Healthcare Quarterly

Technical Supplement

Emergency department, ambulance, admitted patients and elective surgery

January to March 2019

bureau of
health
information

Suggested citation:

Bureau of Health Information. Technical Supplement Sydney (NSW); BHI; 2019.

Please note there is the potential for minor revisions of data in this report. Please check the online version at **bhi.nsw.gov.au** for any amendments.

Published June 2019

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

Contents

Introduction

This Technical Supplement describes the data, methods and technical terms used to calculate descriptive statistics and performance measures reported in the Bureau of Health Information's (BHI) *Healthcare Quarterly* report.

The supplement is technical in nature and intended for audiences interested in the creation and analysis of health system performance information.

A chronological account of additions and enhancements to the data and methods is available from the Technical Supplements section of the BHI website **bhi.nsw.gov.au**

Emergency department

This section contains information about the data and methods used for calculating measures of emergency department (ED) activity and performance reported in *Healthcare Quarterly*.

Data sources

Emergency Department Data Collection

ED information in *Healthcare Quarterly* is based on analyses of attendance data in the Emergency Department Data Collection (EDDC) extracted from the centralised data warehouse, the Health Information Exchange (HIE), administered by the NSW Ministry of Health. BHI received a data file for Northern Beaches Hospital from the NSW Ministry of Health.

EDs are reported individually for hospitals in principal referral, major or district peer groups (A1, A2, A3, B, C1 and C2).

Facilities are included in *Healthcare Quarterly* following assessment of data completeness and accuracy, and in ways that support fair and meaningful comparison.

EDs in NSW have progressively replaced historic information systems with more contemporary electronic record systems. Changeover to a new electronic system may impact the completeness and reliability of input data or extraction from local systems to the HIE for periods longer than one quarter.

Quarters affected by significant changes, for example in policies or systems, are highlighted on time-trend graphs to make readers aware when such changes may contribute to shifts in trend between quarters.

To ensure accuracy in activity and performance comparisons between quarters in the January to March 2019 release of *Healthcare Quarterly*, information is provided on the number of hospitals contributing to the results in each quarter. This facilitates the interpretation of trends by showing the reader at what point in time new hospitals were introduced in quarterly reporting. See the section of this report that lists emergency departments for information on additions and removals of hospitals.

Transfer of Care Reporting System

Data for calculating the 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. Transfer of care is reported for hospitals where the ambulance incident number and the date can be identified in both the NSW Ambulance data and the EDDC.

Summary of changes and notes on data quality

Northern Beaches Hospital (peer group B) opened on 30 October 2018 when all services at Manly Hospital (peer group B) and acute care services at Mona Vale Hospital (peer group B) were transferred to Northern Beaches Hospital. Emergency care continues to be provided at Mona Vale Hospital through its Urgent Care Centre after. BHI does not report on activity and performance at Urgent Care Centres in NSW.

Emergency department (ED) performance results for Northern Beaches Hospital and Northern Sydney LHD should be interpreted with caution because of challenges experienced in the implementation of a new information system at Northern Beaches ED following its opening on 30 October 2018.

ED performance results from Northern Beaches Hospital contribute to NSW and peer group B totals throughout the *Healthcare Quarterly* report and associated information products.

BHI has been monitoring the quality of data extracted from Northern Beaches Hospital's ED information system since it opened. These data are used to calculate performance information reported in *Healthcare Quarterly* and associated information products regarding the timeliness of care in the ED.

The quality of those data at Northern Beaches Hospital in November and December 2018 were deemed by BHI to be insufficient for public

reporting in *Healthcare Quarterly*[1] because of the challenges experienced in the implementation of a new information system. Accordingly, BHI did not release ED performance information for Northern Beaches Hospital in the issue covering the period October to December 2018.

This decision reflected an approach used previously by BHI when EDs across NSW transitioned from a prior ED information system to the current information system used in public hospitals.

In March 2019 an independent review of the quality of data at Northern Beaches Hospital ED assessed data quality and performance for time to treatment and time spent in the ED. This review monitored the timeliness of care of a large sample of ED patients, comparing those results to those derived from Northern Beaches Hospital's information system for the same patients.

The review found that performance information derived from the hospital information system under-estimates time to treatment and over-

estimates time spent in the ED (i.e. underestimates the hospital's performance). However, BHI deems the margin of error is now small enough for the community to still form sufficiently accurate views on the performance of Northern Beaches Hospital ED. Accordingly, BHI has released ED performance information for Northern Beaches Hospital in the issue covering the period January to March 2019.

To acknowledge that a margin of error exists, particularly in relation to time to treatment for patients in triage category 3, BHI recommends that ED performance information for January to March 2019 be interpreted with caution, both for Northern Beaches Hospital and Northern Sydney LHD.

Healthcare Quarterly only includes data relating to publicly contracted services at Northern Beaches Hospital.

Indicator specifications

The definitions of the indicators included in *Healthcare Quarterly* begin on page 10.

---

[1] Bureau of Health Information. *Healthcare Quarterly: Activity and performance. Emergency department, ambulance, admitted patients and elective surgery: October to December 2018.* Sydney, March 2019.

Ambulance

This section contains information about the data and methods used for calculating measures of ambulance activity and performance that are reported in *Healthcare Quarterly*.

Data source

NSW Ambulance Computer Aided Dispatch System

The ambulance component of *Healthcare Quarterly* is based on analyses of data extracted from the NSW Ambulance Computer Aided Dispatch (CAD) system, which is used to manage and record ambulance activity and time points across the entire patient journey. The CAD system contains information from all ambulance local response areas in NSW. Information is recorded using calls, incidents, responses, transports, Emergency Department Network Access and Ambulance Release Teams as counting units.

