AURA Surveillance System

D18-41913

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AUSTRALIAN COMMISSION ON SAFETY AND QUALITY IN HEALTH CARE

AURA
Antimicrobial Use and Resistance in Australia

NSQHS STANDARDS

AURA 2017

AUSTRALIAN COMMISSION
ON SAFETY AND QUALITY IN HEALTH CARE

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Antimicrobial Use and Resistance in Australia

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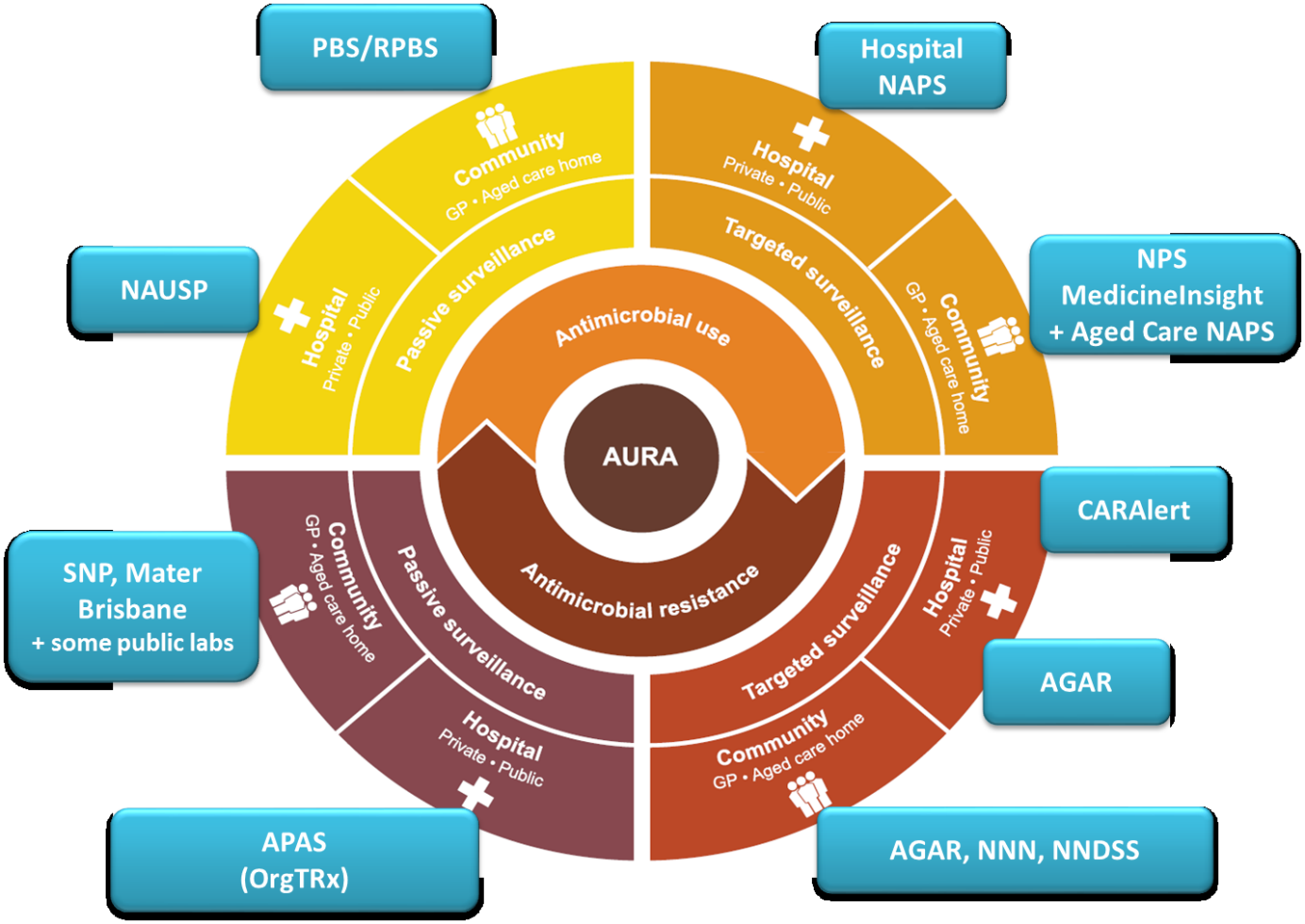

AURA 2019

AURA 2019 will be published early in 2019, data sources will include:

Antimicrobial Use

- 2016 and 2017 Hospital National Antimicrobial Prescribing Study (NAPS)
- 2017 Aged Care NAPS (acNAPS)
- 2016 and 2017 National Antimicrobial Use Surveillance Program (NAUSP)
- PBS/RPBS January 2014 to 31 December 2017 data
- NPS MedicineWise 2015-2017 data

AMR

- APAS data - over 50 million records. 2015-2017 for 10 participating laboratory services and historical data
  (2006 to 2014) from four participating sites
- CARAlert data 2017 and 2018
- 2016 and 2017 AGAR Sepsis Outcome Program reports, NNN and NNDSS (TB)

