National Health Performance Authority

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Hospital Performance:

Healthcare-associated *Staphylococcus aureus* bloodstream infections in 2011–12

Information in this report has been updated in February 2017: see **www.myhospitals.gov.au**

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Please note that there is the potential for minor revisions of this report.
Please check **www.myhospitals.gov.au** for any amendments.

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About the Authority

The National Health Performance Authority (the Authority) has been set up as an independent agency under the *National Health Reform Act 2011*. It commenced full operations in 2012.

Under the terms of the Act, the Authority monitors and reports on the performance of Local Hospital Networks, public and private hospitals, primary health care organisations and other bodies that provide health care services.

The Authority's reports give all Australians access to timely and impartial information that fairly compares their local health care organisations against their peers.

The reports let people see, for the first time, how their local health care organisations measure up against comparable organisations across Australia.

The Authority's activities are guided by a document called the *Performance and Accountability Framework* agreed by the Council of Australian Governments. The framework contains 48 indicators that form the basis for the Authority's performance reports.

The Authority's role includes reporting on the performance of health care organisations against the 48 measures in order to identify both high-performing Local Hospital Networks, Medicare Locals and hospitals (so effective practices can be shared), and Local Hospital Networks and Medicare Locals that perform poorly (so that steps can be taken to address problems).

The Authority releases reports on a quarterly basis, and also publishes performance data on the MyHospitals website and on **www.nhpa.gov.au**

The Authority consists of a Chairman, a Deputy Chairman and five other members, appointed for up to five years. Members of the Authority are:

- Ms Patricia Faulkner AO (Chairman)
- Mr John Walsh AM (Deputy Chairman)
- Dr David Filby PSM
- Prof Michael Reid
- Prof Bryant Stokes AM RFD (On leave)
- Prof Paul Torzillo AM
- Prof Claire Jackson (acting member).

The conclusions in this report are those of the Authority. No official endorsement from any minister, department of health or health care organisation is intended or should be inferred.

Summary

This report looks at the rate of bloodstream infection caused by one type of bacteria, called *Staphylococcus aureus (S. aureus)*, that patients sometimes develop during the course of medical care or treatment provided by hospitals.

Although commonly found on the skin or in the nose or throats of healthy people, *S. aureus* can cause serious health complications for some patients and significant extra costs to the health system. In the most severe cases, *S. aureus* bloodstream infection can prove fatal; between one-fifth to one-third of people who experience this type of infection die as a result.

The annual number of healthcare-associated *S. aureus* bloodstream infections is small compared to the total number of patients that pass through Australia's hospitals each year. However, every case of S. *aureus* bloodstream infection is considered potentially preventable, so there has been an increasing focus on monitoring its impact and introducing strategies to combat it.

The National Healthcare Agreement signed in 2011 sets a target for no more than 2.0 cases of healthcare-associated *S. aureus* bloodstream infection per 10,000 patient bed days for each state and territory. The rate of *S. aureus* bloodstream infection has been set as one of the 48 indicators agreed by the Council of Australian Governments to guide the Authority's work.

This report uses the best available data to show how many healthcare-associated *S. aureus* bloodstream infections were reported by each of 352 public hospitals in 2011–12. The intent is to inform consumers, help hospitals and health service managers to identify opportunities to reduce the rate of preventable infection, and to stimulate improvements in the collection and consistency of national statistics.

Key findings

There were 1,725 cases of healthcare-associated *S. aureus* bloodstream infection in 2011–12 reported by the 352 public hospitals covered by this report. This represents over 99% of all cases of this type of infection reported by public hospitals nationally.

The rates of infection varied markedly between different public hospitals, even within groups of similar hospitals (peer groups). This suggests there may be opportunities at a number of hospitals to reduce infection rates, improve detection and infection reporting systems, or a combination of both.

The report has found two main factors affected the rate of *S. aureus* bloodstream infection within each hospital, namely:

- Hospital size
- The proportion of vulnerable patients within each hospital.

Vulnerable patients are people who have one or more of the risk factors shown to increase the chance of acquiring a healthcare-associated *S. aureus* bloodstream infection. For more information **see page 2**.

To permit fairer comparisons, the Authority allocated each hospital to one of eight peer groups, according to its size and the proportion of its patients deemed at higher risk of developing a healthcare-associated *S. aureus* bloodstream infection **(Appendix table 1, page 11)**.

Bigger hospitals have higher rates

The two peer groups covering the largest hospitals, referred to as major hospitals, accounted for a disproportionately large share (82%) of all cases reported nationally.

The two peer groups covering the next category, large hospitals, accounted for 6% of all reported cases, while medium hospitals accounted for 5% of all reported cases, and small hospitals accounted for 2% **(Figures 1a and 1b on pages 7 to 10)**.

Hospitals with more vulnerable patients have higher rates

Hospitals with higher percentages of vulnerable patients also reported more cases of *S. aureus* bloodstream infection in 2011–12 than hospitals with fewer vulnerable patients.

In major hospitals with more vulnerable patients, the average rate of healthcare-associated *S. aureus* bloodstream infection was 1.38 cases per 10,000 patient bed days.

In major hospitals with fewer vulnerable patients, the average rate of infection was 0.90 cases per 10,000 patient bed days.

Large, medium and small hospitals with more vulnerable patients had higher average rates of healthcare-associated *S. aureus* bloodstream infection than hospitals of similar size but fewer vulnerable patients **(Key findings, page 4)**.

