 

AURA 2019  
Supplementary data

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# Introduction

This report provides supplementary data for *AURA 2019: Third Australian report on antimicrobial use and resistance in human health* (AURA 2019). It includes additional detail relating to Chapter 3 ‘Antimicrobial use and appropriateness’ and Chapter 4 ‘Antimicrobial resistance’. Tables in this supplementary data report are numbered according to the relevant chapter.

Information on sources of antimicrobial use and antimicrobial resistance data is included in Chapter 2 of AURA 2019.

# AURA 2019 Chapter 3: Antimicrobial use and appropriateness

## Table S3.1: Region of residence and socioeconomic status for patients prescribed J01\* antibiotics, MedicineInsight practices, 2015–2017

| Measure | Category | Percentage of patients prescribed one or more antibiotics, 2015 | Percentage of patients prescribed one or more antibiotics, 2016 | Percentage of patients prescribed one or more antibiotics, 2017 |
| --- | --- | --- | --- | --- |
| State or territory | NSW | 33.4 | 30.0 | 27.3 |
| Vic | 30.9 | 29.2 | 24.5 |
| Qld | 32.8 | 29.7 | 26.7 |
| SA | 29.4 | 28.3 | 27.6 |
| WA | 29.1 | 28.6 | 24.8 |
| Tas | 30.9 | 27.8 | 25.1 |
| NT | 26.2 | 23.9 | 21.3 |
| ACT | 37.1 | 35.9 | 31.0 |
| Remoteness | Major cities | 31.9 | 29.6 | 26.5 |
| Inner regional | 31.8 | 29.1 | 25.3 |
| Outer regional | 31.0 | 28.7 | 24.6 |
| Remote | 27.9 | 28.0 | 26.6 |
| Very remote | 27.3 | 22.3 | 21.0 |
| Unknown/other | 23.4 | 16.7 | 13.6 |
| SEIFA decile | 1 (most disadvantaged) | 32.3 | 29.6 | 26.3 |
| 2 | 32.3 | 30.4 | 26.7 |
| 3 | 31.6 | 28.5 | 24.3 |
| 4 | 31.6 | 29.4 | 25.5 |
| 5 | 32.6 | 30.4 | 27.4 |
| 6 | 31.7 | 30.2 | 26.5 |
| 7 | 32.4 | 29.6 | 25.5 |
| 8 | 32.2 | 29.4 | 26.2 |
| 9 | 30.7 | 28.4 | 25.8 |
| 10 (least disadvantaged) | 30.6 | 28.0 | 25.5 |
| Unknown/other | 18.6 | 14.9 | 10.6 |
| Aboriginal and Torres Strait Islander status | Aboriginal and/or Torres Strait Islander | 36.9 | 33.6 | 29.2 |
| Non-Indigenous | 34.1 | 31.5 | 27.7 |
| Not recorded/other | 25.0 | 23.1 | 20.8 |

SEIFA = Socio-Economic Indexes for Areas

\* Subgroup J01 of the Anatomical Therapeutic Chemical classification system is ‘antibacterials for systemic use’.

Notes:

1. The number of MedicineInsight practices was 535 in 2015, 543 in 2016 and 545 in 2017.

2. The number of patients in the denominator may change each year.

3. Differences across states and territories should be interpreted with caution because of non-random sampling and varying levels of participation in the MedicineInsight program.

Source: NPS MedicineWise

## Table S3.2: Top 10 indications associated with the prescribed J01\* antibiotic, MedicineInsight practices, 2015–2017

| Indication | Percentage 2015 | Percentage 2016 | Percentage 2017 |
| --- | --- | --- | --- |
| Skin/wound infection | 11.9 | 12.8 | 13.0 |
| Upper respiratory tract infection (acute) | 14.4 | 13.5 | 12.6 |
| Other infection | 10.8 | 10.7 | 10.8 |
| Urinary tract infection | 9.0 | 9.5 | 9.9 |
| Other relevant problems | 7.9 | 7.9 | 8.0 |
| Other lower respiratory tract infections | 6.3 | 6.3 | 6.3 |
| Sinusitis (acute/chronic) | 6.1 | 6.2 | 6.2 |
| Otitis media | 5.6 | 5.2 | 5.3 |
| Tonsillitis | 4.9 | 5.1 | 5.1 |
| Multiple conditions | 3.4 | 3.5 | 3.8 |
| Bronchitis | 4.0 | 3.8 | 3.7 |

\* Subgroup J01 of the Anatomical Therapeutic Chemical classification system is ‘antibacterials for systemic use’.

