

## Hospital Quarterly

# Technical Supplement

Emergency department measures

January to March 2015

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# Summary

This technical supplement describes the methods and technical terms used to calculate NSW public hospital emergency department (ED) activity and performance measures reported in the Bureau of Health Information (BHI) Hospital Quarterly report. Recent changes to methods are also described.

ED information in Hospital Quarterly is based on analyses of attendance data in the Emergency Department Data Collection (EDDC). Data are extracted from the centralised data warehouse, the Health Information Exchange (HIE), administered by the NSW Ministry of Health.

The activity and performance measures reported in Hospital Quarterly are currently based on 131 hospital EDs which have had an electronic records system in place and reliable data in the EDDC for five or more quarters. These 131 EDs comprise the NSW totals reported in Hospital Quarterly. They account for approximately 95% of all ED presentations in NSW and 98% of records in the EDDC.

BHI reports individual performance for 81 of these EDs in Hospital Quarterly. EDs are reported individually if they are part of hospitals in the principal referral, major or district peer groups (A1, A2, A3, B, C1 and C2).

## Changes to ED reporting in Hospital Quarterly

In Hospital Quarterly, January to March 2015, significant changes have been made to the number of EDs included and the method used to calculate the time patients spent in the ED. Results for EDs in previous issues of Hospital Quarterly therefore cannot be compared with Hospital Quarterly, January to March 2015, onwards.

Figure 1 presents a summary of the changes and their effects on NSW results. The effects of the changes on NSW, local health district (LHD) and peer group results are shown in more detail in the appendix.

## Inclusion of additional EDs in Hospital Quarterly

EDs are eligible to be included in Hospital Quarterly once five or more quarters of reliable electronic data become available in the EDDC. When a new ED is added to Hospital Quarterly, its data for the four preceding quarters are also included in the report. All the additional EDs which have been included over time in Hospital Quarterly are EDs from peer groups C1, C2 or smaller (community and multi-purpose service peer groups).

EDs that have been added to ED reporting since the first issue of Hospital Quarterly are:

- Bega District Hospital (data from July to September 2010)
- Ballina District Hospital, Casino and District Memorial Hospital, Maclean District Hospital and two smaller EDs (data from July to September 2011)
- Bateman's Bay District Hospital, Macksville District Hospital, Moruya District Hospital, Queanbeyan Health Service, Young Health Service, Tumut Health Service, Deniliquin Health Service and a further 16 smaller EDs (data from January to March 2013)
- Bellinger River District Hospital, Mudgee District Hospital, Forbes District Hospital, Parkes District Hospital and 10 smaller EDs (data from January to March 2014).

The smaller EDs are listed separately in Appendix Table 1.

The additional EDs are from the following LHDs:

- Northern NSW (NNSWLHD)
- Southern NSW (SNSWLHD)
- Murrumbidgee (MLHD)
- Mid North Coast (MNCLHD)
- Western NSW (WNSLHD).

### **Change to calculation of time to departure in Hospital Quarterly**

BHI has revised the definition used for calculating time to leaving the ED for patients who were treated and discharged. For these patients, time spent in the ED is now measured from presentation time until the time treatment was completed. For all other patients, time spent in the ED continues to be measured from presentation time to the time the patient actually leaves the ED. Presentation time continues to be defined as the earlier of arrival or triage time. This change was introduced to be consistent with definitions being used for national reporting.

### **Change to types of records included in Hospital Quarterly**

Records for patients who were treated in the ED after already being admitted to the same hospital, those who were eHealth or teleconference patients, and records for patients entered in error are not included in activity or performance measures in Hospital Quarterly. These exclusions account for a small number of records (1,196 or less than 0.2% in the January to March 2015 quarter) and have little effect on activity and performance measures.

### **Effect of additional EDs and change to time to departure calculation for Hospital Quarterly, January to March 2015**

Revising the definition used to calculate time to departure decreases the reported time spent in the ED for patients who were treated and discharged. All quarters reported in Hospital Quarterly, January to March 2015, are affected by this change.

Inclusion of additional EDs increases the number of presentations reported, and may affect performance measures.

For the NSW total in January to March 2015:

- The inclusion of 14 additional EDs increased the number of presentations reported by 2.6% (from 628,803 to 644,840)

- The percentage of patients leaving the ED within four hours increased by two percentage points (from 73% to 75%). Revising the definition used to calculate time to departure resulted in an increase of 1.4 percentage points; the additional EDs resulted in an increase of 0.5 percentage points.
- The median time from presentation to departure decreased by nine minutes (from two hours and 48 minutes to two hours and 39 minutes). Revising the definition used to calculate time to departure resulted in a decrease of six minutes; the additional EDs resulted in a decrease of three minutes.
- The 95th percentile time from presentation to departure decreased by 15 minutes (from nine hours and 33 minutes to nine hours and 18 minutes). Revising the definition used to calculate time to departure resulted in a decrease of 10 minutes; the additional EDs resulted in a decrease of six minutes.
- There was little change at the NSW level on measures of time to treatment.

Revising the definition used to calculate time to departure affects all LHDs and peer groups. There is an additional effect on LHDs and peer groups where more EDs have been included. Results for LHDs and for NSW in other quarters are shown in the appendix.

Comparisons in Hospital Quarterly for January to March 2015 with the same quarter in the previous year, or more recent quarters, will be based on the same number of EDs. Comparisons of presentations and performance over longer intervals, for example, the same quarter two years ago, will include any effect of additional EDs being reported. Therefore caution is advised when interpreting any comparisons that span more than five consecutive quarters.

### **Changeover to a new records system**

EDs in NSW have progressively replaced historic information systems with more contemporary electronic records systems. Changeover to a new electronic system may impact the completeness

and reliability of data input or extraction from local systems to the HIE and more than one quarter may be affected.

At a facility level, during a changeover period, the only information from the EDDC reported by BHI is the total number of ED presentations.

For aggregated NSW reporting (for example, for NSW, LHDs or peer groups), data from affected hospitals are included in total counts but are excluded from calculation of all performance measures.

