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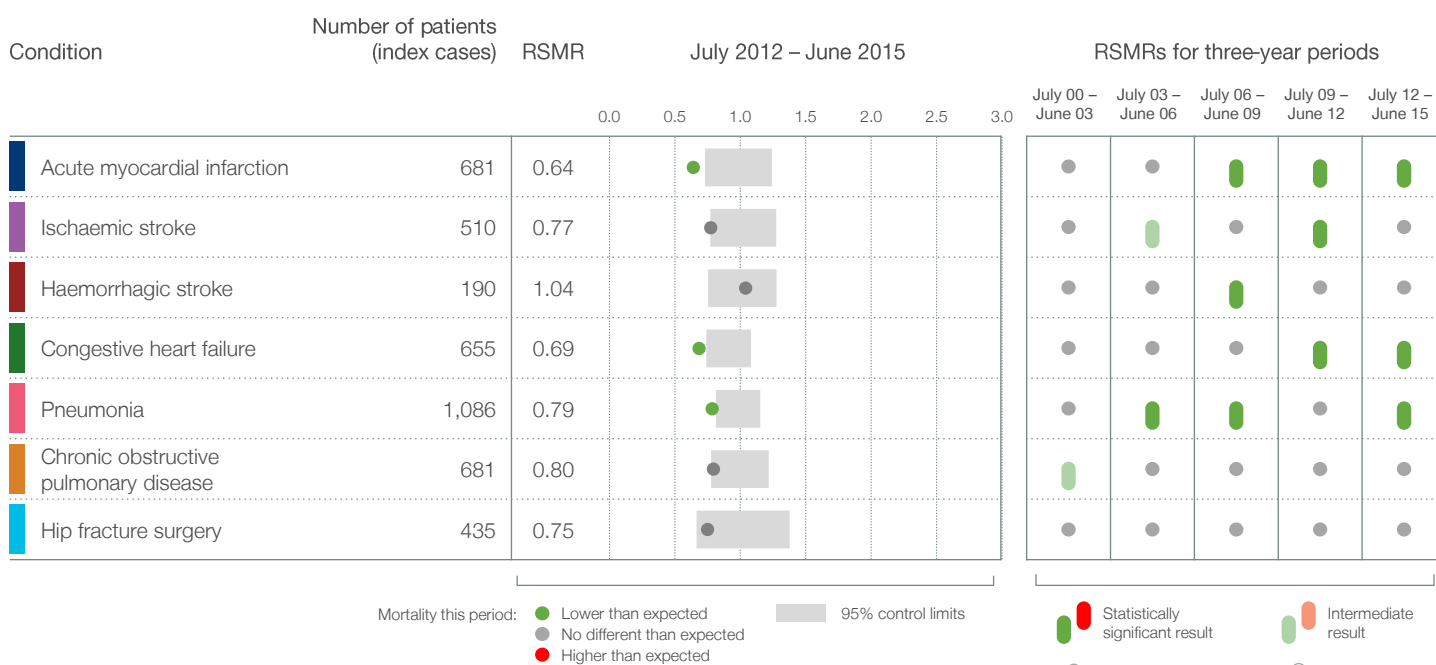# Prince of Wales Hospital

30-day mortality following hospitalisation for seven conditions

The risk-standardised mortality ratio (RSMR) is an indicator that describes, for each hospital's patient cohort, the 'observed' number of deaths divided by the 'expected' number of deaths[1]. The 'expected' number of deaths takes account of the hospital's case mix and is estimated using a statistical model built using the NSW patient population characteristics and outcomes. A ratio of less than 1.0 indicates lower than expected mortality while a ratio greater than 1.0 indicates higher than expected mortality. Small deviations from 1.0 are not considered to be meaningful.
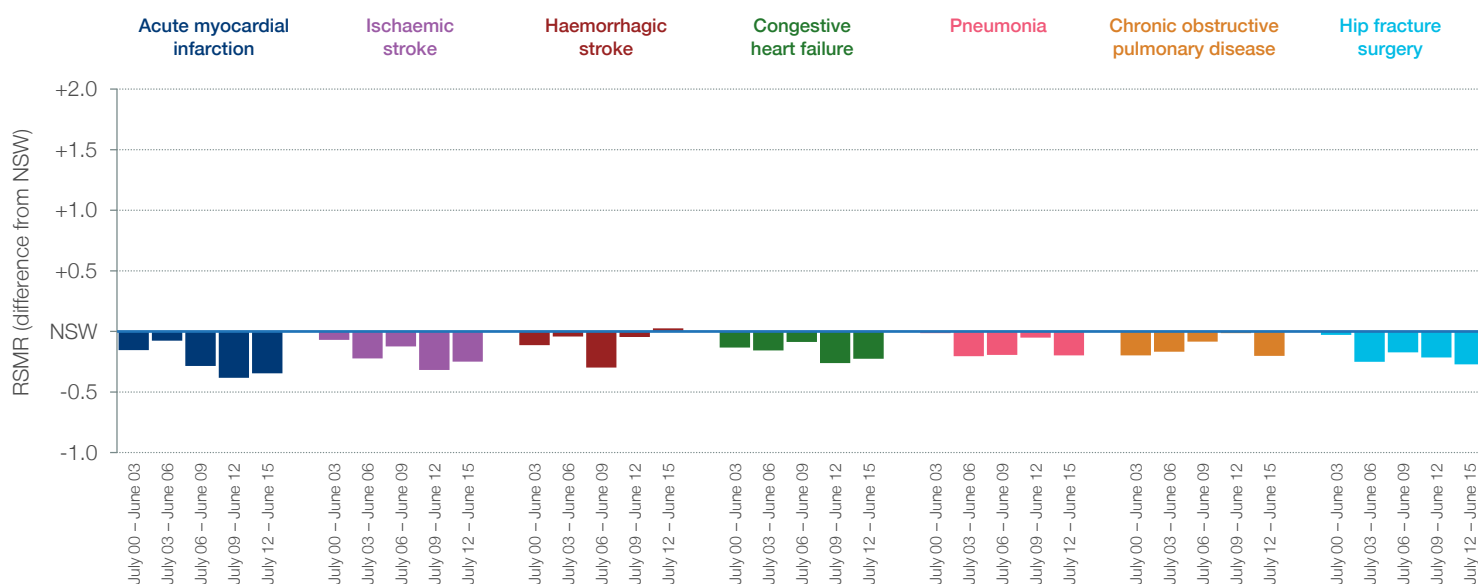
Funnel plots with 95% and 99.8% control limits around the NSW rate are used to identify outlier hospitals – those with 'special cause' variation that may warrant further investigation.

The measure is not designed to enable direct comparisons between hospitals. It assesses each hospital's results given its particular case mix. RSMRs do not distinguish deaths that are avoidable from those that are a reflection of the natural course of illness.
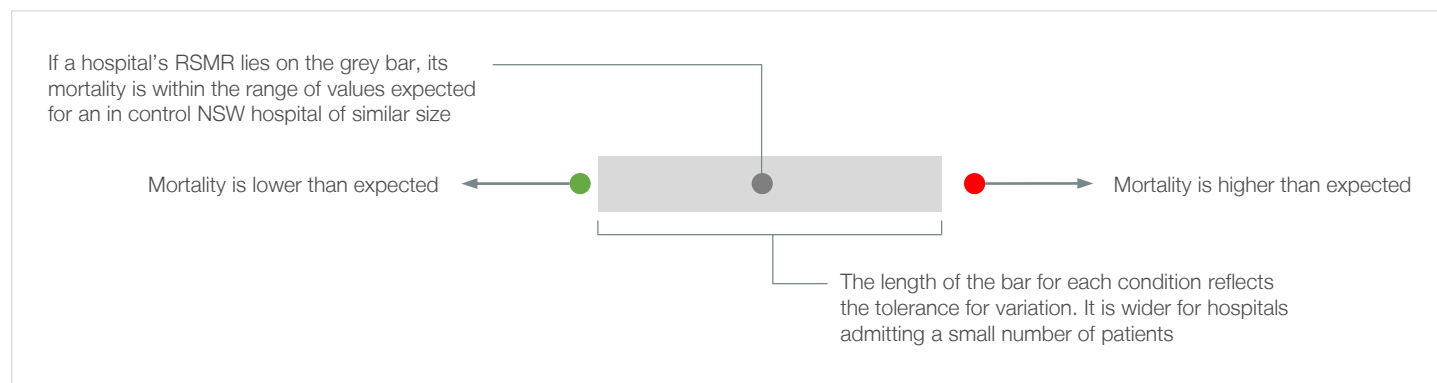
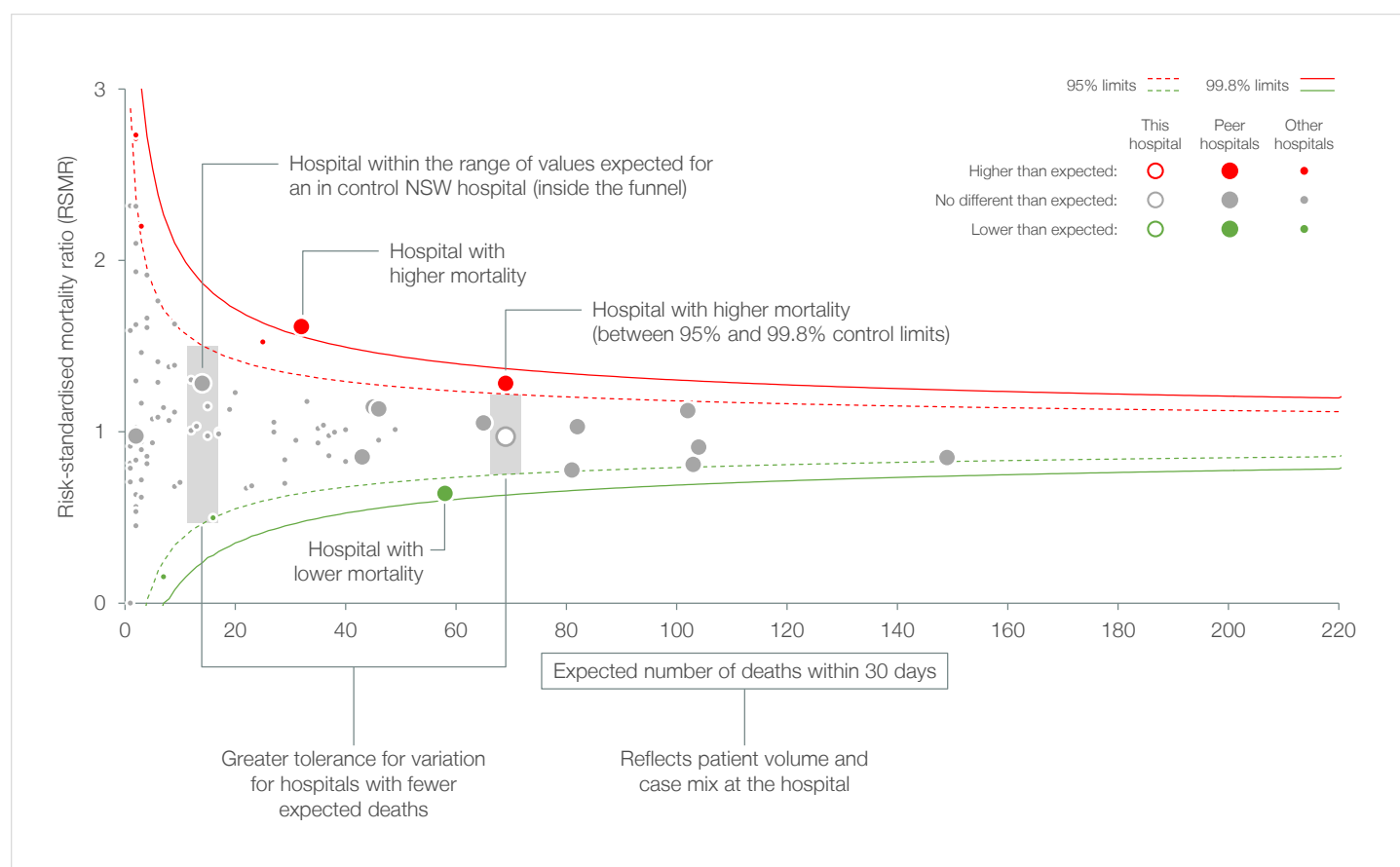## Risk-standardised mortality ratios (RSMRs) for seven conditions

Condition	Number of patients (index cases)	RSMR	July 2012 – June 2015	July 00 – June 03	July 03 – June 06	July 06 – June 09	July 09 – June 12	July 12 – June 15
Acute myocardial infarction	681	0.64						
Ischaemic stroke	510	0.77						
Haemorrhagic stroke	190	1.04						
Congestive heart failure	655	0.69						
Pneumonia	1,086	0.79						
Chronic obstructive pulmonary disease	681	0.80						
Hip fracture surgery	435	0.75						

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

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

RSMRs for three-year periods, seven clinical conditions

RSMR (difference from NSW)

Acute myocardial infarction | Ischaemic stroke | Haemorrhagic stroke | Congestive heart failure | Pneumonia | Chronic obstructive pulmonary disease | Hip fracture surgery

How to interpret the dashboard

If a hospital's RSMR lies on the grey bar, its mortality is within the range of values expected for an in control NSW hospital of similar size

Mortality is lower than expected ← → Mortality 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

95% limits   99.8% limits

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

Hospital within the range of values expected for an in control NSW hospital (inside the funnel)

Hospital with higher mortality

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

Risk-standardised mortality ratio (RSMR)

Hospital with lower mortality

Expected number of deaths within 30 days

Greater tolerance for variation for hospitals with fewer expected deaths

Reflects patient volume and case mix at the hospital

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Prince of Wales Hospital

30-day mortality following hospitalisation for acute myocardial infarction, July 2012 – June 2015

	This hospital	NSW
Total acute myocardial infarction hospitalisations	947	38,352
Acute myocardial infarction patients		
Presenting patients (index cases)[1]	681	30,488
Patients transferred to another hospital within 30 days	573	14,797
Percentage of patients aged 65+ years*[2]	63.7%	62.3%
Percentage of patients aged 75+ years*[2]	39.5%	38.7%

Significant patient factors and comorbidities, this hospital, index cases[3]
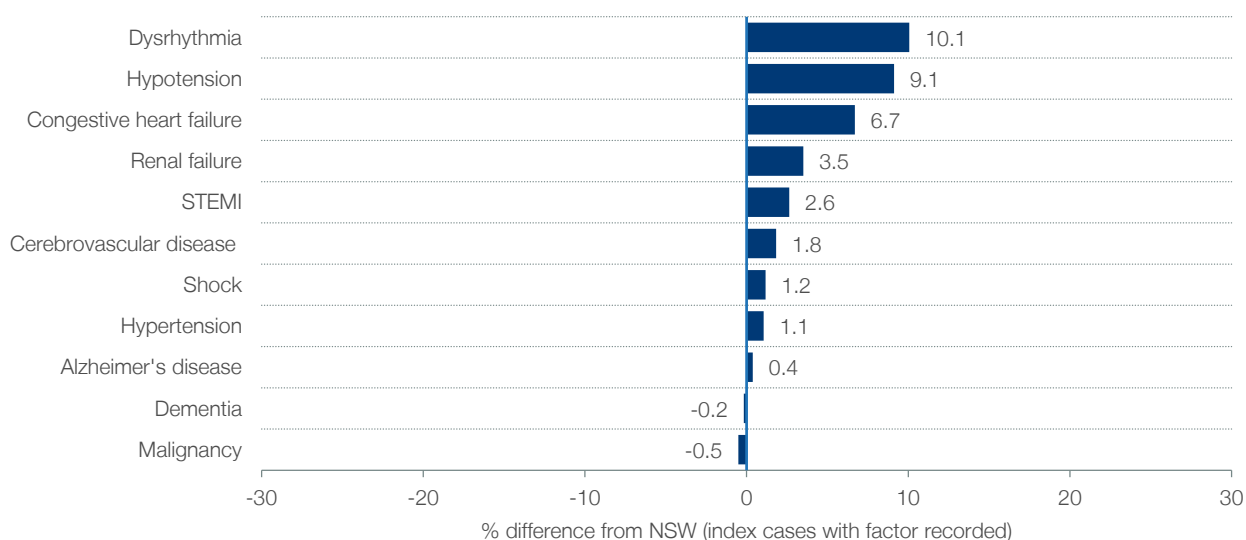
Factor	% difference from NSW
Dysrhythmia	10.1
Hypotension	9.1
Congestive heart failure	6.7
Renal failure	3.5
STEMI	2.6
Cerebrovascular disease	1.8
Shock	1.2
Hypertension	1.1
Alzheimer's disease	0.4
Dementia	-0.2
Malignancy	-0.5

% difference from NSW (index cases with factor recorded)

*Age was a significant factor in the final model of 30-day mortality following hospitalisation for acute myocardial infarction.