The CAD system is a 'live' system and data is updated continuously. The NSW reporting system for CAD data is scheduled to refresh four times daily during business hours (at 6.30am, 10.30am, 2.30pm and 6.30pm). Records are checked for a rolling three-day period for any changes and updates are undertaken accordingly to reflect the changes. On the second day of the new calendar month, all records in the previous month are closed off, that is no further updating is allowed.

The priority codes included in *Healthcare Quarterly* are listed in Table 1. The following Priority Numbers have been excluded:

- 14 (Priority Error)
- 35 (ICEMS)
- 36 (ICEMS Urgent).

Response grid changes and non-emergency patient transport

Changes to the way in which incidents and responses are coded are known as grid changes. Three grid changes over the past five years (March 2013, April 2015 and May 2016) saw some

incidents, formerly coded as priority 1, subsequently coded as priority 2. Accordingly, there was an increase in the number of priority 2 incidents and a decrease in the number of priority 1 incidents around these times.

The introduction of the Patient Transport Service in May 2014 resulted in transfer of cases requiring less urgent patient transport from NSW Ambulance to NSW HealthShare. These changes have affected some results over time, and are represented as grey bars in relevant graphs throughout the *Healthcare Quarterly* report.

Summary of changes

BHI has replaced zone level reporting of ambulance activity and performance with reporting by statistical geographic areas, starting with the June 2019 release of *Healthcare Quarterly* – reporting data from the January to March 2019 quarter. This change is in response to the increased public interest in ambulance performance at the local level, and the introduction of the Paramedic Response Network (PRN) across metropolitan Sydney. The new operational model is made up of Paramedic Response Centres and smaller, standby facilities called Paramedic Response Points, forming local PRNs. The new PRN structure has affected the geographical boundaries for local response areas (LRA), and in some instances, zone boundaries. The change in the size of these areas has affected the number of incidents reported at the zone level. Additionally, continual changes to the administrative boundaries of LRAs and zones impede time trend comparisons and render the data prone to interpretation errors.

Changes were made to report measures of ambulance activity and performance for areas that are stable geographic units and are also more meaningful for the local community. The Australian Bureau of Statistics developed a geographical regional framework, the Australian Statistical Geography Standards (ASGS), to compare data between regions using areas with regional

boundaries that remain stable for five years, thereby allowing comparisons of data over time.[2]

The Statistical Area Level 3 (SA3) and Statistical Area Level 4 (SA4) units have been designed for the output of regional data. They have been adopted by BHI to report ambulance activity and performance as they are small enough to be meaningful to the community yet large enough to capture sufficient incidents to provide stable estimates of performance.

There are 91 SA3 geographies in NSW. Three criteria are used to define the boundaries of SA3s:[3]

- Regional identity – neighbouring areas are grouped according to similar geographic and socio-economic characteristics.
- Population – the population of an SA3 generally ranges from 30,000 to 130,000 residents. Priority is given to the regional identity of an area for defining the boundaries and this can result in SA3s with smaller or larger populations.
- Functionality – the area of an SA3 is defined in relation to transport and commercial centres.

SA4s are built by aggregating whole SA3s. The SA4 regions are the largest sub-State regions in the main structure of ASGS. There are 28 SA4s geographies in NSW reported in the January to March 2019 quarter. Two criteria are used to define the boundaries of SA4s:[4]

- Population – a minimum of 100,000 persons was set for the SA4. It ranges from 100,000 – 300,000 in regional areas to 300,000 – 500,000 in metropolitan areas.
- Functionality – the area of an SA4 is designed to reflect the highest degree of interconnectivity between the labour supply and demand.

The shift to reporting ambulance activity and performance at SA3 and SA4 levels has led to three main changes from the January to March 2019 quarter in the *Healthcare Quarterly* report.

Statistical areas used for reporting activity and performance measures

Quarterly activity and performance measures are reported by statistical areas. Measures of activity and performance are reported by SA3 for all response priorities, with the exception of Priority 1A. For Priority 1A, the median response time is reported by SA4 as the number of P1A incidents in some SA3s is too low to permit consistent reporting of response times. Reporting by SA4 still provides local information, but is based on a higher number of incidents.

Use of choropleth maps

The choropleth maps report ambulance activity and performance by SA3. There are two separate maps presented in the report – one for regional, rural and remote NSW (excluding Greater Sydney) and another for Greater Sydney. Separate maps are used because space does not allow for results within Greater Sydney to be discerned within a map of all NSW in printed materials. Two measures will be presented using choropleth maps:

1. the rate of incidents where a call resulted in the dispatch of one or more ambulances (per 1,000 estimated resident population of an SA3); and
2. the percentage of priority 1 (P1) call to ambulance arrival times under 15 minutes by SA3.

Selection of activity and performance measures

Measures on mobilisation time, turnaround time and the surge day analysis have been discontinued from the issue covering the January to March 2019 quarter.

---

[2] Australian Bureau of Statistics. 2018. Australian Statistical Geography Standard (ASGS). Retrieved from:
http://www.abs.gov.au/websitedbs/d3310114.nsf/home/australian+statistical+geography+standard+(asgs)

[3] Australian Bureau of Statistics. 2016. Statistical Area Level 3 (SA3). Retrieved from:
https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/1270.0.55.001~July%202016~Main%20Features~Statistical%20Area%20Level%203%20(SA3)~10015

[4] Australian Bureau of Statistics. 2016. Statistical Area Level 4 (SA4). Retrieved from:
https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/1270.0.55.001~July%202016~Main%20Features~Statistical%20Area%20Level%204%20(SA4)~10016

Indicator specifications

The definitions of the indicators included in *Healthcare Quarterly* begin on page 15.