**Figure 1 Effect of additional emergency departments and revised definition for calculating time spent in the ED, in Hospital Quarterly, January to March 2015**

Measure		January–March 2015	Effect of additional EDs and revised definition
<b>ED activity</b>			
All ED presentations		644,840 presentations	16,037 presentations (2.6% increase)
<b>ED performance</b>			
<b>Time to start treatment by triage category</b>			
Triage 2	Median	8 minutes	0 minutes
	95th percentile	35 minutes	0 minutes
Triage 3	Median	20 minutes	0 minutes
	95th percentile	98 minutes	0 minutes
Triage 4	Median	26 minutes	-1 minutes
	95th percentile	137 minutes	-1 minutes
Triage 5	Median	24 minutes	0 minutes
	95th percentile	135 minutes	-1 minutes
<b>Time from presentation to departure</b>			
All patients	Median	2h 39m	-9 minutes
	95th percentile	9h 18m	-15 minutes
Patients treated and discharged	Median	2h 06m	-10 minutes
	95th percentile	5h 46m	-24 minutes
<b>Percentage of patients leaving the ED within four hours of presentation</b>			
All patients		74.6%	2.0 percentage points
Patients treated and discharged		86.4%	2.6 percentage points

# Activity and performance measures

This section contains the definitions used for calculating measures of ED activity and performance reported in Hospital Quarterly.

In the following definitions, numbers in brackets indicate the HIE database field code used to identify records by ED visit type or mode of separation (as appropriate). The arrival date and time field is used to select records from the HIE for each quarter. Unless explicitly stated, records with incomplete information in the fields required for a calculation are excluded.

## All presentations

All presentations is the count of every record in the ED visit database of the HIE. This count includes presentations of all ED visit types including emergency presentations, planned return visits, pre-arranged admissions, some outpatient visits, private referrals, persons pronounced dead on arrival and patients in transit. This count excludes records entered in error (mode of separation = 99), telehealth and eHealth presentations (ED visit type = 12), and presentations by patients who are already admitted to the same hospital (ED visit type = 13).

Records are assigned to quarters of the year using the arrival date and time field.

## Emergency presentations

Emergency presentations are records in the ED visit database of the HIE with an ED visit type of emergency (1), an unplanned return visit for a continuing condition (3) or disaster (11).

Emergency presentations in Hospital Quarterly are reported by triage category.

Records with missing or invalid information for triage categories are excluded from reported counts of emergency presentations.

## Emergency presentations by quarter

The time series graphs in Hospital Quarterly present the number of emergency presentations to an ED during each quarter for the past 21 quarters.

## All presentations by mode of separation

Presentations are reported based on the mode of separation field: treated and discharged, treated and admitted to hospital, left without, or before, completing treatment, transferred to another hospital and other modes of separation. Records with a missing mode of separation are included in the 'other' cohort.

The mode of separation cohorts are:

- Treated and discharged – presentations with mode of separation: departed with treatment complete (4)
- Treated and admitted to hospital – presentations with modes of separation: admitted to a ward/inpatient unit (1), admitted and discharged as an inpatient within ED (2), admitted and died in ED (3), admitted to a critical care ward (10), admitted via an operating theatre (11) or admitted – left at own risk (13)
- Left without, or before completing, treatment – presentations with modes of separation: departed, did not wait (6) and departed – left at their own risk (7). Patients who 'did not wait' were triaged, but left the ED before treatment was commenced. Patients who 'left at their own risk' were triaged and treatment was begun by a clinician or nurse, but the patient left prior to completing their treatment.
- Transferred to another hospital – presentations with mode of separation: transferred to another

hospital (5) or admitted and then transferred to another hospital (12)

- Other – presentations with mode of separation: dead on arrival (8) or departed for another clinical service location (9). Presentations with missing mode of separation are also included in this cohort.

### Presentation time

Presentation time is the earlier of the following fields in the emergency visit database of the HIE:

- Arrival time – the date and time the patient presented at the ED
- Triage time – the date and time when the patient was assessed by a triage nurse.

If triage time is more than 12 hours before arrival time, then the triage time field is considered an error and presentation time is set equal to arrival time.

### Treatment time

Treatment time is the earlier of the following fields in the ED visit database of the HIE:

- First seen by clinician time – the date and time when the patient was first seen by a medical officer and has a physical examination or treatment performed that was relevant to their presenting problem(s)
- First seen by nurse time – the date and time when the patient was first seen by a nurse and has an assessment or treatment performed that was relevant to their presenting problem(s).

If either 'first seen by clinician time' or 'first seen by nurse time' is more than 12 hours before presentation time or more than 31 days after presentation time, then that field is considered an error and is excluded from calculations. If both 'first seen by clinician time' and 'first seen by nurse time' are more than 12 hours before presentation time or more than 31 days after presentation time, then treatment time for that record is considered an error and excluded from

calculations. If treatment time is earlier than presentation time, but 12 hours or less before presentation time, then time from presentation until treatment is set to zero.

### Ready for departure time

Ready for departure time is the date and time when the assessment and initial treatment of the person is completed such that if home arrangements of the person (including transport) were available, the person could leave the ED. It is recorded in the ready for departure time field in the emergency visit database in the HIE. If the time recorded for ready for departure is before presentation time or more than 31 days after presentation time, then that departure time field is considered an error and treated as missing. If the time recorded for ready for departure time is missing or is later than the time recorded for actual departure time, then actual departure time is used in calculations. If both ready for departure time and actual departure time are missing, the record is excluded from calculations that use ready for departure time.

### Actual departure time

Actual departure time is the date and time at which the patient physically leaves the ED as recorded in the actual departure time field in the emergency visit database in the HIE. If the time recorded for actual departure is before presentation time or more than 31 days after presentation time, then the actual departure time field is treated as missing and the record is excluded from calculations that use actual departure time.

### Time from presentation to starting treatment

Time from presentation to starting treatment is calculated as the difference between presentation time and treatment time. It is reported by triage category for emergency presentations. Records with an ED visit type of emergency (1), unplanned

return visit for a continuing condition (3) and disaster (11) are included.

If treatment time is more than 12 hours before presentation time or more than 31 days after presentation time, then that time from presentation until treatment is considered an error and set to missing. If treatment time is before presentation time by 12 hours or less, then time from presentation until treatment is set to zero.

Records with a missing treatment time are excluded from calculations that use treatment time.

### **Time from presentation to leaving the ED**

Time from presentation to leaving the ED is calculated as the difference between presentation time and departure time. Departure time is defined as:

- Actual departure time – for all patients other than those who were treated and discharged
- Ready for departure time – for patients who were treated and discharged.

If the time recorded for actual departure is before presentation time, or more than 31 days after presentation time, then that departure time field is considered an error and treated as missing.

If the time recorded for ready for departure time is missing, is before presentation time or more than 31 days after presentation time, or is later than the time recorded for actual departure time, then actual departure time is used in calculations.

Records with missing time to departure are excluded from calculations that use time to departure.

