Healthcare in Focus

People's experiences of hospital care: Insights from five years of patient feedback

Technical Supplement

July 2020

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) 200203-1

Suggested citation:
Bureau of Health Information. Technical Supplement, Healthcare in Focus – People's experiences of hospital care: Insights from five years of patient feedback. Sydney (NSW); BHI; 2020.

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 July 2020

Table of contents

Introduction

This document is a supplement to the Bureau of Health Information (BHI's) annual healthcare performance report, *Healthcare in Focus – People's experiences of hospital care: Insights from five years of patient feedback*. It describes the data sources and methods used to calculate the descriptive statistics and statistical comparisons in the report. This supplement is technical in nature, and is intended for audiences interested in the creation and analysis of similar healthcare performance measures.

To produce the report, BHI used the following data sources:

- patient experience survey results from the NSW Patient Survey Program
- results from BHI's *Healthcare Quarterly* report
- Qualitative interviews.

BHI used SAS version 9.4 software for all the statistical analyses (Copyright © 2019 SAS Institute Inc. SAS and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc., Cary, NC, USA. SAS 9.4 [English]).

Data sources

NSW Patient Survey Program

The NSW Patient Survey Program measures and reports on patients' experiences of care in NSW public hospitals. It uses evidence-based, validated instruments to systematically collect feedback from large samples of patients that are representative of local patient populations, enabling comparison and trend analysis at local health district (LHD) and hospital level.

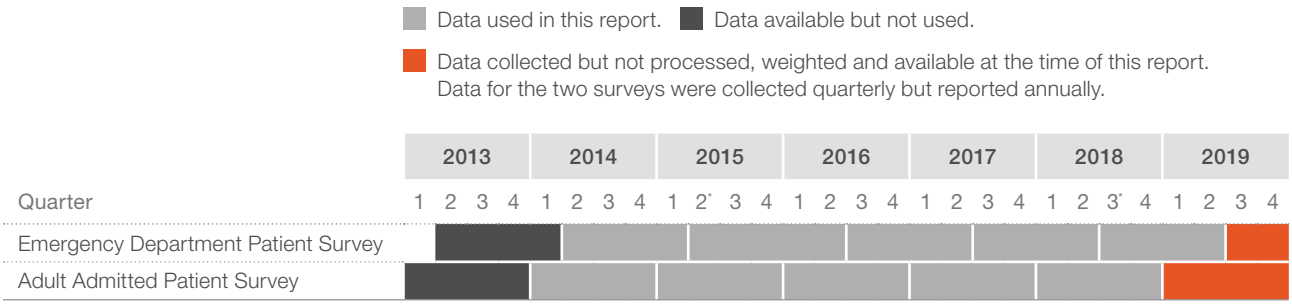
The program includes a range of surveys that focus on different care settings and patient groups. This report focuses on the two largest and longest running surveys in the NSW Patient Survey Program: the Emergency Department Patient Survey (EDPS) and Adult Admitted Patient Survey (AAPS).

Details of questionnaire development, sampling methodology, data management and results for each survey are available at: **bhi.nsw.gov.au/nsw_patient_survey_program**.

The analysis in the report is based on EDPS and AAPS results as they are the longest running, largest collections of patient experiences in the survey program. The periods of collection for both surveys are summarised below. Data from prior to 2014 were excluded due to differences in sampling methods (Table 1).

Detailed information for sampling for each year can be found in the technical supplements for each individual survey at **bhi.nsw.gov.au/BHI_reports/patient_survey_results**.

Table 1 Period of data collection by NSW Patient Survey Program for EDPS and AAPS



*The second quarter of data for 2015 was included in EDPS 2015–16 results due to the transition to financial year reporting from 2015 onwards. As a result, EDPS 2015–16 consisted of five quarters. Due to collection delays, EDPS 2018–19 data were collected over the 11-month period of August 2018 to June 2019. For all other years, EDPS consisted of four full quarters of data.

Data from the NSW Patient Survey Program

Emergency Department Patient Survey (EDPS)

Patients were eligible to participate in EDPS if they visited a NSW public hospital ED between 2014–15 and 2018–19, with a peer group classification of:

- A1: Principal referral
- A2: Ungrouped acute – tertiary referral
- B: Major hospital
- C1: District group 1
- C2: District group 2

Patients who died on arrival or in ED, or those subsequently admitted to hospitals for particularly sensitive reasons, were excluded. Full details of the diagnoses and procedures used for exclusions are available in the technical supplements for each individual survey at **bhi.nsw.gov.au/BHI_reports/patient_survey_results**.

