Measurement Matters

Development of emergency care patient experience key performance indicators

for local health districts in NSW

bureau of health information

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State Health Publication Number: (BHI) 190434
ISSN: 2209-7147

Suggested citation:
Bureau of Health Information. Measurement Matters – Development of emergency care patient experience key performance indicators. Sydney (NSW): BHI; 2019.

Please note there is the potential for minor revisions of data in this report.
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Published October 2019

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Summary

In 2018, the Bureau of Health Information (BHI) was asked by the NSW Ministry of Health to recommend key performance indicators (KPIs) regarding patient experience in emergency departments (EDs). Two KPIs were subsequently introduced to Service Agreements with Local Health Districts in 2019–20.

BHI published a report earlier that year recommending new patient experience KPIs for admitted patients. Two of these measures were accepted as KPIs for the assessment of local health district (LHD) performance in the Service Agreements with NSW Health from 2018–19 onwards. As indices comprise multiple questions, these measures focus attention on a broad range of patient experiences. They provide more reliable and valid estimates of performance than using a single question and allowed BHI to identify benchmark points.

BHI repeated this work for the development of ED KPIs, to assist the Ministry of Health in expanding existing KPIs for emergency department (ED) patient experience. BHI analysed more than 18,000 ED patient survey responses from 2016–17. A statistical method (i.e. factor analysis) was used to group related experiences and to create subsets of survey questions that best measure those experiences. Further analyses of these data were conducted to assess reliability, construct and concurrent validity of proposed measures, including analysis of the reliability of quarterly measures for smaller LHDs and vulnerable populations. The validity of the proposed KPIs was compared at LHD level with the former improvement measure (i.e. percentage of ED patients who reported overall care was excellent or very good).[1] A review of the literature and patient experience indicators used elsewhere in Australia and overseas was conducted.

As a result of this work, BHI demonstrated that the following three measures provide a broad assessment of some of the most important elements of patient experience:

- an overall patient experience index that includes four survey questions (page 12)
- a patient engagement index for discharged patients that includes seven survey questions (page 16)
- a patient-centred care index that includes five survey questions (page 20).

All three indices developed through factor analyses show good internal reliability (Cronbach's alpha = 0.90, 0.87 and 0.77 respectively), such that the survey items used to measure these three indices reflect three distinct groupings of experiences important to patients.

The overall patient experience index is highly correlated with the improvement measure ($r=0.93$, $p<0.001$), which suggests excellent concurrent validity as measured against the current standard. The overall experience and patient-centred care indices are almost as highly correlated ($r=0.92$, $p<0.001$), suggesting that these indices are more strongly related at LHD level than they are at individual level.

The patient engagement index (discharged patients) was correlated with both the other two indices and the improvement measure but the relationship is less strong ($r=0.61$ with the overall experience index, $r=0.68$ with the the patient-centred care index and $r=0.60$ with the improvement measure).

At LHD level, the overall experience and patient-centred care indices are highly correlated (r=0.92, page 24), such that improvement on one index is related to improvement in the other. Both indices are correlated with the improvement measure (r=0.93 and 0.8, respectively), suggesting that the new indices will detect change in LHD performance to a similar standard as the improvement measure (i.e. good concurrent validity). However, the patient engagement index (discharged patients) is not strongly correlated to the two other indices, indicating that it relates to a different cohort or construct of performance.

All three indices appear to be more stable estimates of performance than the improvement measure (pages 13, 14, 18 and 22). Therefore, changes in LHD performance for these three new indices are more likely to demonstrate true changes in performance than the improvement measure. This allows LHDs to assess where there is alignment between significant changes in patient experience, and local interventions that may be responsible for those changes (i.e. face validity) (pages 15, 19 and 23).

In relation to quarterly reporting for the smallest LHDs, BHI assessed the reliability and stability of estimates of performance. Smaller sample sizes in these areas suggest that these LHDs might be assessed on a six-monthly rather than a quarterly basis, or with rolling averages. Due to smaller sample sizes for vulnerable populations, population group performance assessments for each LHD could be assessed annually (page 6).

In relation to the establishment of benchmarks, there was variation across LHDs in performance on all three indices. BHI has analysed the variation across LHDs, as well as what has been demonstrated by districts to be achievable. Therefore, BHI advises a benchmark of 8.5 out of 10 to be categoried as 'performing' for the overall patient experience index, 8.2 for the patient engagement index (discharged patients) and 9.0 for the patient-centred care index (Table 1).

Following review of the BHI findings, the NSW Ministry of Health adopted the use of the overall experience and patient engagement index (discharged patients) scores as KPIs for the 2019–20 Service Agreements with LHDs. The Ministry has applied benchmarks for 'performing' at ≥8.5 for both measures.

Table 1 Summary of performance results for emergency department patients, April to June 2018

				Recommended benchmarks		
Measure	Questions in KPIs (n)	NSW score	LHD scores range	Not Performing	Under Performing	Performing
Overall patient experience index	4	8.58	7.90–9.19	<8.2	8.2–8.5	>8.5
Patient engagement index (discharged patients only)	7	8.13	7.57–8.69	<7.9	7.9–8.2	>8.2
Patient-centred care index	5	8.93	8.45–9.28	<8.7	8.7–9.0	>9.0

Setting the scene

About this report

Patients provide key information about the performance of health services. Patient experience measures are used as key performance indicators (KPIs) by many health systems. Until 2019–20, the performance of local health districts (LHDs) in NSW was assessed using an improvement measure based on a single survey question about overall ratings of care.

This approach has limitations including:

- It is based on a single-item satisfaction-related question to reflect on the broad concept of patient experience.
- Using only the two response options 'very good' and 'good', the combined level ignores any variation in the responses 'neither good nor poor', 'poor', and 'very poor'.
- The target is 'continual improvement', which is not feasible for experience measures that are already skewed to the high end of the distribution of scores.

Accordingly, BHI undertook analysis of the emergency department patient experience data to determine better quality indicators for future use.

The aim of this document is to:

- outline methods used to score survey questions and define composite indices
- present results to support the validity of proposed composite indices
- put forward options for benchmarks used to define performance
- present considerations of validity of measures and variation in annual results by population groups.

Data and methods

The Ministry of Health uses BHI's Emergency Department Patient Survey (EDPS) to monitor patient experiences in NSW emergency departments. This is the second largest survey (by total number of participants) in the NSW Patient Survey Program. EDPS data for 2016 to 2018 were selected as the basis of this KPI development work.

This analysis used the data from 17,922 respondents to the 2016–17 survey and 15,995 respondents to the 2017–18 survey. LHD results are calculated using survey data weighted to be representative of the age and stay type (admitted to hospital, non-admitted) profile of patients at each hospital. The factor analysis component was based on survey data from 2016–17. The number of survey respondents and response rates at NSW and LHD level are described in Table 2.

The ED questionnaires contain approximately 90 questions although patients are not required to answer all questions. Depending on what happened during their visit, patients are directed to skip past some questions. The questionnaire includes a set of questions asked only of patients who were discharged from the ED (i.e. not admitted to hospital after their time in the ED ended). The number of respondents in this group is also provided in Table 2 as this has direct application to the BHI recommendations for the new KPIs.

Technical supplements provide further detail on the sampling methods and exclusions and are available at **bhi.nsw.gov.au/nsw_patient_survey_program**

Table 2 Range in the number of respondents and response rates, by LHD, July 2016 to July 2018

Local health district (LHD)	Minimum number of responses per quarter (all patients)	Maximum number of responses per quarter (all patients)	Minimum number of responses per quarter (discharged patients)	Maximum number of responses per quarter (discharged patients)	Response rate (adjusted) 2016–17 (%)	Response rate (adjusted) 2017–18 (%)
NSW	**3,758**	**4,211**	**2,400**	**2,876**	**25%**	**24%**
Central Coast (CCLHD)	133	160	95	112	28%	27%
Far West (FWLHD)	47	52	35	42	18%	20%
Hunter New England (HNELHD)	573	612	349	438	24%	23%
Illawarra Shoalhaven (ISLHD)	180	228	122	169	28%	26%
Murrumbidgee (MLHD)	169	183	93	136	25%	22%
Mid North Coast (MNCLHD)	215	253	131	166	29%	27%
Nepean Blue Mountains (NBMLHD)	130	156	75	104	24%	23%
Northern NSW (NNSWLHD)	293	320	175	218	27%	24%
Northern Sydney (NSLHD)	357	408	233	281	29%	27%
Sydney Children's Hospitals Network (SCHN)	131	177	97	160	24%	20%
South Eastern Sydney (SESLHD)	285	338	184	233	25%	24%
Southern NSW (SNSWLHD)	151	195	78	118	27%	26%
St Vincent's (SVHN)	60	82	36	57	25%	22%
South Western Sydney (SWSLHD)	310	320	171	223	24%	21%
Sydney (SYDLHD)	214	250	133	189	26%	24%
Western NSW (WNSWLHD)	229	279	149	191	23%	22%
Western Sydney (WSLHD)	198	251	128	170	22%	19%

Creating survey question scores

For each survey question, the most positive response was assigned a score of 10, and the least positive response assigned a score of 0. The remaining response options were allocated scores at even intervals between 0 and 10. 'Don't know' and missing values were not assigned a score. Only questions deemed to reflect on the quality of care were included in this analysis. This scoring system is consistent with the approach used in the United Kingdom (UK), as well as a number of other Australian jurisdictions.

Identifying constructs

Factor analysis methods seek to explain observed variability in a set of data in terms of underlying, unobserved factors. Factor analysis methods were used to uncover possible underlying structure or themes between survey variables in EDPS 2016–17. Data from EDPS 2017–18 was used to test these findings and to propose benchmarks.

An iterative approach was used for factor analysis, constructing groupings of questions and then testing these against criteria for validity and reliability. Only those questions with a performance aspect were included in the analyses (i.e. questions used to filter participants through the survey, or audit-type questions, were not included).