Big differences in infection rates between similar hospitals

Wide differences were seen in the rate of healthcare-associated *S. aureus* bloodstream infection reported by hospitals within the same peer group.

This finding is important because it suggests a component of the variation in infection rates between hospitals may relate to the performance of the hospital, and not to differences in the types of patients seen or treatments provided.

Among major hospitals with a higher proportion of vulnerable patients, the rate of reported healthcare-associated *S. aureus* bloodstream infection was **over four times higher** in some hospitals compared to others in the same group. The range reported was from 0.47 cases per 10,000 patient bed days to 2.15 cases per 10,000 patient bed days **(Figure 1a on page 7)**.

In major hospitals with fewer vulnerable patients, the rate of reported healthcare-associated *S. aureus* bloodstream infection was **over 15 times higher** in some hospitals compared to others, ranging from 0.17 cases per 10,000 patient bed days to 2.59 cases per 10,000 patient bed days **(Figure 1a on page 7)**.

Each of the remaining six peer groups (two peer groups for each of the size categories covering large, medium and small hospitals) had one or more hospitals that reported no cases of *S. aureus* bloodstream infection.

Fair comparisons

In the **Figures 1a and 1b on pages 7 to 10**, the Authority has named the hospitals that have reported the highest and the lowest rates of healthcare-associated *S. aureus* bloodstream infection in the two major hospital peer groups.

Hospitals in other peer groups have not been named for a number of reasons. In smaller facilities, a single extra case can be enough to cause a dramatic increase in the annual rate for a hospital, while zero cases reported by some hospitals could reflect more immature data collection systems rather than zero infections.

Many hospitals and states have been collecting data on healthcare-associated infections for a number of years. However, submission of healthcare-associated *S. aureus* bloodstream infection figures to national data collections is relatively recent, and interpretations of new definitions may vary between hospitals.

Data is typically most consistent in the major hospital peer groups, which see large numbers of patients and have sophisticated healthcare-associated infection monitoring and reporting systems.

The figures for these and the other peer groups only reflect confirmed cases of *S. aureus* bloodstream infection. Other cases that were not confirmed or reported – for example, because tests were not done, or because test results were not properly recorded – could comprise extra cases not currently included in the results.

The Authority is aware of these limitations of the data and is undertaking work to improve future reporting on the comparable performance of healthcare organisations.

Information on healthcare-associated *S. aureus* bloodstream infection for more than 600 public and private hospitals is available on the National Health Performance Authority website at **www.myhospitals.gov.au**

Introduction

About this report

This report examines the number of bloodstream infections caused by a specific organism, called *Staphylococcus aureus (S. aureus)*, that were acquired while patients were receiving medical care or treatment in hospital.

It compares the performance of 352 hospitals across Australia against their peers, after grouping them into categories based on size and proportion of vulnerable patients.

The National Health Performance Authority bases its performance reports on indicators agreed by the Council of Australian Governments. In this report, the Authority has focused on one of these indicators that refers to rates of healthcare-associated *S. aureus* bloodstream infection.

The national benchmark specified in the National Healthcare Agreement[1] is that the rate of *S. aureus* bloodstream infection in each state or territory should be no more than 2.0 cases per 10,000 patient bed days.

The report names some hospitals that have reported higher and lower rates of healthcare-associated *S. aureus* bloodstream infection than their peers. However, uncertainties about the completeness and national consistency of data across all hospitals are such that it is not possible to draw definitive conclusions about hospital performance. As a result, the Authority makes no determination in this report that any hospitals are good or bad performers.

Instead, the information in this report is intended to provide the public, clinicians and public hospital managers with a greater insight into how hospitals are performing against similar hospitals, and to inform efforts to improve care.

It is also intended that the report will demonstrate what could be possible with more detailed and nationally consistent data, and will help stimulate improvements to collection of data for national reporting.

What is healthcare-associated *Staphylococcus aureus* bloodstream infection?

Staphylococcus aureus (S. aureus) is a bacterium frequently found in the airways, lungs and skin of healthy people. *S. aureus* can cause significant illness when it results in an infection in the bloodstream. Doctors call this '*Staphylococcus aureus* bacteraemia' (or bloodstream infection).

The term 'healthcare-associated' means that the infection was acquired during interaction with healthcare services. This report focuses on healthcare-associated *S. aureus* bloodstream infections attributable to Australian public hospitals.

Patients in hospital are vulnerable to *S. aureus* bloodstream infection because wounds, surgery and other medically invasive procedures can provide an opening through our protective skin layers and allow organisms into our body. In addition, some people in hospital are more vulnerable than other patients to such infections, for example, patients with weakened immune systems.

Infections acquired in hospital can mostly be prevented through simple hygiene practices. After infections have developed, they can be mitigated by early detection and effective treatment strategies.

Patients with healthcare-associated *S. aureus* bloodstream infection can become very ill and have longer stays in hospital. Such infections can be very serious: evidence from Australia suggests between 20% to 35% of people who experience *S. aureus* bloodstream infection die from this or a related cause.[2,3,4]

About the data

S. aureus cases are identified when a medical professional notices the symptoms of infection and orders a blood test. If this blood test identifies infection by *S. aureus*, the infection control officer for the hospital is notified. These experts judge if the infection is healthcare-associated and, if so, attribute it to the appropriate hospital.

Many steps are necessary for a case of healthcare-associated *S. aureus* bloodstream infection to be recorded. Failure to take any of these steps can interrupt this sequence and lead to under-reporting of this infection.

