Emergency Department Patient Survey 2020–21

Technical Supplement

March 2022

bureau of health information

BUREAU OF HEALTH INFORMATION
1 Reserve Road
St Leonards NSW 2065
Australia
Telephone: +61 2 9464 4444
bhi.nsw.gov.au

State Health Publication Number: (BHI) SHPN (BHI) 220197-1

Suggested citation:

Bureau of Health Information. Technical Supplement – Emergency Department Patient Survey 2020–21. Sydney (NSW): BHI; 2022.

Please note there is the potential for minor revisions of data in this report.

Please check the online version at bhi.nsw.gov.au for any amendments or errata.

Published May 2022

The conclusions in this report are those of BHI and no official endorsement by the NSW Minister for Health, the NSW Ministry of Health or any other NSW public health organisation is intended or should be inferred.

Contents

Introduction

This technical supplement outlines the sampling methodology, data management and analysis of the results of the Emergency Department Patient Survey (EDPS) 2020–21.

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.

For more information on how to interpret results and statistical analysis of differences between hospitals, LHDs and NSW, please refer to the Guide to interpreting differences in patient survey results on BHI's website at bhi.nsw.gov.au/__data/assets/pdf_file/0003/289533/NSW_PSP_Guide_to_interpreting_survey_differences.pdf

Emergency Department Patient Survey

EDPS asks people who visited a NSW public hospital emergency department (ED) to provide feedback about the care they received. EDPS 2020–21 was mailed to people who visited an ED between July 2020 and June 2021.

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.

Questionnaire

For changes in the questionnaire content between EDPS 2019–20 and EDPS 2020–21, please refer to the development report on BHI's website at bhi.nsw.gov.au/__data/assets/pdf_file/0020/670250/BHI_EDPS_2020-21_DEVREPORT.pdf

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:

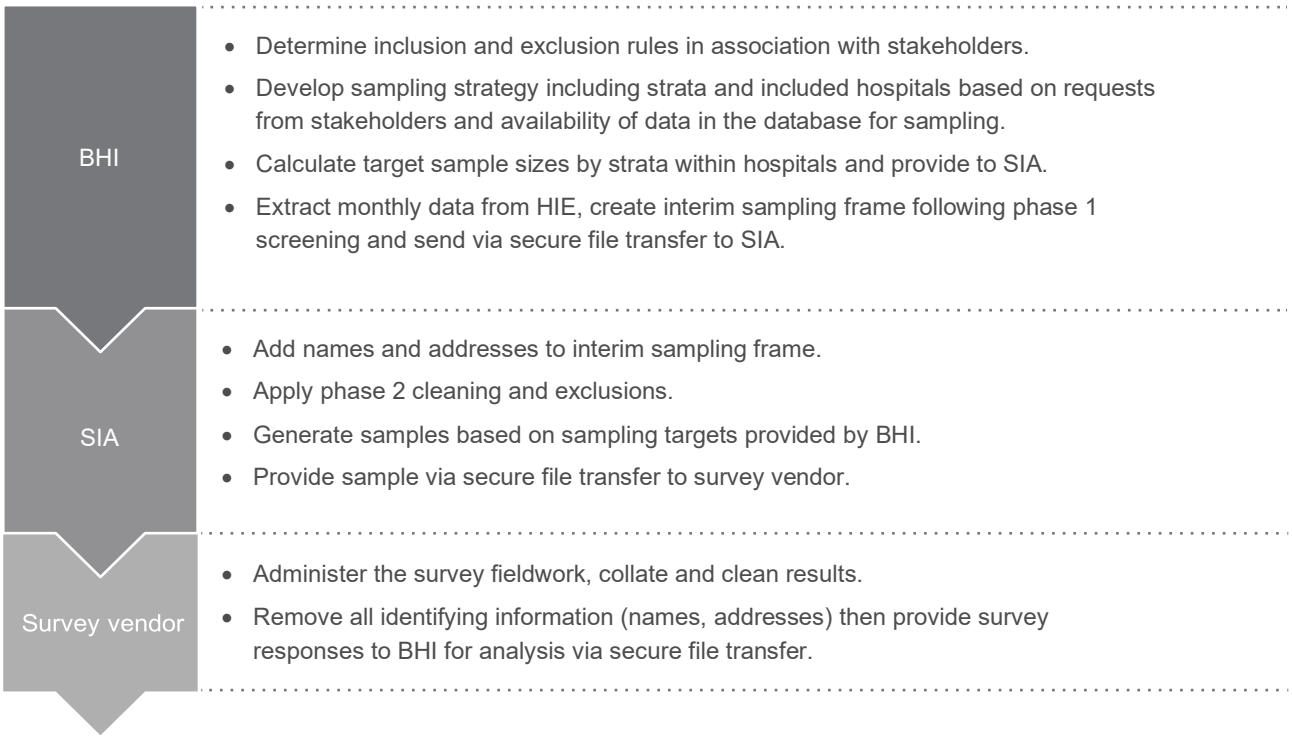
- data suppression (results for fewer than 30 responses are suppressed)
- reporting aggregated results
- anonymisation of patient comments
- segregation of roles when constructing the survey samples (Figure 1).

