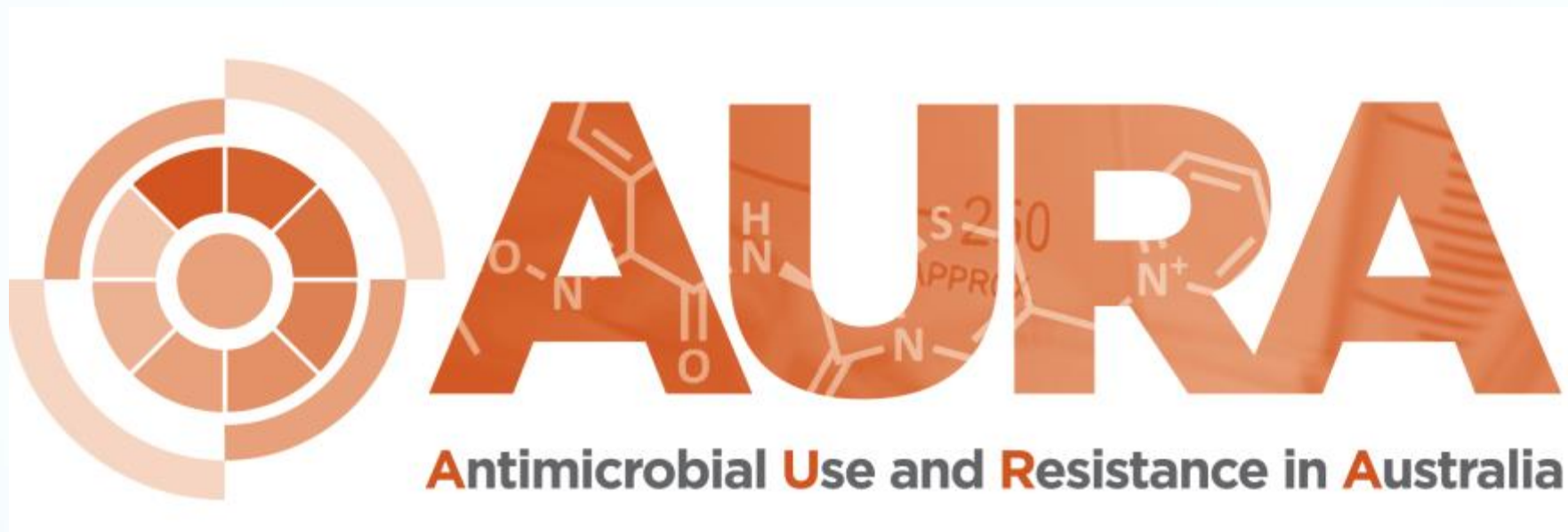
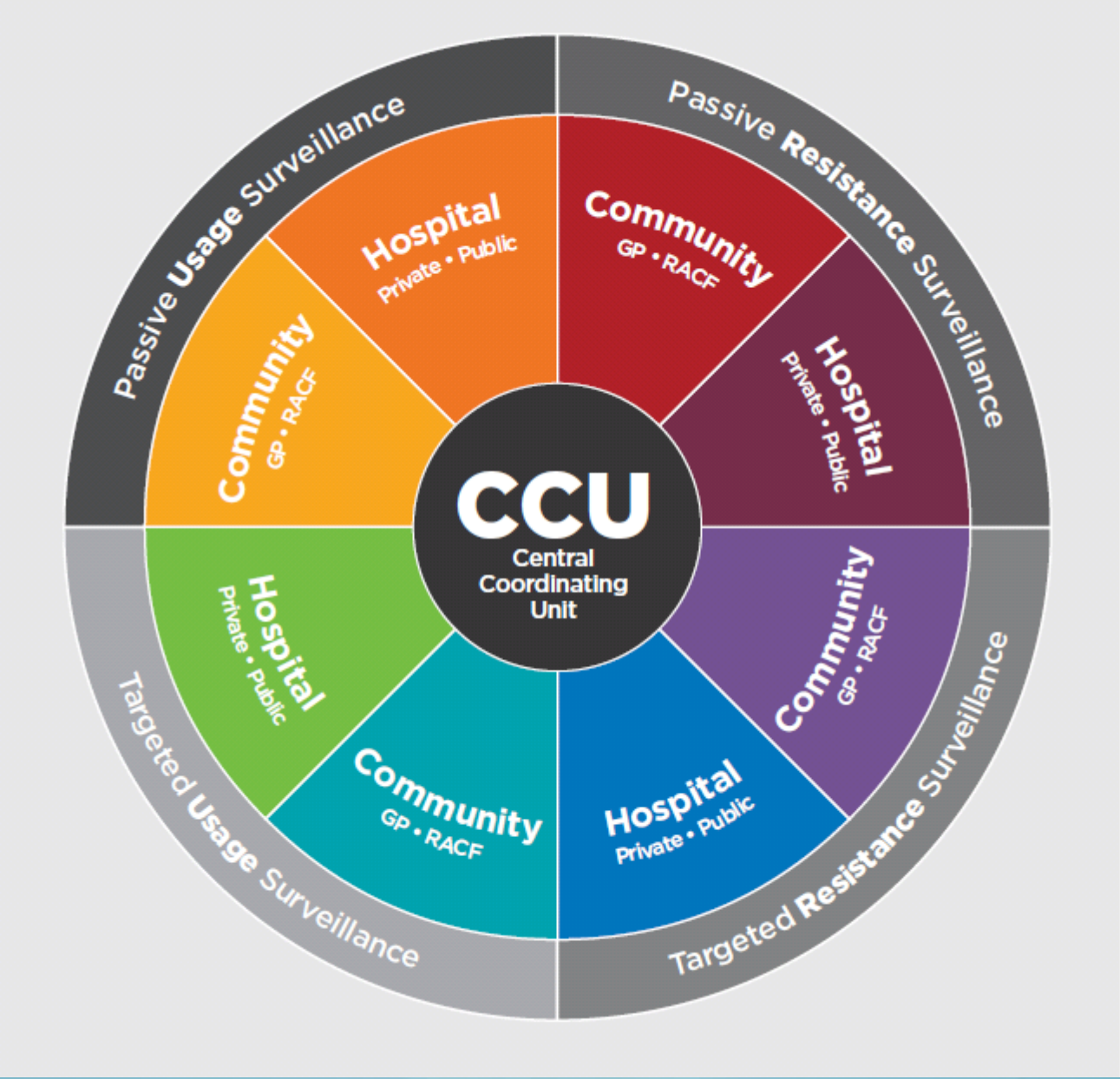


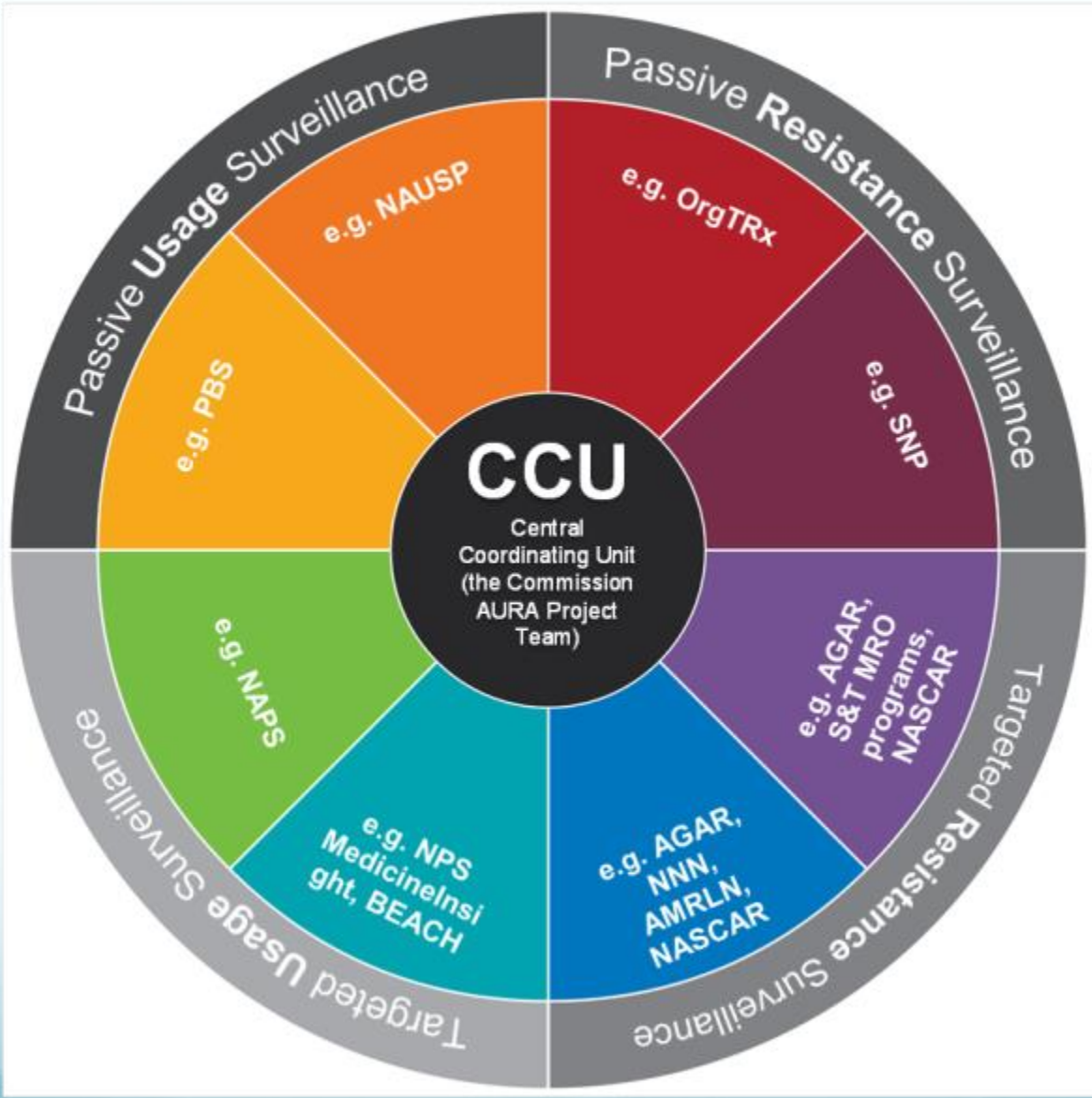
Antimicrobial Use and Resistance in Australia