Patients were stratified according to age (0–17, 18–49, 50+) and stay type (admitted or non-admitted). Surveys were mailed to a random sample of patients within each stratum. In cases where patients had multiple visits within the sampling month, details of their most recent visit were retained for sampling. The questionnaire asked them to respond to the survey based on their most recent visit in a particular month.

Surveys were sent to approximately 80,000 people annually with responses collected from an average of 18,800 people each year, from around 80 EDs in NSW (Tables 2 and 3). Results for 15 local health districts (LHDs) and 37 larger hospitals are presented in this report.

Adult Admitted Patient Survey (AAPS)

Adult patients aged 18 years or older were eligible to participate in AAPS if they were admitted to a NSW public hospital, between 2014 and 2018, with a peer group classification of:

- A1: Principal referral
- A2: Ungrouped acute – tertiary referral
- B: Major hospital
- C1: District group 1
- C2: District group 2

Those who were admitted for specific conditions such as giving birth, those who died during their hospital admission or those with invalid contact details were excluded from the sampling frame. Full details of the diagnoses and procedures used for exclusion are available in the technical supplements for each individual survey at **bhi.nsw.gov.au/BHI_reports/patient_survey_results**.

Patients were stratified according to age (18–49 or 50+) and stay type (same-day or overnight admission). Surveys were mailed to a random sample of patients within each stratum. Where patients had multiple visits within the sampling month, details of their most recent hospital stay were retained for sampling. The questionnaire asked them to respond to the survey based on their most recent admission in a particular month.

Surveys were sent to approximately 60,000 patients annually with responses collected from an average of 24,500 patients each year on a range of experiences between admission and leaving the hospital (Table 2). Results for 14 LHDs and 36 larger hospitals are presented in this report.

Inclusion criteria

There is significant variation in the number and size of NSW public hospitals. To recognise this variation and ensure fair reporting, criteria for inclusion at each level of analysis – state, LHD and hospital – were established.

Inclusion in NSW-level analysis:

- All LHDs.
- Survey responses from all hospitals participating in the NSW Patient Survey Program between 2014–15 and 2018–19 (EDPS), and 2014 and 2018 (AAPS).

Inclusion in LHD-level analysis:

- LHDs with survey respondents drawn from more than one hospital participating in the surveys (exclusions were Far West LHD and St Vincent's Health Network).

Inclusion in hospital-level analysis:

- NSW public hospitals in peer groups A and B between 2014(–15) to 2018(–19), as each of these hospitals are sampled quarterly and have larger numbers of respondents.
- Although Broken Hill is a peer group C hospital, it is in the peer group B cohort for this report as it had sufficient responses to enable trend analysis. It is included in hospital-level analysis.
- Hospitals that are in operation (exclusions were Mona Vale and Manly).
- St Vincent's Hospital is included in hospital-level analysis.
- Southern NSW LHD had no facilities of sufficient size to include in the hospital-level analysis. It is included in LHD-level analysis.

Analysis of NSW and LHD results

Changes in patient experience results for NSW and LHDs were analysed using responses from all respondents to EDPS (2014–15 to 2018–19) and AAPS (2014 to 2018). For EDPS, there were a total of 83 EDs included, and 82 hospitals for AAPS.

Only LHDs with significant changes or results consistently higher/lower than the 90th/10th percentiles in every year for selected questions, are highlighted in the report. Results for all eligible LHDs are provided in the supplementary data tables for this report. Information regarding the methods used to assess statistical significance and consistently higher/lower than 90th/10th percentiles can be found on pages 10 and 11 of this technical supplement.

Analysis of hospital level results

Hospital-level information is based on the results of EDPS (2014–15 to 2018–19) or AAPS (2014 to 2018) based on respondents who received care at principal referral and specialist hospitals, or major public hospitals.

- EDPS – principal referral and specialist (peer group A) and major (peer group B) hospitals, plus Broken Hill Hospital* (n=37)
- AAPS – principal referral and specialist (peer group A) and major (peer group B) hospitals, plus Broken Hill Hospital* (n=36).