This report is based on data from 352 hospitals across Australia that monitored *S. aureus* bloodstream infection and had more than 5,000 patient bed days monitored. These 352 hospitals accounted for over 97% of all monitored bed-days in 2011–12, and over 99% (1725 of 1734) of all reported cases.

Data for this report were provided by states and territories to the National *Staphylococcus aureus* Bacteraemia Data Collection and the Admitted Patient Care National Minimum Data Set, both from 2011–12.

Fair comparisons: hospital peer groups

Direct comparisons between all hospitals is not necessarily fair due to the fact that some hospitals deal with more of the types of patients most at risk of these infections.

To address this, and to allow fairer comparisons, the Authority has allocated hospitals to one of eight groups based on a combination of size of hospital, type of services provided and the percentage of patients more at risk of healthcare-associated infection.

Vulnerable patients

For the purposes of this report, patients are considered 'vulnerable' if they have one or more of the following risk factors:

1. ***Immunosuppressed patients.***

   Such as patients admitted for:

   - Bone marrow transplant
   - Burns
   - Disorders of the immune system
   - HIV/AIDS
   - Oncology, including haematological malignancy
   - Transplant

and

2. ***Opportunities for infection.***

   Such as patients admitted for:

   - Acute renal failure
   - Acute spinal injury
   - Surgery (including cardiac surgery)
   - Venous catheterisation.

Appendix table 1 on page 11 describes the peer group classification for hospitals. In addition to these eight peer groups, two further groups of hospitals were not similar enough to other hospitals or to each other to be compared: specialist women's and children's hospitals, and 'other' hospitals. For more information see *Hospital Performance: Healthcare-associated* Staphylococcus aureus *bloodstream infections in 2011–12, Technical Supplement* at **www.myhospitals.gov.au**

Hospitals in the same peer group are more similar to each other than to hospitals in other peer groups in terms of the hospital size and number of patients with weakened immune systems.

While the Authority has reported details on healthcare-associated *S. aureus* bloodstream infections in more than 600 hospitals on its website, a cautious approach has been taken to comparing performance by only naming the 10% of hospitals in the two major hospitals peer groups that reported the highest rates, as well as the 10% that reported the lowest rates. There are two reasons for this:

1. While the national definition for healthcare-associated *S. aureus* bloodstream infection was endorsed by states and territories in 2009[5], the definition for national submission of data has evolved and changed more than once since then to allow it to be used for public reporting.

   While the data in this report is for the period 2011–12, information reviewed by the Authority demonstrated differences in how states and hospitals measure and record cases and patient bed days. This suggests it is too early to expect national consistency in comparing hospitals across Australia.

2. While there are many hospitals reporting cases, a culture of disclosure is still relatively new. By reporting on the occurrence of these events we can best identify where actions are most needed.

Improving comparisons

In its work to better understand the data available for reporting healthcare-associated *S. aureus* bloodstream infections, the Authority identified opportunities to improve information to compare hospitals.

The Authority undertook to risk-adjust rates of *S. aureus* bloodstream infection but, following analysis and consultation, concluded that the information systems are not mature enough to support this approach. Work will continue to further develop approaches to support fair comparisons between hospitals.

The extent to which a hospital is monitored by infection control staff varies between states and between hospitals within each state. Most hospitals (94%) report complete coverage by infection control monitoring systems of all patient bed days. While monitoring systems are maturing, there remain some hospitals that have partial coverage **(Figure 1a and 1b, pages 7 to 10)**.

See *Hospital Performance: Healthcare-associated* Staphylococcus aureus *bloodstream infections in 2011–12, Technical Supplement* for more details.

Key findings

In 2011–2012, 1,725 cases of healthcare-associated *S. aureus* bloodstream infection were reported by the 352 public hospitals covered in this report. This represents over 99% of all cases of this infection reported nationally **(Figure 1a and 1b, pages 7 to 10)**.

Bigger hospitals report more patient infections

People with healthcare-associated *S. aureus* bloodstream infection are most often detected and reported by the largest hospitals.

All **major hospitals** reported at least one case of *S. aureus* bloodstream infection. Major hospitals accounted for 82% of all reported cases and 64% of all patient bed days monitored.

Among **large hospitals**, 31 of the 39 hospitals reported at least one case. Large hospitals accounted for 6% of all reported cases and 10% of all patient bed days monitored.

Nearly half (41) of hospitals in the **medium hospital** peer group reported at least one case. Medium hospitals accounted for 5% of all reported cases and 9% of all patient bed days monitored.

Only 14 of the 79 **small hospitals** reported at least one case. Small hospitals accounted for 2% of all reported cases and 4% of all patient bed days monitored

Of the remaining 77 cases, 68 were reported in hospitals in the 'specialist women's and children's' hospital peer group and nine in the 'other' hospital peer group. These two groups each accounted for 5% of all patient bed days monitored.

Hospitals with more vulnerable patients report more infections

People with healthcare-associated *S. aureus* bloodstream infection were more often reported by hospitals with more vulnerable patients.

Major hospitals with:

- More vulnerable patients reported 60% (1046) of all cases in 2011–12 and accounted for 41% of patient bed days monitored
- Fewer vulnerable patients reported 22% (381) of all cases in 2011–12 and accounted for 23% of patient bed days monitored.

Large hospitals with:

- More vulnerable patients reported 4% (73) of all cases in 2011–12 and accounted for 4% of patient bed days monitored
- Fewer vulnerable patients reported 2% (40) of all cases in 2011–12 and accounted for 6% of patient bed days monitored.