### **Median**

The median is the midpoint of the waiting times distribution. This measure is used in Hospital Quarterly to describe time from presentation until treatment and time from presentation until leaving the ED. The median is the time by which half of patients started treatment or left the ED. The other

half of patients took equal to or longer than this time. BHI uses the data for each patient and the empirical distribution function with averaging to compute the median in SAS<sup>®5</sup>. Results are rounded to the nearest whole minute for reporting.

### **95th percentile**

The 95th percentile is a statistical measure of the waiting time distribution. It is used in Hospital Quarterly to describe time from presentation until treatment, and time from presentation until leaving the ED. The 95th percentile is the time by which 95% of patients started treatment or left the ED. The final 5% of patients took equal to or longer than this time. BHI uses the data for each patient and the empirical distribution function with averaging to compute the 95th percentile in SAS<sup>®5</sup>. Results are rounded to the nearest whole minute for reporting.

### **Percentage of patients leaving the ED within four hours of presentation**

The percentage of patients leaving the ED within four hours is calculated as the number of patients with time from presentation to leaving the ED of four hours or less as a percentage of the total number of patients.

Records with missing time to departure are excluded from calculations of percentage leaving the ED within four hours.

### **Percentage of patients starting treatment by time**

The distribution curve in Hospital Quarterly shows the cumulative percentage of emergency presentations by minutes from presentation until treatment by triage category. The cumulative percentage is computed by summing the proportions of patients whose treatment started in one minute intervals of time elapsed since presentation within each triage category.

Emergency patients who received treatment are patients with visit type = 1, 3 or 11 and mode of



separation = 1, 2, 3, 4, 5, 7, 10, 11, 12 and 13. This cohort only includes patients who had a valid triage category and treatment time. Calculation of the time elapsed is described in the section Time from presentation to starting treatment.

If the cumulative distribution does not reach 100%, it indicates that some patients in that triage category waited longer than the maximum time shown on the horizontal axis for their treatment to start.

### Percentage of patients leaving the ED by time

The distribution curve in Hospital Quarterly shows the cumulative percentage of presentations by the number of hours from presentation until leaving the ED. The cumulative percentage is computed by summing the proportions of patients who left the ED in one minute intervals of time elapsed from presentation to departure. Records that do not have a valid time from presentation to departure are excluded from calculation. Calculation of the time elapsed is described in the section Time from presentation to leaving the ED.

If the cumulative distribution does not reach 100%, it indicates that some patients waited longer than the maximum time shown on the horizontal axis to leave the ED.

### Percentage of patients leaving the ED by time and mode of separation

The distribution curve in Hospital Quarterly shows the cumulative percentage of presentations by the number of hours from presentation to leaving the ED by mode of separation. The cumulative percentage is computed by summing the proportions of patients leaving the ED in one minute intervals of time elapsed from presentation to departure for each mode of separation. Records that do not have a valid departure time are excluded from calculation. Calculation of the time elapsed is described in the section Time from presentation to leaving the ED.

If the cumulative distribution does not reach 100%, it indicates that some patients in that mode

of separation waited longer than the maximum time shown on the horizontal axis of the graph to leave the ED.

### Arrivals by ambulance and transfer of care time

Data for calculating number of ambulance arrivals and transfer of care time are downloaded from the Transfer of Care Reporting System (TCRS) portal. The TCRS incorporates data drawn from the NSW Ambulance information system and from the EDDC.

Overall results for NSW, peer group and LHD use records for patients arriving at hospitals with an ED which is included in Hospital Quarterly and has records in the TCRS. The TCRS does not include all hospitals with EDs which are reported in Hospital Quarterly. Records in the TCRS for any hospitals where the EDs are not reported in Hospital Quarterly are excluded from all calculations of ambulance arrivals and transfer of care time.

**Ambulance arrivals** is the count of all cases recorded in the TCRS as arriving at a hospital with an ED which is included in Hospital Quarterly. Ambulance arrivals include all emergency and priority medical patients transported by ambulance.

**Transfer of care time** is the time from arrival of patients at the ED by ambulance and transfer of responsibility for their care from ambulance to ED staff in an ED treatment zone. Transfer of care time can only be calculated for matched records. These are records where the ambulance incident number and date can be identified in both the NSW Ambulance data and the ED data. Records which cannot be matched are excluded from all calculations that use transfer of care time.

If the time recorded for transfer of care is earlier than ambulance arrival time, then transfer of care time is calculated starting from ED triage time. If the time of transfer of care is earlier than both arrival and triage time, then transfer of care time is

set to missing and the record is excluded from all calculations requiring transfer of care time.

Transfer of care performance is reported as

- Median time for transfer of care (minutes)
- 95th percentile time for transfer of care (minutes)
- Percentage of ambulance arrivals with transfer of care time within 30 minutes.

The denominator for the percentage is the number of matched records with a valid transfer of care time.

Transfer of care performance is not reported for hospitals with less than 50 matched records in the quarter. Records from these hospitals are excluded from calculation of performance measures.

Caution is advised when interpreting performance results for hospitals where transfer of care could not be calculated for more than 30% of total records because records were not matched or transfer of care time was missing.

For more information, see *Spotlight on Measurement: Measuring transfer of care from the ambulance to the emergency department* available at [www.bhi.nsw.gov.au](http://www.bhi.nsw.gov.au)

# Appendix

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## About this appendix

This appendix details the effect of including additional EDs (cohort changes) and revising the definition used to calculate time spent in the ED (definition change) on measures of activity and performance reported in Hospital Quarterly.

Table 1 lists additional EDs included in Hospital Quarterly, by quarter, since 2010.

### Measures of activity

#### Number of ED presentations

Appendix figure 1 shows the increments in the number of presentations by quarter and cohort for NSW.

Tables 2, 8 and 12 show the effect of including additional emergency departments on the number of presentations reported in Hospital Quarterly. These tables describe the effect of each new cohort of additional hospitals on results for NSW, affected LHDs and the C2 peer group (which increased from 14 to 28 hospitals over five years).

These tables show the following:

- Total number of EDs (cumulative) included in Hospital Quarterly
- Total number of ED presentations reported in Hospital Quarterly
- Number of EDs added in the most recent cohort
- Total number of ED presentations added by the most recent cohort.
- The percentage increase in ED presentations compared to the number of presentations that would have been reported had the most recent cohort not been included.

### Measures of performance

#### Percentage of patients leaving the ED within four hours

Tables 3, 4, 5, 9, 11 and 13 show the effect of changes to ED cohorts and/or calculation of time spent in the ED on the reported percentage of patients leaving the ED within four hours. These tables detail the effect of changes for NSW (Tables 3, 4 and 5), for LHDs (Table 9 and 11) and for the C2 peer group (Table 13).