The utility of a comprehensive approach and integrating AMR and AU data

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NSQHS STANDARDS

MRSA:ACH & Rural Areas

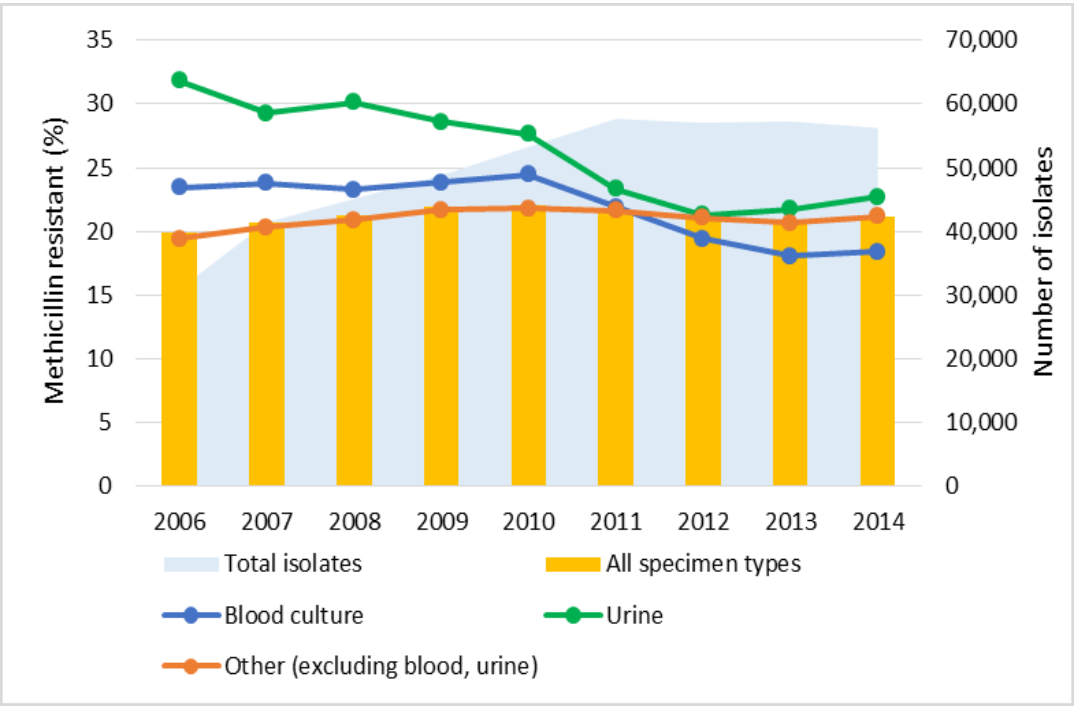
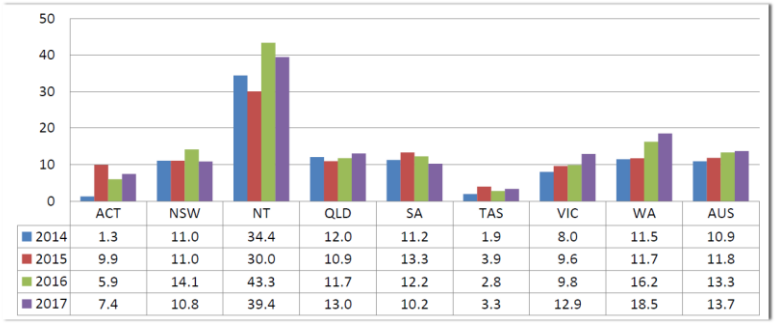


Figure 1: Percentage of methicillin-resistant Staphylococcus aureus by specimen type and total number of S.aureus, from long term APAS contributors, 2006-2014
Source: First APAS report (in press 2018)

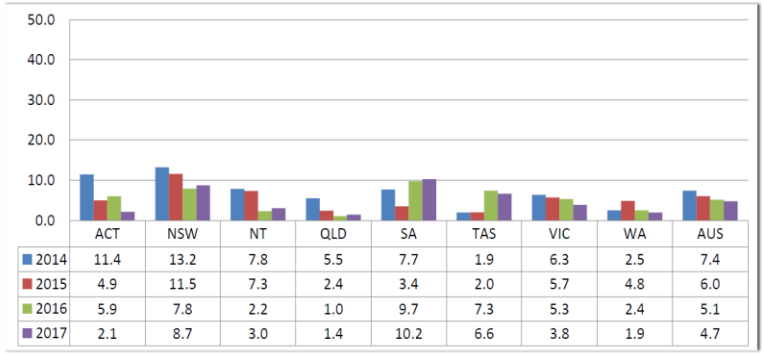
Community-Associated MRSA Clones as a percentage of all *S. aureus*



	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	AUS
2014	1.3	11.0	34.4	12.0	11.2	1.9	8.0	11.5	10.9
2015	9.9	11.0	30.0	10.9	13.3	3.9	9.6	11.7	11.8
2016	5.9	14.1	43.3	11.7	12.2	2.8	9.8	16.2	13.3
2017	7.4	10.8	39.4	13.0	10.2	3.3	12.9	18.5	13.7

Source: First APAS report (in press 2018)

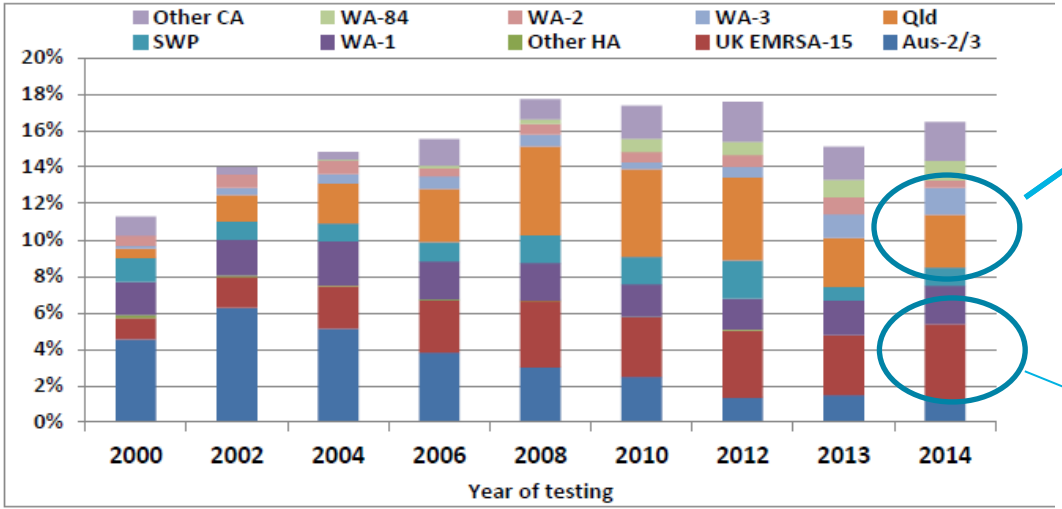
Hospital-Associated MRSA Clones as a percentage of all *S. aureus*



