Cessnock District Hospital

Return to acute care following hospitalisation for six acute conditions and two elective surgeries

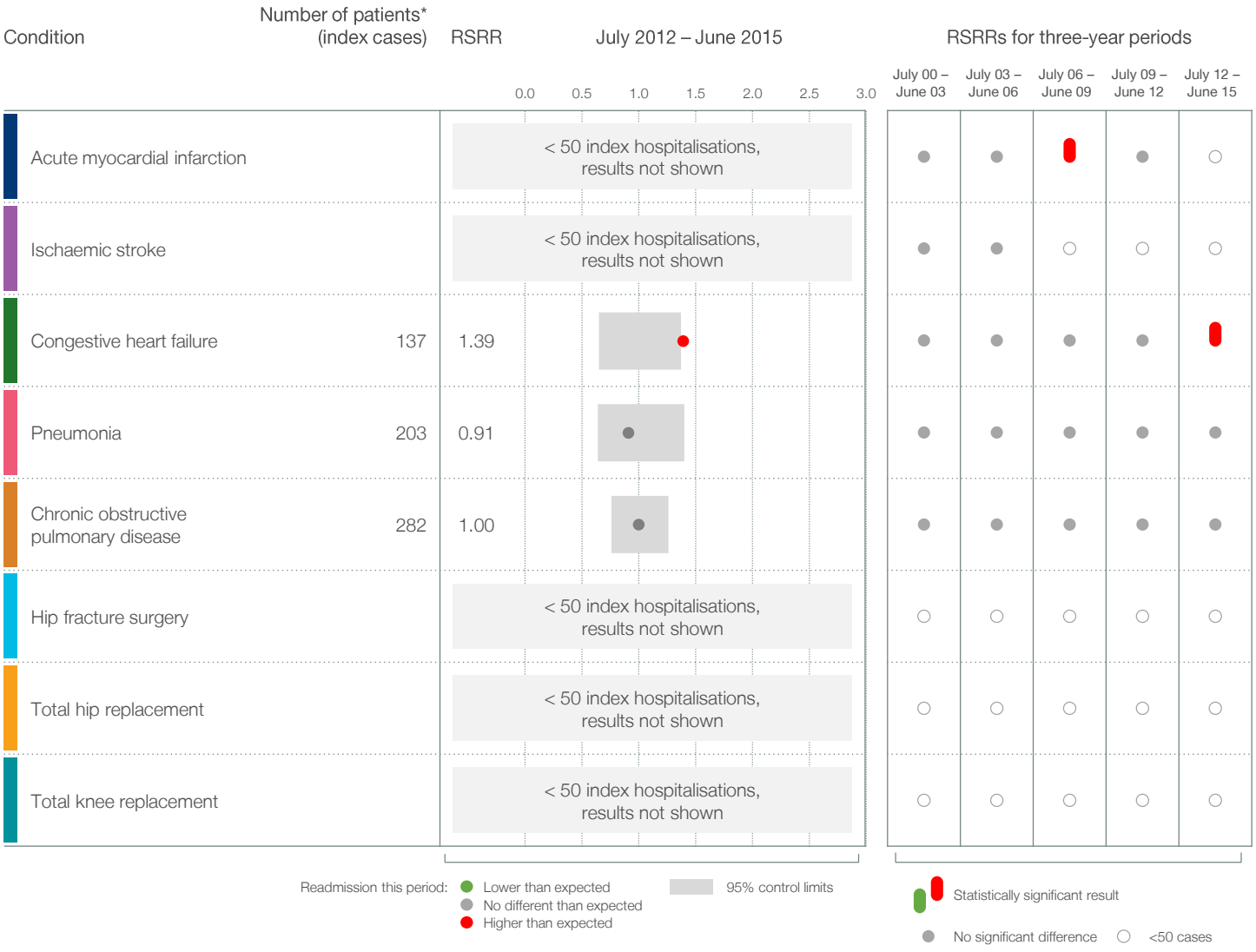
A hospital's risk-standardised readmission ratio (RSRR) is the 'observed' number of readmissions that occurred among its patient cohort divided by the 'expected' number of readmissions among its patients[1]. For this report, readmission is defined as a return to acute care[2].

Funnel plots with 95% and 99.8% control limits around the NSW ratio are used to interpret the ratios and identify outlier hospitals – those with 'special cause' variation that may warrant further investigation. The RSRR does not enable direct comparisons between hospitals. It assesses each hospital's results given its particular case mix.

Slightly different approaches are used for the conditions. A 30-day time period is used for the six acute conditions while a 60-day period is used for the elective surgeries. The analyses focused on acute conditions only consider readmission episodes that are classed as acute emergencies while analyses for the elective surgeries also include some 'planned' readmissions, such as planned returns to theatre for wound wash-outs.

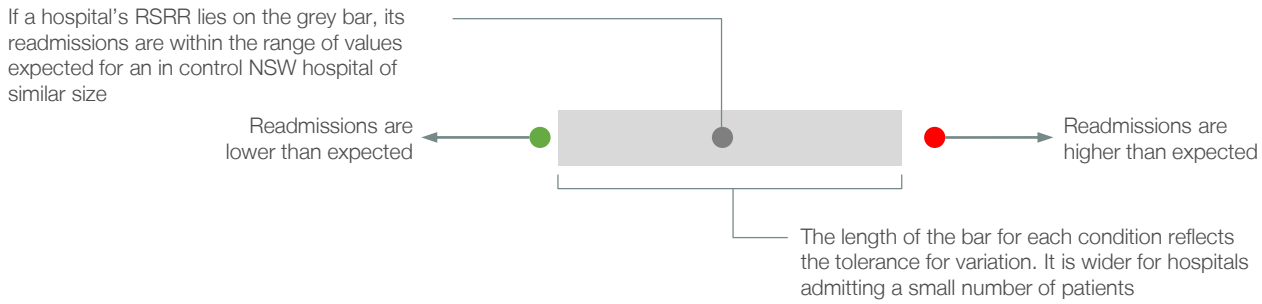
RSRRs do not distinguish readmissions that are avoidable from those that are a reflection of the natural course of illness.

Risk-standardised readmission ratios (RSRRs) for six acute conditions and two elective surgeries

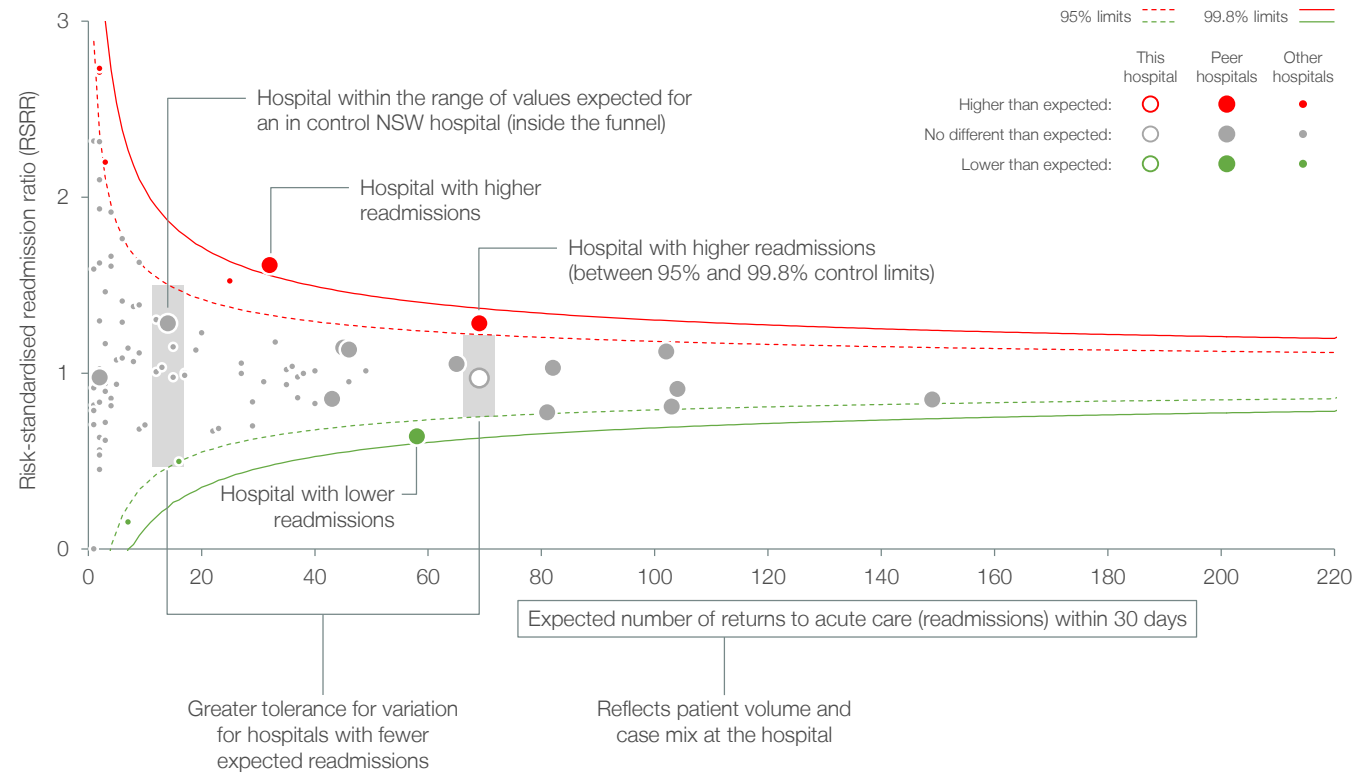


* Index cases exclude those with <30 days follow up information.