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30-day mortality following hospitalisation for acute myocardial infarction, July 2012 – June 2015

	This hospital	NSW
Mortality (all causes) among 681 acute myocardial infarction index cases	37 (5.4%)	2,108 (6.9%)
Percentages: index cases who died within 30 days of hospitalisation		
Where deaths occurred:		
Percentage in this hospital	59.5%	63.4%
Percentage in another hospital following transfer	0.0%	4.6%
Percentage after discharge	40.5%	31.9%
When deaths occurred:		
Percentage on day of admission	5.4%	15.4%
Percentage within seven days	54.1%	63.1%

Cumulative mortality following hospitalisation for acute myocardial infarction, this hospital and NSW[4]
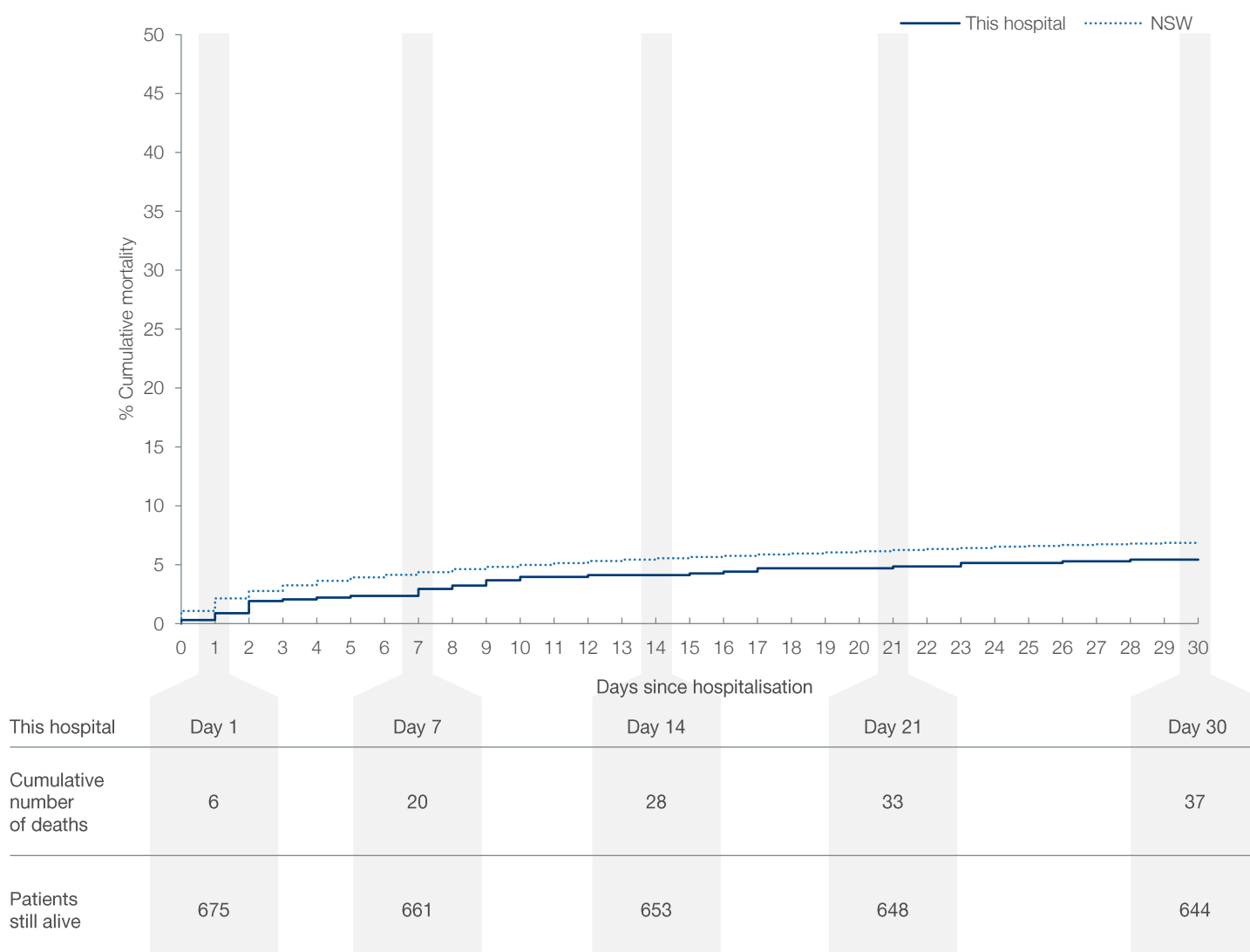
This hospital	Day 1	Day 7	Day 14	Day 21	Day 30
Cumulative number of deaths	6	20	28	33	37
Patients still alive	675	661	653	648	644

Prince of Wales Hospital

30-day mortality following hospitalisation for acute myocardial infarction, July 2012 – June 2015

Acute myocardial infarction risk-standardised mortality ratio by number of expected deaths, NSW public hospitals[5]

Illustrating the effect of standardisation, July 2012 – June 2015

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

Unadjusted ratio	Age and sex standardised ratio	Risk-standardised mortality ratio
0.79	0.80	0.64

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'[6] has been assessed across NSW hospitals. In July 2009 – June 2012, the average depth of coding was 6.2 diagnoses in this hospital and 4.3 in NSW; and in July 2012 – June 2015, there were 7.4 diagnoses in this hospital and 4.8 in NSW.

Three-yearly RSMR and annual unadjusted mortality rates

The RSMR 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 RSMR result for July 2012 – June 2015 alongside differences between this hospital and the NSW result for annual unadjusted mortality rates.
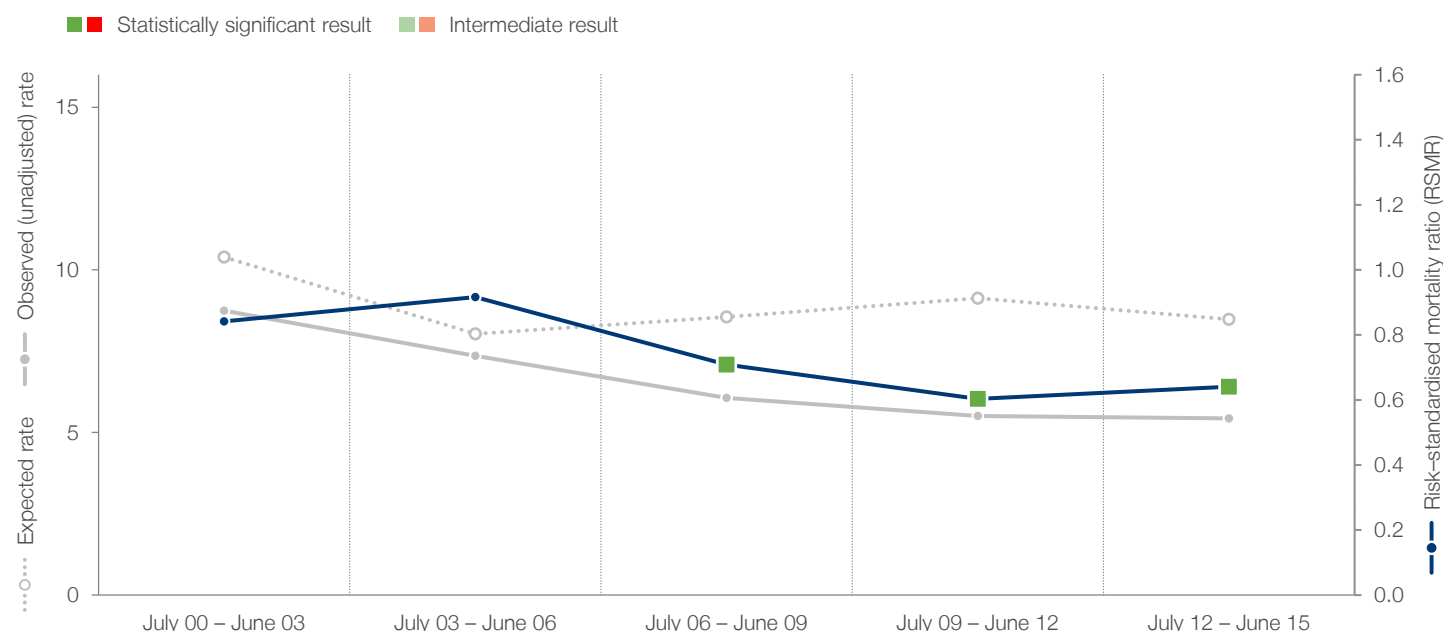
RSMR: Lower than expected / No different than expected / Higher than expected

RSMR July 2012 – June 2015

Unadjusted mortality rate percentage point difference from NSW result

July 12 – June 13	July 13 – June 14	July 14 – June 15
-1.4	-1.6	-1.6

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30-day mortality following hospitalisation for acute myocardial infarction, July 2012 – June 2015

Acute myocardial infarction, this hospital's risk-standardised mortality ratio, expected mortality rates and observed (unadjusted) mortality rates, July 2000 – June 2015

■■ Statistically significant result   ■■ Intermediate result

Notes

1. Data refer to patients who were discharged between July 2012 and June 2015 who were initially admitted to this hospital (regardless of whether they were subsequently transferred) in their last period of care, for an acute and emergency hospitalisation with AMI as principal diagnosis (ICD-10-AM codes I21, excluding I21.9). Deaths are from any cause, in or out of hospital within 30 days of the hospitalisation admission date.

2. Age at admission date.

3. Comorbidities as recorded on patient record, with one year look back from the admission date of the index case. Many are a result of end-organ damage resulting from comorbidities, such as diabetes. The Australian Commission on Safety and Quality in Healthcare comorbidity list was used for acute myocardial infarction, ischaemic stroke, haemorrhagic stroke, pneumonia and hip fracture surgery. The Elixhauser comorbidity list was used for congestive heart failure and chronic obstructive pulmonary disease. STEMI refers to ST-elevation myocardial infarction. Only those conditions that were shown to have a significant impact on mortality (P<0.05) are shown.

4. Cumulative percentage of deaths over the 30 days following admission to hospital for the relevant condition.

5. Results for hospitals with expected deaths <1 are not shown. Peer hospitals are identified according to the NSW Ministry of Health's peer grouping as of April 2012.

6. 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 30-day mortality following hospitalisation, 2nd edition*.
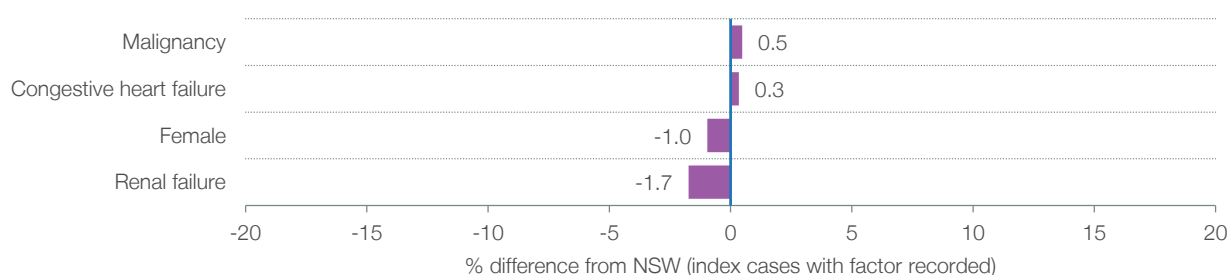
Data source: SAPHaRI, Centre for Epidemiology and Evidence, NSW Ministry of Health.

Prince of Wales Hospital

30-day mortality following hospitalisation for ischaemic stroke, July 2012 – June 2015

	This hospital	NSW
Total ischaemic stroke hospitalisations	549	16,655
Ischaemic stroke patients		
Presenting patients (index cases)[1]	510	15,475
Patients transferred to another hospital within 30 days	38	3,847
Percentage of patients aged 65+ years*[2]	77.7%	77.3%
Percentage of patients aged 75+ years*[2]	56.5%	55.3%

Significant patient factors and comorbidities, this hospital, index cases[3]

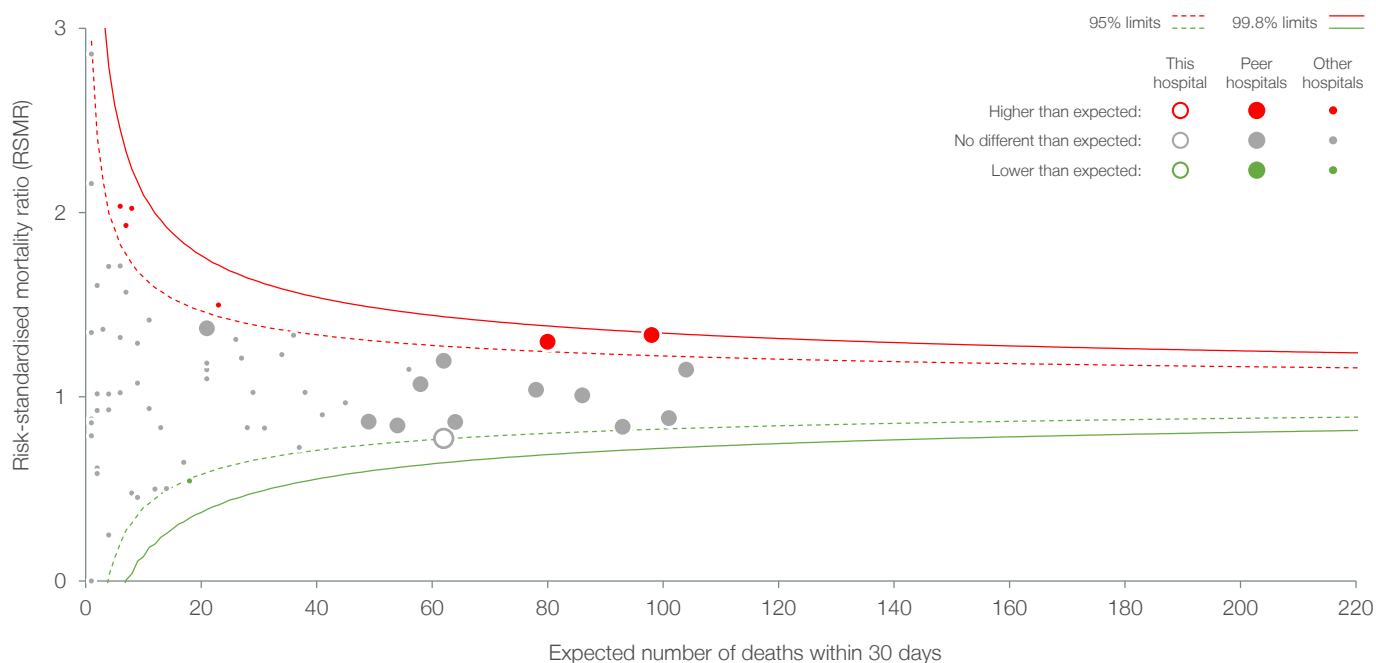|	% difference from NSW (index cases with factor recorded)
Malignancy	0.5
Congestive heart failure	0.3
Female	-1.0
Renal failure	-1.7

*Age was a significant factor in the final model of 30-day mortality following hospitalisation for ischaemic stroke.

