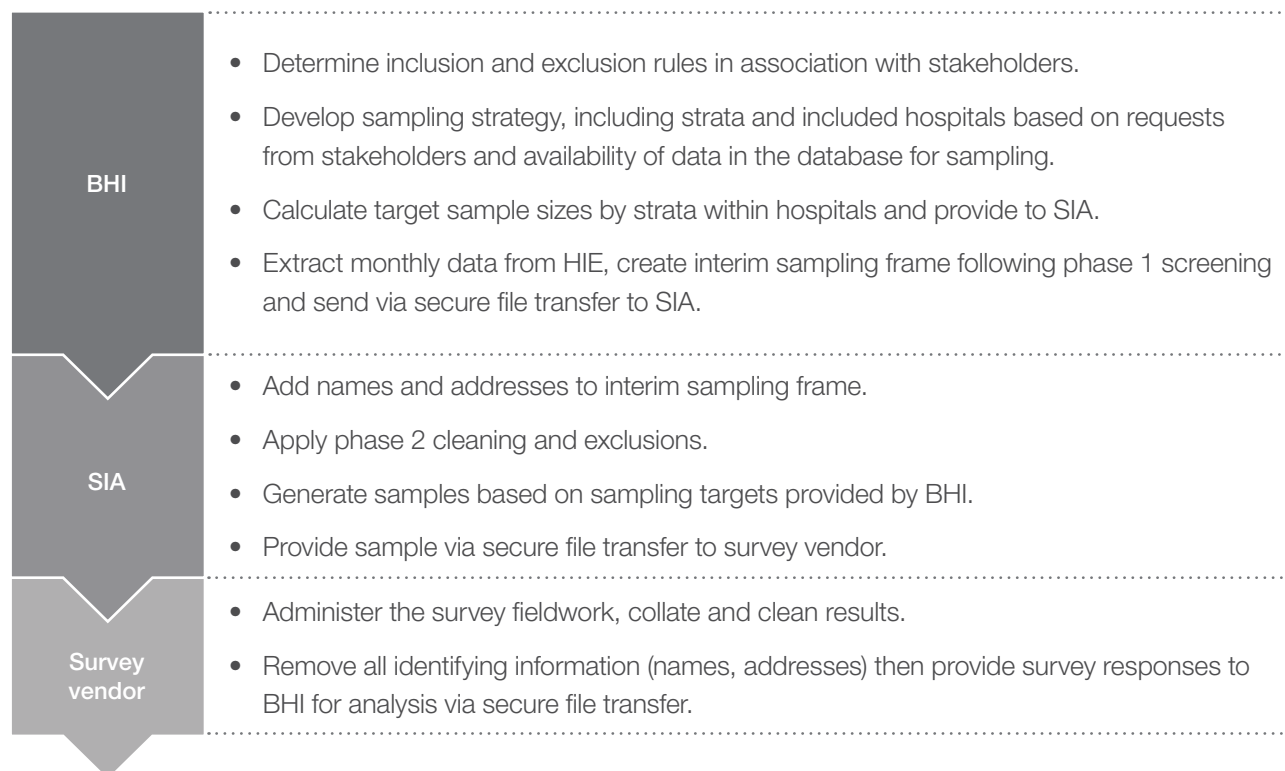
Producing survey samples

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 EDPS, sampling frames were extracted on a monthly basis, with the 'date of discharge' for an ED visit used to define eligible patients. Target sample sizes for each ED were calculated in advance, as explained later in this report.

Figure 1   Organisational responsibilities in sampling and survey processing, EDPS 2019–20

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 target sample sizes 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 samples based on sampling targets provided by BHI.
- Provide sample via secure file transfer to survey vendor.

Survey vendor
- Administer the survey fieldwork, collate and clean results.
- Remove all identifying information (names, addresses) then provide survey responses to BHI for analysis via secure file transfer.

Inclusion criteria

Patients who visited an ED in a NSW public hospital between July 2019 and June 2020 passed through two phases of screening to create a frame of patients eligible to participate in EDPS 2019–20. 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

- Patients who visited an ED in a hospital with a peer group classification:

    – A1: Principal referral

    – A2: Paediatric specialist

    – A3: Ungrouped acute – tertiary referral

    – B1: Major hospitals group 1

    – B2: Major hospitals group 2

    – C1: District group 1

    – C2: District group 2

- Patients who visited the ED at Camden Hospital. This hospital was originally in peer group C2 but was allocated to peer group D1 in 2016 along with three other hospitals previously included in EDPS. The other three hospitals were eligible for the Rural Hospital Emergency Care Patient Survey so they were removed from EDPS, but Camden Hospital was not eligible so remained in EDPS.

Exclusions

- Patients who were dead on arrival or died in the ED ('mode of separation'‡ of '03' and '08', respectively)

- Patients aged 18+ years in peer group A2 hospitals (Paediatric specialist hospitals)

- Patients aged 0–17 years in peer group A3 hospitals (Ungrouped acute – tertiary referral hospitals).

Where patients had multiple visits within the sampling month, their most recent ED visit was retained for sampling. The questionnaire instructed patients to respond to the survey based on their most recent ED visit in a particular month.