These tables include the following:

- The percentage of patients leaving the ED within four hours reported in Hospital Quarterly, January to March 2015 (for NSW, LHD or C2 peer group)
- The effect of the change (in percentage points) on the percentage reported leaving the ED within four hours.

Individual tables also include results for the percentage of patients leaving within four hours for additional EDs, the previous definition of time to depart, or the combined effect of both changes.

#### Time to leaving the ED

Tables 6 and 10 show the combined effect of changes to ED cohorts and calculation of time spent in the ED on the reported median and 95th percentile times to leaving the ED for NSW (Table 6) and for LHDs (Table 10).

These tables show the following:

- Median and 95th percentile times to leaving the ED reported in Hospital Quarterly, January to March 2015 (for NSW or LHD)
- The combined effect of the changes (in minutes) on the median and 95th percentile times to leaving the ED.

#### Time to starting treatment

Table 7 shows the effect of cohort changes on the median and 95th percentile times to starting treatment (in minutes), by triage category.

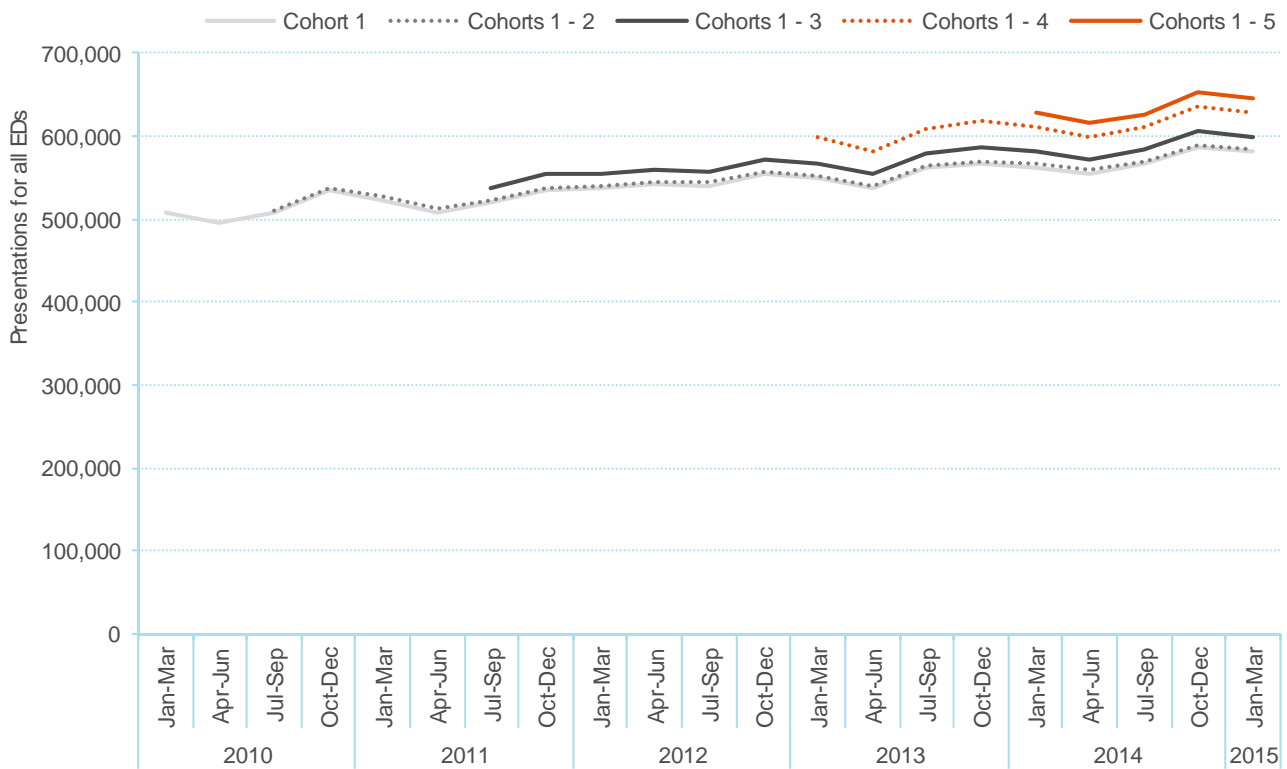
**Appendix table 1:** Emergency departments added to Hospital Quarterly, by quarter

First quarter of data starts	Emergency department	Local health district	Peer group
<b>Cohort 1</b>			
up to January to March 2010			
<b>Cohort 2</b>			
July to September 2010	Bega District Hospital <sup>†</sup>	Southern NSW	C1
<b>Cohort 3</b>			
July to September 2011	Ballina District Hospital	Northern NSW	C2
July to September 2011	Byron District Hospital	Northern NSW	D1b
July to September 2011	Casino and District Memorial Hospital	Northern NSW	C2
July to September 2011	Macleay District Hospital	Northern NSW	C2
July to September 2011	Mullumbimby & District War Memorial Hospital	Northern NSW	D1b
<b>Cohort 4</b>			
January to March 2013	Barham Health Service	Murrumbidgee	D2
January to March 2013	Boorowa Health Service	Murrumbidgee	F3
January to March 2013	Corowa Health Service	Murrumbidgee	D1a
January to March 2013	Culcairn Multi-Purpose Service	Murrumbidgee	F3
January to March 2013	Deniliquin Health Service	Murrumbidgee	C2
January to March 2013	Finley Health Service	Murrumbidgee	D1b
January to March 2013	Gundagai Health Service	Murrumbidgee	D2
January to March 2013	Hay Health Service	Murrumbidgee	D2
January to March 2013	Hillston Health Service	Murrumbidgee	D2
January to March 2013	Jerilderie Multi-Purpose Service	Murrumbidgee	F3
January to March 2013	Lake Cargelligo Multi-Purpose Service	Murrumbidgee	F3
January to March 2013	Lockhart Health Service	Murrumbidgee	D2
January to March 2013	Murrumburrah-Harden Health Service	Murrumbidgee	D1b
January to March 2013	Temora Health Service	Murrumbidgee	D1a
January to March 2013	Tumbarumba Multi-Purpose Service	Murrumbidgee	F3
January to March 2013	Tumut Health Service	Murrumbidgee	C2
January to March 2013	Wyalong Health Service	Murrumbidgee	D1b
January to March 2013	Young Health Service	Murrumbidgee	C2
January to March 2013	Macksville District Hospital	Mid North Coast	C2
January to March 2013	Kyogle Multi-Purpose Service	Northern NSW	F3
January to March 2013	Bateman's Bay District Hospital	Southern NSW	C2
January to March 2013	Moruya District Hospital	Southern NSW	C2
January to March 2013	Queanbeyan Health Service	Southern NSW	C2
<b>Cohort 5</b>			
January to March 2014	Batlow/Adelong Multi-Purpose Service	Murrumbidgee	F3
January to March 2014	Berrigan Multi-Purpose Service	Murrumbidgee	F3

