CEC eChartbook Portal Extract

Healthcare Associated Infections

Staphylococcus Aureus Bacteraemias (SAB)

CLINICAL EXCELLENCE COMMISSION

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HEALTHCARE ASSOCIATED INFECTIONS

Staphylococcus Aureus Bacteraemias (SAB)

Why is this important? Staphylococcus aureus (S. aureus) bacteraemias (SAB) are a serious cause of morbidity and mortality worldwide [1-3]. Patients who develop bloodstream infections, such as SAB, are more likely to suffer serious complications associated with the infection (e.g. infective endocarditis) that may have a negative impact on patient outcomes, including longer hospital stays, increased morbidity, increased risk of mortality, and additional healthcare costs [1-3]. SAB is the most common cause of healthcare associated bacteraemias, with over half of all SAB episodes in Australia being attributed as a healthcare associated infection (HAI) [3]. One of the biggest challenges in treating SAB is that many strains of S. aureus have developed resistance against a number of different antibiotics, including methicillin [4]. These bacteria are known as methicillin-resistant S. aureus (MRSA). If a SAB is able to be treated with common antibiotics, and does not demonstrate any resistance to the antibiotic, the infection is considered to be caused by methicillin-sensitive S. aureus (MSSA). Despite being associated with high mortality, a substantial proportion of healthcare acquired SAB cases are potentially preventable [1].

National reporting of healthcare associated SAB was introduced in Australia in 2008. SAB incidences and rates also are a key performance indicator for jurisdictions under the National Healthcare Agreement [5]. The rationale for monitoring SAB infections is that the incidence and rate of SAB are considered to be a good proxy marker for the measurement of clinical quality in healthcare facilities [2], [6]. This section will present overall SAB data (combined MRSA and MSSA) which include both 'inpatient' and 'non-inpatient' infections.

Findings: The data for SAB infections (MRSA and MSSA) rates per 10,000 occupied bed days was calculated for the period January 2012 to Dec 2018. In the first two years of this reporting period, the annual rate of SAB infections was centred around 1.0 (Chart SA01). The annual rates continued to decline from 0.99 in 2011 to 0.70 infections per 10,000 occupied bed days in 2018. Overall SAB infections rates in NSW were consistently lower than the National Health Agreement benchmark of 2.0 per 10,000 occupied bed days. Data for the three peer groups shows a consistent decreasing trend of infections over the last 6 years in response to infection prevention and control measures (Chart SA02). As the complexity of patients decreases between the peer groups, the average rate of SAB infections is lower.

Implications: Patients who develop bacteraemias, such as SAB, are more likely to suffer complications, resulting in prolonged hospitalisation and increased hospitalisation costs. Serious infections may result in death. Spread of SAB is generally through human-to-human contact, or related to improper use and/or a management an intravenous vascular device. The virulent nature of SAB demands rigorous management of both suspected and confirmed cases [1]. One of the most effective ways to minimise the risk of SAB and other healthcare-associated infections is through good hand hygiene [7]. The application of infection and prevention control interventions has resulted in a decrease in the rate of SAB infections at a state and peer group level. There is room for further improvements, such as improved hand hygiene, to drive infection rates even lower.

What we don't know: *S. aureus* is a normal human commensal that can also behave as a versatile and virulent pathogen [4]. Treatment of these infections is becoming more difficult, because of the increasing prevalence of multi-drug-resistant strains [8-9]. Underlying patient factors are important in determining the likelihood of pathogen transmission and complicated bacteraemia and require further investigation beyond the data presented here. The relative effectiveness of the different infection prevention and control measures is unknown. Further research would enable better targeting of activities.

References:

[1] Corey GR. Staphylococcus aureus Bloodstream Infections: Definitions and Treatment. Clin Infect Dis. 2009; 48 (Suppl 4):S254-9.

[2] Collignon PJ, Wilkinson IJ, Gilbert GL, Grayson ML, Whitby RM. Health care-associated Staphylococcus aureus bloodstream infections: a clinical quality indicator for all hospitals. MedJ Aust 2006; 184: 404-6.