Three high-quality groupings (which are referred to as 'domains' from this point on) were identified in this process. Two of these groups comprised questions that were almost identical to those identified for KPIs in relation to the *Adult Admitted Patient Survey (AAPS)* factor analysis – overall experience and patient engagement.[2] In the ED analysis, the patient engagement group was primarily comprised of questions (five of seven) asked only of patients who were discharged from the ED. The final group was comprised of five questions that were all related to patient-centred care.

These three domains were then investigated using the data from both the 2016–17 survey (17,922 respondents) and the 2017–18 survey (15,995 respondents). BHI survey experts reviewed and updated the three groups based on testing using these data and considering recent and future changes to the questionnaire.

The questions comprising the final three index scores were:

- Overall experience index (four questions)
  - How would you rate how well the ED health professionals worked together?
  - Overall, how would you rate the care you received while in the emergency department?
  - Overall, how would you rate the health professionals that treated you?
  - If asked about your experience in the ED by friends and family how would you respond?
- Patient engagement index – discharged patients (seven questions)
  - During your ED visit, how much information about your condition or treatment was given to you?
  - Were you involved, as much as you wanted to be, in decisions about your care and treatment?
  - Did you feel involved in decisions about your discharge from the ED?
  - Thinking about when you left the ED, were you given enough information about how to manage your care at home?
  - Did ED staff take your family and home situation into account when planning your discharge?
  - Did ED staff tell you who to contact if you were worried about your condition or treatment after you left hospital?
  - 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?

- Patient-centred care index (five questions)
  - Did the ED health professionals introduce themselves to you?
  - Did the ED health professionals explain things in a way you could understand?
  - Were the ED health professionals kind and caring towards you?
  - Did you feel you were treated with respect and dignity while you were in the ED?
  - Were you given enough privacy during your visit to the ED?

The development reports for the two ED surveys contain more detailed information on the questionnaire content and changes. A review of the literature and patient experience indicators used in other jurisdictions was conducted and highlights the importance of a focus on information at discharge (Appendix 1).

BHI determined that these three domains align with State and national priorities, are comprised of survey questions that have been included in multiple NSW surveys in the past five years, and have high concordance with the AAPS KPIs. Based on this, BHI recommended these three indices to the NSW Ministry of Health as the future KPIs for assessment of ED patient experience in NSW emergency departments at LHD level.

Calculating local health district results for composite questions

Composite scores for the overall experience and patient engagement (discharged patients) domains were calculated using the 'patient mean first' aggregation approach. A score for each completed patient survey question is calculated, then a mean score is calculated for each patient. Next, the LHD mean is calculated based on the resultant scores (Table 3).

Sensitivity analyses were conducted using two other approaches, specifically:

- 'question mean first' aggregation (mean score for each question in the group, then calculate an LHD result as the mean of the question means)
- 'group mean' aggregation (LHD mean is based on pooling of all responses for all questions in the domain).

The patient mean first aggregation approach performed slightly better than the other two approaches as it allowed respondent-level weighting to be applied (i.e. to account for the number of respondents that each record is meant to represent following sampling).

Assessment of reliability and validity

BHI assessed the reliability and validity of the indices using July 2016 to June 2018 data (for both annual and quarterly periods), at NSW and LHD level. The improvement measure (i.e. percentage of patients who reported their overall care as 'very good' or 'good') was also calculated and converted to a 0–10 scale to compare with the scored results.

The following assessments were undertaken:

- Reliability of domains was assessed through calculation of Cronbach's alpha.
- Concurrent and predictive validity were assessed by testing the hypothesis about the performance at a NSW and LHD level for the indices, against the improvement measure.
- Stability was assessed using quarterly NSW and LHD level performance over two years, and tests of significant differences over time were conducted across LHDs with large sample sizes and good response rates, to support LHDs' assessments of the face validity of the indices.
- Construct validity was assessed using a correlation matrix of proposed KPIs at the LHD level.

Options for benchmarking

Several options for benchmarking were considered. The focus of the analysis is percentile cut-offs based on quarterly results for LHDs, with confidence intervals shown and considered as context.

Note on presentation of data

Patients report moderate to high levels of positive response for the questions comprising the three index scores. Therefore, scores are skewed toward 10 and, for illustrative purposes, this report truncates the y-axis in most graphs to illustrate variation between LHDs.

Note on July to September 2017 data

In analysis of the data, the July to September 2017 quarter had much lower results than expected, compared with the previous year or adjacent quarters. BHI conducted additional data checks to ensure that this effect was not due to data errors or unusually large bias in the respondent population. This decrease in patient experience performance corresponded to the highest levels of ED attendances ever observed (up to that time) in NSW public hospitals, which is likely to have contributed to this effect. In recommending benchmarks, BHI has taken a conservative approach with this quarter of data in determining thresholds for the three indices.

Table 3 An example of overall experience composite score calculation for two hypothetical patients

Question	Responses (scores)	Patient 1	Patient 2
How would you rate how well the ED health professionals worked together?	Very good (10), Good (7.5), Neither good nor poor (5), Poor (2.5), Very poor (0)	7.5	missing
Overall, how would you rate the care you received while in the emergency department?	Very good (10), Good (7.5), Neither good nor poor (5), Poor (2.5), Very poor (0)	5	7.5
Overall, how would you rate the health professionals that treated you?	Very good (10), Good (7.5), Neither good nor poor (5), Poor (2.5), Very poor (0)	5	10
If asked about your experience in the ED by friends and family how would you respond?	I would speak highly of the hospital (10), I would neither speak highly nor be critical (5), I would be critical of the hospital (0)	5	10
		22.5 / 4 = 5.625	**27.5 / 3 = 9.17**

Results

Analyses

The results section summarises the analyses conducted to validate the proposed KPI measures. We present results for each index separately, followed by a summary of how the index scores are correlated across local health districts (LHDs) and how results differ by population groups. Next, considerations for benchmark options are presented. The following is an outline of the results that are presented:

- overall patient experience index results and trends
- patient engagement index (discharged patients) results and trends
- patient-centred care index results and trends
- summary of results by population group and correlation across measures.

Overall patient experience index

In the 2016–17 data, three questions were identified in the factor analysis in relation to an overall experience domain. Following investigations using the 2017–18 data, considering changes to the questionnaire in 2017–18 and to align with the Adult Admitted Patient Survey (AAPS) key performance indicators (KPIs)[1], the question asking "Overall, how would you rate the emergency department (ED) health professionals who treated you?" was added to this index. As a result, trend analysis is not shown for the 2016–17 period.

Each question (aggregated using the patient mean first approach) had a mean score higher than 8 out of 10. The combined score had good internal reliability, with a Cronbach's alpha of 0.90 (where a value of 1.00 is the highest possible score), and each of the four survey questions had a high correlation with the overall index (Table 4).

The concurrent validity of the overall patient experience index is good when compared with the improvement measure, both as the aggregate index but also for each of the question components. Results for the composite measure follow a similar pattern as each question component with top, bottom and most middle-ranked LHDs similar in each.

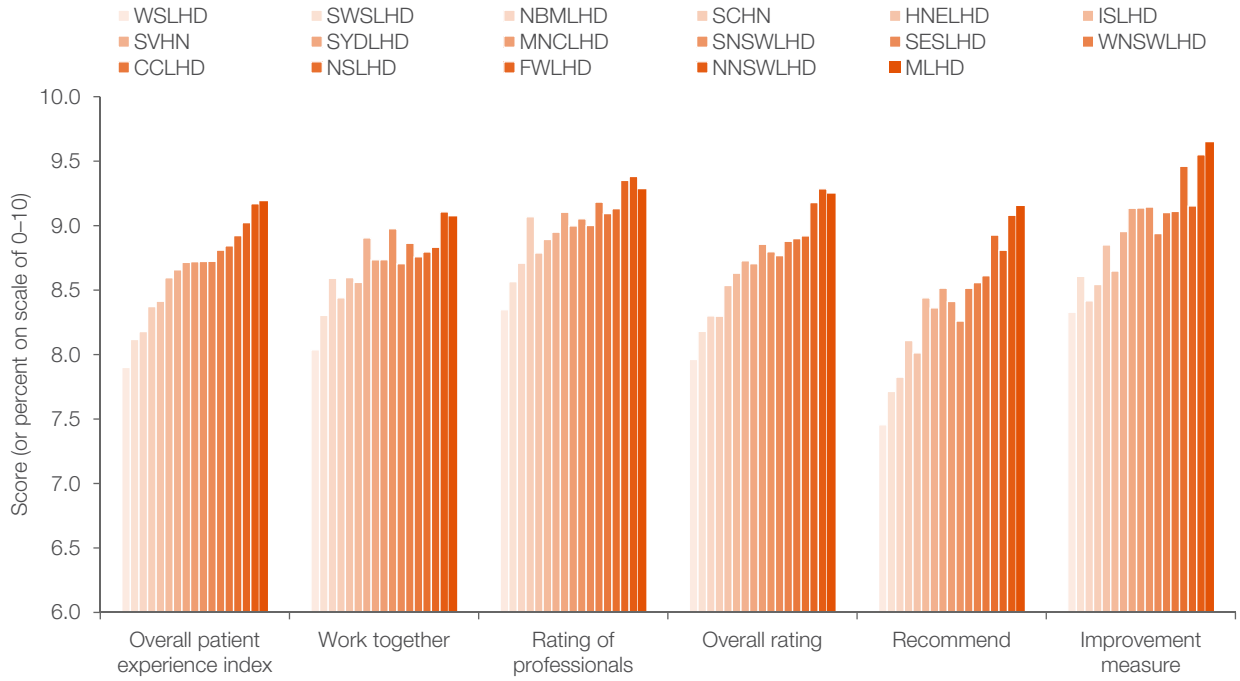
LHD rankings are also similar between the overall patient experience index and the improvement measure (the percentage reporting overall ratings of care as 'very good' or 'good' presented on a scale of 0 to 10) (Figure 1). This suggests that the relative performance of each LHD will change only slightly if the new index is used in place of the improvement measure.