First quarter of data starts	Emergency department	Local health district	Peer group
January to March 2014	Coolamon Multi-Purpose Service	Murrumbidgee	F3
January to March 2014	Cootamundra Health Service	Murrumbidgee	D1a
January to March 2014	Holbrook Health Service	Murrumbidgee	D1b
January to March 2014	Junee Multi-Purpose Service	Murrumbidgee	F3
January to March 2014	Narrandera Health Service	Murrumbidgee	D1a
January to March 2014	Bellingen River District Hospital	Mid North Coast	C2
January to March 2014	Dorrigo Plateau Multi-Purpose Service	Mid North Coast	F3
January to March 2014	Crookwell Health Service	Southern NSW	D2
January to March 2014	Yass Health Service	Southern NSW	D1b
January to March 2014	Forbes District Hospital	Western NSW	C2
January to March 2014	Mudgee District Hospital	Western NSW	C2
January to March 2014	Parkes District Hospital	Western NSW	C2

(†) Bega District ED underwent a reporting system change during July to September 2010. Starting with Hospital Quarterly, October to December 2011, presentation counts are included in activity measures for NSW, Peer group C1 and SNSWLHD from July to September 2010, and times are included in performance measures for NSW, peer group C1 and SNSWLHD from October to December 2010.

**Appendix figure 1:** Effect of including additional emergency departments on presentations, by quarter, NSW



**Appendix table 2:** Effect of including additional emergency departments on presentations, by quarter, NSW

NSW	Number of EDs included	Total presentations	Number of EDs in most recently added cohort	Presentations for most recently included EDs	Change in total presentations from most recently added cohort (%)
<b>Cohort 1</b>					
January to March 2010	88	507,702			
April to June 2010	88	495,602			
<b>Cohort 2</b>					
July to September 2010	89	510,079	1	3,118	0.6%
October to December 2010	89	538,030	1	3,253	0.6%
January to March 2011	89	526,652	1	3,430	0.7%
April to June 2011	89	512,004	1	3,028	0.6%
<b>Cohort 3</b>					
July to September 2011	94	536,763	5	14,663	2.8%
October to December 2011	94	554,486	5	16,103	3.0%
January to March 2012	94	555,334	5	15,334	2.8%
April to June 2012	94	560,445	5	14,698	2.7%
July to September 2012	94	557,981	5	14,204	2.6%
October to December 2012	94	572,538	5	15,747	2.8%
<b>Cohort 4</b>					
January to March 2013	117	598,276	23	30,379	5.3%
April to June 2013	117	581,785	23	28,246	5.1%
July to September 2013	117	607,969	23	29,228	5.1%
October to December 2013	117	617,455	23	30,916	5.3%
<b>Cohort 5</b>					
January to March 2014	131	627,598	14	17,152	2.8%
April to June 2014	131	616,580	14	16,509	2.8%
July to September 2014	131	626,926	14	16,580	2.7%
October to December 2014	131	652,650	14	16,848	2.6%
January to March 2015	131	644,840	14	16,037	2.6%



**Appendix table 3:** Effect of including additional emergency departments on percentage of patients leaving within four hours, by quarter, NSW

Percentage leaving the ED within four hours, Hospital Quarterly, January to March 2015

NSW	All EDs included	Most recently added EDs	Change due to most recently added cohort (percentage points)
<b>Cohort 1</b>			
January to March 2010	62.5%		0.0
April to June 2010	60.8%		0.0
<b>Cohort 2</b>			
July to September 2010	58.4%	†	0.0
October to December 2010	59.7%	83.0%	0.1
January to March 2011	59.7%	78.1%	0.1
April to June 2011	59.6%	83.0%	0.2
<b>Cohort 3</b>			
July to September 2011	57.5%	86.2%	0.8
October to December 2011	60.0%	87.8%	0.9
January to March 2012	61.1%	87.9%	0.8
April to June 2012	60.0%	86.7%	0.7
July to September 2012	58.8%	83.3%	0.7
October to December 2012	64.8%	85.7%	0.6
<b>Cohort 4</b>			
January to March 2013	66.9%	86.1%	1.1
April to June 2013	66.9%	85.7%	0.9
July to September 2013	66.6%	86.3%	1.0
October to December 2013	72.1%	87.9%	0.8
<b>Cohort 5</b>			
January to March 2014	74.6%	93.3%	0.5
April to June 2014	73.7%	94.2%	0.5
July to September 2014	70.6%	92.9%	0.7
October to December 2014	74.7%	94.2%	0.5
January to March 2015	74.6%	94.2%	0.5

**Appendix table 4:** Effect of revised definition of time to departure on percentage of patients leaving the ED within four hours, by quarter, NSW

Percentage leaving the ED within four hours, Hospital Quarterly, January to March 2015

New South Wales	Revised definition	Previous definition	Change due to revised definition (percentage points)
<b>Cohort 1</b>			
January to March 2010	62.5%	61.6%	0.9
April to June 2010	60.8%	59.9%	0.9
<b>Cohort 2</b>			
July to September 2010	58.4%	57.5%	0.9
October to December 2010	59.7%	58.8%	0.9
January to March 2011	59.7%	58.7%	1.0
April to June 2011	59.6%	58.5%	1.1
<b>Cohort 3</b>			
July to September 2011	57.5%	56.4%	1.1
October to December 2011	60.0%	58.8%	1.2
January to March 2012	61.1%	60.0%	1.1
April to June 2012	60.0%	58.7%	1.3
July to September 2012	58.8%	57.4%	1.4
October to December 2012	64.8%	63.4%	1.4
<b>Cohort 4</b>			
January to March 2013	66.9%	65.7%	1.2
April to June 2013	66.9%	65.8%	1.1
July to September 2013	66.6%	65.5%	1.1
October to December 2013	72.1%	71.2%	0.9
<b>Cohort 5</b>			
January to March 2014	74.6%	73.7%	0.9
April to June 2014	73.7%	72.9%	0.8
July to September 2014	70.6%	69.7%	0.9
October to December 2014	74.7%	73.5%	1.2
January to March 2015	74.6%	73.2%	1.4

(†) Bega District ED underwent a reporting system change during July to September 2010. Starting with Hospital Quarterly, October to December 2011, presentation counts are included in activity measures for NSW, Peer group C1 and SNSWLHD from July to September 2010, and times are included in performance measures for NSW, peer group C1 and SNSWLHD from October to December 2010.