Notes:

1. 70% of all antibiotic prescriptions could be associated with a reason for the prescription.

2. The number of MedicineInsight practices was 535 in 2015, 543 in 2016 and 545 in 2017.

Source: NPS MedicineWise

## Table S3.3: Percentage of prescriptions ordered as private for selected J01\* antibiotics, MedicineInsight practices, 2015–2017

| Antibiotic | Percentage 2015 | Percentage 2016 | Percentage 2017 |
| --- | --- | --- | --- |
| Amoxicillin | 0.6 | 0.7 | 0.8 |
| Amoxicillin–clavulanic acid | 0.8 | 0.8 | 1.0 |
| Azithromycin | 42.7 | 44.6 | 47.5 |
| Cefalexin | 0.4 | 0.5 | 0.6 |
| Ciprofloxacin | 46.5 | 49.5 | 52.5 |
| Doxycycline | 10.2 | 11.9 | 13.9 |
| Roxithromycin | 0.3 | 0.4 | 0.4 |

\* Subgroup J01 of the Anatomical Therapeutic Chemical classification system is ‘antibacterials for systemic use’.

Note: The number of MedicineInsight practices was 535 in 2015, 543 in 2016 and 545 in 2017.

Source: NPS MedicineWise

## Table S3.4: Number of patients per 100 patients prescribed one or more J01\* antibiotics, by age group, MedicineInsight practices, 2017

|  | Antibiotic rate per 100 patients | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Age group  (years) | Amoxicillin | Amoxicillin–clavulanic acid | Azithromycin | Cefalexin | Ciprofloxacin | Doxycycline | Roxithromycin |
| 0–4 | 17.61 | 3.17 | 0.48 | 5.83 | 0.48 | 0.00 | 0.20 |
| 5–9 | 13.19 | 3.18 | 0.38 | 7.06 | 0.44 | 0.03 | 0.31 |
| 10–14 | 8.99 | 2.77 | 0.30 | 6.03 | 0.34 | 0.92 | 0.72 |
| 15–19 | 7.25 | 3.58 | 1.06 | 6.15 | 0.27 | 4.15 | 1.53 |
| 20–24 | 5.76 | 3.45 | 1.72 | 5.37 | 0.24 | 2.73 | 1.36 |
| 25–29 | 5.55 | 3.44 | 1.24 | 5.00 | 0.24 | 2.12 | 1.22 |
| 30–34 | 6.36 | 4.07 | 0.89 | 5.22 | 0.29 | 1.96 | 1.39 |
| 35–39 | 6.89 | 4.71 | 0.78 | 5.26 | 0.31 | 2.12 | 1.59 |
| 40–44 | 6.37 | 5.16 | 0.71 | 5.30 | 0.36 | 2.55 | 1.76 |
| 45–49 | 6.12 | 5.24 | 0.66 | 5.50 | 0.39 | 2.71 | 1.80 |
| 50–54 | 6.15 | 5.47 | 0.61 | 5.88 | 0.46 | 2.98 | 1.95 |
| 55–59 | 6.55 | 5.92 | 0.62 | 6.38 | 0.52 | 3.42 | 2.21 |
| 60–64 | 6.87 | 6.40 | 0.62 | 7.31 | 0.62 | 3.89 | 2.46 |
| 65–69 | 7.31 | 6.99 | 0.65 | 8.62 | 0.81 | 4.49 | 2.72 |
| 70–74 | 7.85 | 7.47 | 0.64 | 10.64 | 1.02 | 5.04 | 3.06 |
| 75–79 | 8.59 | 7.78 | 0.61 | 12.96 | 1.24 | 5.44 | 3.42 |
| 80–84 | 9.04 | 7.78 | 0.49 | 15.39 | 1.54 | 5.33 | 3.74 |
| 85–89 | 8.47 | 7.20 | 0.40 | 17.56 | 1.75 | 5.12 | 3.54 |
| 90–94 | 8.26 | 6.70 | 0.41 | 18.81 | 2.11 | 4.63 | 3.21 |
| 95+ | 7.11 | 5.29 | 0.31 | 17.68 | 1.70 | 3.84 | 3.31 |
| Unknown/other | 0.85 | 0.32 | nd | 0.58 | 0.05 | 0.11 | nd |

nd = no data provided

\* Subgroup J01 of the Anatomical Therapeutic Chemical classification system is ‘antibacterials for systemic use’.