The overall patient experience index and the improvement measure show similar patterns over time at LHD level (see Figure 2 for an example of this). Results were considered for all LHDs throughout this report. This finding suggests that the new index will detect change in patient experiences over time.

Table 4 Reliability of the overall patient experience index and four question components, April to June 2018

	Mean score	Correlation with index
How would you rate how the ED health professionals worked together?	8.65	0.78
Overall, how would you rate the ED health professionals who treated you?	8.93	0.82
Overall, how would you rate the care you received while in the ED?	8.74	0.86
If asked about your experience in the ED by friends and family how would you respond?	8.42	0.75
Cronbach's alpha = 0.90		

Figure 1 **Results for overall patient experience index and components, and improvement measure, by LHD, April to June 2018**



Notes: Results presented in ascending order by LHD for the overall care index, and using the same ordering for the other index components and the improvement measure. Rating of professional = "Overall, how would you rate the ED health professionals who treated you?"; Overall rating = "Overall, how would you rate the care you received while in the ED?"; Work together = "How would you rate how the ED health professionals worked together?"; Recommend = "If asked about your experience in the ED by friends and family, how would you respond?". The improvement measure was based on responses of 'very good' and 'good' to the overall care rating question on a 10 point scale. See Appendix 2 for complete data.

Figure 2 **Quarterly results for overall patient experience index, HNELHD, July 2017 to June 2018**

Note: Data is shown for four quarters in 2017–18 when all four components of the index were asked in the survey.

Overall patient experience index – quarterly trends

The overall patient experience index is less subject to quarterly fluctuations than the four single item survey questions that represent its components. This pattern was observed at both NSW and LHD levels; an example for one LHD is presented in Figure 3. At an LHD level, while quarterly fluctuations are attenuated in comparison to single item questions, there are quarterly fluctuations in the overall patient experience index that may represent 'true, positive' or 'true, negative' signals of improvement or decline in performance. At the same time, they may represent an unreliable index score.

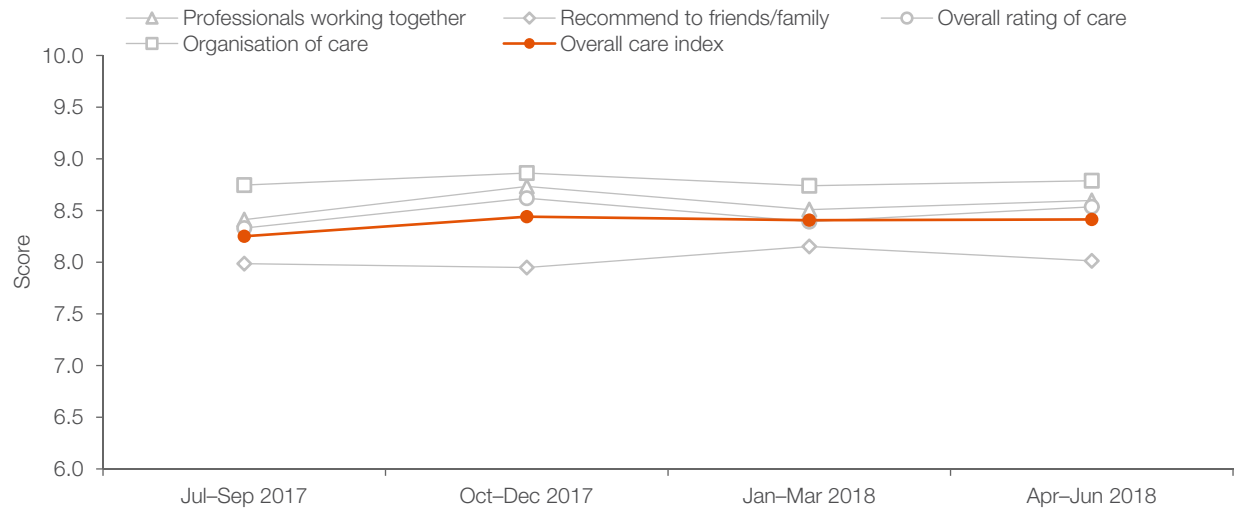
Accordingly, BHI conducted quarterly trend analyses separately for:

- LHDs with small samples sizes due to few hospitals (Figure 4a)
- LHDs that have larger sample sizes where quarterly fluctuations should represent 'true, positive' (Figure 4b)
- 'true, negative' signals of improvement or decline in performance. There were no LHDs in this data that showed a decline in performance at the established levels.

The degree of fluctuation is related to the number of respondents for each LHD, which is a function of both the number of hospitals in the LHD and the response rate for each. Therefore, LHDs with only one hospital (Far West and St Vincent's) and one other LHD with smaller numbers of respondents (Nepean Blue Mountains) have more instability than LHDs with more respondents and are considered separately (Figure 4a). Accordingly, smaller sample sizes in these areas suggest that smaller LHDs might be assessed on a six monthly rather than quarterly basis.

A majority of LHD scores would be based on responses of more than 150 respondents (Table 2, page 6). In these LHDs, the overall patient experience index appears to be more reliable or stable as an estimate of performance. To enable LHDs to determine whether quarterly fluctuations are 'true, positive' or 'true, negative' reflections of historical shifts in performance (i.e. face validity), BHI illustrates temporal shifts in the overall patient experience index across LHDs with large sample sizes for each quarter of data and flags those LHDs that show statistically significant improvement (Figure 4b) in performance across four quarters.

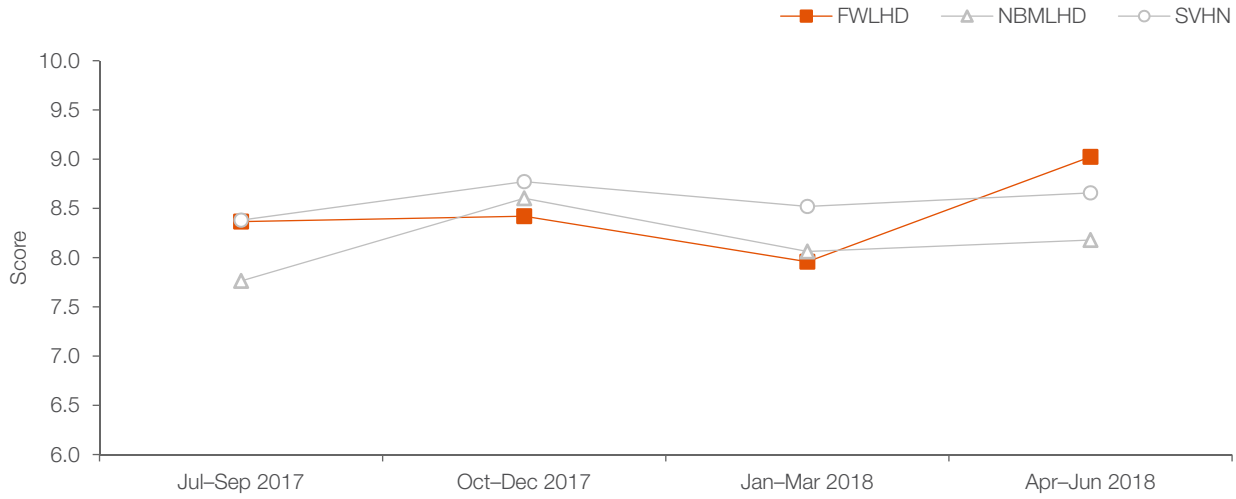
Figure 3 Overall patient experience index and question components, HNELHD, July 2017 to June 2018



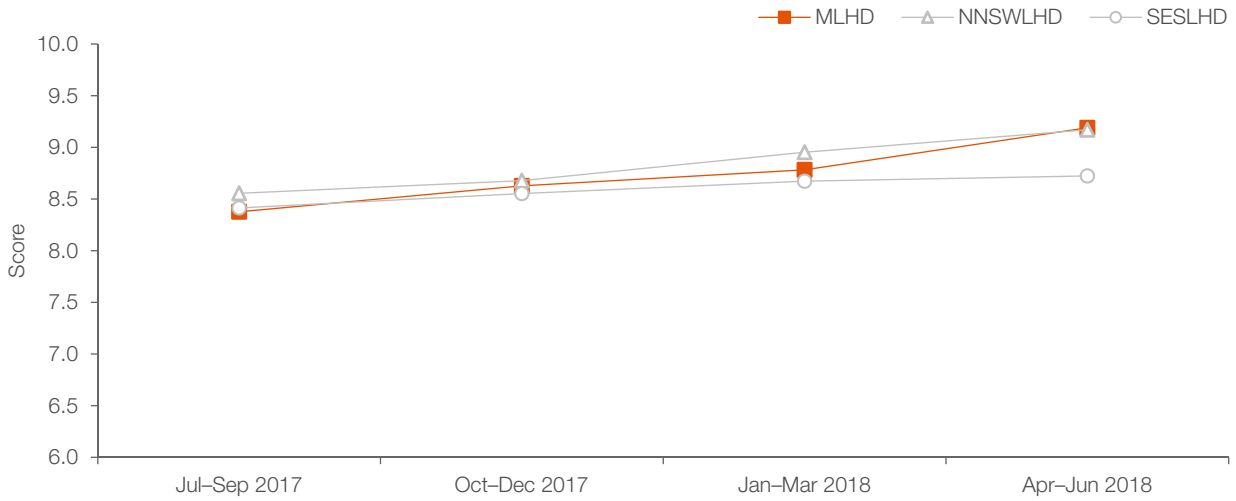
Note: Data is shown for four quarters in 2017–18 when all four questions components of the index were asked in the survey.

Figure 4 Overall patient experience index, by quarter and LHD, July 2017 to June 2018

a) Trends for LHDs with less than or equal to 150 respondents



b) Positive trends for LHDs with more than 150 respondents*



* Shows only those LHDs that had statistically significant trends based on four quarters of data and $p < 0.15$. Data for all LHDs is provided in Table 8.
Note: Data is shown for four quarters in 2017–18 when all four components of the index were asked in the survey.

