The Insights Series

30-day mortality following hospitalisation, five clinical conditions, NSW, July 2009 – June 2012

Acute myocardial infarction, ischaemic stroke, haemorrhagic stroke, pneumonia and hip fracture surgery

Performance Profile:
Coffs Harbour Base Hospital
Hospital-specific risk-standardised mortality ratios (RSMRs) report the ratio of actual or ‘observed’ number of deaths to the ‘expected’ number of deaths. A hierarchical logistic regression model draws on the NSW patient population’s characteristics and outcomes to estimate the expected number of deaths for each hospital, given its case mix. A ratio less than 1.0 indicates lower-than-expected mortality, and a ratio higher than 1.0 indicates higher-than-expected mortality. Small deviations from 1.0 are not considered to be meaningful. Funnel plots with 90% and 95% control limits around the NSW rate are used to identify hospitals with higher and lower mortality.

This measure is not designed to compare hospitals and cannot be used to measure the number of avoidable deaths. RSMRs do not distinguish deaths that are avoidable from those that are a reflection of the natural course of illness. They do not provide, by themselves, a diagnostic of quality and safety of care.

### Risk-standardised mortality ratios (RSMRs) for five conditions, dashboard

- **Lower mortality**
- **No difference**
- **Higher mortality**
- **Range within 90% control limits**

#### RSMR July 2009 to June 2012

<table>
<thead>
<tr>
<th>Condition</th>
<th>RSMR 2000-02</th>
<th>RSMR 2003-05</th>
<th>RSMR 2006-08</th>
<th>RSMR 2009-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute myocardial infarction (AMI)</td>
<td>512 patients</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ischaemic stroke</td>
<td>241 patients</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haemorrhagic stroke</td>
<td>107 patients</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumonia</td>
<td>704 patients</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hip fracture</td>
<td>378 patients</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### 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 average NSW hospital of similar size.

Data for hospitals with an expected mortality of <1 are suppressed.

- (◦) Between 90% and 95% upper control limits; (○) Outside 95% upper control limits.
- (†) Between 90% and 95% lower control limits; (□) Outside 95% lower control limits.

Notes: RSMR data are for patients with a hospitalisation noting the relevant condition as principal diagnosis. Patients include those discharged between July 2009 and June 2012 who were initially admitted to this hospital regardless of whether they were subsequently transferred in their last period of care. Deaths are from any cause, in or out of hospital within 30 days of the hospitalisation admission date.

Details of analyses and risk adjustment are available in Spotlight on Measurement: risk-standardised mortality ratios for five conditions.

Data source: SAPHaRI, Centre for Epidemiology and Evidence, NSW Ministry of Health.
Coffs Harbour Base Hospital profile July 2009 - June 2012
30-day mortality following hospitalisation for Acute Myocardial Infarction (AMI)

Total Acute Myocardial Infarction (AMI) hospitalisations
This hospital 625  NSW 37,794

Acute Myocardial Infarction (AMI) patients

Presenting patients (index cases)¹
Patients not transferred to another hospital
Patients transferred out to another hospital

Age profile, index cases²

<table>
<thead>
<tr>
<th>Age Group</th>
<th>This hospital</th>
<th>NSW</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-55</td>
<td>18</td>
<td>19</td>
</tr>
<tr>
<td>56-65</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>66-74</td>
<td>24</td>
<td>20</td>
</tr>
<tr>
<td>75-82</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>83+</td>
<td>19</td>
<td>21</td>
</tr>
</tbody>
</table>

Significant patient factors and comorbidities, index cases³

<table>
<thead>
<tr>
<th>Factor</th>
<th>This hospital</th>
<th>NSW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>58</td>
<td>58</td>
</tr>
<tr>
<td>STEMI</td>
<td>32</td>
<td>29</td>
</tr>
<tr>
<td>Dysrhythm</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>Congestive heart failure</td>
<td>17</td>
<td>13</td>
</tr>
<tr>
<td>Renal failure</td>
<td>13</td>
<td>12</td>
</tr>
<tr>
<td>Hypotension</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>Dementia</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Cerebrovascular disease</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Malignancy (cancer)</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Shock</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Alzheimer's disease</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>
Coffs Harbour Base Hospital profile July 2009 - June 2012
30-day mortality following hospitalisation for Acute Myocardial Infarction (AMI)