Phase 2 screening

BHI provided the interim sampling frame to SIA, who added patient name and address information. Patients 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

A series of exclusion criteria were 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 effectiveness of this screening is limited for ED visits as patients only have a 'provisional diagnosis'* and 'additional diagnosis'† recorded.

*'Provisional diagnosis' refers to the diagnosis or condition established after assessment as being the main reason for the person presenting to the ED.
†'Additional diagnosis' refers to an additional diagnosis or condition which either: existed at the time the person presented to the ED; OR arose while the person was in ED; OR is expected to affect the person's treatment care plan and/or length of stay in the ED.
‡'Mode of separation' refers to the status of a person at departure from the ED. Separation mode codes: (01) Admitted to ward/inpatient unit, not a critical care ward; (03) Died in ED; (08) Dead on arrival; (10) Admitted: to critical care ward; (11) Admitted: via operating suite.

Because of this, screening to exclude sensitive groups can only be done for patients subsequently admitted to hospital. Therefore, ED patients admitted to hospital ('mode of separation'‡ of '01', '10', '11') with the following procedures or diagnoses recorded for their inpatient stay were omitted:

- admitted for a termination of pregnancy procedure: procedure code 35643-03

- 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'

- treated for contraceptive management: ICD-10 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'

- 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)

- intentional self-harm: ICD-10 codes between X60 and X84

- sequelae of intentional self-harm: ICD-10 code = Y87.0

- unspecified event, 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

- personal history of self-harm: ICD-10 code commencing with Z91.5.

Patients meeting the following exclusion criteria were also removed in Phase 2 screening:

- 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

- mode of separation of death for a subsequent admission to hospital

- 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 EDPS 2019–20.

Drawing the sample

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.

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: 0–17 years, 18–49 years or 50+ years, based on the 'age' variable

- Separation groups: admitted* or non-admitted†, based on the 'mode of separation' variable.

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 fit for 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. For EDPS 2019–20, sampling of the July to September 2019 patients used the same sampling design as EDPS 2018–19, with all hospitals in C1, C2 and D peer groups sampled for semi-annual reporting. Hospitals in peer groups A1, A2, A3 and B were sampled for quarterly reporting.

A decision was made to set the sample size of Broken Hill Health Service for July to September 2019 to be twice that of other C1, C2 or D peer group hospitals in the survey. This was in response to the expected lower response rate compared with other hospitals and to ensure sufficient respondents for reporting results for Far West Local Health District (LHD) in EDPS 2019–20.

From October 2019, hospitals located in Far West LHD, Central Coast LHD, St Vincent's Health Network and Sydney Children's Hospitals Network were sampled for quarterly reporting to ensure these hospitals had sufficient survey responses for LHD-level reporting. The remaining hospitals were sampled for semi-annual reporting.

Patients were selected within strata using simple random sampling without replacement. Sample sizes were defined at the hospital level, with proportional sampling by strata. Monthly strata-level targets for the July to September 2019 quarter were exactly the same as the targets for the 2018–19 sampling period. See the EDPS Technical Supplement 2018–19 for details.

Revised monthly strata-level targets were used for October 2019 patients onwards, based on data collated from July 2018–June 2019 (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 to ensure that allocations across age and separation groups were approximately in proportion to the patient population.

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*'Admitted' includes separation mode codes: (01) Admitted to ward/inpatient unit, not a critical care ward; (10) Admitted: to critical care ward; (11) Admitted: via operating suite
†'Non-admitted' includes separation mode codes: (04) Departed: Treatment completed; (05) Departed: Transferred to another hospital without first being admitted to hospital transferred from; (06) Departed: Did not wait; (07) Departed: Left at own risk; (09) Departed: for other clinical service location.

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

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

Where:

S_i = desired sample size for the reporting period, for hospital i

χ^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 of patients giving a positive response 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).

The sample size calculation assumes simple random sampling, whereas a stratified survey design was used. This, and differences in the response rates between strata and hospitals, may result in some estimates having wider confidence intervals than expected, even when the observed prevalence is 80%.

Finally, 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 age group are presented in Table 1, which notes the change from the variable response rate between July to September 2019 to a common response rate from October 2019.

Use of a common response rate was a more efficient approach to meet the target sample size when adjusted for the expected number of non-responses, irrespective of the lower response rate expected for patients aged below 50 years.

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).

Revised adjusted target sample sizes were provided to SIA as the monthly targets for the EDPS 2019–20 survey. For each month of sampling, SIA randomly selected patients within each stratum, according to these targets.

Table 1   Response rates used when calculating the target sample sizes, EDPS 2019–20

Stratum	Response rate (%) July to September 2019	Response rate (%) October 2019 to June 2020
0–17 years	25	24
18–49 years	15	24
50+ years	50	24

In addition to the change in target sample sizes between July to September 2019 and October 2019, the following changes also occurred during the EDPS 2019–20 sampling year:

- The July to December 2019 sampling for EDPS 2019–20 occurred at the same time as sampling for the Adult Admitted Patient Survey (AAPS) 2019, which included a census sampling of Aboriginal patients who were admitted to a hospital in peer groups A1, A3, B or C. With the exception of hospitals in Sydney Children's Hospitals Network, the Royal Hospital for Women and Camden Hospital, the two surveys have identical specifications. As a result, the census for AAPS reduced the number of Aboriginal patients eligible for and included in the EDPS 2019–20 sample representing patients with a separation group of 'admitted' and age group of '18–49 years' or '50+ years'. The impact was that 119 Aboriginal patients who visited an ED and were admitted to hospital were included in EDPS 2019–20 during the first six-month period, compared with 412 in the second six-month period.