Patient engagement index – discharged patients

Seven questions were identified in the factor analysis in relation to the patient engagement domain. Of the seven questions, five applied only to patients being discharged from the ED. Furthermore, research has demonstrated the importance of experiences at discharge in predicting patient outcomes, especially the likelihood of readmission to hospital[3], and sensitivity analysis identified that the proportion of patients discharged at each hospital had a meaningful impact on KPI performance. Because of this, BHI has recommended this index is limited to just those patients who were discharged from the ED.

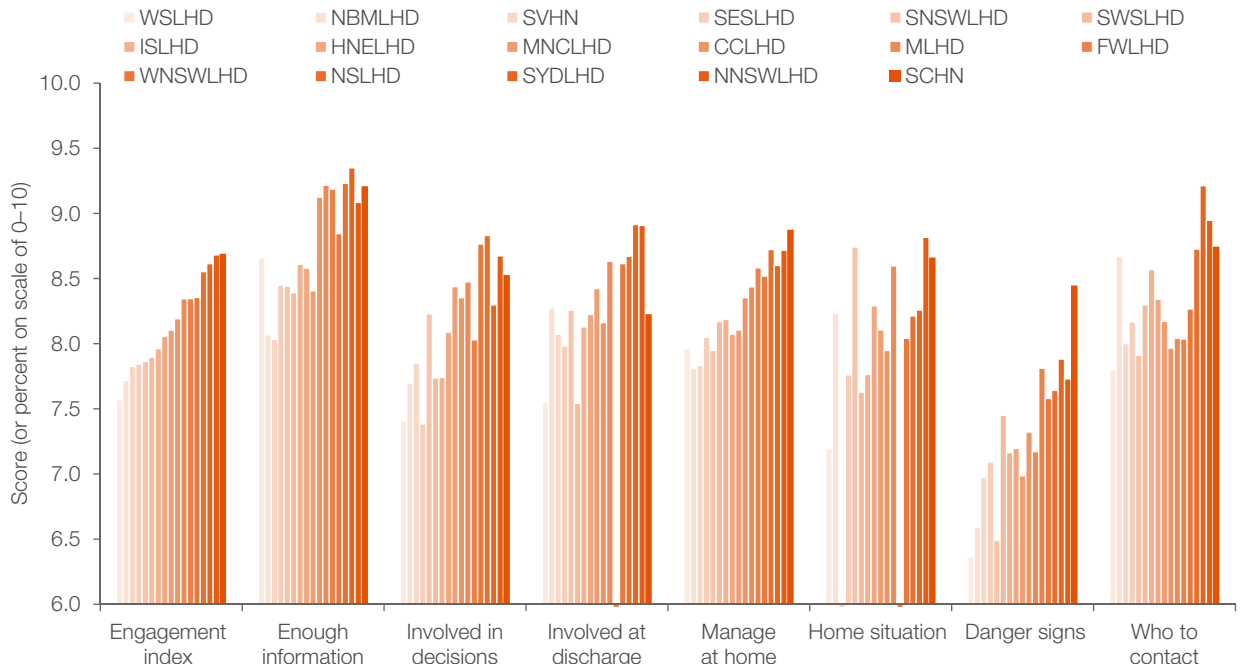
Of the patients who were discharged, each question (aggregated using the patient mean first approach) had a mean score higher than 7.9 out of 10. The index score had good internal reliability, with a Cronbach's alpha of 0.87 (where a value of 1.00 is the highest possible score). As expected, all seven questions were correlated with the patient engagement index score although the strength of correlation was variable across the questions. The questions included in the patient engagement index (discharged patients) are presented in Table 5. The patient engagement factor is suggested as the second indicator to be used to assess LHD performance due to the critical relevance of engagement to the patient experience, in preparation for discharge.

Table 5 Reliability of the patient engagement index (discharged patients) and seven question components, April to June 2018

	Mean score	Correlation with index
During your ED visit, how much information about your condition or treatment was given to you?	8.74	0.58
Were you involved, as much as you wanted to be, in decisions about your care and treatment?	8.13	0.63
Did you feel involved in decisions about your discharge from the ED?	8.38	0.65
Thinking about when you left the ED, were you given enough information about how to manage your care at home?	8.44	0.78
Did ED staff take your family and home situation into account when planning your discharge?	8.26	0.69
Did ED staff tell you who to contact if you were worried about your condition or treatment after you left hospital?	8.65	0.50
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?	7.96	0.69
Cronbach's alpha = 0.87		

The concurrent validity of the patient engagement index (discharged patients) appears good in relation to its component parts. Quarterly results for this index and the seven questions that comprise the index are presented at LHD level (Figure 5). Results for the composite measure follow a similar pattern to each question component with top, bottom and middle ranked LHDs similar in each. However, there is significantly more variation observed in the order of LHDs in the patient engagement index (discharged patients) than in the overall care index, reinforcing that these indices measure different constructs.

Figure 5 LHD results for patient engagement index (discharged patients) and components, April to June 2018



Notes: Results presented in ascending order by LHD for the patient engagement index, and using the same ordering for the other index components. Enough information = "During your ED visit, how much information about your condition or treatment was given to you?"; Involved in decisions= "Were you involved, as much as you wanted to be, in decisions about your care and treatment?"; Involved at discharge = "Did you feel involved in decisions about your discharge from the ED?"; Manage at home = "Thinking about when you left the ED, were you given enough information about how to manage your care at home?"; Home situation = "Did ED staff take your family and home situation into account when planning your discharge?"; Danger signs = "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?"; Who to contact = "Did ED staff tell you who to contact if you were worried about your condition or treatment after you left hospital?". See Appendix 2 for complete data. Results are suppressed where the number of respondents was less than 30.

Quarterly trends

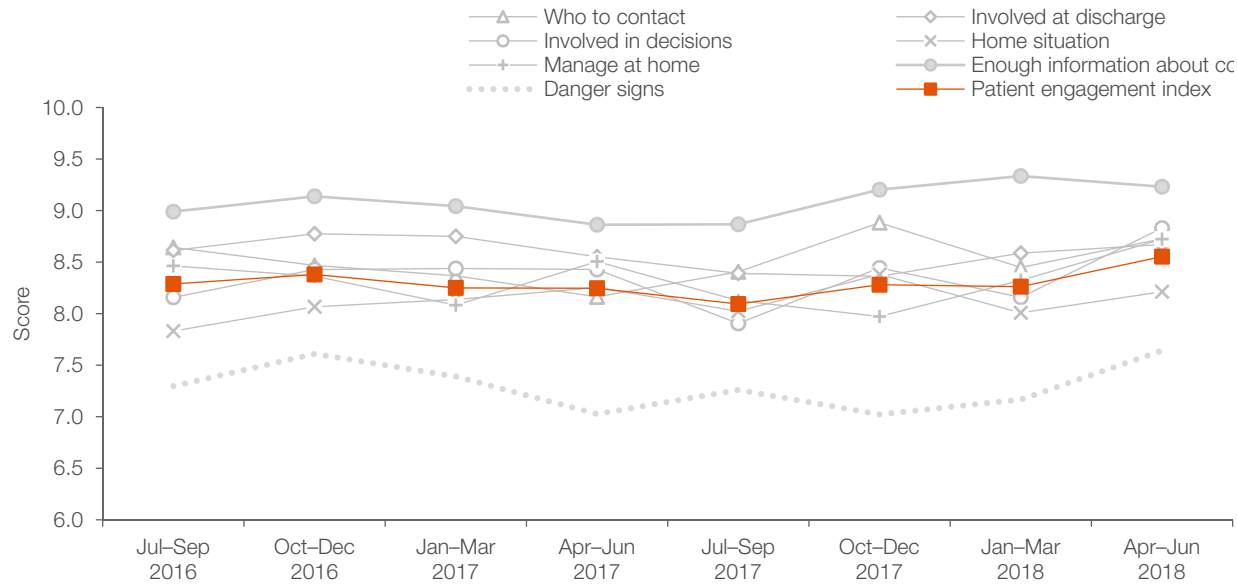
The patient engagement index (discharged patients) is less subject to quarterly fluctuations than the seven single-item survey questions that represent its components. This pattern was observed at both NSW and LHD levels – an example for one LHD is presented in Figure 6. At an LHD level, while quarterly fluctuations are attenuated in comparison with the single item questions, there are quarterly fluctuations in the overall patient experience index that may represent 'true, positive' or 'true, negative' signals of improvement or decline in performance. At the same time, they may also represent an unreliable index score.

As with the overall patient experience index, BHI conducted quarterly trend analyses separately for:

- LHDs with small samples sizes due to few hospitals (Figure 7a)
- LHDs that have large sample sizes where quarterly fluctuations should represent 'true, positive' (Figure 7b).
- 'True, negative' signals of improvement or decline in performance. As with the overall experience index, there were no LHDs in the two years of survey data that showed statistical decline in performance and therefore the graphs for 'true, negative' signals are not presented here.

As five of the seven measures in this index are asked only of patients who are discharged from the ED (i.e. not admitted to hospital), the entire index is calculated only for the discharged group. Therefore there are fewer respondents in each quarter for all LHDs. Several LHDs have fewer than 150 respondents per quarter and, as a result, the results fluctuate more (Figure 7a). However, almost half of the LHD scores would be based on responses of over 150 respondents (Table 2, page 6). In these LHDs, the patient engagement index is a more stable estimate of performance than that seen in LHDs with fewer patients. This suggests that smaller LHDs might be better assessed on a six monthly rather than quarterly basis.