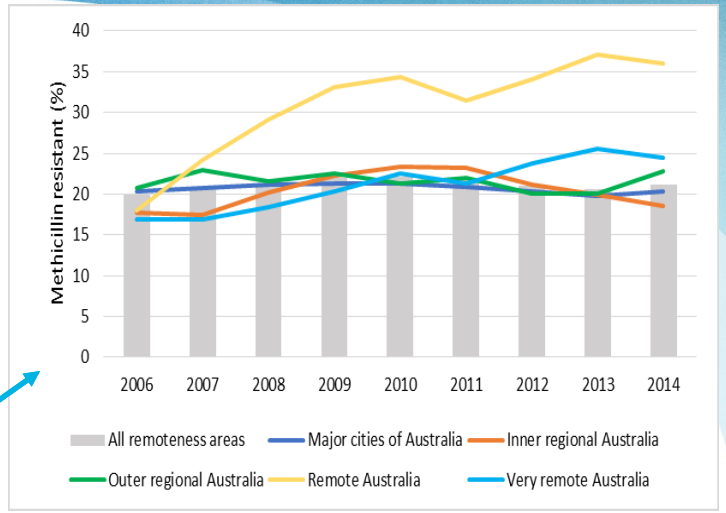
	ACT	NSW	NT	QLD	SA	TAS	VIC	WA	AUS
2014	11.4	13.2	7.8	5.5	7.7	1.9	6.3	2.5	7.4
2015	4.9	11.5	7.3	2.4	3.4	2.0	5.7	4.8	6.0
2016	5.9	7.8	2.2	1.0	9.7	7.3	5.3	2.4	5.1
2017	2.1	8.7	3.0	1.4	10.2	6.6	3.8	1.9	4.7

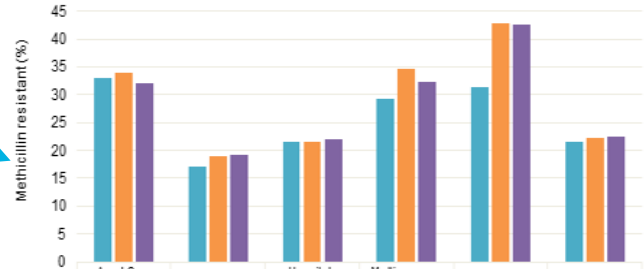
MRSA

Figure 2: Community-onset MRSA, all clones, 2000–2014; percentage of all *S. aureus*



Source: Turnidge, J., Coombs, G., Daley, D., Nimmo, G., Australian Group on Antimicrobial Resistance (AGAR) participants, 2000–14. MRSA: A Tale of Three Types - 15 years of survey data from AGAR. Sydney: ACSQHC; 2016