Mortality (all causes) among 512 Acute Myocardial Infarction (AMI) index cases
Percentages: index cases who died within 30 days of hospitalisation

Of all deaths:
- percentage in this hospital: 69% (64%)
- percentage in another hospital following transfer: 0% (6%)
- percentage after discharge: 31% (31%)
- percentage on day of admission: 22% (14%)
- percentage within 7 days: 75% (61%)

Survival of index cases following hospitalisation for Acute Myocardial Infarction (AMI)
Adjusted for average age and Charlson comorbidity score

THE INSIGHTS SERIES: Performance Profiles - 30-day mortality
December 2013
www.bhi.nsw.gov.au
Hospital-specific RSMRs report the ratio of actual or ‘observed’ number of deaths to the ‘expected’ number of deaths. A hierarchical logistic regression model draws on the NSW patient population’s characteristics and outcomes to estimate the expected number of deaths for each hospital, given the characteristics of its patients.

Actual and expected deaths, compared to local peers

Coffs Harbour Base Hospital

RSMR = 1.00
Illustrating the effect of standardisation, July 2009 - June 2012

In order to make fair comparisons, a number of risk adjustments are made to mortality data. These take into account patient level factors that influence the likelihood of dying. The table below illustrates the cumulative effect of the statistical adjustments. For each ratio, hospitals are compared to the average NSW result, given their case mix.

<table>
<thead>
<tr>
<th>Unadjusted ratio</th>
<th>Age and sex standardised ratio</th>
<th>Risk-standardised mortality ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.93</td>
<td>0.96</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Time series risk-standardised mortality ratio, July 2000 - June 2012

<table>
<thead>
<tr>
<th>Year (financial years)</th>
<th>2000-02</th>
<th>2003-05</th>
<th>2006-08</th>
<th>2009-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk-standardised mortality ratio</td>
<td>1.09</td>
<td>1.15</td>
<td>1.24</td>
<td>1.00</td>
</tr>
</tbody>
</table>

(1) Index cases refer to patients discharged between July 2009 and June 2012 who were initially admitted to this hospital (regardless of whether they were subsequently transferred) in their last period of care.

(2) Age at admission date.

(3) Only those conditions that were shown to have a significant impact on mortality (P<0.05) are shown. Many are a result of end-organ damage resulting from comorbidities, such as diabetes. A broader set of comorbidities was screened for potential impacts on mortality. Comorbidities as recorded on patient record, with one year look back. STEMI refers to ST-elevation myocardial infarction.

(4) Deaths are from any cause, in or out of hospital within 30 days of the index hospitalisation admission date.

(5) Kaplan-Meier survival curve for 30-day following admission for haemorrhagic stroke, adjusted for average age and average Charlson comorbidity score. Survival curves depict the proportion of patients who were alive, day 0 – day 30.

(6) To make RSMRs comparable over time, a reference population is required. Time series RSMRs for each hospital are based on the reference years (July 2009 - June 2012). Control limits are based on the NSW average within each period.

(7) Data for hospitals with an expected mortality of <1 are suppressed.

(8) Between 90% and 95% upper control limits; (○ ○) Outside 95% upper control limits.

(9) Between 90% and 95% lower control limits; (● ●) Outside 95% lower control limits.

Details of analyses and risk adjustment are available in Spotlight on Measurement: risk-standardised mortality ratios.

Data source: SAPHaRI, Centre for Epidemiology and Evidence, NSW Ministry of Health.
Coffs Harbour Base Hospital profile July 2009 - June 2012
30-day mortality following hospitalisation for ischaemic stroke

Total ischaemic stroke hospitalisations

Ischaemic stroke patients

Presenting patients (index cases)¹

Patients not transferred to another hospital

Patients transferred out to another hospital

Age profile, index cases²

Significant patient factors and comorbidities, index cases³
Mortality (all causes) among 241 ischaemic stroke index cases

Percentages: index cases who died within 30 days of hospitalisation

Of all deaths:
- percentage in this hospital
- percentage in another hospital following transfer
- percentage after discharge
- percentage on day of admission
- percentage within 7 days

Survival of index cases following hospitalisation for ischaemic stroke

Adjusted for average age and Charlson comorbidity score
Hospital-level ischaemic stroke risk-standardised mortality ratio by number of expected deaths, NSW public hospitals

Hospital-specific RSMRs report the ratio of actual or ‘observed’ number of deaths to the ‘expected’ number of deaths. A hierarchical logistic regression model draws on the NSW patient population’s characteristics and outcomes to estimate the expected number of deaths for each hospital, given the characteristics of its patients.