- From March 2020, patients with a 'mode of separation' of '99' (registered in error) were excluded.

- There was a noticeable drop in patients visiting ED clinics across NSW in 2020 due to the COVID-19 pandemic. In April 2020, approximately 140,000 patients were included in the interim sampling frame compared with an average of around 200,000 in previous months. For May and June 2020, this number increased to approximately 165,000.

- From May 2020, patients likely to be visiting an ED only for COVID-19 test were excluded, identified by:

  – the 'presenting problem'* field having the word 'Corona' or 'COVID', and/or

  – the 'discharging diagnosis'† field recording the COVID-19 diagnosis codes: SNOMED-CT (840539006, 840544004, 840546002), or ICD-10-AM (U07.1, U07.2, U06.0), and

  – separation group of non-admitted.

*The 'presenting problem' field in the Emergency Department Data Collection (EDDC) provides information on symptoms or condition for a patient when presenting to ED.
†The 'discharging diagnosis' field in the EDDC refers to the principle diagnosis or condition assigned to a patient when discharged from the ED.

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 the week, gender of healthcare provider) 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 hospitals.

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 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 EDPS 2019–20, data was collected from patients who visited an ED in one of 77 NSW public hospitals between July 2019 and June 2020.

Data analysis

For EDPS 2019–20, there were 95,894 questionnaires mailed and 17,839 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, on average, 67 of the 90 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 between July and September 2019, the distribution of patients in the sample (patients who were mailed and those who responded to the questionnaire) did not match the age distribution of patients in the population (Table 2). 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 weighted response rates are shown in Tables 3 and 4.

Table 2

Table 2 Patient population distribution and corresponding proportions of sample and respondents, EDPS 2019–20

Age group	% in patient population	% in sample	% in respondents
0–17 years	23	27	20
18–49 years	39	44	21
50+ years	38	29	59

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:

1. for each quarter of data as they become available

2. once 12 months of data were available, weights for all hospitals were adjusted.

For EDPS 2019–20, strata for weighting included hospital, age group (0–17 years, 18–49 years and 50+ years) and separation group (admitted and non-admitted). An initial weight was calculated for respondents in each stratum 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 stratum

n_i = number of respondents in the ith stratum.

If there were no responses within a cell, this cell was combined with another cell for the same hospital.

The initial 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). A lower bound of one was specified in the macro.

Each quarter of data was weighted separately using this process to match the hospital population by age group and by separation group. These weights were used for results created based on data combined over a period of fewer than 12 months, such as the LHD-level key performance indicators (KPIs).

Once four quarters of data were available, the quarterly datasets were combined into an annual dataset. The quarterly weights were used as initial response weights for annual weighting. The GREGWT macro was used, in two stages, to ensure agreement of weights with populations at the margins for the annual dataset. A lower bound of one was specified in the macro. During the first stage, the GREGWT macro was run with the following benchmarks.

- Benchmark 1: hospital

- Benchmark 2: quarter x LHD

- Benchmark 3: hospital x separation group x age group

For the second stage, 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.

The aggregation was by grouping across age group or separation group, unless this increased the weight of the small cell. For cells that had very large weights (extreme weights), these cells were also combined with other strata to reduce the weights, although the cell size was larger than five. Decisions on aggregation were agreed by two analysts. The GREGWT macro was run with the above benchmarks with combined age group or combined separation group to compute the final annual weights.

Assessment of weights

Weights were assessed to ensure that undue emphasis was not applied to individual responses. For this, the ratio of the maximum to median annual weight and the design effect (DEFF) at the hospital, LHD, peer group and NSW levels were reviewed.

The 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 hospital, LHD, peer group and for NSW, for each quarter and for the annual dataset. 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.

For EDPS 2019–20, the maximum DEFF was 2.3 at both LHD and hospital levels. At the LHD level, the higher than previous year DEFF was caused by a wide range of weights across LHDs, due to the sample sizes being similar in large hospitals as for small hospitals despite the large discrepancy in patient volumes. At hospital level, the higher than previous year DEFF was caused by smaller sample sizes. This is because younger patients (18–49 years) who generally had lower response rates were not oversampled from October 2019 onwards.

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 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, survey responses, DEFF, and weighted response rates based on the full year of data are shown in Table 3 (by LHD and NSW), and in Table 4 (by hospital).

