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Readmission and returns to acute care following hospitalisation for eight clinical conditions, July 2015 – June 2018

Measures that assess how healthcare affects patient outcomes, such as risk-standardised readmission ratios (RSRR), make a crucial contribution to informing efforts to improve care. They should be looked at alongside other measures and used by clinicians as a tool to prompt discussion and inform the development of quality improvement initiatives.

For this report, readmission includes both readmission following hospital discharge and returns to acute care from non-acute inpatient settings. This allows for fairer comparisons given the range of different arrangements hospitals have in place for non-acute care.
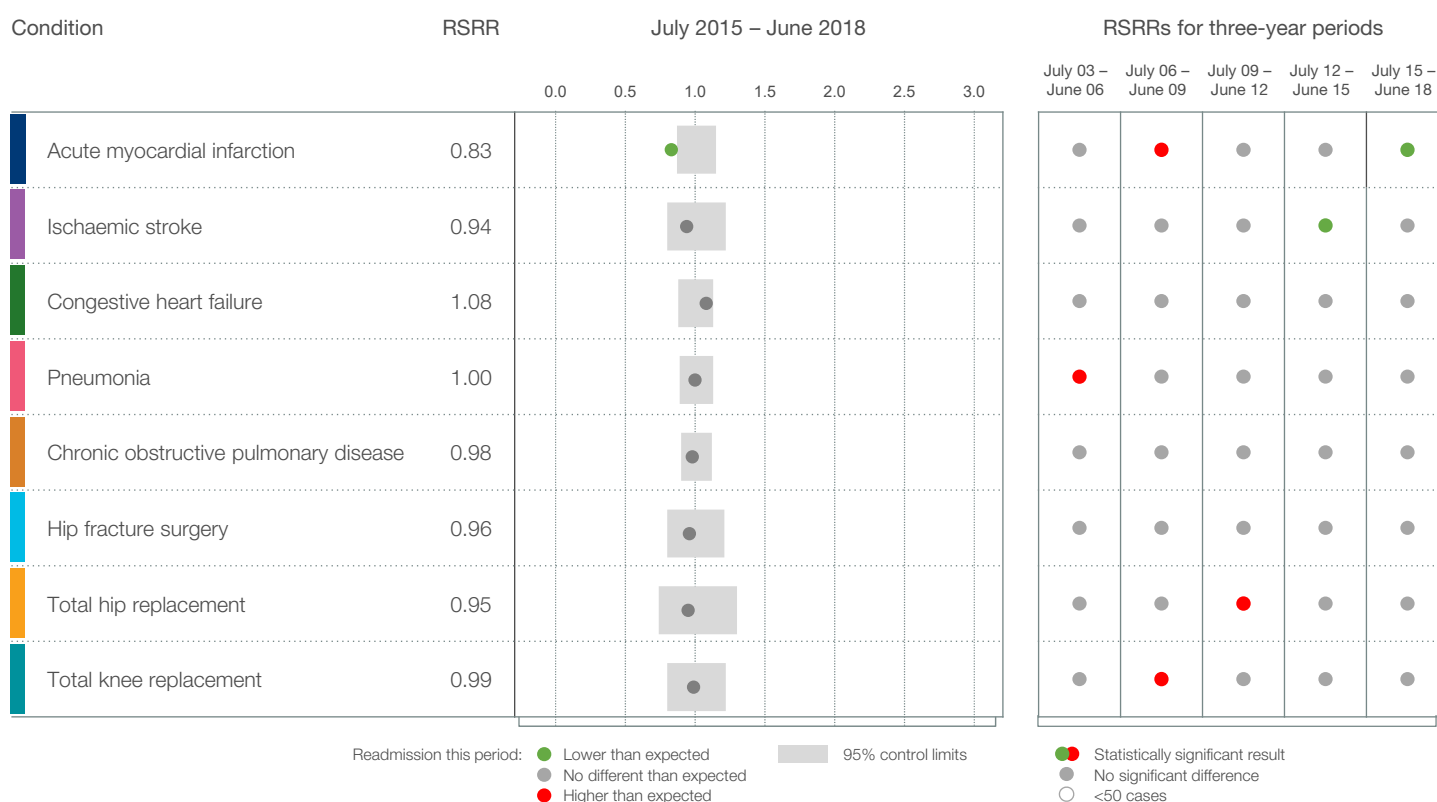
The RSRR differs from other readmission indicators principally because it is risk-adjusted and it takes into account readmission to any, rather than just the same, hospital. This includes readmissions to all hospitals, public and private, and provides a more meaningful and accurate reflection of readmissions, which are attributed to the last discharging hospital.

The RSRR calculation takes into account the volume and characteristics of adults treated in each hospital (known as the case mix), as different hospitals provide care to patients who may be more or less likely to require readmission following discharge.

For each hospital, the RSRR compares the 'observed' number of readmissions to any hospital, within 30 days of discharge for a specific clinical condition or within 60 days for specified surgical procedures, with the 'expected' number of readmissions. The expected number of readmissions is calculated based on all adults admitted with that condition to any New South Wales (NSW) hospital.

The RSRR is a ratio. A ratio of less than 1.0 indicates that readmission was lower than expected to that hospital, whereas a ratio higher than 1.0 indicates higher readmission. Small deviations from 1.0 are not considered meaningful. The RSRR is not designed to compare hospitals to each other. Rather it compares each hospital's outcomes with what would have been expected given its particular case mix.

Risk-standardised readmission ratios (RSRRs) for eight clinical conditions

Condition	RSRR	July 2015 – June 2018	RSRRs for three-year periods

Condition	RSRR	July 03 – June 06	July 06 – June 09	July 09 – June 12	July 12 – June 15	July 15 – June 18
Acute myocardial infarction	0.83	● (grey)	● (red)	● (grey)	● (grey)	● (green)
Ischaemic stroke	0.94	● (grey)	● (grey)	● (grey)	● (green)	● (grey)
Congestive heart failure	1.08	● (grey)	● (grey)	● (grey)	● (grey)	● (grey)
Pneumonia	1.00	● (red)	● (grey)	● (grey)	● (grey)	● (grey)
Chronic obstructive pulmonary disease	0.98	● (grey)	● (grey)	● (grey)	● (grey)	● (grey)
Hip fracture surgery	0.96	● (grey)	● (grey)	● (grey)	● (grey)	● (grey)
Total hip replacement	0.95	● (grey)	● (grey)	● (red)	● (grey)	● (grey)
Total knee replacement	0.99	● (grey)	● (red)	● (grey)	● (grey)	● (grey)

July 2015 – June 2018 scale: 0.0 0.5 1.0 1.5 2.0 2.5 3.0

Readmission this period:
● Lower than expected
● No different than expected
● Higher than expected
▭ 95% control limits

●● Statistically significant result
● No significant difference
○ <50 cases

In June 2017, the NSW Health Admission Policy was released, stating that a patient treated in and discharged from an emergency department (ED) only, should not be recorded as an admitted patient. As a result, patients who attended an ED, but were not transferred to an inpatient ward, were not included in BHI readmission analyses from July 2015 onwards and comparison of results before and after this time should be made with caution. For more information, see the *Technical Supplement – Readmission and returns to acute care following hospitalisation for eight clinical conditions, July 2015-June 2018.*

How to interpret the dashboard

If a hospital's RSRR lies on the grey bar, its readmission is within the range of values expected for a NSW hospital within the control limit

Readmission is lower than expected

Readmission is higher than expected

The length of the bar for each condition reflects the tolerance for variation. It is wider for hospitals admitting a small number of patients

How to interpret a funnel plot

Funnel plots with 95% and 99.8% control limits around the NSW ratio are used to identify outlier hospitals, which are shaded in green or red. Control limits reflect the expected variation in the data.

95% limits   99.8% limits

	This hospital	Peer hospitals	Other hospitals
Higher than expected:	○	●	•
No different than expected:	○	●	•
Lower than expected:	○	●	•

Risk-standardised readmission ratio (RSRR)

Hospital within the range of values expected for a NSW hospital within the control limits (inside the funnel)

Hospital with higher readmission

Hospital with higher readmission (between 95% and 99.8% control limits)

Hospital with lower readmissions

Expected number of readmissions within 30 days

Greater tolerance for variation for hospitals with fewer expected readmissions

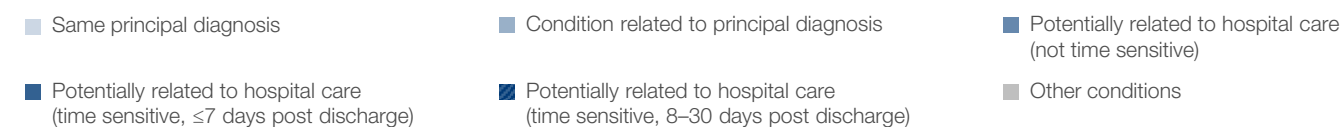Reflects patient volume and case mix at the hospital

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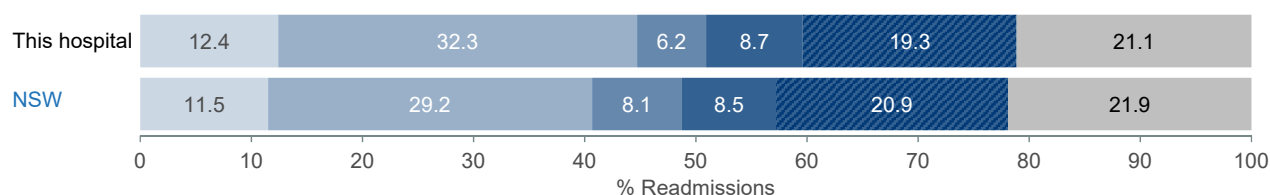## 30-day readmission following hospitalisation for acute myocardial infarction, July 2015 – June 2018

Patient cohort, index hospitalisations[1,2,3]

	This hospital	NSW
Total index cases for acute myocardial infarction	1,303	28,583
Average length of stay (days)	5.4	5.2
Patients transferred in from acute care in another hospital	181	9,182
Discharge destination		
Home	1,203	25,477
Other	100	3,106

Age profile for index hospitalisations (years)[4]

	15–44	45–64	65–74	75–84	85+
This hospital	4.1	36.8	22.0	21.5	15.6
NSW	4.8	34.2	24.1	21.9	15.0

% index cases
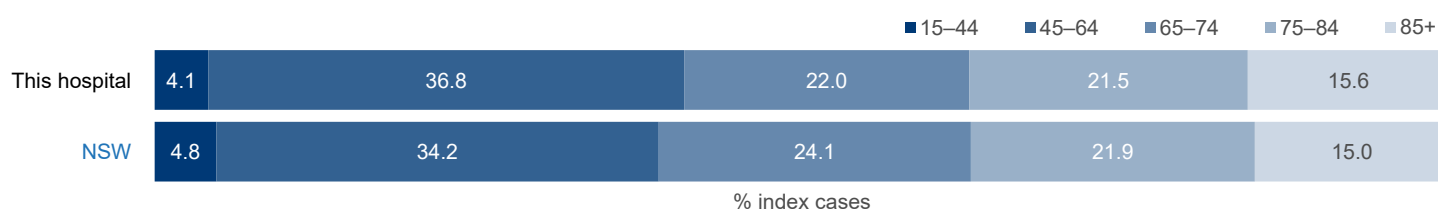
Patient factors associated with 30-day acute myocardial infarction readmission[5,6]
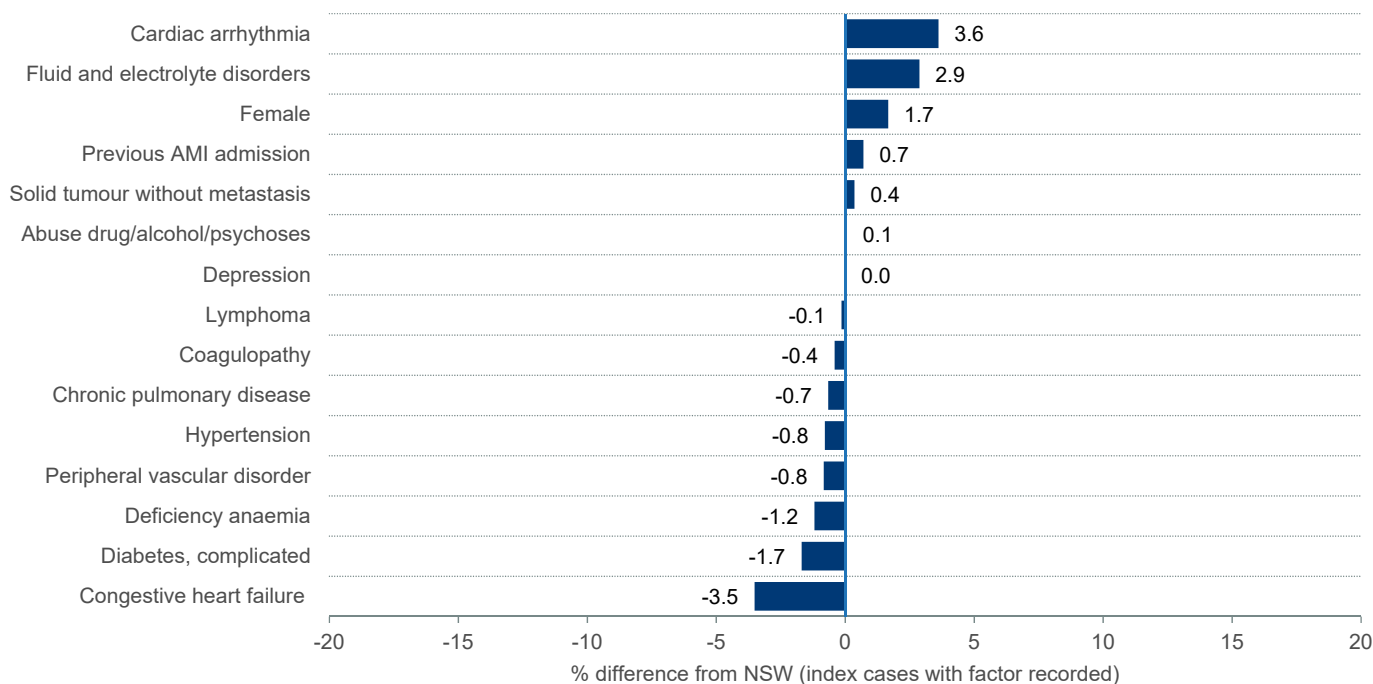
Factor	% difference from NSW
Cardiac arrhythmia	3.6
Fluid and electrolyte disorders	2.9
Female	1.7
Previous AMI admission	0.7
Solid tumour without metastasis	0.4
Abuse drug/alcohol/psychoses	0.1
Depression	0.0
Lymphoma	-0.1
Coagulopathy	-0.4
Chronic pulmonary disease	-0.7
Hypertension	-0.8
Peripheral vascular disorder	-0.8
Deficiency anaemia	-1.2
Diabetes, complicated	-1.7
Congestive heart failure	-3.5

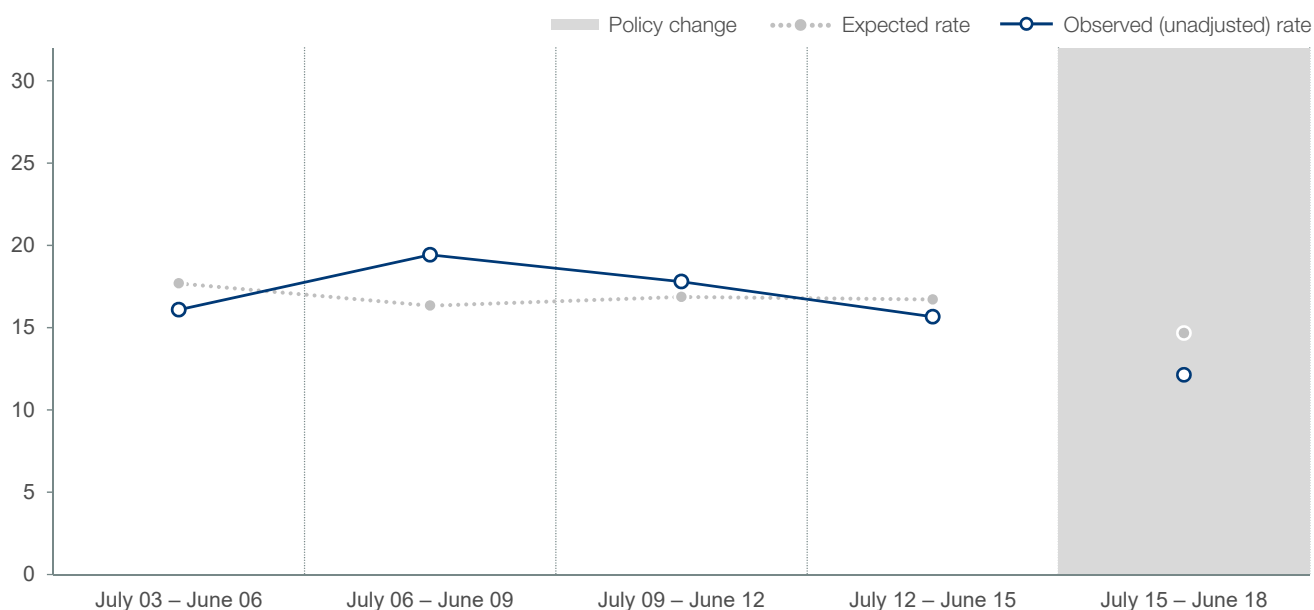% difference from NSW (index cases with factor recorded)

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30-day readmission following hospitalisation for acute myocardial infarction, July 2015 – June 2018

Location of readmissions[7]

	This hospital	NSW
Total readmissions following index hospitalisation for acute myocardial infarction	158	4,250
Returns to acute care	8	159
Readmitted following hospital discharge	150	4,091
Readmitted to the same hospital where acute care was completed	112	2,815
Readmitted to a different hospital	38	1,276
To an urban public hospital	15	
To a regional or rural public hospital	23	
To a private hospital	0	

Reasons for and time to readmission[8]

- Same principal diagnosis
- Condition related to principal diagnosis
- Potentially related to hospital care (not time sensitive)
- Potentially related to hospital care (time sensitive, ≤7 days post discharge)
- Potentially related to hospital care (time sensitive, 8–30 days post discharge)
- Other conditions

Distribution of reasons for readmission

	Same principal diagnosis	Condition related to principal diagnosis	Potentially related (not time sensitive)	Potentially related (time sensitive ≤7 days)	Potentially related (time sensitive 8–30 days)	Other conditions
This hospital	12.4	32.3	6.2	8.7	19.3	21.1
NSW	11.5	29.2	8.1	8.5	20.9	21.9

