

CEC eChartbook Portal Extract

Healthcare Associated Infections

Methicillin-resistant *Staphylococcus Aureus* (MRSA) Bacteraemias



© **Clinical Excellence Commission 2019:** This work is copyright. Apart from any use as permitted under the *Copyright Act 1968*, no part may be reproduced without prior written permission from the Clinical Excellence Commission (CEC). Requests and enquiries concerning reproduction and rights should be directed to the Director, Information Management, Locked Bag 8, Haymarket NSW 1240.

Suggested citation: Clinical Excellence Commission (access date). eChartbook Portal: Safety and Quality of Healthcare in New South Wales. Sydney: Clinical Excellence Commission. Available at: <http://www.cec.health.nsw.gov.au/echartbook/cec-indicators-intro-echartbook/mrsa-hai> Accessed [insert date of access].

Contributors:

Drafted by: CEC eChartbook team and CEC Governance and Assurance Directorate

Data analysis by: CEC eChartbook team

Reviewed by: CEC Governance and Assurance Directorate

Edited by: CEC eChartbook team

Any enquiries or comments about this publication should be directed to:

André Jenkins, Director, Information Management

Clinical Excellence Commission, Locked Bag 8, Haymarket NSW 1240

Phone: (02) 9269 5500 Email: CEC-eChartbook@health.nsw.gov.au

This publication is part of the CEC's Information Management Series. A complete list of CEC publications is available from the Director, Information Management (address above) or via the CEC's web site www.cec.health.nsw.gov.au

PDF File created: Thursday, 2 May 2019

HEALTHCARE ASSOCIATED INFECTIONS

Methicillin-resistant *Staphylococcus Aureus* (MRSA) Bacteraemias

Why is this important? Healthcare associated infections (HAI) are a leading cause of preventable illness and death [1-5]. Among the pathogens that cause HAI, methicillin-resistant *Staphylococcus aureus* (MRSA) causing bacteraemia is a key target for reduction efforts. MRSA remains a pathogen that continues to cause morbidity and mortality in healthcare settings, particularly among patients in intensive care units [4, 6-7]. The epidemiology of MRSA is complex, but the main vehicle of transmission in healthcare settings is likely to be contact transmission between patients, staff and visitors [8].

In Australia, MRSA bacteraemias cause up to 40 per cent of all healthcare-acquired *Staphylococcus aureus* (*S. aureus*) bacteraemia [9]. MRSA bacteraemias are associated with increased risk of mortality [10] and contribute a considerable cost to the healthcare system due to the need for prolonged hospital stays, re-admissions and additional diagnostic tests and treatment [11]. National reporting of healthcare acquired *S. aureus* bacteraemias, including those caused by MRSA, was introduced in Australia in 2008. MRSA bacteraemia incidences and rates also are a key performance indicator for jurisdictions under the National Healthcare Agreement [12]. This section reports 'inpatient' and 'non-inpatient' healthcare-acquired MRSA bacteraemias data.

The HAI Program addresses the Australian Commission on Safety and Quality in Health Care's *National Safety and Quality Health Service (NSQHS) Standards* [13]:

3.1 – 3.4 Clinical governance and quality improvement to prevent and control healthcare-associated infections, and support antimicrobial stewardship;

3.5 – 3.12 Infection prevention and control systems;

3.15 – 3.16 Antimicrobial stewardship;

Findings: The annual rate of MRSA bacteraemias in NSW has declined from 0.36 in 2011 to 0.16 per 10,000 occupied bed days in 2018 (233 and 119

infections recorded respectively) (Chart MR01). The monthly variation in rates provides information to review and enhance infection Prevention and Control programs, an ongoing trend may reflect an actual increase in the overall rates.

Implications: In recent years, rates of MRSA bacteraemia have fallen because of improved hand hygiene, infection prevention and control practices. The prevention of MRSA bacteraemia, however, still remains a priority for NSW Health.

What we don't know: *S. aureus* is a normal human commensal that can also behave as a versatile and virulent pathogen [14]. Treatment of MRSA bacteraemias is becoming increasingly difficult, because of the growing prevalence of multi-drug resistant strains [15]. 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 analysis of infection data by; its origin whether it is hospital- or community-acquired, hospital peer group classification, or a change in severity stages during hospital admission may shed some light on the MRSA transmission process.