Medium hospitals with:

- More vulnerable patients reported 3% (55) of all cases in 2011–12 and accounted for 4% of patient bed days monitored
- Fewer vulnerable patients reported 2% (30) of all cases in 2011–12 and accounted for 5% of patient bed days monitored.

Small hospitals with:

- More vulnerable patients reported 1% (13) of all cases in 2011–12 and accounted for 2% of patient bed days monitored
- Fewer vulnerable patients reported 1% (10) of all cases in 2011–12 and accounted for 2% of patient bed days monitored.

The number of cases of *S. aureus* healthcare-associated bloodstream infection per 10,000 patient bed days, or the rates of infection, are higher in peer groups with more vulnerable patients compared to those with fewer vulnerable patients **(Figure 1a and 1b, pages 7 to 10)**.

Major hospitals with:

- More vulnerable patients have an average rate of infection of 1.38 cases per 10,000 patient bed days
- Fewer vulnerable patients have an average rate of infection of 0.90 cases per 10,000 patient bed days.

Large hospitals with:

- More vulnerable patients have an average rate of infection of 1.01 cases per 10,000 patient bed days
- Fewer vulnerable patients have an average rate of infection of 0.33 cases per 10,000 patient bed days.

Medium hospitals with:

- More vulnerable patients have an average rate of infection of 0.71 cases per 10,000 patient bed days
- Fewer vulnerable patients have an average rate of infection of 0.35 cases per 10,000 patient bed days.

Small hospitals with:

- More vulnerable patients have an average rate of infection of 0.34 cases per 10,000 patient bed days
- Fewer vulnerable patients have an average rate of infection of 0.23 cases per 10,000 patient bed days.

Infection rates differ markedly between similar hospitals

There is noticeable variation between hospitals in terms of the proportions of patients with healthcare-associated *S. aureus* bloodstream infection, even after accounting for hospital size, service provision and patient vulnerability.

In **major hospitals**, the rate of healthcare-associated *S. aureus* bloodstream infection in 2011–12 ranged from:

- 0.47 to 2.15 per 10,000 patient bed days for hospitals with more vulnerable patients
- 0.17 to 2.59 per 10,000 patient bed days for hospitals with fewer vulnerable patients.

Among major hospitals with more vulnerable patients, there are two hospitals with 10 cases or fewer, and rates as low as about 0.5 cases per 10,000 patient bed days. There are five hospitals with more than 30 cases and rates more than 2.0 cases per 10,000 patient bed days **(Figure 1a, pages 7 and 8)**.

Among major hospitals with fewer vulnerable patients, there are hospitals with 10 cases or fewer, and rates as low as about 0.17 cases per 10,000 patient bed days. There is a hospital with more than 30 cases and a rate of 2.59 cases per 10,000 patient bed days **(Figure 1a, pages 7 and 8)**.

This four-fold and 15-fold difference in rates of infection for major hospitals with more or fewer vulnerable patients, respectively, may represent an opportunity to improve the prevention of healthcare-associated *S. aureus* bloodstream infection.

In **large hospitals**, the rate of healthcare-associated *S. aureus* bloodstream infection ranged from:

- 0 to 2.30 per 10,000 patient bed days for hospitals with more vulnerable patients
- 0 to 1.11 per 10,000 patient bed days for hospitals with fewer vulnerable patients.

Among large hospitals with more vulnerable patients, there are two hospitals with 10 cases or fewer, and rates as low as about 0.16 cases per 10,000 patient bed days. There are two hospitals with between 11 and 30 cases and rates of more than 2.0 cases per 10,000 patient bed days **(Figure 1a, pages 7 and 8)**.

This 10-fold difference in rates of infection may represent an opportunity to improve the prevention of healthcare-associated *S. aureus* infection.

In **medium hospitals**, the rate of healthcare-associated *S. aureus* bloodstream infection ranged from:

- 0 to 2.01 per 10,000 patient bed days for hospitals with more vulnerable patients
- 0 to 2.95 per 10,000 patient bed days for hospitals with fewer vulnerable patients.

In **small hospitals**, the rate of healthcare-associated *S. aureus* bloodstream infection ranged from:

- 0 to 2.38 per 10,000 patient bed days for hospitals with more vulnerable patients
- 0 to 1.50 per 10,000 patient bed days for hospitals with fewer vulnerable patients.