Table 1   Incident and response priority codes

Code	Priority	Description	Example	Response required
1	1A Emergency	Highest priority • Life-threatening case	Cardiac or respiratory arrest, unconscious, ineffective breathing	Immediate response • Median within 10 minutes • Under 'lights and sirens'
	1B Emergency	High priority	Unconscious	Emergency response • Under 'lights and sirens'
	1C Emergency	Priority	Breathing problems, chest or neck injury, serious haemorrhage	Emergency response • Under 'lights and sirens'
2	Urgent	Urgent	Abdominal pain	Urgent response without 'lights and sirens' within specified timeframes
3	Time-critical	Time-critical	Medical responses requested by medical practitioners	Undelayed response within specified timeframes
4–9	Non-emergency	Non-emergency	Routine transport	Routine

Admitted patients

This section contains information about the data and methods used for calculating measures of activity and performance for admitted patient episodes of care.

Data source

Admitted Patient Data Collection

Admitted patient information in *Healthcare Quarterly* is based on analyses of data in the Admitted Patient Data Collection (APDC). Data are extracted from a centralised data warehouse administered by the NSW Department of Health called the Health Information Exchange (HIE). BHI also received a data file for Northern Beaches Hospital from the NSW Ministry of Health.

Hospitals are reported individually if they are classified as principal referral, major or district peer groups (A1, A2, A3, B, C1 and C2).

Facilities are included in *Healthcare Quarterly* following assessment of data completeness and accuracy, and in ways that support fair and meaningful comparison.

Quarters affected by significant changes, for example in policies or systems, are highlighted on time-trend graphs to make readers aware when such changes may contribute to shifts in trend between quarters.

To ensure accuracy in activity and performance comparisons between quarters in the January to March 2019 release of *Healthcare Quarterly*,

information is provided on the number of hospitals contributing to the results in each quarter. This facilitates the interpretation of trends by showing the reader at what point in time new hospitals were introduced in quarterly reporting. Showing the fluctuations in the number of facilities contributing to results over time is meant to aid the reader's interpretation of changes in trends.

Summary of changes

Northern Beaches Hospital (peer group B) opened on 30 October 2018 when all services at Manly Hospital (peer group B) and acute care services at Mona Vale Hospital (peer group B) were transferred to Northern Beaches Hospital.

The peer group for Mona Vale Hospital has been changed from B (major hospitals) to F4 (Sub-Acute) following the transfer of services to Northern Beaches Hospital. Mona Vale hospital is a high-level rehabilitation and sub-acute hospital, and also provides palliative care and community health. From the next issue (April to June 2019) of *Healthcare Quarterly*, Mona Vale Hospital will no longer be included in peer group B, but will be included in totals for the 'Other' group, comprising smaller facilities throughout NSW, and in totals for Northern Sydney LHD and NSW.

Indicator specifications

The definitions of the indicators included in *Healthcare Quarterly* begin on page 20.

Elective surgery

This section contains information about the data and methods used for calculating measures of activity and performance for elective surgeries.

Data source

Waiting List Collection On-line System

The elective surgery component of *Healthcare Quarterly* is based on analyses of data extracted from the central data warehouse, the Waiting List Collection On-line System (WLCOS). WLCOS includes information on the date a patient is listed for a surgical procedure, the type of procedure required, the specialty of the surgeon, the urgency category of their surgery and whether the patient is currently ready for surgery. Some of these factors may change during the time a patient is on the waiting list.

Facilities are included in *Healthcare Quarterly* following assessment of data completeness and accuracy, and in ways that support fair and meaningful comparison.

Quarters affected by significant changes, for example in policies or systems, are highlighted on time-trend graphs to make readers aware when such changes may contribute to shifts in trend between quarters.

Summary of changes

Northern Beaches Hospital (peer group B) opened on 30 October 2018 when all services at Manly Hospital (peer group B) and acute care services at Mona Vale Hospital (peer group B) were transferred to Northern Beaches Hospital.

Healthcare Quarterly only includes data relating to publicly contracted services at Northern Beaches Hospital.

Patients still waiting for surgery at Manly or Mona Vale hospitals on 30 October 2018 had their waiting time information transferred to the Northern Beaches Hospital. This means that some patients will have waiting times that exceed the number of days Northern Beaches Hospital has been open.

Indicator definitions

The definitions of the indicators included in *Healthcare Quarterly* begin on page 21.

Suppression rules

Small numbers in any group need to be treated cautiously to protect patients' identity.

BHI suppresses information if it is based on very few patients. If there are fewer than five patients in any group for admitted patient and emergency department data, patient numbers are displayed as < 5.

For ambulance reporting at SA3 level, performance measures for two SA3s, Blue Mountains – South and Illawarra Catchment Reserve, have been suppressed by BHI because the estimated resident population in the area is less than 1,000, and very small volume of ambulance responses results in unstable estimates.

For elective surgery measures reported by urgency category, low counts have been pooled with another urgency group. Because the staged procedure category is excluded from performance measure calculations, low counts in this group are not suppressed.

If there are fewer than 10 patients in any group, on-time performance and median waiting times are suppressed. If there are fewer than 100 patients in any group, the 90th percentile is suppressed.

Indicator specifications

Emergency department: Activity measures

All ED attendances	All ED attendances 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).
Emergency presentations	Emergency presentations are records in the ED visit database of the HIE of presentations with an ED visit type of: emergency (1), an unplanned return visit for a continuing condition (3) or disaster (11). Emergency presentations in *Healthcare Quarterly* are reported by triage category.
Mode of separation	ED presentations by mode of separation includes all presentations at the ED that have a departure time recorded. Mode of separation categories include: • Treated and discharged – presentations with mode of separation: admitted and discharged as patient within ED (2) and departed with treatment complete (4). • Treated and admitted to hospital – presentations with modes of separation: admitted to a ward/inpatient unit (1), 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 commenced. Patients who 'left at their own risk' were triaged and treatment had 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 modes 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.
Triage category	A classification system based on how urgent the patient's need is for treatment: • Triage category 1: Resuscitation (for example, cardiac arrest) • Triage category 2: Emergency (for example, chest pain, severe burns) • Triage category 3: Urgent (for example, moderate blood loss, dehydration) • Triage category 4: Semi-urgent (for example, sprained ankle, earache) • Triage category 5: Non-urgent (for example, small cuts, abrasions).