% Readmissions

Number of, and reasons for, readmissions following hospitalisation for acute myocardial infarction, by days post discharge
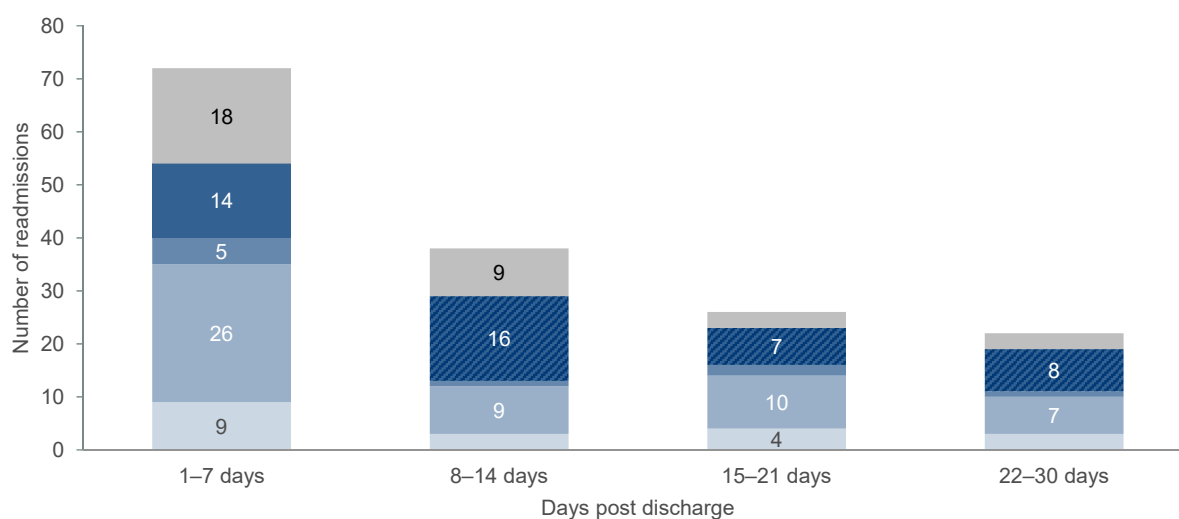
Days post discharge	Same principal diagnosis	Condition related	Potentially related (not time sensitive)	Time sensitive ≤7 days	Time sensitive 8–30 days	Other conditions
1–7 days	9	26	5	14		18
8–14 days		9			16	9
15–21 days	4	10			7	
22–30 days		7			8	

Wollongong Hospital

30-day readmission following hospitalisation for acute myocardial infarction, July 2015 – June 2018

Acute myocardial infarction risk-standardised **readmission ratios** by number of expected readmissions, NSW public hospitals[9]
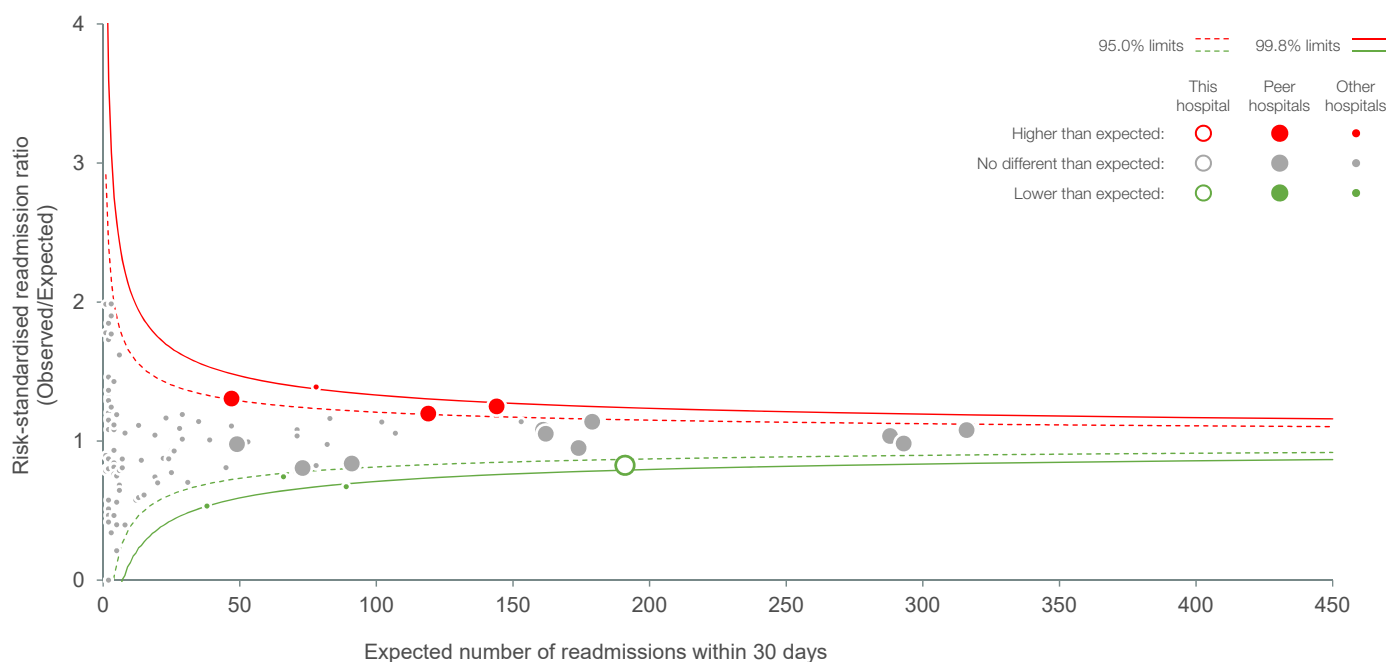
Acute myocardial infarction, this hospital's expected **readmission rates**[10] and observed (unadjusted) readmission rates, July 2003 – June 2018

In June 2017, the NSW Health Admission Policy was released, stating that a patient treated in and discharged from an emergency department (ED) only, should not be recorded as an admitted patient. As a result, patients who attended an ED, but were not transferred to an inpatient ward, were not included in BHI readmission analyses from July 2015 onwards and comparison of results before and after this time should be made with caution. For more information, see the *Technical Supplement – Readmission and returns to acute care following hospitalisation for eight clinical conditions, July 2015-June 2018.*

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Reference notes

1. Data refer to patients aged 15+ years who were discharged from this hospital to a non-acute care setting, between July 2015 and June 2018, following an acute hospitalisation with AMI as principal diagnosis (ICD-10-AM codes I21, I22).

2. 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 1.5x the interquartile range of all in-scope episodes in each DRG.

3. For episodes coded as 'Discharged by hospital' or 'Discharged on leave', patients are considered as discharged home. All other modes of separation are deemed a discharge destination other than home. Where there is a non-acute care admission within one day of any discharge, it is not considered as discharged home regardless of the mode of separation.

4. Age at admission date.

5. Comorbidities are identified from the hospital discharge records using the Elixhauser comorbidity set (plus dementia) with a one year look-back from the date of the admission. Only those conditions that were found to have a statistically significant impact on readmission (p<0.05) are shown.

6. Age was a statistically significant factor in the final model for acute myocardial infarction.

7. Readmissions include both returns to acute care from non-acute inpatient settings and readmissions following hospital discharge. Hospitals are classified as urban and regional/rural using the geocoded address of the hospital assigned to Australian Bureau of Statistics statistical areas (SA2) and the Australian remoteness index for areas.

8. Reasons for readmission follow the same clinical grouping as used in the previous report *Return to acute care following discharge from hospital, July 2012 – June 2015*. Please refer to the previously published *Spotlight on Measurement: Measuring return to acute care following discharge from hospital, 2nd edition*, which outline the specifications used to describe reasons for readmission.

9. Results for hospitals with expected readmission <1 are not shown. Hospitals are classified according to the NSW Ministry of Health's peer grouping as at January 2018.

10. Readmission rates at an average NSW public hospital with the same case-mix.

Details of analyses are available in *Spotlight on Measurement: Measuring return to acute care following discharge from hospital, 2nd edition* and the *Technical Supplement – Readmission and returns to acute care following hospitalisation for eight clinical conditions, July 2015-June 2018*.

Data source: BHI analyses of Hospital Performance Dataset, NSW Ministry of Health Secure Analytics for Population Health Research and Intelligence.
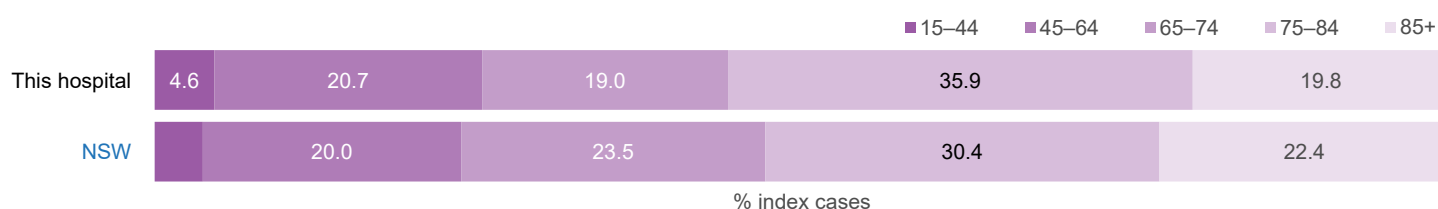
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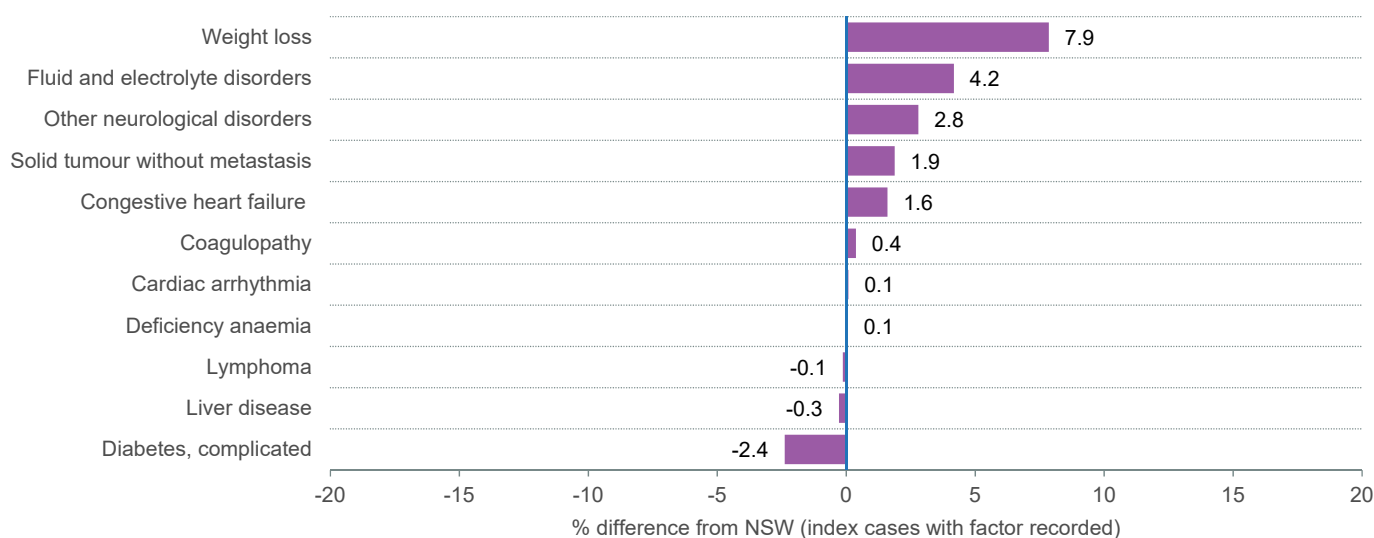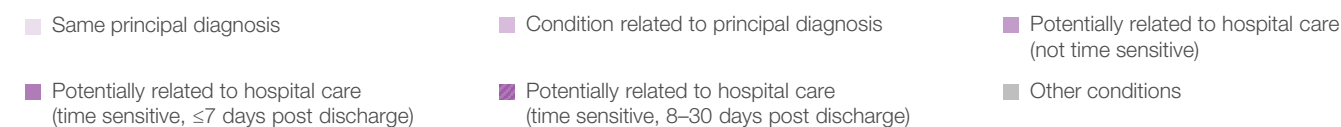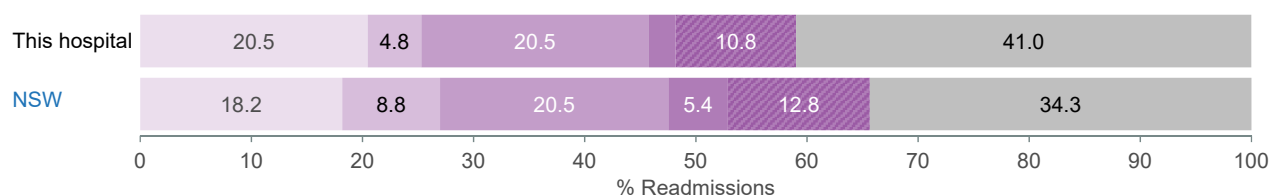## 30-day readmission following hospitalisation for ischaemic stroke, July 2015 – June 2018

Patient cohort, index hospitalisations[1,2,3]

	This hospital	NSW
Total index cases for ischaemic stroke	822	16,435
Average length of stay (days)	8.7	7.3
Patients transferred in from acute care in another hospital	82	1,916
Discharge destination		
Home	478	8,688
Other	344	7,747

Age profile for index hospitalisations (years)[4]

Legend: ■ 15–44 ■ 45–64 ■ 65–74 ■ 75–84 ■ 85+

	15–44	45–64	65–74	75–84	85+
This hospital	4.6	20.7	19.0	35.9	19.8
NSW		20.0	23.5	30.4	22.4

% index cases

Patient factors associated with 30-day ischaemic stroke readmission[5,6]

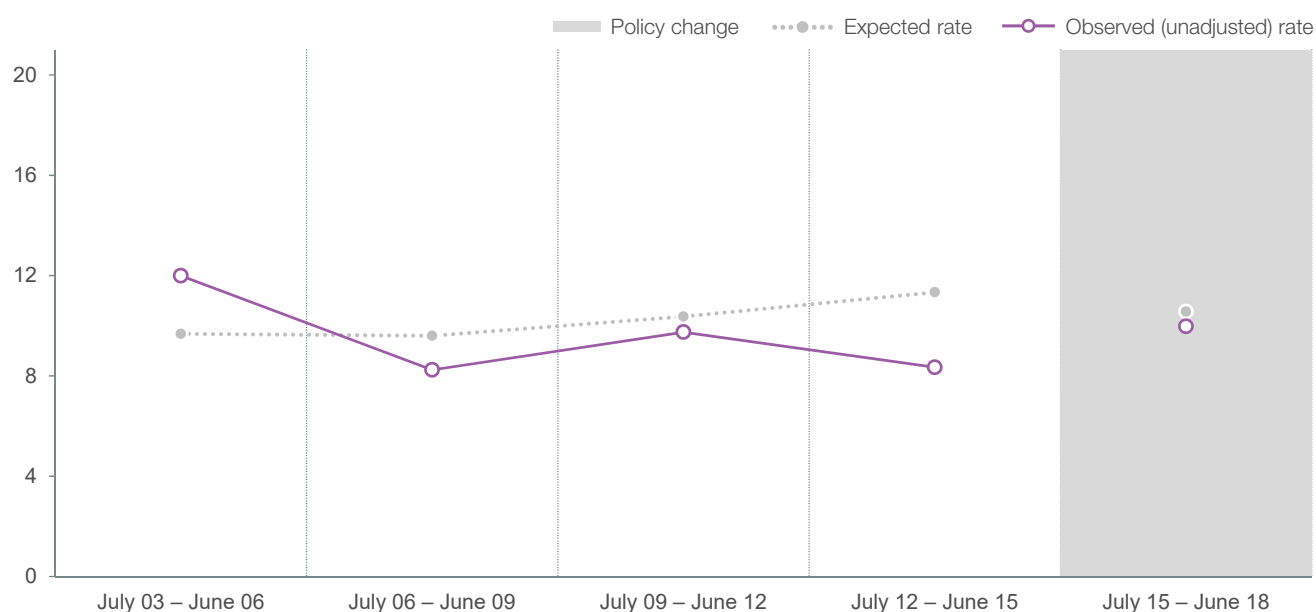| Factor	% difference from NSW
Weight loss	7.9
Fluid and electrolyte disorders	4.2
Other neurological disorders	2.8
Solid tumour without metastasis	1.9
Congestive heart failure	1.6
Coagulopathy	0.4
Cardiac arrhythmia	0.1
Deficiency anaemia	0.1
Lymphoma	-0.1
Liver disease	-0.3
Diabetes, complicated	-2.4

% difference from NSW (index cases with factor recorded)

Wollongong Hospital

30-day readmission following hospitalisation for ischaemic stroke, July 2015 – June 2018

Location of readmissions[7]

	This hospital	NSW
Total readmissions following index hospitalisation for ischaemic stroke	82	1,638
Returns to acute care	30	505
Readmitted following hospital discharge	52	1,133
Readmitted to the same hospital where acute care was completed	43	868
Readmitted to a different hospital	9	265
To an urban public hospital	8	
To a regional or rural public hospital	1	
To a private hospital	0	

Reasons for and time to readmission[8]

- Same principal diagnosis
- Condition related to principal diagnosis
- Potentially related to hospital care (not time sensitive)
- Potentially related to hospital care (time sensitive, ≤7 days post discharge)
- Potentially related to hospital care (time sensitive, 8–30 days post discharge)
- Other conditions

Distribution of reasons for readmission

This hospital: 20.5 | 4.8 | 20.5 | 10.8 | 41.0
NSW: 18.2 | 8.8 | 20.5 | 5.4 | 12.8 | 34.3

% Readmissions

Number of, and reasons for, readmissions following hospitalisation for ischaemic stroke, by days post discharge
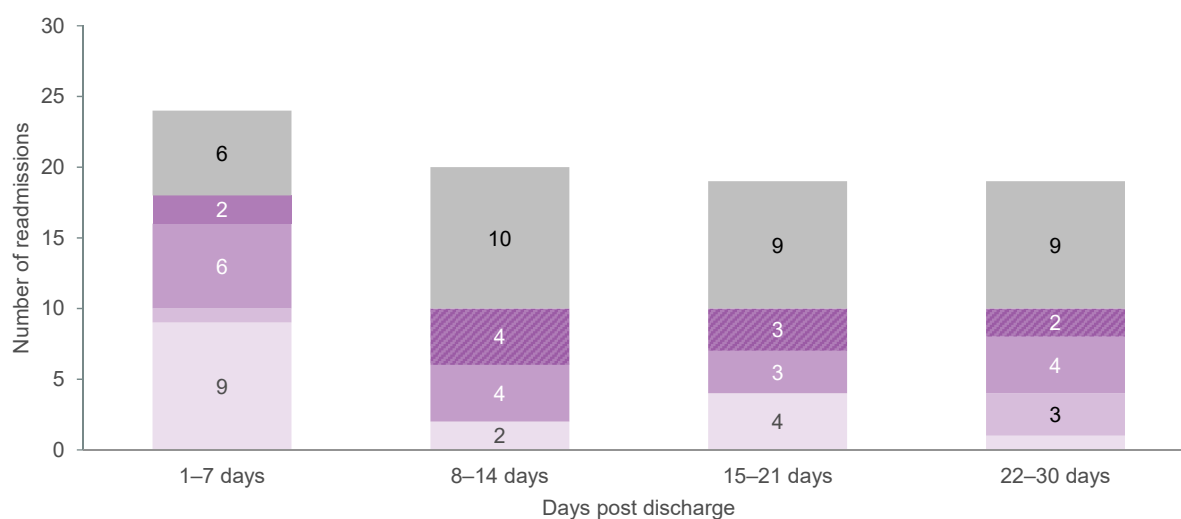
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30-day readmission following hospitalisation for ischaemic stroke, July 2015 – June 2018