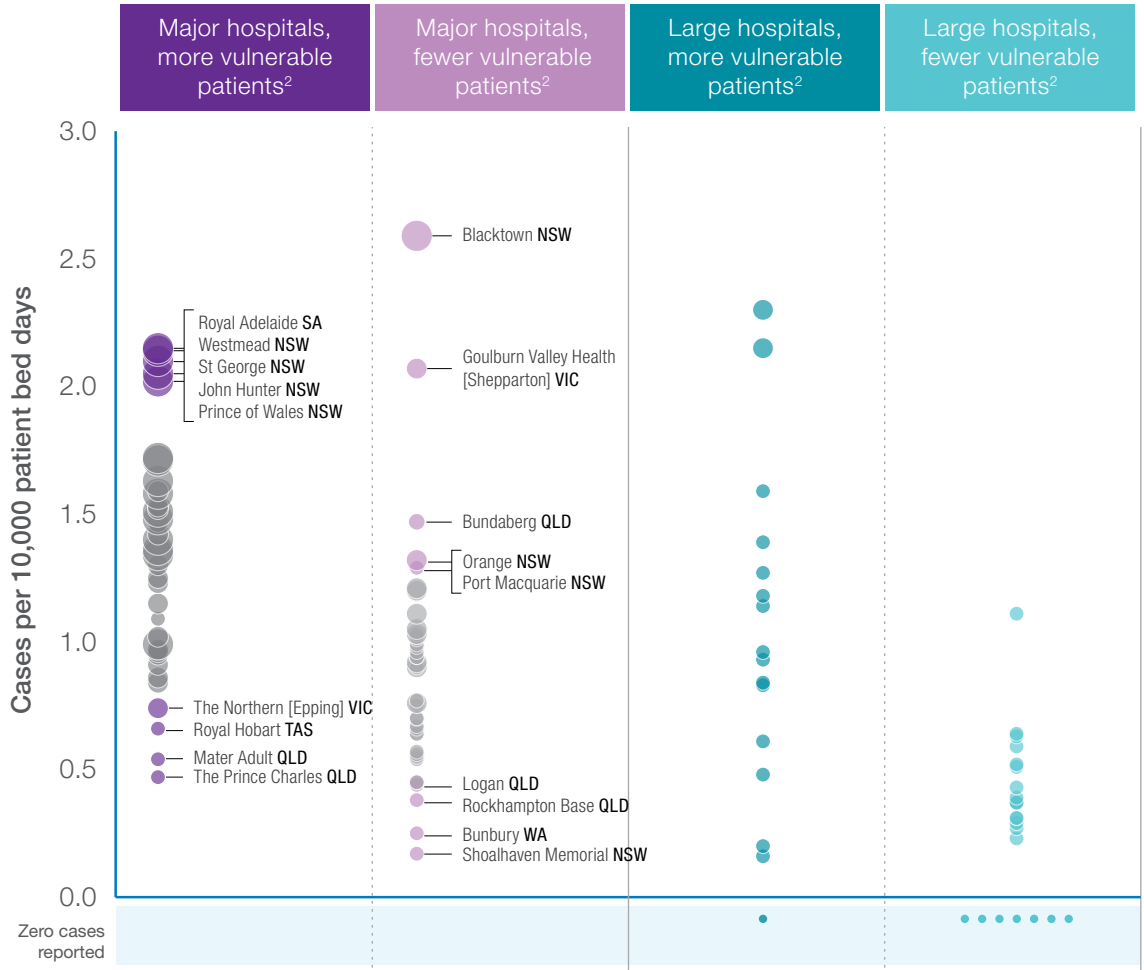
Next steps

The Authority acknowledges all of the people that helped us learn a new and complex information system quickly. We will continue to work on improving reporting of healthcare-associated *S. aureus* bloodstream infection and publish on an annual basis, in line with the availability of data.

This report examines the number of bloodstream infections caused by a specific organism, called *Staphylococcus aureus (S. aureus)*, that were acquired while patients were receiving medical care or treatment in hospital.

Information on healthcare-associated *S. aureus* bloodstream infection for more than 600 public and private hospitals is available on the National Health Performance Authority website at **www.myhospitals.gov.au**

Figure 1a: Healthcare-associated *S. aureus* bloodstream infections in public hospitals[1], by *major* and *large hospitals*, 2011–12



	Major hospitals, more vulnerable patients[2]	Major hospitals, fewer vulnerable patients[2]	Large hospitals, more vulnerable patients[2]	Large hospitals, fewer vulnerable patients[2]
Total number of hospitals in peer group	36	40	16	23
All cases reported nationally (%)	60%	22%	4%	2%
All patient bed days monitored (%)	41%	23%	4%	6%
Average cases per 10,000 patient bed days	1.38	0.90	1.01	0.33
Range of patient bed days monitored (%)	93–100%	86–100%	99–100%	86–100%

Number of cases — Zero cases; 1–10 cases; 11–30 cases; > 30 cases

1. Rates are not shown for hospitals with fewer than 5,000 admitted patient bed days covered by infection control surveillance.
2. More and fewer vulnerable patients refers to hospitals deemed to have, for their peer group, a high or low percentage of patient bed days under surveillance attributable to patients with one or more of the identified risk factors.

Note: For more information on measures and peer groups, see **www.myhospitals.gov.au**

Source: Australian Institute of Health and Welfare. National *Staphylococcus aureus* Bacteraemia Data Collection 2011–12, data extracted 29 November 2012. Australian Institute of Health and Welfare. Admitted Patient Care National Minimum Dataset 2011–12, data extracted 26 March 2012.

Major hospitals, more vulnerable patients

Hospitals reporting cases

- Austin Hospital [Heidelberg]
- Ballarat Health Services [Base Campus]
- Box Hill Hospital
- Canberra Hospital
- Dandenong Campus
- Flinders Medical Centre
- Fremantle Hospital (including cases from Kaleeya Hospital)
- Geelong Hospital
- Gosford
- John Hunter
- Liverpool
- Mater Adult Hospital
- Monash Medical Centre [Clayton]
- Nepean
- Prince of Wales
- Princess Alexandra Hospital
- Queen Elizabeth Hospital Campus (including cases from St. Margaret's Hospital)
- Royal Adelaide Hospital
- Royal Brisbane & Women's Hospital
- Royal Darwin Hospital
- Royal Hobart Hospital
- Royal Melbourne Hospital [Parkville]
- Royal North Shore
- Royal Perth Hospital Wellington Street Campus (including cases from Royal Perth Hospital Shenton Park Campus)
- Royal Prince Alfred
- Sir Charles Gairdner Hospital
- St George
- St Vincent's Darlinghurst
- St Vincent's Hospital [Fitzroy]
- The Alfred
- The Northern [Epping]
- The Prince Charles Hospital
- Townsville Hospital
- Western Hospital [Footscray]
- Westmead
- Wollongong