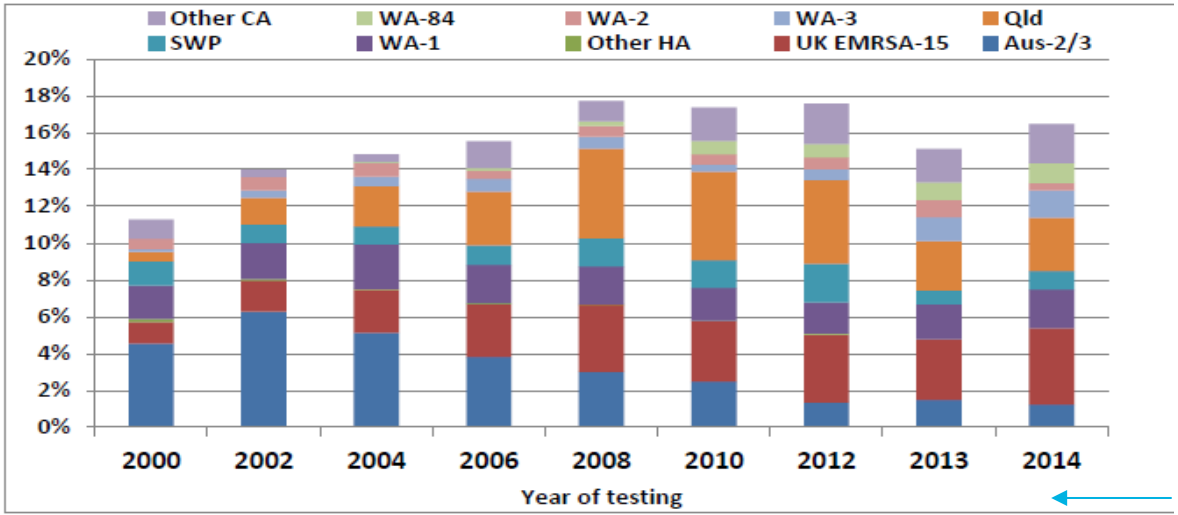


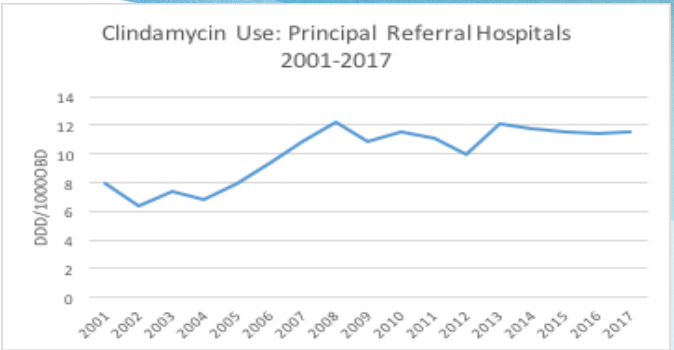
	Aged Care Home	Community	Hospitals (public/private)	Multi-purpose service	Other	All settings
2015 %R	33.1	17.2	21.5	29.3	31.5	21.6
2016 %R	33.9	19.0	21.6	34.6	42.7	22.2
2017 %R	32.1	19.1	22.0	32.2	42.5	22.5
2015 total	765	14,929	73,953	3,291	267	98,478
2016 total	760	15,564	80,579	3,747	365	106,021
2017 total	620	15,576	84,274	3,737	369	109,527

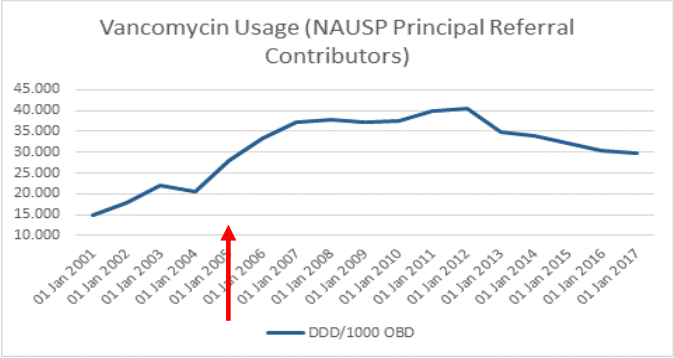
Source: First APAS report (in press 2018)

MRSA

Figure 2: Community-onset MRSA, all clones, 2000–2014; percentage of all *S. aureus*







Source: NAUSP

71.4% of HA-MRSA in 2017 (all APAS labs) (Ciprofloxacin resistant)

Turnidge, J., Coombs, G., Daley, D., Nimmo, G., Australian Group on Antimicrobial Resistance (AGAR) participants, 2000–14. MRSA: A Tale of Three Types
15 years of survey data from AGAR. Sydney: ACSQHC; 2016

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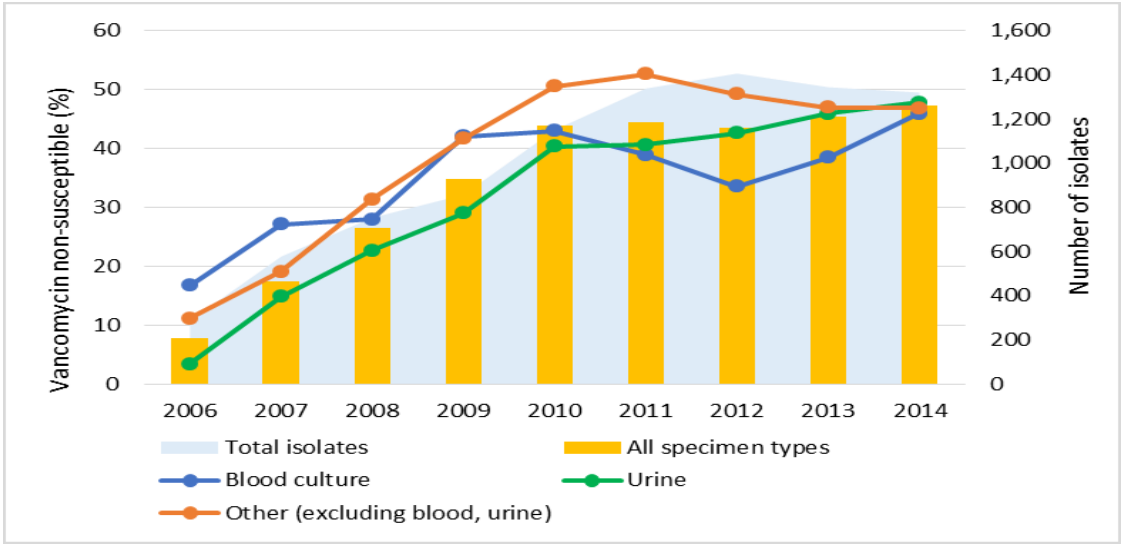
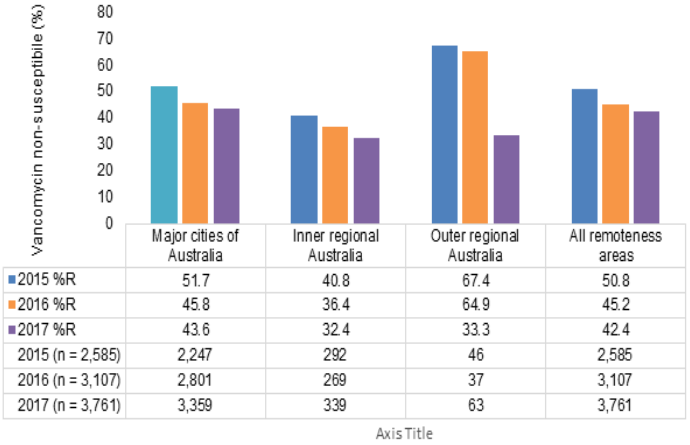
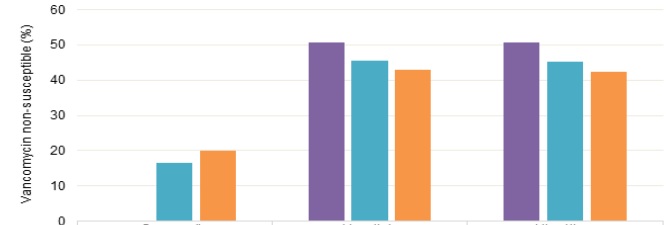
VRE