Actual and expected deaths, compared to local peers

- Coffs Harbour Base Hospital
- Dubbo Base Hospital
- Shoalhaven and District Memorial Hospital
- Port Macquarie Base Hospital
- Tamworth Base Hospital
- Lismore Base Hospital
- Manning Base Hospital
- The Tweed Hospital
- Wagga Wagga Base Hospital
- Orange Base Hospital
- Maitland Hospital

Risk standardised mortality ratio (RSMR)

Expected number of deaths within 30 days

Coffs Harbour Base Hospital profile July 2009 - June 2012

RSMR = 1.33
Illustrating the effect of standardisation, July 2009 - June 2012

In order to make fair comparisons, a number of risk adjustments are made to mortality data. These take into account patient level factors that influence the likelihood of dying. The table below illustrates the cumulative effect of the statistical adjustments. For each ratio, hospitals are compared to the average NSW result, given their case mix.

<table>
<thead>
<tr>
<th>Unadjusted ratio</th>
<th>Age and sex standardised ratio</th>
<th>Risk-standardised mortality ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.24</td>
<td>1.30</td>
<td>1.33</td>
</tr>
</tbody>
</table>

Time series risk-standardised mortality ratio, July 2000 - June 2012

<table>
<thead>
<tr>
<th>Year (financial years)</th>
<th>2000-02</th>
<th>2003-05</th>
<th>2006-08</th>
<th>2009-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk-standardised mortality ratio</td>
<td>2.27</td>
<td>2.32</td>
<td>1.48</td>
<td>1.33</td>
</tr>
</tbody>
</table>

(1) Index cases refer to patients discharged between July 2009 and June 2012 who were initially admitted to this hospital (regardless of whether they were subsequently transferred) in their last period of care.

(2) Age at admission date.

(3) Only those conditions that were shown to have a significant impact on mortality (P<0.05) are shown. Many are a result of end-organ damage resulting from comorbidities, such as diabetes. A broader set of comorbidities was screened for potential impacts on mortality. Comorbidities as recorded on patient record, with one year look back. STEMI refers to ST-elevation myocardial infarction.

(4) Deaths are from any cause, in or out of hospital within 30 days of the index hospitalisation admission date.

(5) Kaplan-Meier survival curve for 30-day following admission for haemorrhagic stroke, adjusted for average age and average Charlson comorbidity score. Survival curves depict the proportion of patients who were alive, day 0 – day 30.

(6) To make RSMRs comparable over time, a reference population is required. Time series RSMRs for each hospital are based on the reference years (July 2009 - June 2012). Control limits are based on the NSW average within each period.

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

Details of analyses and risk adjustment are available in Spotlight on Measurement: risk-standardised mortality ratios.
Coffs Harbour Base Hospital profile July 2009 - June 2012
30-day mortality following hospitalisation for haemorrhagic stroke

Total haemorrhagic stroke hospitalisations

<table>
<thead>
<tr>
<th></th>
<th>This hospital</th>
<th>NSW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total haemorrhagic</td>
<td>128</td>
<td>6,573</td>
</tr>
<tr>
<td>stroke hospitalisations</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Haemorrhagic stroke patients

**Presenting patients (index cases)**

<table>
<thead>
<tr>
<th></th>
<th>This hospital</th>
<th>NSW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients not transferred to another hospital</td>
<td>80</td>
<td>4,148</td>
</tr>
<tr>
<td>Patients transferred out to another hospital</td>
<td>27</td>
<td>1,533</td>
</tr>
</tbody>
</table>

**Age profile, index cases**

<table>
<thead>
<tr>
<th>Age group</th>
<th>Presenting (index) cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-62</td>
<td>16</td>
</tr>
<tr>
<td>63-73</td>
<td>21</td>
</tr>
<tr>
<td>74-80</td>
<td>28</td>
</tr>
<tr>
<td>81-85</td>
<td>13</td>
</tr>
<tr>
<td>86+</td>
<td>22</td>
</tr>
</tbody>
</table>

**Significant patient factors and comorbidities, index cases**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Presenting (index) cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>History of haemorrhagic stroke</td>
<td>9</td>
</tr>
<tr>
<td>Malignancy (cancer)</td>
<td>6</td>
</tr>
<tr>
<td>Congestive heart failure</td>
<td>9</td>
</tr>
</tbody>
</table>
Mortality (all causes) among 107 haemorrhagic stroke index cases