John Turnidge
Senior Medical Advisor, ACSQHC

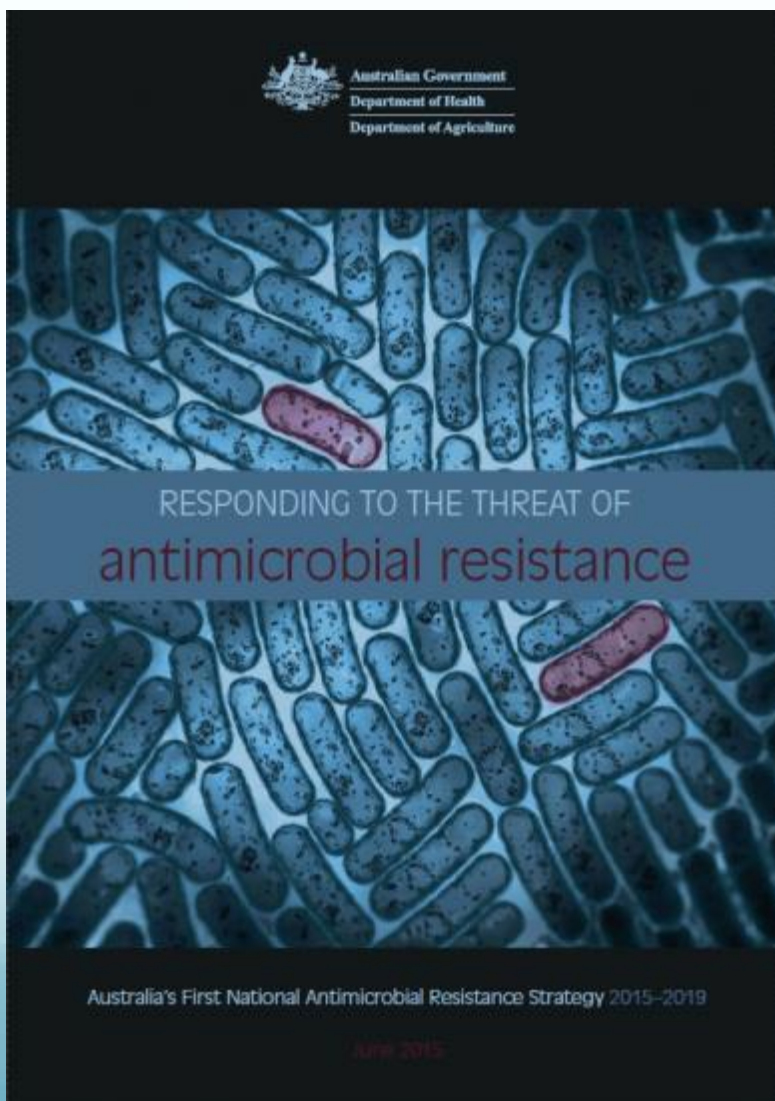


**Funding from July 2013 to June 2016 to establish
antimicrobial resistance surveillance in Australia**





The National Strategy



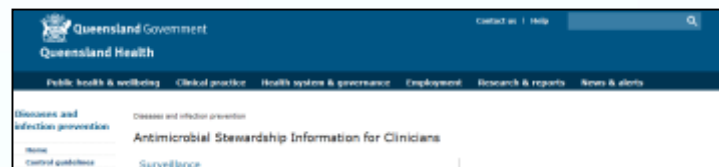
Objectives

1. Increase awareness and understanding of antimicrobial resistance, its implications, and actions to combat it through effective **communication, education and training**.
2. Implement effective **antimicrobial stewardship** practices across human health and animal care settings to ensure the appropriate and judicious prescribing, dispensing and administering of antimicrobials.
3. Develop nationally coordinated One Health **surveillance** of antimicrobial resistance and antimicrobial usage.
4. Improve **infection prevention and control** measures across human health and animal care settings to help prevent infections and the spread of antimicrobial resistance.
5. Agree a national **research** agenda and promote investment in the discovery and development of new products and approaches to prevent, detect and contain antimicrobial resistance.
6. Strengthen **international partnerships and collaboration** on regional and global efforts to respond to antimicrobial resistance.
7. Establish and support clear **governance** arrangements at the local, jurisdictional, national and international levels to ensure leadership, engagement and accountability for actions to combat antimicrobial resistance.

Resistance Surveillance

- **Passive**

- Hospital
 - OrgTRx expansion
- Community
 - OrgTRx expansion



- **Targeted**

- Hospital
 - AGAR expansion and enhancement
- Community
 - AGAR expansion and enhancement
 - NNN: *Neisseria gonorrhoeae* and *meningitidis*
 - AMRLN: *Mycobacterium tuberculosis*
 - *Salmonella*, *Shigella*



Usage Surveillance

- **Passive**

- Hospital
 - NAUSP
- Community
 - PBS

- **Targeted**

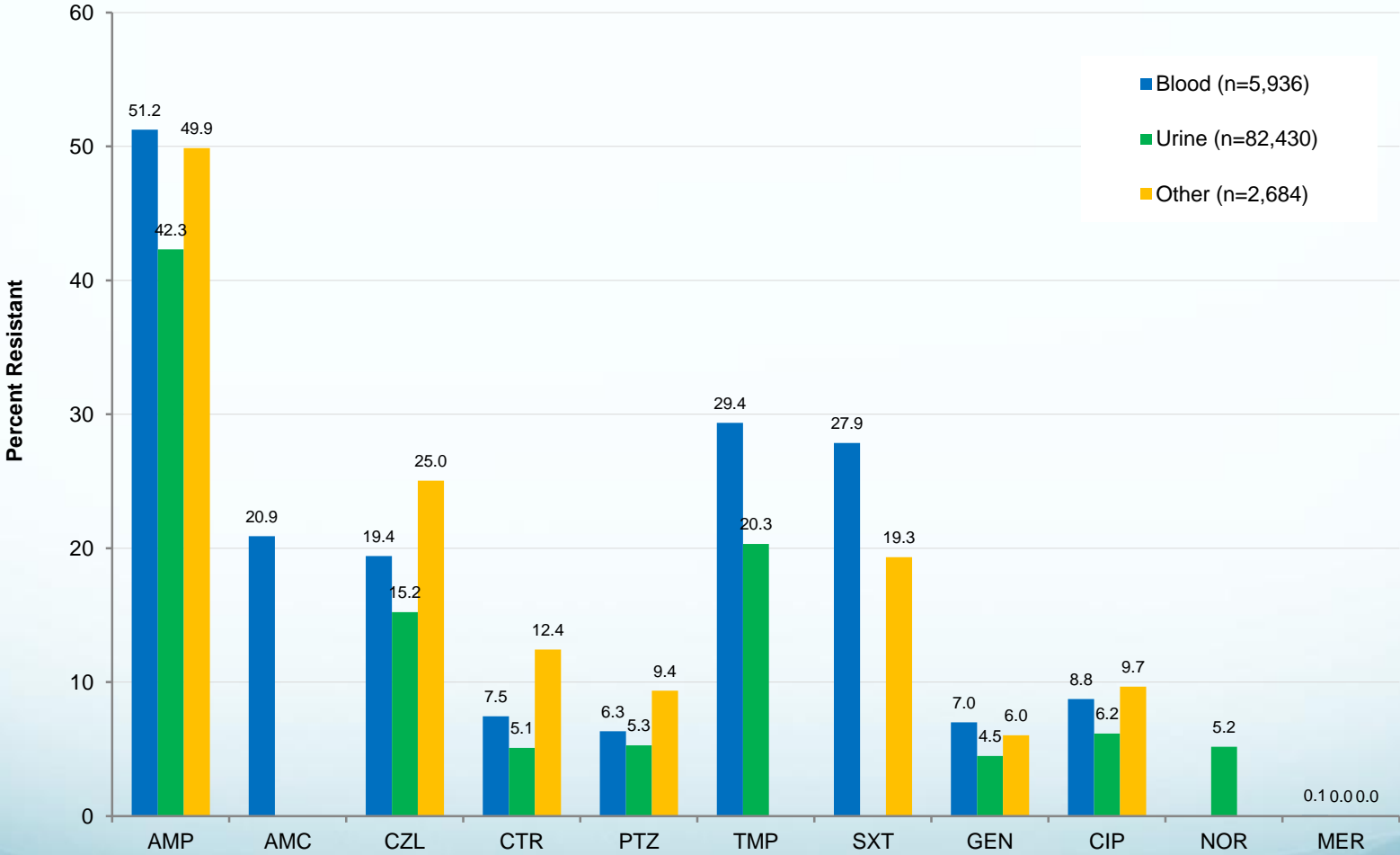
- Hospital
 - NAPS
- Community
 - MedicineInsight