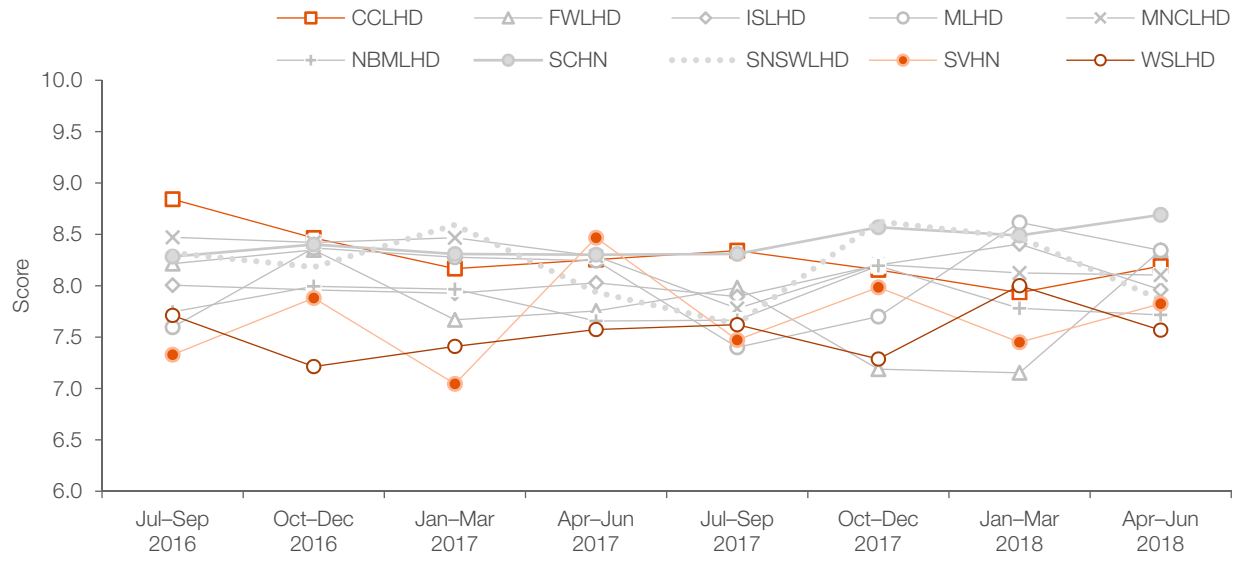
Figure 6 Patient engagement index (discharged patients) and question components, NSLHD, July 2016 to June 2018



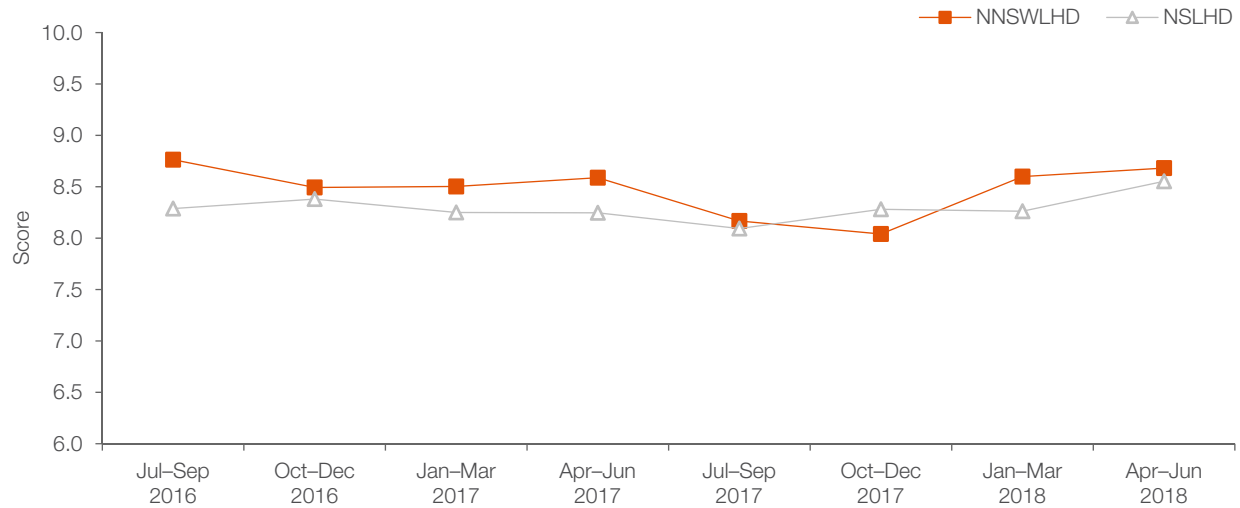
To enable LHDs to determine whether quarterly fluctuations are 'true, positive' or 'true, negative' reflections of historical shifts in performance from July 2016 to June 2018 (i.e. face validity), BHI illustrates temporal shifts in the patient engagement index across LHDs with large sample sizes for each quarter and flags those LHDs that show statistically significant improvement (Figure 7b) or decline. There were no LHDs in this data that showed a decline in performance at the established levels in the most recent four quarters.

Figure 7 Patient engagement index (discharged patients), by quarter and LHD, July 2016 to June 2018

a) Trends for LHDs with less than or equal to 150 respondents



b) Positive trends for LHDs with more than 150 respondents



* Shows only those LHDs that had statistically significant trends based on four quarters of data and p<0.15. Data for all LHDs is provided in Table 9.

Patient-centred care index

Five questions were identified in the factor analysis in relation to a patient-centred care domain. Each question (aggregated using the patient mean first approach) had a mean score higher than 8.6 out of 10. The index score had good internal reliability, with a Cronbach's alpha of 0.77 (where a value of 1.00 is the highest possible score). As expected, all five questions correlated with the patient-centred care index score although the strength of correlation was variable across the questions. The questions included in the patient-centred care index are presented in Table 6.

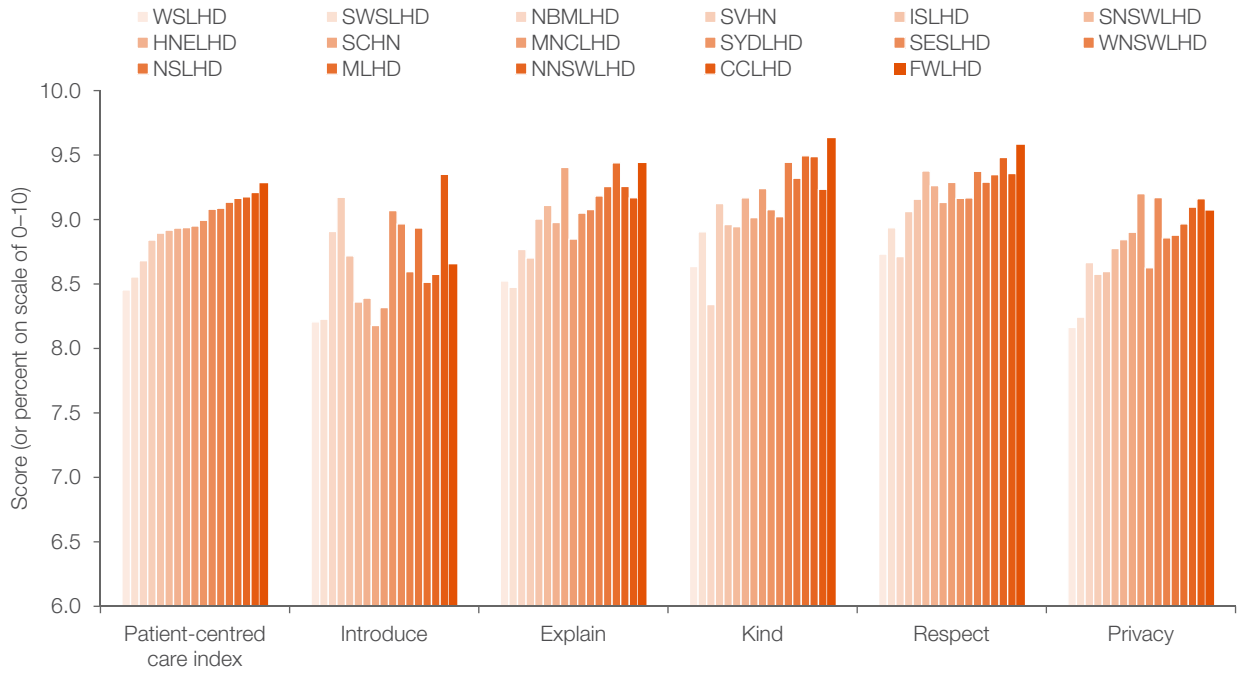
The patient-centred care index is suggested as the third indicator to be used to assess LHD performance due to the importance of putting the patient at the centre of their care and treating them with respect and kindness.

Table 6 Reliability of the patient-centred care index and six question components, April to June 2018

	Mean score	Correlation with index
Did the ED health professionals introduce themselves to you?	8.63	0.77
Did the ED health professionals explain things in a way you could understand?	8.99	0.73
Were the ED health professionals kind and caring towards you?	9.09	0.68
Did you feel you were treated with respect and dignity while you were in the ED?	9.17	0.68
Were you given enough privacy during your visit to the ED?	8.78	0.75
Cronbach's alpha = 0.77		

The concurrent validity of the patient-centred care index appears good in relation to its component parts. Quarterly results for the patient-centred care index and the five questions that comprise the index are presented at LHD level (Figure 8). The ranking of LHDs for the composite patient-centred care index is similar to the rankings for most of the individual components. However, this correlation is not as strong as seen for the overall experience index, reinforcing that these two indices measure different constructs.

Figure 8 LHD results for patient-centred care index and components, April to June 2018



Notes: Results presented in ascending order by LHD for the patient engagement index, and using the same ordering for the other index components. Introduce = "Did the ED health professionals introduce themselves to you?"; Explain = "Did the ED health professionals explain things in a way you could understand?"; Kind = "Were the ED health professionals kind and caring towards you?"; Respect = "Did you feel you were treated with respect and dignity while you were in the ED?" Privacy = "Were you given enough privacy during your visit to the ED?" See Appendix 2 for complete data.

Quarterly trends

The patient-centred care index is less subject to quarterly fluctuations than the five single item survey questions that represent its components. This pattern was observed at both NSW and LHD levels – an example for one LHD is presented in Figure 9. At an LHD level, while quarterly fluctuations are attenuated in comparison to the single item questions, there are quarterly fluctuations in the patient-centred care index that may represent 'true, positive' or 'true, negative' signals of improvement or decline in performance. At the same time, they may also represent an unreliable index score.