Prince of Wales Hospital

30-day mortality following hospitalisation for ischaemic stroke, July 2012 – June 2015

	This hospital	NSW
Mortality (all causes) among 510 ischaemic stroke index cases	48 (9.4%)	1,861 (12.0%)
Percentages: index cases who died within 30 days of hospitalisation		
Where deaths occurred:		
Percentage in this hospital	60.4%	55.8%
Percentage in another hospital following transfer	0.0%	1.7%
Percentage after discharge	39.6%	42.6%
When deaths occurred:		
Percentage on day of admission	0.0%	1.7%
Percentage within seven days	47.9%	47.8%

Cumulative mortality following hospitalisation for ischaemic stroke, this hospital and NSW[4]

This hospital	Day 1	Day 7	Day 14	Day 21	Day 30
Cumulative number of deaths	1	23	40	45	48
Patients still alive	509	487	470	465	462

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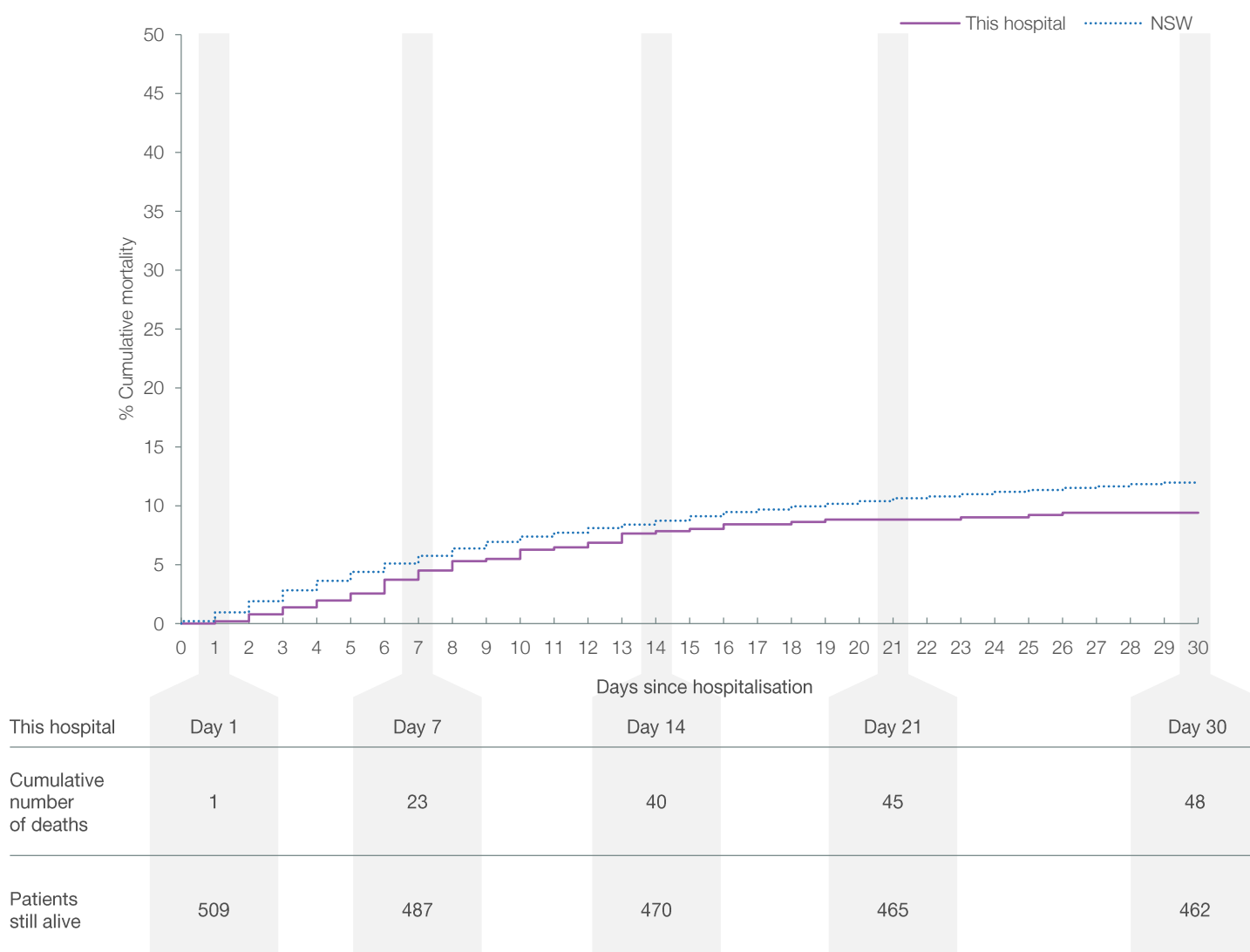
Prince of Wales Hospital

30-day mortality following hospitalisation for ischaemic stroke,
July 2012 – June 2015

Ischaemic stroke risk-standardised mortality ratio by number of expected deaths,
NSW public hospitals[5]

Illustrating the effect of standardisation,
July 2012 – June 2015

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

Unadjusted ratio	Age and sex standardised ratio	Risk-standardised mortality ratio
0.78	0.79	0.77

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'[6] has
been assessed across NSW hospitals. In July 2009 – June 2012,
the average depth of coding was 8.5 diagnoses in this hospital
and 6.3 in NSW; and in July 2012 – June 2015, there were 9.4
diagnoses in this hospital and 7.0 in NSW.

Three-yearly RSMR and annual unadjusted
mortality rates

The RSMR 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 RSMR result for July 2012 – June 2015 alongside
differences between this hospital and the NSW result for annual
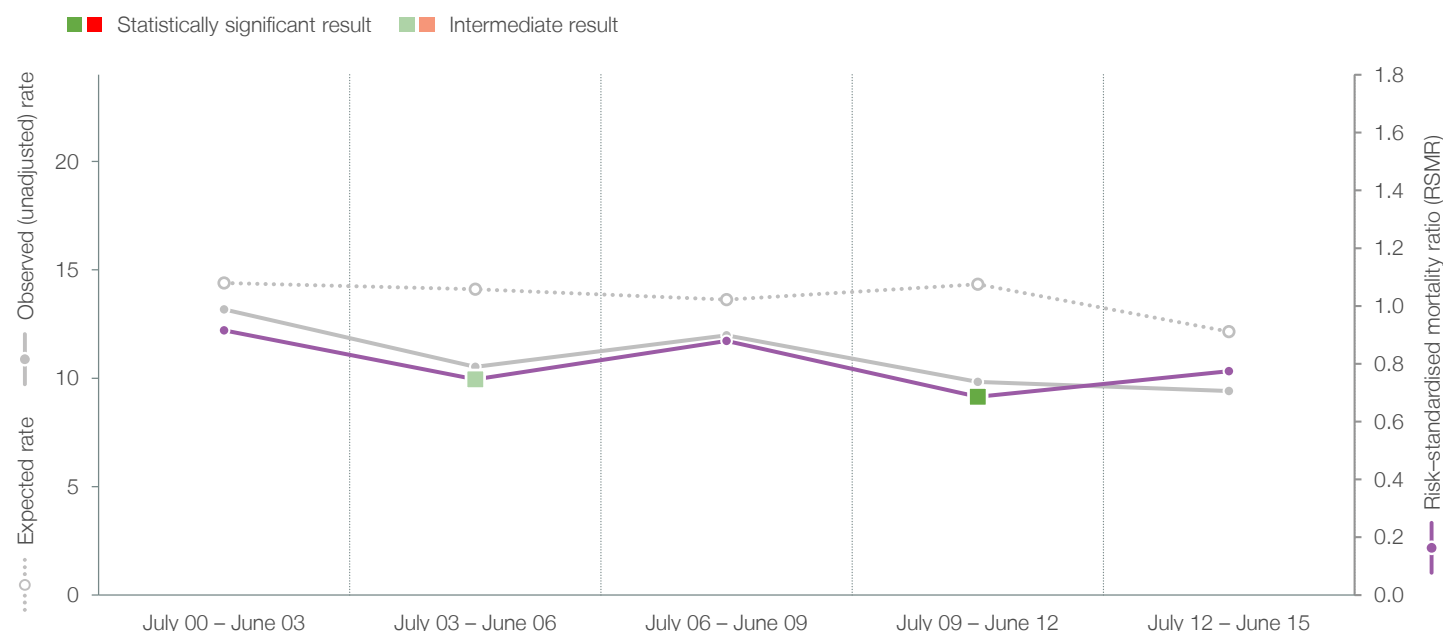unadjusted mortality rates.

RSMR: ○ Lower than expected   ○ No different than expected   ○ Higher than expected

Prince of Wales Hospital

30-day mortality following hospitalisation for ischaemic stroke, July 2012 – June 2015

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

Notes

1. Data refer to patients who were discharged between July 2012 and June 2015 who were initially admitted to this hospital (regardless of whether they were subsequently transferred) in their last period of care, for an acute and emergency hospitalisation with ischaemic stroke as principal diagnosis (ICD-10-AM code I63). Deaths are from any cause, in or out of hospital within 30 days of the hospitalisation admission date.

2. Age at admission date.

3. Comorbidities as recorded on patient record, with one year look back from the admission date of the index case. Many are a result of end-organ damage resulting from comorbidities, such as diabetes. The Australian Commission on Safety and Quality in Healthcare comorbidity list was used for acute myocardial infarction, ischaemic stroke, haemorrhagic stroke, pneumonia and hip fracture surgery. The Elixhauser comorbidity list was used for congestive heart failure and chronic obstructive pulmonary disease. STEMI refers to ST-elevation myocardial infarction. Only those conditions that were shown to have a significant impact on mortality (P<0.05) are shown.

4. Cumulative percentage of deaths over the 30 days following admission to hospital for the relevant condition.

5. Results for hospitals with expected deaths <1 are not shown. Peer hospitals are identified according to the NSW Ministry of Health's peer grouping as of April 2012.

6. 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 30-day mortality following hospitalisation, 2nd edition*.
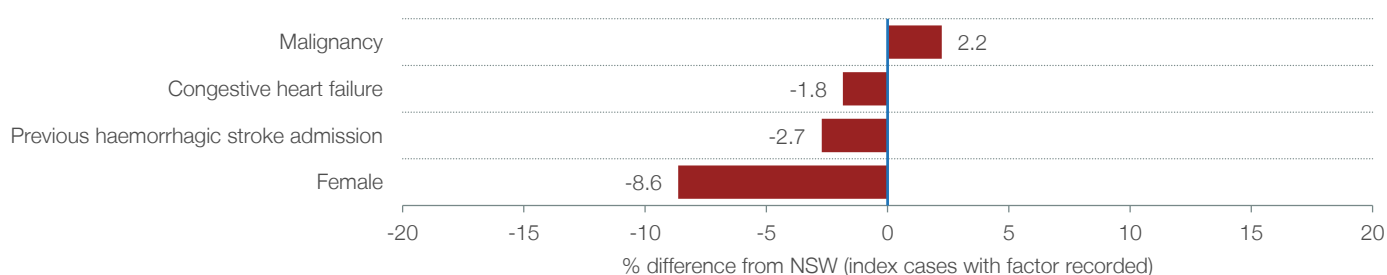
Data source: SAPHaRI, Centre for Epidemiology and Evidence, NSW Ministry of Health.

Prince of Wales Hospital

30-day mortality following hospitalisation for haemorrhagic stroke, July 2012 – June 2015

	This hospital	NSW
Total haemorrhagic stroke hospitalisations	207	6,469
Haemorrhagic stroke patients		
Presenting patients (index cases)[1]	190	5,659
Patients transferred to another hospital within 30 days	13	1,855
Percentage of patients aged 65+ years*[2]	66.3%	77.7%
Percentage of patients aged 75+ years*[2]	49.0%	57.6%

Significant patient factors and comorbidities, this hospital, index cases[3]

Malignancy 2.2
Congestive heart failure -1.8
Previous haemorrhagic stroke admission -2.7
Female -8.6

% difference from NSW (index cases with factor recorded)

*Age was a significant factor in the final model of 30-day mortality following hospitalisation for haemorrhagic stroke.