Percentages: index cases who died within 30 days of hospitalisation

Of all deaths:
- percentage in this hospital
- percentage in another hospital following transfer
- percentage after discharge
- percentage on day of admission
- percentage within 7 days

Survival of index cases following hospitalisation for haemorrhagic stroke

Adjusted for average age and Charlson comorbidity score

The Insights Series: Performance Profiles - 30-day mortality
Hospital-specific RSMRs report the ratio of actual or ‘observed’ number of deaths to the ‘expected’ number of deaths. A hierarchical logistic regression model draws on the NSW patient population’s characteristics and outcomes to estimate the expected number of deaths for each hospital, given the characteristics of its patients.

Actual and expected deaths, compared to local peers

- Port Macquarie Base Hospital
- Lismore Base Hospital
- Coffs Harbour Base Hospital
- Shoalhaven and District Memorial Hospital
- The Tweed Hospital
- Orange Base Hospital
- Manning Base Hospital
- Tamworth Base Hospital
- Walga Waaga Base Hospital
- Dubbo Base Hospital

This hospital, actual deaths
Peer group hospitals, actual deaths
Expected deaths (based on model)

RSMR = 0.95
30-day mortality following hospitalisation for haemorrhagic stroke

Illustrating the effect of standardisation, July 2009 - June 2012

In order to make fair comparisons, a number of risk adjustments are made to mortality data. These take into account patient level factors that influence the likelihood of dying. The table below illustrates the cumulative effect of the statistical adjustments. For each ratio, hospitals are compared to the average NSW result, given their case mix.

<table>
<thead>
<tr>
<th>Lower mortality</th>
<th>No difference</th>
<th>Higher mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unadjusted ratio</td>
<td>Age and sex standardised ratio</td>
<td>Risk-standardised mortality ratio</td>
</tr>
<tr>
<td>0.97</td>
<td>0.95</td>
<td>0.95</td>
</tr>
</tbody>
</table>

Time series risk-standardised mortality ratio, July 2000 - June 2012

<table>
<thead>
<tr>
<th>Lower mortality</th>
<th>No difference</th>
<th>Higher mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year (financial years)</td>
<td>2000-02</td>
<td>2003-05</td>
</tr>
<tr>
<td>Risk-standardised mortality ratio</td>
<td>1.50</td>
<td>1.24</td>
</tr>
</tbody>
</table>

Details of analyses and risk adjustment are available in Spotlight on Measurement: risk-standardised mortality ratios.

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

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(1) Index cases refer to patients discharged between July 2009 and June 2012 who were initially admitted to this hospital (regardless of whether they were subsequently transferred) in their last period of care.

(2) Age at admission date.

(3) Only those conditions that were shown to have a significant impact on mortality (P<0.05) are shown. Many are a result of end-organ damage resulting from comorbidities, such as diabetes. A broader set of comorbidities was screened for potential impacts on mortality. Comorbidities as recorded on patient record, with one year look back. STEMI refers to ST-elevation myocardial infarction.

(4) Deaths are from any cause, in or out of hospital within 30 days of the index hospitalisation admission date.

(5) Kaplan-Meier survival curve for 30-day following admission for haemorrhagic stroke, adjusted for average age and average Charlson comorbidity score. Survival curves depict the proportion of patients who were alive, day 0 – day 30.

(6) To make RSMRs comparable over time, a reference population is required. Time series RSMRs for each hospital are based on the reference years (July 2009 - June 2012). Control limits are based on the NSW average within each period.

(7) Data for hospitals with an expected mortality of <1 are suppressed.

• Between 90% and 95% upper control limits; • Outside 95% upper control limits.