Major hospitals, fewer vulnerable patients

Hospitals reporting cases

- Alice Springs Hospital
- Bankstown/ Lidcombe
- Bendigo Hospital
- Blacktown
- Bunbury Hospital
- Bundaberg Hospital
- Caboolture Hospital
- Cairns Base Hospital
- Calvary Public Hospital
- Campbelltown
- Casey Hospital
- Coffs Harbour
- Concord
- Dubbo
- Frankston Hospital
- Gold Coast Hospital
- Goulburn Valley Health [Shepparton]
- Ipswich Hospital
- Latrobe Regional Hospital [Traralgon]
- Launceston General Hospital
- Lismore
- Logan Hospital
- Lyell McEwin Hospital
- Mackay Base Hospital
- Manning
- Maroondah Hospital [East Ringwood]
- Nambour Hospital
- Orange
- Port Macquarie
- Redcliffe Hospital
- Rockhampton Base Hospital
- Shoalhaven Memorial
- South West Healthcare [Warrnambool]
- Sunshine Hospital
- Sutherland
- Tamworth
- Toowoomba Hospital
- Tweed Hospital
- Wagga Wagga
- Wyong

Large hospitals, more vulnerable patients

Hospitals reporting cases

- Albury Wodonga Health - Albury Campus
- Calvary Mater Newcastle
- Canterbury
- Hervey Bay Hospital
- Maitland
- Mildura Base Hospital
- Modbury Hospital
- Monash Medical Centre [Moorabbin]
- Northeast Health Wangaratta
- North West Regional Hospital [Burnie]
- **Peter MacCallum Cancer Institute ***
- Queen Elizabeth II Jubilee Hospital
- **Royal Victorian Eye & Ear Hospital ***
- Ryde
- West Gippsland Healthcare Group [Warragul]

Hospitals reporting **no** cases

- Wimmera Base Hospital [Horsham]

Large hospitals, fewer vulnerable patients

Hospitals reporting cases

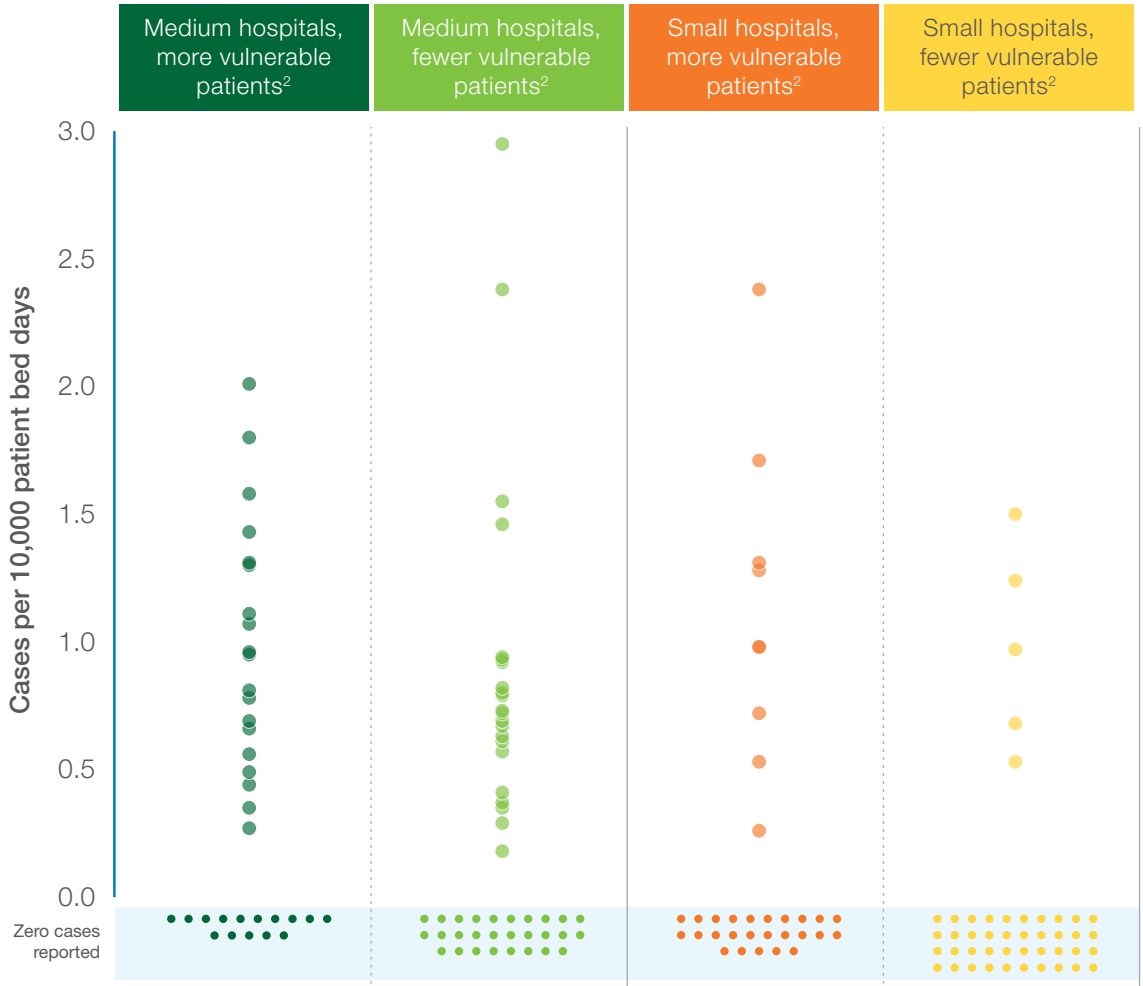
- Albany Hospital
- Albury Wodonga Health - Wodonga Camps
- Armadale-Kelmscott Memorial Hospital
- Auburn
- Bathurst
- Central Gippsland Health Service [Sale]
- Fairfield
- Geraldton Hospital
- Hornsby and Ku-Ring-Gai
- Kalgoorlie Hospital
- Manly
- Mercy Public Hospital Inc. [Werribee]
- Mona Vale
- Repatriation General Hospital
- Rockingham General Hospital
- Shellharbour