Table 3   Sample sizes, responses, weighted response rates and design effects (DEFF) by LHD and overall, EDPS 2019–20

LHD	Sample size (questionnaires mailed)	Survey responses	Weighted response rate (%)	DEFF
Central Coast	4,161	891	23	1.4
Far West	2,034	287	15	1.8
Hunter New England	16,981	2,920	20	2.3
Illawarra Shoalhaven	4,748	963	22	1.8
Mid North Coast	4,683	1,002	24	1.8
Murrumbidgee	4,421	796	20	2.0
Nepean Blue Mountains	4,450	863	21	2.1
Northern NSW	8,960	1,750	22	1.9
Northern Sydney	3,711	850	25	1.5
South Eastern Sydney	5,472	1,107	23	1.4
South Western Sydney	7,498	1,255	19	1.6
Southern NSW	6,359	1,301	23	1.7
St Vincent's Health Network	2,189	375	20	1.3
Sydney	4,091	736	20	1.4
Sydney Children's Hospitals Network	4,080	795	20	1.1
Western NSW	6,725	1,134	18	2.0
Western Sydney	5,331	814	17	1.4
NSW	**95,894**	**17,839**	**21**	**1.9**

Table 4 — Sample sizes, responses, weighted response rates and design effects (DEFF) by hospital and overall, EDPS 2019–20

Hospital	Sample size (questionnaires mailed)	Survey responses	Weighted response rate (%)	DEFF
Armidale Hospital	1,063	201	21	1.7
Auburn Hospital	1411	185	14	1.3
Ballina District Hospital	1,029	231	24	1.7
Bankstown-Lidcombe Hospital	1,351	199	16	1.2
Batemans Bay District Hospital	1,062	222	25	1.9
Bathurst Health Service	1,061	175	18	1.5
Belmont Hospital	1,063	242	26	1.6
Blacktown Hospital	1,386	222	17	1.3
Blue Mountains District Anzac Memorial Hospital	1,078	249	26	1.6
Bowral and District Hospital	1,077	253	26	1.5
Broken Hill Health Service	2,034	287	15	1.8
Byron Central Hospital	1,116	174	17	1.5
Calvary Mater Newcastle	1,314	273	23	1.8
Camden Hospital	1,040	155	16	1.6
Campbelltown Hospital	1,333	231	20	1.2
Canterbury Hospital	1,355	205	16	1.4
Casino & District Memorial Hospital	1,047	168	16	2.1
Cessnock Hospital	1,063	181	19	1.6
Coffs Harbour Health Campus	1,300	274	23	1.6
Concord Repatriation General Hospital	1,345	260	22	1.4
Cooma Hospital and Health Service	1,029	198	21	1.9
Cowra Health Service	975	183	19	2
Deniliquin Hospital and Health Services	989	183	20	1.8
Dubbo Base Hospital	1,301	212	17	1.7
Fairfield Hospital	1,346	193	16	1.2
Gosford Hospital	2,047	467	24	1.4
Goulburn Base Hospital and Health Service	1,071	214	22	1.6
Grafton Base Hospital	1,092	214	21	1.9
Griffith Base Hospital	1,092	175	17	1.6
Gunnedah Hospital	1,005	141	15	2
Hawkesbury District Health Services	997	180	20	1.4
Hornsby Ku-ring-gai Hospital	1,311	313	26	1.2
Inverell Hospital	1,014	168	18	2.1
John Hunter Hospital	1,319	265	23	1.4

Hospital	Sample size (questionnaires mailed)	Survey responses	Weighted response rate (%)	DEFF
Kempsey District Hospital	1,075	203	21	1.8
Kurri Kurri Hospital	960	143	17	2.3
Lachlan Health Service – Forbes	990	176	19	1.8
Lismore Base Hospital	1,300	241	21	1.5
Lithgow Hospital	1,042	187	20	1.8
Liverpool Hospital	1,351	224	19	1.2
Macksville District Hospital	1,023	225	24	2
Maclean District Hospital	1,008	239	27	1.5
Maitland Hospital	1,375	226	19	1.6
Manning Hospital	1,310	276	25	1.7
Milton Ulladulla Hospital	999	227	25	1.7
Moree Hospital	1,010	124	12	2.1
Moruya District Hospital	1,038	231	25	1.6
Mount Druitt Hospital	1,106	155	14	1.4
Mudgee Health Service	1,067	155	16	1.8
Murwillumbah District Hospital	1,050	210	21	1.8
Muswellbrook Hospital	1,073	143	14	1.8
Narrabri Hospital	990	147	16	2.2
Nepean Hospital	1,333	247	21	1.4
Orange Health Service	1,331	233	20	1.6
Port Macquarie Base Hospital	1,285	300	26	1.6
Prince of Wales Hospital	1438	269	22	1.3
Queanbeyan Hospital and Health Service	1,115	197	19	1.4
Royal North Shore Hospital	1,340	290	24	1.2
Royal Prince Alfred Hospital	1,391	271	22	1.2
Ryde Hospital	1,060	247	24	1.3
Shellharbour Hospital	1,091	223	22	1.5
Shoalhaven District Memorial Hospital	1,333	265	22	1.5
Singleton Hospital	1,094	165	16	1.5
South East Regional Hospital	1,044	239	26	1.4
St George Hospital	1,331	267	22	1.2
St Vincent's Hospital Sydney	2,189	375	20	1.3
Sutherland Hospital	1,325	309	26	1.3
Sydney Children's Hospital, Randwick	2,028	405	20	1.1
Sydney Hospital and Sydney Eye Hospital	1,378	262	22	1.5
Tamworth Hospital	1,328	225	19	1.7

Hospital	Sample size (questionnaires mailed)	Survey responses	Weighted response rate (%)	DEFF
The Children's Hospital at Westmead	2,052	390	19	1
The Tweed Hospital	1.318	273	24	1.5
Wagga Wagga Rural Referral Hospital	1,316	265	22	1.5
Westmead Hospital	1,428	252	20	1.2
Wollongong Hospital	1,325	248	21	1.4
Wyong Hospital	2,114	424	22	1.4
Young Health Service	1,024	173	18	2
NSW	**95,894**	**17,839**	**21**	**1.9**