*Broken Hill Hospital (peer group C1) was included because it provided sufficient data for trend analysis across the five years of the report.

Only hospitals with significant changes or results consistently higher/lower than the 90th/10th percentiles in every year for selected questions, are highlighted in the report. Results for all hospitals in peer groups A and B, and Broken Hill are provided in the supplementary data tables for this report. Hospitals that were closed or opened during the reporting period are not shown individually, irrespective of peer group status (e.g. Manly, Mona Vale, Byron Central). Information regarding the methods used to assess statistical significance and consistently higher/lower than 90th/10th percentiles can be found on pages 10 and 11 of this technical supplement.

Survey questions

Analysis was undertaken on performance-related patient experience questions in EDPS and AAPS that were consistently collected for the five years of the reporting period (31 questions for EDPS and 51 questions for AAPS).

Questions relating to outcomes (patient-reported complications or whether care helped) were excluded, because results could be influenced by clinical information (e.g. condition, procedures) that was not available within the survey. Therefore, it would not be possible to fairly assess changes in patient-reported outcomes. Some questions were also excluded because they were answered by a small subset of patients.

The report highlights results for eight selected questions for each survey, chosen in consultation with internal working groups and in discussion with an advisory group made up of stakeholders with expertise in patient experience from the NSW Ministry of Health, Agency for Clinical Innovation and LHDs.

Questions were selected to represent a range of domains of patient experience considered important for improvement in care. These include; overall ratings, health professionals, information, patient engagement, physical comfort or pain, facilities, waiting time, and experiences with discharge. For each domain, the question selected was that which best met the criteria: demonstrating significant changes over time, answered by most respondents, and associated with overall ratings of care. A balance of both improvements and declines was sought in the chapter where possible. The supplementary data tables provide full results for all questions.

Healthcare Quarterly

To provide context for patient experience, previously published healthcare activity and performance information from BHI's *Healthcare Quarterly* report is included in the report. *Healthcare Quarterly* is a series of regular reports that track activity and performance for emergency department, elective surgery, admitted patient and ambulance services in NSW. More details are available at **bhi.nsw.gov.au/BHI_reports/healthcare_quarterly.**

Additional population information from other government sources is also provided.

LHD interviews

Quantitative data sources have been supplemented with qualitative analysis through structured interviews with patient experience leads in selected LHDs. BHI's analyses of results for this report identified LHDs with notable improvements in patients' ratings of care. From these analyses, selected LHDs were interviewed about patient experience improvement initiatives in their area, which are profiled in the Patient experience in focus section of the report.

Data management and analysis

Adjusted response rate

The response rate (RR) is the percentage of patients who completed and returned the questionnaire, based on all patients who were mailed a questionnaire. In both surveys, younger patients were oversampled to ensure representation in the respondent profile due to the known low response rate among this cohort. Response rates were therefore adjusted to account for this. Tables 2 and 3 show there was a decline in response rates over the five-year report period at the NSW level for both surveys. A full list of response rates for LHDs and hospitals for each year can be found in the technical supplements for each individual survey at **bhi.nsw.gov.au/BHI_reports/patient_survey_results**.

Table 2 Number of patients sampled, mailings, respondents and adjusted response rates, EDPS

Emergency Department Patient Survey	2014–15	2015–16	2016–17	2017–18	2018–19	Total
Number of records	2,125,531	2,730,877	2,242,381	2,345,054	2,177,764	11,621,607
Number eligible	1,728,528	2,174,086	1,765,699	1,844,352	1,720,070	9,232,735
Number mailed	80,900	106,930	84,171	87,389	109,967	469,357
Number responded	18,301	23,810	17,922	15,995	18,086	94,114
Adjusted RR (%)	27	27	25	24	23	25

Table 3 Number of patients sampled, mailings, respondents and adjusted response rates, AAPS

Adult Admitted Patient Survey	2014	2015	2016	2017	2018	Total
Number of records	943,796	961,231	1,006,722	1,023,911	990,591	4,926,251
Number eligible	666,117	693,769	720,937	758,054	777,139	3,616,016
Number mailed	73,821	73,864	74,594	59,363	59,113	340,755
Number responded	26,711	28,391	28,693	21,026	17,805	122,626
Adjusted RR (%)	43	42	42	40	37	41

Weighting

All results in the report are weighted estimates, which ensure the findings are representative of all patients who received care and not just the cohort who responded to the survey.