The sampling method for EDPS, as with all other BHI surveys, is a collaboration between BHI, the survey vendor and the Ministry's Systems Information and Analytics (SIA) branch. Figure 1 shows the organisational responsibilities in sampling and survey processing EDPS 2020–21.

BHI has access to de-identified unit record administrative data from selected tables of NSW Health's Health Information Exchange (HIE) database. Use of an encrypted patient number allows de-duplication of patients within a hospital.

For EDPS, 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 in the section 'Targets for sampling and drawing the sample' (Page 9).

Figure 1 Organisational responsibilities in sampling and data collection, EDPS 2020–21



Inclusion criteria

For EDPS 2020–21, the target population included patients who visited an ED in a NSW public hospital between July 2020 and June 2021.

Data from the HIE Emergency Department Data Collection (EDDC) were passed through two phases of screening to create a frame of patients eligible to participate in EDPS 2020–21. BHI conducted phase 1 screening, and SIA conducted phase 2 screening.

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.
- In total, 77 hospitals were sampled.

Exclusions

The following patients were excluded from the sampling frame:

- patients who were dead on arrival or died in the ED ('mode of separation'* of '03' and '08', respectively)
- patients who did not wait for treatment or left before treatment ('mode of separation'* of '06' and '07', 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).
- patients likely to be visiting an ED only for COVID-19 test, identified by:

* '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; (06) Departed: Did not wait; (07) Departed: Left at own risk; (08) Dead on arrival; (10) Admitted: to critical care ward; (11) Admitted: via operating suite.

– the patient departed and the 'provisional diagnosis'* reported is one of the following COVID-19 diagnosis codes:

  i) SNOMED-CT-AU codes: 840539006, 840544004 or 840546002 captured as 'discharge diagnosis' (ed_diagnosis_type = 'D') or 'admission diagnosis' (ed_diagnosis_type = 'P')

  ii) ICD-10-AM code: U07.1, U07.2 or U06.0 captured as 'principal diagnosis' (ed_diagnosis_type = 'P') or 'additional diagnosis'† (ed_diagnosis_type = '1')

– the 'provisional diagnosis' and 'additional diagnosis' do not have a COVID-19 diagnosis code, and the 'presenting problem'‡ field includes the text 'CORONA' or 'COVID'.

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.

Additional Phase 1 exclusions occurred for the June 2021 cohort. See section 'Changes during the survey year' for further information.

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.

Until May 2021, the following exclusions were applied by identifying patients from the Admitted Patient Data Collection (APDC) for the same month and excluding these same patients from the survey. This process meant that most excluded patients were patients subsequently admitted to hospital ('mode of separation'§ of '01', '10' and '11'), with the following procedures or diagnoses recorded for their inpatient stay:

- 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'

* '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.

‡ The 'presenting problem' is the clinical interpretation of the problem or concern identified by the triage clinician as the main reason for the person's presentation to 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; (06) Departed: Did not wait; (07) Departed: Left at own risk; (08) Dead on arrival; (10) Admitted: to critical care ward; (11) Admitted: via operating suite.

- 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 2020–21.

For the June 2021 cohort, screening for sensitive diagnoses changed to be based on diagnosis information collected as part of the EDDC, and occurred as part of Phase 1 screening. See section 'Changes during the survey year' for further information.

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.

Simple random sampling without replacement was applied within each stratum to create a final sample of patients who were mailed a survey.

Changes between EDPS 2019–20 and 2020–21

77 hospitals were included for both survey years and there was no change in hospital inclusion. In EDPS 2020–21, the below changes were applied to the sample design:

- Patients who did not wait for treatment or left before treatment ('mode of separation'‡ of '06' and '07') were excluded.
- Patients were included if the arrival date was within the sampling month (instead of departure date).
- A response rate of 0.23 (based on ED 2018–19, Q4 2019) was used to adjust for non-response.

Changes during the survey year

From June 2021, the screening of sensitive diagnoses changed.

Previously, sensitive diagnoses were screened out as part of phase 2, because screening depended on identifying sensitive diagnoses from the admitted patient record of patients admitted from ED.

For the June cohort, the screening of sensitive diagnoses became part of phase 1 screening. From June 2021, the provisional diagnosis information available at the time of data extraction from the EDDC was used to exclude patients attending due to sensitive diagnoses. This change reduced the time between the end of the month and mailing of the questionnaire, and also meant screening could be applied for all patients attending an ED, rather than just for patients who were admitted.