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 5 shows demographic characteristics of respondents 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 5   Demographic characteristics of patient population and respondents, EDPS 2019–20

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	1	1	2	1
	Hunter New England	14	14	16	14
	Illawarra Shoalhaven	6	6	5	6
	Mid North Coast	5	4	6	4
	Murrumbidgee	3	3	4	3
	Nepean Blue Mountains	5	5	5	5
	Northern NSW	7	7	10	7
	Northern Sydney	6	6	5	6
	South Eastern Sydney	9	10	6	10
	South Western Sydney	11	12	7	12
	Southern NSW	4	4	7	4
	St Vincent's Health Network	2	2	2	2
	Sydney	7	6	4	6
	Sydney Children's Hospitals Network	3	4	4	4
	Western NSW	5	4	6	4
	Western Sydney	8	8	5	8
Peer group	A1	36	36	20	36
	A2	3	4	4	4
	A3	3	3	3	3
	B	33	33	27	33
	C1	13	13	17	13
	C2	12	11	27	11
Age group	0–17 years	23	25	20	26
	18–49 years	39	38	21	36
	50+ years	38	36	59	38
Separation group	Admitted Emergency	27	24	30	24
	Non-admitted Emergency	73	76	70	76
Aboriginal status	Non-Aboriginal	93	#	98	98
	Aboriginal and/or Torres Strait Islander	7	#	2	2
Sex	Male	50	#	48	47
	Female	50	#	52	53

#Data not available.

Reporting

Confidentiality

BHI does not receive any confidential patient information and only publishes aggregated data and statistics. Any question must include 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. For EDPS 2019–20, all hospitals had more than 30 respondents and were therefore eligible for public reporting.

Suppression rules

For suppression at the hospital and LHD levels, 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 group and separation group). 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 EDPS 2019–20, all 77 hospitals had at least 49 respondents and were reportable. Among these, 30 hospitals had a response rate less than 20% and while their results were publicly released, they were accompanied by an 'interpret with caution' note.

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 July 2019 to June 2020 combined, as well as by quarter. Analysis was undertaken in SAS V9.4 using the SURVEYFREQ procedure, with hospital, age and stay type as strata variables. Results were obtained for each individual survey question. Results were weighted for all questions including patient socio-demographic characteristics, except for questions related to 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 their 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 6.

Table 6   Levels of reporting, EDPS 2019–20

Grouping	Reporting frequency	NSW	Peer group	LHD	Hospital
All patients	Annual / Quarterly	✓	✓	✓	✓
Age group: self-reported – administrative data used where question on year of birth was missing or invalid	Annual	✓	✓	✓	✓
Sex: self-reported – administrative data used where question on gender was missing or invalid	Annual	✓	✓	✓	✓
Main language spoken at home	Annual	✓	✓	✓	✓
Education level	Annual	✓	✓	✓	✓
Long-term health condition	Annual	✓	✓	✓	✓
Self-reported health status	Annual	✓	✓	✓	✓
Separation group: admitted or non-admitted	Annual	✓	✓	✓	✓
Quintile of disadvantage: based on the Australian Bureau of Statistics Index of Relative Socio-demographic Disadvantage	Annual	✓	✓	✓	✓
Rurality of patient residence: based on ARIA+* category of postcode of respondent residence – outer regional, remote and very remote combined	Annual	✓	✓	✓	✓

*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**

Standardised comparisons

Previously, BHI's approach to comparisons between hospitals 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 in results 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. significant testing).

The standardised comparison is currently only applied for results at the hospital level and not at the 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 (performance questions), the percentage of respondents who selected the most positive response

category was compared between each hospital and NSW. For example, one question asked patients: 'Were you given enough privacy during your visit to the ED?' 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:

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

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) were also considered as they may relate to response tendency. However, BHI chose not to include factors such as rurality or SES as these factors 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 7.

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. However, these 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 7   Patient characteristics considered for adjustment, EDPS 2019–20

Variable	Source	Categories
Age group	Survey question, or using administrative data if missing	0–17, 18–34, 35–54, 55–74, 75+ years
Sex	Survey question, or using administrative data if missing	Female, male
Education level	Survey question	Completed year 12, trade/technical certificate/diploma, university degree, postgraduate degree, missing
Language mainly spoken at home	Survey question	English, other than English, missing
Separation group	Administrative data	Admitted [to hospital], non-admitted [to hospital upon ED departure]
Survey mode	Response data	Paper, online
Proxy response	Survey question	The patient, the patient with help, other people on patient's behalf, missing
Had previous visit to ED for the same or a related condition	Survey question	Yes, no, missing

Table 8 presents a list of covariates considered for adjustment by selection stage. These patient characteristics were then passed through two selection stages, as follows:

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.

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.[1]

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 8   Covariates considered for adjustment for comparisons at each selection stage, EDPS 2019–20.

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 group	✓	✓	✓
Sex	✓	✓	✓
Education	✓	✓	✓
Language mainly spoken at home	✓	✓	✓
Separation group	✓	✓	
Mode of response	✓	✓	
Proxy response	✓	✓	
Had previous visit to ED for the same or a related condition	✓	✓	

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.