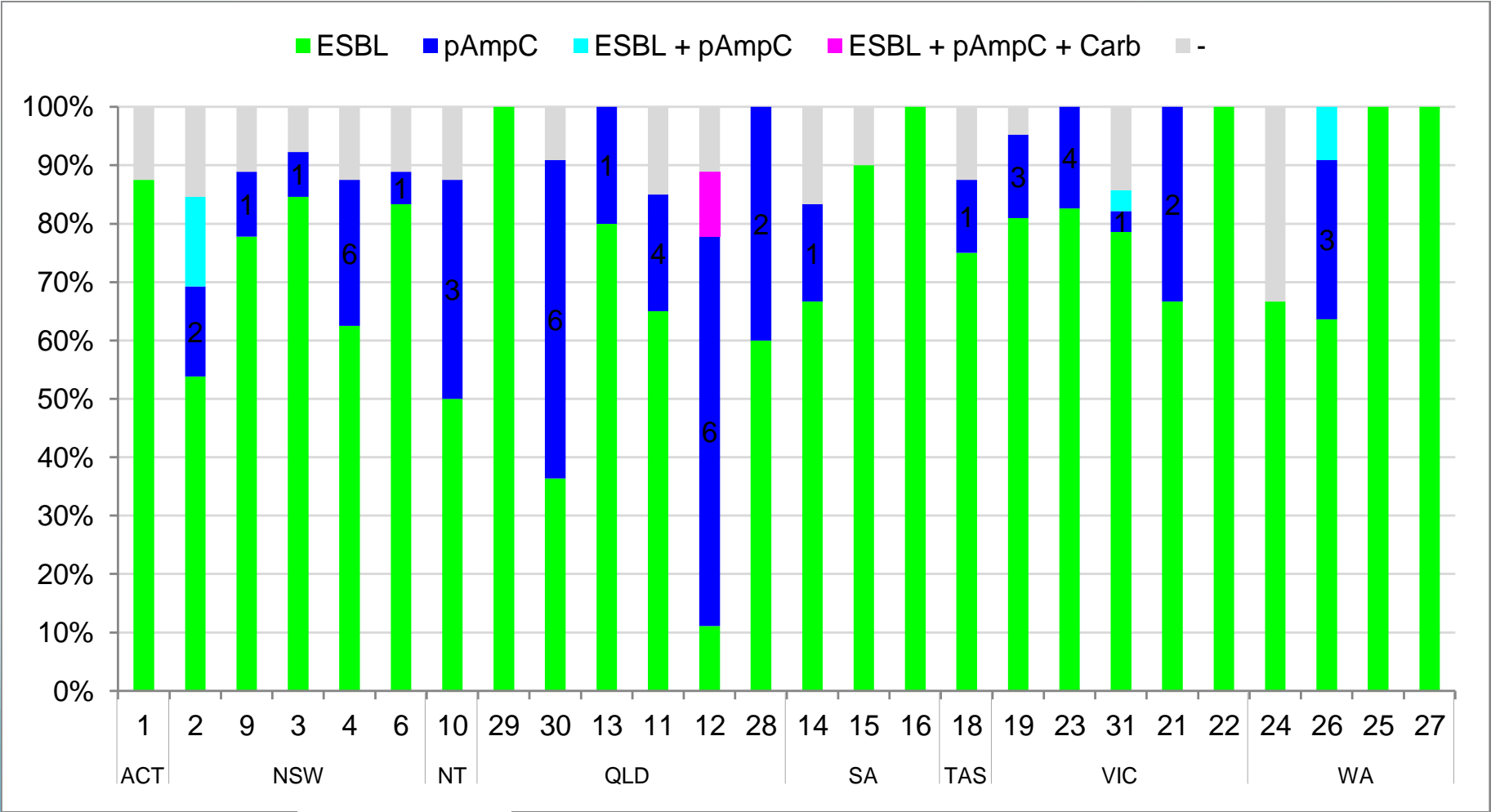
Resistance Rates 2014 and trends

Data sources: OrgTRx, Sullivan Nicolaides
Pathology, AGAR, AGSP, AMSP, AMRLN

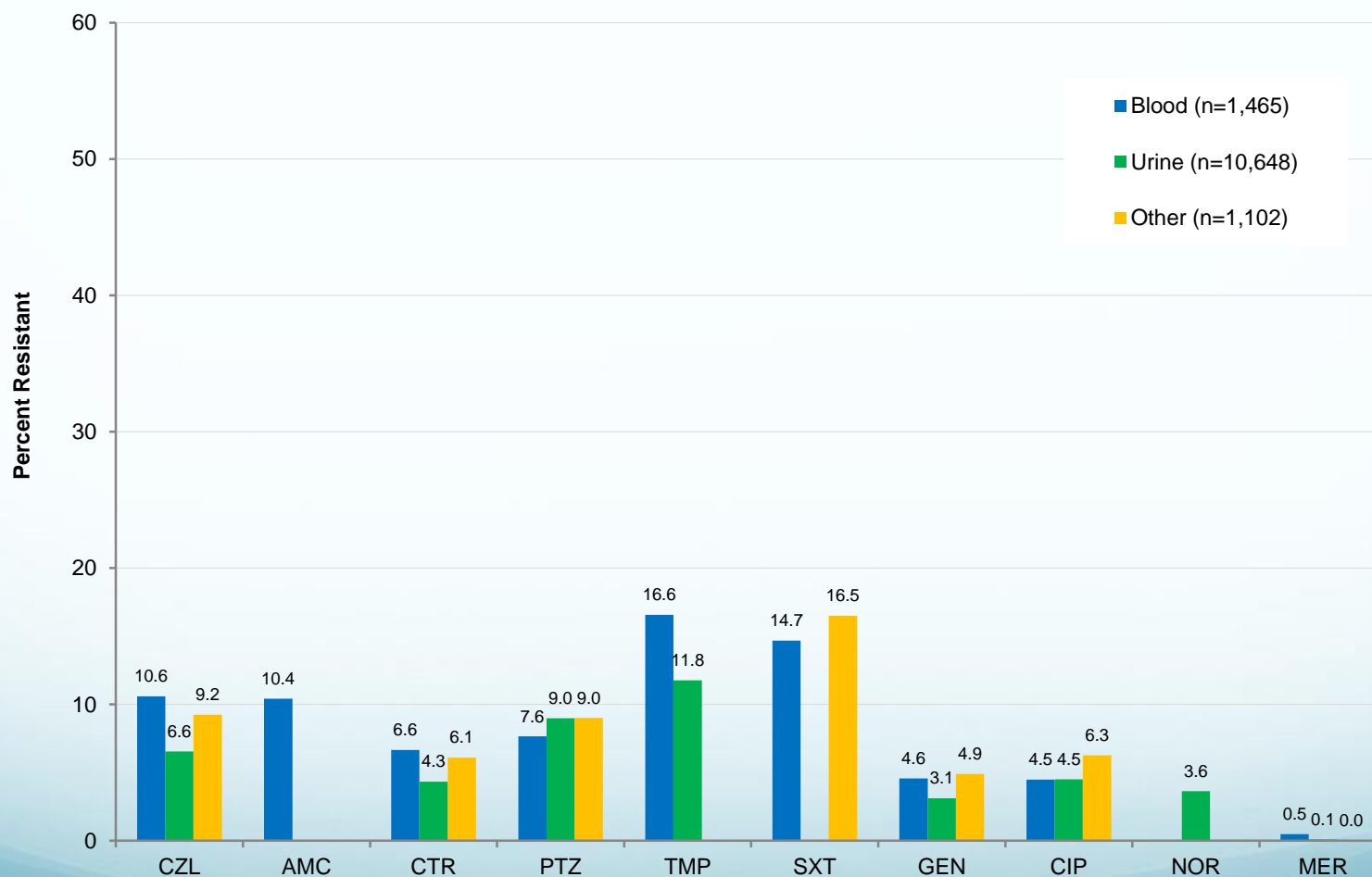
E. coli



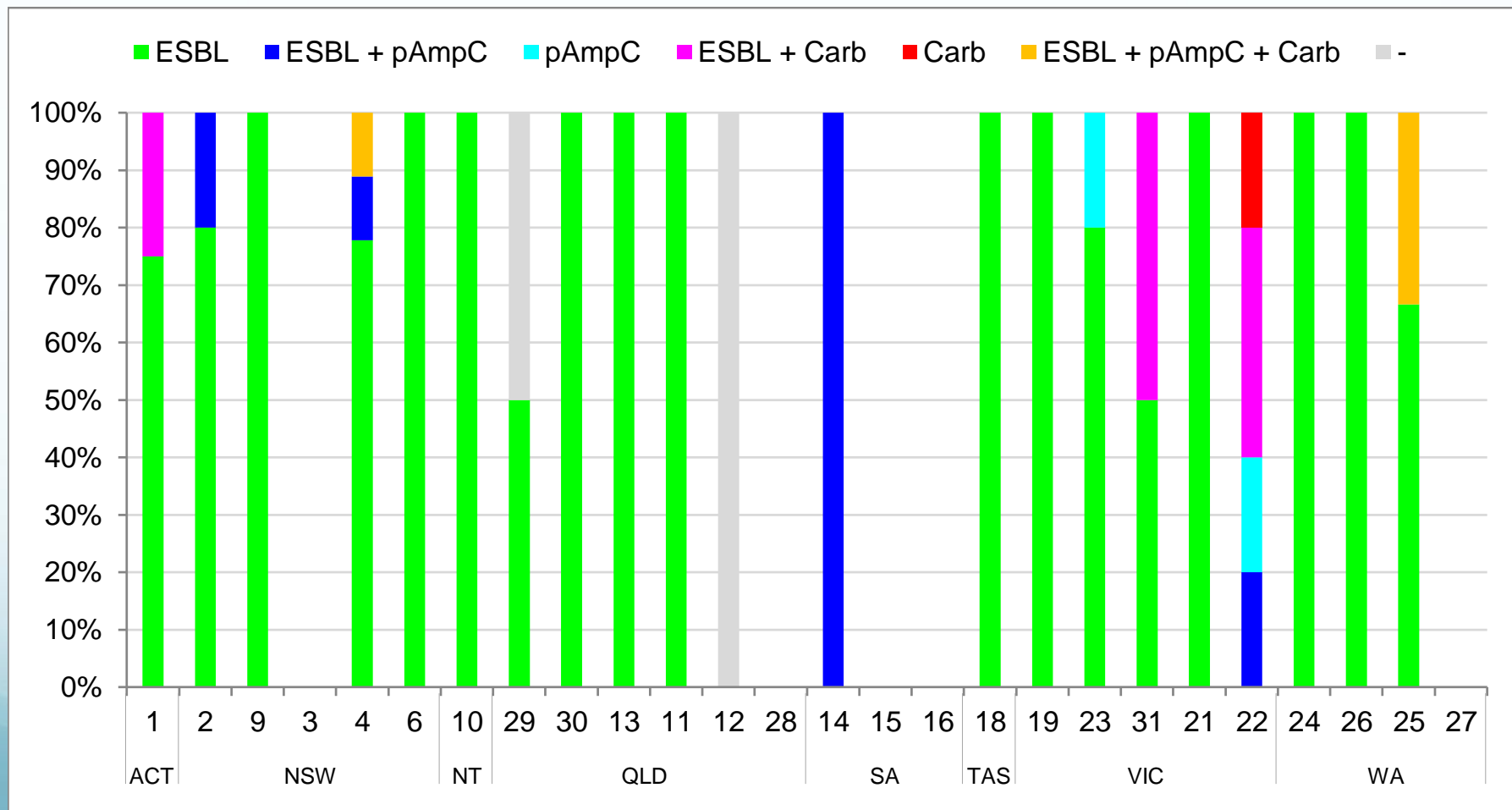
E. coli – ESBLs



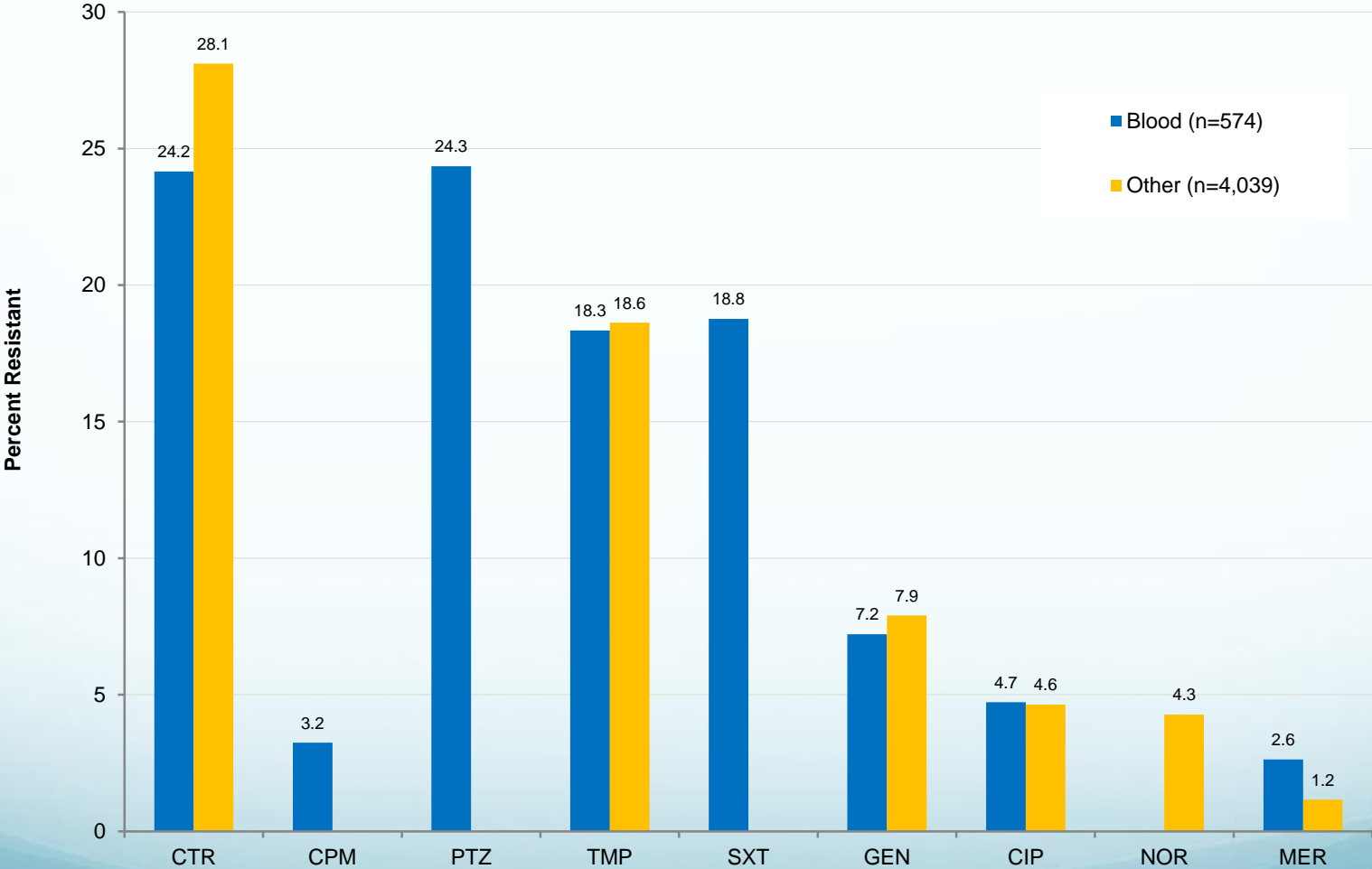
K. pneumoniae



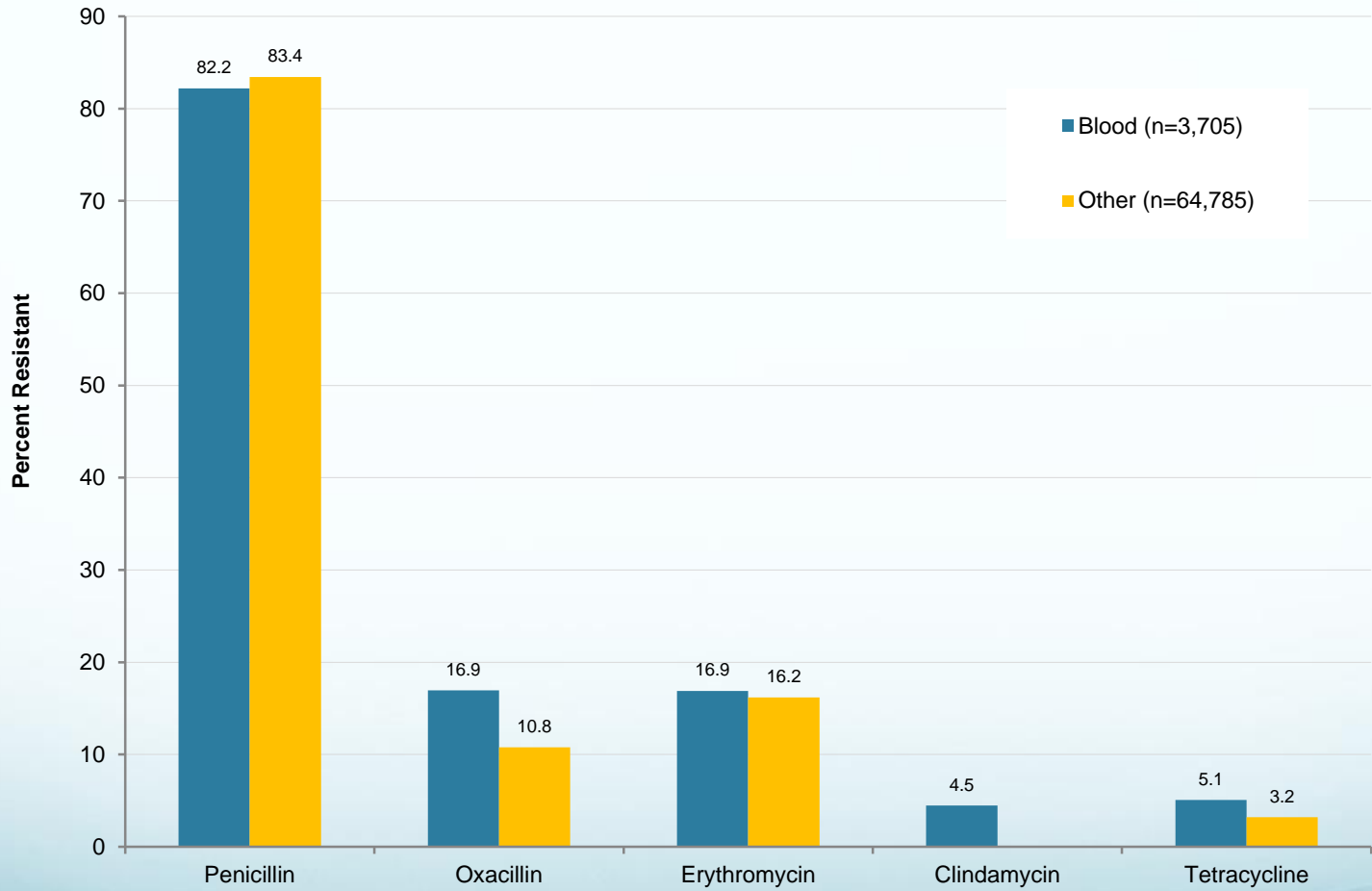
K. pneumoniae – ESBLs



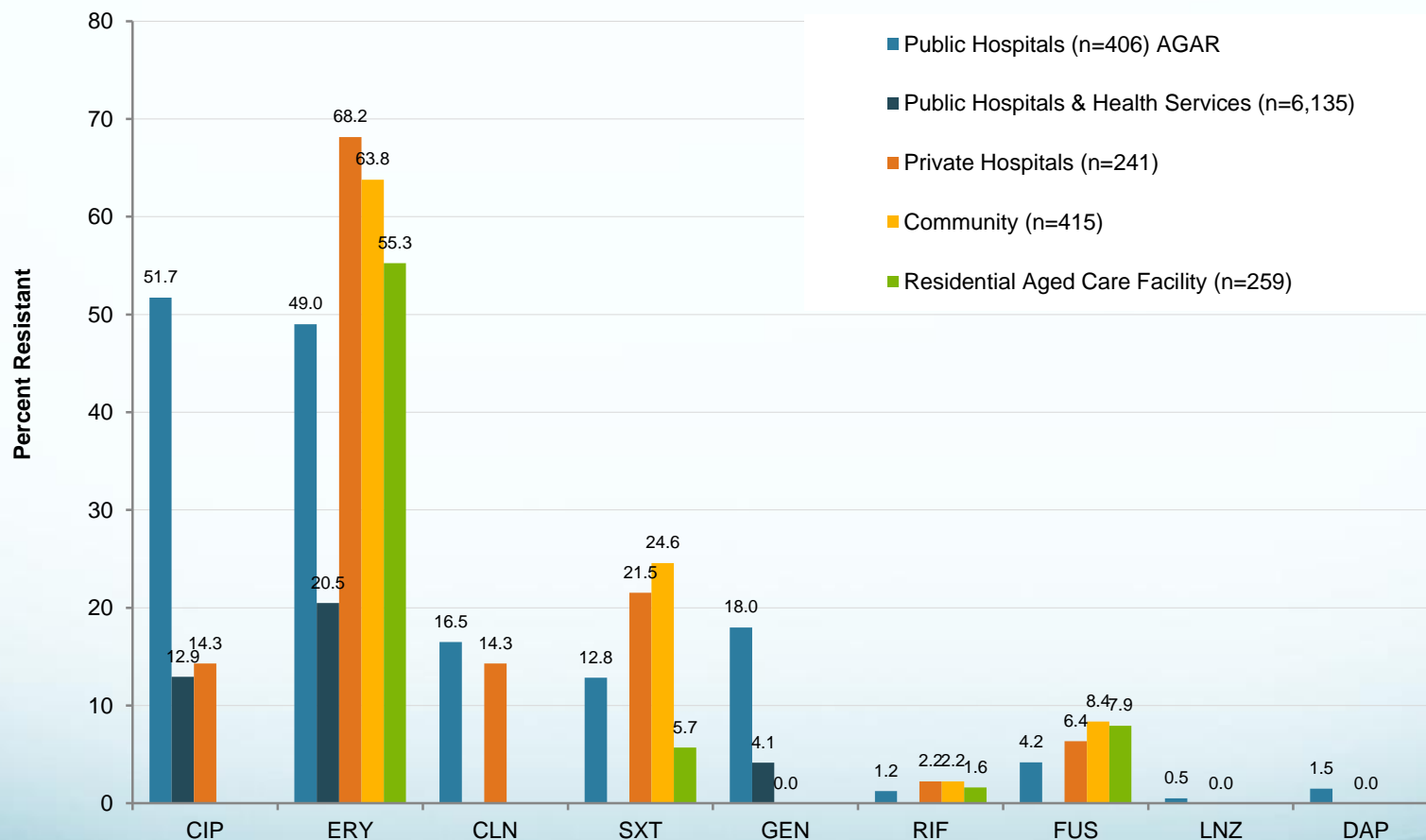
E. cloacae



S. aureus



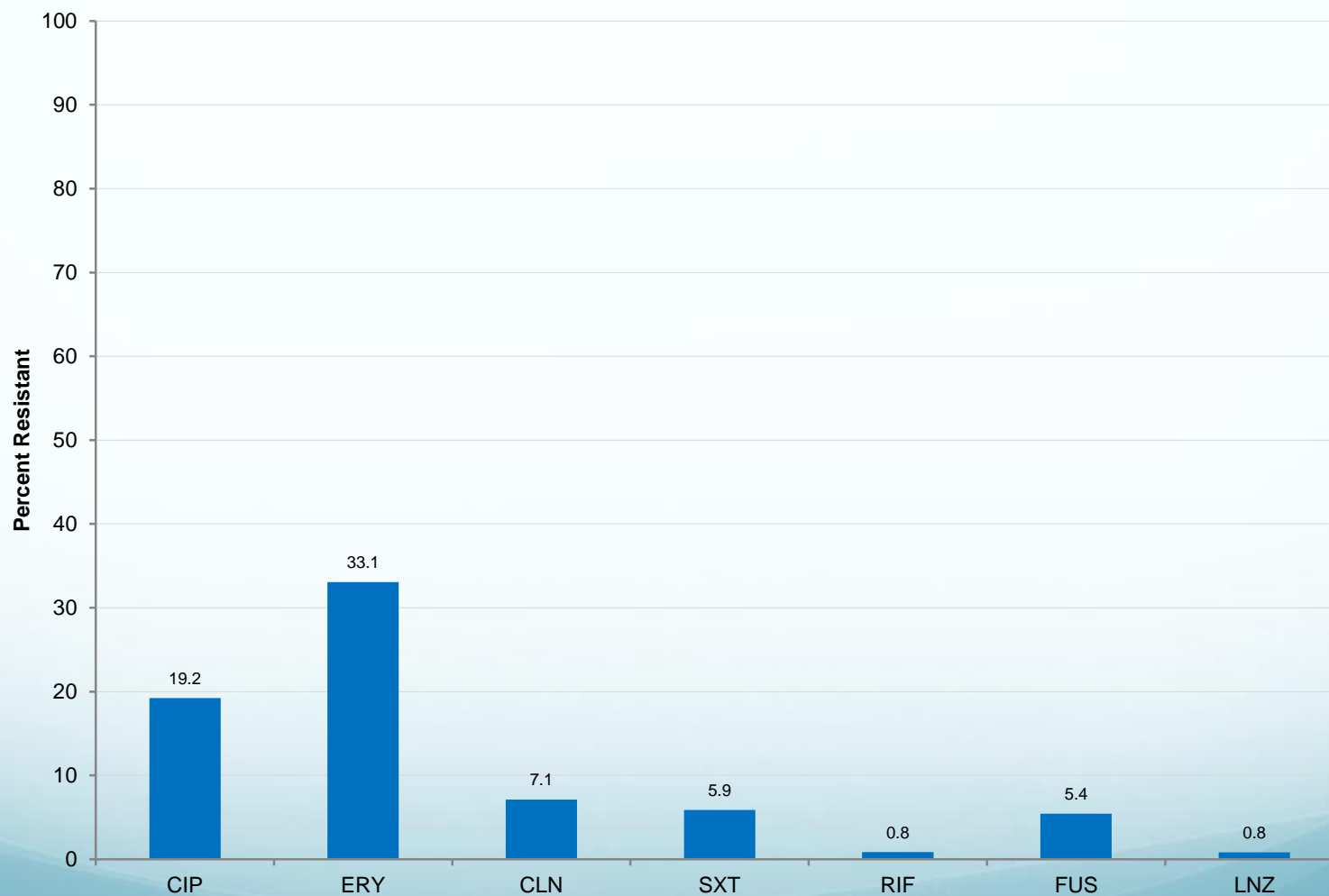
S. aureus - MRSA



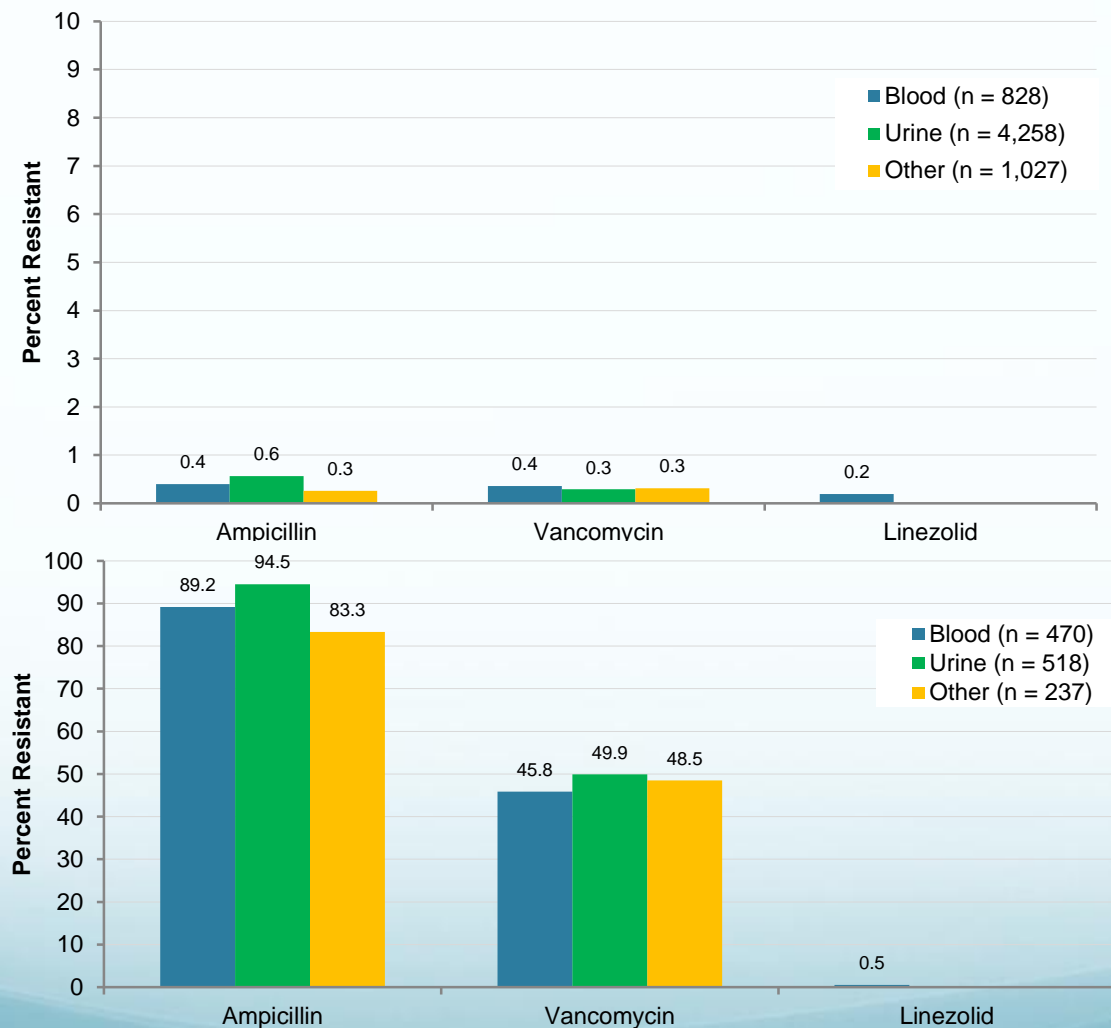
S. aureus – HA-MRSA



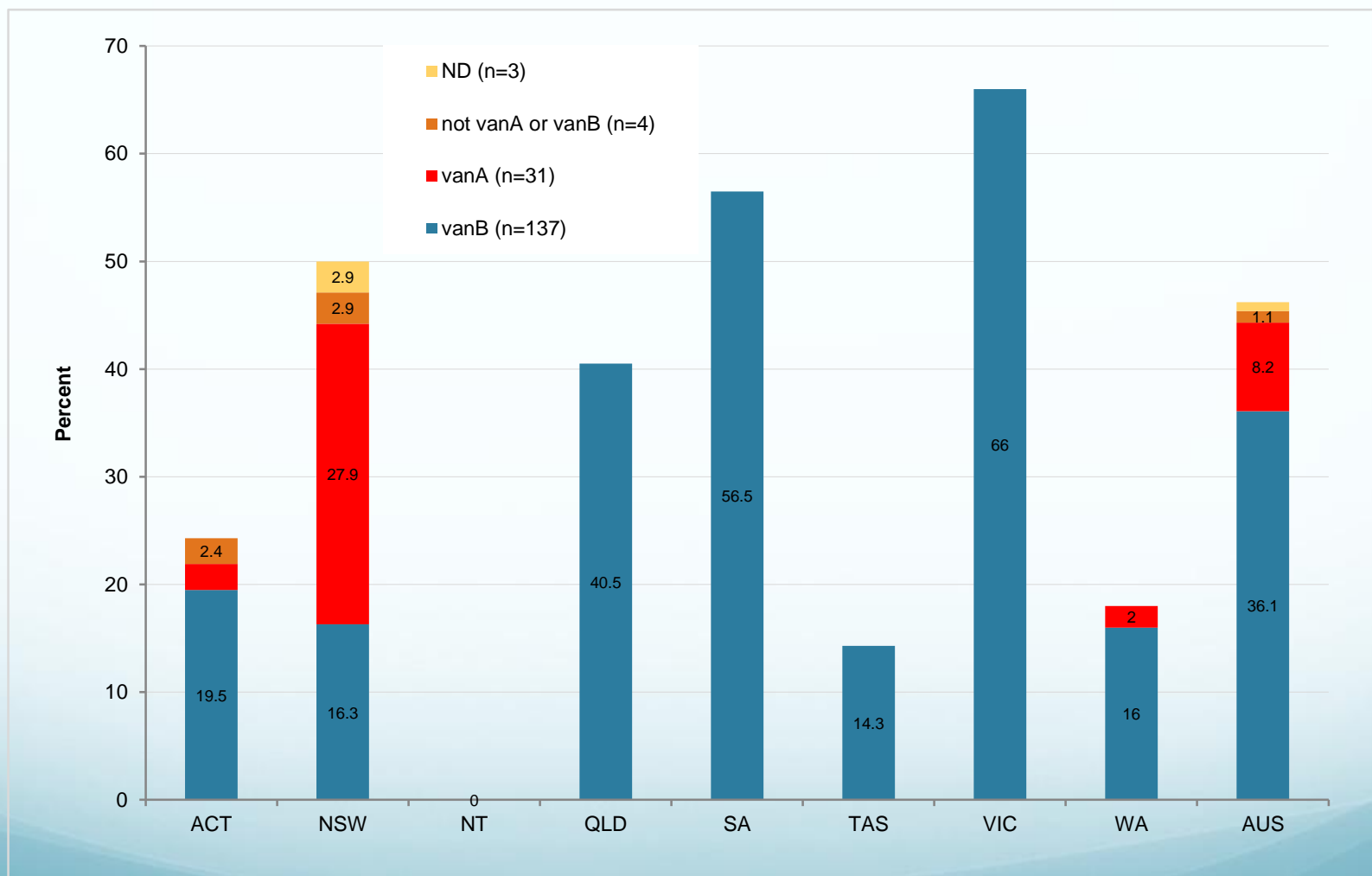
S. aureus – CA-MRSA



E. faecalis and *E. faecium*



E. faecium

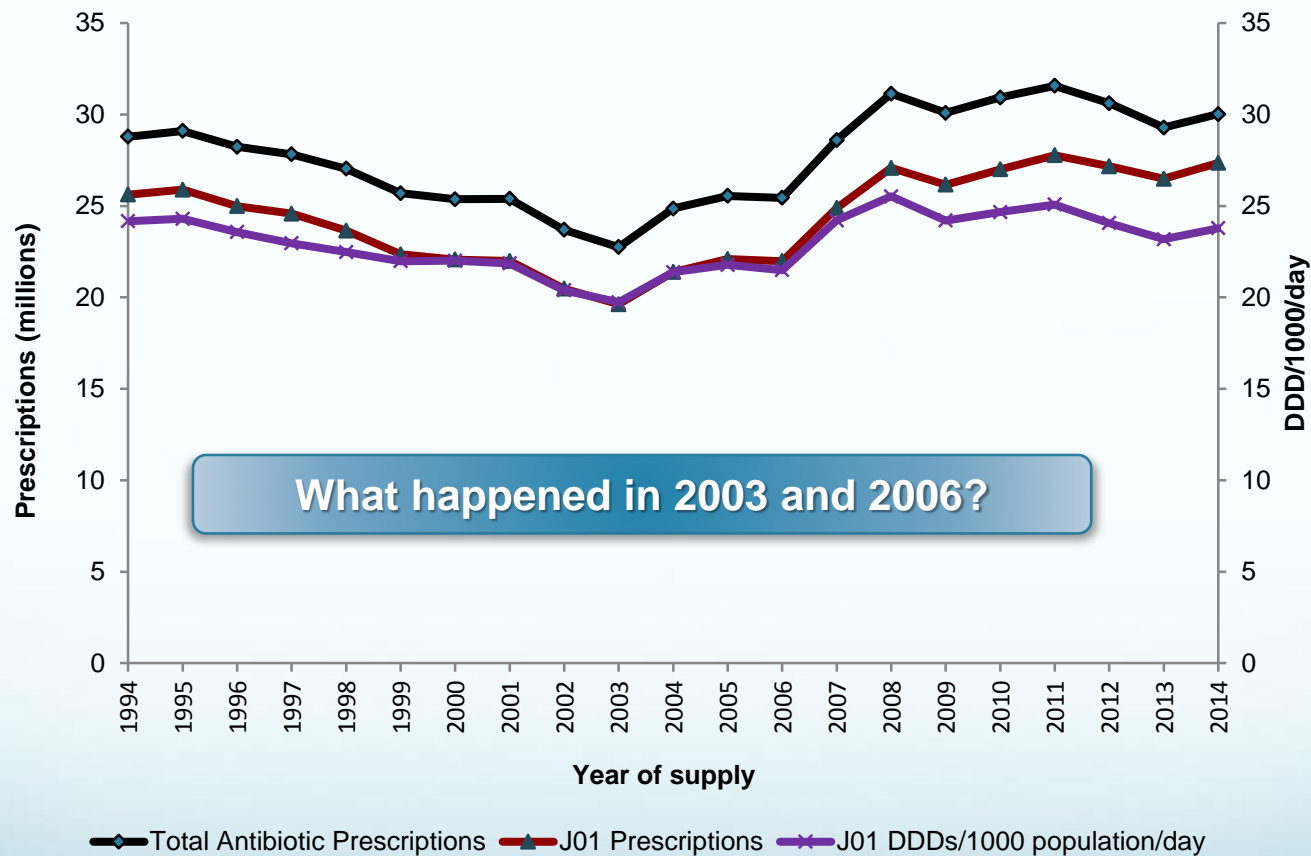


Pharmaceutical Benefits Scheme