Figure 17: Percentage of vancomycin non-susceptible Enterococcus faecium by specimen type and total number of E. faecium, long-term APAS contributors, 2006–2014*





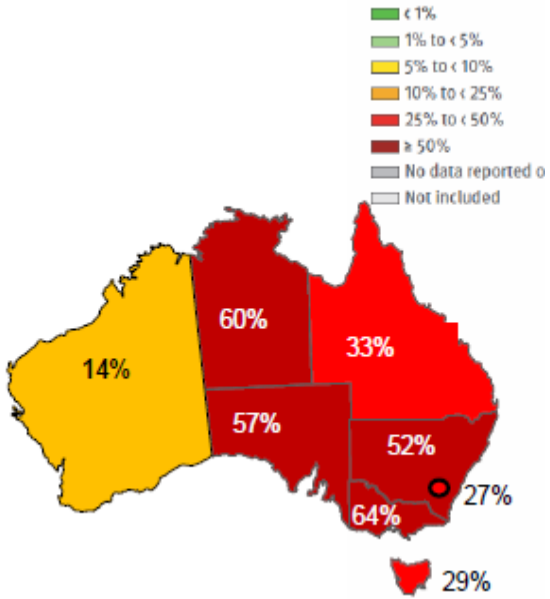
	Major cities of Australia	Inner regional Australia	Outer regional Australia	All remoteness areas
2015 %R	51.7	40.8	67.4	50.8
2016 %R	45.8	36.4	64.9	45.2
2017 %R	43.6	32.4	33.3	42.4
2015 (n = 2,585)	2,247	292	46	2,585
2016 (n = 3,107)	2,801	269	37	3,107
2017 (n = 3,761)	3,359	339	63	3,761



	Community	Hospitals	All settings
2015 %R	0.0	50.8	50.8
2016 %R	16.7	45.5	45.2
2017 %R	20.0	42.9	42.4
2015	0	2,585	2,585
2016	30	3,077	3,107
2017	70	3,691	3,761

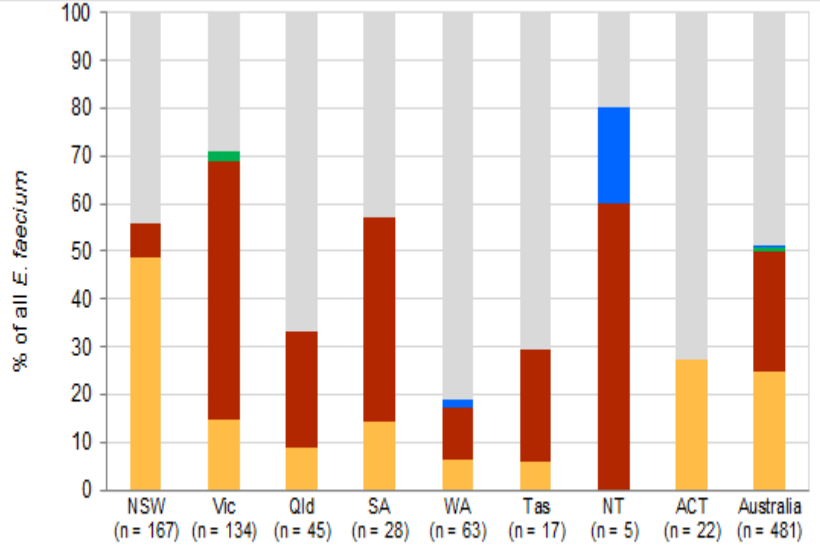
Source: First APAS report (in press 2018)

VRE: Jurisdictional Differences



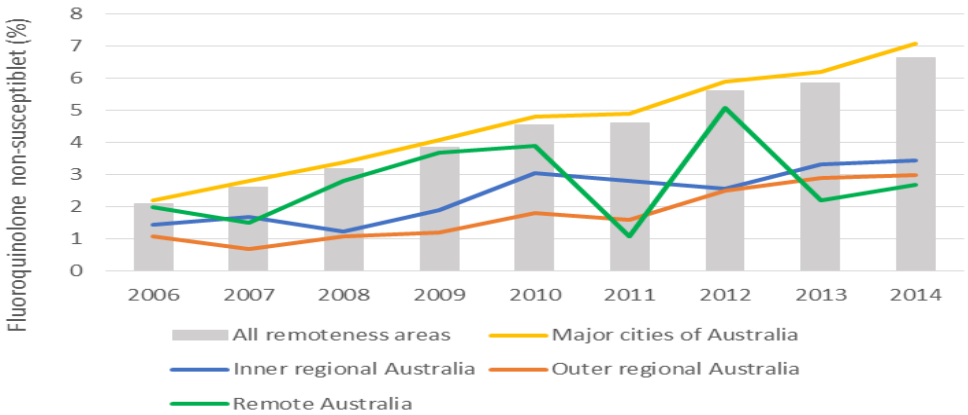
Source: AGAR Sepsis Outcome Programs (2017 report in press 2018, ACSQHC