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30-day mortality following hospitalisation for haemorrhagic stroke, July 2012 – June 2015

	This hospital	NSW
Mortality (all causes) among 190 haemorrhagic stroke index cases	59 (31.1%)	1,855 (32.8%)
Percentages: index cases who died within 30 days of hospitalisation		
Where deaths occurred:		
Percentage in this hospital	89.8%	72.9%
Percentage in another hospital following transfer	0.0%	3.6%
Percentage after discharge	10.2%	23.5%
When deaths occurred:		
Percentage on day of admission	13.6%	16.9%
Percentage within seven days	74.6%	75.3%

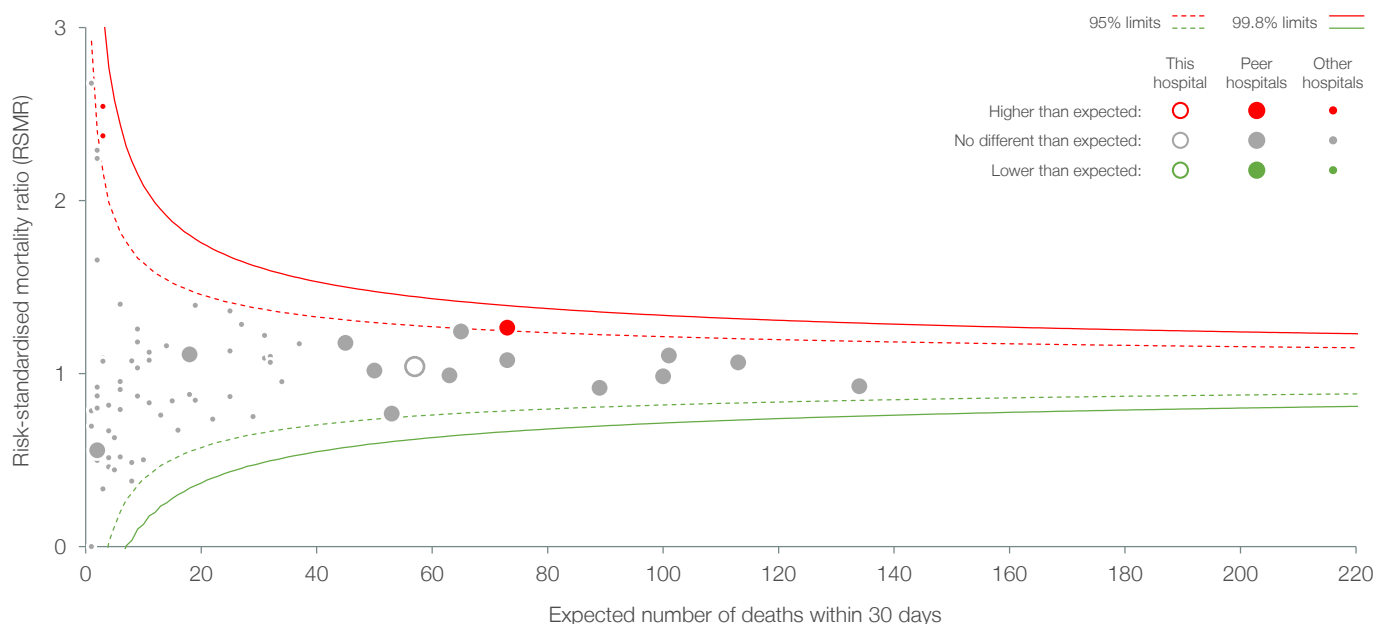## Cumulative mortality following hospitalisation for haemorrhagic stroke, this hospital and NSW[4]
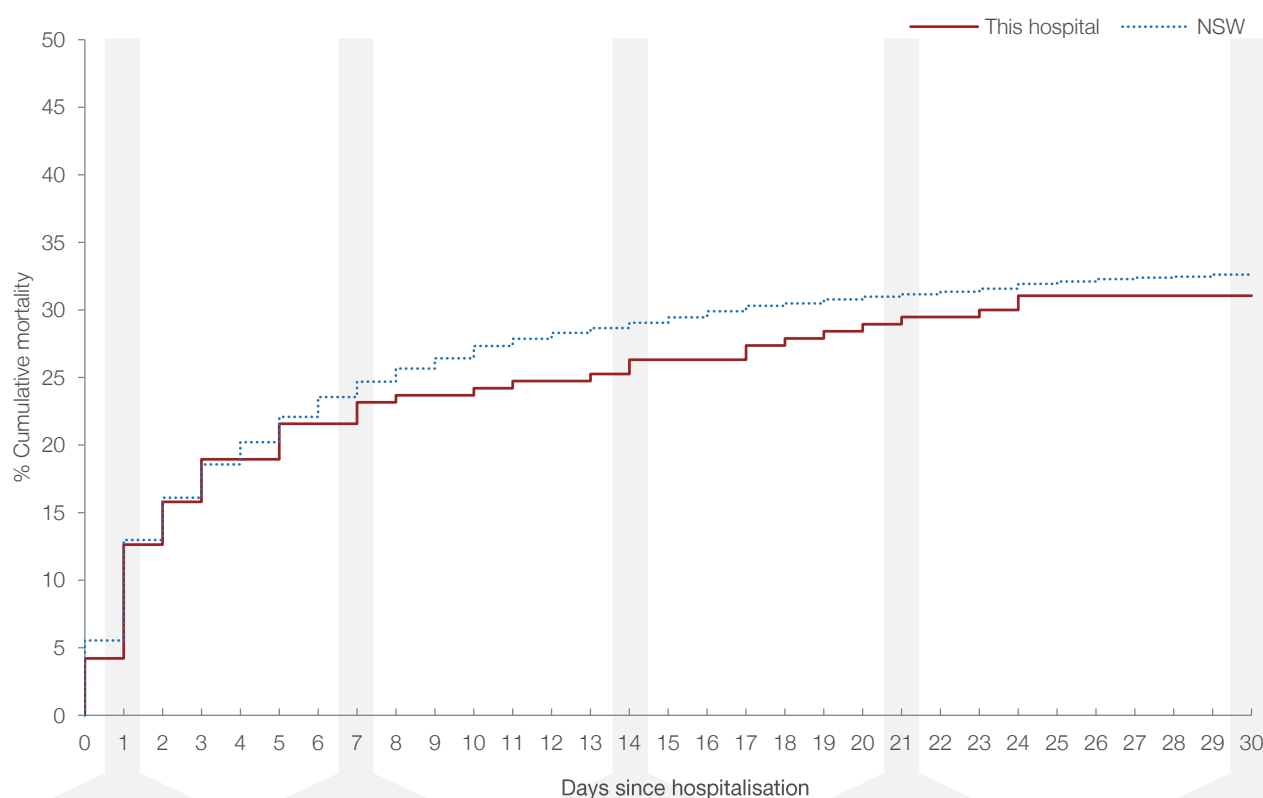
This hospital	Day 1	Day 7	Day 14	Day 21	Day 30
Cumulative number of deaths	24	44	50	56	59
Patients still alive	166	146	140	134	131

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30-day mortality following hospitalisation for haemorrhagic stroke, July 2012 – June 2015

Haemorrhagic stroke risk-standardised mortality ratio by number of expected deaths, NSW public hospitals[5]

Illustrating the effect of standardisation, July 2012 – June 2015

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

Unadjusted ratio	Age and sex standardised ratio	Risk-standardised mortality ratio
0.95	1.05	1.04

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'[6] has been assessed across NSW hospitals. In July 2009 – June 2012, the average depth of coding was 7.0 diagnoses in this hospital and 5.1 in NSW; and in July 2012 – June 2015, there were 7.6 diagnoses in this hospital and 5.8 in NSW.

Three-yearly RSMR and annual unadjusted mortality rates

The RSMR 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 RSMR result for July 2012 – June 2015 alongside differences between this hospital and the NSW result for annual unadjusted mortality rates.
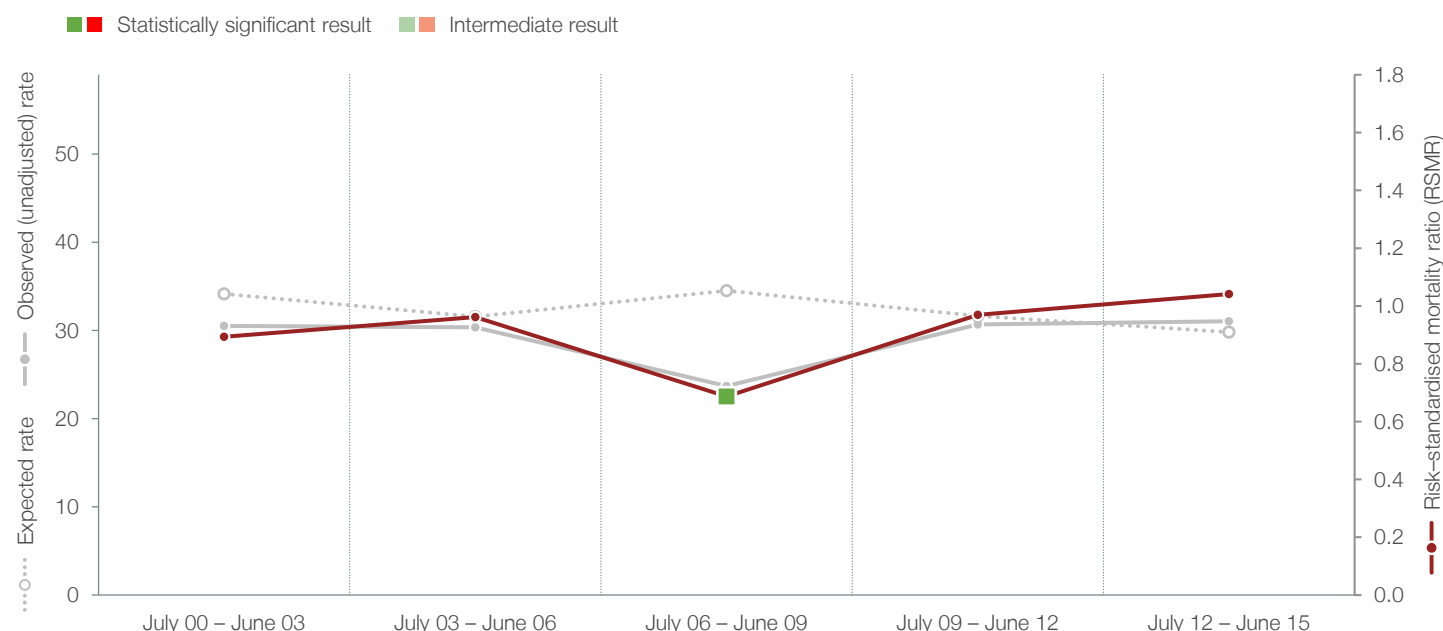
RSMR: ○ Lower than expected   ○ No different than expected   ○ Higher than expected

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30-day mortality following hospitalisation for haemorrhagic stroke, July 2012 – June 2015

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

Notes

1. Data refer to patients who were discharged between July 2012 and June 2015 who were initially admitted to this hospital (regardless of whether they were subsequently transferred) in their last period of care, for an acute and emergency hospitalisation with haemorrhagic stroke as principal diagnosis (ICD-10-AM code I61, I62). Deaths are from any cause, in or out of hospital within 30 days of the hospitalisation admission date.

2. Age at admission date.

3. Comorbidities as recorded on patient record, with one year look back from the admission date of the index case. Many are a result of end-organ damage resulting from comorbidities, such as diabetes. The Australian Commission on Safety and Quality in Healthcare comorbidity list was used for acute myocardial infarction, ischaemic stroke, haemorrhagic stroke, pneumonia and hip fracture surgery. The Elixhauser comorbidity list was used for congestive heart failure and chronic obstructive pulmonary disease. STEMI refers to ST-elevation myocardial infarction. Only those conditions that were shown to have a significant impact on mortality (P<0.05) are shown.

4. Cumulative percentage of deaths over the 30 days following admission to hospital for the relevant condition.

5. Results for hospitals with expected deaths <1 are not shown. Peer hospitals are identified according to the NSW Ministry of Health's peer grouping as of April 2012.

6. 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 30-day mortality following hospitalisation, 2nd edition*.
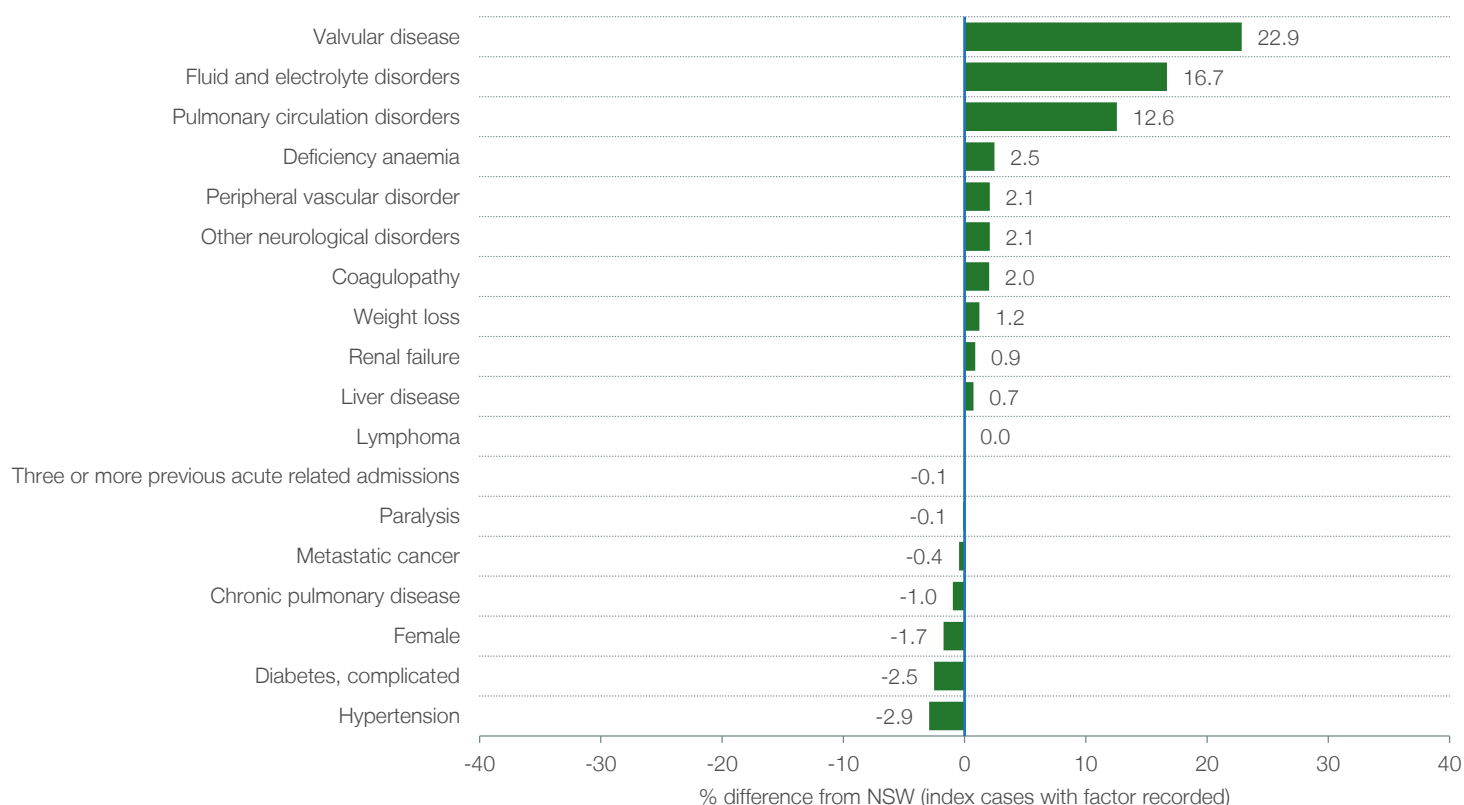
Data source: SAPHaRI, Centre for Epidemiology and Evidence, NSW Ministry of Health.