**Appendix table 5:** Combined effect of revised definition of time to departure and additional emergency departments on percentage of patients leaving the ED within four hours, by quarter, NSW

Percentage leaving the ED within four hours, Hospital Quarterly, January to March 2015

New South Wales	Revised definition and all EDs included	Previous definition and ED cohort	Change due to revised definition and most recently added cohort (percentage points)
<b>Cohort 1</b>			
January to March 2010	62.5%	61.6%	0.9
April to June 2010	60.8%	59.9%	0.9
<b>Cohort 2</b>			
July to September 2010	58.4%	57.5%	0.9
October to December 2010	59.7%	58.6%	1.1
January to March 2011	59.7%	58.5%	1.2
April to June 2011	59.6%	58.3%	1.3
<b>Cohort 3</b>			
July to September 2011	57.5%	55.5%	2.0
October to December 2011	60.0%	58.0%	2.0
January to March 2012	61.1%	59.2%	1.9
April to June 2012	60.0%	58.0%	2.0
July to September 2012	58.8%	56.8%	2.0
October to December 2012	64.8%	62.9%	1.9
<b>Cohort 4</b>			
January to March 2013	66.9%	64.7%	2.2
April to June 2013	66.9%	64.8%	2.1
July to September 2013	66.6%	64.5%	2.1
October to December 2013	72.1%	70.4%	1.7
<b>Cohort 5</b>			
January to March 2014	74.6%	73.2%	1.4
April to June 2014	73.7%	72.3%	1.4
July to September 2014	70.6%	69.1%	1.5
October to December 2014	74.7%	73.0%	1.7
January to March 2015	74.6%	72.6%	2.0

**Appendix table 6:** Combined effect of revised definition of time to departure and additional emergency departments on time to leaving the ED, by quarter, NSW

New South Wales	Median time to departure Hospital Quarterly, January to March 2015		95th percentile time to departure Hospital Quarterly, January to March 2015	
	Revised definition and all EDs included	Change due to revised definition and most recently added cohort (minutes)	Revised definition and all EDs included	Change due to revised definition and most recently added cohort (minutes)
<b>Cohort 1</b>				
January to March 2010	3h 0m	-5	11h 30m	-7
April to June 2010	3h 8m	-5	12h 0m	-6
<b>Cohort 2</b>				
July to September 2010	3h 18m	-5	13h 45m	-7
October to December 2010	3h 13m	-6	12h 23m	-8
January to March 2011	3h 12m	-6	12h 28m	-10
April to June 2011	3h 13m	-6	12h 57m	-10
<b>Cohort 3</b>				
July to September 2011	3h 22m	-10	14h 1m	-19
October to December 2011	3h 11m	-10	12h 22m	-18
January to March 2012	3h 9m	-10	11h 42m	-13
April to June 2012	3h 14m	-10	12h 44m	-16
July to September 2012	3h 20m	-10	14h 13m	-17
October to December 2012	3h 0m	-9	11h 3m	-15
<b>Cohort 4</b>				
January to March 2013	2h 53m	-12	10h 33m	-18
April to June 2013	2h 54m	-12	11h 10m	-18
July to September 2013	2h 57m	-12	11h 48m	-23
October to December 2013	2h 44m	-10	9h 41m	-18
<b>Cohort 5</b>				
January to March 2014	2h 38m	-8	9h 16m	-13
April to June 2014	2h 41m	-8	9h 49m	-13
July to September 2014	2h 49m	-8	11h 39m	-15
October to December 2014	2h 38m	-9	9h 22m	-15
January to March 2015	2h 39m	-9	9h 18m	-15

**Appendix table 7:** Effect of including additional emergency departments on time to starting treatment (minutes), by triage category, NSW, January to March 2015

New South Wales	Median time to starting treatment Hospital Quarterly, January to March 2015		95th percentile time to starting treatment Hospital Quarterly, January to March 2015	
	All EDs included	Change due to most recently added cohort (minutes)	All EDs included	Change due to most recently added cohort (minutes)
Triage 2	8	0	35	0
Triage 3	20	0	98	0
Triage 4	26	-1	137	-1
Triage 5	24	0	135	-1

**Appendix table 8:** Effect of including additional emergency departments on presentations, by LHD and quarter

Mid North Coast LHD	Number of EDs included	Total presentations	Number of EDs in most recently added cohort	Presentations for most recently included EDs	Change in total presentations from most recently added cohort (%)
<b>Cohort 1</b>					
January to March 2010	3	20,883			
April to June 2010	3	20,523			
<b>Cohort 2</b>					
July to September 2010	3	21,151			
October to December 2010	3	22,113			
January to March 2011	3	21,545			
April to June 2011	3	20,317			
<b>Cohort 3</b>					
July to September 2011	3	21,444			
October to December 2011	3	22,172			
January to March 2012	3	22,284			
April to June 2012	3	21,714			
July to September 2012	3	22,292			
October to December 2012	3	21,982			
<b>Cohort 4</b>					
January to March 2013	4	24,093	1	3,296	15.8%
April to June 2013	4	23,459	1	2,834	13.7%
July to September 2013	4	24,641	1	3,033	14.0%
October to December 2013	4	25,831	1	3,248	14.4%
<b>Cohort 5</b>					
January to March 2014	6	26,680	2	2,070	8.4%
April to June 2014	6	26,390	2	1,928	7.9%
July to September 2014	6	27,149	2	2,027	8.1%
October to December 2014	6	28,780	2	2,094	7.8%
January to March 2015	6	28,958	2	2,126	7.9%

Murrumbidgee LHD	Number of EDs included	Total presentations	Number of EDs in most recently added cohort	Presentations for most recently included EDs	Change in total presentations from most recently added cohort (%)
<b>Cohort 1</b>					
January to March 2010	2	12,847			
April to June 2010	2	13,196			
<b>Cohort 2</b>					
July to September 2010	2	13,490			
October to December 2010	2	14,325			
January to March 2011	2	13,229			
April to June 2011	2	13,339			
<b>Cohort 3</b>					
July to September 2011	2	13,443			
October to December 2011	2	13,156			
January to March 2012	2	13,139			
April to June 2012	2	13,501			
July to September 2012	2	13,829			
October to December 2012	2	13,859			
<b>Cohort 4</b>					
January to March 2013	20	27,339	18	14,272	109.2%
April to June 2013	20	26,659	18	13,772	106.9%
July to September 2013	20	28,263	18	13,985	97.9%
October to December 2013	20	28,263	18	14,603	106.9%
<b>Cohort 5</b>					
January to March 2014	27	31,023	7	4,591	17.4%
April to June 2014	27	30,519	7	4,488	17.2%
July to September 2014	27	30,500	7	3,829	14.4%
October to December 2014	27	32,512	7	4,261	15.1%
January to March 2015	27	30,754	7	3,874	14.4%