Ischaemic stroke risk-standardised **readmission ratios** by number of expected readmissions, NSW public hospitals[9]
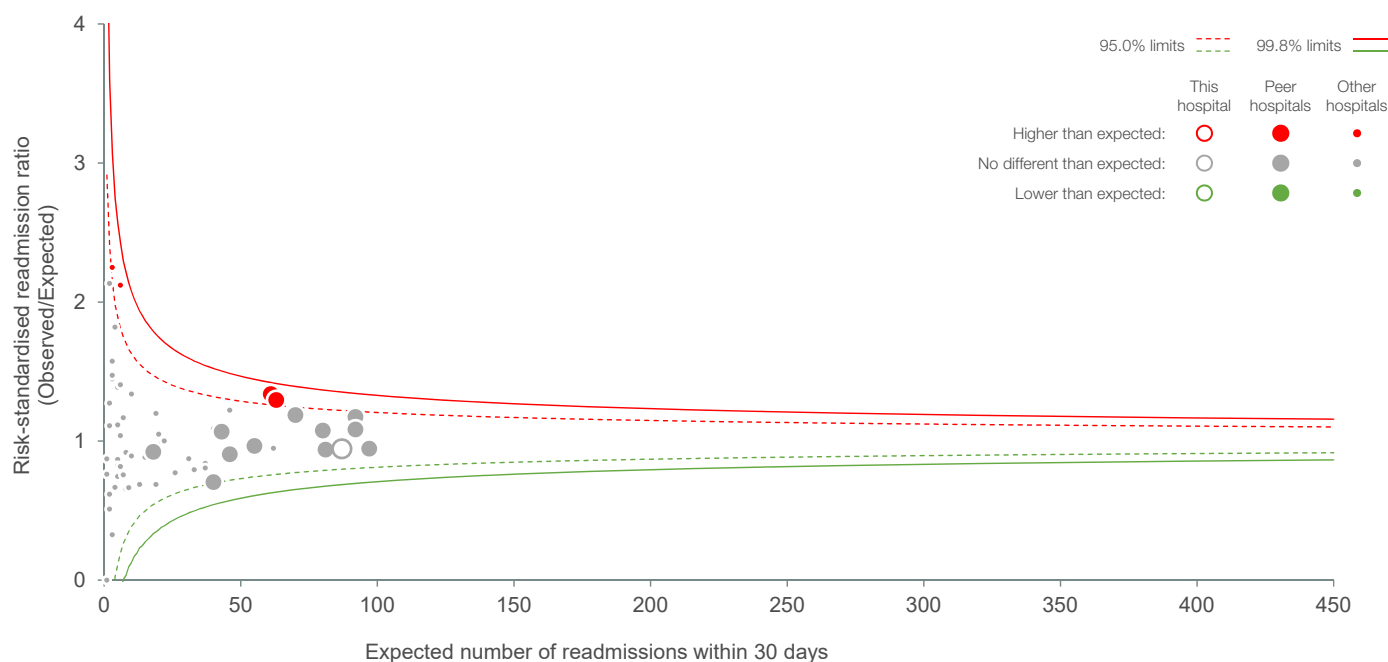
Ischaemic stroke, this hospital's expected **readmission rates**[10] and observed (unadjusted) readmission rates, July 2003 – June 2018

In June 2017, the NSW Health Admission Policy was released, stating that a patient treated in and discharged from an emergency department (ED) only, should not be recorded as an admitted patient. As a result, patients who attended an ED, but were not transferred to an inpatient ward, were not included in BHI readmission analyses from July 2015 onwards and comparison of results before and after this time should be made with caution. For more information, see the *Technical Supplement – Readmission and returns to acute care following hospitalisation for eight clinical conditions, July 2015-June 2018*.

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Reference notes

1. Data refer to patients aged 15+ years who were discharged from this hospital to a non-acute care setting, between July 2015 and June 2018, following an acute hospitalisation with ischaemic stroke as principal diagnosis (ICD-10-AM code I63).

2. 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 1.5x the interquartile range of all in-scope episodes in each DRG.

3. For episodes coded as 'Discharged by hospital' or 'Discharged on leave', patients are considered as discharged home. All other modes of separation are deemed a discharge destination other than home. Where there is a non-acute care admission within one day of any discharge, it is not considered as discharged home regardless of the mode of separation.

4. Age at admission date.

5. Comorbidities are identified from the hospital discharge records using the Elixhauser comorbidity set (plus dementia) with a one year look-back from the date of the admission. Only those conditions that were found to have a statistically significant impact on readmission (p<0.05) are shown.

6. Age was not a statistically significant factor in the final model for ischaemic stroke.

7. Readmissions include both returns to acute care from non-acute inpatient settings and readmissions following hospital discharge. Hospitals are classified as urban and regional/rural using the geocoded address of the hospital assigned to Australian Bureau of Statistics statistical areas (SA2) and the Australian remoteness index for areas.

8. Reasons for readmission follow the same clinical grouping as used in the previous report *Return to acute care following discharge from hospital, July 2012 – June 2015*. Please refer to the previously published *Spotlight on Measurement: Measuring return to acute care following discharge from hospital, 2nd edition*, which outline the specifications used to describe reasons for readmission.

9. Results for hospitals with expected readmission <1 are not shown. Hospitals are classified according to the NSW Ministry of Health's peer grouping as at January 2018.

10. Readmission rates at an average NSW public hospital with the same case-mix.

Details of analyses are available in *Spotlight on Measurement: Measuring return to acute care following discharge from hospital, 2nd edition* and the *Technical Supplement – Readmission and returns to acute care following hospitalisation for eight clinical conditions, July 2015-June 2018*.

Data source: BHI analyses of Hospital Performance Dataset, NSW Ministry of Health Secure Analytics for Population Health Research and Intelligence.

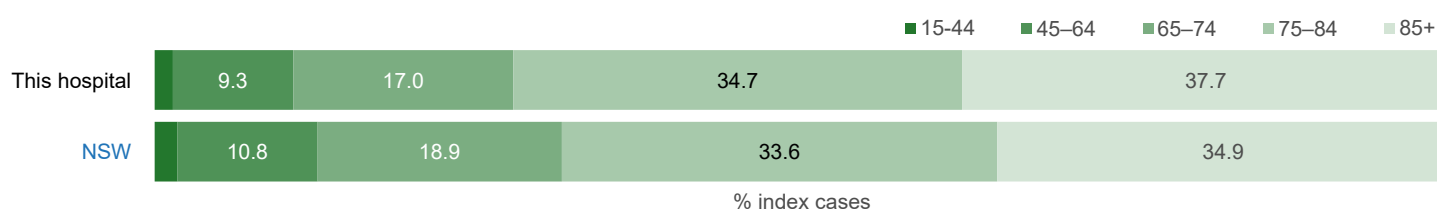bureau of
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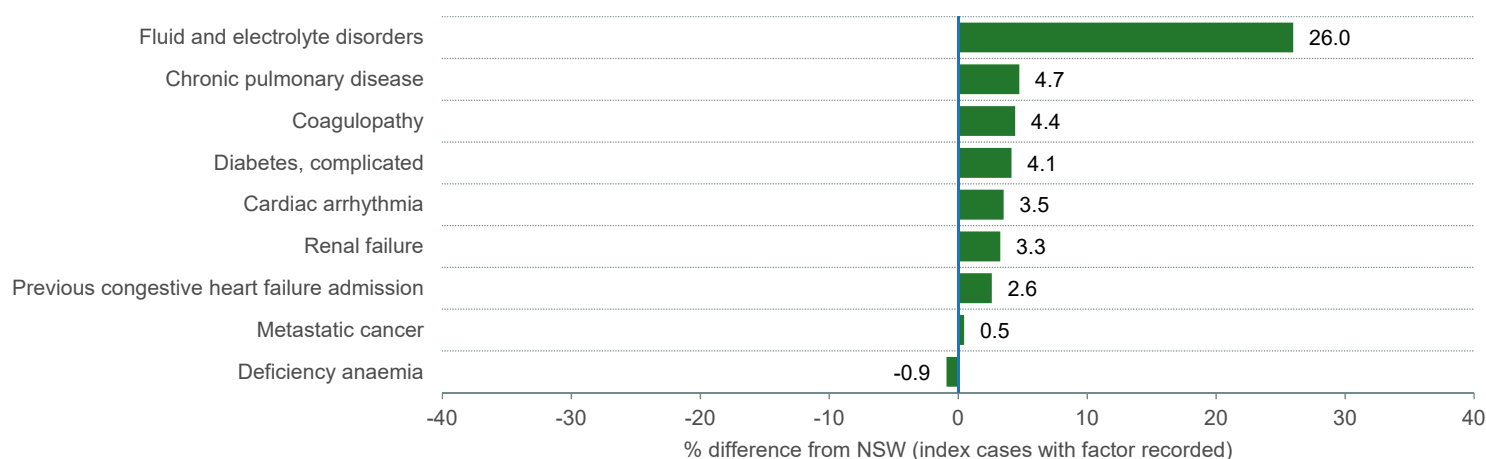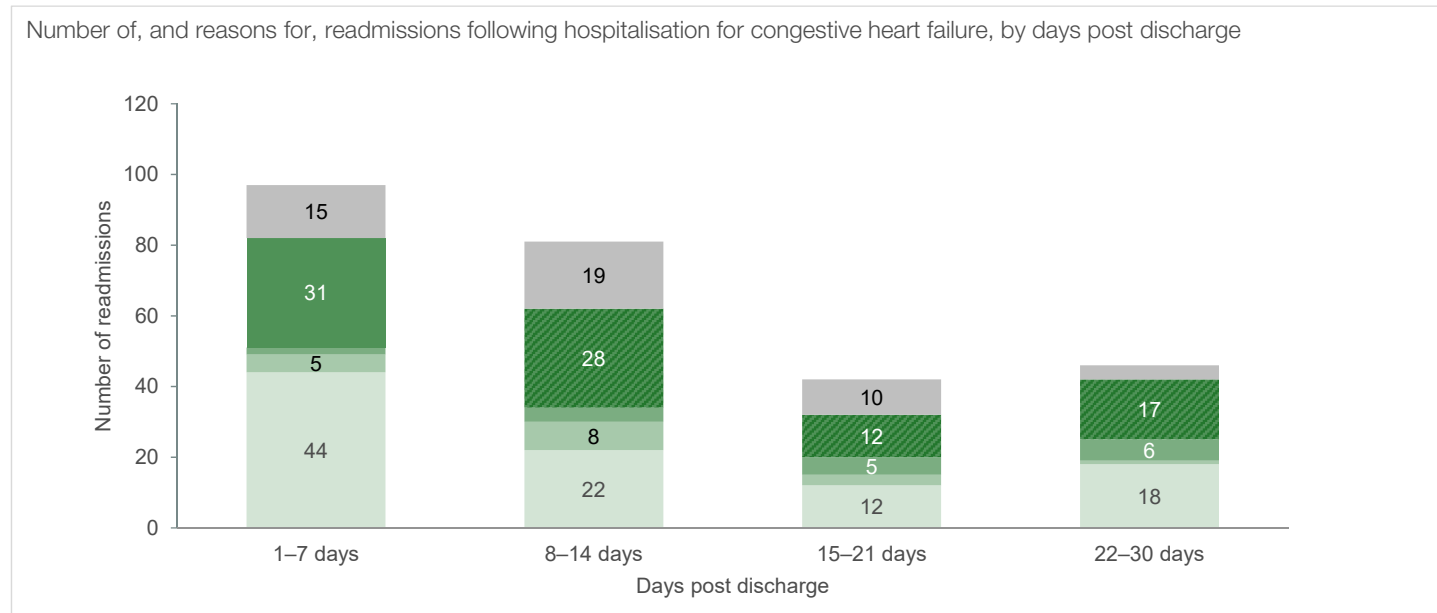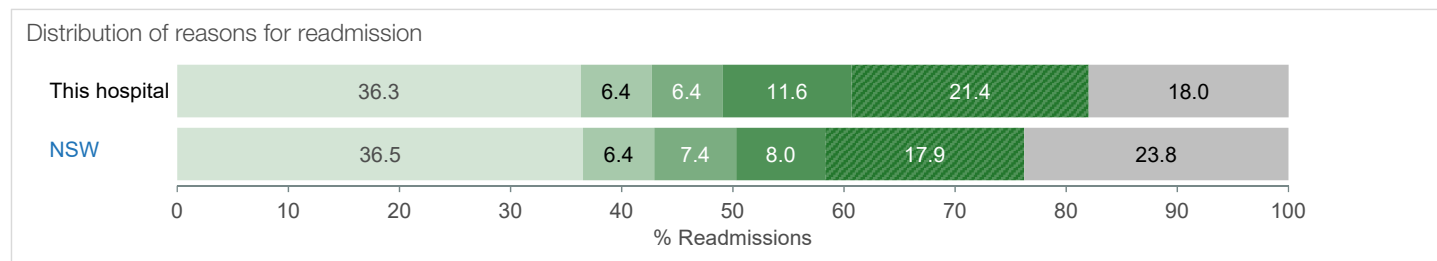## 30-day readmission following hospitalisation for congestive heart failure, July 2015 – June 2018

Patient cohort, index hospitalisations[1,2,3]

	This hospital	NSW
Total index cases for congestive heart failure	1,065	33,686
Average length of stay (days)	6.0	6.0
Patients transferred in from acute care in another hospital	61	2,723
Discharge destination		
Home	814	29,025
Other	251	4,661

Age profile for index hospitalisations (years)[4]

■ 15-44   ■ 45–64   ■ 65–74   ■ 75–84   ■ 85+

	15-44	45–64	65–74	75–84 & 85+
This hospital	9.3	17.0	34.7	37.7
NSW	10.8	18.9	33.6	34.9

% index cases

Patient factors associated with 30-day congestive heart failure readmission[5,6]

Factor	% difference from NSW
Fluid and electrolyte disorders	26.0
Chronic pulmonary disease	4.7
Coagulopathy	4.4
Diabetes, complicated	4.1
Cardiac arrhythmia	3.5
Renal failure	3.3
Previous congestive heart failure admission	2.6
Metastatic cancer	0.5
Deficiency anaemia	-0.9

% difference from NSW (index cases with factor recorded)
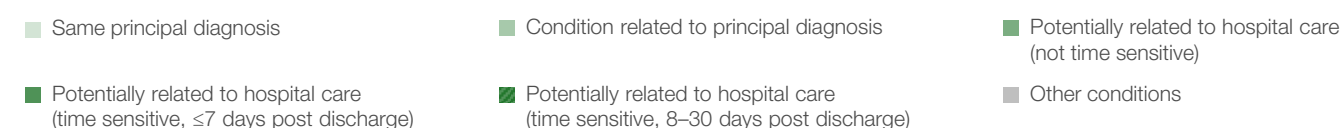
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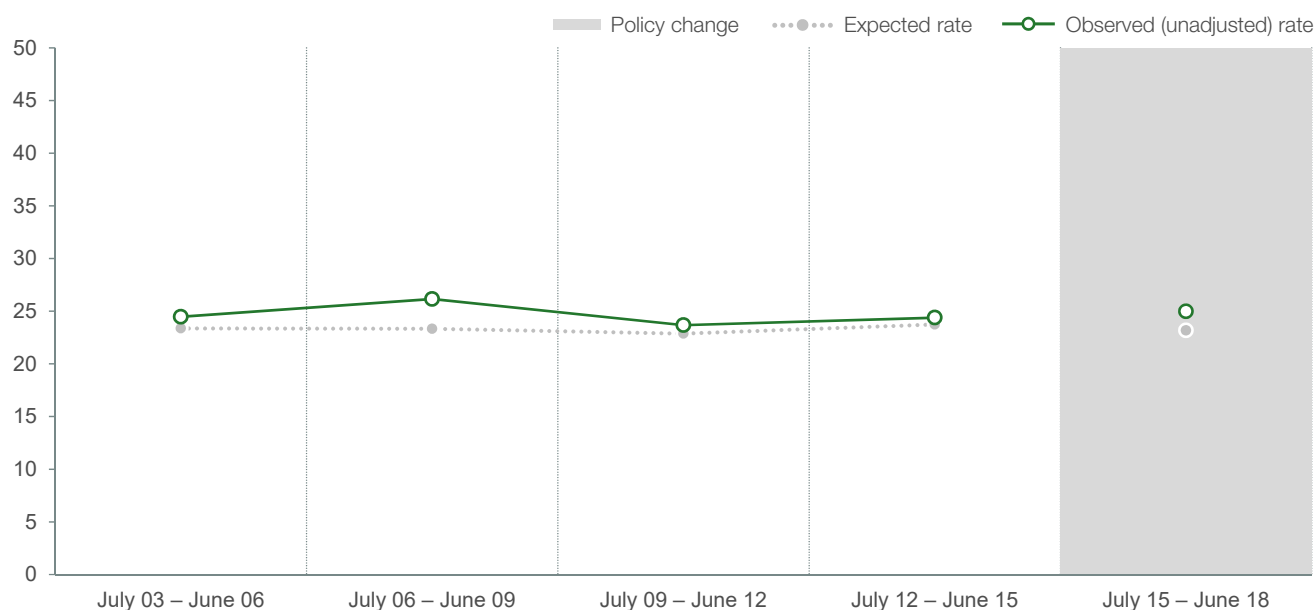information

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30-day readmission following hospitalisation for congestive heart failure, July 2015 – June 2018

Location of readmissions[7]

	This hospital	NSW
Total readmissions following index hospitalisation for congestive heart failure	266	7,465
Returns to acute care	25	309
Readmitted following hospital discharge	241	7,156
Readmitted to the same hospital where acute care was completed	220	5,843
Readmitted to a different hospital	21	1,313
To an urban public hospital	17	
To a regional or rural public hospital	4	
To a private hospital	0	

Reasons for and time to readmission[8]

- Same principal diagnosis
- Condition related to principal diagnosis
- Potentially related to hospital care (not time sensitive)
- Potentially related to hospital care (time sensitive, ≤7 days post discharge)
- Potentially related to hospital care (time sensitive, 8–30 days post discharge)
- Other conditions

Distribution of reasons for readmission

This hospital	36.3	6.4	6.4	11.6	21.4	18.0
NSW	36.5	6.4	7.4	8.0	17.9	23.8

% Readmissions

Number of, and reasons for, readmissions following hospitalisation for congestive heart failure, by days post discharge

Days post discharge			
1–7 days	**8–14 days**	**15–21 days**	**22–30 days**
15	19	10	17
31	28	12	6
5	8	5	18
44	22	12	

Number of readmissions

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30-day readmission following hospitalisation for congestive heart failure, July 2015 – June 2018

Congestive heart failure risk-standardised **readmission ratios** by number of expected readmissions, NSW public hospitals[9]
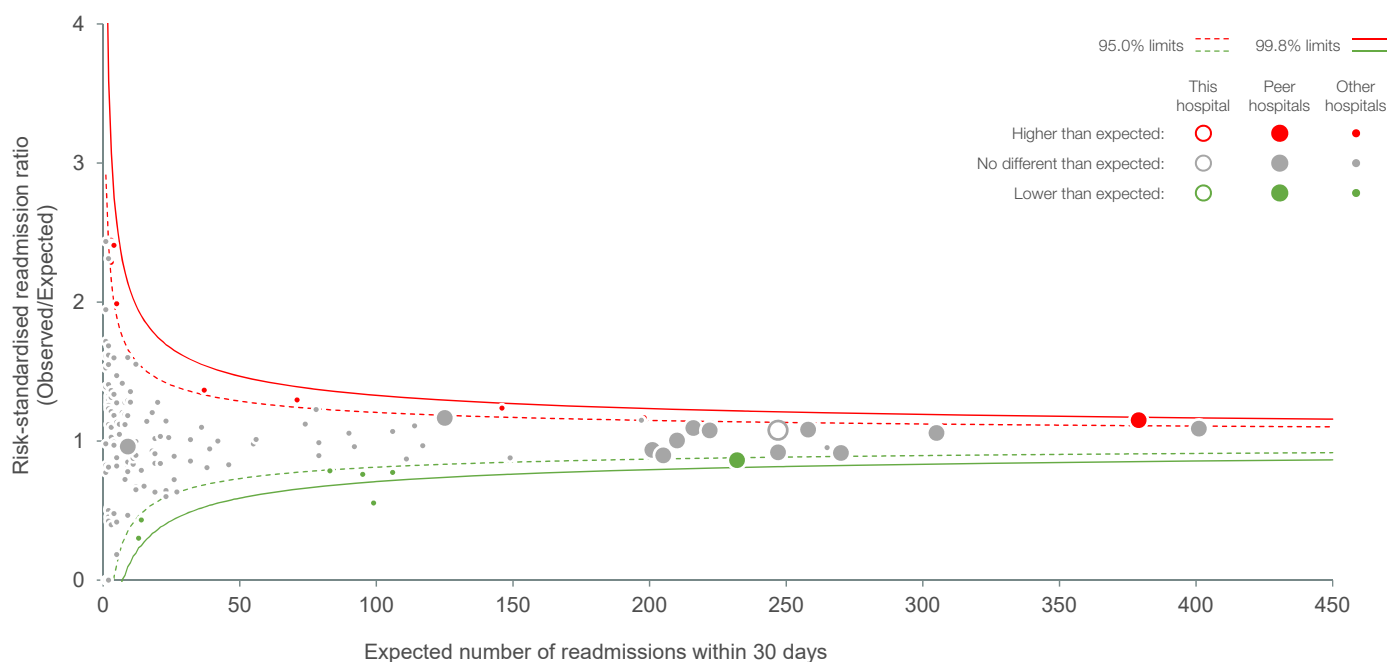
Congestive heart failure, this hospital's expected **readmission rates**[10] and observed (unadjusted) readmission rates, July 2003 – June 2018

In June 2017, the NSW Health Admission Policy was released, stating that a patient treated in and discharged from an emergency department (ED) only, should not be recorded as an admitted patient. As a result, patients who attended an ED, but were not transferred to an inpatient ward, were not included in BHI readmission analyses from July 2015 onwards and comparison of results before and after this time should be made with caution. For more information, see the *Technical Supplement – Readmission and returns to acute care following hospitalisation for eight clinical conditions, July 2015-June 2018.*

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Reference notes

1. Data refer to patients aged 15+ years who were discharged from this hospital to a non-acute care setting, between July 2015 and June 2018, 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. 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 1.5x the interquartile range of all in-scope episodes in each DRG.