Prince of Wales Hospital

30-day mortality following hospitalisation for congestive heart failure, July 2012 – June 2015

	This hospital	NSW
Total congestive heart failure hospitalisations	895	40,670
Congestive heart failure patients		
Presenting patients (index cases)[1]	655	27,484
Patients transferred to another hospital within 30 days	117	4,200
Percentage of patients aged 65+ years*[2]	93.1%	90.2%
Percentage of patients aged 75+ years*[2]	80.2%	73.0%

Significant patient factors and comorbidities, this hospital, index cases[3]

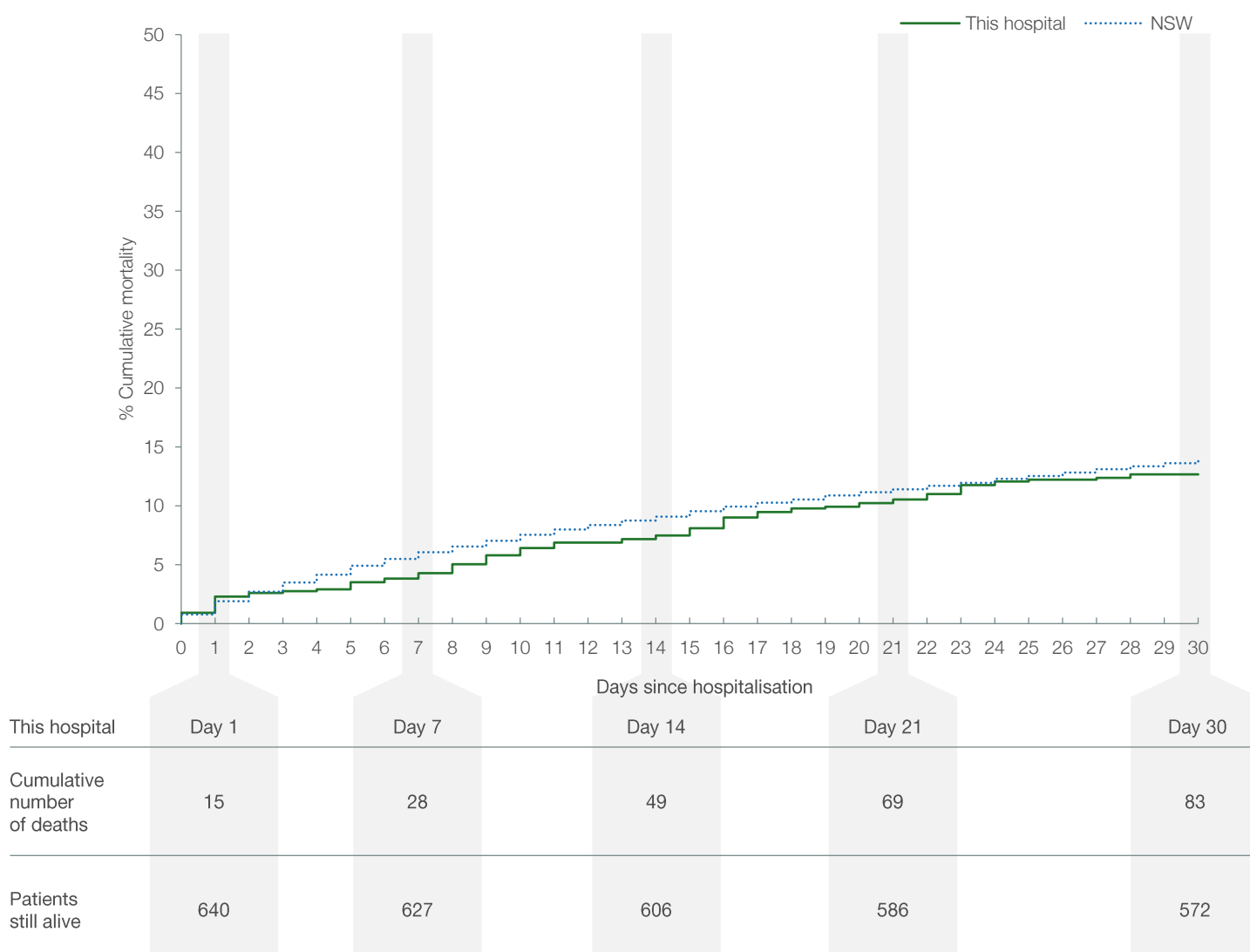| Factor	% difference from NSW
Valvular disease	22.9
Fluid and electrolyte disorders	16.7
Pulmonary circulation disorders	12.6
Deficiency anaemia	2.5
Peripheral vascular disorder	2.1
Other neurological disorders	2.1
Coagulopathy	2.0
Weight loss	1.2
Renal failure	0.9
Liver disease	0.7
Lymphoma	0.0
Three or more previous acute related admissions	-0.1
Paralysis	-0.1
Metastatic cancer	-0.4
Chronic pulmonary disease	-1.0
Female	-1.7
Diabetes, complicated	-2.5
Hypertension	-2.9

% difference from NSW (index cases with factor recorded)

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

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30-day mortality following hospitalisation for congestive heart failure, July 2012 – June 2015

	This hospital	NSW
Mortality (all causes) among 655 congestive heart failure index cases	83 (12.7%)	3,793 (13.8%)
Percentages: index cases who died within 30 days of hospitalisation		
Where deaths occurred:		
Percentage in this hospital	49.4%	57.2%
Percentage in another hospital following transfer	0.0%	1.5%
Percentage after discharge	50.6%	41.3%
When deaths occurred:		
Percentage on day of admission	7.2%	5.5%
Percentage within seven days	33.7%	43.9%

Cumulative mortality following hospitalisation for congestive heart failure, this hospital and NSW[4]

This hospital	Day 1	Day 7	Day 14	Day 21	Day 30
Cumulative number of deaths	15	28	49	69	83
Patients still alive	640	627	606	586	572

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30-day mortality following hospitalisation for congestive heart failure, July 2012 – June 2015

Congestive heart failure risk-standardised mortality ratio by number of expected deaths, NSW public hospitals[5]

Illustrating the effect of standardisation, July 2012 – June 2015

In order to make fair comparisons, a number of risk adjustments are made to mortality data. These take into account patient factors that influence the likelihood of dying. The table below illustrates the effect of statistical adjustments on this hospital's results.
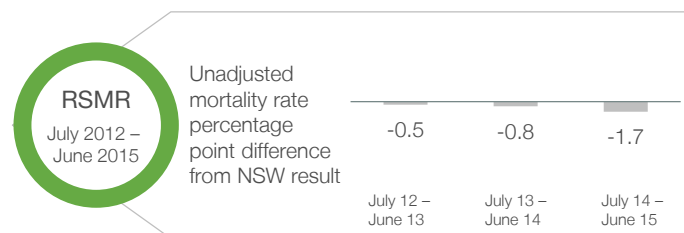
Unadjusted ratio	Age and sex standardised ratio	Risk-standardised mortality ratio
0.92	0.85	0.69

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'[6] has been assessed across NSW hospitals. In July 2009 – June 2012, the average depth of coding was 7.0 diagnoses in this hospital and 5.1 in NSW; and in July 2012 – June 2015, there were 7.9 diagnoses in this hospital and 6.0 in NSW.

Three-yearly RSMR and annual unadjusted mortality rates

The RSMR 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 RSMR result for July 2012 – June 2015 alongside differences between this hospital and the NSW result for annual unadjusted mortality rates.
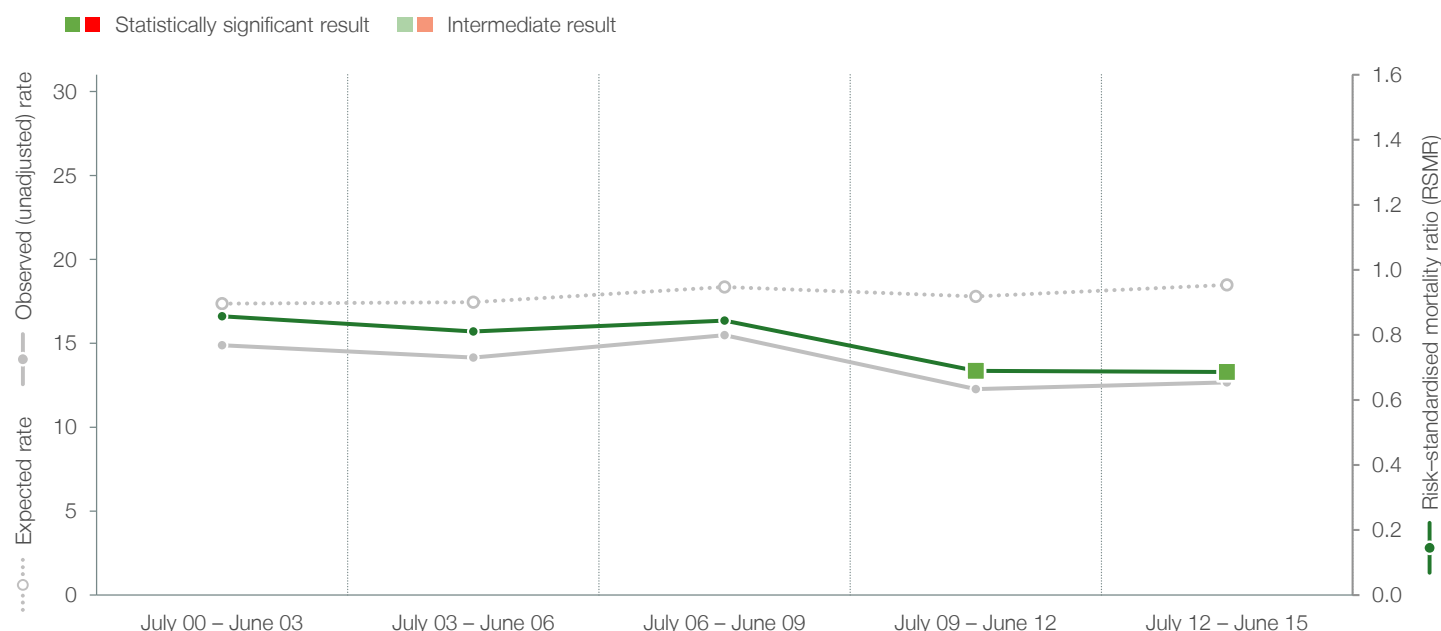
RSMR: ○ Lower than expected   ○ No different than expected   ○ Higher than expected

RSMR
July 2012 –
June 2015

Unadjusted mortality rate percentage point difference from NSW result

July 12 – June 13	July 13 – June 14	July 14 – June 15
-0.5	-0.8	-1.7

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30-day mortality following hospitalisation for congestive heart failure, July 2012 – June 2015

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

■■ Statistically significant result   ■■ Intermediate result

Notes

1. Data refer to patients who were discharged between July 2012 and June 2015 who were initially admitted to this hospital (regardless of whether they were subsequently transferred) in their last period of care, for an acute and emergency hospitalisation with congestive heart failure as principal diagnosis (ICD-10-AM codes I11.0, I13.0, I13.2, I50.0, I50.1, I50.9). Deaths are from any cause, in or out of hospital within 30 days of the hospitalisation admission date.

2. Age at admission date.

3. Comorbidities as recorded on patient record, with one year look back from the admission date of the index case. Many are a result of end-organ damage resulting from comorbidities, such as diabetes. The Australian Commission on Safety and Quality in Healthcare comorbidity list was used for acute myocardial infarction, ischaemic stroke, haemorrhagic stroke, pneumonia and hip fracture surgery. The Elixhauser comorbidity list was used for congestive heart failure and chronic obstructive pulmonary disease. STEMI refers to ST-elevation myocardial infarction. Only those conditions that were shown to have a significant impact on mortality (P<0.05) are shown.

4. Cumulative percentage of deaths over the 30 days following admission to hospital for the relevant condition.

5. Results for hospitals with expected deaths <1 are not shown. Peer hospitals are identified according to the NSW Ministry of Health's peer grouping as of April 2012.

6. 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 30-day mortality following hospitalisation, 2nd edition*.
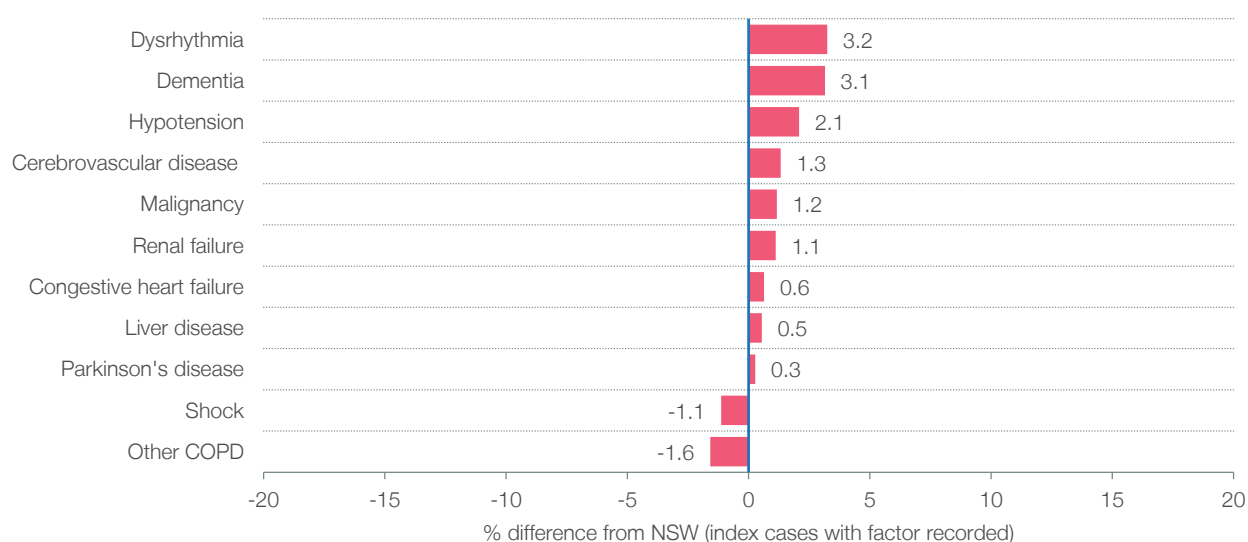
Data source: SAPHaRI, Centre for Epidemiology and Evidence, NSW Ministry of Health.