How to interpret the dashboard



How to interpret a funnel plot



Cessnock District Hospital

30-day return to acute care following hospitalisation for acute myocardial infarction

<50 index hospitalisations, results not shown

Cessnock District Hospital

30-day return to acute care following hospitalisation for ischaemic stroke

<50 index hospitalisations, results not shown

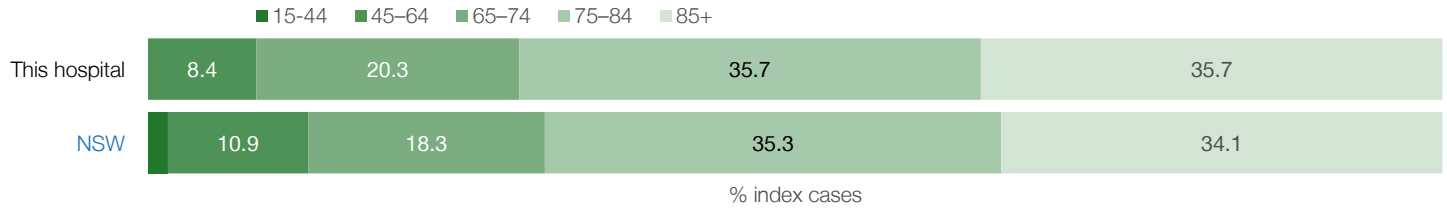
Cessnock District Hospital

30-day return to acute care following hospitalisation for congestive heart failure

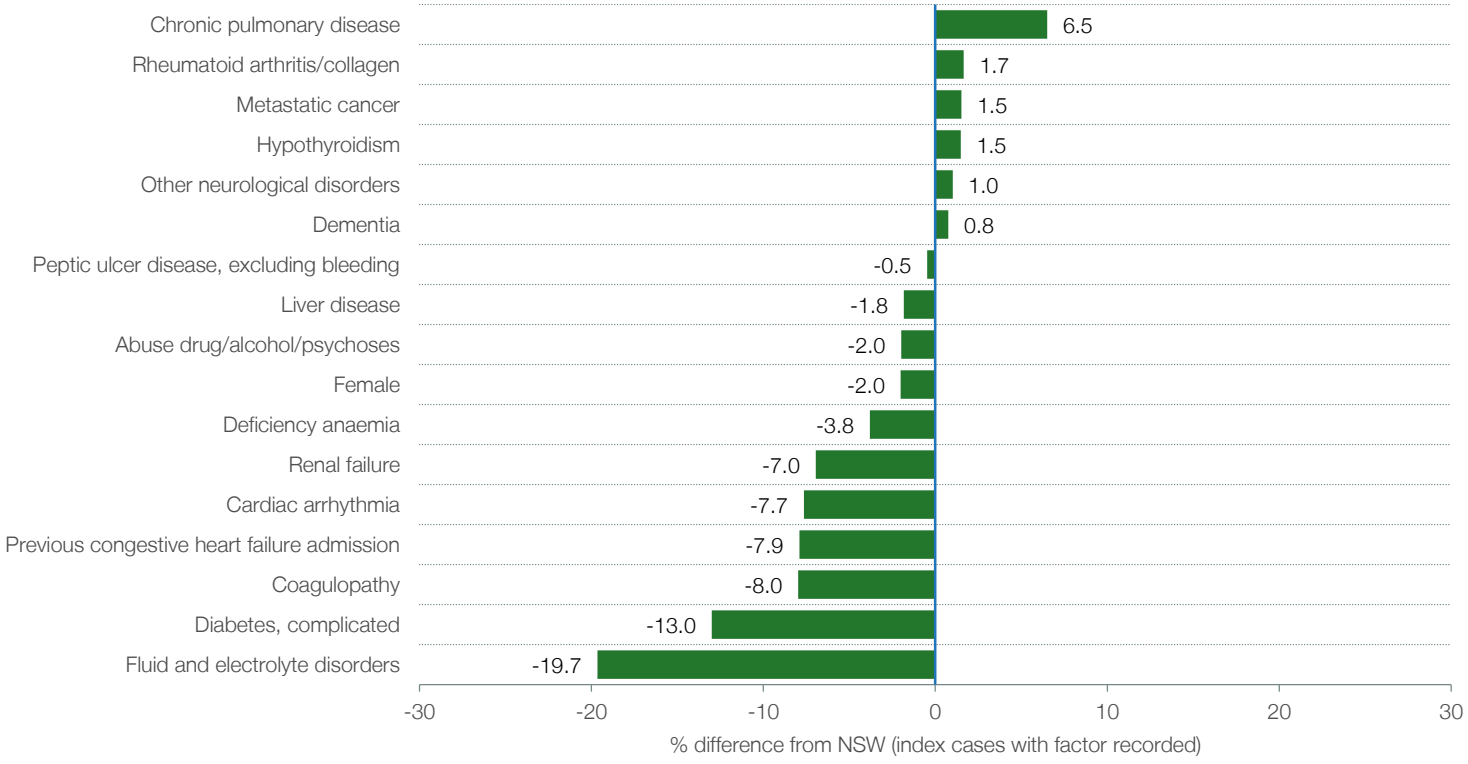
Patient cohort, index cases[3,4]

	This hospital	NSW
Total index cases for congestive heart failure	143	33,450
Average length of stay (days)	6.3	6.1
Patients transferred in from acute care in another hospital	8	3,216
Discharge destination:		
Home	131	28,883
Other	12	4,567

Age profile for index cases (years)*[5]



Factors associated with 30-day congestive heart failure return to acute care[6]



*Age was a significant factor in the final model of 30-day readmission following hospitalisation for congestive heart failure.