Data from 2014

- 27.4 million scripts dispensed for systemic antimicrobials (J01)
 - 22.8 DDD/1000/day
- 2.7 million scripts dispensed for topical antimicrobials
- 10.7 million unique patients (46% of population)
 - ***Captured***
 - Public hospital outpatients (except NSW)
 - Repeats
 - ***Not captured***
 - Private scripts ?5%
 - Aboriginal medical services and similar

Pharmaceutical Benefits Scheme



[illegible]

NPS MedicineWise **MEDICINEINSIGHT** Program

MEDICINEINSIGHT

Excerpts from Post Market Surveillance
Report 3

ANTIBIOTICS

February 2015

As at the end of December 2014:

- ▶ 351 general practices from seven States and Territories had registered to participate in MedicineInsight
- ▶ They are located in 7 states: Victoria (100), NSW (91), South Australia (29), Tasmania (30), Queensland (87), Western Australia (11) and ACT (3).
- ▶ These practices reported 1005 currently active GPs.
- ▶ MedicineInsight software has been installed and is operational in 272 of these practices.

NPS MedicineWise

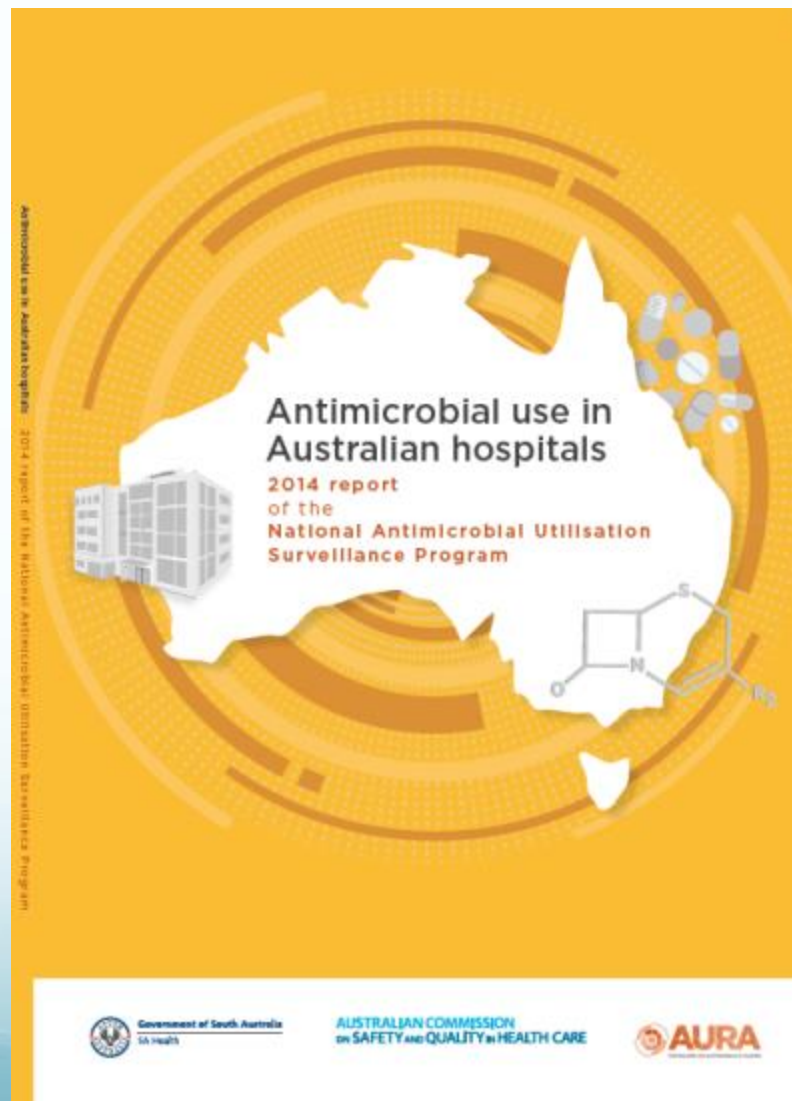
MEDICINEINSIGHT Program

TABLE 5 PATIENTS PRESCRIBED SYSTEMIC ANTIBIOTICS FOR SELECT CONDITIONS

Condition	Patients	N	% (95% CI)	Accept- able range ⁵ %
Acute URTI	Older than 1 year prescribed antibiotics*	45743	47 (44–56)	0-20
Acute bronchitis/ bronchiolitis	Aged 18-75 years prescribed antibiotics*	23619	90 (89–91)	0-30
Acute tonsillitis	Older than 1 year prescribed antibiotics	13135	91 (90–92)	0-20
	- and prescribed TG recommended antibiotic (penicillin V)	6243	48 (42–54)	80-100
Sinusitis (chronic or acute)	Older than 18 years prescribed antibiotics	17300	86 (84–87)	0-20
	- and prescribed the TG recommended antibiotic (amoxycillin)	5607	32 (29–36)	80-100
Acute otitis media/myringitis	Older than 2 years prescribed antibiotics	11387	91 (90–92)	0-20
	- and prescribed the TG recommended antibiotics (amoxycillin)	7154	63 (59–67)	80-100
Pneumonia	Aged 18-65 years prescribed antibiotics	607	68 (64–71)	90-100
	- and prescribed the TG recommended antibiotics (mild CAP — amoxycillin OR doxycycline)	146	24 (19–29)	80-100
Cystitis or other UTI	Females older than 18 years prescribed antibiotics	18898	94 (93–95)	80-100
	- and prescribed the TG recommended antibiotic (trimethoprim)	8858	47 (44–49)	80-100