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 GLIMMIX procedure and 'weight statement' was used for performing logistic mixed models to compare hospital results with NSW, adjusting for covariates and sampling weights.[2]

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

Percentage of 'Don't know' and/or missing responses by question, EDPS 2019–20

Question number	Question text	Missing %	Don't know %	Missing + Don't know %*
1	What was your main form of transport to the emergency department (ED)?	1.9		1.9
2	Was there a problem in finding a parking place near the ED?	2.4		2.4
3	Was the signposting directing you to the ED of the hospital easy to follow?	2.8		2.8
4	Were the reception staff you met on your arrival polite and courteous?	1.5	1.9	3.5
5	Did the ED staff you met on arrival give you enough information about what to expect during your visit?	1.9	5.4	7.3
6	Did the ED staff you met on arrival tell you how long you would have to wait for treatment?	2	8.4	10.4
7	Was the waiting time given to you by the ED staff you met on arrival about right?	2.3	4.8	7.1
8	Did you experience any of the following issues when in the waiting area?	5.3		5.3
9	How clean was the waiting area in the ED?	1.2		1.2
10	From the time you first arrived at the ED, how long did you wait before being triaged by a nurse – that is, before an initial assessment of your condition was made?	2.5	4.6	7.2
11	Did you stay until you received treatment?	2.6		2.6
12	Why did you leave the ED before receiving treatment?	3.7	1.2	4.9
13	After triage (initial assessment), how long did you wait before being treated by an ED doctor or nurse?	3.7	6	9.6
14	While you were waiting to be treated, did ED staff check on your condition?	0.6	5.3	5.9
15	While you were waiting to be treated, did your symptoms or condition get worse?	0.8	4.6	5.4
16	Did the ED health professionals introduce themselves to you?	3.1	4.6	7.8
17	Did the ED health professionals explain things in a way you could understand?	3.6		3.6
18	Did you have enough time to discuss your health or medical problem with the ED doctors?	3.2	2.3	5.6
19	During your ED visit, how much information about your condition or treatment was given to you?	3.5		3.5
20	Were you involved, as much as you wanted to be, in decisions about your care and treatment?	3.3		3.3
21	If your family members or someone else close to you wanted to talk to the ED staff, did they get the opportunity to do so?	3.4	2.7	6.1
22	How much information about your condition or treatment was given to your family, carer or someone else close to you?	3.7	4.3	8
23	Were you able to get assistance or advice from ED staff for your personal needs (e.g. for eating, drinking, going to the toilet, contacting family)?	3.4		3.4
24	How would you rate how the ED health professionals worked together?	3.2		3.2
25	Did you have confidence and trust in the ED health professionals treating you?	3.3		3.3
26	Were the ED health professionals polite and courteous?	3.2		3.2
27	Overall, how would you rate the ED health professionals who treated you?	3.2		3.2

*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.

Question number	Question text	Missing %	Don't know %	Missing + Don't know %*
28	Did you ever receive contradictory information about your condition or treatment from ED health professionals?	3.9		3.9
29	Were the ED health professionals kind and caring towards you?	3.4		3.4
30	Did you feel you were treated with respect and dignity while you were in the ED?	3.5		3.5
31	Were you given enough privacy during your visit to the ED?	3.5		3.5
32	Were your cultural or religious beliefs respected by the ED staff?	4		4
33	Did you have worries or fears about your condition or treatment while in the ED?	3.9		3.9
34	Did an ED health professional discuss your worries or fears with you?	3.5		3.5
35	In your opinion, did the ED nurses who treated you know enough about your care and treatment?	4.1	3.1	7.2
36	Were you ever in pain while in the ED?	4.2		4.2
37	Do you think the ED health professionals did everything they could to help manage your pain?	2.4		2.4
38	Did you see ED health professionals wash their hands, or use hand gel to clean their hands, before touching you?	3.9	19.2	23.1
39	How clean was the treatment area in the ED?	3.9		3.9
40	While you were in the ED, did you feel threatened by other patients or visitors?	3.7		3.7
41	While you were in the ED, did you see or hear any aggressive or threatening behaviour towards ED staff?	3.6	3.1	6.7
42	Were there things for your child to do (such as books, games and toys) in the ED?	1.9	8.6	10.5
43	Was the area in which your child was treated suitable for someone of their age group?	2		2
44	Did the ED staff provide care and understanding appropriate to the needs of your child?	1.7		1.7
45	During your visit to the ED, did you have any tests, X-rays or scans?	8	3.4	11.4
46	Did an ED health professional discuss the purpose of these tests, X-rays or scans with you?	1.3	2.4	3.7
47	Did an ED health professional explain the test, X-ray or scan results in a way that you could understand?	1.8		1.8
48	What happened at the end of your ED visit?	5.2		5.2
49	Did you feel involved in decisions about your discharge from the ED?	1.6		1.6
50	Thinking about when you left the ED, were you given enough information about how to manage your care at home?	1.3		1.3
51	Did ED staff take your family and home situation into account when planning your discharge?	1.7	3.2	4.9
52	Thinking about when you left the ED, were adequate arrangements made by the hospital for any services you needed?	1.7		1.7
53	Did ED staff tell you who to contact if you were worried about your condition or treatment after you left hospital?	1.7	9.7	11.4

*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.