Diagnosis codes differ between APDC and EDDC. Table 1 provides a list of the sensitive diagnoses based on APDC and the codes used to exclude sensitive diagnoses using diagnosis information available from the EDDC.

As a result of the change, the period between the end of the month and the first mailout was four weeks shorter for the June 2021 cohort compared with the previous 11 months of the survey year.

* '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; (09) Departed: for other clinical service location.

‡ '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; (06) Departed: Did not wait; (07) Departed: Left at own risk; (08) Dead on arrival; (10) Admitted: to critical care ward; (11) Admitted: via operating suite.

Table 1 Criteria used to exclude patients attending ED for sensitive conditions for June 2021 compared with July 2020 to May 2021

Current specification	Codes in APDC – used from July 2020 to May 2021	Codes in SNOMED-CT or ICD-10-AM used in EDs – used for June 2021 cohort
Patients with a personal history of self-harm	ICD-10 Z91.5	Not incorporated in exclusions: no codes commencing with Z9 nor appropriate SNOMED-CT codes in mapping file.
Patients who have intentionally self-harmed	ICD-10 X60-X84, Y87.0, Y34	No codes commencing with Z9 in mapping file. Instead, use the following:* • T14.9 plus SNOMED-CT codes 403583006, 440144004, 276853009, 284744004 (deliberate self-cutting/injury due to suicide attempt/self-inflicted injury/burning self) • Z04.9 plus SNOMED-CT code 248062006 (deliberate self-harm) • T65.9 plus SNOMED-CT codes 410061008, 86849004 (suicidal deliberate poisoning) • T59.9 plus SNOMED-CT codes 418409002, 219125007, 57335002 (suicide and self-inflicted poisoning by gases in domestic use/poisoning of undetermined intent by corrosive, acid or caustic alkali) • T75.4 plus SNOMED-CT codes 219359001, 224946001 (injury of unknown intent by electrocution/self-electrocution).
Patients with a family history of mental or behavioural disorders	ICD-10 Z81.8	Not incorporated in exclusions: no codes commencing with Z8 in mapping file.
Patients who have expressed suicidal ideation	ICD-10 R45.81	ICD-10 R45.81
Patients recorded with maltreatment syndromes/abuse in any diagnosis field	ICD-10 T74	ICD-10 T74
Patients who experienced a stillbirth	ICD-10 Z37.1, Z37.3, Z37.4, Z37.6, Z37.7	No codes commencing with Z3 in mapping file. Instead, use: ICD-10 P96.9
Patients who experienced pregnancy with an abortive outcome	ICD-10 O00-O08	ICD-10 O00-O08
Patients recorded as receiving contraceptive management	ICD-10 Z30	ICD-10 Z30 ICD-10 T83.9 ICD-10 O26.9
Patients admitted for a termination of pregnancy procedure	Procedure codes 35643-03, 35640-03	ED records rarely mention procedure codes. ICD-10 O75.9 ICD-10 P96.9

* The addition of SNOMED-CT codes is necessary for intentional self-harm because the ICD-10 code includes many benign conditions. For instance, 86 SNOMED-CT codes are mapped to Z04.9, of which only one relates to deliberate self-harm.

Targets for sampling

Sample size calculation ensures that enough patients are receiving the questionnaire, so that the level of accuracy of the results is sufficient for the purpose.

Monthly sample sizes were determined before the start of the survey cycle. Although sampling was undertaken monthly, sample size calculations were based on the reporting frequency. For EDPS 2020–21, hospitals located in Far West LHD, Central Coast LHD, St Vincent's Health Network and Sydney Children's Hospitals Network were sampled with a quarterly measurement frequency to ensure these hospitals had sufficient survey responses for quarterly internal reporting of LHD-level key performance indicators (KPIs). 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 were based on data collated from January 2019 to December 2019 (after phase 1 of the screening process), in order to avoid the impact of the reduction in patient volumes due to the pandemic.

Calculation method

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 stay type groups were approximately in proportion to the patient population.

The target sample size (desired number of responses) for each hospital (i) was estimated using the following equation:

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

Where:

S_i = target sample size for the measurement period, i for hospital

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 measurement period

P = expected proportion giving 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 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%.

Calculation of sample sizes

Finally, sample sizes were inflated to account for non-responses to the survey. This was done by dividing the target sample size by the expected response rate. A response rate of 0.20 was used for EDPS 2020-21. In previous years a different response rate has been used to adjust for non-response. Use of a common response rate provides a more efficient approach to meet the target number of responses, despite the lower response rate expected for patients aged under 50 years.

Sample sizes are set to have a minimum monthly target of six patients for all strata (i.e. 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 EDPS 2020–21. For each month of sampling, SIA randomly selected patients within each stratum, according to these targets.