As with the overall patient experience index, BHI conducted quarterly trend analyses separately for:

- LHDs with small samples sizes due to few hospitals (Figure 10a)
- LHDs that have large sample sizes where quarterly fluctuations should represent 'true, positive' (Figure 10b)
- LHDs that have large sample sizes where quarterly fluctuations should represent 'true, negative' (Figure 10c)

As with the overall patient experience index, quarterly results for LHDs with only one hospital (i.e. Far West and St Vincent's) have greater instability than LHDs with many hospitals (Figure 10a). There were no additional LHDs with lower survey response rates for this index. As most LHD scores are expected to be based on more than 150 respondents (Table 2, page 6), data for this index would be stable and reliable for most LHDs. The two LHDs with fewer patients might be better assessed on a six monthly rather than quarterly basis.

To enable LHDs to determine whether quarterly fluctuations are 'true, positive' or 'true, negative' reflections of historical shifts in performance from July 2016 to March 2018 (i.e. face validity), BHI illustrates temporal shifts in the patient-centred care index across LHDs with large sample sizes for each quarter and flags those LHDs that show statistically significant improvement (Figure 10b) or decline for the previous four quarters. There was also one LHD that had a negative trend (Figure 10c).

Figure 9 Patient-centred care index and question components, NSLHD, July 2016 to June 2018

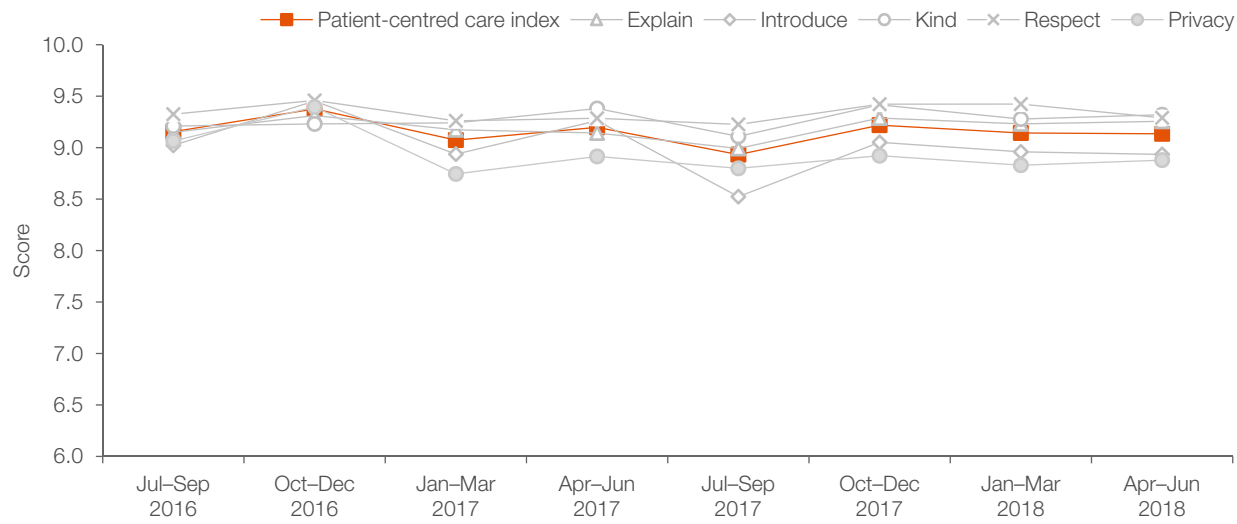
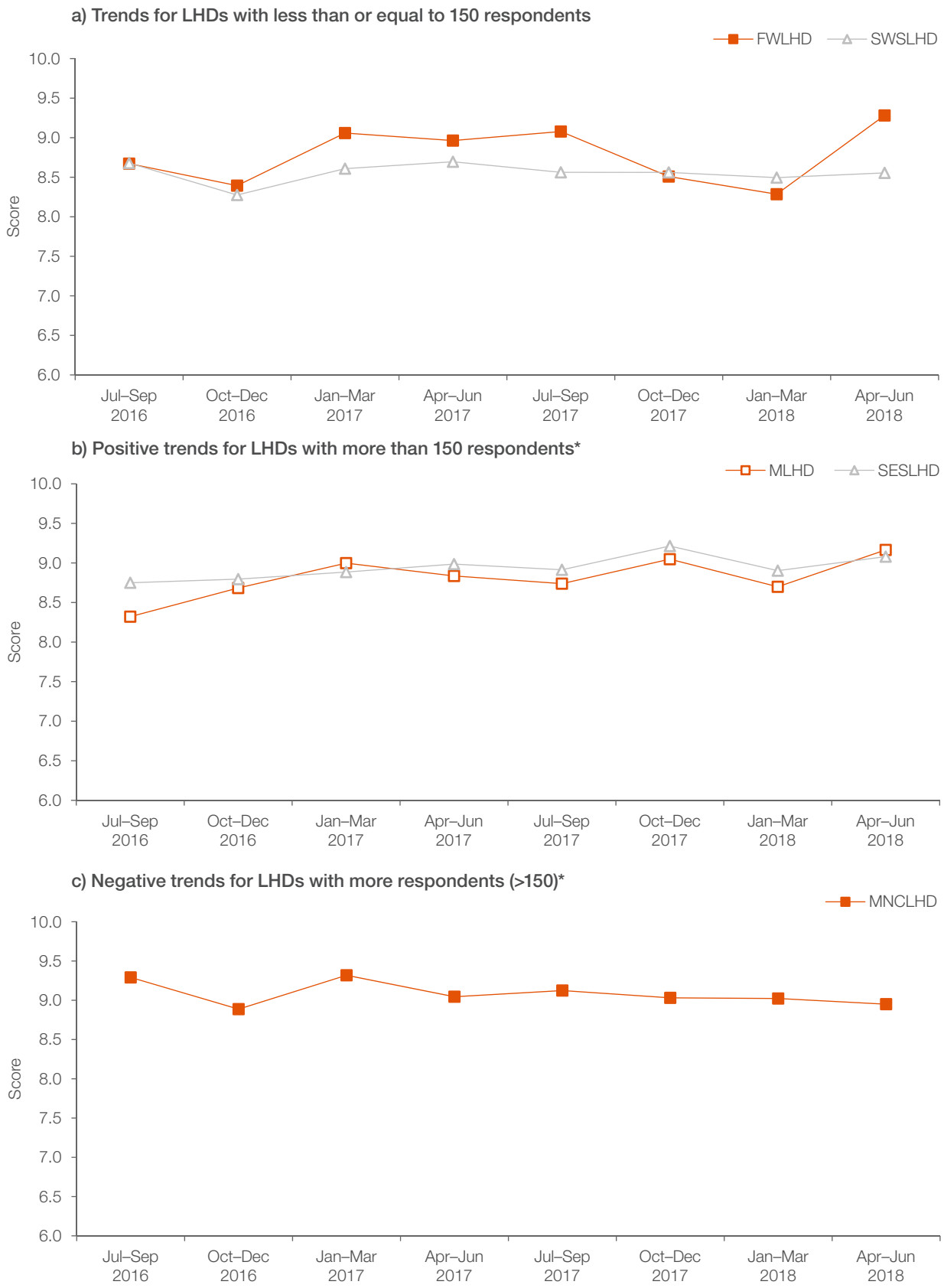


Figure 10 Patient-centred care index, by quarter and LHD, July 2016 to June 2018



* Shows only those LHDs that had statistically significant trends based on four quarters of data and p<0.15. Data for all LHDs is provided in Table 10.

Relationship between measures at a local health district level

In order to assess construct and concurrent validity, a correlation matrix was created using LHD results for the proposed overall experience, patient engagement (discharged patients) and patient-centred care indices, and the improvement measure results (Table 7). The overall patient experience index is highly correlated with the improvement measure (r=0.93, p<0.001), which suggests excellent concurrent validity as measured against the current standard. The overall experience and patient-centred care indices are almost as highly correlated (r=0.92, p<0.001), suggesting that these indices are more strongly related at LHD level than they are at individual level.

The patient engagement index (discharged patients) was correlated with the other three measures but the relationship is less strong (r=0.61 with the overall experience index, r=0.68 with the patient-centred care index and r=0.60 with the improvement measure).

Table 7 Correlation matrix between overall experience, patient engagement and patient-centred care indices, and the improvement measure, by LHD, April to June 2018

	Overall experience index	Patient engagement index (discharged patients)	Patient-centred care index	Very good and good ratings of care (on 10 pt. scale)
CCLHD	8.84	8.19	9.21	9.11
FWLHD	9.02	8.35	9.28	9.15
HNELHD	8.41	8.06	8.93	8.85
ISLHD	8.60	7.96	8.89	8.65
MLHD	9.19	8.34	9.16	9.65
MNCLHD	8.72	8.10	8.95	9.14
NBMLHD	8.18	7.72	8.68	8.42
NNSWLHD	9.17	8.68	9.18	9.55
NSLHD	8.92	8.55	9.13	9.46
SCHN	8.37	8.69	8.94	8.54
SESLHD	8.72	7.84	9.08	8.94
SNSWLHD	8.72	7.86	8.92	9.14
SVHN	8.66	7.83	8.84	8.95
SWSLHD	8.12	7.90	8.55	8.61
SYDLHD	8.72	8.61	8.99	9.13
WNSWLHD	8.81	8.36	9.09	9.10
WSLHD	7.90	7.57	8.45	8.33
LHD correlations (p-value)				
Overall experience index	1	0.61 (0.007)	0.92 (<0.001)	0.93 (<0.001)
Patient engagement index		1	0.68 (0.0019)	0.60 (0.01)
Patient-centred care index			1	0.80 (<0.001)
Very good/good ratings				1

Benchmark options for composite scores

There are a number of ways to identify potential benchmark levels using data, including use of statistical tests, deciles and interquartile ranges. Following a review of initial data and discussions with the NSW Ministry of Health, interquartile ranges were selected to investigate benchmark levels. This section looks at mean scores for the proposed KPIs and the interquartile ranges in scores across LHDs.