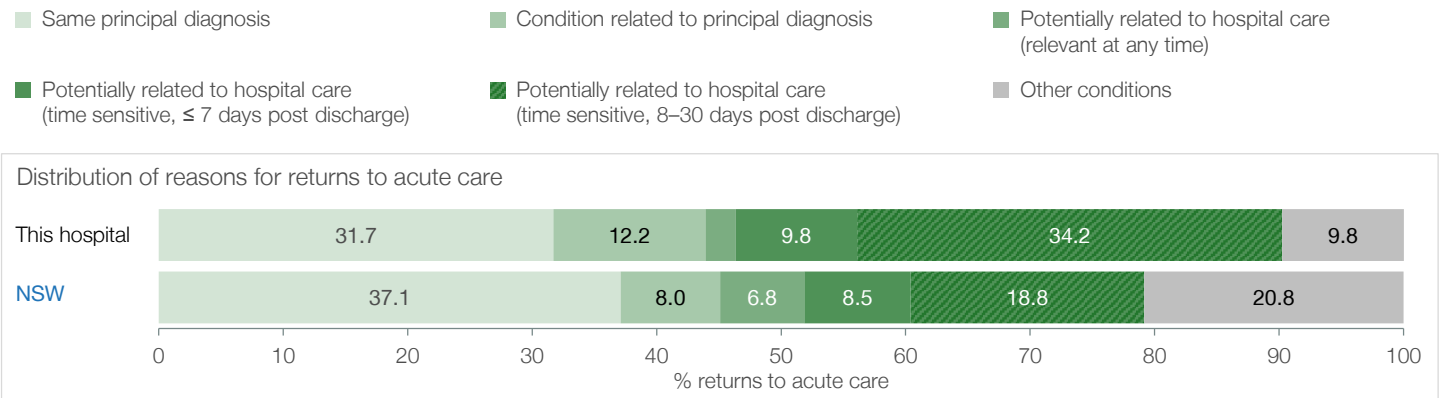
Cessnock District Hospital

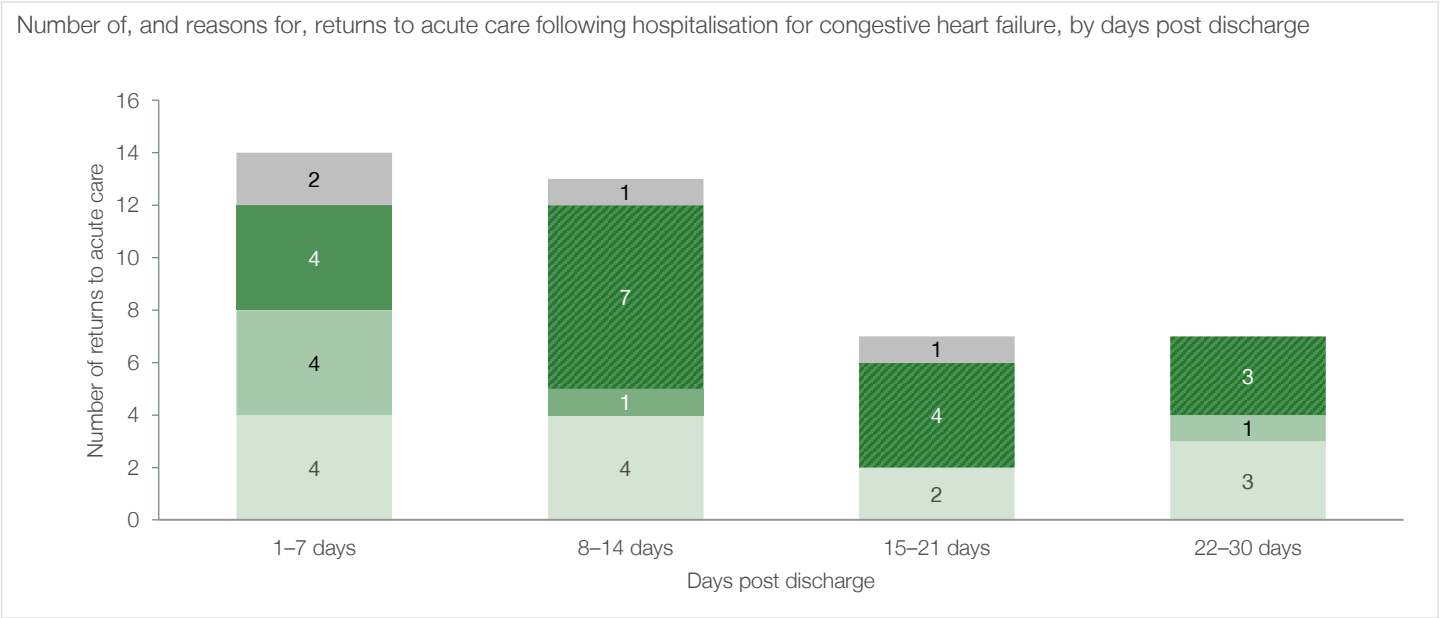
30-day return to acute care following hospitalisation for congestive heart failure

Location of returns to acute care[7]

	This hospital	NSW
Total readmissions following index hospitalisation for congestive heart failure	41	7,602
Readmitted to the hospital where acute care was completed	36	6,256
Readmitted to a different hospital	5	1,346
Of these:		
To an urban public hospital	4	
To a regional or rural public hospital	0	
To a private hospital	1	

Reasons for and time to returns to acute care[8]





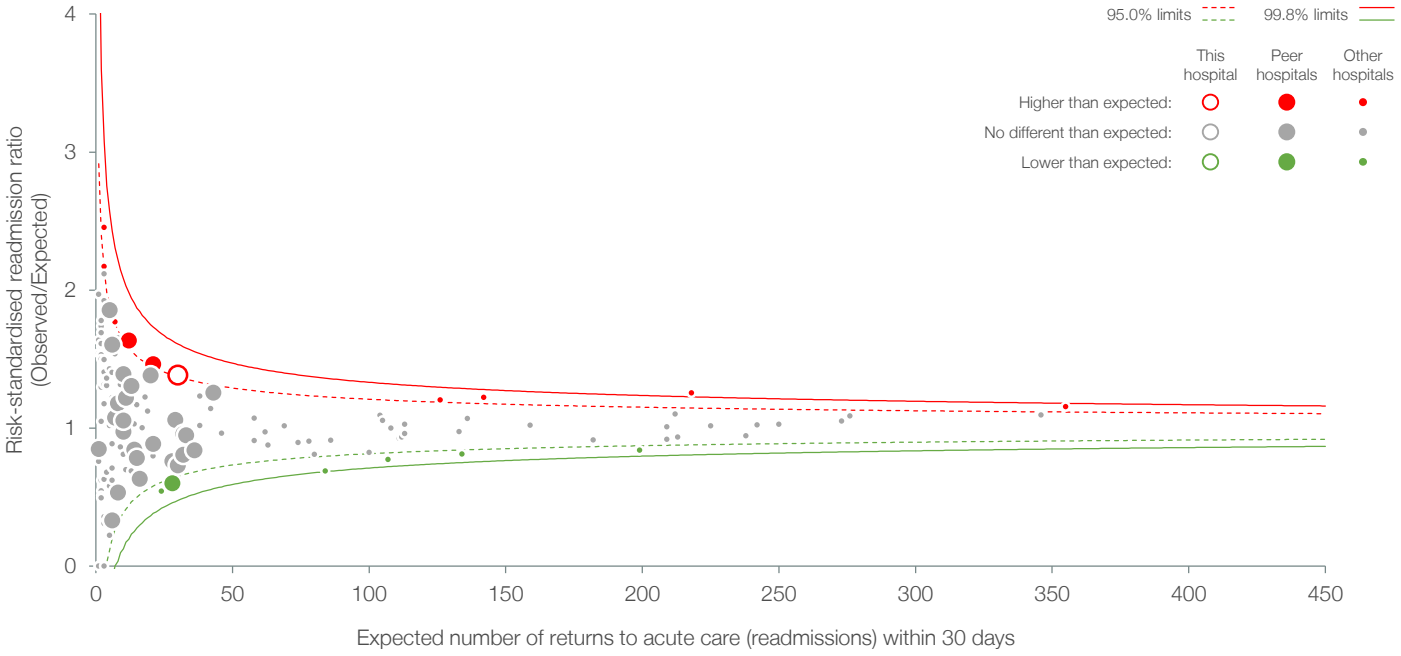
Cessnock District Hospital

30-day return to acute care following hospitalisation for congestive heart failure

Hospital-specific RSRRs report the ratio of actual or 'observed' number of returns to acute care to the 'expected' number of returns. A competing risk regression model draws on the NSW patient population's characteristics and outcomes to estimate the expected number of returns for each hospital, given the characteristics of its patients.

An RSRR less than 1.0 indicates lower-than-expected returns to acute care, and a ratio higher than 1.0 indicates higher-than-expected returns. Small deviations from 1.0 are not considered to be meaningful. Funnel plots with 95% and 99.8% control limits around the NSW ratio are used to identify outliers.

Hospital level congestive heart failure RSRR by number of expected returns to acute care (readmissions)[9]



Illustrating the effect of standardisation, July 2012 – June 2015

In order to make fair comparisons, a number of risk adjustments are made to readmission data. These take into account patient factors that influence the likelihood of returning to acute care within 30 days. The table below illustrates the effect of statistical adjustments on this hospital's results.

Unadjusted ratio	Age and sex standardised ratio	Risk-standardised readmission ratio
1.29	1.30	1.39

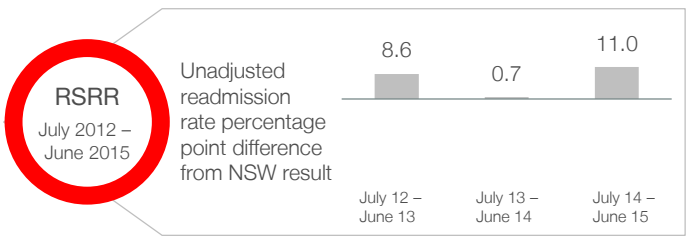
Ratio: Lower than expected; No different than expected; Higher than expected

The extent to which comorbidities are coded in the patient record may affect risk adjustment. Therefore the 'depth of coding'[10] has been assessed across NSW hospitals. In July 2009 – June 2012, the average depth of coding was 4.0 diagnoses in this hospital and 4.8 in NSW public hospitals; and in July 2012 – June 2015, there were 3.6 diagnoses in this hospital and 5.9 in NSW public hospitals.

Three-yearly RSRR and annual unadjusted readmission rates

The RSRR is calculated on the basis of three years of data. It takes account of differences in patient characteristics so that assessments of hospital performance are fair. To give an indication of results within the three-year period, the figure below shows the RSRR result for July 2012 – June 2015 alongside differences between this hospital and the NSW result for annual unadjusted readmission rates.