Data collection and processing

Data collection

Sampled patients 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 fields were checked for potential identifying information (e.g. mentions of patient or staff names, dates of treatment, date of birth or age, contact details or addresses, physical appearance) 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 questionnaire's 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 access by authorised staff only.

The process of data collection ensures that BHI does not have access to patient names and contact details, to maintain 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.

Data processing

For EDPS 2020–21, data were collected from patients who visited an ED in one of 77 large NSW public hospitals between July 2020 and June 2021.

Completion 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, 39 of the 43 non-text questions (this includes questions that were correctly skipped).

Response rate

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

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 2020–21, 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:

$$w_i = \frac{N_i}{n_i} \quad (2)$$

where:

N_i = total number of patients eligible for the survey in the i^{th} stratum

n_i = number of respondents in the i^{th} 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 LHD patient 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 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 level 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 and 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.

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.

For EDPS 2020–21, the maximum DEFF was 2.7 for LHD level and 2.3 for hospital level.

Sample sizes, survey responses, DEFF and weighted response rates based on the full year of data are shown in Table 5 (by LHD and NSW) and Table 6 (by hospital) in Appendix 1.

Weighted percentages

All the results in the report were weighted. The weighted percentage of patients selecting each response option in the questionnaire was determined using the following method:

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

Denominator – the (weighted) number of survey respondents who selected any of the response options to a certain question, minus exclusions.

Calculation – the numerator/denominator x 100.

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

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

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

Comparing weighted and unweighted patient characteristics

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

Table 1 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 2 Demographic characteristics of patient population and respondents, EDPS 2020–21

Demographic variable	Sub-group	% in patient population	% in eligible population	% in respondents (unweighted)	% in respondents (weighted)
LHD	Central Coast	6	6	6	6
	Far West	1	1	2	1
	Hunter New England	14	14	16	14
	Illawarra Shoalhaven	6	6	6	6
	Mid North Coast	5	5	5	5
	Murrumbidgee	3	3	4	3
	Nepean Blue Mountains	5	5	5	5
	Northern NSW	7	7	10	7
	Northern Sydney	6	7	5	7
	South Eastern Sydney	9	9	5	9
	South Western Sydney	11	11	7	11
	Southern NSW	4	4	8	4
	St Vincent's Health Network	2	2	2	2
	Sydney	6	6	4	6
	Sydney Children's Hospitals Network	4	4	5	4
	Western NSW	5	5	6	5
	Western Sydney	7	7	4	7
Peer group	A1	35	36	19	36
	A2	4	4	5	4
	A3	3	2	3	2
	B	33	33	25	33
	C1	13	13	18	13
	C2	12	12	29	12
	D	<1	<1	1	<1
Age group	0–17 years	24	26	20	27
	18–49 years	37	38	17	37
	50+ years	39	36	63	36
Separation group	Admitted emergency	29	25	30	25
	Non-admitted emergency	71	75	70	75

Demographic variable	Sub-group	% in patient population	% in eligible population	% in respondents (unweighted)	% in respondents (weighted)
Aboriginal status	Non-Aboriginal	93	#	98	97
	Aboriginal	7	#	2	3
Sex*	Male	50	#	48	48
	Female	50	#	52	52

Data not available.

* Information on sex is drawn from administrative data.

Data analysis

Standardised comparisons

To enable fairer comparisons between a hospital and the NSW result, in this survey, BHI used models adjusted for patients' socio-demographic characteristics (age, sex, language spoken at home and education level). Therefore, when a hospital is flagged as having a significantly higher or lower result than NSW, this should reflect differences in patient experiences rather than differences in a hospital's patient mix. The standardised comparison is currently only applied at the hospital level and not at LHD level.

The covariates included in the modelling for EDPS 2020–21 data are based on results of a thorough study conducted in 2018.

Methodology

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. Missing data in questions were excluded from the analyses. Logistic regression mixed models were used, with hospitals included as a random intercept term. Other covariates were included as fixed variates in the model.

The general formula for the logistic mixed model is:

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

where:

- The link function $g(\cdot)$ is the logistic function
- $g(\pi_{ij}) = \log\left(\frac{\pi_{ij}}{1-\pi_{ij}}\right)$
- X_i is the design matrix for fixed effect covariates
- β 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.

A list of all patient characteristics considered for inclusion in the model for standardised comparisons and how they were sourced is included in Table 3.

Information regarding rurality of patients and socioeconomic status were also considered as they may relate to response tendency.

Information on patient health status – such as self-reported overall health or mental health status – or mode of survey response could also influence both experiences of care and responding tendency, but 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. Missing data for other characteristics were included as a separate category in the model.