3. For episodes coded as 'Discharged by hospital' or 'Discharged on leave', patients are considered as discharged home. All other modes of separation are deemed a discharge destination other than home. Where there is a non-acute care admission within one day of any discharge, it is not considered as discharged home regardless of the mode of separation.

4. Age at admission date.

5. Comorbidities are identified from the hospital discharge records using the Elixhauser comorbidity set (plus dementia) with a one year look-back from the date of the admission. Only those conditions that were found to have a statistically significant impact on readmission (p<0.05) are shown.

6. Age was not a statistically significant factor in the final model for congestive heart failure.

7. Readmissions include both returns to acute care from non-acute inpatient settings and readmissions following hospital discharge. Hospitals are classified as urban and regional/rural using the geocoded address of the hospital assigned to Australian Bureau of Statistics statistical areas (SA2) and the Australian remoteness index for areas.

8. Reasons for readmission follow the same clinical grouping as used in the previous report *Return to acute care following discharge from hospital, July 2012 – June 2015*. Please refer to the previously published *Spotlight on Measurement: Measuring return to acute care following discharge from hospital, 2nd edition*, which outline the specifications used to describe reasons for readmission.

9. Results for hospitals with expected readmission <1 are not shown. Hospitals are classified according to the NSW Ministry of Health's peer grouping as at January 2018.

10. Readmission rates at an average NSW public hospital with the same case-mix.

Details of analyses are available in *Spotlight on Measurement: Measuring return to acute care following discharge from hospital, 2nd edition* and the *Technical Supplement – Readmission and returns to acute care following hospitalisation for eight clinical conditions, July 2015-June 2018*.

Data source: BHI analyses of Hospital Performance Dataset, NSW Ministry of Health Secure Analytics for Population Health Research and Intelligence.
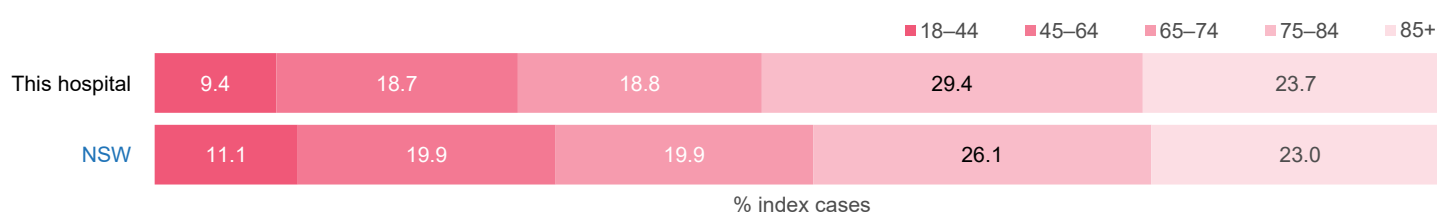
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Wollongong Hospital

30-day readmission following hospitalisation for pneumonia, July 2015 – June 2018

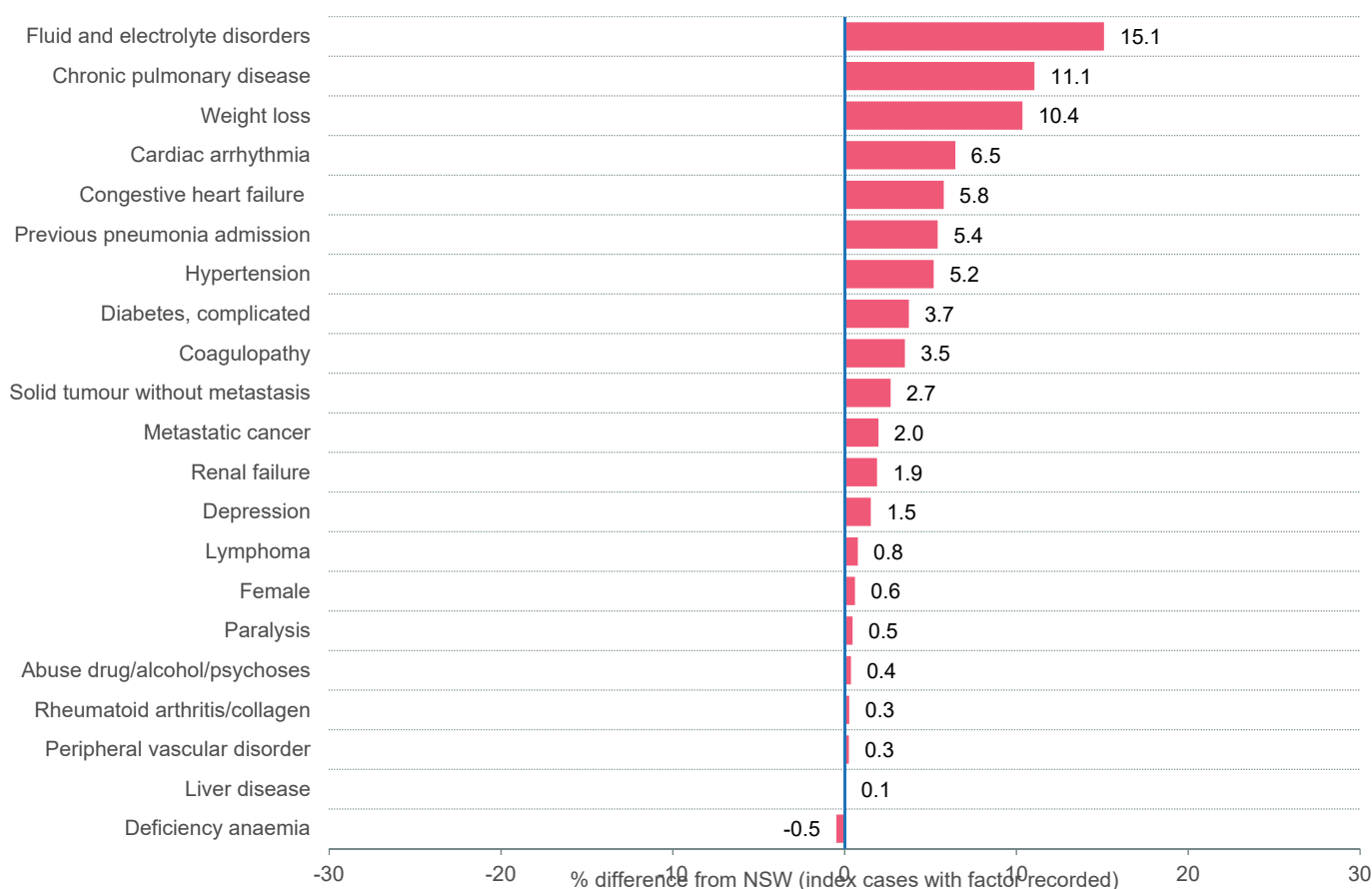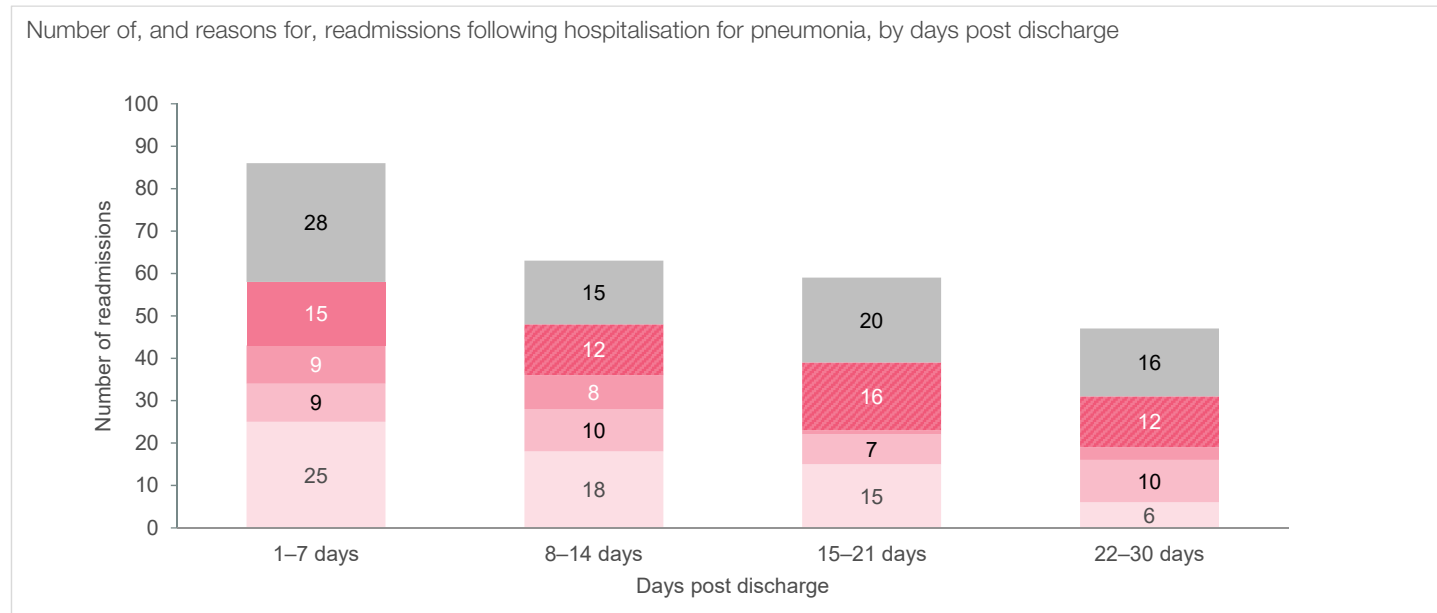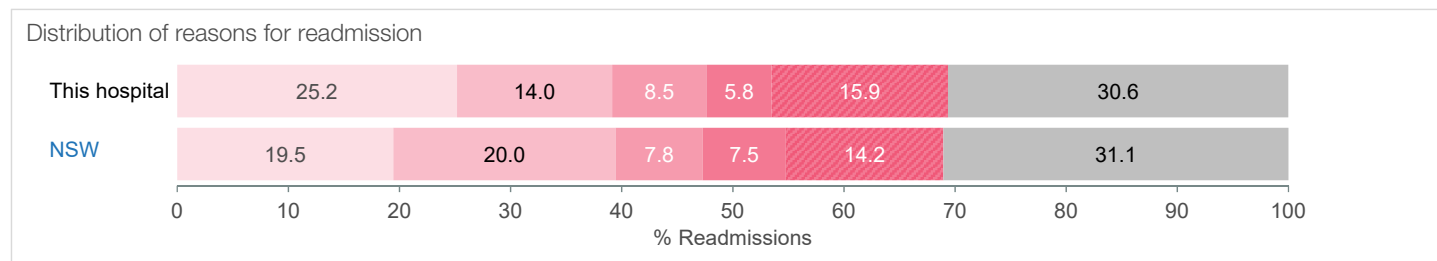### Patient cohort, index hospitalisations[1,2,3]

	This hospital	NSW
Total index cases for pneumonia	1,608	48,855
Average length of stay (days)	5.4	5.1
Patients transferred in from acute care in another hospital	66	3,190
Discharge destination		
Home	1,281	42,535
Other	327	6,320

Age profile for index hospitalisations (years)[4]

	18–44	45–64	65–74	75–84	85+
This hospital	9.4	18.7	18.8	29.4	23.7
NSW	11.1	19.9	19.9	26.1	23.0

% index cases

Patient factors associated with 30-day pneumonia readmission[5,6]

Factor	% difference from NSW
Fluid and electrolyte disorders	15.1
Chronic pulmonary disease	11.1
Weight loss	10.4
Cardiac arrhythmia	6.5
Congestive heart failure	5.8
Previous pneumonia admission	5.4
Hypertension	5.2
Diabetes, complicated	3.7
Coagulopathy	3.5
Solid tumour without metastasis	2.7
Metastatic cancer	2.0
Renal failure	1.9
Depression	1.5
Lymphoma	0.8
Female	0.6
Paralysis	0.5
Abuse drug/alcohol/psychoses	0.4
Rheumatoid arthritis/collagen	0.3
Peripheral vascular disorder	0.3
Liver disease	0.1
Deficiency anaemia	-0.5

% difference from NSW (index cases with factor recorded)
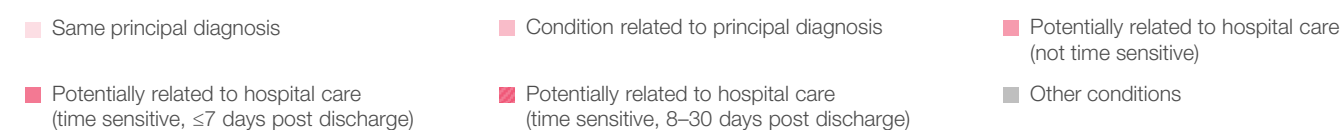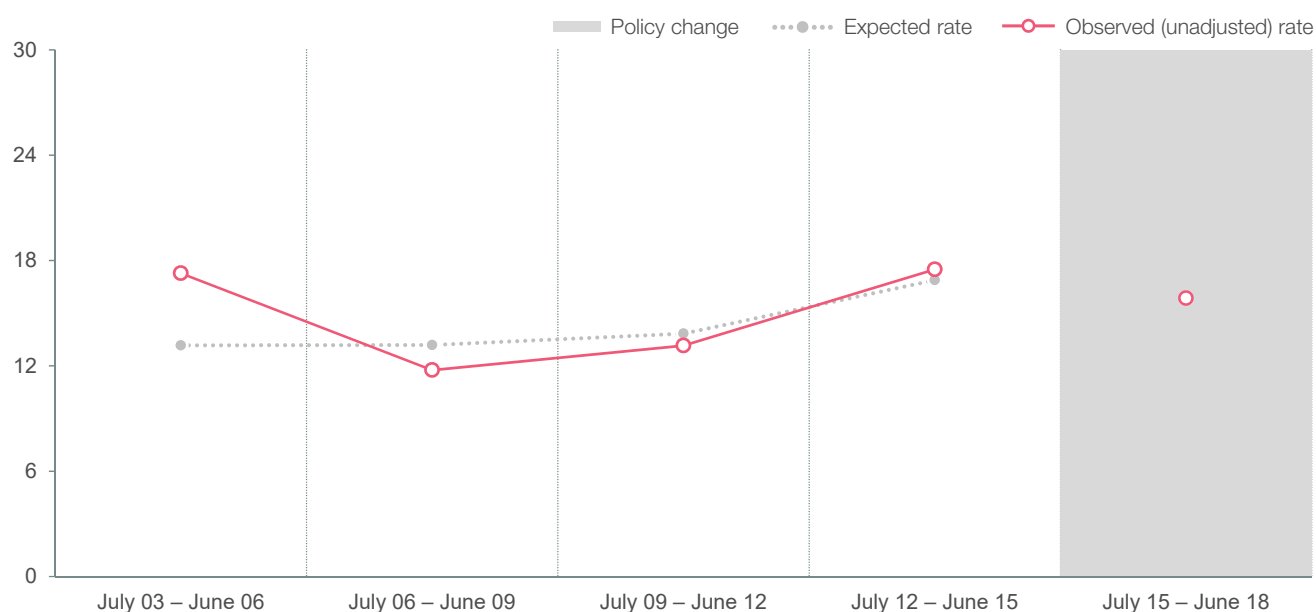
(axis: -30, -20, -10, 0, 10, 20, 30)

Wollongong Hospital

30-day readmission following hospitalisation for pneumonia, July 2015 – June 2018

Location of readmissions[7]

	This hospital	NSW
Total readmissions following index hospitalisation for pneumonia	255	6,704
Returns to acute care	31	325
Readmitted following hospital discharge	224	6,379
Readmitted to the same hospital where acute care was completed	204	5,201
Readmitted to a different hospital	20	1,178
To an urban public hospital	13	
To a regional or rural public hospital	7	
To a private hospital	0	

Reasons for and time to readmission[8]

- Same principal diagnosis
- Condition related to principal diagnosis
- Potentially related to hospital care (not time sensitive)
- Potentially related to hospital care (time sensitive, ≤7 days post discharge)
- Potentially related to hospital care (time sensitive, 8–30 days post discharge)
- Other conditions

Distribution of reasons for readmission

This hospital	25.2	14.0	8.5	5.8	15.9	30.6
NSW	19.5	20.0	7.8	7.5	14.2	31.1

% Readmissions

Number of, and reasons for, readmissions following hospitalisation for pneumonia, by days post discharge

Wollongong Hospital

30-day readmission following hospitalisation for pneumonia, July 2015 – June 2018