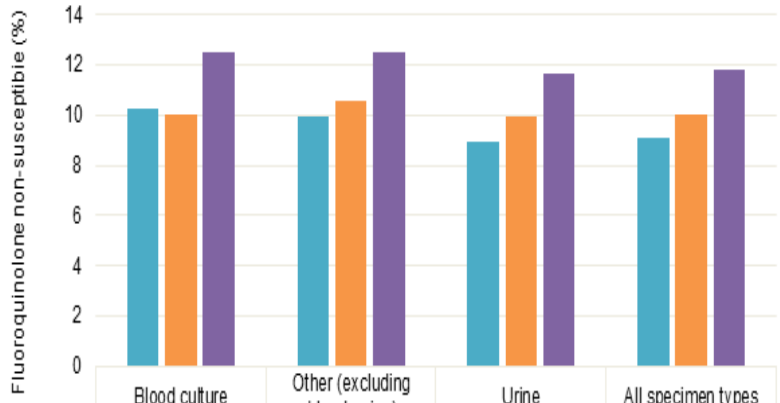
Figure 20: Vancomycin genotype of *Enterococcus faecium* isolates, by state and territory, and nationally, 2017



	NSW (n = 167)	Vic (n = 134)	Qld (n = 45)	SA (n = 28)	WA (n = 63)	Tas (n = 17)	NT (n = 5)	ACT (n = 22)	Australia (n = 481)
not vanA or vanB (n = 235)	44.3	29.1	66.7	42.9	81.0	70.6	20.0	72.7	48.9
Not determined (n = 2)	0.0	0.0	0.0	0.0	1.6	0.0	20.0	0.0	0.4
vanA and vanB (n = 3)	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.6
vanB (n = 121)	7.2	53.7	24.4	42.9	11.1	23.5	60.0	0.0	25.2
vanA (n = 120)	48.5	14.9	8.9	14.3	6.3	5.9	0.0	27.3	24.9

E. Coli and Fluoroquinolones





	Blood culture	Other (excluding blood, urine)	Urine	All specimen types
2015 %R	10.2	9.9	8.9	9.1
2016 %R	10.0	10.6	10.0	10.0
2017 %R	12.5	12.5	11.7	11.8
2015 total	6,329	6,165	73,594	86,088
2016 total	7,428	7,305	83,532	98,265
2017 total	7,569	7,216	77,164	91,949

Source: First APAS report (in press 2018)

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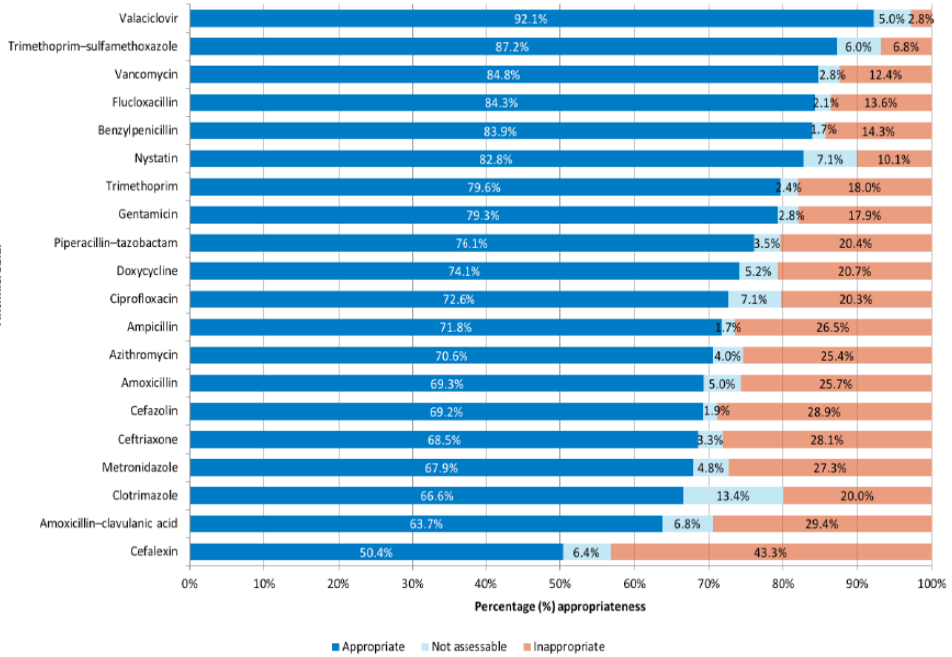
HOSPITAL NAPS National Antimicrobial Prescribing Survey

2017



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NPS MedicineWise

Table 3.5: Number and percentage of patients prescribed systemic antimicrobials by general practitioners for selected conditions, confidence intervals and acceptable range, 2015

Condition	Patient	2015			Acceptable range (%)
		Number	Percentage	95% CI	
Acute URTI	Older than 1 year prescribed antibacterials*	125,291	60	58–62	0–20
Acute bronchitis or bronchiolitis	Aged 18–75 years prescribed antibacterials*	70,882	93	92–94	0–30
Acute tonsillitis	Older than 1 year prescribed antibacterials	28,687	71	69–73	0–20
	And prescribed TG-recommended penicillin V	15,772	39	37–42	80–100
Sinusitis (chronic or acute)	Older than 18 years prescribed antibacterials	48,408	91	90–92	0–20
	And prescribed TG-recommended amoxicillin	14,451	27	26–29	80–100
Acute otitis media/ myringitis	Older than 2 years prescribed antibacterials	32,490	94	93–95	0–20
	And prescribed TG-recommended amoxicillin	17,835	51	50–53	80–100
Pneumonia	Aged 18–65 years prescribed antibacterials	439	90	85–94	90–100
	And prescribed TG-recommended antibiotic (for mild CAP – amoxicillin or doxycycline)	328	67	59–75	80–100
Cystitis or other UTI	Females older than 18 years prescribed antibacterials	67,375	97	97–98	80–100
	And prescribed TG-recommended trimethoprim	22,343	32	31–33	80–100