Table 3 Patient characteristics considered for adjustment, EDPS 2020–21

Variable	Source	Categories
Age	Survey question ('What year were you born?'), or using administrative data if missing	18–34
		35–54
		55–74
		75+
Sex	Survey question ('What is your gender?'), or using administrative data if missing	Female
		Male
Education	Survey question ('What is the highest level of education you have completed?')	Completed year 12
		Trade/technical certificate/diploma
		University degree
		Postgraduate/higher degree
		Missing
Language spoken at home	Survey question ('Which language do you mainly speak at home?')	English
		Language other than English
		Missing
Separation group	Administrative data	Admitted [to hospital]
		Non-admitted [to hospital upon ED departure]
Mode of survey response	Response data	Paper
		Online

Table 4 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) as independent variables for all performance 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 models.
2. Multivariate logistic mixed models were fitted across all performance questions 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. 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 which has the list of covariates to be included in the standardised comparisons. This process is assessed independently for each survey in the NSW Patient Survey Program. That is, the optimal model had a high count of first ranking, a low mean rank, and a low mean AIC relative to other models, across all performance questions in the survey.

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 at home were chosen for adjustment for the comparison mode.

Table 4 Covariates considered for adjustment for comparisons at each selection stage, EDPS 2020–21

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

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 to be 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.
- When results are flagged as 'interpret with caution' (Page 20) or when the model did not converge, 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 with a finite population correction factor and the Clopper-Pearson adjustment were used to adjust for the sampling weights when calculating the percentages and related confidence intervals. Hospital, service category and age group were included as strata variables.

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

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

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.

Since all the EDs have more than 30 respondents, there is no suppression necessary for public or internal release at ED level.

Suppression rules

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

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

Where the confidence interval was wider than 20 percentage points, results for individual questions are noted with 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.

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

Reporting by population groups

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

- Age group
- Sex
- Education level
- Language spoken at home
- Longstanding health condition: 'had condition/s', 'none reported'
- Rurality of hospital: 'urban', 'rural'.*

The above results, where they satisfy BHI's suppression rules (Page 20), are available on the BHI Data Portal.

In the Snapshot report for EDPS 2020–21, results are shown by the rurality of hospitals. Results included in the report showed significant difference between urban and rural hospitals after adjusting for age, sex, education level and language spoken at home (P value < 0.05) using logistic regression. PROC SURVEYLOGISTIC procedure was used to perform the analysis. Results for all measures by the rurality listed above, without significance testing, can be found on the BHI Data Portal.

Monthly trend results

In the Snapshot report, results are presented for each month of the 2020–21 survey year in comparison with 2019–20, to provide insights into patient experience at different times throughout the year. For EDPS 2020–21, the NSW-level data were analysed by month and weighted by the annual weight. The results are shown alongside the EDPS 2019–20 results to highlight any changes in patient experience over time. Changes in patient experience could be due to factors not accounted for in the results such as patient characteristics, or by changes in the system (e.g. the introduction of a new policy).

Monthly trend results by the rurality of hospitals

The results for urban and rural hospitals were compared for each month during July 2020 to June 2021 using the overlapping confidence intervals method. For each month, there was evidence to suggest the results for rural and urban hospitals were different if the 95% confidence intervals of the estimates did not overlap. All questions were assessed, and for the majority of questions, there was no statistical difference in results across months between urban and rural hospitals. Questions with differences observed for urban and rural hospitals included:

- How clean was the treatment area in the ED? – differences observed for 10 months.
- Were you provided with a document that summarised the care you received (e.g. a copy of the letter to your GP or a discharge summary)? – differences observed for all 12 months.

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

Category 'urban' was created by mapping to 'major cities' of the ABS classification. Category 'rural' was mapped to 'inner regional', 'outer regional', and 'remote and very remote'.

Reporting for age groups and education level

Patients self-reported older ages in EDPS 2020–21 than their administrative ages. The differences were concentrated in the 0–17 age group, especially at the two hospitals in the Sydney Children's Hospital Network. Comparing self-reported to administrative ages, there were fewer patients aged 0–17 at the two hospitals, and more patients aged 18–35, although no patients aged 18+ were selected to participate in the survey. The administrative age (rather than the self-reported age) was used to calculate and report the results by population groups in the BHI Data Portal and across all EDPS 2020–21 products.

Similarly, the responses for the two hospitals in the Sydney Children's Hospital Network showed that a high portion of respondents reported that they had a university or postgraduate degree. This could be due to respondents providing their own education level, rather than the patient's (the child). As a result, results for education level for the two hospitals are not included in all EDPS 2020–21 products.