Annual weights for each patient responding to each survey were calculated when all quarters of data were available. The quarterly weights were calculated as the ratio of the total number of patients eligible for sampling to the number of respondents in their strata (age and stay type). The interim quarterly weights were then passed through the generalised regression weights (GREGWT) macro, a survey-specific SAS program developed by the Australian Bureau of Statistics (ABS) to assist with weighting at annual level. More details about weighting for each survey each year can be found in the technical supplements for each individual survey at **bhi.nsw.gov.au/BHI_reports/patient_survey_results.**

For EDPS 2018–19, there was a delay which meant that data were collected over an 11-month period, having missed a month in July 2018. For that year (2018–19), weighting was adjusted to the patient population to account for 11 months rather than the usual 12-month period. The second quarter of data for 2015 was included in EDPS 2015–16 results due to the transition to financial year reporting from 2015 onwards. As a result, EDPS 2015–16 consisted of five quarters. Weighting was adjusted to the patient population for the corresponding period of five quarters.

Patient characteristics

Patient survey responses are partially influenced by the socio-demographic characteristics of the patient. For example, older and male patients are more likely to respond positively to surveys. To reduce the influence of changes in patient characteristics over time, selected variables such as age, sex, education and language spoken at home were used to adjust the trend analysis to enable a fairer comparison.

Information for these four variables has been collected over the report period. Missing values for these variables were grouped in a separate category to ensure the same population in all analyses. Tables 4 and 5 present the weighted percentage of patients in the indicated population group in the first (2014[–15]) and most recent year (2018[–19]).

Table 4 Selected components of patients characteristics, 2014–15 and 2018–19, EDPS

	Patient characteristic							
	50+ years		Female		University-level or higher education		English spoken at home	
Year	2014–15	2018–19	2014–15	2018–19	2014–15	2018–19	2014–15	2018–19
Result	35	36	53	53	19	21	82	83

Table 5 Selected components of patients characteristics, 2014 and 2018, AAPS

	Patient characteristic							
	50+ years		Female		University-level or higher education		English spoken at home	
Year	2014	2018	2014	2018	2014	2018	2014	2018
Result	69	68	54	54	19	22	80	78

Note: Age is based on the sampling frame information from the administrative data; all other characteristics are patient reported. For EDPS, results reflect fiscal years, with exceptions noted in Table 1.

Calculating percentages of the most positive response option

For each survey question, the annual weighted percentage of patients who provided the most positive response option (Very good; Yes, definitely; Yes, always; Yes, completely) was calculated using the SURVEYFREQ procedure. This is calculated as the ratio of the (weighted) number of survey respondents who selected the most positive response option to the (weighted) number of survey respondents.

Missing responses and responses of 'Don't know/ can't remember' and 'Not necessary' were excluded from the denominator. The results in the report match the results previously published on BHI's interactive data portal, **Healthcare Observer**, with some exceptions due to:

- Differences in defining the cohort (applicable to EDPS 2015–16, where this report used all five quarters of data).
- Differences in defining the denominator (applicable to questions where this report excluded "Don't know/Can't remember" responses).

For annual releases, BHI retains responses of 'Don't know/can't remember' in any calculations, when these are relatively high (10% or higher). See the technical supplements for each individual survey on BHI's website at **bhi.nsw.gov.au/BHI_reports/patient_survey_results** for more information about how missing data was handled for each survey. The results presented in the report and supplementary data tables are weighted percentages, based on at least 30 patient responses.

Changes over time

For analysing changes in patient experiences over time, five consecutive years of survey data were pooled. Changes in patients' selection of the most positive response option, for the five-year period, were examined via multivariable logistic regression using the SURVEYLOGISTIC procedure. In each model, the most positive response option for each question was modelled as a dependent variable, with year as an independent variable.

P-values were used to determine if the change over time was statistically significant (0.05 for hospital results, 0.01 for LHD results, and 0.001 for NSW results). Lower p-value thresholds were used for the LHD and NSW results to reflect the larger numbers of respondents and power to detect differences.