Northern NSW LHD	Number of EDs included	Total presentations	Number of EDs in most recently added cohort	Presentations for most recently included EDs	Change in total presentations from most recently added cohort (%)
<b>Cohort 1</b>					
January to March 2010	4	27,492			
April to June 2010	4	26,617			
<b>Cohort 2</b>					
July to September 2010	4	27,488			
October to December 2010	4	27,845			
January to March 2011	4	27,307			
April to June 2011	4	26,331			
<b>Cohort 3</b>					
July to September 2011	9	41,106	5	14,663	55.5%
October to December 2011	9	43,430	5	16,103	58.9%
January to March 2012	9	42,030	5	15,334	57.4%
April to June 2012	9	41,483	5	14,698	54.9%
July to September 2012	9	41,726	5	14,204	51.6%
October to December 2012	9	44,067	5	15,747	55.6%
<b>Cohort 4</b>					
January to March 2013	10	44,163	1	1,365	3.2%
April to June 2013	10	42,737	1	1,329	3.2%
July to September 2013	10	44,315	1	1,462	3.4%
October to December 2013	10	46,134	1	1,312	2.9%
<b>Cohort 5</b>					
January to March 2014	10	45,860			
April to June 2014	10	43,704			
July to September 2014	10	44,888			
October to December 2014	10	48,258			
January to March 2015	10	47,497			



<b>Southern NSW LHD</b>	<b>Number of EDs included</b>	<b>Total presentations</b>	<b>Number of EDs in most recently added cohort</b>	<b>Presentations for most recently included EDs</b>	<b>Change in total presentations from most recently added cohort (%)</b>
<b>Cohort 1</b>					
January to March 2010	1	4,403			
April to June 2010	1	4,304			
<b>Cohort 2</b>					
July to September 2010	2	7,574	1	3,118	70.0%
October to December 2010	2	7,988	1	3,253	68.7%
January to March 2011	2	8,049	1	3,430	74.3%
April to June 2011	2	7,383	1	3,028	69.5%
<b>Cohort 3</b>					
July to September 2011	2	7,622			
October to December 2011	2	7,609			
January to March 2012	2	7,428			
April to June 2012	2	7,198			
July to September 2012	2	7,324			
October to December 2012	2	7,456			
<b>Cohort 4</b>					
January to March 2013	5	18,782	3	11,446	156.0%
April to June 2013	5	17,226	3	10,311	149.1%
July to September 2013	5	17,804	3	10,748	152.3%
October to December 2013	5	18,977	3	11,753	162.7%
<b>Cohort 5</b>					
January to March 2014	7	20,563	2	2,477	13.7%
April to June 2014	7	19,145	2	2,198	13.0%
July to September 2014	7	19,459	2	2,558	15.1%
October to December 2014	7	21,192	2	2,866	15.6%
January to March 2015	7	20,261	2	2,300	12.8%

Western NSW LHD	Number of EDs included	Total presentations	Number of EDs in most recently added cohort	Presentations for most recently included EDs	Change in total presentations from most recently added cohort (%)
<b>Cohort 1</b>					
January to March 2010	3	19,170			
April to June 2010	3	19,351			
<b>Cohort 2</b>					
July to September 2010	3	19,717			
October to December 2010	3	20,517			
January to March 2011	3	19,585			
April to June 2011	3	19,464			
<b>Cohort 3</b>					
July to September 2011	3	19,812			
October to December 2011	3	20,236			
January to March 2012	3	19,319			
April to June 2012	3	20,413			
July to September 2012	3	20,147			
October to December 2012	3	20,338			
<b>Cohort 4</b>					
January to March 2013	3	19,539			
April to June 2013	3	19,182			
July to September 2013	3	19,940			
October to December 2013	3	19,992			
<b>Cohort 5</b>					
January to March 2014	6	27,122	3	8,014	41.9%
April to June 2014	6	27,915	3	7,895	39.4%
July to September 2014	6	28,680	3	8,166	39.8%
October to December 2014	6	28,644	3	7,627	36.3%
January to March 2015	6	27,621	3	7,737	38.9%

**Appendix table 9:** Effect of revised definition of time to departure and additional emergency departments on percentage of patients leaving the ED within four hours, by LHD, January to March 2015

**Percentage leaving the ED within four hours, Hospital Quarterly, January to March 2015**

<b>Local health district</b>	<b>Revised definition and all EDs included</b>	<b>Change due to most recently added cohort (percentage points)</b>	<b>Change due to revised definition (percentage points)</b>	<b>Change due to revised definition and most recently added cohort (percentage points)</b>
NSW	74.6%	0.5	1.4	2.0
CCLHD	67.5%	0.0	2.5	2.5
FWLHD	85.1%	0.0	1.7	1.7
HNELHD	76.7%	0.0	0.1	0.1
ISLHD	69.6%	0.0	1.7	1.7
MLHD	86.4%	1.3	0.4	1.7
MNCLHD	81.4%	1.1	0.4	1.5
NBMLHD	68.5%	0.0	1.0	1.0
NNSWLHD	80.7%	0.0	1.0	1.0
NSLHD	77.5%	0.0	1.7	1.7
SCHN	76.3%	0.0	0.0	0.0
SESLHD	74.8%	0.0	2.3	2.3
SNSWLHD	81.6%	1.9	1.1	3.2
SVHN	66.5%	0.0	2.0	2.0
SWSLHD	69.8%	0.0	3.7	3.7
SYDLHD	69.7%	0.0	1.0	1.0
WNSWLHD	81.9%	4.3	1.1	5.5
WSLHD	63.2%	0.0	1.7	1.7

**Appendix table 10:** Combined effect of revised definition of time to departure and additional emergency departments on time to leaving the ED within four hours, by LHD, January to March 2015