Pneumonia risk-standardised **readmission ratios** by number of expected readmissions, NSW public hospitals[9]
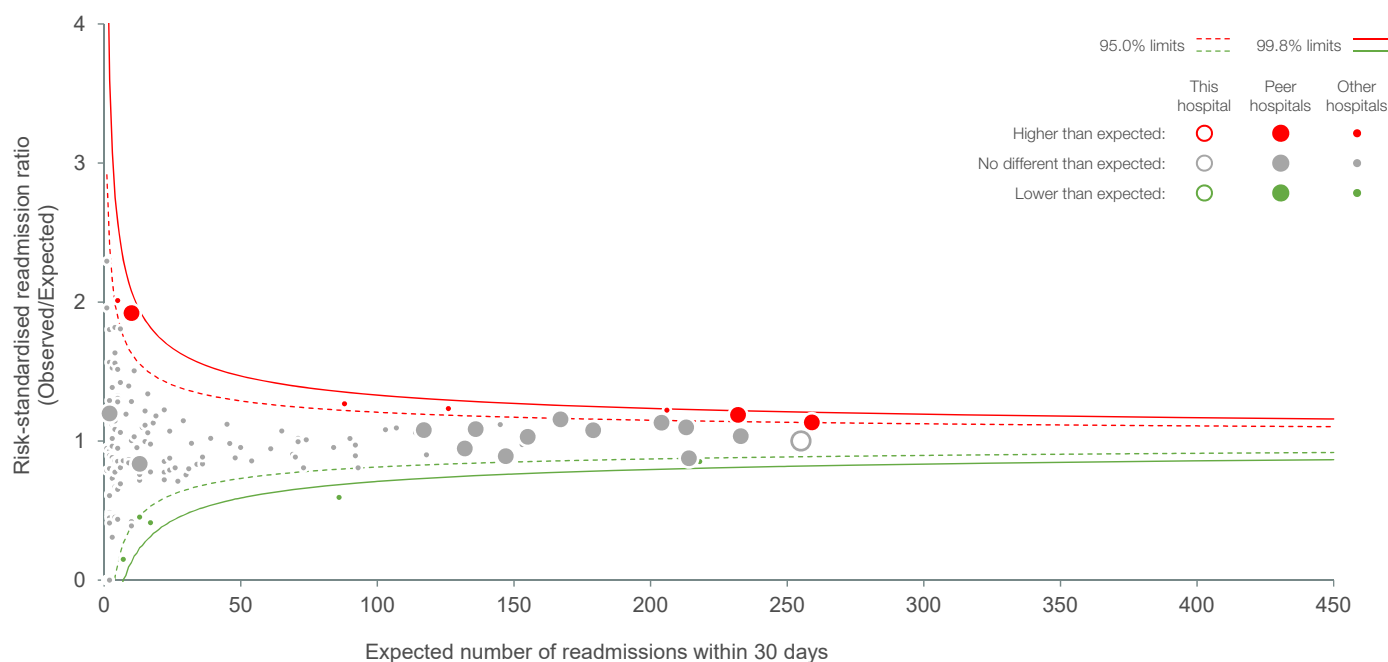
Pneumonia, this hospital's expected **readmission rates**[10] and observed (unadjusted) readmission rates, July 2003 – June 2018

In June 2017, the NSW Health Admission Policy was released, stating that a patient treated in and discharged from an emergency department (ED) only, should not be recorded as an admitted patient. As a result, patients who attended an ED, but were not transferred to an inpatient ward, were not included in BHI readmission analyses from July 2015 onwards and comparison of results before and after this time should be made with caution. For more information, see the *Technical Supplement – Readmission and returns to acute care following hospitalisation for eight clinical conditions, July 2015-June 2018*.

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Reference notes

1. Data refer to patients aged 18+ years who were discharged from this hospital to a non-acute care setting, between July 2015 and June 2018, following an acute hospitalisation with pneumonia as principal diagnosis (ICD-10-AM codes J13, J14, J15, J16, J18).

2. 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 1.5x the interquartile range of all in-scope episodes in each DRG.

3. For episodes coded as 'Discharged by hospital' or 'Discharged on leave', patients are considered as discharged home. All other modes of separation are deemed a discharge destination other than home. Where there is a non-acute care admission within one day of any discharge, it is not considered as discharged home regardless of the mode of separation.

4. Age at admission date.

5. Comorbidities are identified from the hospital discharge records using the Elixhauser comorbidity set (plus dementia) with a one year look-back from the date of the admission. Only those conditions that were found to have a statistically significant impact on readmission (p<0.05) are shown.

6. Age was a statistically significant factor in the final model for pneumonia.

7. Readmissions include both returns to acute care from non-acute inpatient settings and readmissions following hospital discharge. Hospitals are classified as urban and regional/rural using the geocoded address of the hospital assigned to Australian Bureau of Statistics statistical areas (SA2) and the Australian remoteness index for areas.

8. Reasons for readmission follow the same clinical grouping as used in the previous report *Return to acute care following discharge from hospital, July 2012 – June 2015*. Please refer to the previously published *Spotlight on Measurement: Measuring return to acute care following discharge from hospital, 2nd edition*, which outline the specifications used to describe reasons for readmission.

9. Results for hospitals with expected readmission <1 are not shown. Hospitals are classified according to the NSW Ministry of Health's peer grouping as at January 2018.

10. Readmission rates at an average NSW public hospital with the same case-mix.

Details of analyses are available in *Spotlight on Measurement: Measuring return to acute care following discharge from hospital, 2nd edition* and the *Technical Supplement – Readmission and returns to acute care following hospitalisation for eight clinical conditions, July 2015-June 2018*.

Data source: BHI analyses of Hospital Performance Dataset, NSW Ministry of Health Secure Analytics for Population Health Research and Intelligence.
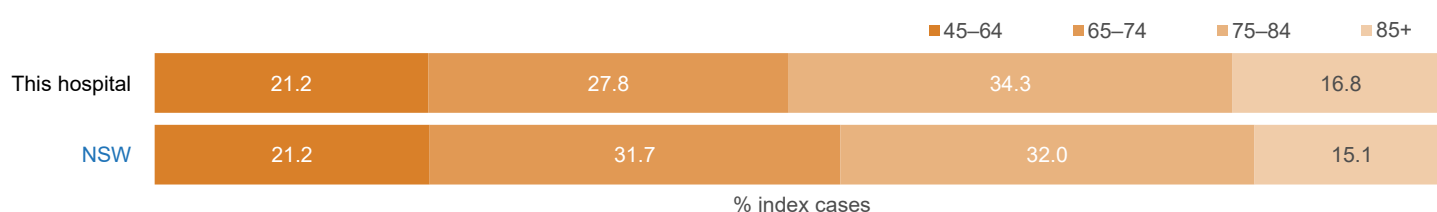
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Wollongong Hospital

30-day readmission following hospitalisation for chronic obstructive pulmonary disease, July 2015 – June 2018

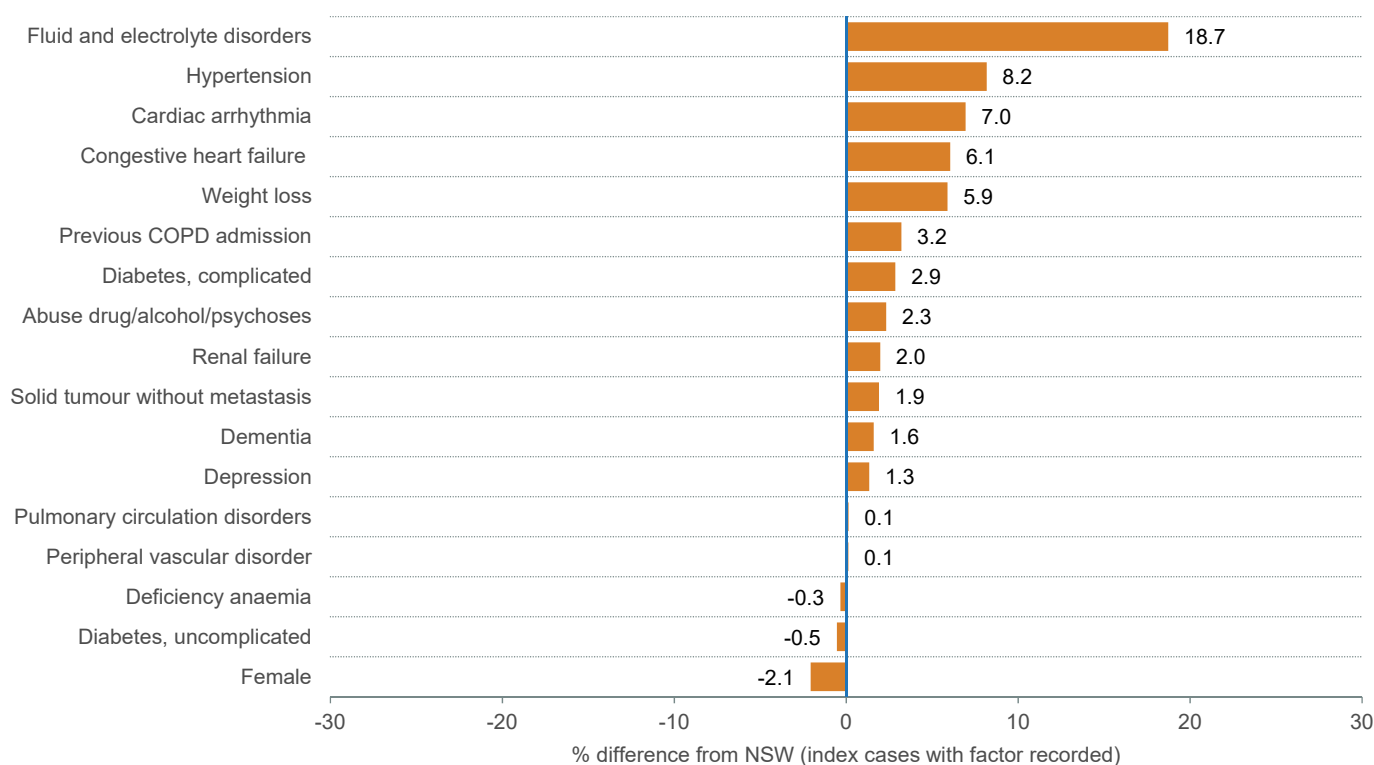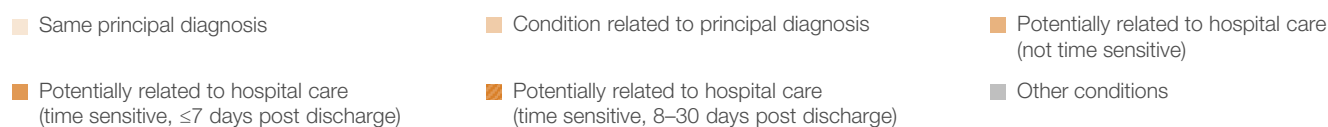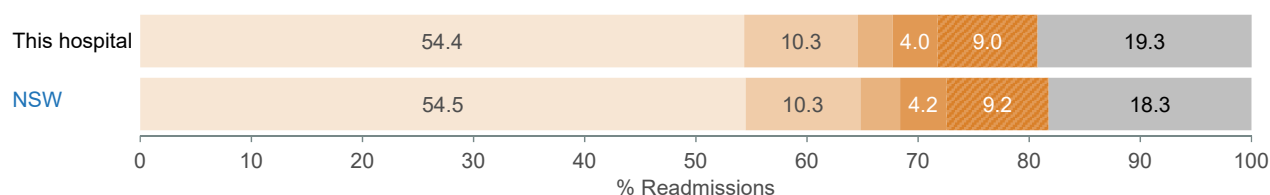### Patient cohort, index hospitalisations[1,2,3]

	This hospital	NSW
Total index cases for chronic obstructive pulmonary disease	1,409	48,336
Average length of stay (days)	4.8	4.8
Patients transferred in from acute care in another hospital	48	2,330
Discharge destination		
Home	1,061	43,932
Other	348	4,404

Age profile for index hospitalisations (years)[4]

█ 45–64 █ 65–74 █ 75–84 █ 85+

	45–64	65–74	75–84	85+
This hospital	21.2	27.8	34.3	16.8
NSW	21.2	31.7	32.0	15.1

% index cases

Patient factors associated with 30-day chronic obstructive pulmonary disease readmission[5,6]

Factor	% difference from NSW
Fluid and electrolyte disorders	18.7
Hypertension	8.2
Cardiac arrhythmia	7.0
Congestive heart failure	6.1
Weight loss	5.9
Previous COPD admission	3.2
Diabetes, complicated	2.9
Abuse drug/alcohol/psychoses	2.3
Renal failure	2.0
Solid tumour without metastasis	1.9
Dementia	1.6
Depression	1.3
Pulmonary circulation disorders	0.1
Peripheral vascular disorder	0.1
Deficiency anaemia	-0.3
Diabetes, uncomplicated	-0.5
Female	-2.1

% difference from NSW (index cases with factor recorded)

Wollongong Hospital

30-day readmission following hospitalisation for chronic obstructive pulmonary disease, July 2015 – June 2018

Location of readmissions[7]

	This hospital	NSW
Total readmissions following index hospitalisation for chronic obstructive pulmonary disease	320	10,241
Returns to acute care	34	233
Readmitted following hospital discharge	286	10,008
Readmitted to the same hospital where acute care was completed	266	8,472
Readmitted to a different hospital	20	1,536
To an urban public hospital	17	
To a regional or rural public hospital	2	
To a private hospital	1	

Reasons for and time to readmission[8]

- Same principal diagnosis
- Condition related to principal diagnosis
- Potentially related to hospital care (not time sensitive)
- Potentially related to hospital care (time sensitive, ≤7 days post discharge)
- Potentially related to hospital care (time sensitive, 8–30 days post discharge)
- Other conditions

Distribution of reasons for readmission

This hospital: 54.4 | 10.3 | 4.0 | 9.0 | 19.3
NSW: 54.5 | 10.3 | 4.2 | 9.2 | 18.3
% Readmissions

Number of, and reasons for, readmissions following hospitalisation for chronic obstructive pulmonary disease, by days post discharge
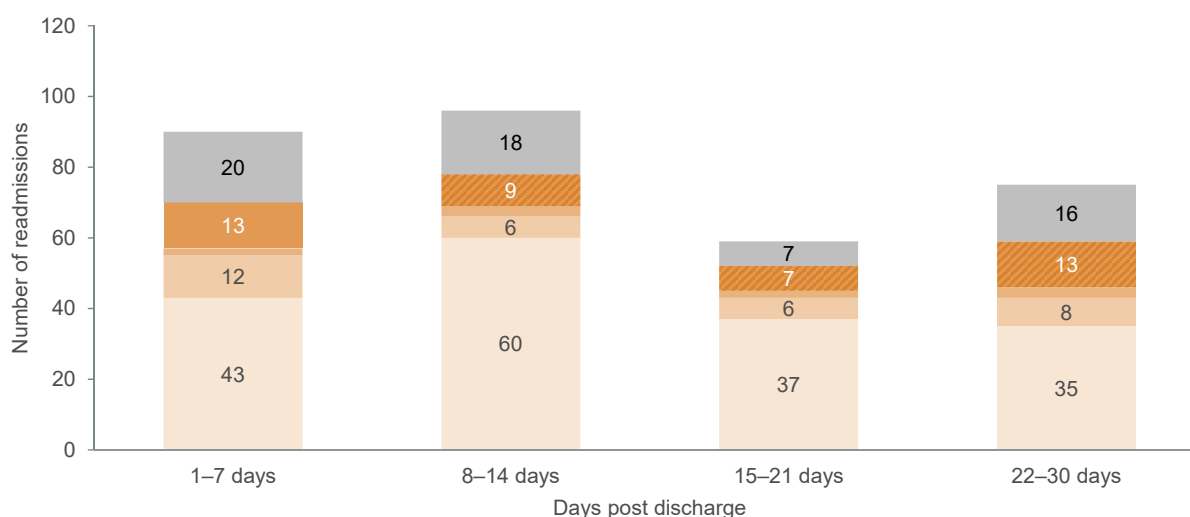
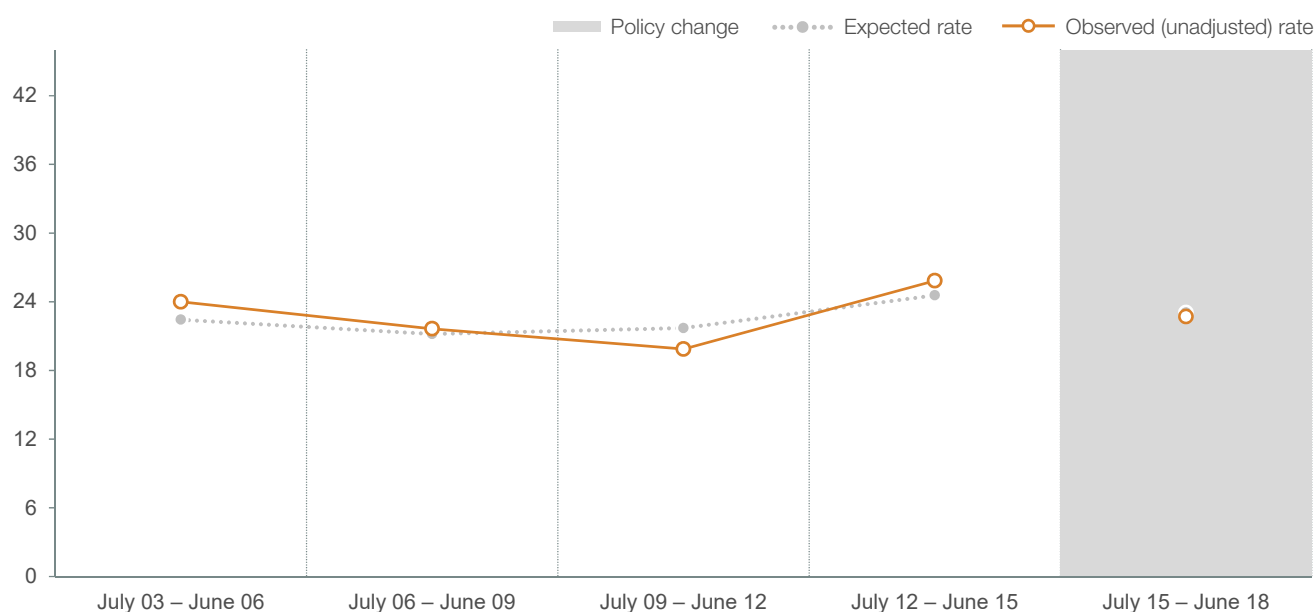| Days post discharge	Values
1–7 days	43, 12, 13, 20
8–14 days	60, 6, 9, 18
15–21 days	37, 6, 7, 7
22–30 days	35, 8, 13, 16

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Wollongong Hospital

30-day readmission following hospitalisation for chronic obstructive pulmonary disease, July 2015 – June 2018

Chronic obstructive pulmonary disease risk-standardised **readmission ratios** by number of expected readmissions,