CAP = community-acquired pneumonia; CI = confidence interval; TG = *Therapeutic Guidelines: Antibiotic*; URTI = upper respiratory tract infection; UTI = urinary tract infection

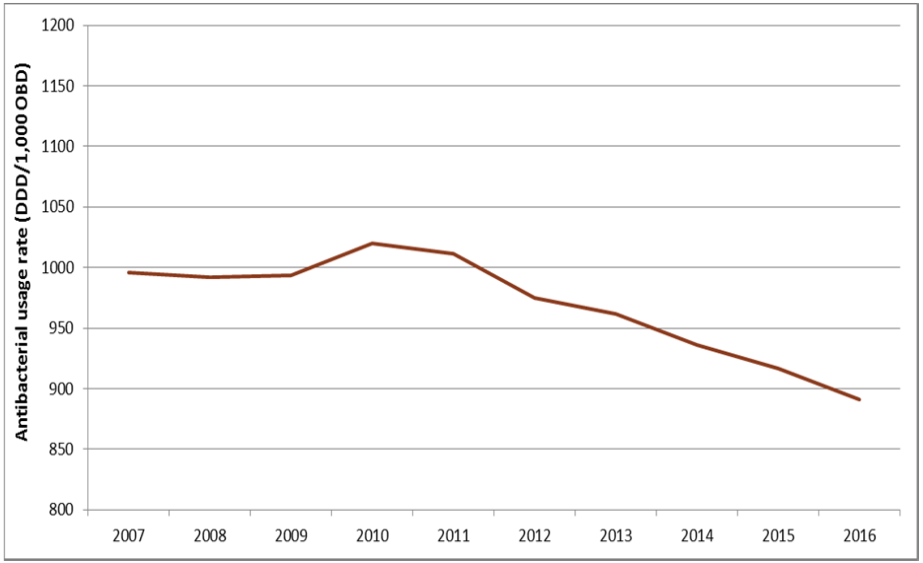
* No antibacterials recommended by *Therapeutic Guidelines: Antibiotic*

Source: NPS MedicineWise[37] (data for 2015 from 423 general practices participating in MedicineInsight)

Source: AURA 2017

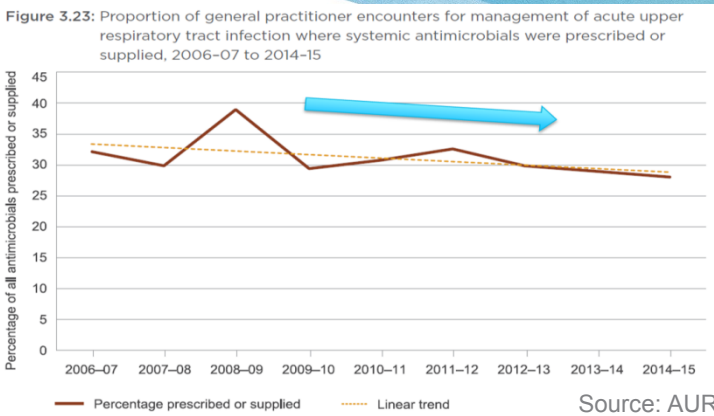
Table 3.5: Number and percentage of patients prescribed systemic antimicrobials by general practitioners for selected conditions, confidence intervals and acceptable range, 2015

Total Antibiotic Usage

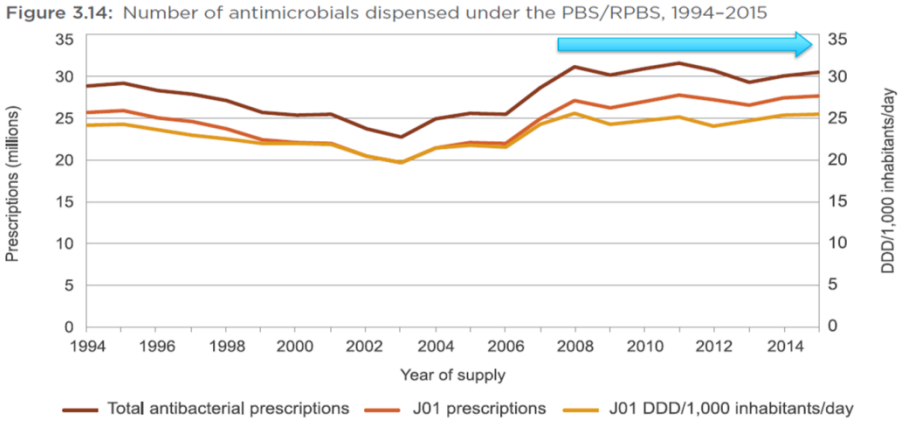


Annual aggregate antibacterial use in NAUSP contributing hospitals (DDD/1,000 OBD), 2007-2016

Source: NAUSP Report 2016



Source: AURA 2017



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CARAlert™
THE NATIONAL ALERT SYSTEM FOR CRITICAL ANTIMICROBIAL RESISTANCE