Emergency department: Performance measures

Time to starting treatment in the ED

Description of measure	The time from first presenting at the ED to the time treatment started in a designated ED treatment area.
	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 is first seen by a medical officer and has a physical examination or treatment performed that is relevant to their presenting problem(s)
	• First seen by nurse time – the date and time when the patient is first seen by a nurse and has an assessment or treatment performed that is 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.
	BHI does not report time from presentation to starting treatment for patients in triage category 1, because BHI considers waiting time for these patients to not be informative. Recording of presentation, triage and treatment times for patients who should be assessed or treated within two minutes (triage 1) is unlikely to be recorded precisely enough to report against a two-minute benchmark, particularly when clinicians are focused on providing immediate and essential care.
Cohort description (numerator and denominator)	Emergency presentations to NSW EDs
	Emergency presentations are records in the ED visit database of the HIE of presentations with an ED visit type of emergency (1), an unplanned return visit for a continuing condition (3) or disaster (11).
	Emergency presentations are reported by triage category.
Further details (inclusions, exclusions)	Inclusions:
	Patients who had a valid triage category and treatment time.
	Records with an ED visit type of Emergency (1), Unplanned return visit for a continuing condition (3) and Disaster (11) are included.
	Exclusions:
	Non-emergency presentations
	Records with a missing treatment time
	Records with missing or invalid information for triage category are excluded from reported counts of emergency presentations.
	Records with a mode of separation of Did not wait for treatment (6), Dead on Arrival (8) or Departed for other Clinical Service Location (9)
	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.
Data source	Emergency Department Data Collection

Measures used in this report

Median time to starting treatment	Time from presentation by which half of patients started their treatment. The other half of patients took equal to or longer than this time.
90th percentile time to starting treatment	Time from presentation by which 90% of patients started treatment. The final 10% of patients took equal to or longer than this time.
Percentage of patients whose treatment started within clinically recommended time	The number of presentations where the time from presentation to treatment was less than, or equal to, the clinically recommended time as a percentage of the total number of presentations. The percentage is reported for emergency patients with a triage category of 2 to 5. It is reported by triage category, and for these triage categories combined.

For the "Percentage of patients..." row:

Denominator:

All emergency presentations to NSW public hospital EDs.

Numerator:

Denominator cases where the time between arrival at the ED and treatment time was within the clinically recommended timeframe for the relevant triage category.

A patient started treatment within the clinically recommended timeframe if the time from presentation to the start of clinical treatment is less than, or equal to, the maximum waiting times recommended in the Australasian College for Emergency Medicine policy on the Australasian Triage Scale.

AUSTRALASIAN TRIAGE SCALE CATEGORY	TREATMENT ACUITY (maximum waiting time for medical assessment and treatment)	PERFORMANCE INDICATOR THRESHOLD
Triage 1: Resuscitation	Immediate	100%
Triage 2: Emergency	10 minutes	80%
Triage 3: Urgent	30 minutes	75%
Triage 4: Semi-urgent	60 minutes	70%
Triage 5: Non-urgent	120 minutes	70%

Time spent in the ED

Description of measure	The difference between presentation time and departure time. Departure time is defined as: • Actual departure time –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 the presentation time or more than 31 days after the presentation time, then the actual departure time field is treated as missing and the record is excluded from calculations that use actual departure time. • Ready for departure time – 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. • Ready for departure time is used to calculate time spent in the ED for patients who are treated and discharged. Actual departure time is used for all other patients. • 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.
Cohort description (numerator and denominator)	All ED presentations with a valid departure time. '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. Records are assigned to quarters of the year using the arrival date and time field.
Further details (exclusions)	Exclusions: 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). 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.
Data source	Emergency Department Data Collection

Measures used in this report

Median time spent in the ED	The time half the patients spent in the ED, calculated as the difference between presentation time and departure time. The other half of patients spent equal to or longer than this time.
90th percentile time spent in the ED	The time by which 90% of patients had left the ED. The remaining 10% spent equal to or longer than this time.
Percentage of patients who spent four hours or less in the ED	Denominator: All presentations to NSW public hospital EDs Numerator: Denominator cases where the time between arrival at and departure from the ED was equal to or less than four hours.

Transfer of care time

Description of measure	The difference between arrival time and the time responsibility for the patients' care was transferred from paramedics to ED staff in an ED treatment zone
	For more information, see *Spotlight on Measurement: Measuring transfer of care from the ambulance to the emergency department* available at **bhi.nsw.gov.au**
Cohort description (numerator and denominator)	All patients arriving by ambulance at hospitals with an ED which is included in *Healthcare Quarterly* and with records in the Transfer of Care Reporting System (TCRS).
Further details (exclusions)	Inclusions:
	Matched records; those where the ambulance incident number and date can be identified in both the NSW Ambulance data and the ED data.
	Exclusions:
	Hospitals with less than 50 matched records in the quarter. 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.
Data source	Transfer of Care Reporting System (TCRS) portal.
	The TCRS incorporates data drawn from the NSW Ambulance information system and from the EDDC.