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[4] Lowy FD. Staphylococcus aureus infections. N Engl J Med 1998; 339:520-32.

[5] Standing Council on Federal Financial Relations. National Healthcare Agreement 2012. Accessed November 2013 [Online]: http://www.federalfinancialrelations.gov.au/content/npa/healthcare/national-agreement.pdf

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[7] Grayson ML, Russo PL, Cruickshank M, et al. Outcomes from the first 2 years of the Australian National Hand Hygiene Initiative. Med J Aust. 2011; 195 (10): 615-9.

[8] Bauer TM, Ofner E, Just HM, et al. An epidemiological study assessing the relative importance of airborne and direct contact transmission of microorganisms in the medical intensive care unit. J Hosp Infect. 1990; 15 (4):301-309.

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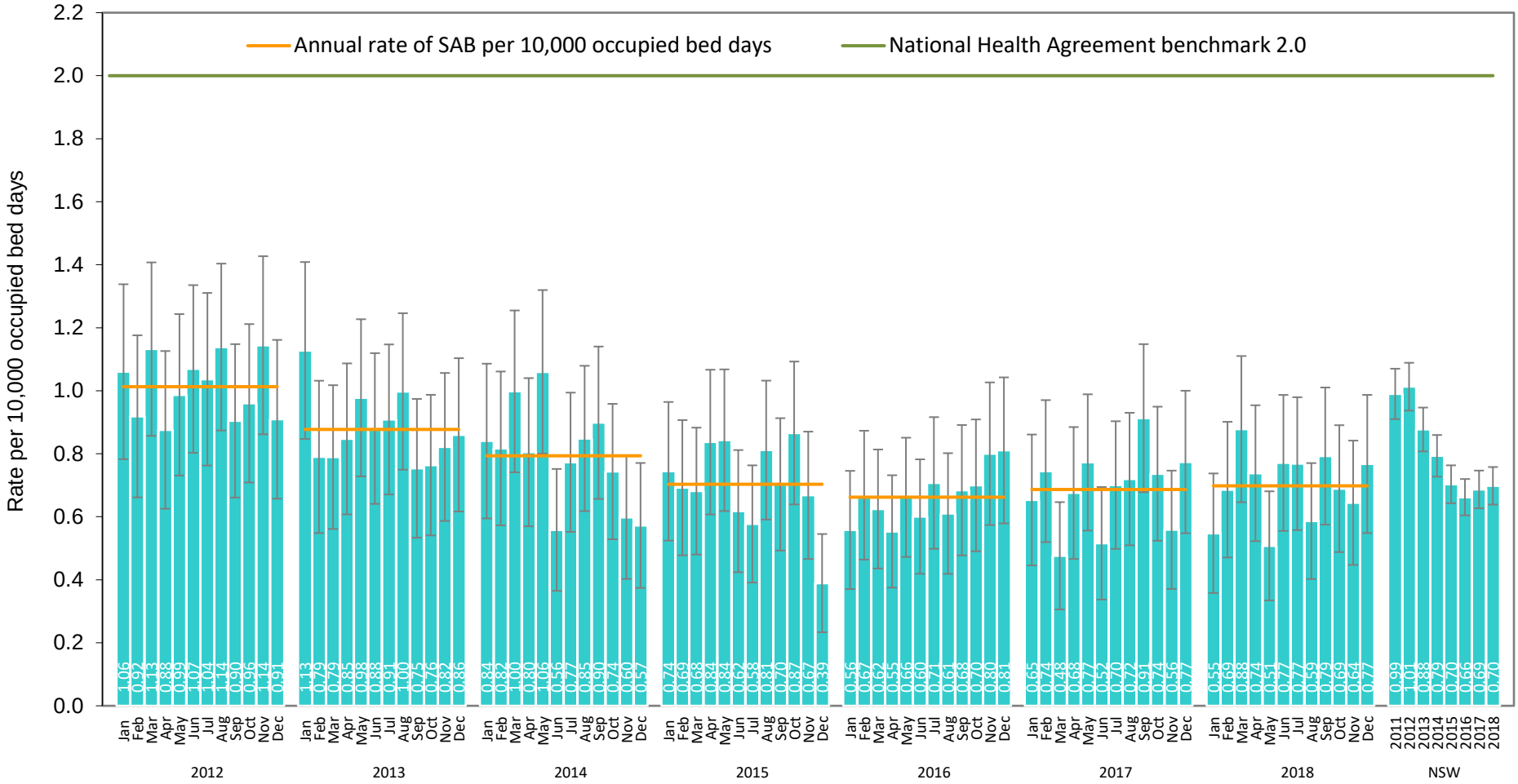
Chart SA01 – *Staphylococcus aureus* bacteraemias (SAB)