NSW public hospitals[9]
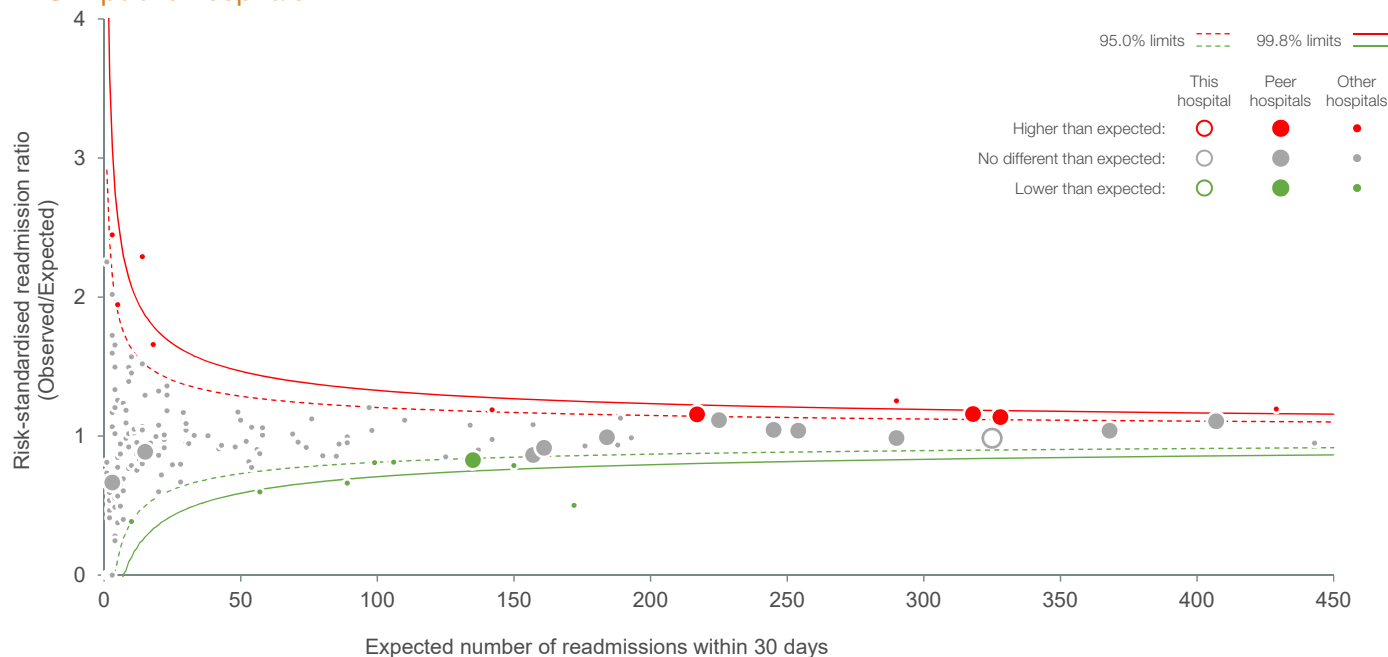
Chronic obstructive pulmonary disease, this hospital's expected **readmission rates**[10] and observed (unadjusted) readmission rates, July 2003 – June 2018

In June 2017, the NSW Health Admission Policy was released, stating that a patient treated in and discharged from an emergency department (ED) only, should not be recorded as an admitted patient. As a result, patients who attended an ED, but were not transferred to an inpatient ward, were not included in BHI readmission analyses from July 2015 onwards and comparison of results before and after this time should be made with caution. For more information, see the *Technical Supplement – Readmission and returns to acute care following hospitalisation for eight clinical conditions, July 2015-June 2018*.

Wollongong Hospital

Reference notes

1. Data refer to patients aged 45+ years who were discharged from this hospital to a non-acute care setting, between July 2015 and June 2018, 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. 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 1.5x the interquartile range of all in-scope episodes in each DRG.

3. For episodes coded as 'Discharged by hospital' or 'Discharged on leave', patients are considered as discharged home. All other modes of separation are deemed a discharge destination other than home. Where there is a non-acute care admission within one day of any discharge, it is not considered as discharged home regardless of the mode of separation.

4. Age at admission date.

5. Comorbidities are identified from the hospital discharge records using the Elixhauser comorbidity set (plus dementia) with a one year look-back from the date of the admission. Only those conditions that were found to have a statistically significant impact on readmission (p<0.05) are shown.

6. Age was a statistically significant factor in the final model for chronic obstructive pulmonary disease.

7. Readmissions include both returns to acute care from non-acute inpatient settings and readmissions following hospital discharge. Hospitals are classified as urban and regional/rural using the geocoded address of the hospital assigned to Australian Bureau of Statistics statistical areas (SA2) and the Australian remoteness index for areas.

8. Reasons for readmission follow the same clinical grouping as used in the previous report *Return to acute care following discharge from hospital, July 2012 – June 2015*. Please refer to the previously published *Spotlight on Measurement: Measuring return to acute care following discharge from hospital, 2nd edition*, which outline the specifications used to describe reasons for readmission.

9. Results for hospitals with expected readmission <1 are not shown. Hospitals are classified according to the NSW Ministry of Health's peer grouping as at January 2018.

10. Readmission rates at an average NSW public hospital with the same case-mix.

Details of analyses are available in *Spotlight on Measurement: Measuring return to acute care following discharge from hospital, 2nd edition* and the *Technical Supplement – Readmission and returns to acute care following hospitalisation for eight clinical conditions, July 2015-June 2018*.

Data source: BHI analyses of Hospital Performance Dataset, NSW Ministry of Health Secure Analytics for Population Health Research and Intelligence.
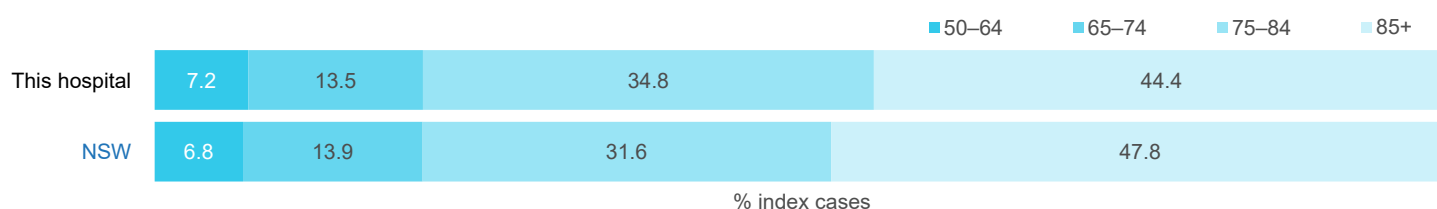
Wollongong Hospital

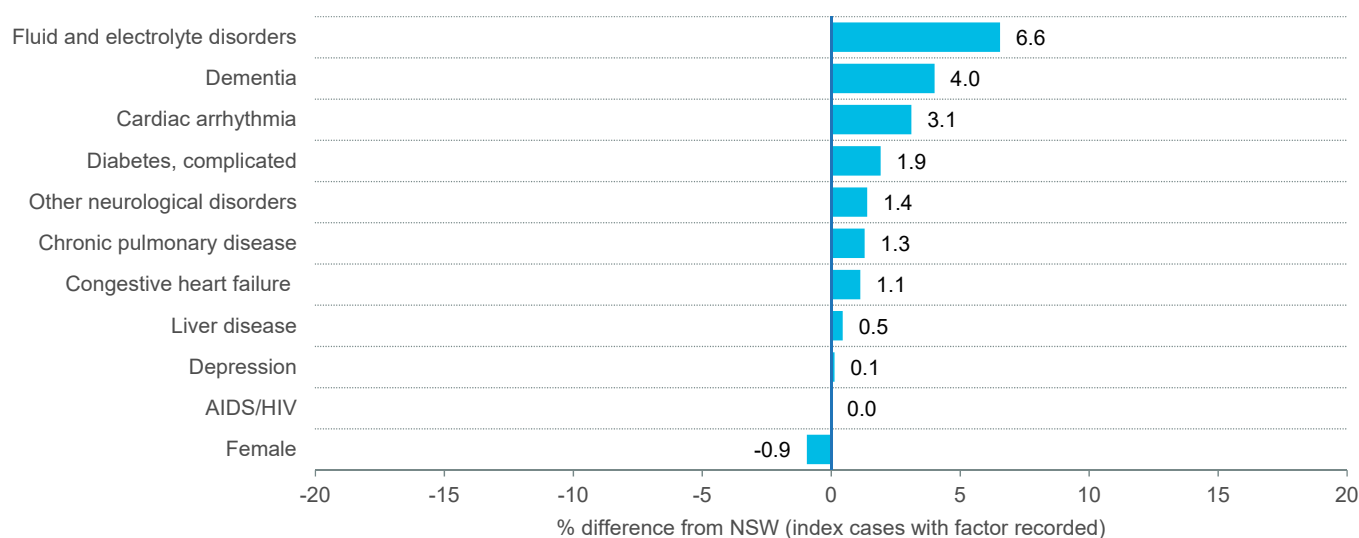## 30-day readmission following hospitalisation for hip fracture surgery, July 2015 – June 2018

Patient cohort, index hospitalisations[1,2,3]

	This hospital	NSW
Total index cases for hip fracture surgery	801	14,895
Average length of stay (days)	10.0	9.7
Patients transferred in from acute care in another hospital	18	2,030
Discharge destination		
Home	171	4,404
Other	630	10,491

Age profile for index hospitalisations (years)[4]

	50–64	65–74	75–84	85+
This hospital	7.2	13.5	34.8	44.4
NSW	6.8	13.9	31.6	47.8

% index cases

Patient factors associated with 30-day hip fracture surgery readmission[5,6]

Factor	% difference from NSW
Fluid and electrolyte disorders	6.6
Dementia	4.0
Cardiac arrhythmia	3.1
Diabetes, complicated	1.9
Other neurological disorders	1.4
Chronic pulmonary disease	1.3
Congestive heart failure	1.1
Liver disease	0.5
Depression	0.1
AIDS/HIV	0.0
Female	-0.9

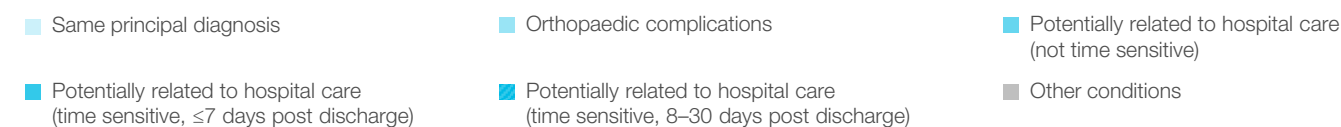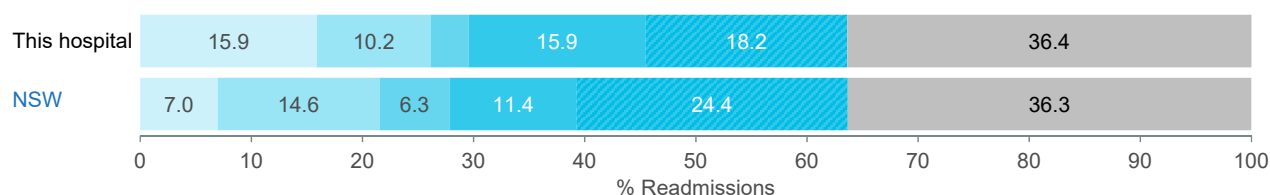% difference from NSW (index cases with factor recorded)

Wollongong Hospital

30-day readmission following hospitalisation for hip fracture surgery, July 2015 – June 2018

Location of readmissions[7]

	This hospital	NSW
Total readmissions following index hospitalisation for hip fracture surgery	87	1,617
Returns to acute care	55	677
Readmitted following hospital discharge	32	940
Readmitted to the same hospital where acute care was completed	26	696
Readmitted to a different hospital	6	244
To an urban public hospital	5	
To a regional or rural public hospital	1	
To a private hospital	0	

Reasons for and time to readmission[8]

- Same principal diagnosis
- Orthopaedic complications
- Potentially related to hospital care (not time sensitive)
- Potentially related to hospital care (time sensitive, ≤7 days post discharge)
- Potentially related to hospital care (time sensitive, 8–30 days post discharge)
- Other conditions

Distribution of reasons for readmission

	Same principal diagnosis	Orthopaedic complications	Potentially related (not time sensitive)	Potentially related (≤7 days)	Potentially related (8–30 days)	Other conditions
This hospital	15.9	10.2		15.9	18.2	36.4
NSW	7.0	14.6	6.3	11.4	24.4	36.3

% Readmissions

Number of, and reasons for, readmissions following hospitalisation for hip fracture surgery, by days post discharge
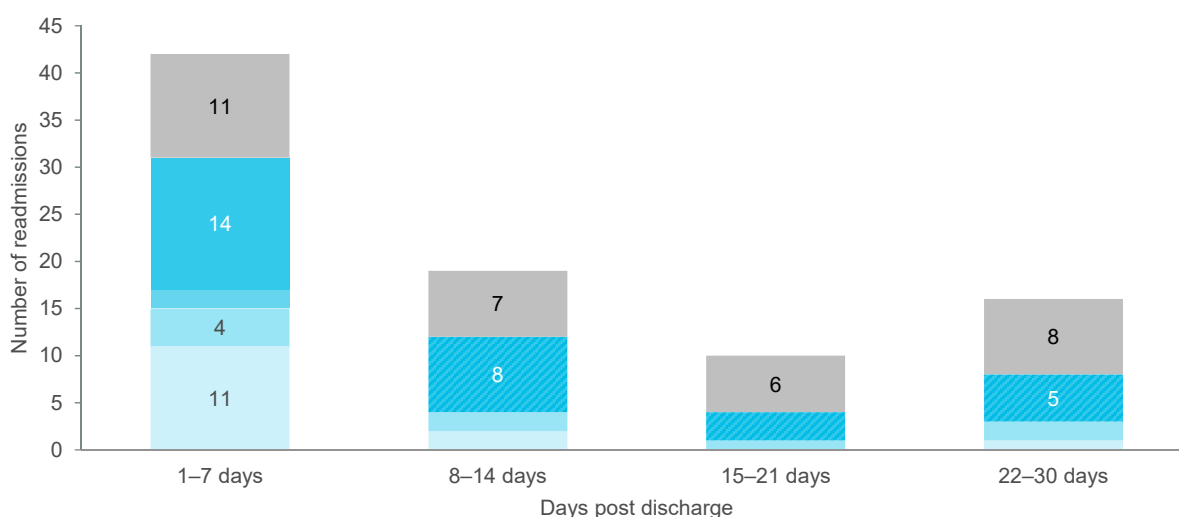
Number of readmissions (y-axis, 0–45) by Days post discharge (x-axis):
- 1–7 days: 11, 4, 14, 11
- 8–14 days: 8, 7
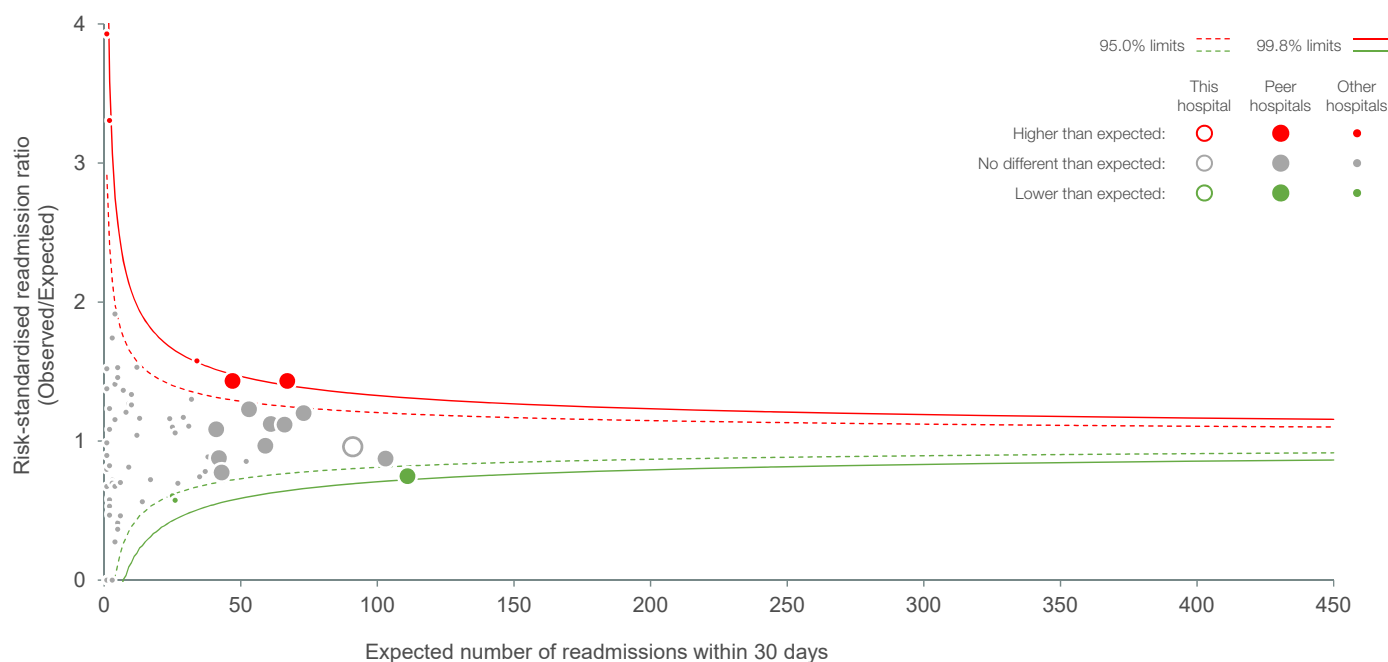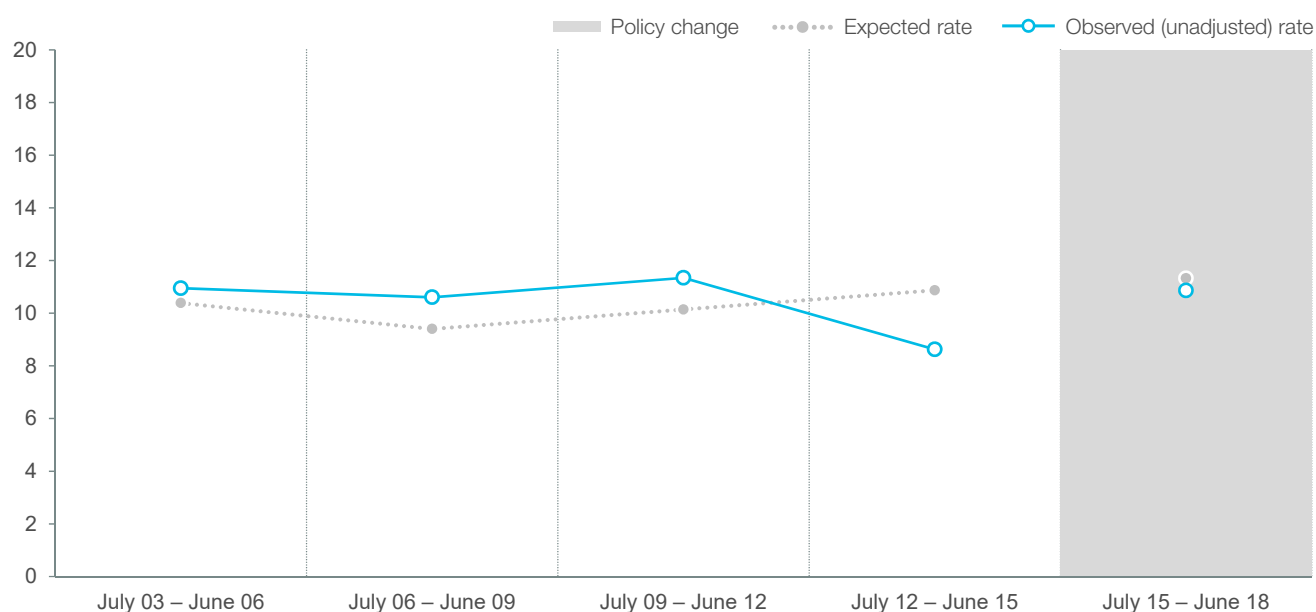- 15–21 days: 6
- 22–30 days: 5, 8

Wollongong Hospital

30-day readmission following hospitalisation for hip fracture surgery, July 2015 – June 2018

Hip fracture surgery risk-standardised **readmission ratios** by number of expected readmissions, NSW public hospitals[9]

Hip fracture surgery, this hospital's expected **readmission rates**[10] and observed (unadjusted) readmission rates, July 2003 – June 2018

In June 2017, the NSW Health Admission Policy was released, stating that a patient treated in and discharged from an emergency department (ED) only, should not be recorded as an admitted patient. As a result, patients who attended an ED, but were not transferred to an inpatient ward, were not included in BHI readmission analyses from July 2015 onwards and comparison of results before and after this time should be made with caution. For more information, see the *Technical Supplement – Readmission and returns to acute care following hospitalisation for eight clinical conditions, July 2015-June 2018*.