Measures used in this report

Median transfer of care time	The time between arrival of patients at the ED by ambulance and transfer of responsibility for their care, for half of the patients, from paramedics to ED staff in an ED treatment zone.
	The other half took equal to or longer than this time.
90th percentile transfer of care time	The time between arrival of patients at the ED by ambulance and transfer of responsibility for their care for 90% of patients from paramedics to ED staff in an ED treatment zone.
	The final 10% of patients took equal to or longer than this time.
Percentage of patients whose care was transferred within 30 minutes	The percentage of patients who arrived by ambulance for whom responsibility for their care was transferred from paramedics to ED staff in an ED treatment zone within 30 minutes. The denominator for the percentage is the number of matched records with a valid transfer of care time.

Ambulance: Activity measures

Number of calls

Description of measure	Count of all calls requesting an ambulance vehicle, received by NSW Ambulance's Computer Aided Dispatch (CAD) system
CAD data element description	Count of records where 'Time_CallTakingComplete' is a valid date.

Number of incidents

Description of measure	Count of all events requiring one or more ambulance responses.
	An incident is a call that results in the dispatch of one or more ambulance vehicles.
	Incidents are prioritised as highest priority (priority 1A) — immediate response under lights and sirens required (incident is potentially life threatening), priority 1 (emergency response under lights and sirens required); urgent (priority 2) — undelayed response required without lights and sirens; time-critical (priority 3) – medical responses requested by health professionals, often pre-booked; undelayed response and non-emergency (priority 4–9).
Data element description	Count of the number of calls where at least one response vehicle is assigned.

Number of responses

Description of measure	Count of all dispatches of an ambulance service vehicle.
	A response is the dispatch of an ambulance vehicle. There may be multiple responses to a single incident.
	Responses are prioritised as per incidents.
	Responses include vehicles which are cancelled prior to arrival at the incident scene.
CAD data element description	When 'Time_Enroute' is a valid date

Number of patient transports

Description of measure	Count of the number of responses where a patient was transported by the ambulance service.
CAD data element description	Responses where 'Time_ArrivedAt_Scene' is a valid date AND 'Time_Depart_Scene' is a valid date AND 'Time_ArrivedAtScene' is prior to 'Time_Depart_Scene'

Ambulance: Performance (timeliness) measures

Call to ambulance arrival time

Description of measure	Call to ambulance arrival time is measured from the time the call is answered (phone pickup) to the time the first ambulance service response arrives at the incident scene.
Calculation	Difference between 'Time_phonepickup' and 'Time_First_Unit_Arrived'

Measures used in this report

Percentage of priority 1 incidents with call to ambulance arrival time within 15 minutes	Percentage of emergency (priority 1) response times where it takes less or equal to 15 minutes for the first ambulance service vehicle to arrive at the scene after the call is received.
Calculation	The number of emergency (priority 1) incidents responded to in under or equal to 15 minutes as a percentage of emergency (priority 1) incidents. Results (%) are rounded to one decimal point for reporting.
Inclusions	Responses with a priority code of 1. First ambulance service vehicle to arrive at the scene after the call answered. All values 0 and higher are acceptable.
Percentage of priority 1 incidents with call to ambulance arrival time within 30 minutes	Percentage of emergency (priority 1) incidents where it takes less or equal to 30 minutes for the first ambulance service vehicle to arrive at the scene after the call is received.
Calculation	The number of emergency (priority 1) incidents responded to in under or equal to 30 minutes as a percentage of emergency (priority 1) incidents. Results (%) are rounded to one decimal point for reporting.
Inclusions	Responses with a priority code of 1. First ambulance service vehicle to arrive at the scene after the call answered. All values 0 and higher are acceptable.
Exclusions	NA
Percentage of priority 2 incidents with call to ambulance arrival time within 30 minutes	Percentage of urgent (priority 2) response times where it takes less or equal to 30 minutes for the first ambulance service vehicle to arrive at the scene after the call is received.
Calculation	The number of urgent (priority 2) incidents responded to in under or equal to 30 minutes as a percentage of urgent (priority 2) incidents. Results (%) are rounded to one decimal point for reporting.

Inclusions	Responses with a priority code of 2.
	First ambulance service vehicle to arrive at the scene after the call answered.
	All values 0 and higher are acceptable.
Exclusions	NA
Percentage of priority 2 incidents with call to ambulance arrival time within 60 minutes	Percentage of all State wide urgent (priority 2) response times where it takes less or equal to 60 minutes for the first ambulance service vehicle to arrive at the scene after the call is received.
Calculation	The number of urgent (priority 2) incidents responded to in under or equal to 60 minutes as a percentage of urgent (priority 2) incidents
	Results (%) are rounded to one decimal point for reporting.
Inclusions	Responses with a priority code of 2.
	First ambulance service vehicle to arrive at the scene after the call answered
	All values 0 and higher are acceptable.
Exclusions	NA

Ambulance response time

Description of measure	Ambulance response time is measured from the time a call is placed in queue (for an ambulance to be dispatched) to the time the first ambulance service response arrives at the incident scene.
NSW Ambulance Business rule	WHEN: 　'Time_CallEnteredQueue' is a valid date 　AND 'Time_ArrivedAtScene' is valid date 　AND 'Time_CallEnteredQueue' is a valid date 　AND 'Time_ArrivedAtScene' is a valid date 　AND 'Time_CallEnteredQueue' is prior to 'Time_ArrivedAtScene' 　AND 'Time_First_Unit_Arrived' = 'Time_ArrivedAtScene' 　THEN calculate time difference between 'Time_CallEnteredQueue' and 'Time_First_Unit_Arrived'