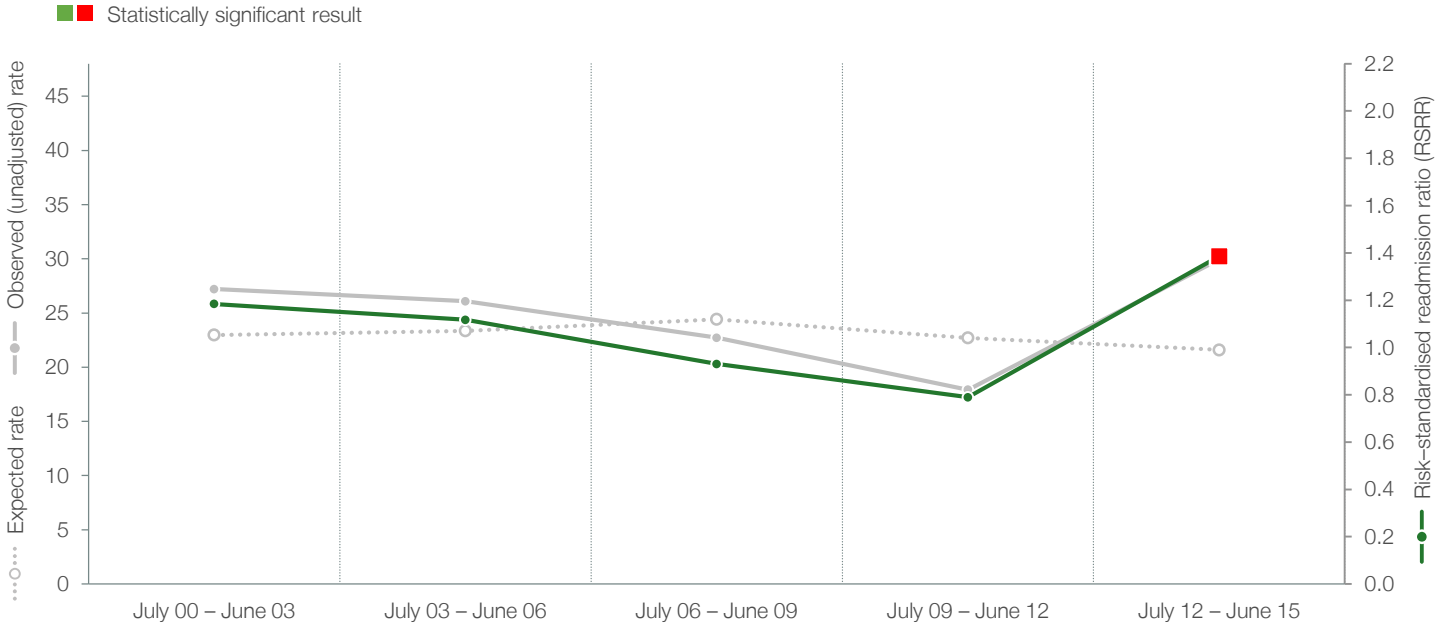
RSRR: Lower than expected; No different than expected; Higher than expected



Cessnock District Hospital

30-day return to acute care following hospitalisation for congestive heart failure

Congestive heart failure, this hospital's risk-standardised readmission ratio, expected readmission rates and observed (unadjusted) readmission rates, July 2000 – June 2015



Notes

1. Data refer to patients who were discharged from this hospital, between July 2012 and June 2015, following an acute hospitalisation with congestive heart failure as principal diagnosis (ICD-10-AM codes I11.0, I13.0, I13.2, I50.0, I50.1, I50.9).
2. Returns to acute care are to any NSW hospital in the 30 days (for acute conditions) or 60 days (for elective surgeries) following discharge, and are attributed to the last discharging hospital. For patients whose acute hospitalisation ended in discharge home, a return to acute care involves readmission to hospital; while for patients whose acute hospitalisation ended with a 'discharge' to non-acute care, a return involved a move back into an acute care setting regardless of whether they physically left the hospital.
3. For calculation of average length of stay, index admissions that were transferred in from, or transferred out to, another acute care hospital were excluded. Unreasonably long episodes are trimmed on the basis of the Diagnosis Related Group (DRG) of the episode. The trim point is the third quartile plus 1.5 x the interquartile range of all in-scope episodes in each DRG.
4. Discharge destinations are based on the mode of separation of the index case. For episodes coded as 'Discharged by hospital' or 'Discharged on leave', patients are considered to be destined for their place of usual residence. All other modes of separation are deemed to indicate a discharge destination other than a patient's place of usual residence.
5. Age at admission date.
6. Comorbidities are identified from the hospital discharge records using the Elixhauser comorbidity set (plus dementia) with a one year look-back from the admission date of the index case. Only those conditions that were shown to have a significant impact on readmission ($P<0.05$) are shown.
7. Hospitals are classified as urban and regional/rural using the geocoded address of the hospital assigned to ABS statistical areas (SA2) and the Australian remoteness index for areas.
8. Reasons for return to acute care are classified according to a draft specification made available to BHI by the Australian Institute of Health and Welfare. Principal diagnoses for the return to acute care episode, are stratified as: the same as the index hospitalisation; related to that of the index hospitalisation (same ICD-10-AM chapter); potentially related to hospital care (i.e. complications and adverse events) using various time horizons; and, other reasons. Percentages may not add to 100% due to rounding.
9. Results for hospitals with <1 expected readmission are not shown. Peer hospitals are identified according to the NSW Ministry of Health's peer grouping as of April 2012.
10. The depth of coding has been defined as the average number of secondary diagnosis coded for the index cases. The one year look back method which is used for risk adjustment, to some extent accounts for possible lower depth of coding in some hospitals.

Details of analyses are available in *Spotlight on Measurement: Measuring return to acute care following discharge from hospital, 2nd edition*.

Data source: SAPHaRI, Centre for Epidemiology and Evidence, NSW Ministry of Health.

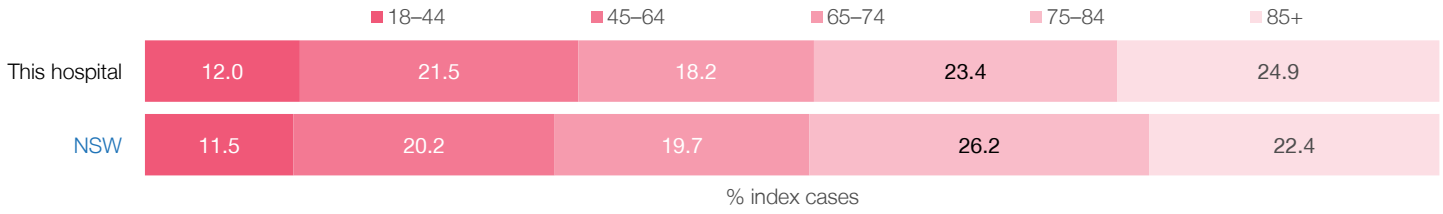
Cessnock District Hospital

30-day return to acute care following hospitalisation for pneumonia

Patient cohort, index cases[3,4]

	This hospital	NSW
Total index cases for pneumonia	209	46,422
Average length of stay (days)	5.9	5.6
Patients transferred in from acute care in another hospital	14	4,505
Discharge destination:		
Home	194	40,374
Other	15	6,048

Age profile for index cases (years)*[5]



Factors associated with 30-day pneumonia return to acute care[6]

*Age was a significant factor in the final model of 30-day readmission following hospitalisation for pneumonia.