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30-day mortality following hospitalisation for pneumonia, July 2012 – June 2015

	This hospital	NSW
Total pneumonia hospitalisations	1,201	54,478
Pneumonia patients		
Presenting patients (index cases)[1]	1,086	47,133
Patients transferred to another hospital within 30 days	73	6,564
Percentage of patients aged 65+ years*[2]	70.4%	69.1%
Percentage of patients aged 75+ years*[2]	53.4%	50.0%

Significant patient factors and comorbidities, this hospital, index cases[3]

Factor	% difference from NSW
Dysrhythmia	3.2
Dementia	3.1
Hypotension	2.1
Cerebrovascular disease	1.3
Malignancy	1.2
Renal failure	1.1
Congestive heart failure	0.6
Liver disease	0.5
Parkinson's disease	0.3
Shock	-1.1
Other COPD	-1.6

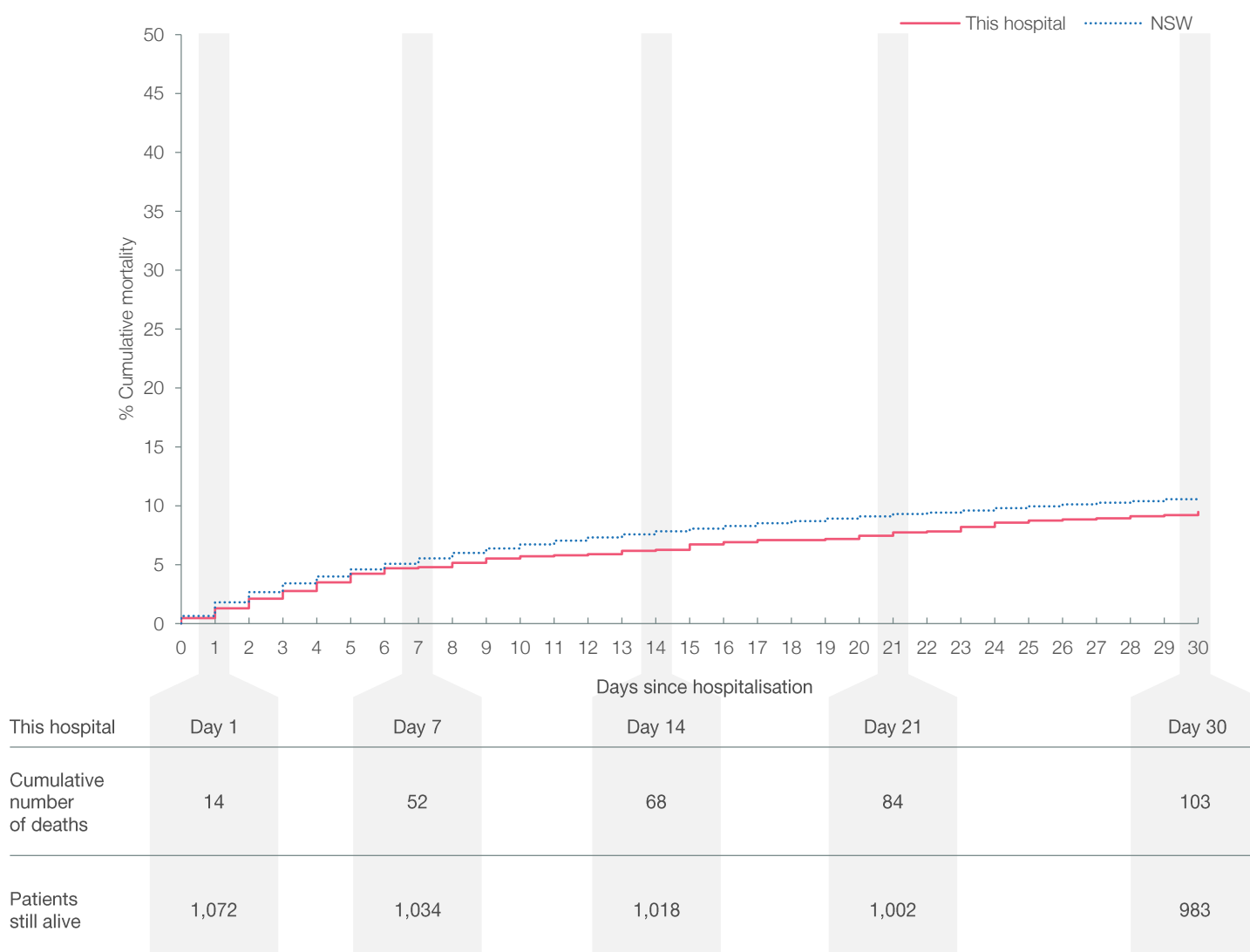% difference from NSW (index cases with factor recorded)
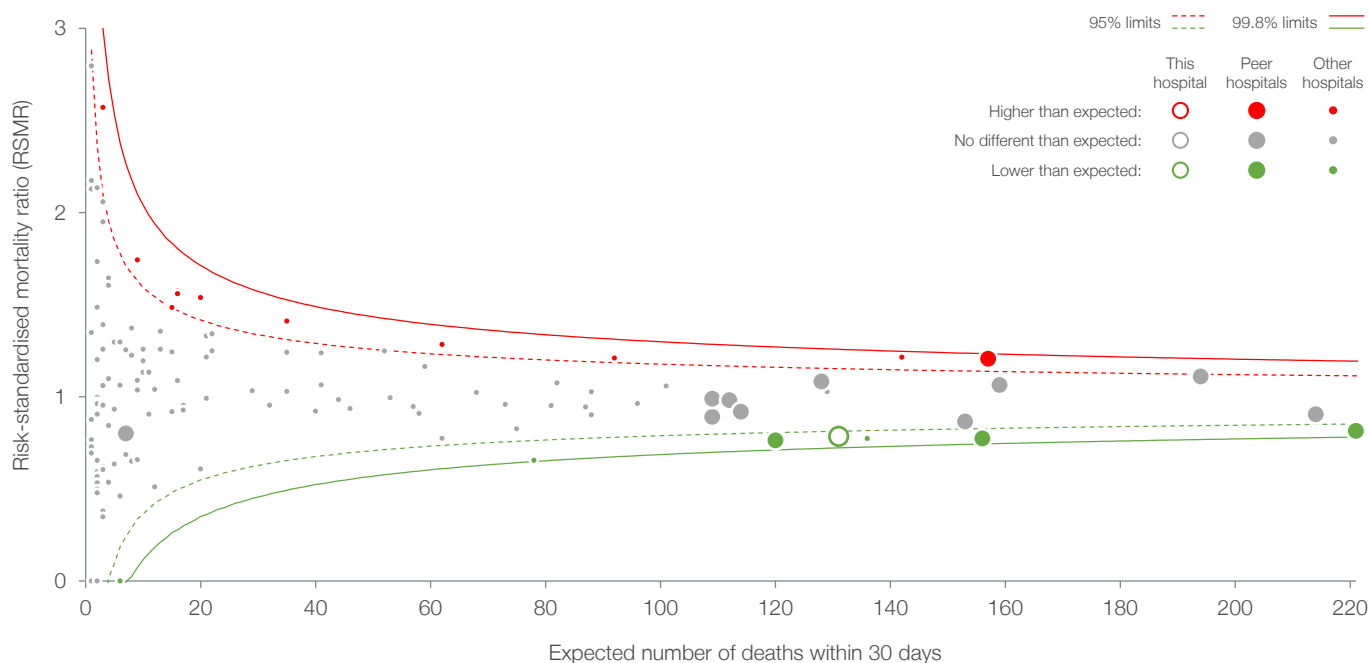
*Age was a significant factor in the final model of 30-day mortality following hospitalisation for pneumonia.

Prince of Wales Hospital

30-day mortality following hospitalisation for pneumonia, July 2012 – June 2015

	This hospital	NSW
Mortality (all causes) among 1,086 pneumonia index cases	103 (9.5%)	5,037 (10.7%)
Percentages: index cases who died within 30 days of hospitalisation		
Where deaths occurred:		
Percentage in this hospital	55.3%	60.3%
Percentage in another hospital following transfer	0.0%	1.4%
Percentage after discharge	44.7%	38.3%
When deaths occurred:		
Percentage on day of admission	4.9%	6.0%
Percentage within seven days	50.5%	51.8%

Cumulative mortality following hospitalisation for pneumonia, this hospital and NSW[4]

This hospital	Day 1	Day 7	Day 14	Day 21	Day 30
Cumulative number of deaths	14	52	68	84	103
Patients still alive	1,072	1,034	1,018	1,002	983

Prince of Wales Hospital

30-day mortality following hospitalisation for pneumonia, July 2012 – June 2015

Pneumonia risk-standardised mortality ratio by number of expected deaths, NSW public hospitals[5]

Illustrating the effect of standardisation, July 2012 – June 2015

In order to make fair comparisons, a number of risk adjustments are made to mortality data. These take into account patient factors that influence the likelihood of dying. The table below illustrates the effect of statistical adjustments on this hospital's results.
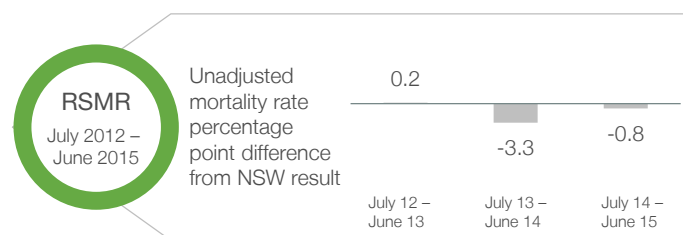
Unadjusted ratio	Age and sex standardised ratio	Risk-standardised mortality ratio
0.89	0.88	0.79

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'[6] has been assessed across NSW hospitals. In July 2009 – June 2012, the average depth of coding was 5.0 diagnoses in this hospital and 3.8 in NSW; and in July 2012 – June 2015, there were 5.9 diagnoses in this hospital and 4.8 in NSW.

Three-yearly RSMR and annual unadjusted mortality rates

The RSMR 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 RSMR result for July 2012 – June 2015 alongside differences between this hospital and the NSW result for annual unadjusted mortality rates.

RSMR: ○ Lower than expected   ○ No different than expected   ○ Higher than expected

RSMR July 2012 – June 2015

Unadjusted mortality rate percentage point difference from NSW result

	July 12 – June 13	July 13 – June 14	July 14 – June 15
	0.2	-3.3	-0.8

Prince of Wales Hospital

30-day mortality following hospitalisation for pneumonia, July 2012 – June 2015

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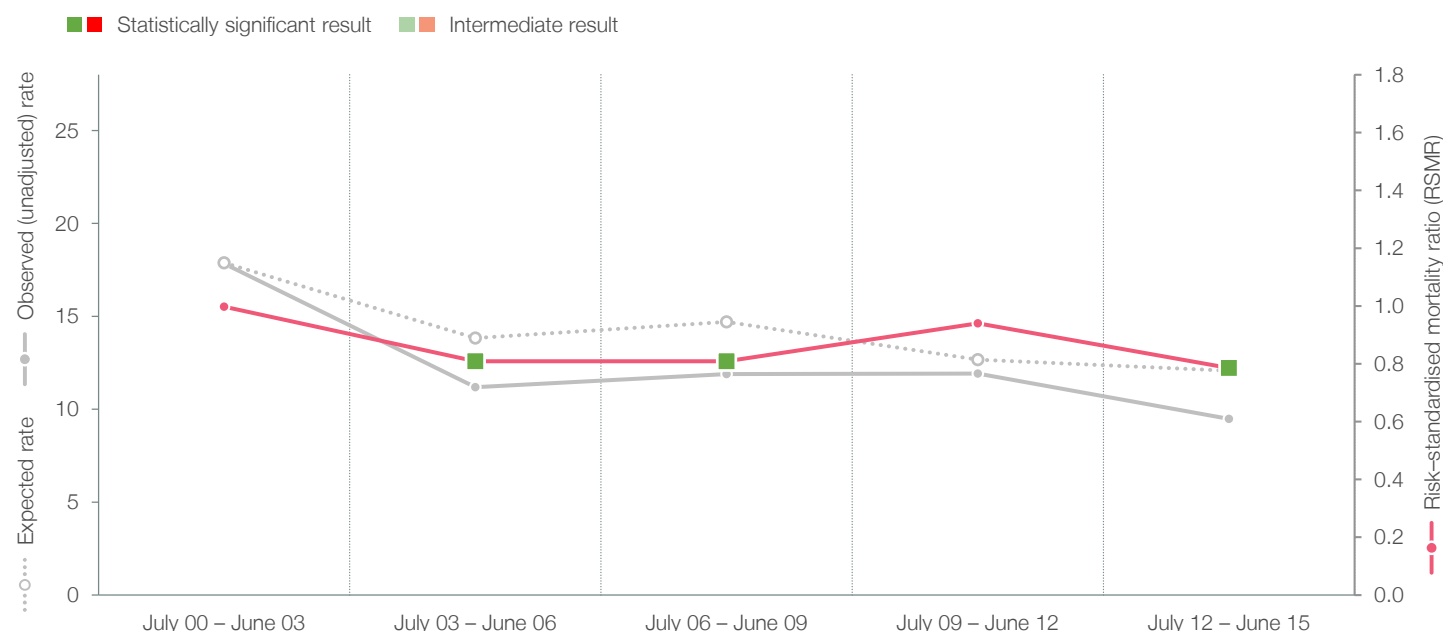
Notes

1. Data refer to patients who were discharged between July 2012 and June 2015 who were initially admitted to this hospital (regardless of whether they were subsequently transferred) in their last period of care, for an acute and emergency hospitalisation with pneumonia as principal diagnosis (ICD-10-AM codes J13, J14, J15, J16, J18). Deaths are from any cause, in or out of hospital within 30 days of the hospitalisation admission date.

2. Age at admission date.

3. Comorbidities as recorded on patient record, with one year look back from the admission date of the index case. Many are a result of end-organ damage resulting from comorbidities, such as diabetes. The Australian Commission on Safety and Quality in Healthcare comorbidity list was used for acute myocardial infarction, ischaemic stroke, haemorrhagic stroke, pneumonia and hip fracture surgery. The Elixhauser comorbidity list was used for congestive heart failure and chronic obstructive pulmonary disease. STEMI refers to ST-elevation myocardial infarction. Only those conditions that were shown to have a significant impact on mortality (P<0.05) are shown.

4. Cumulative percentage of deaths over the 30 days following admission to hospital for the relevant condition.

5. Results for hospitals with expected deaths <1 are not shown. Peer hospitals are identified according to the NSW Ministry of Health's peer grouping as of April 2012.

6. 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 30-day mortality following hospitalisation, 2nd edition*.
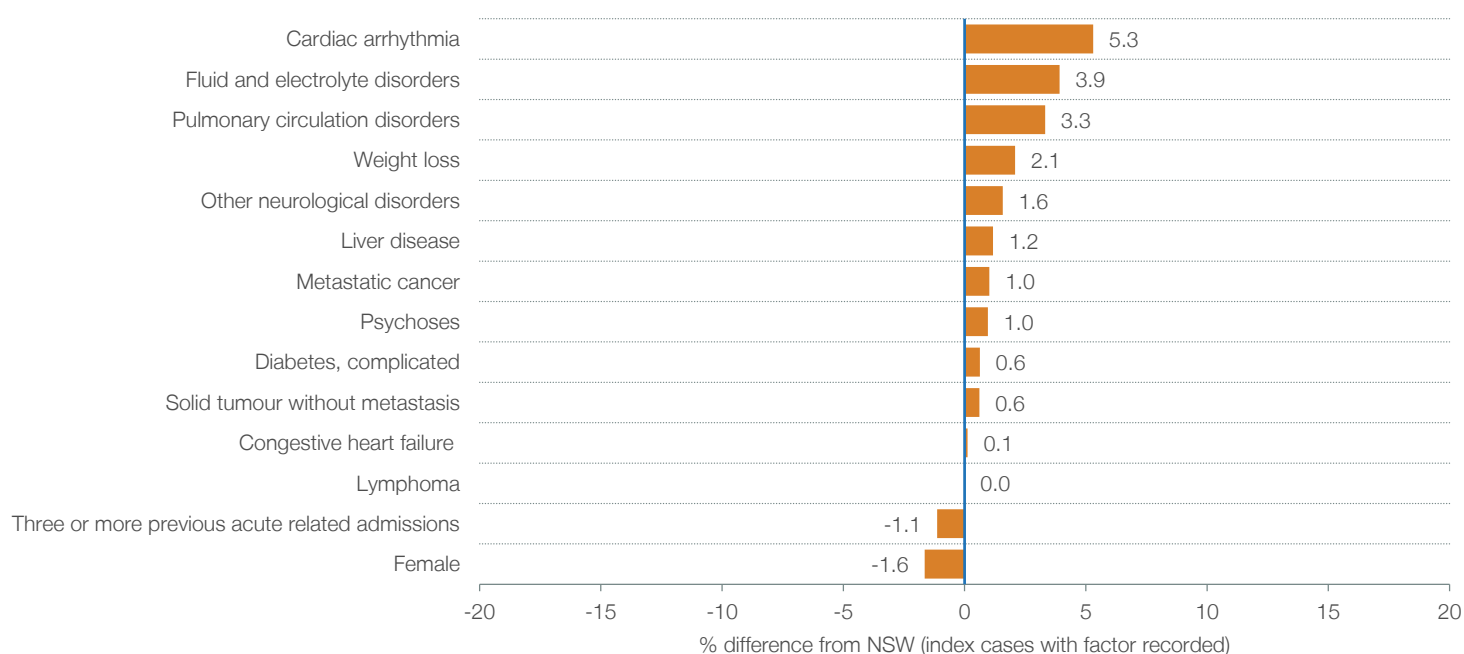
Data source: SAPHaRI, Centre for Epidemiology and Evidence, NSW Ministry of Health.