Hospitals reporting **no** cases

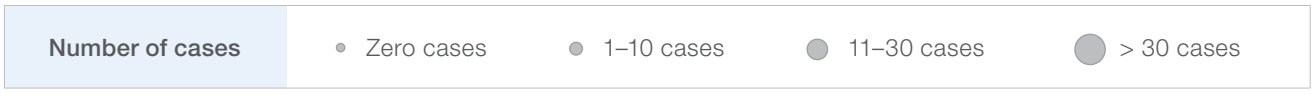
- Angliss Hospital
- Goulburn
- Grafton
- Mount Isa Hospital
- Redland Hospital
- Sandringham & District Memorial Hospital
- Swan District Hospital (including cases from Kalamunda Hospital)

* The percentage of vulnerable patients in this hospital was much higher than other hospitals in this peer group.

Figure 1b: Healthcare-associated *S. aureus* bloodstream infections in public hospitals[1], by *medium* and *small hospitals*, 2011–12



	Medium hospitals, more vulnerable patients[2]	Medium hospitals, fewer vulnerable patients[2]	Small hospitals, more vulnerable patients[2]	Small hospitals, fewer vulnerable patients[2]
Total number of hospitals in peer group	34	50	34	45
All cases reported nationally (%)	3%	2%	1%	1%
All patient bed days monitored (%)	4%	5%	2%	2%
Average cases per 10,000 patient bed days	0.71	0.35	0.34	0.23
Range of patient bed days monitored (%)	90–100%	50–100%	100%	100%



1. Rates are not shown for hospitals with fewer than 5,000 admitted patient bed days covered by infection control surveillance.
2. More and fewer vulnerable patients refers to hospitals deemed to have, for their peer group, a high or low percentage of patient bed days under surveillance attributable to patients with one or more of the identified risk factors.

Note: For more information on measures and peer groups, see **www.myhospitals.gov.au**

Source: Australian Institute of Health and Welfare. National *Staphylococcus aureus* Bacteraemia Data Collection 2011–12, data extracted 29 November 2012. Australian Institute of Health and Welfare. Admitted Patient Care National Minimum Dataset 2011–12, data extracted 26 March 2012.

Medium hospitals, more vulnerable patients

Hospitals reporting cases

- Armidale
- Bairnsdale Regional Health Service
- Bass Coast Regional Health
- Bega
- Belmont
- Bowral
- Broken Hill
- Busselton Hospital
- Caloundra Hospital
- Caulfield General Medical Centre
- Colac Area Health
- Echuca Regional Health
- Heidelberg Repatriation Hospital [Heidelberg West]
- Mersey
- Mount Druitt
- Mount Gambier and Districts Health Service
- Sydney/Sydney Eye
- Western District Health Service [Hamilton]
- Williamstown Hospital

Hospitals reporting **no** cases

- Atherton Hospital
- Benalla & District Memorial Hospital
- Cranbourne Integrated Care Centre
- Djerriwarrh Health Service [Bacchus Marsh]
- East Grampians Health Service [Ararat]
- Gawler Health Service
- Gippsland Southern Health Service - Leongatha
- Kurri Kurri
- Mount Barker District Soldiers' Memorial Hospital
- Osborne Park Hospital
- Portland District Health
- Riverland Regional Health Service - Berri
- Stawell Regional Health
- Swan Hill District Health [Swan Hill]
- Whyalla Hospital & Health Services

Medium hospitals, fewer vulnerable patients

Hospitals reporting cases

- Ballina
- Batemans Bay
- Blue Mountains
- Casino
- Cessnock
- Gladstone Hospital
- Griffith
- Gympie Hospital
- Innisfail Hospital
- Kempsey Hospital
- Kingaroy Hospital
- Lithgow
- Macksville
- Milton and Ulladulla
- Moruya
- Murwillumbah
- Muswellbrook
- Pambula
- Peter James Centre (East Burwood)
- Queanbeyan
- Rosebud Hospital
- Singleton

Hospitals reporting **no** cases

- Bentley Hospital
- Broadmeadows Health Service
- Castlemaine Health
- Cooma HS
- Cowra
- Deniliquin
- Emerald Hospital
- Inverell
- Kyabram & District Health Service
- Maclean
- Mareeba Hospital
- Maryborough District Health Service [Maryborough]
- Maryborough Hospital
- Millicent & District Hospital & Health Services
- Moree
- Mudgee
- Murray Bridge Soldiers' Memorial Hospital
- Naracoorte Health Service
- Narrogin Hospital
- Noarlunga Health Services (Noarlunga Public Hospital)
- Northern Yorke Peninsula Health Service
- Port Augusta Hospital & Regional Health Services
- Port Pirie Regional Health Service
- Proserpine Hospital
- Seymour District Memorial Hospital
- South Coast District Hospital
- Warwick Hospital
- Young