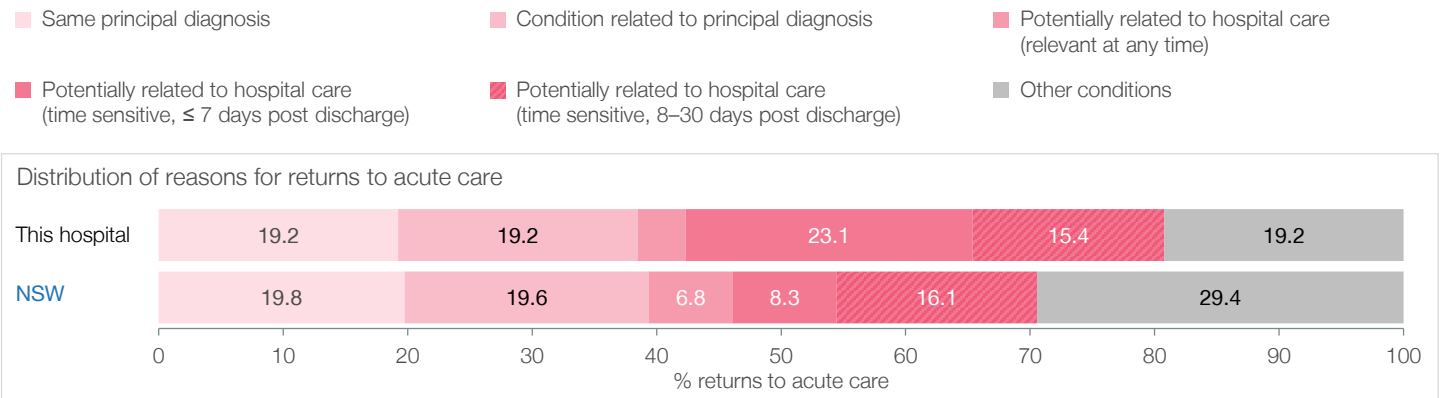
Cessnock District Hospital

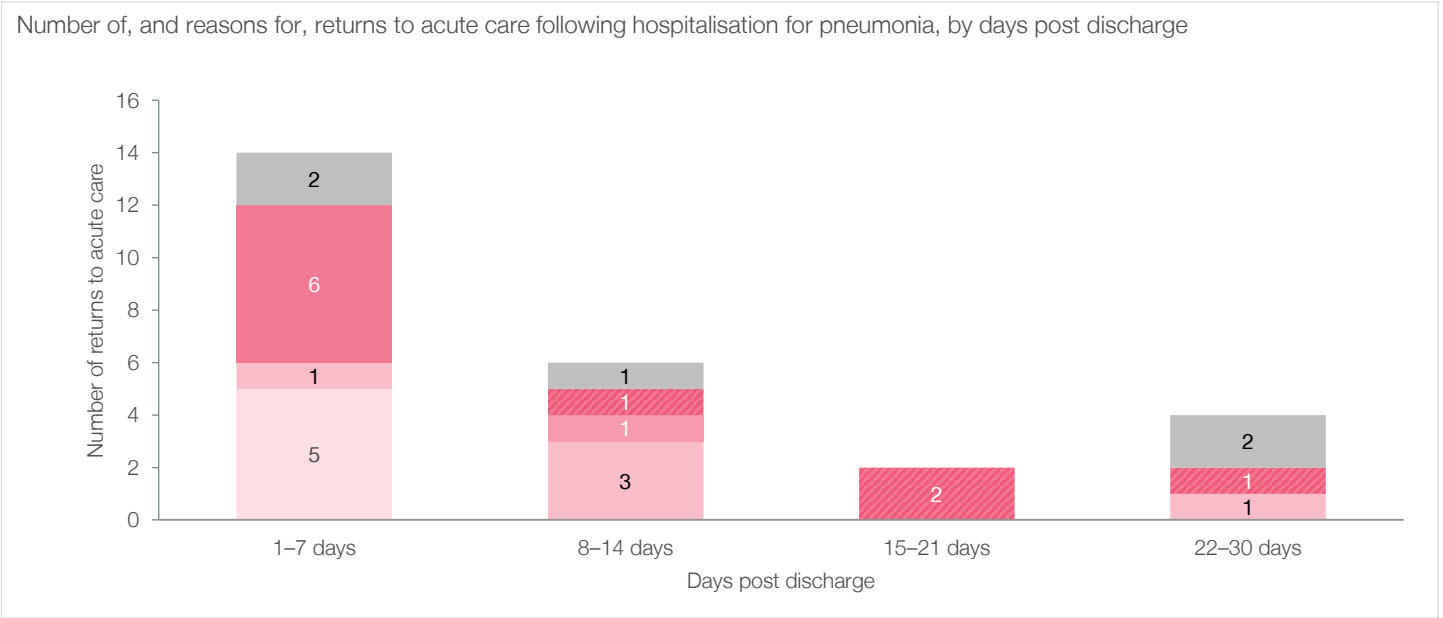
30-day return to acute care following hospitalisation for pneumonia

Location of returns to acute care[7]

	This hospital	NSW
Total readmissions following index hospitalisation for pneumonia	26	6,543
Readmitted to the hospital where acute care was completed	20	5,304
Readmitted to a different hospital	6	1,239
Of these:		
To an urban public hospital	6	
To a regional or rural public hospital	0	
To a private hospital	0	

Reasons for and time to returns to acute care[8]





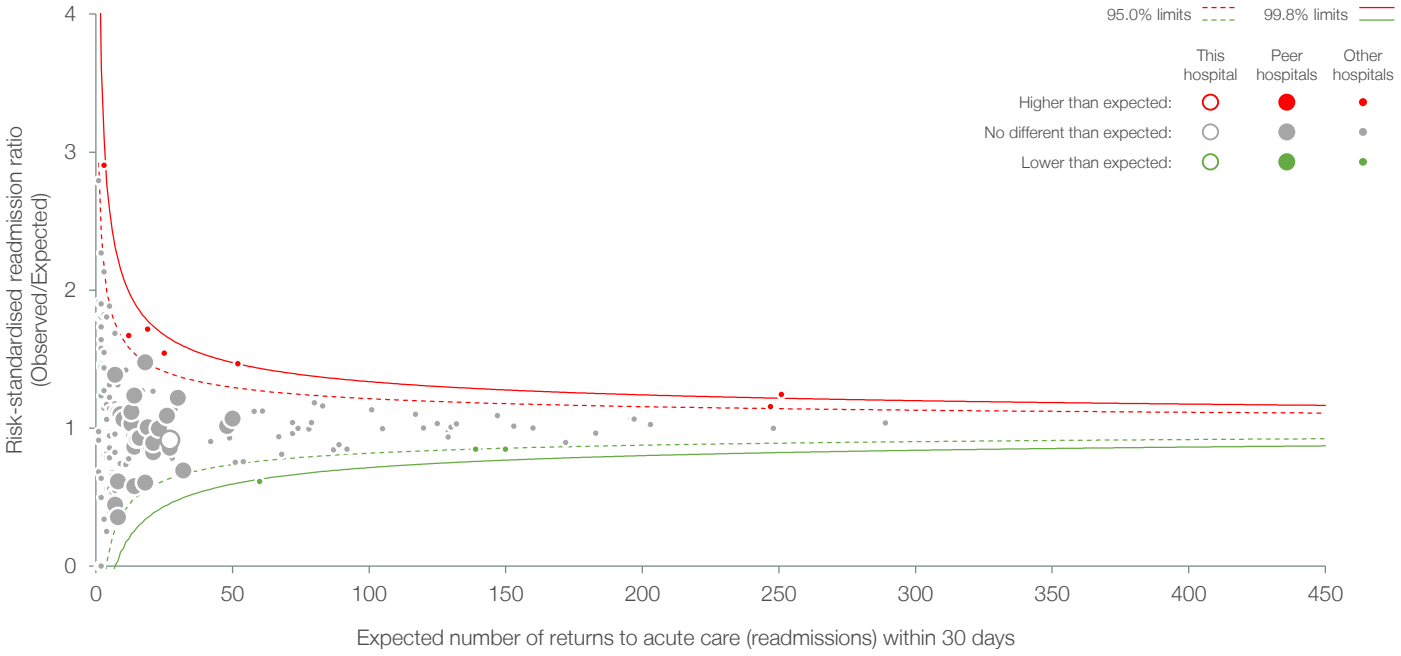
Cessnock District Hospital

30-day return to acute care following hospitalisation for pneumonia

Hospital-specific RSRRs report the ratio of actual or 'observed' number of returns to acute care to the 'expected' number of returns. A competing risk regression model draws on the NSW patient population's characteristics and outcomes to estimate the expected number of returns for each hospital, given the characteristics of its patients.

An RSRR less than 1.0 indicates lower-than-expected returns to acute care, and a ratio higher than 1.0 indicates higher-than-expected returns. Small deviations from 1.0 are not considered to be meaningful. Funnel plots with 95% and 99.8% control limits around the NSW ratio are used to identify outliers.

Hospital level pneumonia RSRR by number of expected returns to acute care (readmissions)[9]



Illustrating the effect of standardisation, July 2012 – June 2015

In order to make fair comparisons, a number of risk adjustments are made to readmission data. These take into account patient factors that influence the likelihood of returning to acute care within 30 days. The table below illustrates the effect of statistical adjustments on this hospital's results.

Unadjusted ratio	Age and sex standardised ratio	Risk-standardised readmission ratio
0.85	0.87	0.91

Ratio: Lower than expected | No different than expected | Higher than expected

The extent to which comorbidities are coded in the patient record may affect risk adjustment. Therefore the 'depth of coding'[10] has been assessed across NSW hospitals. In July 2009 – June 2012, the average depth of coding was 2.5 diagnoses in this hospital and 3.7 in NSW public hospitals; and in July 2012 – June 2015, there were 2.9 diagnoses in this hospital and 4.8 in NSW public hospitals.