Wollongong Hospital

Reference notes

1. Data refer to patients aged 50+ years who were discharged from this hospital to a non-acute care setting, between July 2015 and June 2018, following an acute hospitalisation with hip fracture as principal diagnosis and treated with surgery (ICD-10-AM codes for hip fracture S72.0, S72.1, S72.2 accompanied with a fall codes W00-W19 and R29.6 and treated with a surgical procedure).

2. 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 1.5x the interquartile range of all in-scope episodes in each DRG.

3. For episodes coded as 'Discharged by hospital' or 'Discharged on leave', patients are considered as discharged home. All other modes of separation are deemed a discharge destination other than home. Where there is a non-acute care admission within one day of any discharge, it is not considered as discharged home regardless of the mode of separation.

4. Age at admission date.

5. Comorbidities are identified from the hospital discharge records using the Elixhauser comorbidity set (plus dementia) with a one year look-back from the date of the admission. Only those conditions that were found to have a statistically significant impact on readmission ($p < 0.05$) are shown.

6. Age was a statistically significant factor in the final model for hip fracture surgery.

7. Readmissions include both returns to acute care from non-acute inpatient settings and readmissions following hospital discharge. Hospitals are classified as urban and regional/rural using the geocoded address of the hospital assigned to Australian Bureau of Statistics statistical areas (SA2) and the Australian remoteness index for areas.

8. Reasons for readmission follow the same clinical grouping as used in the previous report *Return to acute care following discharge from hospital, July 2012 – June 2015*. Please refer to the previously published *Spotlight on Measurement: Measuring return to acute care following discharge from hospital, 2nd edition*, which outline the specifications used to describe reasons for readmission.

9. Results for hospitals with expected readmission <1 are not shown. Hospitals are classified according to the NSW Ministry of Health's peer grouping as at January 2018.

10. Readmission rates at an average NSW public hospital with the same case-mix.

Details of analyses are available in *Spotlight on Measurement: Measuring return to acute care following discharge from hospital, 2nd edition* and the *Technical Supplement – Readmission and returns to acute care following hospitalisation for eight clinical conditions, July 2015-June 2018*.

Data source: BHI analyses of Hospital Performance Dataset, NSW Ministry of Health Secure Analytics for Population Health Research and Intelligence.
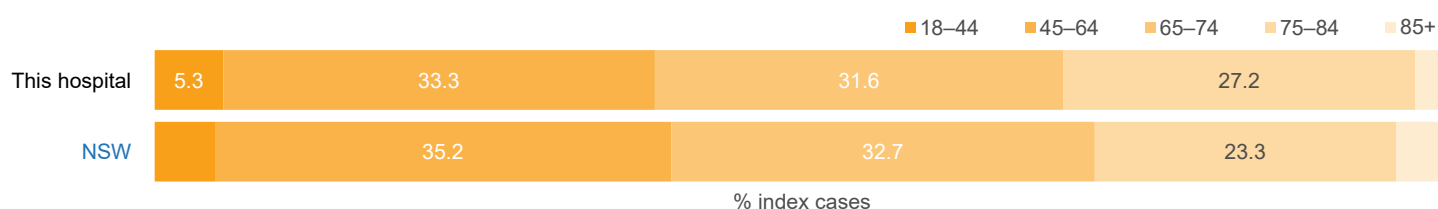
Wollongong Hospital

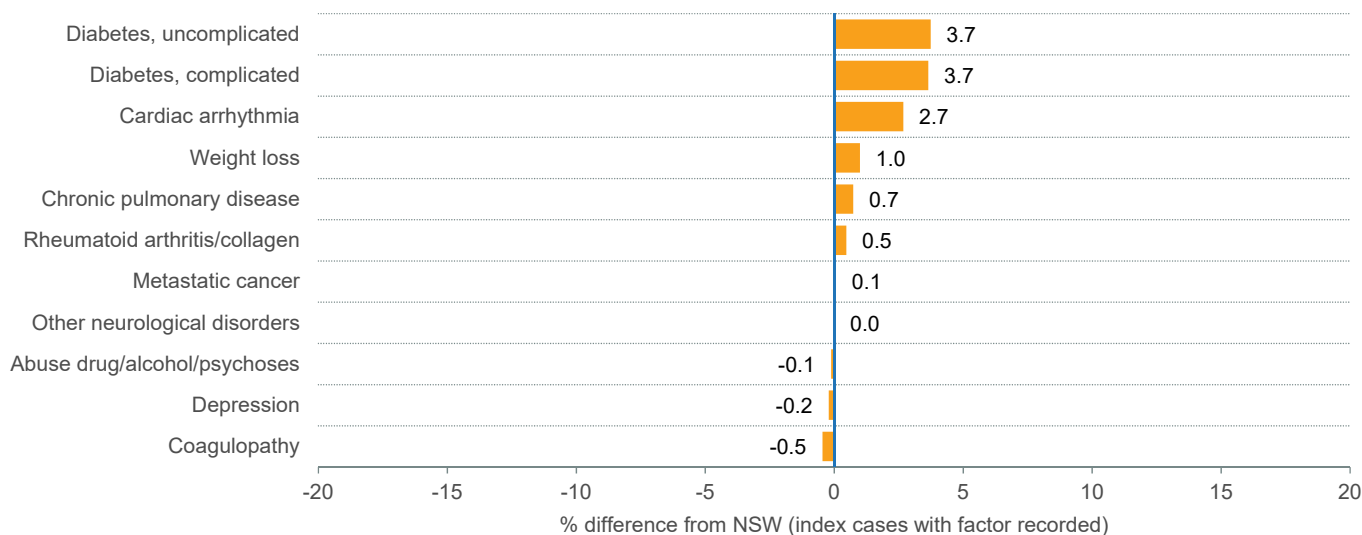## 60-day readmission following hospitalisation for total hip replacement, July 2015 – June 2018

Patient cohort, index hospitalisations[1,2,3]

	This hospital	NSW
Total index cases for total hip replacement	453	8,985
Average length of stay (days)	4.3	4.7
Discharge destination		
Home	364	7,472
Other	89	1,513

Age profile for index hospitalisations (years)[4]

■ 18–44 ■ 45–64 ■ 65–74 ■ 75–84 ■ 85+

This hospital	5.3	33.3	31.6	27.2
NSW		35.2	32.7	23.3

% index cases

Patient factors associated with 60-day total hip replacement readmission[5,6]

Factor	% difference from NSW
Diabetes, uncomplicated	3.7
Diabetes, complicated	3.7
Cardiac arrhythmia	2.7
Weight loss	1.0
Chronic pulmonary disease	0.7
Rheumatoid arthritis/collagen	0.5
Metastatic cancer	0.1
Other neurological disorders	0.0
Abuse drug/alcohol/psychoses	-0.1
Depression	-0.2
Coagulopathy	-0.5

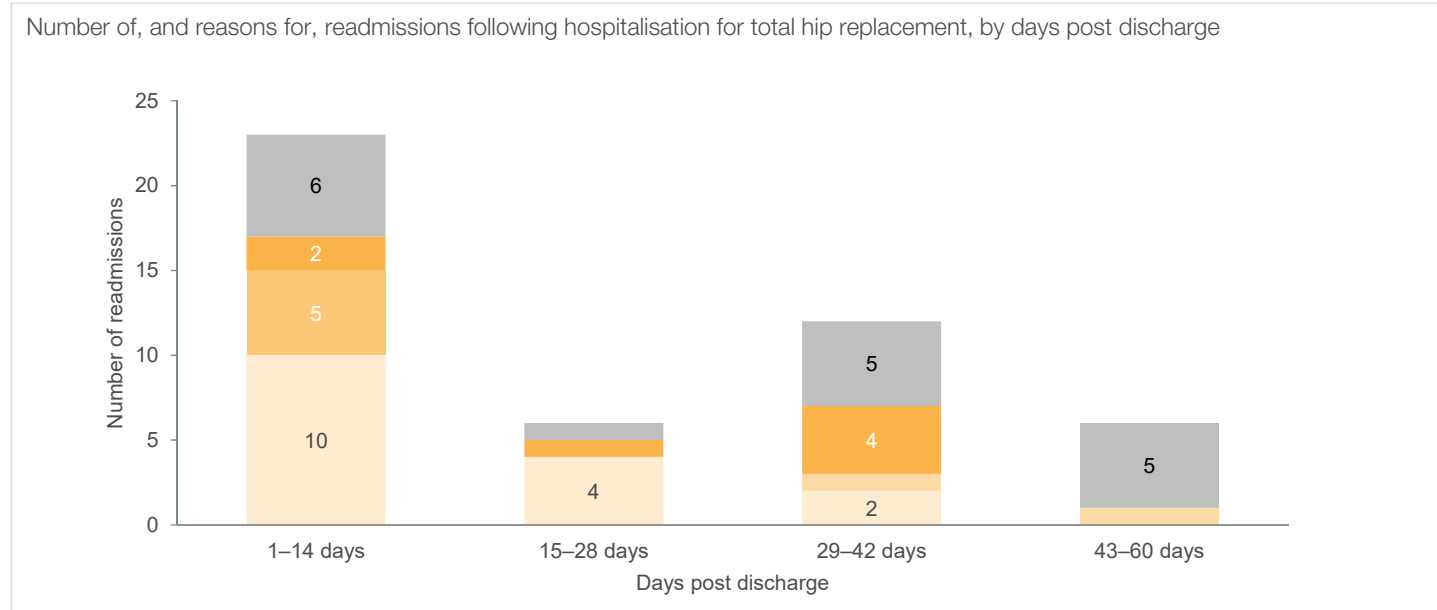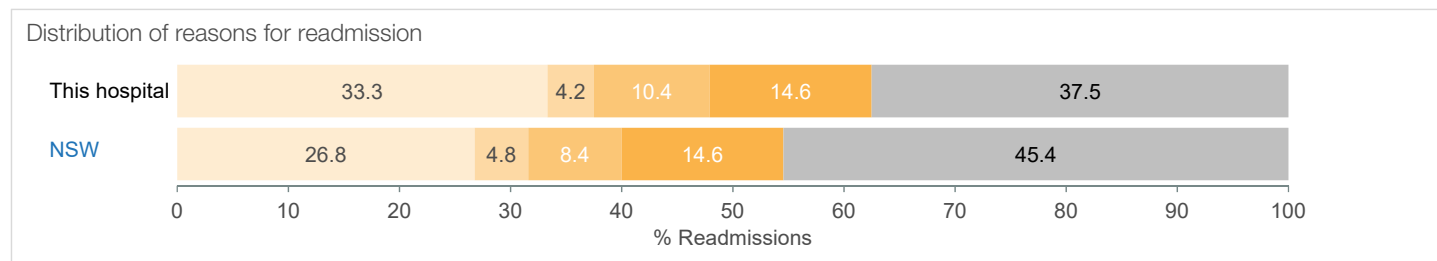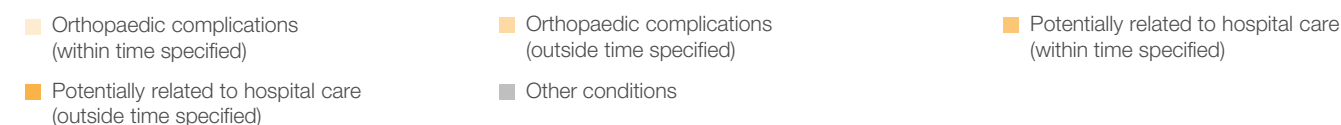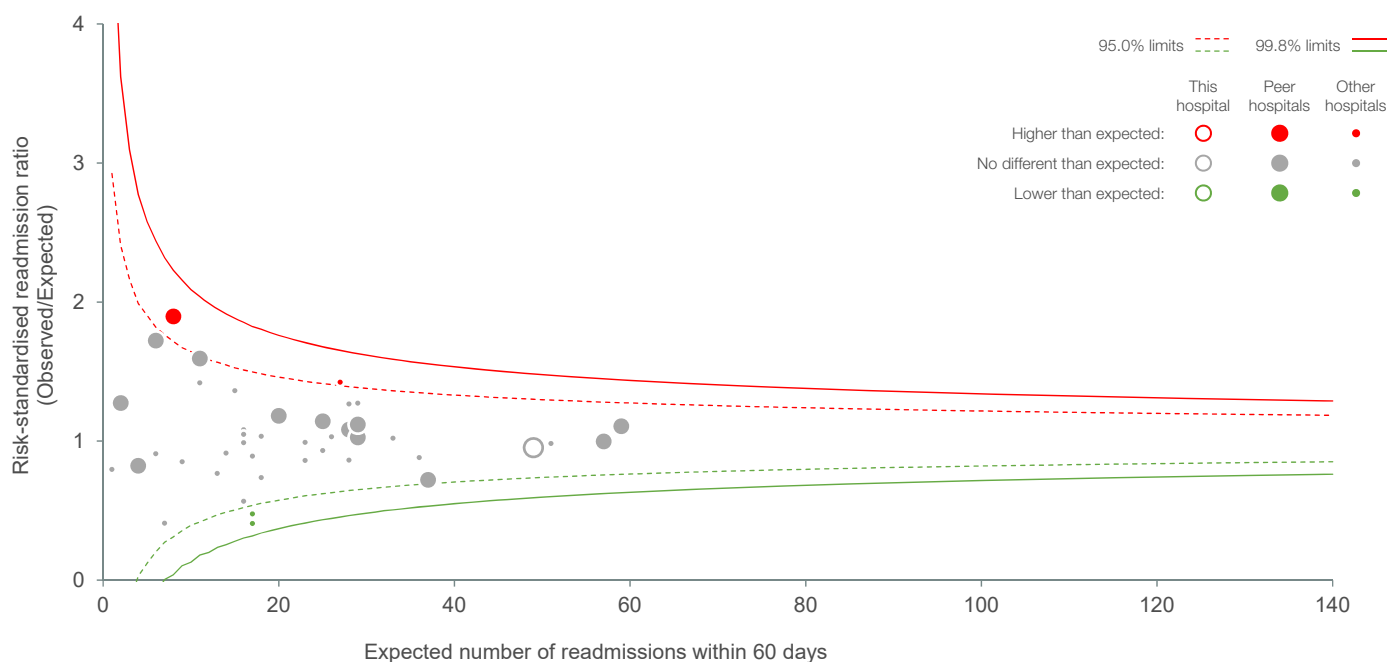% difference from NSW (index cases with factor recorded)

Wollongong Hospital

60-day readmission following hospitalisation for total hip replacement, July 2015 – June 2018

Location of readmissions[7]

	This hospital	NSW
Total readmissions following index hospitalisation for total hip replacement	47	949
Returns to acute care	11	107
Readmitted following hospital discharge	36	842
Readmitted to the same hospital where acute care was completed	22	499
Readmitted to a different hospital	14	343
To an urban public hospital	10	
To a regional or rural public hospital	2	
To a private hospital	2	

Reasons for and time to readmission[8]

- Orthopaedic complications (within time specified)
- Orthopaedic complications (outside time specified)
- Potentially related to hospital care (within time specified)
- Potentially related to hospital care (outside time specified)
- Other conditions

Distribution of reasons for readmission

	Orthopaedic (within)	Orthopaedic (outside)	Potentially related (within)	Potentially related (outside)	Other conditions
This hospital	33.3	4.2	10.4	14.6	37.5
NSW	26.8	4.8	8.4	14.6	45.4

% Readmissions

Number of, and reasons for, readmissions following hospitalisation for total hip replacement, by days post discharge

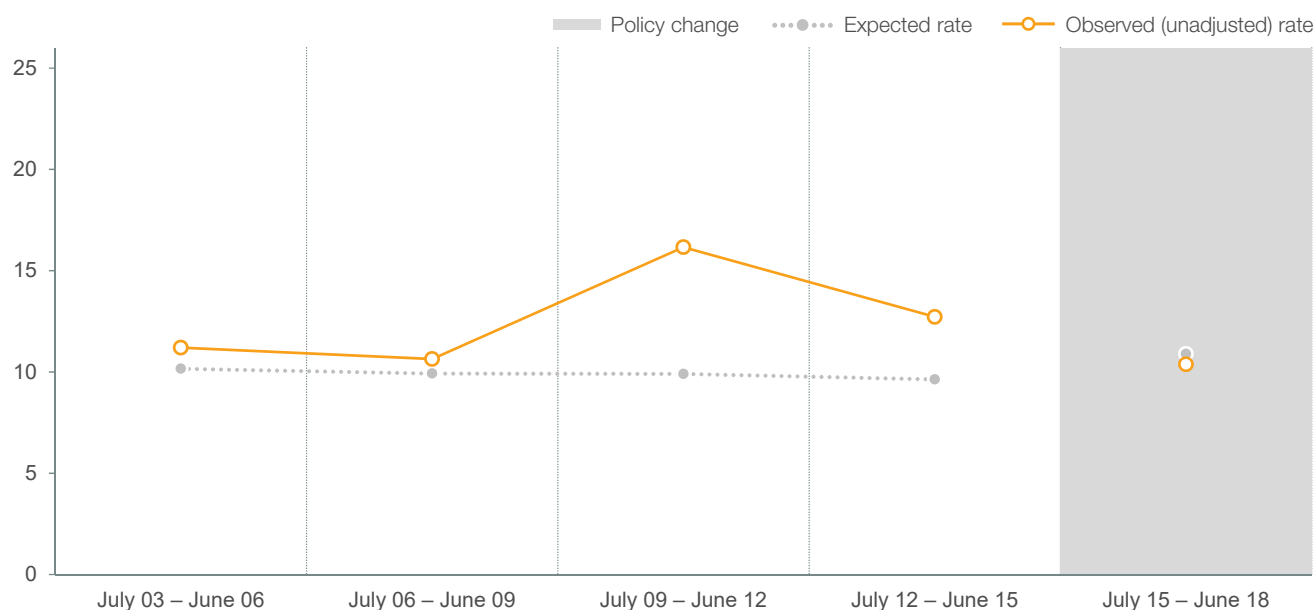| Days post discharge	Orthopaedic (within)	Potentially related (within)	Potentially related (outside)	Other conditions
1–14 days	10	5	2	6
15–28 days	4			
29–42 days	2		4	5
43–60 days				5

Wollongong Hospital

60-day readmission following hospitalisation for total hip replacement, July 2015 – June 2018

Total hip replacement risk-standardised **readmission ratios** by number of expected readmissions, NSW public hospitals[9]

Total hip replacement, this hospital's expected **readmission rates**[10] and observed (unadjusted) readmission rates, July 2003 – June 2018

In June 2017, the NSW Health Admission Policy was released, stating that a patient treated in and discharged from an emergency department (ED) only, should not be recorded as an admitted patient. As a result, patients who attended an ED, but were not transferred to an inpatient ward, were not included in BHI readmission analyses from July 2015 onwards and comparison of results before and after this time should be made with caution. For more information, see the *Technical Supplement – Readmission and returns to acute care following hospitalisation for eight clinical conditions, July 2015-June 2018*.