Note: The number of MedicineInsight practices was 545.

Source: NPS MedicineWise

# AURA 2019 Chapter 4: Antimicrobial resistance

## Table S4.1: Acinetobacter baumannii resistance (all specimen sources), 2015–2017

| Antimicrobial | 2015, % resistant (n) | 2016, % resistant (n) | 2017, % resistant (n) |
| --- | --- | --- | --- |
| Ceftazidime | 23.4 (736) | 20.2 (693) | 17.0 (690) |
| Ceftriaxone/cefotaxime | 83.0 (1,034) | 83.1 (929) | 82.3 (947) |
| Ciprofloxacin/norfloxacin | 5.3 (1,240) | 6.5 (1,161) | 4.2 (1,194) |
| Gentamicin | 1.9 (1,279) | 5.0 (1,212) | 3.2 (1,266) |
| Meropenem | 2.8 (1,088) | 5.0 (976) | 2.8 (1,063) |
| Piperacillin–tazobactam | 12.5 (872) | 15.7 (893) | 13.4 (1,058) |
| Trimethoprim–sulfamethoxazole | 5.3 (1,073) | 9.0 (970) | 6.4 (1,093) |

Sources: AGAR (national); APAS (NSW, Vic, Qld, SA, WA, Tas, ACT); SNP (Qld, northern NSW)

## Table S4.2: Acinetobacter baumannii resistance, by clinical setting, 2015–2017

| Antimicrobial | Year | Private hospitals, % resistant (n) | Public hospitals, % resistant (n) | Multi-purpose services, % resistant (n) | Community, % resistant (n) |
| --- | --- | --- | --- | --- | --- |
| Ceftazidime | 2015 | nd | 23.4 (736) | nd | nd |
| 2016 | nd | 20.2 (693) | nd | nd |
| 2017 | nd | 17.0 (690) | nd | nd |
| Ceftriaxone/cefotaxime | 2015 | 96.8 (63) | 80.3 (791) | 67.7 (31) | 94.6 (149) |
| 2016 | 98.0 (49) | 79.5 (748) | nd | 97.7 (132) |
| 2017 | 94.9 (39) | 79.3 (753) | 77.1 (35) | 98.3 (120) |
| Ciprofloxacin/norfloxacin | 2015 | 6.3 (63) | 3.7 (1,001) | 0.0 (35) | 17.7 (141) |
| 2016 | 10.4 (48) | 5.6 (987) | nd | 11.9 (126) |
| 2017 | 12.5 (40) | 3.5 (1,008) | 0.0 (38) | 9.3 (108) |
| Gentamicin | 2015 | 0.0 (64) | 2.2 (1,028) | 0.0 (39) | 0.7 (148) |
| 2016 | 2.1 (48) | 5.7 (1,025) | nd | 1.4 (139) |
| 2017 | 7.3 (41) | 3.6 (1,063) | 0.0 (38) | 0.0 (124) |
| Meropenem | 2015 | 0.0 (51) | 2.9 (1,002) | 2.9 (35) | nd |
| 2016 | nd | 5.0 (976) | nd | nd |
| 2017 | 9.4 (32) | 2.6 (994) | 2.7 (37) | nd |
| Piperacillin–tazobactam | 2015 | nd | 13.0 (839) | 0.0 (33) | nd |
| 2016 | nd | 15.7 (893) | nd | nd |
| 2017 | 19.4 (31) | 14.8 (890) | 2.7 (37) | 3.0 (100) |
| Trimethoprim–sulfamethoxazole | 2015 | 2.0 (51) | 5.1 (984) | 15.8 (38) | nd |
| 2016 | nd | 9.0 (970) | nd | nd |
| 2017 | 6.5 (31) | 6.3 (1,024) | 10.5 (38) | nd |

nd = no data (either not tested or tested against an inadequate number of isolates)