Three-yearly RSRR and annual unadjusted readmission rates

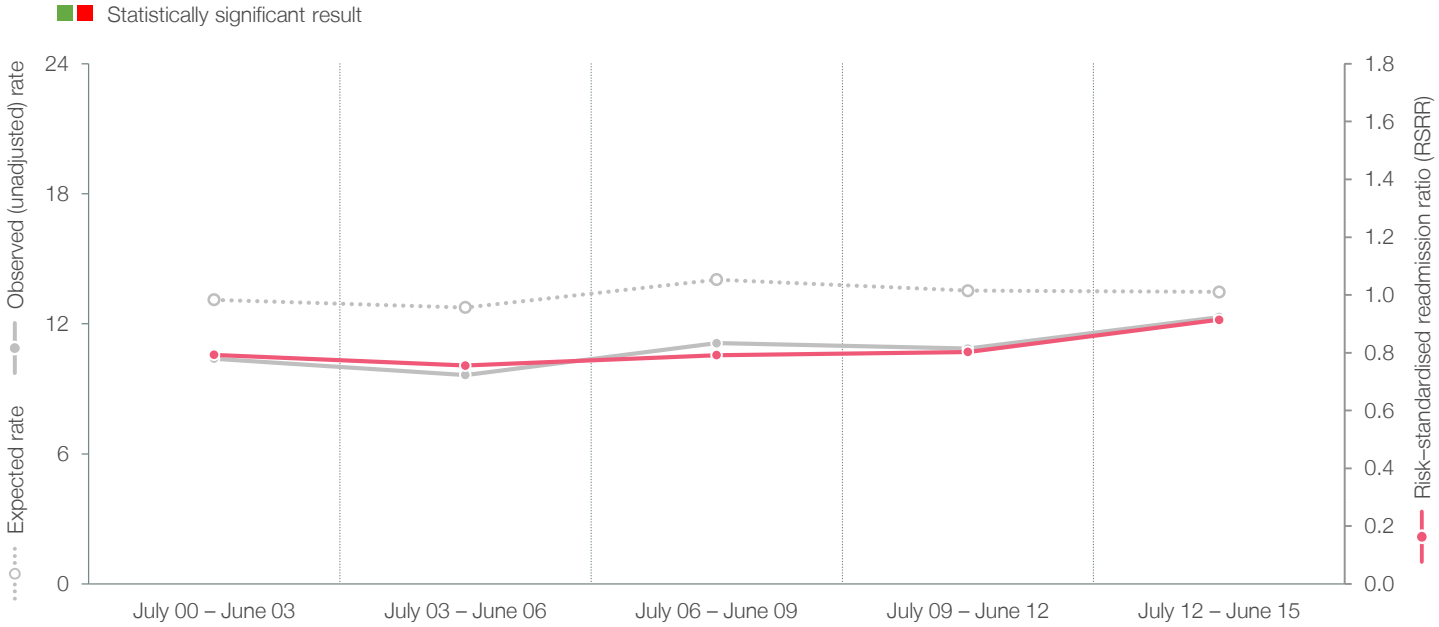
The RSRR is calculated on the basis of three years of data. It takes account of differences in patient characteristics so that assessments of hospital performance are fair. To give an indication of results within the three-year period, the figure below shows the RSRR result for July 2012 – June 2015 alongside differences between this hospital and the NSW result for annual unadjusted readmission rates.

RSRR: Lower than expected | No different than expected | Higher than expected

Cessnock District Hospital

30-day return to acute care following hospitalisation for pneumonia

Pneumonia, this hospital's risk-standardised readmission ratio, expected readmission rates and observed (unadjusted) readmission rates, July 2000 – June 2015



Notes

1. Data refer to patients who were discharged from this hospital, between July 2012 and June 2015, following an acute hospitalisation with pneumonia as principal diagnosis (ICD-10-AM codes J13, J14, J15, J16, J18).
2. Returns to acute care are to any NSW hospital in the 30 days (for acute conditions) or 60 days (for elective surgeries) following discharge, and are attributed to the last discharging hospital. For patients whose acute hospitalisation ended in discharge home, a return to acute care involves readmission to hospital; while for patients whose acute hospitalisation ended with a 'discharge' to non-acute care, a return involved a move back into an acute care setting regardless of whether they physically left the hospital.
3. For calculation of average length of stay, index admissions that were transferred in from, or transferred out to, another acute care hospital were excluded. Unreasonably long episodes are trimmed on the basis of the Diagnosis Related Group (DRG) of the episode. The trim point is the third quartile plus 1.5 x the interquartile range of all in-scope episodes in each DRG.
4. Discharge destinations are based on the mode of separation of the index case. For episodes coded as 'Discharged by hospital' or 'Discharged on leave', patients are considered to be destined for their place of usual residence. All other modes of separation are deemed to indicate a discharge destination other than a patient's place of usual residence.
5. Age at admission date.
6. Comorbidities are identified from the hospital discharge records using the Elixhauser comorbidity set (plus dementia) with a one year look-back from the admission date of the index case. Only those conditions that were shown to have a significant impact on readmission ($P<0.05$) are shown.
7. Hospitals are classified as urban and regional/rural using the geocoded address of the hospital assigned to ABS statistical areas (SA2) and the Australian remoteness index for areas.
8. Reasons for return to acute care are classified according to a draft specification made available to BHI by the Australian Institute of Health and Welfare. Principal diagnoses for the return to acute care episode, are stratified as: the same as the index hospitalisation; related to that of the index hospitalisation (same ICD-10-AM chapter); potentially related to hospital care (i.e. complications and adverse events) using various time horizons; and, other reasons. Percentages may not add to 100% due to rounding.
9. Results for hospitals with <1 expected readmission are not shown. Peer hospitals are identified according to the NSW Ministry of Health's peer grouping as of April 2012.
10. The depth of coding has been defined as the average number of secondary diagnosis coded for the index cases. The one year look back method which is used for risk adjustment, to some extent accounts for possible lower depth of coding in some hospitals.

Details of analyses are available in *Spotlight on Measurement: Measuring return to acute care following discharge from hospital, 2nd edition*.

Data source: SAPHaRI, Centre for Epidemiology and Evidence, NSW Ministry of Health.

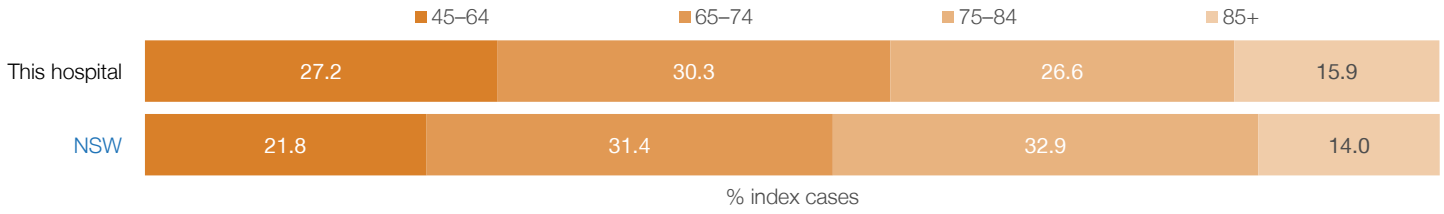
Cessnock District Hospital

30-day return to acute care following hospitalisation for chronic obstructive pulmonary disease

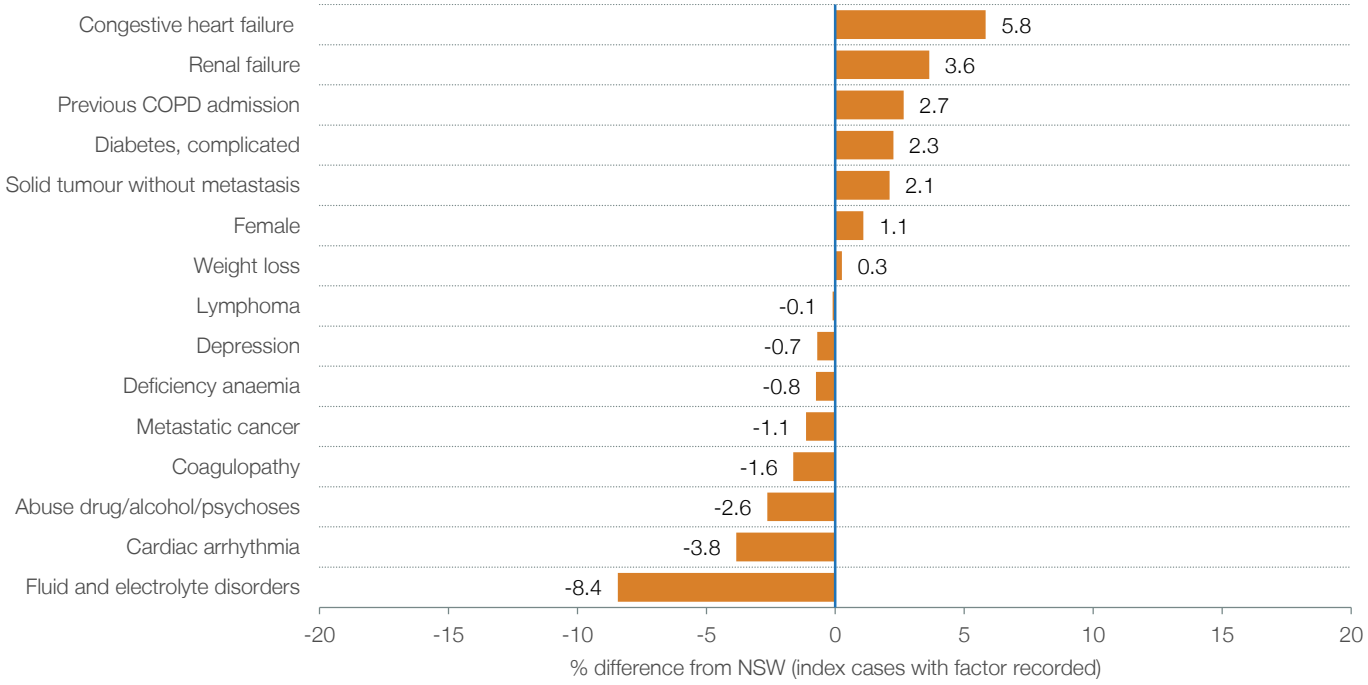
Patient cohort, index cases[3,4]

	This hospital	NSW
Total index cases for chronic obstructive pulmonary disease	290	47,359
Average length of stay (days)	6.2	5.3
Patients transferred in from acute care in another hospital	15	3,367
Discharge destination:		
Home	280	42,937
Other	10	4,422

Age profile for index cases (years)*[5]



Factors associated with 30-day chronic obstructive pulmonary disease return to acute care[6]



*Age was a significant factor in the final model of 30-day readmission following hospitalisation for chronic obstructive pulmonary disease.