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30-day mortality following hospitalisation for chronic obstructive pulmonary disease, July 2012 – June 2015

	This hospital	NSW
Total chronic obstructive pulmonary disease hospitalisations	1,225	58,675
Chronic obstructive pulmonary disease patients		
Presenting patients (index cases)[1]	681	30,525
Patients transferred to another hospital within 30 days	36	3,337
Percentage of patients aged 65+ years*[2]	79.9%	79.5%
Percentage of patients aged 75+ years*[2]	53.7%	50.7%

Significant patient factors and comorbidities, this hospital, index cases[3]

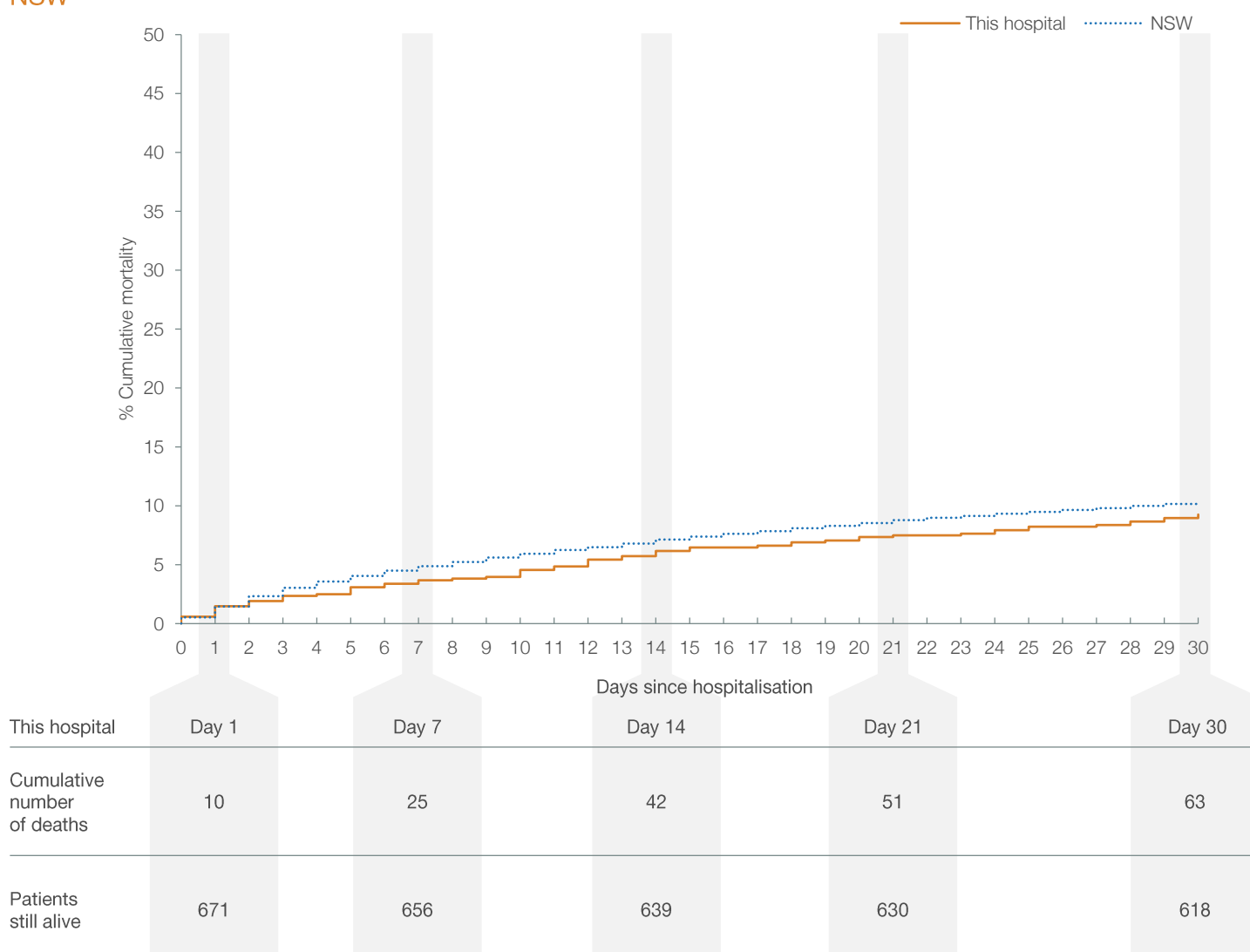|	% difference from NSW
Cardiac arrhythmia	5.3
Fluid and electrolyte disorders	3.9
Pulmonary circulation disorders	3.3
Weight loss	2.1
Other neurological disorders	1.6
Liver disease	1.2
Metastatic cancer	1.0
Psychoses	1.0
Diabetes, complicated	0.6
Solid tumour without metastasis	0.6
Congestive heart failure	0.1
Lymphoma	0.0
Three or more previous acute related admissions	-1.1
Female	-1.6

% difference from NSW (index cases with factor recorded)

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

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30-day mortality following hospitalisation for chronic obstructive pulmonary disease, July 2012 – June 2015

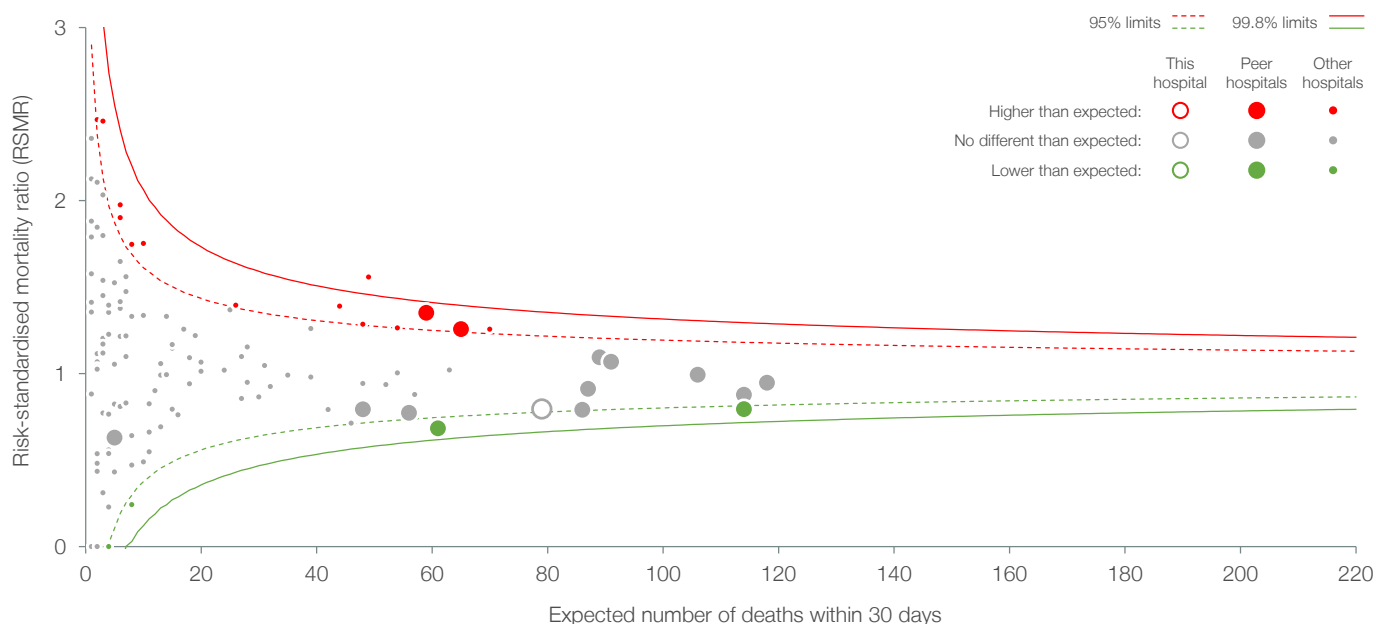|	This hospital	NSW
Mortality (all causes) among 681 chronic obstructive pulmonary disease index cases	63 (9.3%)	3,160 (10.4%)
Percentages: index cases who died within 30 days of hospitalisation		
Where deaths occurred:		
Percentage in this hospital	52.4%	55.8%
Percentage in another hospital following transfer	0.0%	1.4%
Percentage after discharge	47.6%	42.8%
When deaths occurred:		
Percentage on day of admission	6.3%	5.1%
Percentage within seven days	39.7%	47.1%

Cumulative mortality following hospitalisation for chronic obstructive pulmonary disease, this hospital and NSW[4]

This hospital ——— NSW ··········

% Cumulative mortality

Days since hospitalisation

This hospital	Day 1	Day 7	Day 14	Day 21	Day 30
Cumulative number of deaths	10	25	42	51	63
Patients still alive	671	656	639	630	618

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30-day mortality following hospitalisation for chronic obstructive pulmonary disease, July 2012 – June 2015

Chronic obstructive pulmonary disease risk-standardised mortality ratio by number of expected deaths, NSW public hospitals[5]

Illustrating the effect of standardisation, July 2012 – June 2015

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

Unadjusted ratio	Age and sex standardised ratio	Risk-standardised mortality ratio
0.89	0.91	0.80

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'[6] has been assessed across NSW hospitals. In July 2009 – June 2012, the average depth of coding was 4.8 diagnoses in this hospital and 3.6 in NSW; and in July 2012 – June 2015, there were 5.5 diagnoses in this hospital and 4.3 in NSW.

Three-yearly RSMR and annual unadjusted mortality rates

The RSMR 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 RSMR result for July 2012 – June 2015 alongside differences between this hospital and the NSW result for annual unadjusted mortality rates.
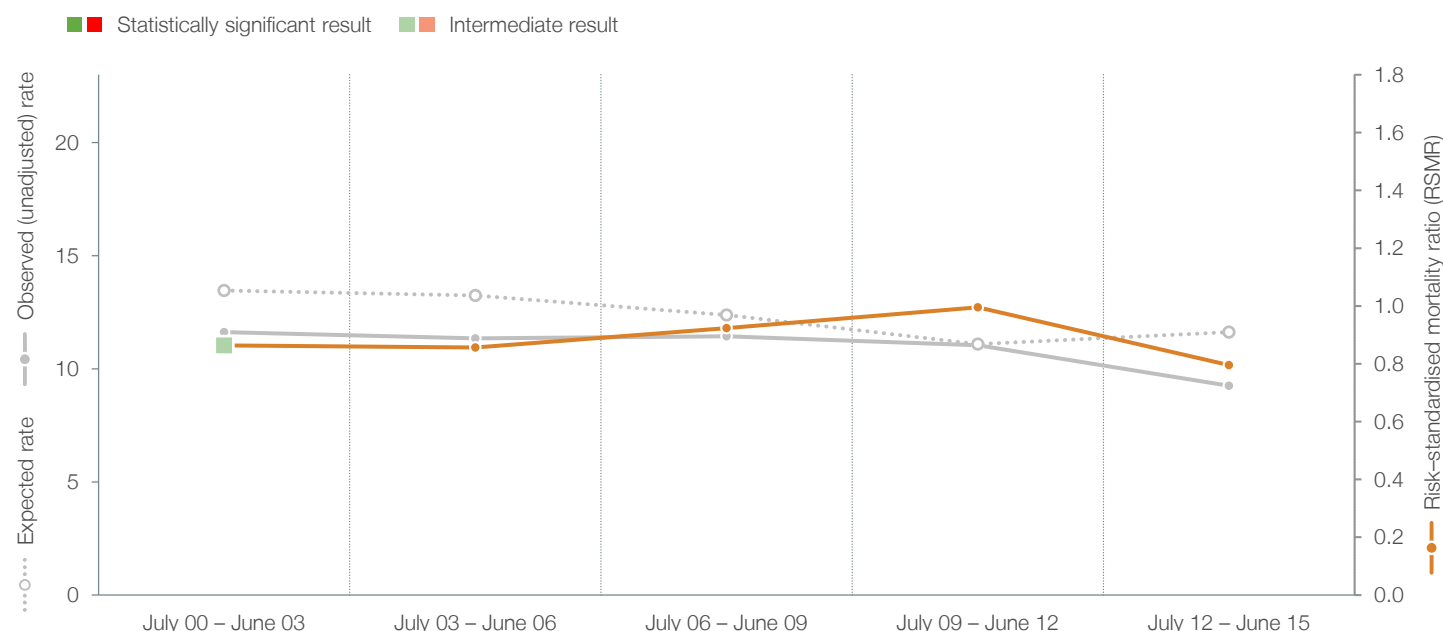
RSMR: ○ Lower than expected ○ No different than expected ○ Higher than expected

Prince of Wales Hospital

30-day mortality following hospitalisation for chronic obstructive pulmonary disease, July 2012 – June 2015

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

Notes

1. Data refer to patients who were discharged between July 2012 and June 2015 who were initially admitted to this hospital (regardless of whether they were subsequently transferred) in their last period of care, for an acute and emergency 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). Deaths are from any cause, in or out of hospital within 30 days of the hospitalisation admission date.

2. Age at admission date.

3. Comorbidities as recorded on patient record, with one year look back from the admission date of the index case. Many are a result of end-organ damage resulting from comorbidities, such as diabetes. The Australian Commission on Safety and Quality in Healthcare comorbidity list was used for acute myocardial infarction, ischaemic stroke, haemorrhagic stroke, pneumonia and hip fracture surgery. The Elixhauser comorbidity list was used for congestive heart failure and chronic obstructive pulmonary disease. STEMI refers to ST-elevation myocardial infarction. Only those conditions that were shown to have a significant impact on mortality (P<0.05) are shown.

4. Cumulative percentage of deaths over the 30 days following admission to hospital for the relevant condition.

5. Results for hospitals with expected deaths <1 are not shown. Peer hospitals are identified according to the NSW Ministry of Health's peer grouping as of April 2012.