Measures used in this report

Median (50th percentile) ambulance response time	The total time by which half of incidents were responded to by ambulance service vehicles. The other half took equal or longer than this time. The median is a statistical measure of the midpoint of the response time distribution. BHI uses the data for the first vehicle to arrive at the scene and the empirical distribution function with averaging to compute the median in SAS©9.
Data element description	Response time is the difference in minutes between when a call is placed in queue (for an ambulance to be dispatched) to the time the first ambulance service response arrives at the incident scene. Results (minutes) are rounded to one decimal point for reporting.
Inclusions	Responses with a priority code of 1, 1A and 2. First ambulance service vehicle to arrive at the scene after the call is placed in queue.
Exclusions	NA
90th percentile ambulance response time	The time by which 90% of incidents were responded to by ambulance service vehicles. The final 10% took equal or longer than this time. The 90th percentile is a statistical measure of response time distribution. BHI uses the first vehicle to arrive at the scene and the empirical distribution function with averaging to compute the 90th percentile in SAS©9.
Data element description	Response time is the difference in minutes between when a call is placed in queue (for an ambulance to be dispatched) to the time the first ambulance service response arrives at the incident scene. Results (minutes) are rounded to one decimal point for reporting.
Exclusions	NA
Percentage of priority 1A responses within 10 minutes	Percentage of emergency (priority 1A) incidents (requiring at least one immediate response under lights and sirens) responded to in under or equal to 10 minutes
Calculation	The percentage is calculated as the number of priority 1A responses where the time from when a call is placed in queue (for an ambulance to be dispatched) to the time the first ambulance service response arrives at the incident scene was less than, or equal to, 10 minutes as a percentage of the total number of priority 1A responses. Results (%) are rounded to one decimal point for reporting.

Inclusions	Responses with a priority code of 1A.
	First ambulance service vehicle to arrive at the scene after the call is placed in queue.
	All values 0 and higher are acceptable.
Exclusions	NA
Number of days the median priority 1A response time was within 10 minutes	In NSW there is a target of 10 minutes for the median time within which priority 1A responses should have occurred.
Inclusions	Responses with a priority code of 1A.
	First ambulance service vehicle to arrive at the scene after the call is placed in queue.

Admitted patients

Episode of care	A period of care in a hospital or other healthcare facility with a defined start and end.
	When a person is admitted to hospital they begin what is termed an admitted patient episode or 'episode of care'. Acute episodes are typically short-term admissions for immediate care or treatment. Non-acute episodes include admissions for rehabilitation, palliative care and other non-acute reasons. Patients can have more than one episode of care during the same hospital admission. For example, a patient may begin with acute care and then change to rehabilitation or palliative care.
Total episodes	The count of all records with an episode end date in the defined period.
Planned episodes	The count of all recorded admissions with an emergency status of 'non-emergency / planned' or 'regular same-day planned admission'.
Unplanned / other episodes	All episodes with an episode end date in the defined period minus planned episodes.
Babies born	The count of records with source of referral of 'born in hospital'; it is a subset of unplanned episodes. Unlike all other fields in the admitted patient dataset, babies born uses the 'episode' table of the Health Information Exchange.
Stay type	Admitted patient episodes can be for 'same-day' or 'overnight' care.
	Same-day refers to patients who are admitted and discharged on the same day. Overnight refers to patients who spend at least one night in hospital.
	Admitted patient episodes can be either 'planned' or 'unplanned'. Planned refers to admissions that are arranged in advance (for example, patients who are admitted for planned elective surgery). Unplanned refers to emergency admissions (for example, for unplanned surgical patients).
Acute episodes	The count of records with episode of care type values of 1 (acute care) and 5 (newborn care).
Acute same day episodes	The count of acute episode records with an episode start date equal to the episode end date.
Acute overnight episodes	The count of the acute episode records with an episode start date that is earlier (not equal) to the episode end date.
Bed days	Bed days are calculated for all admitted patient episodes completed during the reference period.
	Total acute bed days is the sum of bed days for all episodes with an episode end date within the defined period. Total acute bed days for an overnight episode is the difference, in days, between the episode start date and the episode end date, minus the number of episode leave days recorded. Same-day episodes count as one bed day.
Total acute bed days	The sum of bed days for all acute episodes with an episode end date within the defined period. Total acute bed days for an overnight episode is the difference, in days, between the episode start date and the episode end date, minus the number of episode leave days recorded. Same day episodes count as one bed day.
Average length of stay	The mean of total bed days for all acute episodes with an episode end date in the defined period. That is, the total number of days in hospital for all admitted patient episodes (including same-day and overnight patients) divided by the total number of admitted patient episodes. The average length of stay is usually measured from midnight.

Elective surgery: Activity measures

The number of patients who received elective surgery during the quarter	The count of patients who were removed from the waiting list during the quarter because they were a routine admission for surgery, an admission for their listed procedure as an emergency admission, or an admission for surgery contracted to a private hospital or private day procedure centre.
The number of patients waiting for elective surgery at the end of the quarter	The count of all patients who are on the waiting list at the end of the quarter.
Ready for care	Ready for care patients are those who are prepared to be admitted to hospital or to begin the process leading directly to admission. Patients ready for elective surgery and on the waiting list excludes those waiting for staged procedures. Patients ready for non-urgent surgery on the waiting list also excludes those waiting for non-urgent cystoscopy.
Not ready for care	Not ready for care patients are those who are not in a position to be admitted to hospital. Patients not ready for surgery on the waiting list includes those waiting for staged procedures, non-urgent cystoscopy, and patients currently not available for personal reasons.
Urgency category	A classification system based on how urgent the patient's need for surgery is: Urgent surgery: Admission within 30 days is desirable for a condition that has potential to deteriorate quickly and become an emergency. Semi-urgent surgery: Admission within 90 days is desirable for a condition unlikely to deteriorate quickly. Non-urgent surgery: Admission within 365 days acceptable for a condition unlikely to deteriorate quickly.
Staged surgery	Surgery that, for medical reasons, cannot take place before a certain amount of time has elapsed. BHI uses this term to define all patients that could be identified as being a staged patient for most of their time on the waiting list and all non-urgent cystoscopy patients.
Common procedure	Commonly performed elective surgery procedures.
Specialty	The area of clinical expertise held by the doctor who performed the surgery. Medical (specialty) refers to any surgery performed by a non-specialist medical practitioner.