Question number	Question text	Missing %	Don't know %	Missing + Don't know %*
54	Thinking about your illness or treatment, did an ED health professional tell you about what signs or symptoms to watch out for after you went home?	2.1		2.1
55	Were you given or prescribed any new medication to take at home?	1.6		1.6
56	Did an ED health professional explain the purpose of this medication in a way you could understand?	2		2
57	Did an ED health professional tell you about medication side effects to watch for?	2.5		2.5
58	Did you feel involved in the decision to use this medication in your ongoing treatment?	2.4		2.4
59	Did an ED health professional tell you when you could resume your usual activities, such as when you could go back to work or drive a car?	2.4		2.4
60	Did the ED staff provide you with a document that summarised the care you received (e.g. a copy of the letter to your GP or a discharge summary)?	2.3	13.1	15.5
61	Was your departure from the ED delayed – that is, before leaving the ED to go to a ward, another hospital, home, or elsewhere?	5.5		5.5
62	Did a member of the ED staff explain the reason for the delay? [in discharge]	4		4
63	What were the main reasons for the delay? [in discharge]	3.9	3.6	7.5
64	Overall, how would you rate the care you received while in the ED?	1.6		1.6
65	If asked about your experience in the ED by friends and family, how would you respond?	1.9		1.9
66	Did the care and treatment you received in the ED help you?	1.9		1.9
67	In total, how long did you spend in the ED? (From the time you entered the ED until the time you left the ED to go to a ward, another hospital, home, or elsewhere)	2.3	6.9	9.2
68	Did you want to make a complaint about something that happened in the ED?	2		2
69	Were you ever treated unfairly for any of the reasons below?	4.6		4.6
70	Not including the reason you came to the ED, during your visit or soon afterwards, did you experience any of the following complications or problems?	3.2		3.2
71	Was the impact of this complication or problem …?	3.4		3.4
72	In your opinion, were members of the hospital staff open with you about this complication or problem?	3.4		3.4
73	What were your reasons for going to the ED?	1.8		1.8
74	Was your visit to the ED for a condition that, at the time, you thought could have been treated by a GP?	2		2
75	In the month before visiting the ED, did you...?	2.4	7.5	9.9
76	Before your visit to the ED, had you previously been to an ED for the same condition or something related to it?	2.1		2.1
77	In the past 12 months, how many times have you visited an ED for your own care?	2.8		2.8
78	What year were you born?	2		2
79	What is your gender?	1.4		1.4

*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.

Question number	Question text	Missing %	Don't know %	Missing + Don't know %*
80	What is the highest level of education you have completed?	3.4		3.4
81	Are you of Aboriginal origin, Torres Strait Islander origin, or both?	2.4		2.4
82	Did you receive support, or the offer of support, from an Aboriginal Health Worker while you were in the ED?	1.7	6.9	8.5
83	Which, if any, of the following longstanding conditions do you have (including age related conditions)?	2.5		2.5
84	Does this condition(s) cause you difficulties with your day-to-day activities?	2.1		2.1
85	Are you a participant of the National Disability Insurance Scheme (NDIS)?	3	5.5	8.5
86	Which language do you mainly speak at home?	1.8		1.8
87	Did you need, or would have liked, to use an interpreter at any stage while you were in the ED?	1.4		1.4
88	Did the ED provide an interpreter when you needed one?	2.2		2.2
89	In general, how would you rate your health?	1.6		1.6
90	Who completed this survey?	1.4		1.4
91	Do you give permission for the BHI to link your answers from this survey to health records related to you (the patient)?	2.2		2.2

*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 in the supplementary documents section attached to each patient survey results report 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 questions and responses in Table 10 were used in the construction of the derived measures.

Table 10   Derived measures for the EDPS 2019–20 questionnaire

Derived measure	Original question	Derived measure categories	Response options
Needed parking near the ED	Q2. Was there a problem in finding a parking place near the ED?	Needed parking	Yes, a big problem
			Yes, a small problem
			No problem
		Didn't need parking	I did not need to park
Needed to wait for treatment after meeting reception staff	Q6. Did the ED staff you met on arrival tell you how long you would have to wait for treatment?	Needed to wait	Yes
			No
		Didn't need to wait	I didn't need to wait for treatment
Spent time in the waiting area	Q8. Did you experience any of the following issues when in the waiting area?	Spent time in waiting area	I couldn't find somewhere to sit
			The seats were uncomfortable
			I did not feel safe
			It was too noisy
			It was too hot
			It was too cold
			There were bad or unpleasant smells
			No, I did not experience these issues
		Wasn't in waiting area	I did not spend time in the waiting area
Experienced issues with seating, safety, noise, temperature or odour in the waiting area	Q8. Did you experience any of the following issues when in the waiting area?	Experienced these issues	I couldn't find somewhere to sit
			The seats were uncomfortable
			I did not feel safe
			It was too noisy
			It was too hot
			It was too cold
			There were bad or unpleasant smells
		Didn't experience these issues	No, I did not experience these issues
Triaged by a nurse	Q10. From the time you first arrived at the ED, how long did you wait before being triaged by a nurse – that is, before an initial assessment of your condition was made?	Saw a triage nurse	I was triaged immediately
			1-15 minutes
			16-30 minutes
			31-59 minutes
			1 hour to less than 2 hours
			2 hours or more
		Didn't see a triage nurse	I did not see a triage nurse