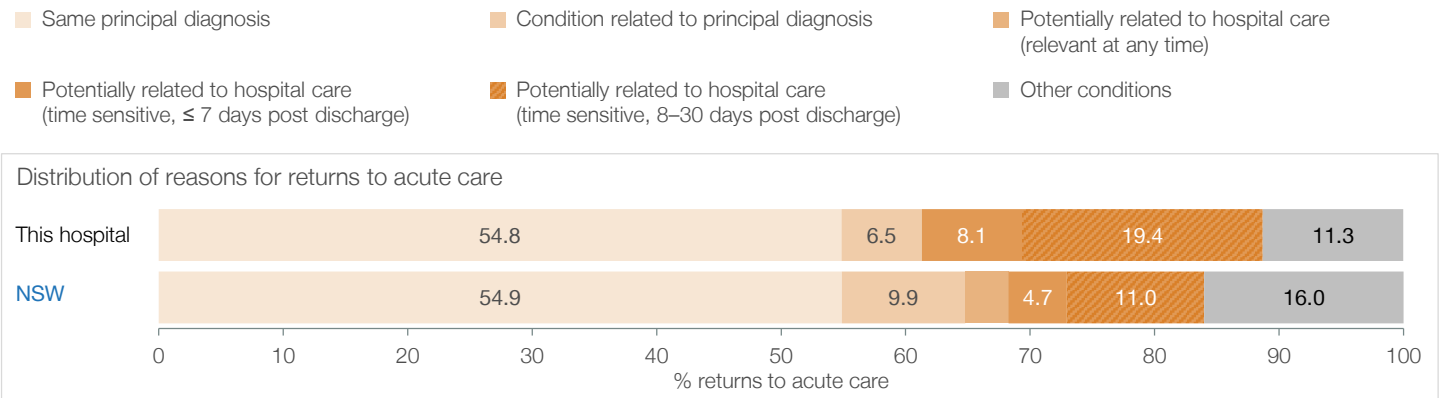
Cessnock District Hospital

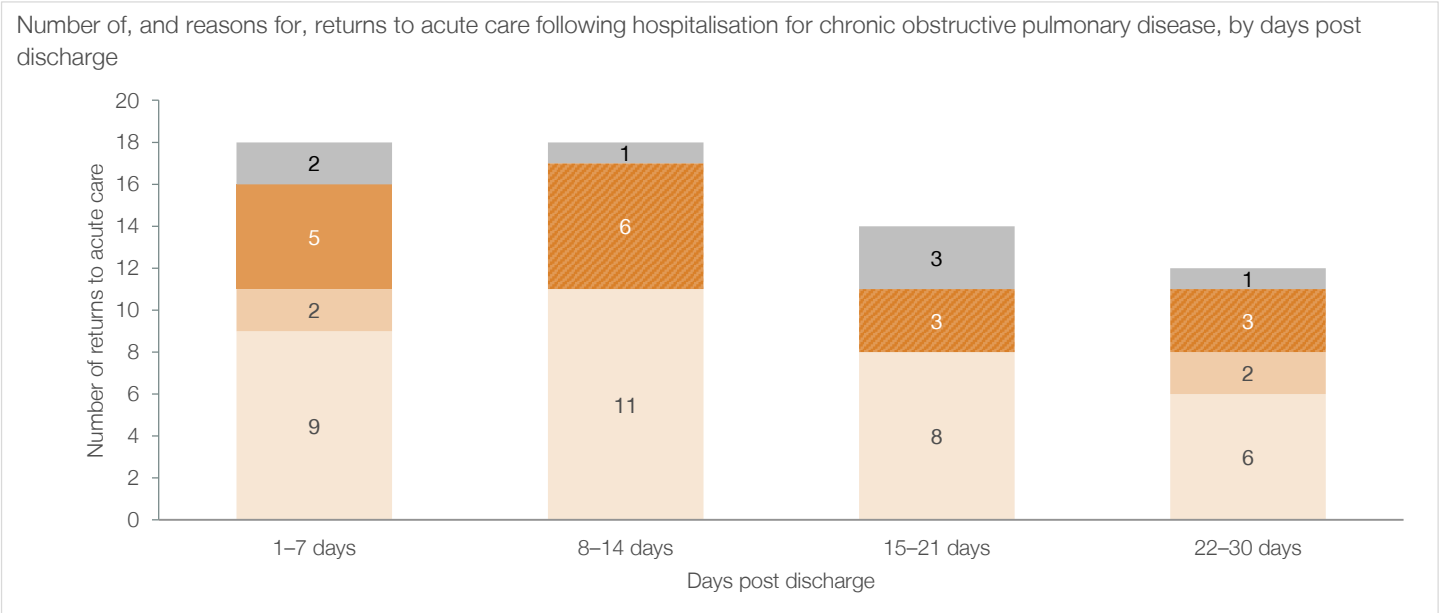
30-day return to acute care following hospitalisation for chronic obstructive pulmonary disease

Location of returns to acute care[7]

	This hospital	NSW
Total readmissions following index hospitalisation for chronic obstructive pulmonary disease	62	10,293
Readmitted to the hospital where acute care was completed	52	8,696
Readmitted to a different hospital	10	1,597
Of these:		
To an urban public hospital	10	
To a regional or rural public hospital	0	
To a private hospital	0	

Reasons for and time to returns to acute care[8]





Cessnock District Hospital

30-day return to acute care following hospitalisation for chronic obstructive pulmonary disease

Hospital-specific RSRRs report the ratio of actual or 'observed' number of returns to acute care to the 'expected' number of returns. A competing risk regression model draws on the NSW patient population's characteristics and outcomes to estimate the expected number of returns for each hospital, given the characteristics of its patients.

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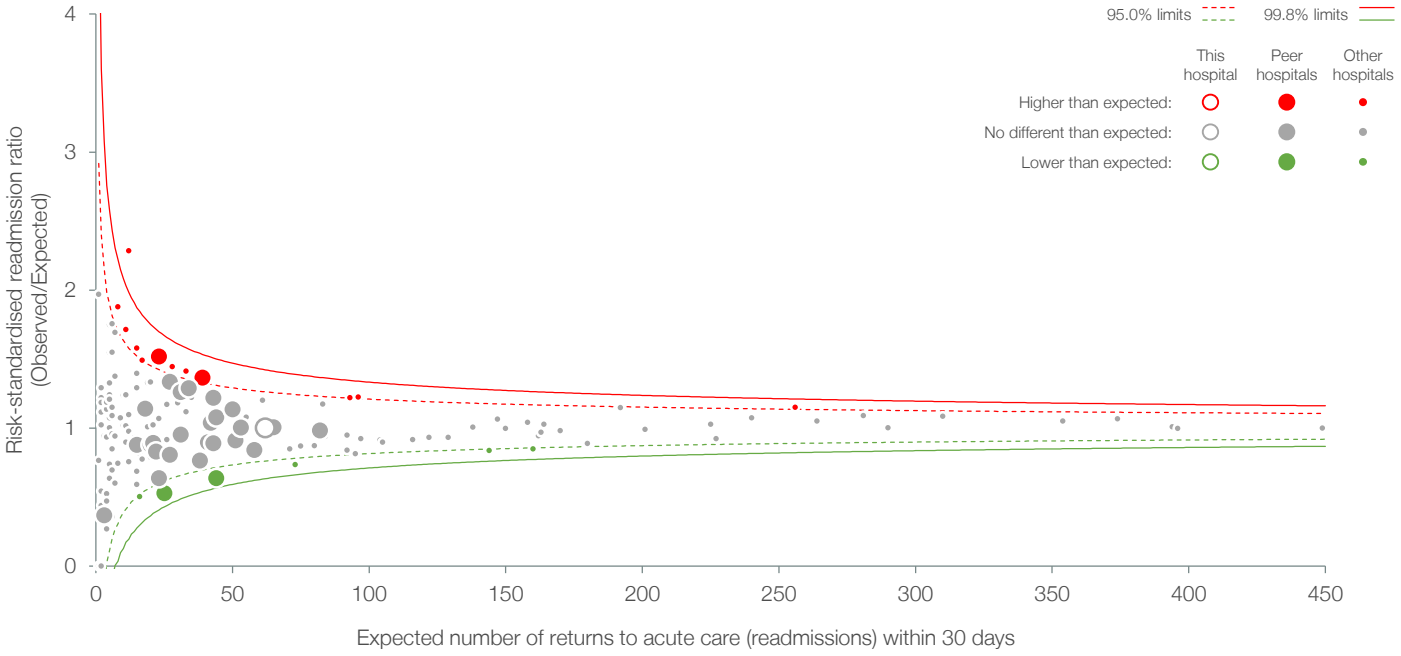
Hospital level chronic obstructive pulmonary disease RSRR by number of expected returns to acute care (readmissions)[9]



Illustrating the effect of standardisation, July 2012 – June 2015

In order to make fair comparisons, a number of risk adjustments are made to readmission data. These take into account patient factors that influence the likelihood of returning to acute care within 30 days. The table below illustrates the effect of statistical adjustments on this hospital's results.