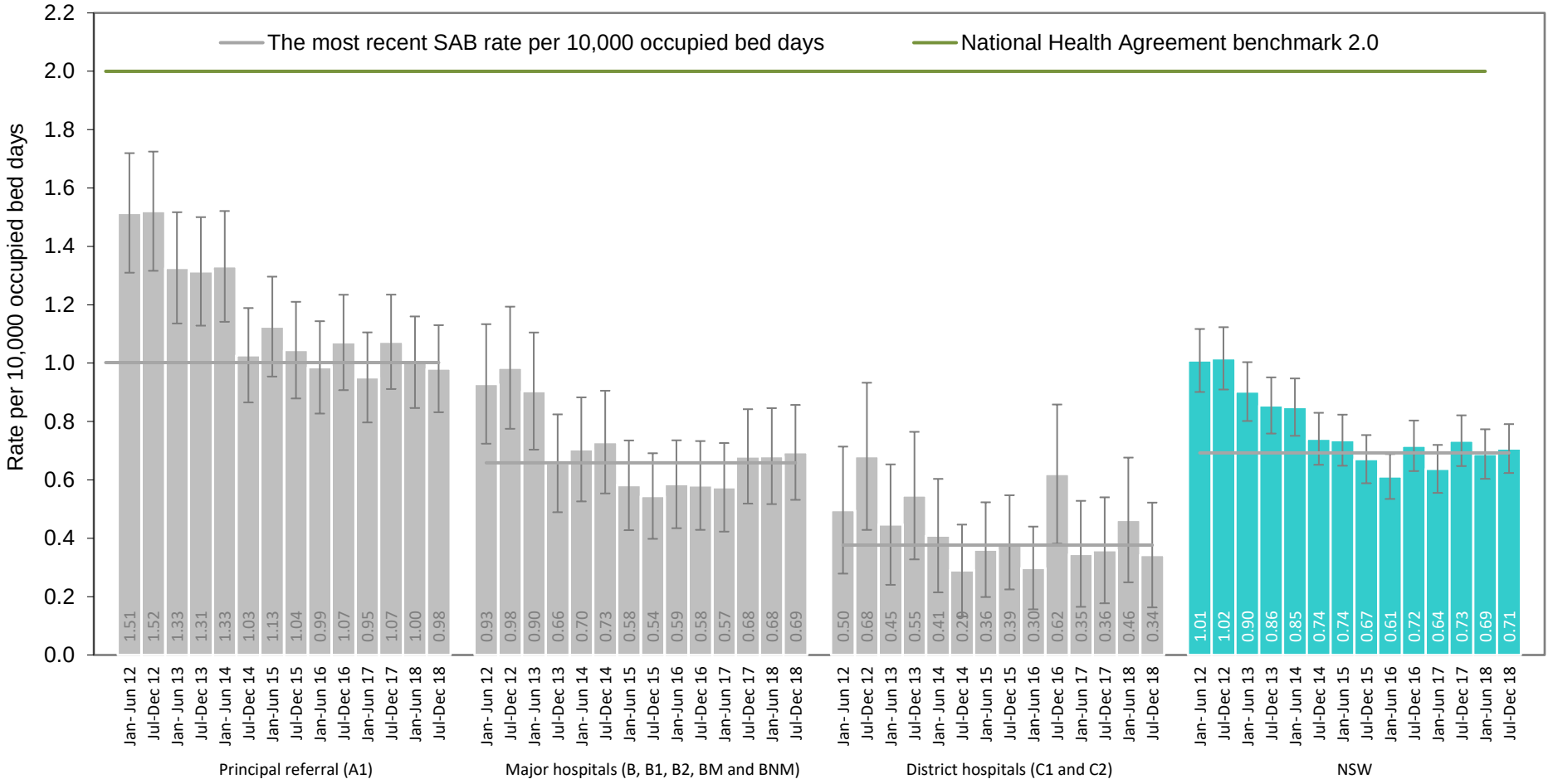
Staphylococcus aureus bacteraemia (SAB) rate per 10,000 occupied bed days*, NSW, Jan 2012 – Dec 2018