Elective surgery: Performance measures

Elective surgery waiting time

Description of measure	The waiting period for a particular patient is defined as the time between the list date and the removal date. The time a patient waited for the initial appointment with a specialist is not included in the time a patient spent on the waiting list for elective surgery.
Cohort description (numerator and denominator)	All patients removed from the waiting list during the quarter because they were a routine admission for surgery, an admission for their listed procedure as an emergency admission, or an admission for surgery contracted to a private hospital or private day procedure centre.
Further details (inclusions, exclusions)	Exclusions: Patients who were coded as not ready for surgery (NRFC) at the time of surgery. Patients who were recorded as NRFC on the day they were entered onto the wait list and who were transferred to another urgency category within a day or two of removal date. Patients who received cystoscopy and were in the non-urgent category. The count for a hospital does not include admissions contracted to another public hospital.
Data source	Waiting List Collection On-line System (WLCOS).

Measures used in this report

Median waiting time in days	The number of days it took for half of patients who received elective surgery during the period to be admitted and receive their surgery. The other half took equal to or longer than this time. Median waiting time is calculated using the Commonwealth waiting time definition. The number of days is calculated by subtracting the listing date for care from the removal date, minus any days when the patient was 'not ready for care', and also minus any days the patient was waiting with a less urgent clinical urgency category than their clinical urgency category at removal from the waiting list. BHI reports the median by urgency category, surgical specialty and common procedure.
90th percentile waiting time in days	The number of days it took for 90 percent of patients who received elective surgery during the period to be admitted and receive their surgery. BHI reports the 90th percentile by urgency category. The 90th percentile waiting time is also reported using the Commonwealth waiting time definition.

Percentage of patients admitted within the recommended timeframe

Description of measure	The proportion of patients admitted within the clinically recommended timeframe for each of the elective surgery urgency categories.
Cohort description (numerator and denominator)	Denominator: Number of patients admitted to hospital for their elective surgery within the clinically recommended timeframe, i.e. in 30 days or less for category A patients, 90 days or less for category B patients and 365 days or less for category C patients. Numerator: Total number of patients admitted for elective surgery in each urgency category

List of statistical area level 4 (SA4) by statistical area level 3 (SA3)

Hospital	Local health district
Capital Region	Goulburn - Mulwaree, Queanbeyan, Snowy Mountains, South Coast and Young - Yass
Central Coast	Gosford and Wyong
Central West	Bathurst, Lachlan Valley, Lithgow - Mudgee and Orange
Coffs Harbour - Grafton	Clarence Valley and Coffs Harbour
Far West and Orana	Bourke - Cobar - Coonamble, Broken Hill and Far West and Dubbo
Hunter Valley exc Newcastle	Lower Hunter, Maitland, Port Stephens and Upper Hunter
Illawarra	Dapto - Port Kembla, Illawarra Catchment Reserve, Kiama - Shellharbour and Wollongong
Mid North Coast	Great Lakes, Kempsey - Nambucca, Port Macquarie and Taree - Gloucester
Murray	Albury, Lower Murray and Upper Murray exc. Albury
New England and North West	Armidale, Inverell - Tenterfield, Moree - Narrabri and Tamworth - Gunnedah
Newcastle and Lake Macquarie	Lake Macquarie - East, Lake Macquarie - West and Newcastle
Richmond - Tweed	Richmond Valley - Coastal, Richmond Valley - Hinterland and Tweed Valley
Riverina	Griffith - Murrumbidgee (West), Tumut - Tumbarumba and Wagga Wagga
Southern Highlands and Shoalhaven	Shoalhaven and Southern Highlands
Sydney - Baulkham Hills and Hawkesbury	Baulkham Hills, Dural - Wisemans Ferry, Hawkesbury and Rouse Hill - McGraths Hill
Sydney - Blacktown	Blacktown, Blacktown - North and Mount Druitt
Sydney - City and Inner South	Botany, Marrickville - Sydenham - Petersham and Sydney Inner City
Sydney - Eastern Suburbs	Eastern Suburbs - North and Eastern Suburbs - South
Sydney - Inner South West	Bankstown, Canterbury, Hurstville and Kogarah - Rockdale
Sydney - Inner West	Canada Bay, Leichhardt and Strathfield - Burwood - Ashfield
Sydney - North Sydney and Hornsby	Chatswood - Lane Cove, Hornsby, Ku-ring-gai and North Sydney - Mosman
Sydney - Northern Beaches	Manly, Pittwater and Warringah
Sydney - Outer South West	Camden, Campbelltown (NSW) and Wollondilly
Sydney - Outer West and Blue Mountains	Blue Mountains, Blue Mountains - South, Penrith, Richmond - Windsor and St Marys
Sydney - Parramatta	Auburn, Carlingford, Merrylands - Guildford and Parramatta
Sydney - Ryde	Pennant Hills - Epping and Ryde - Hunters Hill
Sydney - South West	Bringelly - Green Valley, Fairfield and Liverpool
Sydney - Sutherland	Cronulla - Miranda - Caringbah and Sutherland - Menai - Heathcote