Appendix 1

Survey response summary

Table 5 Number of questionnaires mailed, responses, response rates and design effects (DEFF), by LHD and overall, EDPS 2020–21

NSW/LHD		Questionnaires mailed	Responses	Response rate (%)	DEFF
NSW		89,233	20,728	22.8	2.1
LHD	Central Coast	4,333	1,164	25.7	1.6
	Far West	2,115	377	17.0	1.8
	Hunter New England	15,939	3,226	20.1	2.7
	Illawarra Shoalhaven	4,302	1,192	26.4	2.2
	Mid North Coast	4,325	1,099	25.2	2.0
	Murrumbidgee	4,257	915	20.9	2.2
	Nepean Blue Mountains	4,228	1,045	23.6	2.6
	Northern NSW	8,597	2,062	23.6	2.2
	Northern Sydney	3,276	965	28.9	1.5
	South Eastern Sydney	4,379	1,121	25.1	1.5
	South Western Sydney	6,498	1,516	22.8	1.9
	Southern NSW	6,490	1,593	23.7	1.7
	St Vincent's Health Network	2,165	482	22.2	1.3
	Sydney	3,320	816	24.0	1.4
	Sydney Children's Hospitals Network	4,305	970	22.6	1.0
	Western NSW	6,362	1,281	19.2	2.4
	Western Sydney	4,342	904	20.5	1.4

Table 6 Measurement frequency, number of questionnaires mailed, responses, response rates and design effects (DEFF) by hospital, EDPS 2020–21

Hospital	Measurement frequency	Questionnaires mailed	Responses	Response rate (%)	DEFF
Armidale Hospital	Semi-annual	1,072	222	20.0	1.8
Auburn Hospital	Semi-annual	1,090	208	19.3	1.3
Ballina District Hospital	Semi-annual	1,070	291	26.3	1.7
Bankstown-Lidcombe Hospital	Semi-annual	1,086	230	20.8	1.3
Batemans Bay District Hospital	Semi-annual	1,092	255	23.1	2.3
Bathurst Health Service	Semi-annual	1,066	213	19.6	1.5
Belmont Hospital	Semi-annual	1,103	309	27.9	1.5
Blacktown Hospital	Semi-annual	1,088	249	22.6	1.3
Blue Mountains District Anzac Memorial Hospital	Semi-annual	1,096	325	29.1	1.4
Bowral and District Hospital	Semi-annual	1,095	315	27.7	1.6
Broken Hill Health Service	Quarterly	2,115	377	17.0	1.8
Byron Central Hospital	Semi-annual	1,087	220	19.8	1.6
Calvary Mater Newcastle	Semi-annual	1,078	267	21.5	1.8
Camden Hospital	Semi-annual	1,068	252	23.3	1.4
Campbelltown Hospital	Semi-annual	1,089	230	20.2	1.3
Canterbury Hospital	Semi-annual	1,089	237	21.1	1.3
Casino & District Memorial Hospital	Semi-annual	1,060	203	18.2	1.7
Cessnock Hospital	Semi-annual	1,083	185	16.5	2.1
Coffs Harbour Health Campus	Semi-annual	1,075	285	25.6	1.4
Concord Repatriation General Hospital	Semi-annual	1,121	308	27.5	1.2
Cooma Hospital and Health Service	Semi-annual	1,068	246	23.1	1.5
Cowra Health Service	Semi-annual	1,021	229	21.0	2.0
Deniliquin Health Service	Semi-annual	1,052	224	20.4	1.6
Dubbo Hospital	Semi-annual	1,064	189	17.1	1.8
Fairfield Hospital	Semi-annual	1,089	249	22.0	1.3
Gosford Hospital	Quarterly	2,158	598	26.4	1.5
Goulburn Base Hospital	Semi-annual	1,063	246	22.6	1.5
Grafton Base Hospital	Semi-annual	1,086	260	24.2	1.7

Hospital	Measurement frequency	Questionnaires mailed	Responses	Response rate (%)	DEFF
Griffith Base Hospital	Semi-annual	1,075	199	18.1	1.5
Gunnedah Hospital	Semi-annual	1,017	171	15.9	1.9
Hawkesbury District Health Service	Semi-annual	988	213	20.9	1.5
Hornsby Ku-ring-gai Hospital	Semi-annual	1,089	325	29.3	1.2
Inverell Hospital	Semi-annual	1,074	207	18.2	1.7
John Hunter Hospital	Semi-annual	1,085	246	22.1	1.5
Kempsey District Hospital	Semi-annual	1,103	238	22.3	2.2
Kurri Kurri Hospital	Semi-annual	995	190	18.7	1.9
Lachlan Health Service - Forbes	Semi-annual	1,039	219	19.2	2.1
Lismore Base Hospital	Semi-annual	1,070	269	24.3	1.5
Lithgow Hospital	Semi-annual	1,070	257	23.8	1.6
Liverpool Hospital	Semi-annual	1,071	240	22.1	1.3
Macksville District Hospital	Semi-annual	1,063	283	26.4	1.9
Maclean District Hospital	Semi-annual	1,069	315	28.9	1.7
Maitland Hospital	Semi-annual	1,077	234	21.1	1.6
Manning Hospital	Semi-annual	1,078	292	26.3	1.6
Milton Ulladulla Hospital	Semi-annual	1,053	336	30.1	2.0
Moree Hospital	Semi-annual	1,036	148	13.5	1.9
Moruya Hospital	Semi-annual	1,094	320	28.3	1.7
Mount Druitt Hospital	Semi-annual	1,074	200	18.2	1.3
Mudgee Health Service	Semi-annual	1,094	208	18.8	1.6
Murwillumbah District Hospital	Semi-annual	1,093	249	22.9	1.5
Muswellbrook Hospital	Semi-annual	1,085	160	14.1	1.7
Narrabri Hospital	Semi-annual	1,001	177	17.0	1.8
Nepean Hospital	Semi-annual	1,074	250	22.2	1.6
Orange Health Service	Semi-annual	1,078	223	20.0	1.6
Port Macquarie Base Hospital	Semi-annual	1,084	293	26.7	1.7
Prince of Wales Hospital	Semi-annual	1,122	249	21.6	1.4
Queanbeyan Hospital and Health Service	Semi-annual	1,098	240	21.9	1.3