Sources: AGAR and APAS (public hospitals); AGAR, APAS (Qld, SA) and SNP (private hospitals); APAS and SNP (community); APAS (multi-purpose services)

## Table S4.3: Enterobacter cloacae complex resistance, by specimen source, 2015–2017

| Antimicrobial | Year | Blood, % resistant (n) | Urine, % resistant (n) | Other, % resistant (n) | Total, % resistant (n) |
| --- | --- | --- | --- | --- | --- |
| Ceftazidime | 2015 | 18.5 (455) | 26.5 (2,205) | 19.0 (1,540) | 22.9 (4,200) |
| 2016 | 24.3 (378) | 26.2 (2,171) | 18.4 (1,570) | 23.1 (4,119) |
| 2017 | 25.9 (382) | 27.6 (2,067) | 17.0 (1,590) | 23.2 (4,039) |
| Ceftriaxone/cefotaxime | 2015 | 21.6 (872) | 33.6 (6,091) | 25.9 (5,139) | 29.5 (12,102) |
| 2016 | 29.6 (900) | 32.9 (5,683) | 22.8 (4,795) | 28.4 (11,378) |
| 2017 | 28.7 (881) | 35.5 (5,661) | 24.3 (4,949) | 30.2 (11,491) |
| Ciprofloxacin/norfloxacin | 2015 | 3.5 (520) | 6.1 (5,066) | 3.4 (2,787) | 5.0 (8,373) |
| 2016 | 2.5 (642) | 6.2 (5,597) | 2.5 (3,000) | 4.7 (9,239) |
| 2017 | 3.7 (617) | 7.2 (5,379) | 2.7 (3,106) | 5.4 (9,102) |
| Gentamicin | 2015 | 7.7 (520) | 8.6 (3,552) | 6.0 (2,948) | 7.4 (7,020) |
| 2016 | 4.5 (646) | 6.9 (3,713) | 4.6 (3,091) | 5.7 (7,450) |
| 2017 | 5.9 (622) | 6.9 (3,822) | 3.9 (3,192) | 5.5 (7,636) |
| Meropenem | 2015 | 2.3 (514) | 1.7 (2,721) | 1.4 (2,691) | 1.6 (5,926) |
| 2016 | 1.2 (594) | 1.2 (2,238) | 1.5 (2,851) | 1.4 (5,683) |
| 2017 | 1.3 (602) | 1.2 (2,891) | 0.8 (2,945) | 1.0 (6,438) |
| Nitrofurantoin | 2015 | n/a | 52.2 (5,056) | n/a | 52.2 (5,056) |
| 2016 | n/a | 38.2 (5,428) | n/a | 38.2 (5,428) |
| 2017 | n/a | 34.8 (4,707) | n/a | 34.8 (4,707) |
| Piperacillin–tazobactam | 2015 | 20.9 (483) | 28.8 (2,589) | 23.4 (2,287) | 25.8 (5,359) |
| 2016 | 28.5 (583) | 28.3 (1,990) | 23.9 (2,702) | 26.1 (5,275) |
| 2017 | 36.9 (507) | 27.8 (1,841) | 28.6 (2,465) | 29.2 (4,813) |
| Trimethoprim | 2015 | 14.2 (365) | 20.3 (5,239) | 10.7 (1,649) | 17.8 (7,253) |
| 2016 | 14.5 (379) | 19.6 (5,816) | 9.3 (1,705) | 17.2 (7,900) |
| 2017 | 19.3 (383) | 19.0 (5,817) | 8.3 (1,744) | 16.6 (7,944) |
| Trimethoprim–sulfamethoxazole | 2015 | 15.0 (508) | 19.0 (2,231) | 10.2 (2,650) | 14.3 (5,389) |
| 2016 | 14.6 (589) | 18.2 (2,191) | 9.4 (2,889) | 13.4 (5,669) |
| 2017 | 16.3 (600) | 18.2 (2,099) | 8.2 (2,972) | 12.7 (5,671) |

n/a = not applicable

Note: Members of the Enterobacter cloacae complex are considered intrinsically resistant to ampicillin, amoxicillin–clavulanic acid, cefazolin and cefoxitin.