Small hospitals, more vulnerable patients

Hospitals reporting cases

- Ballarat Health Services [Queen Elizabeth Campus]
- Broome Hospital
- Bulli
- Cootamundra
- Hedland Health Campus
- Nickol Bay Hospital
- Royal Melbourne Hospital-Royal Park Campus
- Springwood
- Wauchope

Hospitals reporting **no** cases

- Babinda Hospital
- Bendigo Health Care Group [Anne Caudle]
- Bourke (MPS)
- Camden
- Clare Hospital
- Crookwell
- Derby Hospital
- Esperance Hospital
- Gilgandra (MPS)
- Gloucester
- Gunnedah
- Hay
- Ingham Hospital
- Junee
- Kerang District Health
- Kilmore & District Hospital
- Kununurra Hospital
- Kyneton District Health Service
- Mansfield District Hospital
- Northam Hospital
- Parkes
- Port Lincoln Health Services
- Roma Hospital
- West Wimmera Health Service [Nhill]
- Wynnum Hospital

Small hospitals, fewer vulnerable patients

Hospitals reporting cases

- Bellinger River
- Katherine Hospital
- Kingston Centre [Cheltenham]
- St George's Health Service-Aged Care
- Stanthorpe Hospital

Hospitals reporting **no** cases

- Ayr Hospital
- Balranald
- Barraba (MPS)
- Beaudesert Hospital
- Bingara (MPS)
- Boorowa
- Bowen Hospital
- Brewarrina (MPS)
- Bundoora Extended Care Centre
- Byron Bay
- Capricorn Coast Hospital & Health Service
- Collie Hospital
- Coonamble
- Corowa
- Forbes
- Glen Innes
- Gove Hospital
- Gundagai
- Holbrook
- Kyogle (MPS)
- Leeton
- Maleny Hospital
- Molong
- Mullumbimby
- Murrumburrah - Harden
- Narrabri
- Narrandera
- Narromine
- Nyngan (MPS)
- Rylstone (MPS)
- Scott Memorial Scone
- Temora
- Tennant Creek Hospital
- Thursday Island Hospital
- Tumut
- Waikerie Hospital & Health Services
- Walcha (MPS)
- Warialda (MPS)
- Wellington
- Yarrawonga Health

Appendix: Hospital peer groups

Appendix table 1: Hospital peer groups for reporting healthcare-associated *S. aureus* bloodstream infection

Hospital risk profile group	Description
Major hospitals 1. With more vulnerable patients 2. With fewer vulnerable patients	Metropolitan hospitals with >20,000 acute casemix-adjusted separations and rural hospitals with >16,000 acute casemix-adjusted separations per annum.
Large hospitals 3. With more vulnerable patients 4. With fewer vulnerable patients	Metropolitan hospitals with >10,000 acute casemix-adjusted separations, rural acute hospitals with >8,000 acute casemix-adjusted separations and remote hospitals with >5,000 acute casemix-adjusted separations per annum.
Medium hospitals 5. With more vulnerable patients 6. With fewer vulnerable patients	Medium hospitals between 2,000 and 10,000 acute casemix-adjusted separations per annum and acute hospitals treating <2,000 casemix-adjusted separations per annum but with >2,000 separations per annum.
Small hospitals 7. With more vulnerable patients 8. With fewer vulnerable patients	Small rural acute hospitals (mainly small country town hospitals), acute hospitals treating <2,000 separations per annum, and with less than 40% non-acute and outlier patient days of total patient days and small remote hospitals (<5,000 acute casemix-adjusted separations that are not allocated to the 'MPS' or 'community non-acute' peer groups).

Note: More information on the risk profile group methodology is available in *Hospital Performance: Healthcare-associated* Staphylococcus aureus *bloodstream infections in 2011–12, Technical Supplement* at **www.myhospitals.gov.au**

References

1. Council of Australian Governments, 2011. National Healthcare Agreement. [Online] Available at: **www.federalfinancialrelations.gov.au/content/national_agreements/downloads/National_Healthcare_Agreement_2011.pdf** Accessed 28 April 2013.

2. Collignon PJ, Wilkinson IJ et al. Health care-associated *Staphylococcus aureus* bloodstream infections: a clinical quality indicator for all hospitals. Med J Aust 2006;184(8):404-406.

3. Turnidge JD, Kotsanas D et al. *Staphylococcus aureus* bacteraemia: a major cause of mortality in Australia and New Zealand. Med J Aust 2009;191(7):368-373.

4. Van Hal SJ, Jensen SO et al. Predictors of Mortality in *Staphylococcus aureus* Bacteremia. Clin Microbiol Rev 2012:25(2):362-386.

5. Australian Commission on Quality and Safety in Health Care. Implementation guide for the surveillance of *Staphylococcus aureus* bacteraemia. Sydney:ACQSHC, 2011.

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Neither of these committees had any role in the writing of this report.

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This report relies on data provided by state and territory governments. These data were used to calculate the performance measures in this report. The Authority conducts checks to ensure data quality and also relies on the data quality work of AIHW done under contract to the Authority. The Authority provides jurisdictions with the opportunity to verify their data.

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