• Between 90% and 95% lower control limits; • Outside 95% lower control limits.
Coffs Harbour Base Hospital profile July 2009 - June 2012
30-day mortality following hospitalisation for pneumonia

Total pneumonia hospitalisations
This hospital 818
NSW 50,644

Pneumonia patients

Presenting patients (index cases)¹
Patients not transferred to another hospital
Patients transferred out to another hospital

Age profile, index cases ²

Significant patient factors and comorbidities, index cases ³

% of index cases

Mortality (all causes) among 704 pneumonia index cases

Percentages: index cases who died within 30 days of hospitalisation

Of all deaths:
- percentage in this hospital
- percentage in another hospital following transfer
- percentage after discharge
- percentage on day of admission
- percentage within 7 days

<table>
<thead>
<tr>
<th></th>
<th>This hospital percentage</th>
<th>NSW percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10%</td>
<td>(66%)</td>
</tr>
<tr>
<td></td>
<td>70%</td>
<td>(3%)</td>
</tr>
<tr>
<td></td>
<td>1%</td>
<td>(31%)</td>
</tr>
<tr>
<td></td>
<td>29%</td>
<td>(54%)</td>
</tr>
<tr>
<td></td>
<td>1%</td>
<td>(6%)</td>
</tr>
</tbody>
</table>

Survival of index cases following hospitalisation for pneumonia

Adjusted for average age and Charlson comorbidity score

Coffs Harbour Base Hospital

NSW
Hospital-specific RSMRs report the ratio of actual or ‘observed’ number of deaths to the ‘expected’ number of deaths. A hierarchical logistic regression model draws on the NSW patient population’s characteristics and outcomes to estimate the expected number of deaths for each hospital, given the characteristics of its patients.

Actual and expected deaths, compared to local peers

- Shoalhaven and District Memorial Hospital
- Manning Base Hospital
- Coffs Harbour Base Hospital
- Port Macquarie Base Hospital
- Tamworth Base Hospital
- Wagga Wagga Base Hospital
- The Tweed Hospital
- Dubbo Base Hospital
- Orange Base Hospital
- Maitland Hospital
- Lismore Base Hospital

This hospital, actual deaths
Peer group hospitals, actual deaths
Expected deaths (based on model)

RSMR = 0.90
In order to make fair comparisons, a number of risk adjustments are made to mortality data. These take into account patient level factors that influence the likelihood of dying. The table below illustrates the cumulative effect of the statistical adjustments. For each ratio, hospitals are compared to the average NSW result, given their case mix.

<table>
<thead>
<tr>
<th>Unadjusted ratio</th>
<th>Age and sex standardised ratio</th>
<th>Risk-standardised mortality ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.92</td>
<td>0.95</td>
<td>0.90</td>
</tr>
</tbody>
</table>

Time series risk-standardised mortality ratio, July 2000 - June 2012

<table>
<thead>
<tr>
<th>Year (financial years)</th>
<th>2000-02</th>
<th>2003-05</th>
<th>2006-08</th>
<th>2009-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk-standardised mortality ratio</td>
<td>1.29</td>
<td>0.83</td>
<td>1.20</td>
<td>0.90</td>
</tr>
</tbody>
</table>

---

(1) Index cases refer to patients discharged between July 2009 and June 2012 who were initially admitted to this hospital (regardless of whether they were subsequently transferred) in their last period of care.

(2) Age at admission date.

(3) Only those conditions that were shown to have a significant impact on mortality (P<0.05) are shown. Many are a result of end-organ damage resulting from comorbidities, such as diabetes. A broader set of comorbidities was screened for potential impacts on mortality. Comorbidities as recorded on patient record, with one year look back. STEMI refers to ST-elevation myocardial infarction.

(4) Deaths are from any cause, in or out of hospital within 30 days of the index hospitalisation admission date.

(5) Kaplan-Meier survival curve for 30-day following admission for haemorrhagic stroke, adjusted for average age and average Charlson comorbidity score. Survival curves depict the proportion of patients who were alive, day 0 – day 30.

(6) To make RSMRs comparable over time, a reference population is required. Time series RSMRs for each hospital are based on the reference years (July 2009 - June 2012). Control limits are based on the NSW average within each period.

(7) Data for hospitals with an expected mortality of <1 are suppressed.

(8) Between 90% and 95% upper control limits; (88) Outside 95% upper control limits.

(9) Between 90% and 95% lower control limits; (94) Outside 95% lower control limits.