Hospital	Measurement frequency	Questionnaires mailed	Responses	Response rate (%)	DEFF
Royal North Shore Hospital	Semi-annual	1,075	315	29.0	1.2
Royal Prince Alfred Hospital	Semi-annual	1,110	271	24.0	1.3
Ryde Hospital	Semi-annual	1,112	325	28.4	1.3
Shellharbour Hospital	Semi-annual	1,098	260	22.7	1.8
Shoalhaven District Memorial Hospital	Semi-annual	1,077	294	26.6	1.8
Singleton Hospital	Semi-annual	1,078	201	18.3	1.6
South East Regional Hospital	Semi-annual	1,075	286	25.5	1.6
St George Hospital	Semi-annual	1,082	284	25.7	1.3
St Vincent's Hospital Sydney	Quarterly	2,165	482	22.2	1.3
Sutherland Hospital	Semi-annual	1,085	300	26.5	1.3
Sydney Children's Hospital, Randwick	Quarterly	2,147	486	22.5	1.0
Sydney Hospital and Sydney Eye Hospital	Semi-annual	1,090	288	26.4	1.6
Tamworth Hospital	Semi-annual	1,077	217	19.4	1.7
The Children's Hospital at Westmead	Quarterly	2,158	484	22.5	1.0
The Tweed Hospital	Semi-annual	1,062	255	23.3	1.8
Wagga Wagga Base Hospital	Semi-annual	1,075	263	23.9	1.4
Westmead Hospital	Semi-annual	1,090	247	21.9	1.3
Wollongong Hospital	Semi-annual	1,074	302	27.4	1.6
Wyong Hospital	Quarterly	2,175	566	25.0	1.7
Young Health Service	Semi-annual	1,055	229	20.2	1.7

Appendix 2

Rates of missing or 'Don't know'/'Can't remember' responses

Table 7 Unweighted percentage of 'Don't know'/'Can't remember' and missing responses by question, EDPS 2020–21

Number	Question	Missing %	'Don't know'/'Can't remember' %	Missing + 'Don't know'/'Can't remember' %*
1	Was the signposting directing you to the ED easy to follow?	2.6		2.6
2	Were the ED staff you met on your arrival polite and courteous?	2.1	1.6	3.6
3	Did the ED staff give you enough information about what to expect during your visit?	2.2	3.8	6.0
4	Did the ED staff tell you how long you might have to wait for treatment?	2.4	8.5	10.9
5	While you were waiting to be treated, did the ED staff check on your condition?	2.7	3.7	6.3
6	Did the ED health professionals who treated you introduce themselves to you?	2.1	3.4	5.5
7	Did the ED health professionals explain things in a way you could understand?	2.4		2.4
8	Did you have enough time to discuss your health or medical problem with the ED health professionals?	2.2	2.2	4.4
9	During your ED visit, how much information about your condition or treatment was given to you?	2.5		2.5
10	Were you involved, as much as you wanted to be, in decisions about your care and treatment?	2.0		2.0
11	Did the ED health professionals listen carefully to any views and concerns you had?	2.1		2.1
12	If your family members or someone else close to you wanted to talk to the ED health professionals, did they get the opportunity to do so?	2.1	2.9	5.1
13	How would you rate how the ED health professionals worked together?	1.9		1.9
14	Did you have confidence and trust in the ED health professionals treating you?	1.8		1.8