Wollongong Hospital

Reference notes

1. Data refer to patients aged 18+ years who were discharged from this hospital to a non-acute care setting, between July 2015 and June 2018, following an acute hospitalisation for an elective total hip replacement (ACHI codes 49318-00, 49319-00).

2. 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 1.5x the interquartile range of all in-scope episodes in each DRG.

3. For episodes coded as 'Discharged by hospital' or 'Discharged on leave', patients are considered as discharged home. All other modes of separation are deemed a discharge destination other than home. Where there is a non-acute care admission within one day of any discharge, it is not considered as discharged home regardless of the mode of separation.

4. Age at admission date.

5. Comorbidities are identified from the hospital discharge records using the Elixhauser comorbidity set (plus dementia) with a one year look-back from the date of the admission. Only those conditions that were found to have a statistically significant impact on readmission (p<0.05) are shown.

6. Age was a statistically significant factor in the final model for total hip replacement.

7. Readmissions include both returns to acute care from non-acute inpatient settings and readmissions following hospital discharge. Hospitals are classified as urban and regional/rural using the geocoded address of the hospital assigned to Australian Bureau of Statistics statistical areas (SA2) and the Australian remoteness index for areas.

8. Reasons for readmission follow the same clinical grouping as used in the previous report *Return to acute care following discharge from hospital, July 2012 – June 2015*. Please refer to the previously published *Spotlight on Measurement: Measuring return to acute care following discharge from hospital, 2nd edition*, which outline the specifications used to describe reasons for readmission.

9. Results for hospitals with expected readmission <1 are not shown. Hospitals are classified according to the NSW Ministry of Health's peer grouping as at January 2018.

10. Readmission rates at an average NSW public hospital with the same case-mix.

Details of analyses are available in *Spotlight on Measurement: Measuring return to acute care following discharge from hospital, 2nd edition* and the *Technical Supplement – Readmission and returns to acute care following hospitalisation for eight clinical conditions, July 2015-June 2018*.

Data source: BHI analyses of Hospital Performance Dataset, NSW Ministry of Health Secure Analytics for Population Health Research and Intelligence.
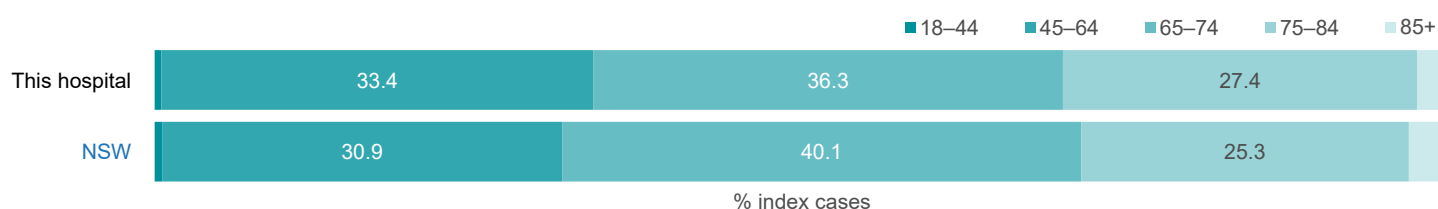
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Wollongong Hospital

60-day readmission following hospitalisation for total knee replacement, July 2015 – June 2018

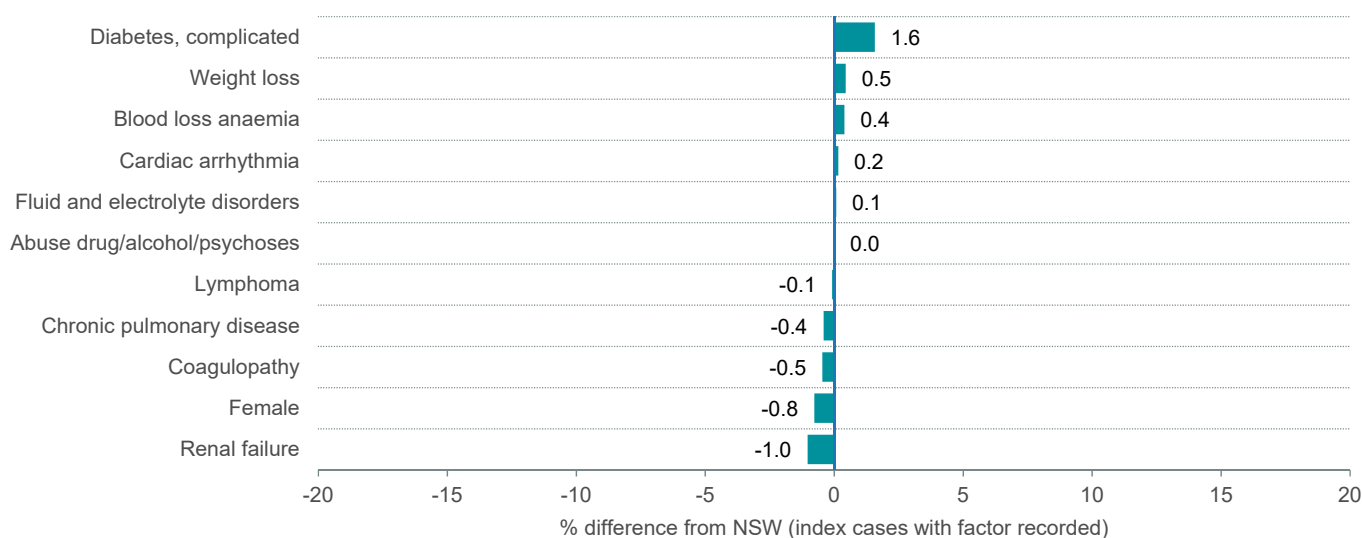### Patient cohort, index hospitalisations[1,2,3]

	This hospital	NSW
Total index cases for total knee replacement	767	15,940
Average length of stay (days)	4.6	4.9
Discharge destination		
Home	582	13,175
Other	185	2,765

Age profile for index hospitalisations (years)[4]

	18–44	45–64	65–74	75–84	85+

This hospital	33.4	36.3	27.4
NSW	30.9	40.1	25.3

% index cases

Patient factors associated with 60-day total knee replacement readmission[5,6]

Factor	% difference from NSW
Diabetes, complicated	1.6
Weight loss	0.5
Blood loss anaemia	0.4
Cardiac arrhythmia	0.2
Fluid and electrolyte disorders	0.1
Abuse drug/alcohol/psychoses	0.0
Lymphoma	-0.1
Chronic pulmonary disease	-0.4
Coagulopathy	-0.5
Female	-0.8
Renal failure	-1.0

% difference from NSW (index cases with factor recorded)
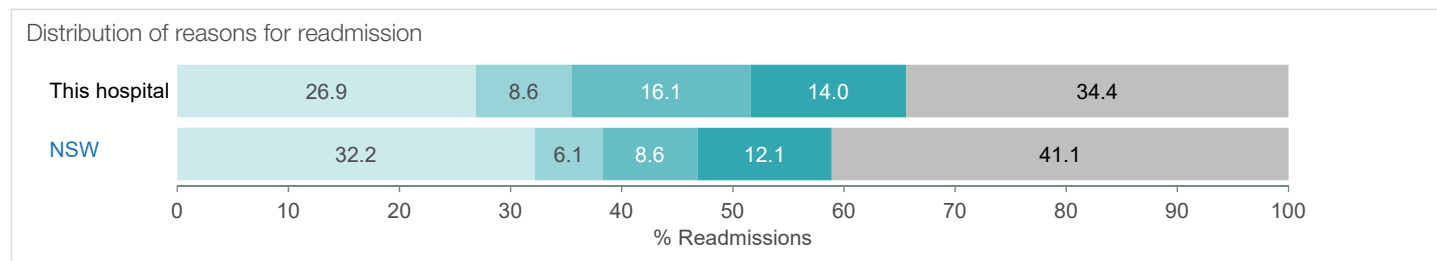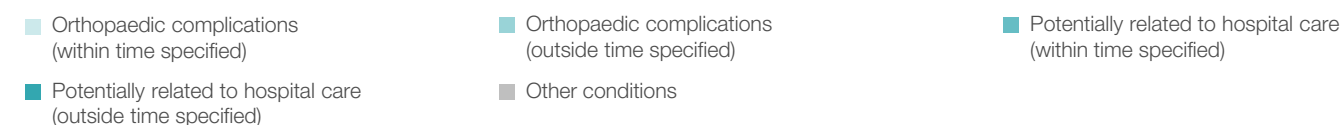
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60-day readmission following hospitalisation for total knee replacement, July 2015 – June 2018

Location of readmissions[7]
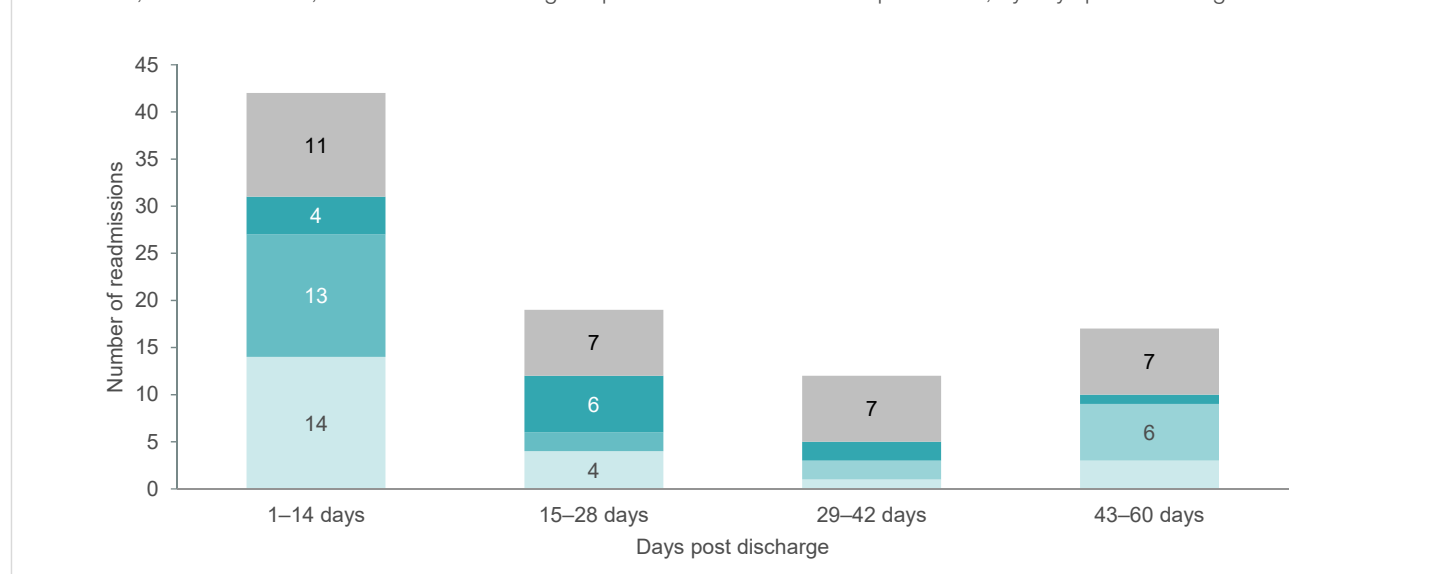
	This hospital	NSW
Total readmissions following index hospitalisation for total knee replacement	90	1,892
Returns to acute care	16	152
Readmitted following hospital discharge	74	1,740
Readmitted to the same hospital where acute care was completed	59	1,052
Readmitted to a different hospital	15	688
To an urban public hospital	13	
To a regional or rural public hospital	1	
To a private hospital	1	

Reasons for and time to readmission[8]

- Orthopaedic complications (within time specified)
- Orthopaedic complications (outside time specified)
- Potentially related to hospital care (within time specified)
- Potentially related to hospital care (outside time specified)
- Other conditions

Distribution of reasons for readmission

This hospital	26.9 / 8.6 / 16.1 / 14.0 / 34.4	
NSW	32.2 / 6.1 / 8.6 / 12.1 / 41.1	

% Readmissions

Number of, and reasons for, readmissions following hospitalisation for total knee replacement, by days post discharge

Number of readmissions

1–14 days: 14, 13, 4, 11
15–28 days: 4, 6, 7
29–42 days: 7
43–60 days: 6, 7

Days post discharge
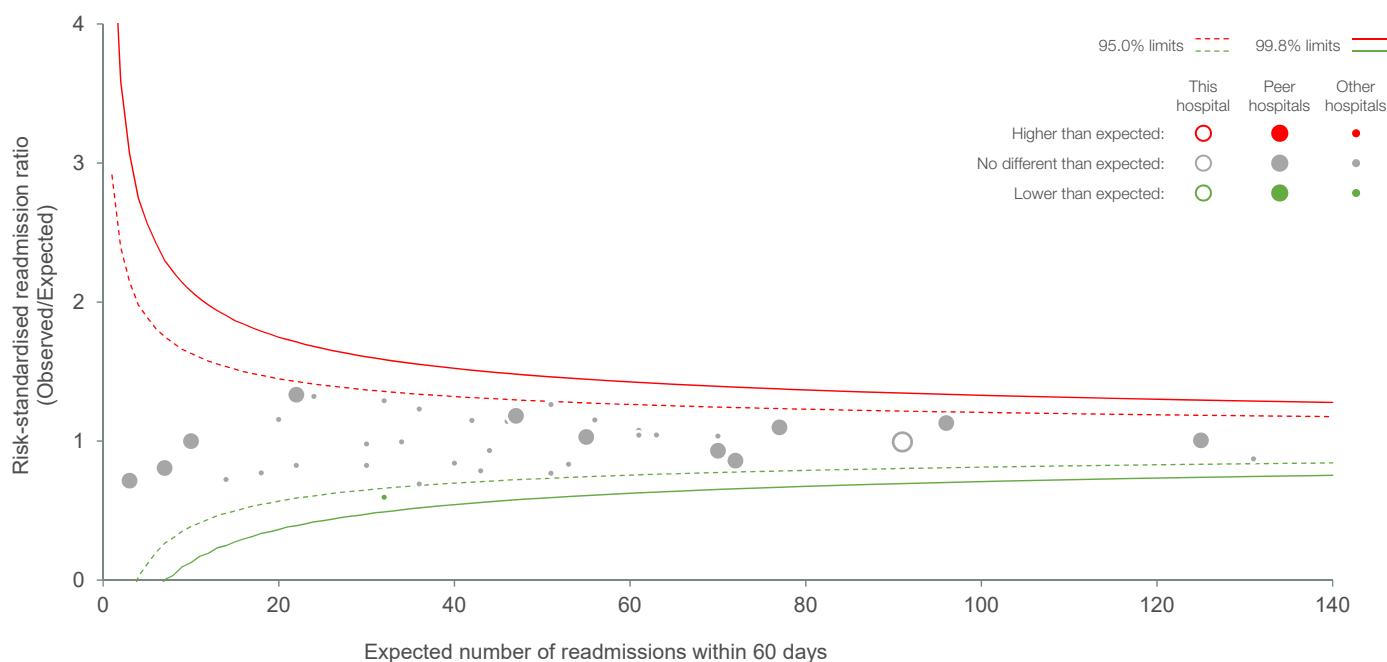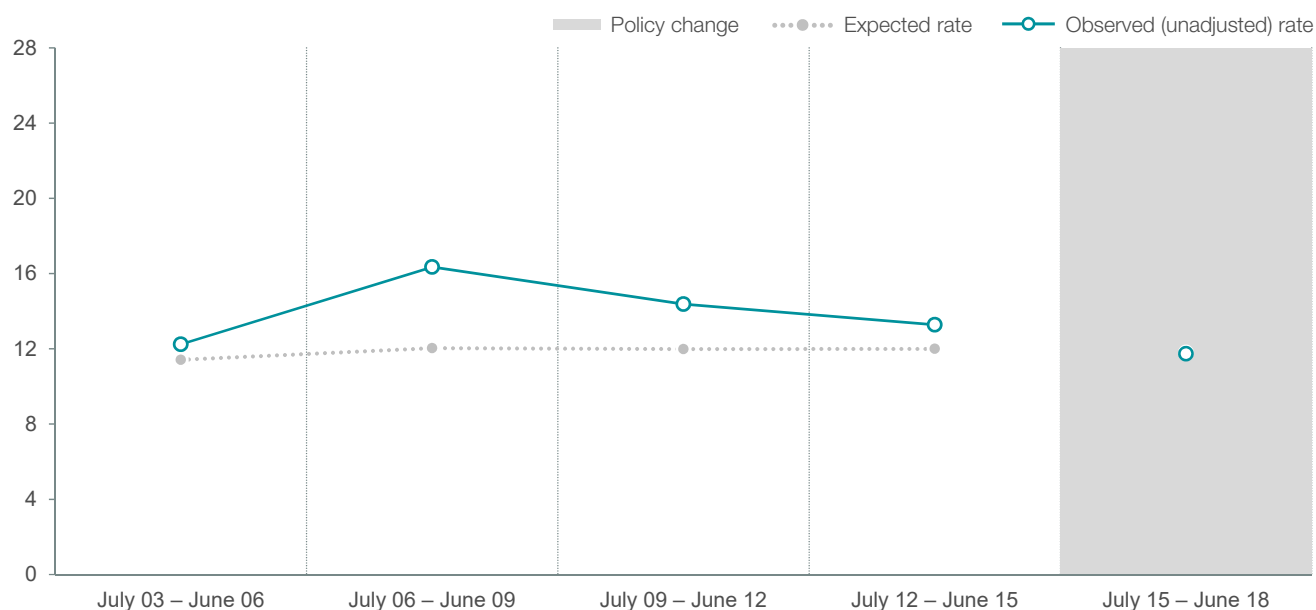
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60-day readmission following hospitalisation for total knee replacement, July 2015 – June 2018

Total knee replacement risk-standardised **readmission ratios** by number of expected readmissions, NSW public hospitals[9]

Total knee replacement, this hospital's expected **readmission rates**[10] and observed (unadjusted) readmission rates, July 2003 – June 2018

In June 2017, the NSW Health Admission Policy was released, stating that a patient treated in and discharged from an emergency department (ED) only, should not be recorded as an admitted patient. As a result, patients who attended an ED, but were not transferred to an inpatient ward, were not included in BHI readmission analyses from July 2015 onwards and comparison of results before and after this time should be made with caution. For more information, see the *Technical Supplement – Readmission and returns to acute care following hospitalisation for eight clinical conditions, July 2015-June 2018*.

Wollongong Hospital

Reference notes

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2. 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 1.5x the interquartile range of all in-scope episodes in each DRG.

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