Unadjusted ratio	Age and sex standardised ratio	Risk-standardised readmission ratio
0.99	1.01	1.00

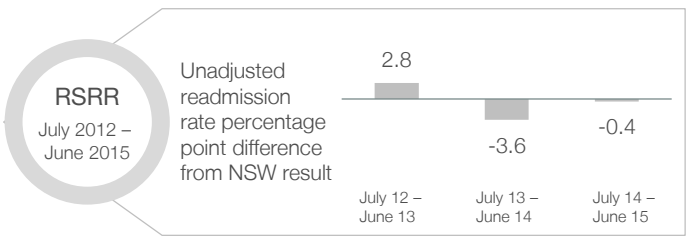
Ratio: Lower than expected | No different than expected | Higher than expected

The extent to which comorbidities are coded in the patient record may affect risk adjustment. Therefore the 'depth of coding'[10] has been assessed across NSW hospitals. In July 2009 – June 2012, the average depth of coding was 2.8 diagnoses in this hospital and 3.2 in NSW public hospitals; and in July 2012 – June 2015, there were 2.7 diagnoses in this hospital and 4.1 in NSW public hospitals.

Three-yearly RSRR and annual unadjusted readmission rates

The RSRR is calculated on the basis of three years of data. It takes account of differences in patient characteristics so that assessments of hospital performance are fair. To give an indication of results within the three-year period, the figure below shows the RSRR result for July 2012 – June 2015 alongside differences between this hospital and the NSW result for annual unadjusted readmission rates.

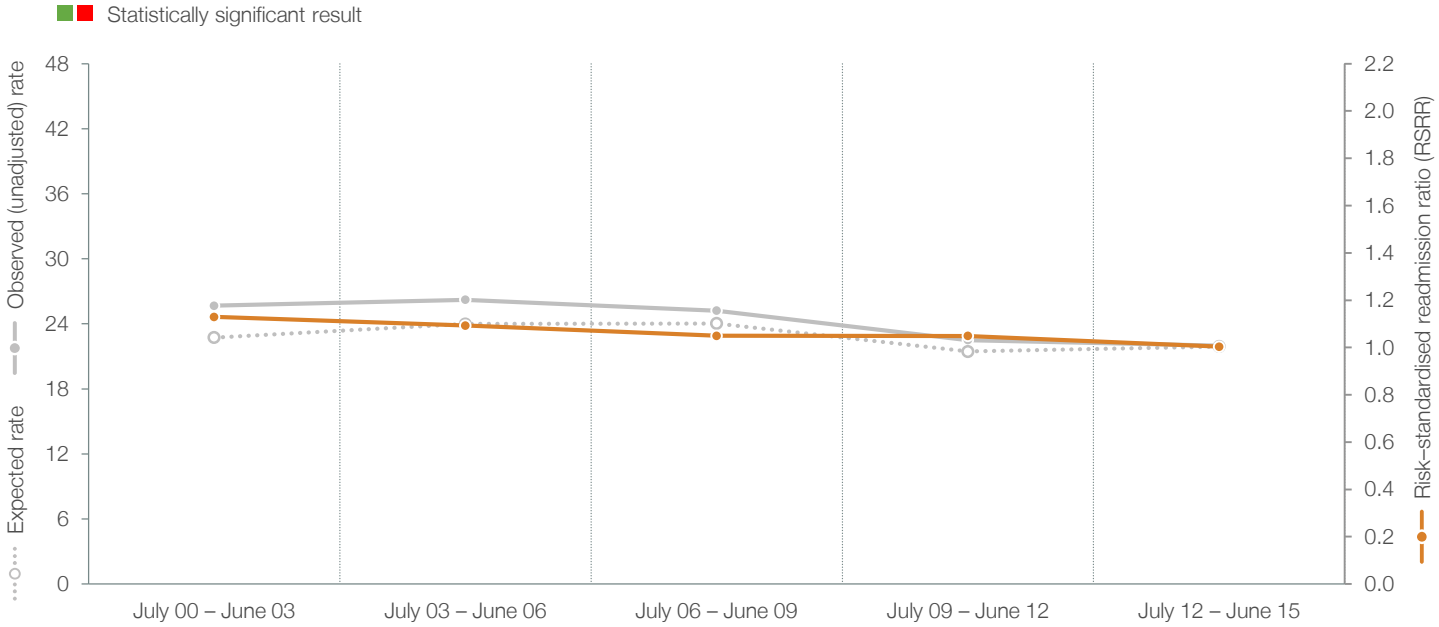
RSRR: Lower than expected | No different than expected | Higher than expected



Cessnock District Hospital

30-day return to acute care following hospitalisation for chronic obstructive pulmonary disease

Chronic obstructive pulmonary disease, this hospital's risk-standardised readmission ratio, expected readmission rates and observed (unadjusted) readmission rates, July 2000 – June 2015



Notes

1. Data refer to patients who were discharged from this hospital, between July 2012 and June 2015, following an acute hospitalisation with COPD as principal diagnosis (ICD-10-AM code J41, J42, J43, J44, J47, and J20 and J40 if accompanied by J41, J42, J43, J44 and J47 in any secondary diagnoses).
2. Returns to acute care are to any NSW hospital in the 30 days (for acute conditions) or 60 days (for elective surgeries) following discharge, and are attributed to the last discharging hospital. For patients whose acute hospitalisation ended in discharge home, a return to acute care involves readmission to hospital; while for patients whose acute hospitalisation ended with a 'discharge' to non-acute care, a return involved a move back into an acute care setting regardless of whether they physically left the hospital.
3. For calculation of average length of stay, index admissions that were transferred in from, or transferred out to, another acute care hospital were excluded. Unreasonably long episodes are trimmed on the basis of the Diagnosis Related Group (DRG) of the episode. The trim point is the third quartile plus 1.5 x the interquartile range of all in-scope episodes in each DRG.
4. Discharge destinations are based on the mode of separation of the index case. For episodes coded as 'Discharged by hospital' or 'Discharged on leave', patients are considered to be destined for their place of usual residence. All other modes of separation are deemed to indicate a discharge destination other than a patient's place of usual residence.
5. Age at admission date.
6. Comorbidities are identified from the hospital discharge records using the Elixhauser comorbidity set (plus dementia) with a one year look-back from the admission date of the index case. Only those conditions that were shown to have a significant impact on readmission ($P<0.05$) are shown.
7. Hospitals are classified as urban and regional/rural using the geocoded address of the hospital assigned to ABS statistical areas (SA2) and the Australian remoteness index for areas.
8. Reasons for return to acute care are classified according to a draft specification made available to BHI by the Australian Institute of Health and Welfare. Principal diagnoses for the return to acute care episode, are stratified as: the same as the index hospitalisation; related to that of the index hospitalisation (same ICD-10-AM chapter); potentially related to hospital care (i.e. complications and adverse events) using various time horizons; and, other reasons. Percentages may not add to 100% due to rounding.
9. Results for hospitals with <1 expected readmission are not shown. Peer hospitals are identified according to the NSW Ministry of Health's peer grouping as of April 2012.
10. The depth of coding has been defined as the average number of secondary diagnosis coded for the index cases. The one year look back method which is used for risk adjustment, to some extent accounts for possible lower depth of coding in some hospitals.

Details of analyses are available in *Spotlight on Measurement: Measuring return to acute care following discharge from hospital, 2nd edition*.

Data source: SAPHaRI, Centre for Epidemiology and Evidence, NSW Ministry of Health.

Cessnock District Hospital

30-day return to acute care following hospitalisation for hip fracture surgery

<50 index hospitalisations, results not shown

Cessnock District Hospital

60-day return to acute care following hospitalisation for total hip replacement

<50 index hospitalisations, results not shown

Cessnock District Hospital

60-day return to acute care following hospitalisation for total knee replacement

<50 index hospitalisations, results not shown