Overall patient experience index

In the April to June 2018 quarter, the mean score for the overall patient experience index for NSW was 8.58, with 25th and 75th percentile scores of 8.41 and 8.84 respectively (Table 8).

The NSW range across quarters was 8.24 in the third quarter of 2017 to 8.58 in quarter two of 2018. This suggests that a NSW benchmark to support continued improvement could be set at 8.50. This is close to the NSW state performance level in the latest quarter of data and within the 25th and 75th percentiles of seven of the eight reported quarters.

Table 8 Overall experience index, by LHD and quarter, July 2016 to June 2018

< 8.2 Not performing > 8.5 Performing

LHD	Jul–Sep 2016	Oct–Dec 2016	Jan–Mar 2017	Apr–Jun 2017	Jul–Sep 2017	Oct–Dec 2017	Jan–Mar 2018	Apr–Jun 2018
CCLHD	8.97	8.80	9.08	9.12	8.93	9.06	8.63	8.84
FWLHD	8.45	8.67	8.22	8.67	8.37	8.42	7.96	9.02
HNELHD	8.64	8.43	8.66	8.53	8.25	8.44	8.41	8.41
ISLHD	8.46	8.34	8.41	8.58	8.42	8.78	8.75	8.60
MLHD	8.23	8.76	8.81	8.66	8.38	8.63	8.78	9.19
MNCLHD	8.99	8.75	8.90	8.88	8.26	8.71	8.76	8.72
NBMLHD	7.90	8.47	8.09	8.45	7.76	8.60	8.06	8.18
NNSWLHD	8.99	8.81	8.77	8.94	8.56	8.68	8.95	9.17
NSLHD	8.71	8.97	8.70	8.86	8.48	8.88	8.79	8.92
SCHN	8.18	8.43	8.32	8.06	8.13	8.69	8.58	8.37
SESLHD	8.49	8.41	8.57	8.39	8.41	8.55	8.67	8.72
SNSWLHD	8.54	8.71	8.78	8.58	8.25	8.83	9.06	8.72
SVHN	8.75	9.16	8.06	8.85	8.38	8.77	8.52	8.66
SWSLHD	8.18	8.21	8.10	7.97	7.70	8.00	8.11	8.12
SYDLHD	8.61	8.46	8.40	8.60	8.41	8.24	8.39	8.72
WNSWLHD	8.54	8.72	8.66	8.63	8.21	8.84	8.41	8.81
WSLHD	8.12	7.55	7.58	8.00	7.65	7.89	8.12	7.90
NSW	**8.51**	**8.49**	**8.48**	**8.52**	**8.24**	**8.53**	**8.52**	**8.58**
25th percentile	**8.23**	**8.43**	**8.22**	**8.45**	**8.21**	**8.44**	**8.39**	**8.41**
75th percentile	**8.71**	**8.76**	**8.77**	**8.85**	**8.41**	**8.78**	**8.76**	**8.84**

Note: The overall experience index from July 2016 to June 2017 is comprised of three questions. From July 2017 onwards, all four questions in the index are included.

Patient engagement index (discharged patients)

Table 9 highlights quarterly results for the patient engagement index (discharged patients) across all LHDs from July 2016 to June 2018.

In the April to June 2018 quarter, the mean score for the patient engagement index for NSW was 8.13 with 25th and 75th percentile score of 7.86 and 8.36 respectively. The NSW result ranged from 7.91 in the third quarter of 2017 to 8.16 in the third quarter of 2016.

On review of these results, BHI advises that a NSW benchmark to support continued improvement could be set as 8.20, which is slightly higher than the NSW state performance level in the latest quarter of data and within the 25th and 75th percentiles of seven of the eight reported quarters.

Table 9 Patient engagement index (discharged patients), by LHD and quarter, July 2016 to June 2018

< 7.9 Not performing > 8.2 Performing

LHD	Jul–Sep 2016	Oct–Dec 2016	Jan–Mar 2017	Apr–Jun 2017	Jul–Sep 2017	Oct–Dec 2017	Jan–Mar 2018	Apr–Jun 2018
CCLHD	8.84	8.46	8.17	8.25	8.34	8.15	7.93	8.19
FWLHD	8.21	8.35	7.67	7.75	7.98	7.19	7.15	8.35
HNELHD	8.35	8.10	8.27	8.00	7.94	8.15	8.03	8.06
ISLHD	8.01	7.96	7.93	8.03	7.89	8.20	8.41	7.96
MLHD	7.60	8.37	8.28	8.24	7.40	7.70	8.62	8.34
MNCLHD	8.47	8.42	8.47	8.29	7.78	8.21	8.12	8.10
NBMLHD	7.75	7.99	7.97	7.66	7.67	8.19	7.78	7.72
NNSWLHD	8.76	8.49	8.50	8.59	8.17	8.04	8.60	8.68
NSLHD	8.29	8.38	8.25	8.25	8.09	8.28	8.26	8.55
SCHN	8.28	8.40	8.31	8.30	8.31	8.57	8.49	8.69
SESLHD	7.78	7.61	7.94	8.16	7.99	7.93	8.34	7.84
SNSWLHD	8.32	8.18	8.59	7.94	7.63	8.63	8.47	7.86
SVHN	7.33	7.88	7.04	8.47	7.47	7.98	7.45	7.83
SWSLHD	8.03	7.75	7.75	7.83	7.59	7.75	7.60	7.90
SYDLHD	8.05	7.76	7.55	7.98	8.03	8.07	7.82	8.61
WNSWLHD	8.22	8.14	8.20	8.29	7.89	8.67	8.17	8.36
WSLHD	7.71	7.21	7.41	7.57	7.62	7.29	8.00	7.57
NSW	**8.16**	**8.04**	**8.06**	**8.08**	**7.91**	**8.08**	**8.12**	**8.13**
25th percentile	**7.78**	**7.88**	**7.75**	**7.94**	**7.63**	**7.93**	**7.82**	**7.86**
75th percentile	**8.32**	**8.38**	**8.28**	**8.29**	**8.03**	**8.21**	**8.41**	**8.36**

Patient-centred care index

Table 10 highlights quarterly results for the patient-centred care index across all LHDs from July 2016 to June 2018.

In the April to June 2018 quarter, the mean score for the patient engagement index for NSW was 8.93 with 25th and 75th percentile scores of 8.89 and 9.13 respectively. The NSW result ranged from 8.68 in the third quarter of 2017 to 8.96 in the fourth quarter of 2016 and the second quarter of 2017.

On review of these results, BHI advises that a NSW benchmark to support continued improvement could be set at 9.00, which is slightly higher than the NSW state performance level in the latest quarter of data and within the 25th and 75th percentiles of seven of the eight reported quarters.

Table 10 Patient-centred care index, by LHD and quarter, July 2016 to June 2018

< 8.7	Not performing	> 9.0	Performing

	Jul–Sep 2016	Oct–Dec 2016	Jan–Mar 2017	Apr–Jun 2017	Jul–Sep 2017	Oct–Dec 2017	Jan–Mar 2018	Apr–Jun 2018
CCLHD	9.24	9.29	9.33	9.36	8.84	9.15	9.13	9.21
FWLHD	8.67	9.06	8.96	9.08	8.39	8.29	8.51	9.28
HNELHD	9.03	9.06	9.02	8.96	8.72	8.91	8.81	8.93
ISLHD	8.88	8.96	8.94	8.97	8.59	9.00	8.97	8.89
MLHD	8.32	9.00	8.84	8.74	8.68	8.70	9.05	9.16
MNCLHD	9.29	9.32	9.04	9.12	8.89	9.02	9.03	8.95
NBMLHD	8.87	8.86	8.60	8.79	8.20	9.09	8.70	8.68
NNSWLHD	9.17	8.97	9.17	9.21	8.94	9.05	9.14	9.18
NSLHD	9.16	9.38	9.07	9.20	8.93	9.22	9.14	9.13
SCHN	8.92	8.95	9.03	8.70	8.89	8.97	9.15	8.94
SESLHD	8.75	8.88	8.99	8.91	8.80	8.90	9.21	9.08
SNSWLHD	9.04	9.24	9.34	9.04	8.89	9.21	9.19	8.92
SVHN	8.86	9.36	8.57	9.20	8.71	8.91	8.97	8.84
SWSLHD	8.68	8.61	8.70	8.56	8.28	8.49	8.56	8.55
SYDLHD	9.06	8.90	8.96	9.09	8.79	8.90	8.65	8.99
WNSWLHD	8.96	9.01	8.93	9.22	8.66	9.04	8.77	9.09
WSLHD	8.65	8.31	8.58	8.66	8.40	8.29	8.71	8.45
NSW	**8.93**	**8.96**	**8.95**	**8.96**	**8.68**	**8.90**	**8.92**	**8.93**
25th percentile	**8.75**	**8.90**	**8.84**	**8.79**	**8.59**	**8.90**	**8.71**	**8.89**
75th percentile	**9.06**	**9.24**	**9.04**	**9.20**	**8.89**	**9.05**	**9.14**	**9.13**

Analysis by population groups

It is useful to be able to report KPIs by three key population groups to provide data on equity of care. Results by population are more stable when reported on an annual basis to ensure there are sufficient numbers of respondents and a more representative population. These groups are commonly presented in state and national reporting as well as groups recently explored in the Snapshot report, *Results from the 2017–18 patient survey – Emergency department.*[4] They include:

- Aboriginal status: defined by patient reported Aboriginal status included in all survey questionnaires
- Deprivation: defined as quintile of deprivation using the Index of Relative and Social Deprivation (IRSD), based on patient postcode of residence
- Remoteness: defined as rurality using the Accessibility and Remoteness Index of Australia (ARIA), based on patient postcode of residence.