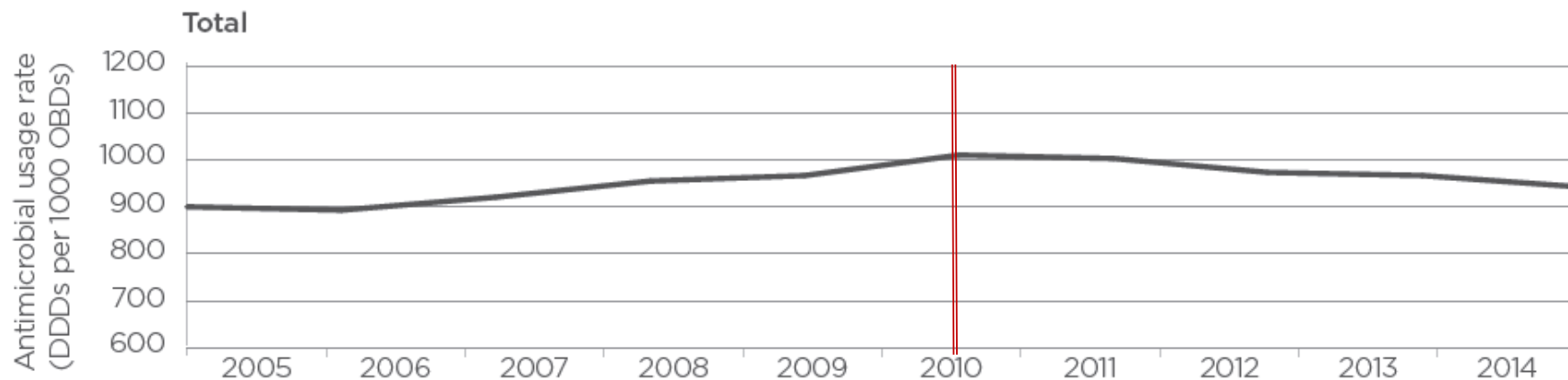
* No antibiotic recommended by TG

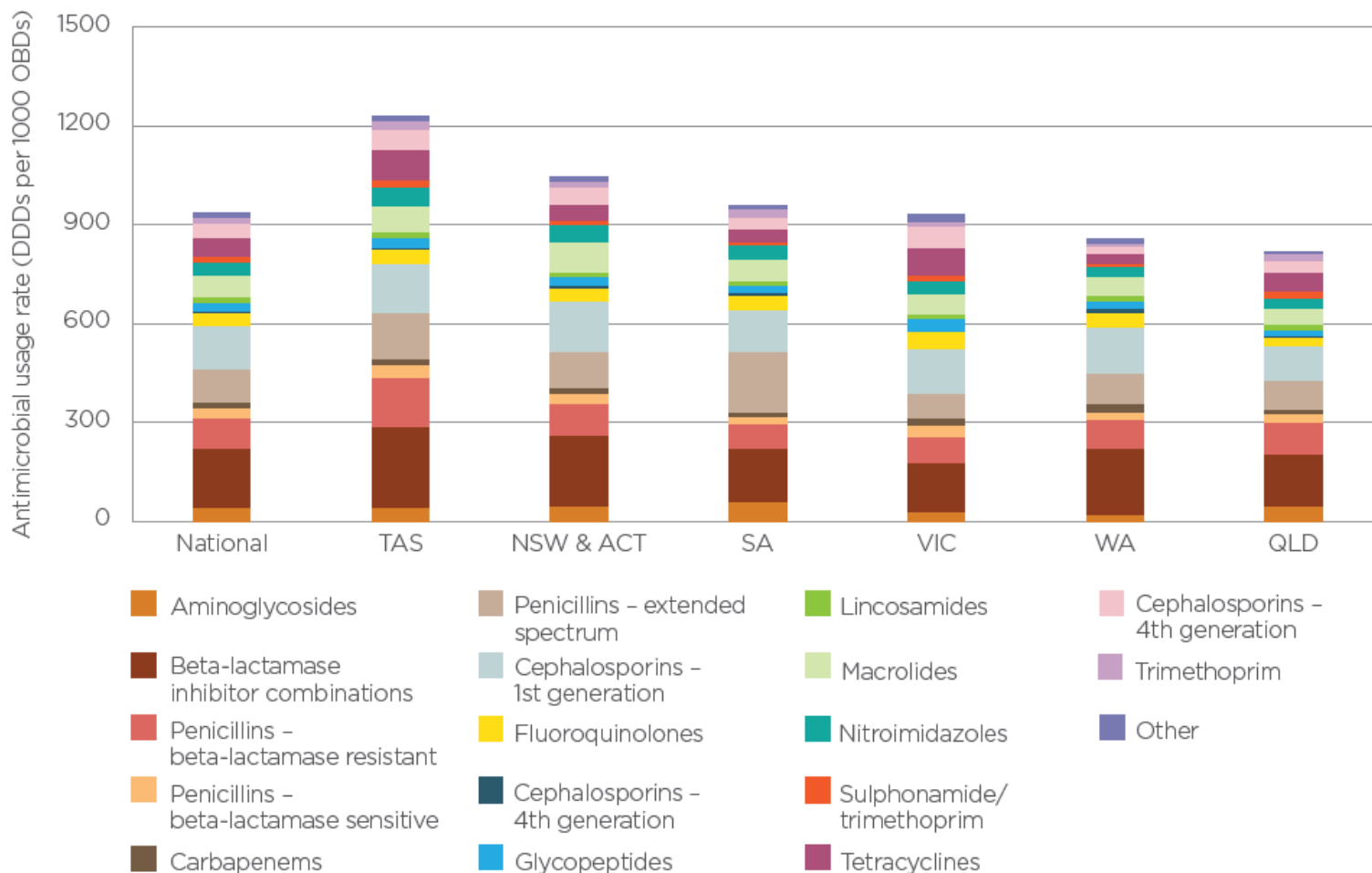
National Antimicrobial Utilisation Surveillance Program



National Antimicrobial Utilisation Surveillance Program

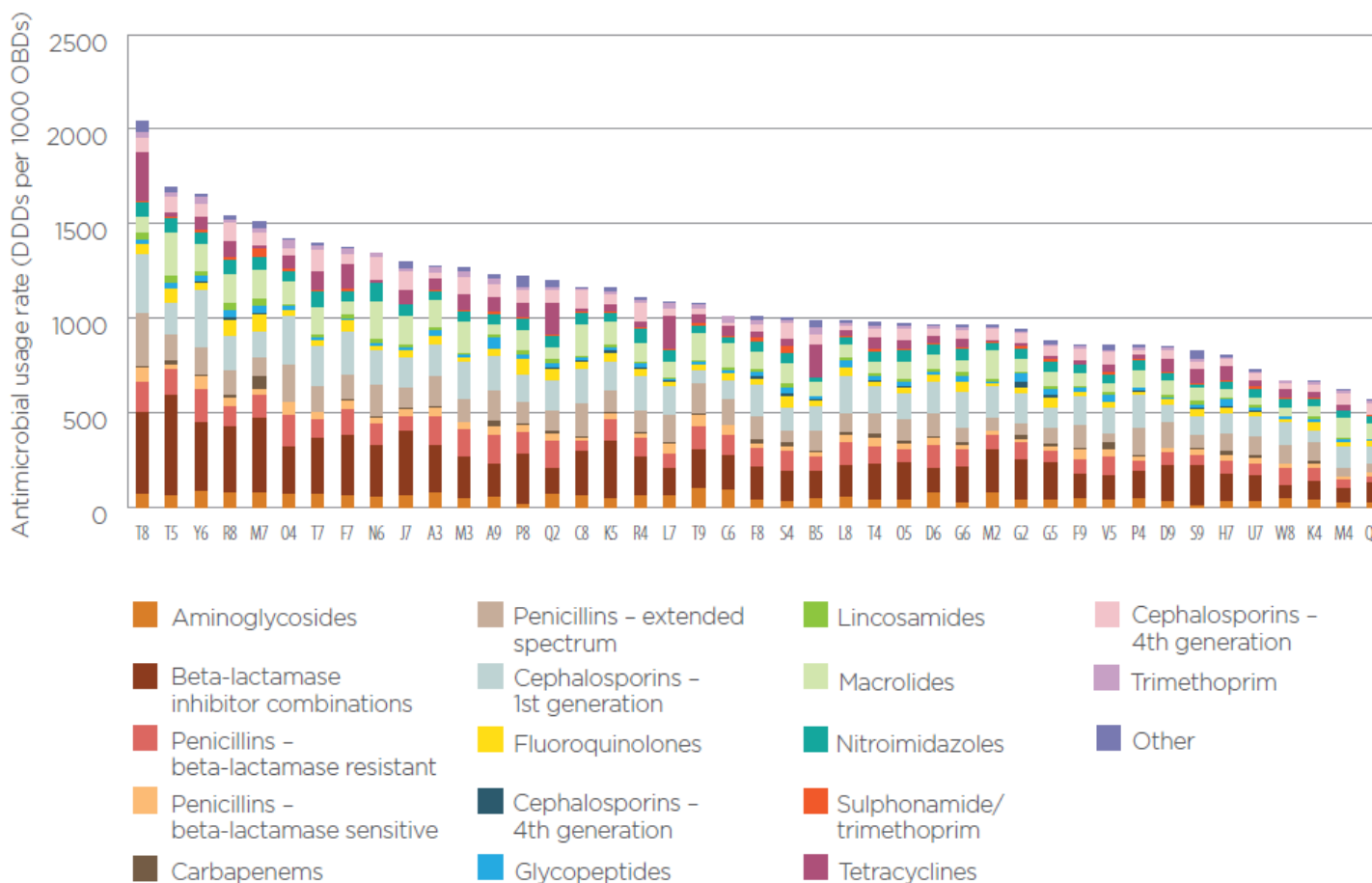
Figure 2 Total-hospital annual antimicrobial use in hospitals participating in NAUSP, 2005-14





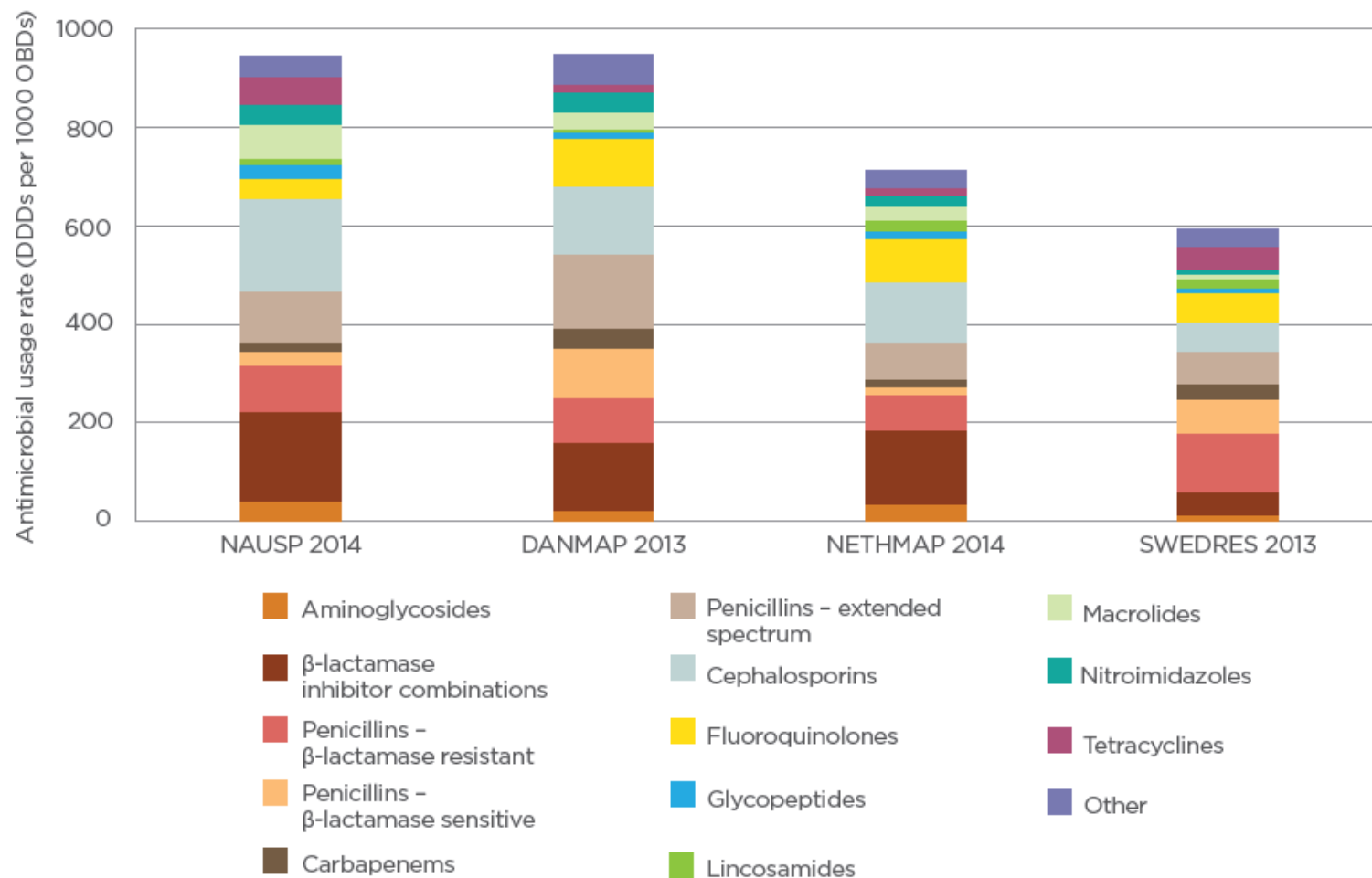
National Antimicrobial Utilisation Surveillance Program