Sources: AGAR (national); APAS (NSW, Vic, Qld, SA, WA, Tas, ACT); SNP (Qld, northern NSW)

## Table S4.4: Enterobacter cloacae complex resistance (blood culture isolates), by state and territory, 2015–2017

| Antimicrobial | Year | NSW, % resistant | Vic, % resistant | Qld, % resistant | SA, % resistant | WA, % resistant | Tas, % resistant | NT, % resistant | ACT, % resistant | Australia, % resistant (n) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Amikacin | 2015 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 (326) |
| 2016 | 0.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 (396) |
| 2017 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 (433) |
| Cefepime | 2015 | 4.7 | 8.8 | 4.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.3 (326) |
| 2016 | 1.9 | 3.6 | 8.0 | 0.0 | 3.7 | 0.0 | 0.0 | 7.1 | 3.8 (394) |
| 2017 | 8.8 | 4.0 | 0.9 | 7.7 | 3.6 | 11.8 | 14.3 | 10.0 | 5.5 (433) |
| Ceftazidime | 2015 | 23.5 | 27.5 | 23.1 | 0.0 | 20.0 | 28.6 | 22.2 | 0.0 | 22.4 (326) |
| 2016 | 24.5 | 25.3 | 28.7 | 12.5 | 18.5 | 23.1 | 18.2 | 35.7 | 24.2 (396) |
| 2017 | 27.2 | 37.3 | 18.7 | 23.1 | 14.5 | 23.5 | 28.6 | 30.0 | 24.9 (433) |
| Ceftriaxone | 2015 | 24.7 | 30.0 | 27.7 | 0.0 | 22.0 | 21.4 | 22.2 | 10.0 | 24.5 (326) |
| 2016 | 24.5 | 27.7 | 35.6 | 12.5 | 18.5 | 23.1 | 27.3 | 28.6 | 26.3 (396) |
| 2017 | 27.9 | 40.0 | 23.4 | 26.9 | 20.0 | 23.5 | 28.6 | 30.0 | 27.7 (433) |
| Ciprofloxacin | 2015 | 8.2 | 5.0 | 3.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.0 (326) |
| 2016 | 2.7 | 4.8 | 4.6 | 4.2 | 0.0 | 0.0 | 0.0 | 7.1 | 3.3 (396) |
| 2017 | 8.1 | 5.3 | 1.9 | 7.7 | 3.6 | 11.8 | 14.3 | 10.0 | 5.8 (433) |
| Gentamicin | 2015 | 12.9 | 5.0 | 10.8 | 0.0 | 0.0 | 7.1 | 11.1 | 0.0 | 7.4 (326) |
| 2016 | 6.4 | 4.8 | 9.2 | 0.0 | 0.0 | 15.4 | 0.0 | 7.1 | 5.6 (396) |
| 2017 | 10.3 | 4.0 | 6.5 | 7.7 | 3.6 | 11.8 | 14.3 | 10.0 | 7.4 (433) |
| Meropenem | 2015 | 4.7 | 0.0 | 4.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.1 (326) |
| 2016 | 0.9 | 0.0 | 3.4 | 0.0 | 0.0 | 0.0 | 0.0 | 7.1 | 1.3 (396) |
| 2017 | 3.7 | 0.0 | 1.9 | 0.0 | 1.9 | 0.0 | 0.0 | 10.0 | 2.1 (431) |
| Piperacillin–tazobactam | 2015 | 14.0 | 27.3 | 18.8 | 7.7 | 26.8 | 18.2 | 22.2 | 0.0 | 20.6 (277) |
| 2016 | 17.2 | 24.0 | 29.1 | 15.4 | 20.5 | 16.7 | 18.2 | 22.2 | 22.3 (332) |
| 2017 | 31.7 | 43.1 | 20.2 | 10.0 | 18.9 | 20.0 | 28.6 | 33.3 | 27.6 (351) |
| Ticarcillin–clavulanic acid | 2015 | 23.0 | 31.3 | 26.2 | 0.0 | 22.0 | 21.4 | 22.2 | 0.0 | 23.8 (315) |
| 2016 | 28.4 | 27.7 | 34.5 | 26.1 | 20.4 | 30.8 | 27.3 | 35.7 | 28.7 (380) |
| 2017 | 31.4 | 41.3 | 24.3 | 33.3 | 23.6 | 23.5 | 28.6 | 50.0 | 30.4 (382) |
| Tobramycin | 2015 | 14.1 | 10.0 | 12.5 | 0.0 | 0.0 | 7.1 | 11.1 | 0.0 | 9.2 (325) |
| 2016 | 7.3 | 6.0 | 9.2 | 0.0 | 0.0 | 15.4 | 0.0 | 14.3 | 6.3 (396) |
| 2017 | 11.0 | 4.0 | 5.6 | 11.5 | 3.6 | 11.8 | 14.3 | 10.0 | 7.6 (433) |
| Trimethoprim | 2015 | 16.5 | 20.0 | 18.8 | 15.4 | 2.0 | 21.4 | 22.2 | 20.0 | 16.0 (325) |
| 2016 | 15.5 | 6.0 | 23.3 | 33.3 | 3.7 | 38.5 | 0.0 | 28.6 | 15.4 (395) |
| 2017 | 21.5 | 17.3 | 22.4 | 34.6 | 18.2 | 11.8 | 28.6 | 20.0 | 21.1 (432) |
| Trimethoprim–sulfamethoxazole | 2015 | 16.5 | 18.8 | 18.5 | 15.4 | 2.0 | 21.4 | 22.2 | 20.0 | 15.6 (326) |
| 2016 | 16.4 | 6.0 | 24.1 | 25.0 | 3.7 | 38.5 | 0.0 | 42.9 | 15.9 (396) |
| 2017 | 20.6 | 16.0 | 22.4 | 30.8 | 16.4 | 11.8 | 14.3 | 20.0 | 19.9 (433) |