6. 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 30-day mortality following hospitalisation, 2nd edition*.
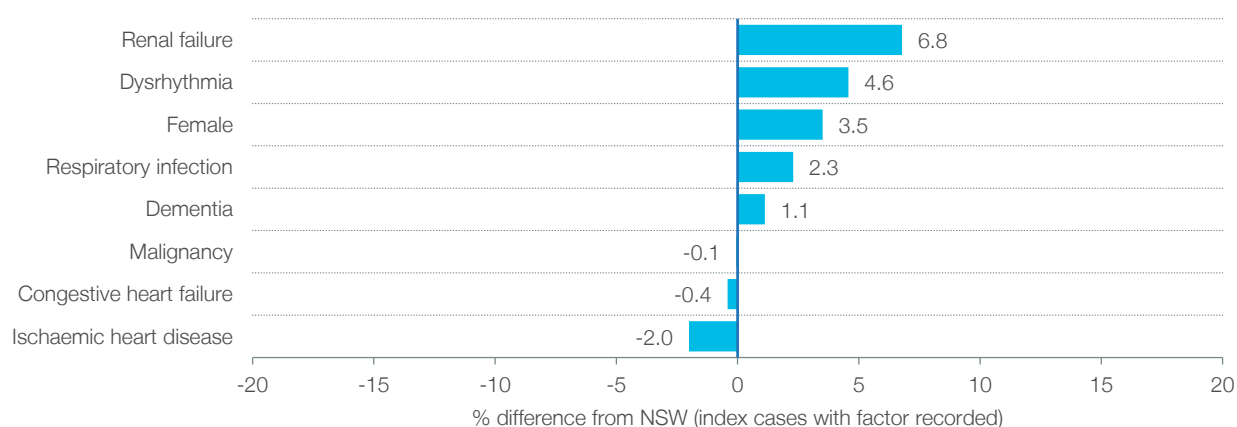
Data source: SAPHaRI, Centre for Epidemiology and Evidence, NSW Ministry of Health.

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Prince of Wales Hospital

30-day mortality following hospitalisation for hip fracture surgery,
July 2012 – June 2015

	This hospital	NSW
Total hip fracture surgery hospitalisations	566	23,914
Hip fracture surgery patients		
Presenting patients (index cases)[1]	435	16,193
Patients transferred to another hospital within 30 days	105	6,987
Percentage of patients aged 65+ years*[2]	94.7%	94.3%
Percentage of patients aged 75+ years*[2]	83.0%	81.6%

Significant patient factors and comorbidities, this hospital, index cases[3]

Factor	% difference from NSW
Renal failure	6.8
Dysrhythmia	4.6
Female	3.5
Respiratory infection	2.3
Dementia	1.1
Malignancy	-0.1
Congestive heart failure	-0.4
Ischaemic heart disease	-2.0

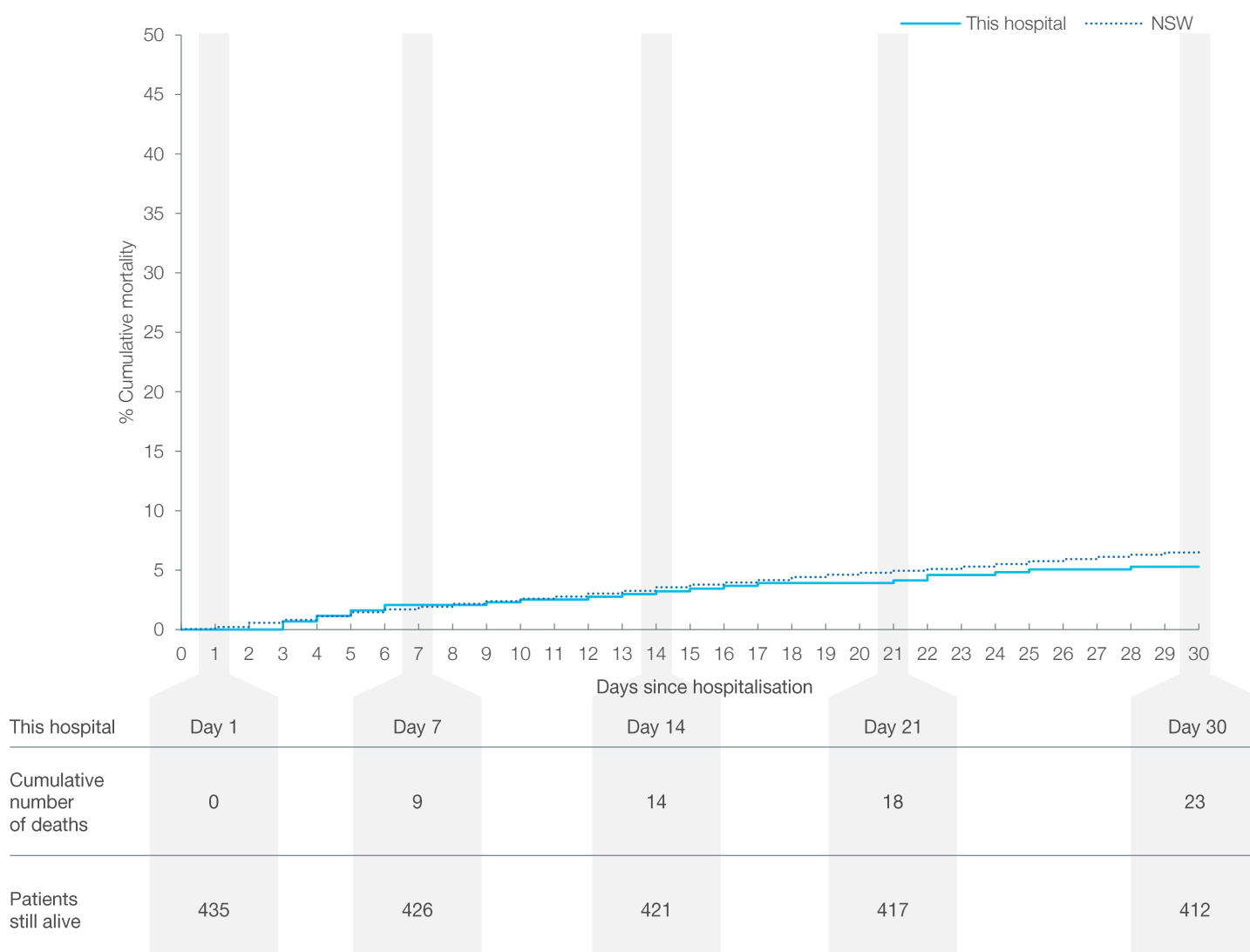% difference from NSW (index cases with factor recorded)

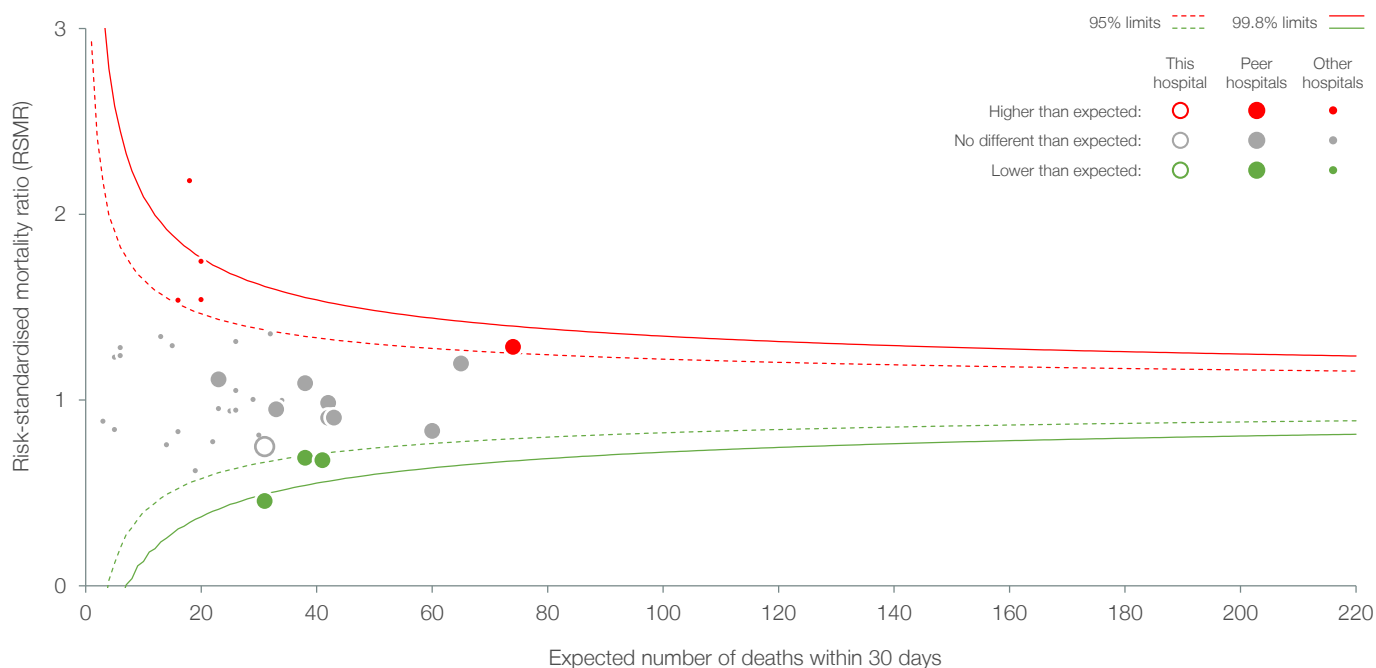*Age was a significant factor in the final model of 30-day mortality following hospitalisation for hip fracture surgery.

Prince of Wales Hospital

30-day mortality following hospitalisation for hip fracture surgery, July 2012 – June 2015

	This hospital	NSW
Mortality (all causes) among 435 hip fracture surgery index cases	23 (5.3%)	1,093 (6.7%)
Percentages: index cases who died within 30 days of hospitalisation		
Where deaths occurred:		
Percentage in this hospital	56.5%	46.9%
Percentage in another hospital following transfer	0.0%	0.4%
Percentage after discharge	43.5%	52.7%
When deaths occurred:		
Percentage on day of admission	0.0%	0.5%
Percentage within seven days	39.1%	28.4%

Cumulative mortality following hospitalisation for hip fracture surgery, this hospital and NSW[4]

This hospital	Day 1	Day 7	Day 14	Day 21	Day 30
Cumulative number of deaths	0	9	14	18	23
Patients still alive	435	426	421	417	412

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30-day mortality following hospitalisation for hip fracture surgery, July 2012 – June 2015

Hip fracture surgery risk-standardised mortality ratio by number of expected deaths, NSW public hospitals[5]

Illustrating the effect of standardisation, July 2012 – June 2015

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

Unadjusted ratio	Age and sex standardised ratio	Risk-standardised mortality ratio
0.78	0.80	0.75

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'[6] has been assessed across NSW hospitals. In July 2009 – June 2012, the average depth of coding was 9.6 diagnoses in this hospital and 8.5 in NSW; and in July 2012 – June 2015, there were 11.2 diagnoses in this hospital and 9.4 in NSW.

Three-yearly RSMR and annual unadjusted mortality rates

The RSMR 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 RSMR result for July 2012 – June 2015 alongside differences between this hospital and the NSW result for annual unadjusted mortality rates.
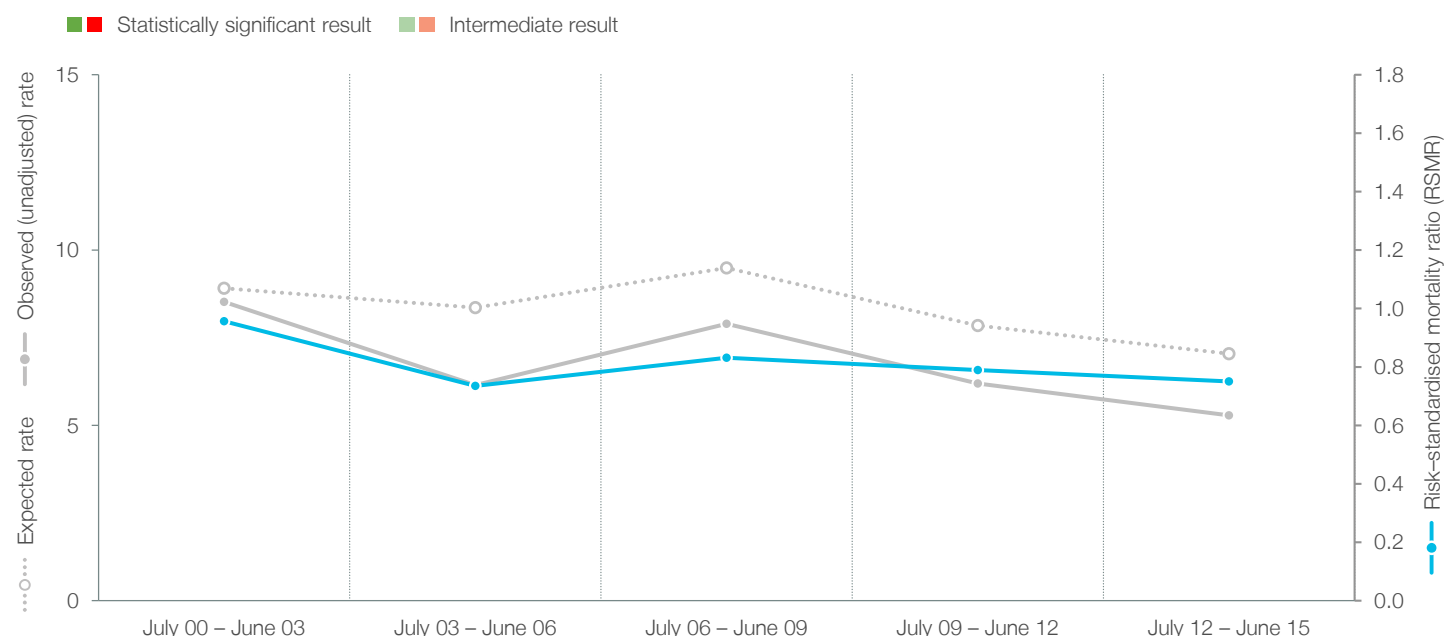
RSMR: ○ Lower than expected ○ No different than expected ○ Higher than expected

RSMR
July 2012 – June 2015

Unadjusted mortality rate percentage point difference from NSW result

-1.5	-2.3	-0.7
July 12 – June 13	July 13 – June 14	July 14 – June 15

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Prince of Wales Hospital

30-day mortality following hospitalisation for hip fracture surgery, July 2012 – June 2015

Hip fracture surgery, this hospital's risk-standardised mortality ratio, expected mortality rates and observed (unadjusted) mortality rates, July 2000 – June 2015

Notes

1. Data refer to patients who were discharged between July 2012 and June 2015 who were initially admitted to this hospital (regardless of whether they were subsequently transferred) in their last period of care, for 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). Deaths are from any cause, in or out of hospital within 30 days of the hospitalisation admission date.

2. Age at admission date.

3. Comorbidities as recorded on patient record, with one year look back from the admission date of the index case. Many are a result of end-organ damage resulting from comorbidities, such as diabetes. The Australian Commission on Safety and Quality in Healthcare comorbidity list was used for acute myocardial infarction, ischaemic stroke, haemorrhagic stroke, pneumonia and hip fracture surgery. The Elixhauser comorbidity list was used for congestive heart failure and chronic obstructive pulmonary disease. STEMI refers to ST-elevation myocardial infarction. Only those conditions that were shown to have a significant impact on mortality (P<0.05) are shown.

4. Cumulative percentage of deaths over the 30 days following admission to hospital for the relevant condition.

5. Results for hospitals with expected deaths <1 are not shown. Peer hospitals are identified according to the NSW Ministry of Health's peer grouping as of April 2012.

6. 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.

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