Details of analyses and risk adjustment are available in Spotlight on Measurement: risk-standardised mortality ratios

Data source: SAPhAri, Centre for Epidemiology and Evidence, NSW Ministry of Health.
Coffs Harbour Base Hospital profile July 2009 - June 2012
30-day mortality following hospitalisation for hip fracture surgery

Total hip fracture surgery hospitalisations
This hospital 390 NSW 16,355

Hip fracture surgery patients
Presenting patients (index cases)\(^1\)
- Patients not transferred to another hospital
  - This hospital NSW
  - 378 15,836
- Patients transferred out to another hospital
  - 200 10,739
  - 178 5,097

Age profile, index cases\(^2\)

Significant patient factors and comorbidities, index cases\(^3\)
## Coffs Harbour Base Hospital profile July 2009 - June 2012

### 30-day mortality following hospitalisation for hip fracture surgery

Mortality (all causes) among 378 hip fracture surgery index cases

Percentages: index cases who died within 30 days of hospitalisation

<table>
<thead>
<tr>
<th>Of all deaths:</th>
<th>This hospital percentage</th>
<th>NSW percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>percentage in this hospital</td>
<td>17%</td>
<td>(50%)</td>
</tr>
<tr>
<td>percentage in another hospital following transfer</td>
<td>0%</td>
<td>(0%)</td>
</tr>
<tr>
<td>percentage after discharge</td>
<td>83%</td>
<td>(50%)</td>
</tr>
<tr>
<td>percentage on day of admission</td>
<td>not applicable for hip fracture surgery</td>
<td></td>
</tr>
<tr>
<td>percentage within 7 days</td>
<td>23%</td>
<td>(27%)</td>
</tr>
</tbody>
</table>

### Survival of index cases following hospitalisation for hip fracture surgery

Adjusted for average age and Charlson comorbidity score

![Coffs Harbour Base Hospital](image1)

% Survival vs Days since admission for Coffs Harbour Base Hospital

![NSW](image2)

% Survival vs Days since admission for NSW

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Hospital-specific RSMRs report the ratio of actual or ‘observed’ number of deaths to the ‘expected’ number of deaths. A hierarchical logistic regression model draws on the NSW patient population’s characteristics and outcomes to estimate the expected number of deaths for each hospital, given the characteristics of its patients.

Actual and expected deaths, compared to local peers
Coffs Harbour Base Hospital profile July 2009 - June 2012
30-day mortality following hospitalisation for hip fracture surgery

Illustrating the effect of standardisation, July 2009 - June 2012

In order to make fair comparisons, a number of risk adjustments are made to mortality data. These take into account patient level factors that influence the likelihood of dying. The table below illustrates the cumulative effect of the statistical adjustments. For each ratio, hospitals are compared to the average NSW result, given their case mix.

<table>
<thead>
<tr>
<th></th>
<th>Unadjusted ratio</th>
<th>Age and sex standardised ratio</th>
<th>Risk-standardised mortality ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.35</td>
<td>1.37</td>
<td>1.37</td>
</tr>
</tbody>
</table>

Time series risk-standardised mortality ratio, July 2000 - June 2012

<table>
<thead>
<tr>
<th>Year (financial years)</th>
<th>2000-02</th>
<th>2003-05</th>
<th>2006-08</th>
<th>2009-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk-standardised mortality ratio</td>
<td>0.87</td>
<td>1.19</td>
<td>1.08</td>
<td>1.37</td>
</tr>
</tbody>
</table>

(1) Index cases refer to patients discharged between July 2009 and June 2012 who were initially admitted to this hospital (regardless of whether they were subsequently transferred) in their last period of care.
(2) Age at admission date.
(3) Only those conditions that were shown to have a significant impact on mortality (P<0.05) are shown. Many are a result of end-organ damage resulting from comorbidities, such as diabetes. A broader set of comorbidities was screened for potential impacts on mortality. Comorbidities as recorded on patient record, with one year look back. STEMI refers to ST-elevation myocardial infarction.
(4) Deaths are from any cause, in or out of hospital within 30 days of the index hospitalisation admission date.
(5) Kaplan-Meier survival curve for 30-day following admission for haemorrhagic stroke, adjusted for average age and average Charlson comorbidity score. Survival curves depict the proportion of patients who were alive, day 0 – day 30.
(6) To make RSMRs comparable over time, a reference population is required. Time series RSMRs for each hospital are based on the reference years (July 2009 - June 2012). Control limits are based on the NSW average within each period.
(p) Data for hospitals with an expected mortality of <1 are suppressed.
(<> Between 90% and 95% upper control limits; (<><> Outer 95% upper control limits. (<><> Between 90% and 95% lower control limits; (<><><> Outer 95% lower control limits.

Details of analyses and risk adjustment are available in Spotlight on Measurement: risk-standardised mortality ratios

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