Notes:

1. Members of the Enterobacter cloacae complex are considered intrinsically resistant to ampicillin, amoxicillin–clavulanic acid, cefazolin and cefoxitin.

2. Not all isolates were tested against all agents.

3. The numbers of isolates for each state and territory are in the following table.

| Year | NSW | Vic | Qld | SA | WA | Tas | NT | ACT | Australia |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2015 | 85 | 80 | 65 | 13 | 50 | 14 | 9 | 10 | 326 |
| 2016 | 110 | 83 | 87 | 24 | 54 | 13 | 11 | 14 | 396 |
| 2017 | 136 | 75 | 107 | 26 | 55 | 17 | 7 | 10 | 433 |

Source: AGAR (national)

## Table S4.5: Enterococcus faecalis resistance (blood culture isolates), by state and territory, 2015–2017

| Antimicrobial | Year | NSW, % resistant | Vic, % resistant | Qld, % resistant | SA, % resistant | WA, % resistant | Tas, % resistant | NT, % resistant | ACT, % resistant | Australia. % resistant (n) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Ampicillin | 2015 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 (561) |
| 2016 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 (592) |
| 2017 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 (601) |
| Ciprofloxacin | 2015 | 8.7 | 15.5 | 9.6 | 7.0 | 8.8 | nd | 30.0 | 14.3 | 10.9 (521) |
| 2016 | 7.2 | 11.5 | 8.2 | 3.9 | 8.0 | 21.4 | 0.0 | 12.1 | 8.8 (559) |
| 2017 | 7.0 | 13.6 | 16.8 | 9.7 | 5.5 | 6.3 | 20.0 | nd | 10.3 (546) |
| Linezolid | 2015 | 0.0 | 0.0 | 1.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 (561) |
| 2016 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 (591) |
| 2017 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 (601) |
| Nitrofurantoin | 2015 | 0.0 | 0.0 | 1.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 (558) |
| 2016 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 (591) |
| 2017 | 0.0 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 (595) |
| Teicoplanin | 2015 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 (558) |
| 2016 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 (592) |
| 2017 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 (601) |
| Trimethoprim–sulfamethoxazole | 2015 | 16.8 | 20.9 | 24.2 | 20.7 | 15.4 | nd | 50.0 | 22.9 | 20.0 (505) |
| 2016 | 12.5 | 17.3 | 16.3 | 25.5 | 18.4 | 28.6 | 0.0 | 17.5 | 16.8 (524) |
| 2017 | 14.2 | 15.9 | 18.8 | 17.2 | 22.0 | 18.8 | 14.3 | 17.9 | 17.2 (518) |
| Vancomycin | 2015 | 1.3 | 0.9 | 0.0 | 0.0 | 0.0 | 8.3 | 0.0 | 0.0 | 0.7 (561) |
| 2016 | 0.0 | 0.8 | 0.0 | 1.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 (592) |
| 2017 | 0.0 | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 (601) |