Analyses of 2017–18 ED patient experiences suggest large differences between patients that self-report having a longstanding mental health condition versus those that do not. Accordingly, BHI recommends considering an annual performance or surveillance measure regarding experiences in ED among those who self-report having a longstanding mental health condition. A similar effect was seen for language spoken at home (English vs non-English), which BHI recommends is monitored on an annual basis.

Table 11 presents the number of survey respondents in each population group for the 2017–18 financial year at NSW level. In addition, indicative levels of performance against the proposed ED KPIs have been presented for each group.

These results align with reporting of other BHI surveys, which have identified a substantial gap in experiences between Aboriginal and non-Aboriginal patients, rural and metropolitan patients, and patients with and without a longstanding mental health condition.

Table 11 Mean scores for the improvement measure and proposed KPIs by population group, NSW, 2017–18

	n	Overall experience index	Patient engagement index (discharged patients)	Patient-centred care index	Improvement measure
All	15,283	8.45	8.07	8.85	8.84
Aboriginal and/or Torres Strait Islander	453	7.98	7.56	8.29	8.11
Neither Aboriginal nor Torres Strait Islander	14,732	8.47	8.08	8.87	8.86
Quintile 1: Most disadvantaged	2,786	8.32	7.90	8.75	8.74
Quintile 2	3,292	8.45	8.02	8.77	8.81
Quintile 3	3,582	8.39	8.05	8.80	8.81
Quintile 4	2,774	8.48	8.10	8.91	8.84
Quintile 5: Least disadvantaged	2,849	8.63	8.23	9.02	8.98
Major cities	9,285	8.42	8.06	8.85	8.82
Inner regional	4,527	8.53	8.06	8.86	8.85
Outer regional, remote or very remote	1,471	8.58	8.17	8.82	8.98
English spoken at home	13,125	8.52	8.09	8.88	8.87
A language other than English spoken at home	2,158	8.11	7.96	8.69	8.67
No longstanding mental health condition	13,702	8.50	8.14	8.91	8.88
Longstanding mental health condition	1,581	8.05	7.34	8.36	8.46

Appendices

Appendix 1: Key measure or domains in other emergency department patient surveys

Table 12 Emergency Department Patient Surveys: Other states and territories

Location	Measures or benchmarking (if available)
Western Australia[5]	Patient satisfaction measure for emergency department services is determined by an average of seven domain scores. Results for each facility are compared with the median of all the public facilities. Facilities not reported publicly.
Queensland[6]	Overall ratings of care as single question and reported for each category. No composite measures or benchmarks used.

Table 13 International organisations and select literature reviews on key measures or domains from emergency department patient surveys

Location	Method or measures	Key domains of experience
England[7]	Compare experiences for trusts based on 'type 1' major consultant-led 24 hour emergency facilities. Methods focus on most positive response 10, and the least positive responses. For example, the total number of responses scored as 0–10 is divided by the number of responses scored as '0' (the most negative option) to calculate the trust-level proportion of 'poor experience'. Z-scores are used indicate the difference between the proportion of poor experience in a trust and the average. Two thresholds are used to flag trusts that have a concerning level of poor patient experience: Worse than expected: z-score lower than -1.96, Much worse than expected: z-score lower than -3.09. The same methods are used for the positive experience and identifying better than expected. Results are standardised by age and sex.	No specified domains for outlier report, all performance questions are used.
United States[8,9]	Report on developing emergency department care survey instruments discussed factor analysis based on two separate question sets: Emergency Department Patient Experience of Care – Discharged to community instrument Emergency Department Patient Experience of Care – Admitted Stand Alone survey. Four domains of experience were discussed.	1. Getting Timely Care 2. Communication About Medicines 3. How Well Emergency Room Doctors and Nurses Communicate with Patients 4. Communication with Patients Prior to Releases
Canada[10]	Emergency Department Patient Experiences of Care Survey was adapted from the US survey. Select provinces using this survey. Principal components analysis was used to look at the factors that mattered there and resulting domains were similar. Online quarterly reporting also includes overall ratings on a 0–10 scale for one province.	1. Communication with patients by doctors 2. Communication with patients by emergency department nurses 3. Communication with patients about medicines 4. Getting timely care
England/ Netherlands[11,12]	Principal components analysis of Emergency Department Survey in England for 2008. Similar domains and questionnaire used in the Netherlands.	1. Overall ratings 2. Information before discharge 3. Waiting time 4. Doctors and Nurses 5. Your Care and Treatment 6. Hygiene (cleanliness)

Appendix 2: Most recent quarterly results

Each index and its components

Overall patient experience index

- Overall, how would you rate the ED health professionals who treated you?
- Overall, how would you rate the care you received while in the emergency department?
- If asked about your experience in the ED by friends and family how would you respond?
- How would you rate how well the ED health professionals worked together?

Patient engagement index (discharged patients)

- During your ED visit, how much information about your condition or treatment was given to you?
- Were you involved, as much as you wanted to be, in decisions about your care and treatment?
- Did you feel involved in decisions about your discharge from the ED?
- Thinking about when you left the ED, were you given enough information about how to manage your care at home?
- Did ED staff take your family and home situation into account when planning your discharge?
- Did ED staff tell you who to contact if you were worried about your condition or treatment after you left hospital?
- 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?

Patient-centred care index

- Did the ED health professionals explain things in a way you could understand?
- Did the ED health professionals introduce themselves to you?
- Were the ED health professionals kind and caring towards you?
- Were you given enough privacy during your visit to the ED?
- Did you feel you were treated with respect and dignity while you were in the ED?

Former improvement measure

- 'Very good' or 'good' overall ratings of care in the emergency department (on a 10 point scale)

Table 14 Quarterly results for each index and its components, and improvement measure, by LHD, April to June 2018

	Overall patient experience index	Rate professionals	Overall rating	Recommend	Work together	Patient engagement index (discharged patients)	Involved in discharge	Manage at home	Involved in decisions	Home situation	Know who to contact	Danger signs	Given enough information	Patient-centred care index	Explain	Introduce	Kind	Privacy	Respect	Very good/good overall ratings
CCLHD	8.84	9.09	8.90	8.61	8.76	8.19	8.16	8.35	8.35	7.95	7.97	7.32	9.12	9.21	9.17	9.35	9.23	9.16	9.36	9.11
FWLHD	9.02	9.35	9.18	8.81	8.83	8.35	8.33	8.58	8.03	8.61	8.04	7.81	9.19	9.28	9.44	8.65	9.63	9.07	9.58	9.15
HNELHD	8.41	8.79	8.54	8.01	8.60	8.06	8.23	8.07	8.09	8.29	8.34	7.20	8.58	8.93	8.98	8.39	9.17	8.84	9.26	8.85
ISLHD	8.60	8.89	8.63	8.44	8.56	7.96	8.13	8.19	7.74	7.76	8.57	7.16	8.61	8.89	9.00	8.72	8.96	8.60	9.16	8.65
MLHD	9.19	9.28	9.25	9.15	9.07	8.34	8.63	8.44	8.47	8.60	8.04	7.17	9.22	9.16	9.44	8.51	9.49	8.97	9.35	9.65
MNCLHD	8.72	9.00	8.86	8.41	8.74	8.10	8.42	8.11	8.44	8.11	8.17	6.99	8.41	8.95	8.85	8.32	9.24	9.20	9.29	9.14
NBMLHD	8.18	8.71	8.30	7.83	8.59	7.72	8.27	7.81	7.70	8.23	8.67	6.59	8.07	8.68	8.77	8.91	8.34	8.67	8.71	8.42
NNSWLHD	9.17	9.38	9.29	9.08	9.11	8.68	8.91	8.72	8.67	8.82	8.95	7.73	9.08	9.18	9.26	8.58	9.49	9.10	9.48	9.55
NSLHD	8.92	9.13	8.92	8.93	8.80	8.55	8.67	8.72	8.83	8.21	8.73	7.64	9.23	9.13	9.26	8.93	9.32	8.88	9.29	9.46
SCHN	8.37	9.07	8.30	8.11	8.44	8.69	8.23	8.87	8.53	8.66	8.74	8.45	9.21	8.94	9.40	8.18	9.01	8.90	9.13	8.54
SESLHD	8.72	9.00	8.77	8.51	8.70	7.84	7.98	8.05	7.38	7.76	8.17	7.09	8.45	9.08	9.08	8.97	9.02	9.17	9.17	8.94
SNSWLHD	8.72	9.05	8.80	8.26	8.98	7.86	8.26	7.95	8.23	8.74	7.91	6.49	8.44	8.92	9.11	8.36	8.94	8.78	9.38	9.14
SVHN	8.66	8.95	8.73	8.36	8.91	7.83	8.07	7.83	7.85	8.08	8.00	6.98	8.03	8.84	8.70	9.17	9.12	8.58	9.06	8.95
SWSLHD	8.12	8.57	8.18	7.71	8.30	7.90	7.54	8.17	7.74	7.63	8.30	7.45	8.39	8.55	8.47	8.23	8.90	8.24	8.94	8.61
SYDLHD	8.72	9.10	8.70	8.52	8.74	8.61	8.91	8.60	8.30	8.26	9.21	7.88	9.35	8.99	9.05	9.07	9.08	8.63	9.16	9.13
WNSWLHD	8.81	9.18	8.88	8.56	8.86	8.36	8.61	8.52	8.77	8.04	8.27	7.58	8.84	9.09	9.18	8.60	9.44	8.86	9.37	9.10
WSLHD	7.90	8.35	7.96	7.46	8.04	7.57	7.55	7.97	7.41	7.20	7.80	6.36	8.66	8.45	8.52	8.21	8.64	8.16	8.73	8.33
NSW	8.58	8.93	8.64	8.32	8.65	8.13	8.24	8.28	8.12	8.08	8.38	7.28	8.74	8.93	8.99	8.63	9.09	8.78	9.17	8.94

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bureau of health information

About the Bureau of Health Information

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

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

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

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

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

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