Number	Question	Missing %	'Don't know'/'Can't remember' %	Missing + 'Don't know'/'Can't remember' %*
15	Overall, how would you rate the ED health professionals who treated you?	2.1		2.1
16	Did you ever receive contradictory information about your condition or treatment from the ED health professionals?	2.8		2.8
17	Were the ED health professionals kind and caring towards you?	2.2		2.2
18	Were you treated with respect and dignity while you were in the ED?	2.1		2.1
19	Were you given enough privacy during your visit to the ED?	2.3		2.3
20	Did you have worries or fears about your condition or treatment while in the ED?	2.9		2.9
21	Did the ED health professionals discuss your worries or fears with you?	3.5		3.5
22	Were you ever in pain while in the ED?	1.8		1.8
23	Do you think the ED health professionals did everything they could to help manage your pain?	2.6		2.6
24	How clean was the treatment area in the ED?	1.2		1.2
25	While you were in the ED, did you feel threatened by other patients or visitors?	1.0		1.0
26	What happened at the end of your ED visit?	2.3		2.3
27	Did you feel involved in decisions about your discharge from the ED?	1.3		1.3
28	Thinking about when you left the ED, were you given enough information about how to manage your care at home?	1.0		1.0
29	Was your family and home situation taken into account when you were discharged?	1.2	2.6	3.8
30	Were you told who to contact if you were worried about your condition or treatment after you left the ED?	1.1	10.2	11.3
31	Were you told about what signs or symptoms, related to your illness or treatment, to watch out for after you went home?	1.4		1.4

Number	Question	Missing %	'Don't know'/'Can't remember' %	Missing + 'Don't know'/'Can't remember' %*
32	Were you provided with a document that summarised the care you received (e.g. a copy of the letter to your GP or a discharge summary)?	1.2	13.7	14.9
33	Overall, how would you rate the care you received while in the ED?	0.8		0.8
34	If asked about your experience in the ED by friends and family, how would you respond?	1.1		1.1
35	Did the care and treatment received in the ED help you?	1.0		1.0
36	Did you need to return to this or any other ED within 48 hours of discharge?	1.3	1.6	2.9
37	What year were you born?	3.1		3.1
38	What is your gender?	2.8		2.8
39	What is the highest level of education you have completed?	3.4		3.4
40	Do you have longstanding health conditions that cause you difficulty with your day-to-day activities?	3.2		3.2
41	Are you of Aboriginal origin, Torres Strait Islander origin, or both?	1.6		1.6
42	Which language do you mainly speak at home?	1.5		1.5
43	Do you give permission for BHI to link your answers from this survey to health records related to you (the patient)?	2.3		2.3

Appendix 3

Derived measures

Definition

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

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

Statistical methods

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

Numerator

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

Denominator

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

Exclusions

For derived measures, the following 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.

Table 8 shows the questions and responses used in the construction of the derived measures.

Table 8 Derived measures for EDPS 2020–21

Derived measure	Question	Derived measure categories	Original question responses
Respondents who needed directions	Q1. Was the signposting directing you to the ED easy to follow?	Needed directions	Yes, definitely
			Yes, to some extent
			No
		Didn't need directions	Not applicable
Needed to wait for treatment	Q4. Did the ED staff tell you how long you might have to wait for treatment?	Needed to wait	Yes
			No
		Didn't need to wait	I didn't need to wait for treatment
Needed information about condition or treatment	Q9. 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	I didn't need this type of information
Wanted or were well enough to be involved in decisions about care and treatment	Q10. 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 views or concerns	Q11. Did the ED health professionals listen carefully to any views and concerns you had?	Had views or concerns	Yes, definitely
			Yes, to some extent
			No
		Didn't have views or concerns	I didn't have any views and concerns
Family members or someone else close wanted to talk to the ED health professionals	Q12. If your family members or someone else close to you wanted to talk to the ED health professionals, did they get the opportunity to do so?	Wanted to talk to staff	Yes, definitely
			Yes, to some extent
			No, they didn't get the opportunity
			Don't know/can't say
		Not applicable	Not applicable to my situation

Derived measure	Question	Derived measure categories	Original question responses
Patients who were discharged	Q26. What happened at the end of your ED visit?	Admitted or transferred	I was admitted to the same hospital
			I was transferred to a different hospital or healthcare facility
		Discharged	I went home or to stay with a friend, relative, or elsewhere
Wanted involvement in decisions about discharge	Q27. Did you feel involved in decisions about your discharge from the ED?	Wanted involvement	Yes, definitely
			Yes, to some extent
			No
		Didn't want involvement	I didn't want or need to be involved
Needed information about how to manage care at home	Q28. 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
		Didn't need information	I didn't need this type of information
Had family and home situation to consider upon discharge	Q29. Was your family and home situation taken into account when you were discharged?	Had situation to consider	Yes, definitely
			Yes, to some extent
			No
		Not necessary	It wasn't necessary

References

1. KP Burnham and DR Anderson, *Model selection and multi-model inference: a practical information-theoretic approach*, 2nd edn, Springer, New York, 2002.
2. SAS Documentation, *Example Weighted Multilevel Model for Survey Data*, 13 December 2019, accessed February 2022. https://documentation.sas.com/doc/en/pgmsascdc/9.4_3.4/statug/statug_glimmix_examples23.htm