nd = no data (either not tested or tested against an inadequate number of isolates)

Notes:

1. Not all isolates were tested against all agents.

2. The numbers of isolates for each state and territory are in the following table.

| Year | NSW | Vic | Qld | SA | WA | Tas | NT | ACT | Australia |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2015 | 150 | 110 | 96 | 58 | 91 | 12 | 10 | 35 | 562 |
| 2016 | 152 | 130 | 100 | 52 | 87 | 27 | 7 | 40 | 595 |
| 2017 | 187 | 119 | 102 | 31 | 94 | 31 | 10 | 28 | 602 |

Source: AGAR (national)

## Table S4.6: Enterococcus faecium resistance (blood culture isolates), by state and territory, 2015–2017

| Antimicrobial | Year | NSW, % resistant | Vic, % resistant | Qld, % resistant | SA, % resistant | WA, % resistant | Tas, % resistant | NT, % resistant | ACT, % resistant | Australia, % resistant (n) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Ampicillin/amoxicillin | 2015 | 85.2 | 88.3 | 83.3 | 93.2 | 79.2 | 50.0 | 87.5 | 95.5 | 86.0 (400) |
| 2016 | 91.9 | 89.0 | 90.7 | 97.7 | 92.6 | 85.7 | 100.0 | 90.9 | 91.5 (412) |
| 2017 | 89.2 | 92.5 | 95.6 | 85.7 | 81.0 | 88.2 | 80.0 | 95.5 | 89.6 (481) |
| Ciprofloxacin | 2015 | 64.9 | 90.0 | 82.1 | 11.1 | 79.2 | 100.0 | 87.5 | 95.5 | 74.8 (373) |
| 2016 | 71.0 | 85.3 | 89.7 | 23.3 | 90.7 | 91.7 | 100.0 | 89.5 | 76.0 (404) |
| 2017 | 66.1 | 91.7 | 90.0 | 42.9 | 79.4 | 100.0 | 80.0 | nd | 77.3 (444) |
| Linezolid | 2015 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 (400) |
| 2016 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 (408) |
| 2017 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 (481) |
| Teicoplanin | 2015 | 33.9 | 12.5 | 19.4 | 2.3 | 5.7 | 0.0 | 0.0 | 31.8 | 17.7 (401) |
| 2016 | 38.7 | 13.8 | 2.3 | 0.0 | 9.3 | 0.0 | 0.0 | 40.9 | 18.9 (413) |
| 2017 | 45.5 | 17.2 | 13.3 | 17.9 | 4.8 | 5.9 | 0.0 | 27.3 | 24.9 (481) |
| Trimethoprim–sulfamethoxazole | 2015 | 47.8 | 83.9 | 70.0 | 45.5 | 62.3 | 100.0 | 75.0 | 59.1 | 59.6 (327) |
| 2016 | 61.3 | 64.4 | 55.8 | 26.2 | 55.6 | 75.0 | 100.0 | 68.2 | 57.2 (346) |
| 2017 | 62.7 | 78.7 | 55.0 | 35.7 | 41.3 | 70.0 | 80.0 | 81.8 | 59.8 (376) |
| Vancomycin | 2015 | 51.7 | 63.3 | 61.3 | 52.3 | 11.3 | 12.5 | 75.0 | 50.0 | 50.2 (402) |
| 2016 | 47.6 | 62.4 | 30.2 | 46.5 | 14.8 | 42.9 | 75.0 | 68.2 | 46.5 (413) |
| 2017 | 51.5 | 64.2 | 33.3 | 57.1 | 14.3 | 29.4 | 60.0 | 27.3 | 47.0 (481) |

nd = no data (either not tested or tested against an inadequate number of isolates)