The logistic regression analysis assessed whether there was a significant change over the five-year period at the state, LHD and hospital level, after accounting for differences in patients' characteristics (age, sex, education level and language spoken at home). Therefore, when the results are flagged as having significantly improved or declined in the report or supplementary data tables, this reflects changes in patients' experiences rather than changes in patient mix over the period. Detailed information on demographic distributions can be found on the BHI website either in the supplementary data tables for each individual survey at **bhi.nsw.gov.au/BHI_reports/patient_survey_results** or on BHI's interactive data portal **Healthcare Observer**.

The shading for each question indicates if the slope of the time variable is positive (improved – 'green') or negative (declined – 'red') with significance testing using the above p-value thresholds as appropriate.

Sensitivity analysis was performed when treating responses as a score, instead of a binary response. Responses to each question were assigned a score between 0 and 100, with 0 being the least positive and 100 being the most positive, with intermediate scores for questions that had more than two response options. Changes over time in patients' experiences were tested using multivariable linear regression with the SURVEYREG procedure.

Comparing the two approaches showed treating questions as binary responses was slightly more conservative than using a score. This report included five time points, which is generally considered too few for trend analysis. Sensitivity analyses using quarterly data (20 time points for AAPS and 21 time points for EDPS), rather than annual (five time points), showed similar trends for most questions at NSW level (P value <0.001).

Consistently higher and lower results

Where patients' experiences are relatively high, it may be more difficult to improve. For each question, the 10th and 90th percentiles were calculated for the most positive response option for each survey measure. Percentiles were calculated within groups by: LHD, principal referral and specialist hospitals (all hospitals in peer group A), and for major hospitals (all hospitals in peer group B and Broken Hill). LHDs or hospitals were classified as:

- consistently lower, if they were less than or equal to the 10th percentile of results for each year, and;
- consistently higher, if they were greater than or equal to the 90th percentile of results, for each year.

These results were highlighted to acknowledge the challenge for hospitals with relatively high results to improve further.

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 for percentages of the most positive responses were wider than 20 percentage points, results in the supplementary data tables 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 is less than 200.

Limitations

While survey design and methods remained relatively unchanged over time, there was a general decline in response rates for both surveys, similar to that observed in other international survey programs.[1] This could lead to an increase in non-response bias. However, characteristics of the respondents were examined and compared to the sample frame each year. There were only minor changes in patient characteristics at hospital level.

The observed changes in patients' experiences over the period may be due to chance in some cases. However, the use of more conservative p-values (0.01 for LHD and 0.001 for NSW) would have reduced any potential false positives. Furthermore, the results also showed improvements in areas that national campaigns in healthcare targeted (for example, hand hygiene[2]) and declines that would be expected based on findings from other data sources (for example, longer waiting times in ED[3]) providing validation that these changes in patients' experiences were not random.

The surveys were cross-sectional, thus respondents are not the same each year. Findings in this report therefore should only reflect changes for the population groups (or aggregate change) and not suggest changes in the experiences of individual patients.

Methods used for modelling changes over time did not consider the clustering effect within hospitals, such as when patients within the same hospitals give similar responses. However, the report focuses on changes over the five time points within a given hospital rather than comparing between hospitals, therefore the method is more appropriate at that level. There could be other factors such as length of stay, patients' health status and comorbidities contributing to the variation in patients' experience of care. However, this information is unavailable as part of the survey without linkage to other administrative data.

This report focused on linear changes only (either a positive or negative slope), however in some cases there was more of a non-linear pattern where results could fluctuate and both go up and down during the period.

References

1. The Survey Coordination Centre for Existing Methods. NHS Patient Survey Programme (2018) Urgent and Emergency Care Survey: Quality and Methodology Report. Access in March 2020. Available at: **https://www.cqc.org.uk/sites/default/files/20191023_uec18_qualitymethodology.pdf**.
2. Grayson ML, Stewardson AJ, Russo PL, Ryan KE, Olsen KL, Havers SM, et al. Effects of the Australian National Hand Hygiene Initiative after 8 years on infection control practices, health-care worker education, and clinical outcomes: a longitudinal study. Lancet Infect Dis. 2018;18(11):1269-77.
3. Bureau of Health Information. Healthcare Quarterly, Trend report, Emergency department, ambulance, admitted patients and elective surgery, October to December 2019. Sydney (NSW); BHI; 2020.

bureau of health information

About the Bureau of Health Information

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

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

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

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

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

bhi.nsw.gov.au