List of hospitals by local health district and hospital peer group, A1 – C2 only

Hospital	Local health district	Hospital peer group
Armidale Hospital	Hunter New England	C1
Auburn Hospital	Western Sydney	B
Ballina District Hospital	Northern NSW	C2
Bankstown-Lidcombe Hospital	South Western Sydney	A1
Batemans Bay District Hospital	Southern NSW	C2
Bathurst Health Service	Western NSW	C1
Belmont Hospital	Hunter New England	C1
Blacktown Hospital	Western Sydney	B
Blue Mountains District Anzac Memorial Hospital	Nepean Blue Mountains	C2
Bowral and District Hospital	South Western Sydney	C1
Broken Hill Health Service	Far West	C1
Byron Central Hospital	Northern NSW	C2
Calvary Mater Newcastle	Hunter New England	A3
Campbelltown Hospital	South Western Sydney	B
Canterbury Hospital	Sydney	B
Casino & District Memorial Hospital	Northern NSW	C2
Cessnock Hospital	Hunter New England	C2
Coffs Harbour Health Campus	Mid North Coast	B
Concord Repatriation General Hospital	Sydney	A1
Cooma Hospital and Health Service	Southern NSW	C2
Cowra Health Service	Western NSW	C2
Deniliquin Hospital and Health Services	Murrumbidgee	C2
Dubbo Base Hospital	Western NSW	B
Fairfield Hospital	South Western Sydney	B
Gosford Hospital	Central Coast	A1
Goulburn Base Hospital and Health Service	Southern NSW	C1
Grafton Base Hospital	Northern NSW	C1
Griffith Base Hospital	Murrumbidgee	C1
Gunnedah Hospital	Hunter New England	C2
Hawkesbury District Health Services	Nepean Blue Mountains	C1
Hornsby Ku-ring-gai Hospital	Northern Sydney	B
Inverell Hospital	Hunter New England	C2
John Hunter Hospital	Hunter New England	A1
Kempsey District Hospital	Mid North Coast	C2
Kurri Kurri Hospital	Hunter New England	C2
Lachlan Health Service - Forbes	Western NSW	C2
Lismore Base Hospital	Northern NSW	B
Lithgow Hospital	Nepean Blue Mountains	C2
Liverpool Hospital	South Western Sydney	A1
Macksville District Hospital	Mid North Coast	C2
Maclean District Hospital	Northern NSW	C2
Maitland Hospital	Hunter New England	B
Manly Hospital*	Northern Sydney	B
Manning Hospital	Hunter New England	B
Milton Ulladulla Hospital	Illawarra Shoalhaven	C2

Hospital	Local health district	Hospital peer group
Mona Vale Hospital^	Northern Sydney	B
Moree Hospital	Hunter New England	C2
Moruya District Hospital	Southern NSW	C2
Mount Druitt Hospital	Western Sydney	C1
Mudgee Health Service	Western NSW	C2
Murwillumbah District Hospital	Northern NSW	C1
Muswellbrook Hospital	Hunter New England	C2
Narrabri Hospital	Hunter New England	C2
Nepean Hospital	Nepean Blue Mountains	A1
Northern Beaches Hospital	Northern Sydney	B
Orange Health Service	Western NSW	B
Port Macquarie Base Hospital	Mid North Coast	B
Prince of Wales Hospital	South Eastern Sydney	A1
Queanbeyan Hospital and Health Service	Southern NSW	C2
Royal North Shore Hospital	Northern Sydney	A1
Royal Prince Alfred Hospital	Sydney	A1
Ryde Hospital	Northern Sydney	C1
Shellharbour Hospital	Illawarra Shoalhaven	C1
Shoalhaven District Memorial Hospital	Illawarra Shoalhaven	B
Singleton Hospital	Hunter New England	C2
South East Regional Hospital	Southern NSW	C1
St George Hospital	South Eastern Sydney	A1
St Vincent's Hospital Sydney	St Vincent's Health Network	A1
Sutherland Hospital	South Eastern Sydney	B
Sydney Children's Hospital, Randwick	Sydney Children's Network	A2
Sydney Hospital and Sydney Eye Hospital	South Eastern Sydney	A3
Tamworth Hospital	Hunter New England	B
The Children's Hospital at Westmead	Sydney Children's Network	A2
The Tweed Hospital	Northern NSW	B
Wagga Wagga Rural Referral Hospital	Murrumbidgee	B
Westmead Hospital	Western Sydney	A1
Wollongong Hospital	Illawarra Shoalhaven	A1
Wyong Hospital	Central Coast	B
Young Health Service	Murrumbidgee	C2

^ The peer group for Mona Vale Hospital has been changed from B (major hospitals) to F4 (Sub-Acute) following the transfer of services to Northern Beaches Hospital on 30 October 2018. From the next issue of Healthcare Quarterly, Mona Vale Hospital will no longer be included in Peer Group B, but will be included in Admitted Patients totals for the 'Other' group, comprising smaller facilities throughout NSW, and in totals for Northern Sydney LHD and NSW. Historical activity and performance measures available on HCO.

• Manly hospital closed on 30 October and services transferred to Northern Beaches Hospital. Historical activity and performance measures available on HCO.

References

1. Health System Information & Performance Reporting, NSW Ministry of Health, NSW Hospital peer groups 2016, 06 April 2016 [online] [cited 04 November 2016]. Available from www1.health.nsw.gov.au/PDS/pages/doc.aspx?dn=IB2016_013

2. NSW Government. NSW Health admission policy [online]. 2017 [cited 15 April 2018]. Available from http://www1.health.nsw.gov.au/pds/ActivePDSDocuments/PD2017_015.pdf

About the Bureau of Health Information

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

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

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

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

BHI's work relies on the efforts of a wide range of healthcare, data and policy experts. All of our assessment efforts leverage the work of hospital coders, analysts, technicians and healthcare providers who gather, codify and supply data.

Our public reporting of performance information is enabled and enhanced by the infrastructure, expertise and stewardship provided by colleagues from NSW Health and its pillar organisations.

bhi.nsw.gov.au

bureau of
**health
information**