Figure 8 Total-hospital antimicrobial use, New South Wales and Australian Capital Territory, 2014

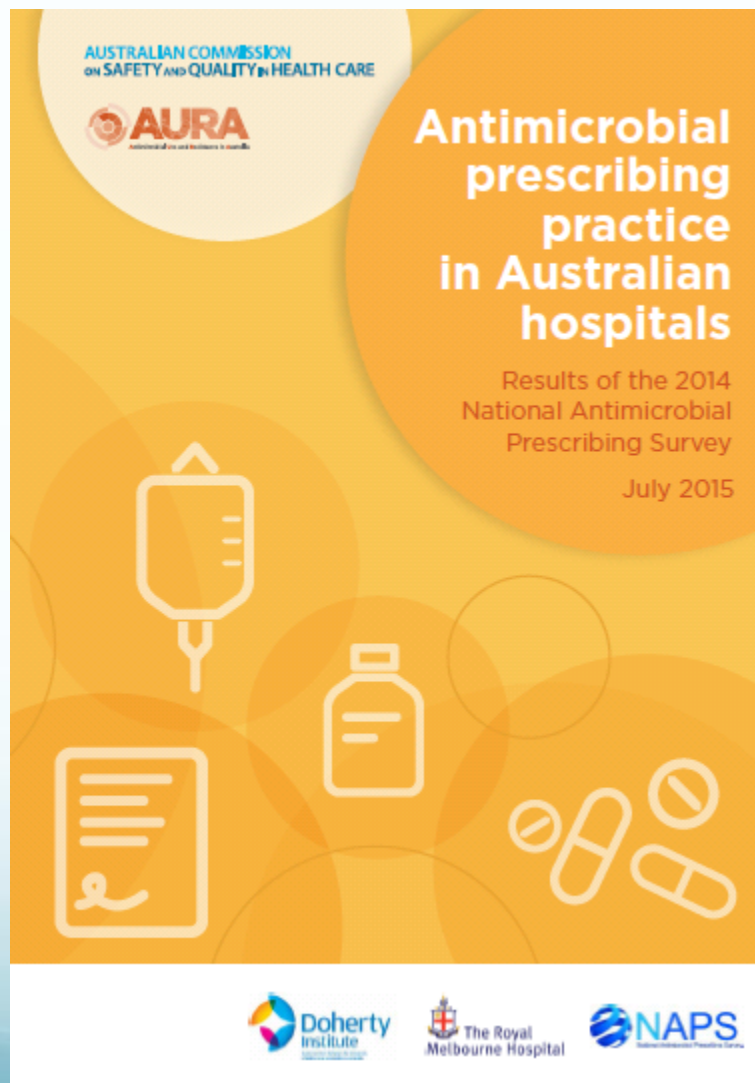


National Antimicrobial Utilisation Surveillance Program

Figure 30 Antimicrobial usage rates in hospitals in Australia, Denmark, the Netherlands and Sweden



National Antimicrobial Prescribing Survey



National Antimicrobial Prescribing Survey

Table 4 Results for key indicators in 2013 and 2014 for all contributing facilities

Key indicator		% of total prescriptions		% change from 2013	
		2013	2014	Absolute	Relative
Indication documented in medical notes (best practice >95%)		70.9	74.0	+3.1	+4.4
Surgical prophylaxis given for >24 hours (best practice <5%)		41.8	35.9 ^a	-5.9	-14.1
Compliance with guidelines	Compliant with <i>Therapeutic Guidelines: Antibiotic or local guidelines</i>	59.7 (72.2) ^b	56.2 (73.7) ^b	-3.5	-6.0
	Noncompliant	23.0 (27.8) ^b	24.3 (26.3) ^b	+1.3	+5.5
	Directed therapy ^c	na	10.4	na	na
	No guideline available	11.0	4.6	-6.4	-58.3
	Not assessable	6.3	4.5	-1.8	-27.7
Appropriateness	Appropriate (optimal and adequate)	70.8 (70.6) ^d	72.3 (75.9) ^d	+1.5	+2.1
	Inappropriate (suboptimal and inadequate)	22.9 (24.4) ^d	23.0 (24.1) ^d	+0.1	+0.5
	Not assessable	6.3	4.7	-1.6	-24.9

National Antimicrobial Prescribing Survey

Table 12 Indications for which antimicrobials were most inappropriately prescribed (>30% inappropriateness)

Indication	Number of prescriptions	Appropriate (%)	Inappropriate (%)	Not assessable (%)
Asthma: infective exacerbation	40	30.0	70.0	0.0
Bronchitis	75	46.7	50.7	2.7
Surgical prophylaxis	2246	56.9	40.2	2.9
COPD: infective exacerbation	552	62.3	36.8	0.9
Fever/pyrexia of unknown origin	67	50.7	34.3	14.9
Conjunctivitis	83	65.1	33.7	1.2
Bronchiectasis	107	66.4	31.8	1.9
Deep soft tissue infection	32	65.6	31.3	3.1
Pancreatitis	42	69.0	31.0	0.0
Colitis	52	67.3	30.8	1.9

National Antimicrobial Prescribing Survey

Table 9 Reasons for inappropriateness of surgical prophylaxis prescriptions

Reason	Reason found (%)	Reason not found (%)	Not specified (%)
Incorrect duration	39.7	36.3	24.1
Antimicrobial not indicated	22.9	51.8	25.3
Incorrect dose or frequency	15.7	57.4	26.8
Spectrum too broad	7.1	63.2	29.7
Incorrect route	4.1	66.3	29.6
Spectrum too narrow	2.8	66.5	30.7
Allergy mismatch	1.0	99.0	0.0
Microbiology mismatch	0.7	99.3	0.0

Table 13 Reasons for inappropriateness of prescribing for infective exacerbation of COPD, infective exacerbation of asthma and bronchitis

Reason	Reason found (%)	Reason not found (%)	Not specified (%)
Spectrum too broad	38.7	35.3	26.0
Antimicrobial not indicated	27.9	44.2	27.9
Incorrect dose or frequency	8.6	60.6	30.9
Incorrect route	5.6	64.7	29.7
Microbiology mismatch	5.2	94.8	0.0
Incorrect duration	4.5	63.6	32.0
Spectrum too narrow	2.6	63.2	34.2
Allergy mismatch	1.9	98.1	0.0

Aged Care NAPS Pilot

Table 1: Participating RACFs, by state

State	Number (%)
NSW	17 (9.1)
QLD	7 (3.8)
SA	8 (4.3)
TAS	6 (3.2)
VIC	130 (69.9)
WA	18 (9.7)
Total	186

Table 2: Participating RACFs, by remoteness

Remoteness	Number (%)
Major Cities of Australia	51 (27.4)
Inner Regional Australia	81 (43.5)
Outer Regional Australia	45 (24.2)
Remote Australia	8 (4.3)
Very Remote Australia	1 (0.5)
Total	186

Table 1: Registered auditors for participating facilities, by profession category

Profession category	n (%)
ICP	56 (47.5)
Nurse	42 (35.6)
Nurse Practitioner	1 (0.8)
Pharmacist	13 (11.0)
Quality manager	2 (1.7)
Other	4 (3.4)
TOTAL	118

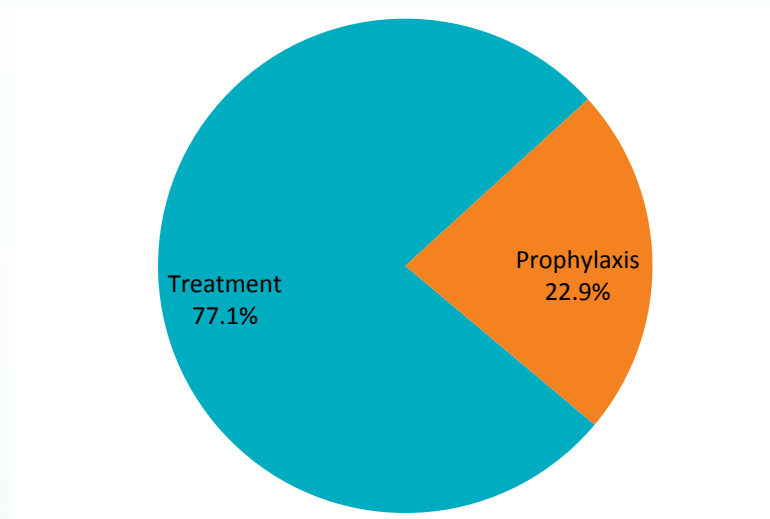
Note: In this table, individual auditors are only counted once however several auditors were registered for multiple facilities.

Aged Care NAPS Pilot

Quality Indicator	% of total antimicrobial prescriptions (n = 975)
Indication documented (Best practice >95%)	68.4
Review or stop date documented (Best practice > 95%)	35.0

Aged Care NAPS Pilot

Figure 1: The most common indications, by prophylaxis vs treatment prescriptions



Just the beginning...