Derived measure	Original question	Derived measure categories	Response options
Treated by a doctor	Q18. Did you have enough time to discuss your health or medical problem with the ED doctors?	Treated by a doctor	Yes, definitely
			Yes, to some extent
			No
		Not treated by a doctor	I wasn't treated by a doctor
Needed information about condition or treatment	Q19. During your ED visit, how much information about your condition or treatment was given to you?	Needed information	Not enough
			The right amount
			Too much
		Didn't need information	Not applicable to my situation
Wanted or were well enough to be involved in decisions about care and treatment	Q20. Were you involved, as much as you wanted to be, in decisions about your care and treatment?	Wanted involvement and was well enough	Yes, definitely
			Yes, to some extent
			No
		Not well enough or didn't want involvement	I was not well enough to be involved
			I did not want or need to be involved
Had family/someone close who wanted to talk to staff	Q21. If your family members or someone else close to you wanted to talk to the ED staff, did they get the opportunity to do so?	Wanted to talk to staff	Yes, definitely
			Yes, to some extent
			No, they did not get the opportunity
		Not applicable	Not applicable to my situation
Had family/someone close who wanted information about condition or treatment	Q22. How much information about your condition or treatment was given to your family, carer or someone else close to you?	Wanted information	Not enough
			The right amount
			Too much
		Not applicable	It was not necessary to provide information to any family or friends
Needed assistance or advice from ED staff for personal needs	Q23. Were you able to get assistance or advice from ED staff for your personal needs (e.g. for eating, drinking, going to the toilet, contacting family)?	Needed assistance	Yes, always
			Yes, sometimes
			No
		Didn't need assistance	I did not need assistance or advice
Had religious or cultural beliefs to consider	Q32. Were your cultural or religious beliefs respected by the ED 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
Received treatment from an ED nurse	Q35. In your opinion, did the ED nurses who treated you know enough about your care and treatment?	Treated by an ED nurse	Yes, always
			Yes, sometimes
			No
		Wasn't treated by an ED nurse	I wasn't treated by a nurse

Derived measure	Original question	Derived measure categories	Response options
Needed things for child to do (such as books, games and toys)	Q42. Were there things for your child to do (such as books, games and toys) in the ED?	Child needed things to do	There were plenty of things for my child to do
			There were some things, but not enough
			There was nothing for my child's age group
			There was nothing for children to do
		Not applicable	Not applicable to my child's visit
Received results of test, X-ray or scan results while in ED	Q47. Did an ED health professional explain the test, X-ray or scan results in a way that you could understand?	Told results	Yes, completely
			Yes, to some extent
			No
		Not told results in ED	I was not told the results while in the ED
Wanted or needed to be involved in decisions about discharge	Q49. Did you feel involved in decisions about your discharge from the ED?	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	Q50. Thinking about when you left the ED, were you given enough information about how to manage your care at home?	Needed information	Yes, definitely
			Yes, to some extent
			No, I was not given enough information
		Didn't need information	I did not need this type of information
Needed family and home situation taken into account when planning discharge	Q51. Did ED staff take your family and home situation into account when planning your discharge?	Had situation to consider	Yes, definitely
			Yes, to some extent
			No, staff did not take my situation into account
		Not necessary	It was not necessary
Needed services after discharge	Q52. Thinking about when you left the ED, were adequate arrangements made by the hospital for any services you needed?	Needed services	Yes, definitely
			Yes, to some extent
			No, arrangements were not adequate
		Didn't need services	It was not necessary
Wanted or needed to be involved in decisions about medication	Q58. Did you feel involved in the decision to use this medication in your ongoing treatment?	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 when could resume usual activities	Q59. Did an ED health professional tell you when you could resume your usual activities, such as when you could go back to work or drive a car?	Needed information	Yes, definitely
			Yes, to some extent
			No
		Didn't need information	Not applicable

Derived measure	Original question	Derived measure categories	Response options
Treated unfairly in the ED	Q69. 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 complication or problem during or shortly after ED visit	Q70. Not including the reason you came to the ED, during your visit or soon afterwards, did you experience any of the following complications or problems?	Had complication	An infection
			Uncontrolled bleeding
			A negative reaction to medication
			Complications as a result of tests or procedures
			A blood clot
			A fall
			Any other complication or problem
		None reported	None of these
			Missing
Complication or problem occurred during ED visit	Q72. In your opinion, were members of the hospital staff open with you about this complication or problem?	Occurred in ED	Yes, completely
			Yes, to some extent
			No
		Occurred after left	Not applicable, as it happened after I left

References

1. Burnham, K. P., & Anderson, D. R. (2002). Model selection and multimodel inference: a practical information-theoretic approach (2nd ed.) New York: Springer.

2. SAS Documentation: Example Weighted Multilevel Model for Survey Data. [online] Available from: **https://documentation.sas.com/?cdcI d=pgmsascdc&cdcVersion=9.4_3.4&docse tId=statug&docsetTarget=statug_glimmix_ examples23.htm&locale=en**

bureau of
**health
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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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