References:

- [1] Klevens RM, Edwards JR, Richards CL, et al. Estimating health care-associated infections and deaths in U.S. hospitals, 2002. *Public Health Rep.* 2007; 122(2):160-6.
- [2] Jarvis WR, Jarvis AA, Chinn RY et al. National prevalence of methicillin-resistant *Staphylococcus aureus* in inpatients at US health care facilities, 2010. *Am J Infect Control.* 2012; 40 (3):194-200.
- [3] Sievert DM, Ricks P, Edwards JR, et al. Antimicrobial-resistant pathogens associated with healthcare-associated infections: summary of data reported

to the National Healthcare Safety Network at the Centers for Disease Control and Prevention, 2009-2010. *Infect Control Hosp Epidemiol.* 2013; 34 (1):1-14.

[4] Huang SS, Septimus E, Kleinman K, et al. Targeted versus universal decolonization to prevent ICU infection. *N Engl J Med.* 2013; 368 (24):2255-65.

[5] Graves N, Weinhold D, Tong E, et al. Effect on healthcare-acquired infection on length of hospital stay and cost. *Infect Control Hosp Epidemiol.* 2007; 28(3): 280-292.

[6] Fridkin SK. Increasing prevalence of antimicrobial resistance in intensive care units. *Crit Care Med.* 2001; 29(Suppl 4):N64-N68.

[7] Archibald L, Phillips L, Monnet D, et al. Antimicrobial resistance in isolates from inpatients and outpatients in the United States: increasing importance of the intensive care unit. *Clin Infect Dis.* 1997; 24(2):211-215.

[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.

[9] Collignon P, Nimmo GR, Gottlieb T, et al. *Staphylococcus aureus* bacteremia, Australia. *Emerg Infect Dis.* 2005; 11(4):554-561.

[10] Cosgrove SE, Sakoulas G, Perencevich EN, et al. Comparison of mortality associated with methicillin-resistant and methicillin-susceptible

Staphylococcus aureus bacteremia: a meta-analysis. *Clin Infect Dis.* 2003; 36 (1):53-59.

[11] Engemann JJ, Carmeli Y, Cosgrove SE, et al. Adverse clinical and economic outcomes attributable to methicillin resistance among patients with *Staphylococcus aureus* surgical site infection. *Clin Infect Dis.* 2003, 36 (5):592-598.

[12] Standing Council on Federal Financial Relations. National Healthcare Agreement 2012. Accessed 7 November 2013 [Online]: <http://www.federalfinancialrelations.gov.au/content/npa/healthcare/national-agreement.pdf>