Local health district	Median time to departure Hospital Quarterly, January to March 2015		95th percentile time to departure Hospital Quarterly, January to March 2015	
	Revised definition and all EDs included	Change due to revised definition and most recently added cohort (minutes)	Revised definition and all EDs included	Change due to revised definition and most recently added cohort (minutes)
NSW	2h 39m	-9	9h 18m	-15
CCLHD	2h 58m	-13	8h 28m	-12
FWLHD	2h 0m	-4	6h 19m	-18
HNELHD	2h 13m	0	8h 24m	-3
ISLHD	2h 52m	-9	11h 43m	-16
MLHD	1h 20m	-10	7h 0m	-24
MNCLHD	2h 5m	-9	7h 45m	-14
NBMLHD	3h 7m	-3	11h 39m	-11
NNSWLHD	1h 51m	-8	8h 11m	-5
NSLHD	2h 46m	-12	7h 48m	-8
SCHN	2h 36m	-1	7h 56m	-1
SESLHD	2h 56m	-9	7h 56m	-15
SNSWLHD	1h 58m	-15	6h 54m	-25
SVHN	3h 13m	-6	14h 42m	0
SWSLHD	3h 12m	-10	11h 12m	-14
SYDLHD	3h 15m	-3	9h 18m	-5
WNSWLHD	1h 56m	-33	8h 37m	-88
WSLHD	3h 31m	-6	15h 35m	-3

**Appendix table 11:** Effect of revised definition of time to departure and additional emergency departments on percentage of patients leaving the ED within four hours, by LHD, patients who were treated and discharged, January to March 2015

Local health district	Percentage leaving the ED within four hours, Hospital Quarterly, January to March 2015			
	Revised definition	Effect of additional EDs (percentage points)	Effect of revised definition (percentage points)	Effect of revised definition and additional EDs (percentage points)
NSW	86.4%	0.3	2.2	2.6
CCLHD	84.4%	0.0	3.9	3.9
FWLHD	90.0%	0.0	3.0	3.0
HNELHD	84.6%	0.0	0.3	0.3
ISLHD	80.0%	0.0	2.6	2.6
MLHD	95.3%	0.3	0.5	0.9
MNCLHD	93.5%	0.4	0.6	1.0
NBMLHD	79.8%	0.0	1.5	1.5
NNSWLHD	93.0%	0.0	1.3	1.3
NSLHD	89.6%	0.0	2.8	2.8
SCHN	84.4%	0.0	0.1	0.1
SESLHD	85.2%	0.0	3.5	3.5
SNSWLHD	90.1%	1.1	1.6	3.0
SVHN	88.3%	0.0	4.3	4.3
SWSLHD	84.9%	0.0	6.6	6.6
SYDLHD	82.2%	0.0	1.6	1.6
WNSWLHD	90.8%	2.0	1.4	3.7
WSLHD	79.6%	0.0	3.3	3.3

**Appendix table 12:** Effect of including additional emergency departments on presentations, by quarter, for hospital peer group C2

Peer group C2	Number of EDs included	Total presentations	Number of EDs in most recently added cohort	Presentations for most recently included EDs	Change in total presentations from most recently cohort (%)
<b>Cohort 1</b>					
January to March 2010	14	39,944			
April to June 2010	14	39,706			
<b>Cohort 2</b>					
July to September 2010	14	40,308			
October to December 2010	14	44,578			
January to March 2011	14	42,496			
April to June 2011	14	40,501			
<b>Cohort 3</b>					
July to September 2011	17	51,244	3	10,430	25.6%
October to December 2011	17	53,628	3	10,869	25.4%
January to March 2012	17	53,334	3	10,476	24.4%
April to June 2012	17	52,425	3	10,415	24.8%
July to September 2012	17	51,404	3	10,054	24.3%
October to December 2012	17	53,399	3	10,636	24.9%
<b>Cohort 4</b>					
January to March 2013	24	71,294	7	21,018	41.8%
April to June 2013	24	68,174	7	19,047	38.8%
July to September 2013	24	71,382	7	19,979	38.9%
October to December 2013	24	74,220	7	21,144	39.8%
<b>Cohort 5</b>					
January to March 2014	28	79,818	4	9,376	13.3%
April to June 2014	28	76,226	4	9,103	13.6%
July to September 2014	28	77,642	4	9,410	13.8%
October to December 2014	28	82,216	4	8,953	12.2%
January to March 2015	28	80,308	4	9,007	12.6%

**Appendix table 13**

Effect of revised definition of time to departure and additional emergency departments on percentage of patients leaving the ED within four hours, by quarter, for hospital peer group C2

**Percentage leaving the ED within four hours, Hospital Quarterly, January to March 2015**

Peer group C2	Revised definition and all EDs included	Effect of additional EDs (percentage points)	Effect of revised definition (percentage points)	Effect of revised definition and additional EDs (percentage points)
<b>Cohort 1</b>				
January to March 2010	89.6%		0.4	0.4
April to June 2010	89.4%		0.3	0.3
<b>Cohort 2</b>				
July to September 2010	88.6%		0.3	0.3
October to December 2010	88.7%		0.2	0.2
January to March 2011	88.5%		0.3	0.3
April to June 2011	88.2%		0.3	0.3
<b>Cohort 3</b>				
July to September 2011	87.0%	-0.8	0.7	-0.4
October to December 2011	88.0%	-0.5	0.6	-0.1
January to March 2012	87.8%	-0.2	0.5	0.1
April to June 2012	87.2%	-0.5	0.7	-0.2
July to September 2012	85.5%	-1.1	0.8	-0.7
October to December 2012	87.1%	-0.8	0.7	-0.4
<b>Cohort 4</b>				
January to March 2013	86.0%	-1.5	0.7	-1.1
April to June 2013	85.3%	-1.6	0.7	-1.0
July to September 2013	85.0%	-1.0	0.9	-0.3
October to December 2013	86.8%	-0.9	0.7	-0.2
<b>Cohort 5</b>				
January to March 2014	87.2%	0.6	0.8	1.3
April to June 2014	87.2%	0.7	0.6	1.3
July to September 2014	85.9%	0.8	0.6	1.4
October to December 2014	87.5%	0.7	0.8	1.6
January to March 2015	87.4%	0.7	0.9	1.6

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## About the Bureau of Health Information

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

BHI was established in 2009 to provide system-wide support through transparent reporting.

BHI 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 publishes a range of reports and tools that provide relevant, accurate and impartial information about how the NSW healthcare system is measuring up in terms of:

- Accessibility: healthcare when and where needed
- Appropriateness: the right healthcare, the right way
- Effectiveness: making a difference for patients
- Efficiency: value for money
- Equity: health for all, healthcare that's fair
- Sustainability: caring for the future.

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

[www.bhi.nsw.gov.au](http://www.bhi.nsw.gov.au)