Source: NSW Ministry of Health, Clinical Excellence Commission. *Public hospitals only.

Chart SA02 – *Staphylococcus aureus* bacteraemias (SAB)

Six-monthly SAB rate per 10,000 occupied bed days by selected Hospital peer groups*, NSW, Jan 2012 – Dec 2018



Source: NSW Ministry of Health, Clinical Excellence Commission.* Public hospitals only.

Data Definitions

Chart:	SA01
Admin Status:	Current, Dec 2018
Indicator Name:	*Staphylococus aureus* bacteraemias (SAB)
Description:	*Staphylococcus aureus* bacteraemia (SAB) rate per 10,000 occupied bed days (public hospitals only), NSW, Jan 2012 – Dec 2018
Dimension:	Patient safety
Clinical Area:	Initiatives in safety and quality health care
Data Inclusions:	All s*taphylococcus aureus* bacteraemias (including MSSA and MRSA)
Data Exclusions:	None
Numerator:	Total number of *staphylococcus aureus* bacteraemias
Denominator:	Total number of occupied bed days
Standardisation:	None (crude infection rate per 10,000 bed days was calculated)
Data Source:	NSW Healthcare Associated Infections Data Collection, NSW Ministry of Health
Comments:	The data for Staphylococcus aureus bacteraemia rates from July 2011 are based on a revised national definition which differs from the NSW definition used prior to that date. This revised surveillance definition means in some cases it is more difficult to determine if these infections were associated with performance of a particular hospital. Infections reported now include both those that are Methicillin resistant (MRSA) and those that are Methicillin sensitive (MSSA).

Chart:	SA02
Admin Status:	Current, Dec 2018
Indicator Name:	*Staphylococus aureus* bacteraemias (SAB) per 10,000 occupied bed days by selected Hospital peer groups and year
Description:	Six-monthly SAB rate per 10,000 occupied bed days by selected Hospital peer groups (public hospitals only), NSW, Jan 2012 –Dec 2018
Dimension:	Patient safety
Clinical Area:	Initiatives in safety and quality health care
Data Inclusions:	All s*taphylococcus aureus* bacteraemias (including MSSA and MRSA) occurred in hospital peer groups A1, B (consisting of B, B1, B2, BM and BNM) and C (consisting of C1 an dC2)
Data Exclusions:	Other peer groups apart from A1, B and C
Numerator:	Total number of *staphylococcus aureus* bacteraemias in the selected peer groups
Denominator:	Total number of occupied bed days in the selected peer groups
Standardisation:	None (crude infection rate per 10,000 bed days was calculated)
Data Source:	NSW Healthcare Associated Infections Data Collection, NSW Ministry of Health
Comments:	The data for Staphylococcus aureus bacteraemia rate from July 2011 are based on a revised national definition which differs from the NSW definition used prior to that date. This revised surveillance definition means in some cases it is more difficult to determine if these infections were associated with performance of a particular hospital. Infections reported now include both those that are Methicillin resistant (MRSA) and those that are Methicillin sensitive (MSSA).