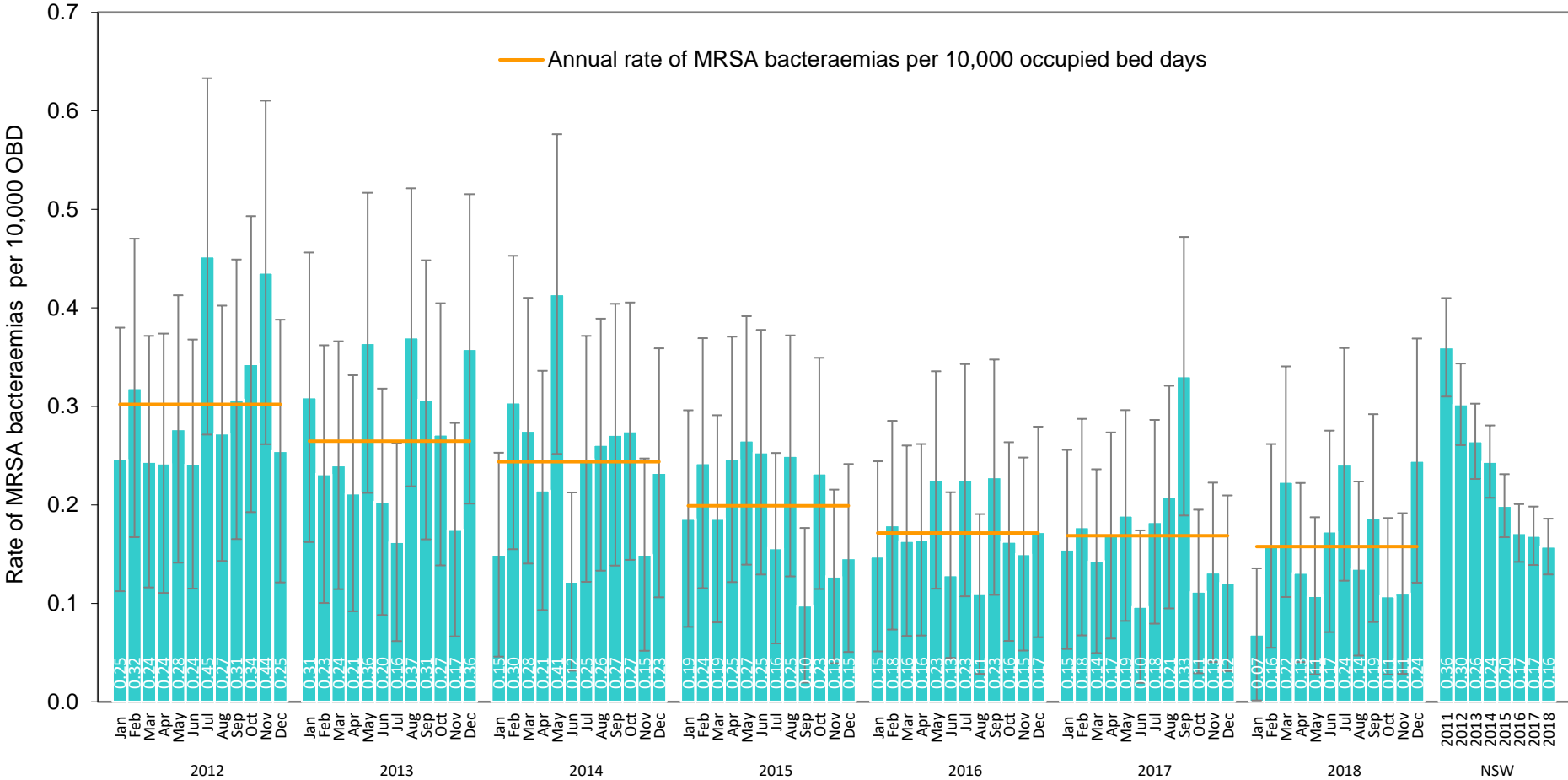
[13] Australian Commission on Safety and Quality in Health Care (2017). National Safety and Quality Health Service Standards, ACSQHC, Sydney. http://nationalstandards.safetyandquality.gov.au/sites/default/files/files/media/National-Safety-and-Quality-Health-Service-Standards-second-edition_1.pdf

[14] Lowy FD. *Staphylococcus aureus* infections. *N Engl J Med.* 1998; 339 (8):520-32.

[15] Grundmann H, Aires-de-Sousa M, Boyce J, et al. Emergence and resurgence of methicillin-resistant *Staphylococcus aureus* as a public-health threat. *Lancet.* 2006; 368 (9538):874-85.

Chart MR01- Methicillin-resistant *Staphylococcus aureus* (MRSA) Bacteraemia

MRSA bacteraemias per 10,000 occupied bed days (public hospitals only), NSW, Jan 2012- Dec 2018



Source: NSW Ministry of Health, Clinical Excellence Commission

Data Definitions

Chart:	MR01
Admin Status:	Current, Dec 2018
Indicator Name:	Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) bacteraemias
Description:	Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) bacteraemias 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 methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) bacteraemias (including inpatient & non-inpatient)
Data Exclusions:	None
Numerator:	Total number of methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) bacteraemias (including inpatient & non-inpatient)
Denominator:	Total number of bed days
Standardisation:	None (crude infection rate per 10,000 occupied bed days calculated)
Data Source:	NSW Health Healthcare Associated Infections Data Collection Jan 2012 to Dec 2018, NSW Ministry of Health, Clinical Excellence Commission
Comments:	MRSA comprises infections recorded in two clinical indicators (Clinical indicator 2.2 Healthcare associated (inpatient) MRSA BSIs per 10,000 occupied bed days and Clinical indicator 2.4 Healthcare associated (non-inpatient) MRSA BSIs per 10,000 occupied bed days).