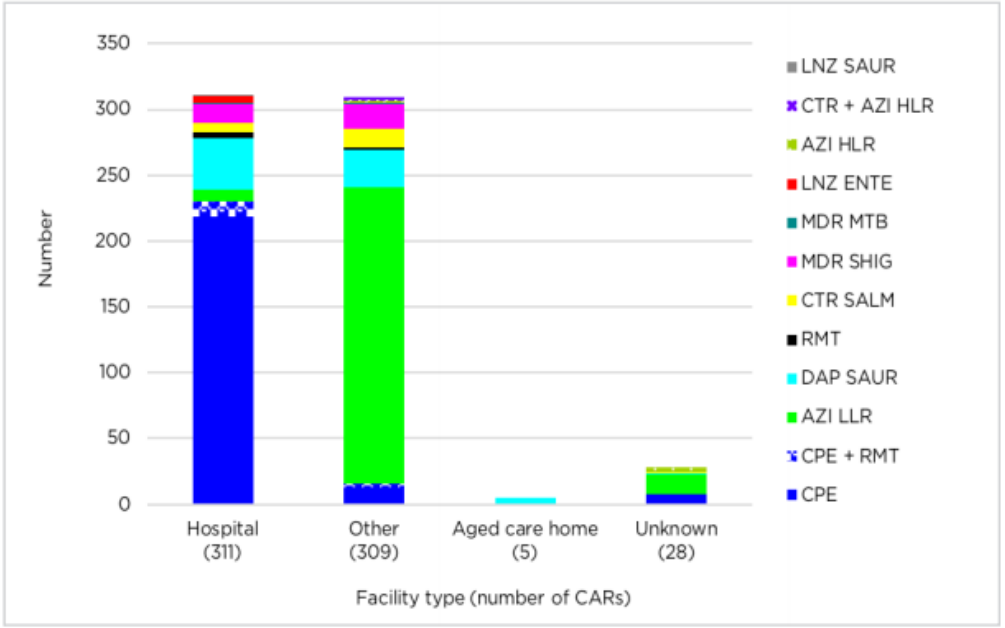
Species	Critical Resistance
Enterobacterales	Carbapenemase-producing, and/or ribosomal methyltransferase-producing
Enterococcus species	Linezolid non-susceptible
Mycobacterium tuberculosis	Multidrug-resistant – resistant to at least rifampicin and isoniazid
Neisseria gonorrhoeae	Ceftriaxone or azithromycin non-susceptible
Salmonella species	Ceftriaxone non-susceptible
Shigella species	Multidrug-resistant
Staphylococcus aureus	Vancomycin, linezolid or daptomycin non-susceptible
Streptococcus pyogenes	Penicillin reduced susceptibility

Following a recent review by the AURA NCU, four new CARs will be added - *Candida auris*, Enterobacterales harbouring mcr genes, *Acinetobacter* spp. harbouring carbapenemases and *Pseudomonas aeruginosa*

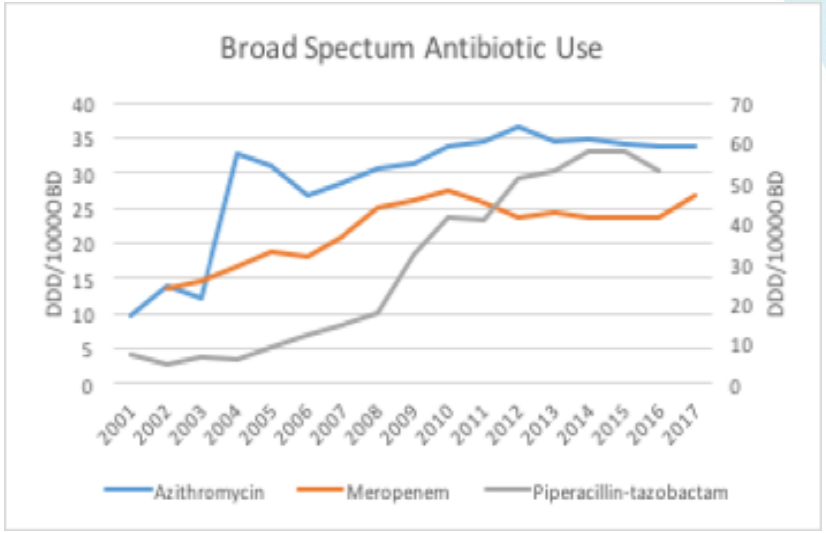
CARAlert™
THE NATIONAL ALERT SYSTEM FOR CRITICAL ANTIMICROBIAL RESISTANCE

Emerging Issues

Figure 5: Critical antimicrobial resistances, number reported by facility type, 1 October 2017 to 31 March 2018



Other: Community (non-hospital and non-aged care home)



Source: NAUSP

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The Future ?
AMR and response - a chronic disease approach to a model of care and an integrated care approach

- Ensure formalised links between the community and acute health care sectors
  - Governance
  - Communication
  - Shared decision-making, multidisciplinary approach
  - Informed consumers

AURA 2017
Identified areas for action – now underway

1. Intensify efforts to reduce unnecessary prescribing in the community
2. Improve the appropriateness of antimicrobial prescribing in surgical prophylaxis
3. Strengthen infection-control practices to minimise spread of VRE
4. Implement actions to control CPE
5. Monitor resistant gonococcal infections to inform treatment guidelines.

Future Enhancements

- **Overall**
  - Increase participation and representativeness
- **Programs**
  - **PBS**: enhanced access to data – recently approved
  - **NAUSP**: paediatric measure
  - **APAS**: Increase participation from target jurisdictions - Victoria, NT, private labs
  - **AGAR**: more “resistome” sequencing
  - **CARAlert**: additional CARs.

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