Notes:

1. Not all isolates were tested against all agents.

2. The numbers of isolates for each state and territory are in the following table.

| Year | NSW | Vic | Qld | SA | WA | Tas | NT | ACT | Australia |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2015 | 116 | 120 | 31 | 44 | 53 | 8 | 8 | 22 | 402 |
| 2016 | 124 | 109 | 43 | 43 | 54 | 14 | 4 | 22 | 413 |
| 2017 | 167 | 134 | 45 | 28 | 63 | 17 | 5 | 22 | 481 |

Source: AGAR (national)

## Table S4.7: Escherichia coli resistance, by specimen source, 2015–2017

| Antimicrobial | Year | Blood, % resistant (n) | Urine, % resistant (n) | Other, % resistant (n) | Total, % resistant (n) |
| --- | --- | --- | --- | --- | --- |
| Amikacin | 2015 | 0.2 (1,325) | nd | nd | 0.2 (1,325) |
| 2016 | 0.2 (1,322) | nd | nd | 0.2 (1,322) |
| 2017 | 0.2 (1,602) | nd | nd | 0.2 (1,602) |
| Amoxicillin–clavulanic acid | 2015 | 16.5 (7,922) | 10.4 (164,616) | 17.0 (10,268) | 11.1 (182,806) |
| 2016 | 15.6 (8,893) | 10.7 (164,501) | 18.5 (7,482) | 11.3 (180,876) |
| 2017 | 16.7 (9,485) | 13.5 (108,327) | 20.7 (7,512) | 14.2 (125,324) |
| Ampicillin/amoxicillin | 2015 | 52.1 (8,346) | 44.0 (164,872) | 47.3 (11,179) | 44.6 (184,397) |
| 2016 | 52.5 (9,504) | 44.3 (175,118) | 50.1 (8,572) | 45.0 (193,194) |
| 2017 | 53.0 (9,950) | 45.3 (178,000) | 52.2 (8,308) | 46.0 (196,258) |
| Cefalexin | 2015 | nd | 7.1 (47,458) | nd | 7.1 (47,458) |
| 2016 | nd | 7.4 (47,795) | nd | 7.4 (47,795) |
| 2017 | nd | 8.0 (47,763) | nd | 8.0 (47,763) |
| Cefazolin | 2015 | 21.4 (5,259) | 16.8 (30,302) | 22.3 (6,708) | 18.2 (42,269) |
| 2016 | 22.3 (4,409) | 16.9 (35,491) | 23.6 (3,259) | 18.0 (43,159) |
| 2017 | 22.5 (4,747) | 18.1 (36,734) | 28.7 (3,092) | 19.3 (44,573) |
| Cefepime | 2015 | 5.8 (1,693) | nd | nd | 5.8 (1,693) |
| 2016 | 5.2 (1,750) | nd | nd | 5.2 (1,750) |
| 2017 | 4.7 (1,997) | nd | nd | 4.7 (1,997) |
| Cefoxitin | 2015 | 8.6 (1,325) | 6.1 (64,644) | nd | 6.1 (65,969) |
| 2016 | 6.1 (1,322) | 6.9 (68,785) | nd | 6.9 (70,107) |
| 2017 | 6.7 (1,602) | 7.3 (69,113) | nd | 7.3 (70,715) |
| Ceftazidime | 2015 | 7.7 (6,557) | 5.3 (27,228) | 8.4 (3,794) | 6.0 (37,579) |
| 2016 | 7.8 (5,601) | 6.5 (31,561) | 8.2 (3,905) | 6.9 (41,067) |
| 2017 | 8.5 (6,016) | 7.5 (31,893) | 9.7 (3,885) | 7.9 (41,794) |
| Ceftriaxone/cefotaxime | 2015 | 9.2 (14,920) | 6.3 (88,175) | 8.5 (18,844) | 7.0 (121,939) |
| 2016 | 9.4 (17,021) | 6.9 (91,576) | 9.9 (15,311) | 7.6 (123,908) |
| 2017 | 10.2 (17,685) | 7.5 (98,550) | 11.5 (15,076) | 8.3 (131,311) |
| Ciprofloxacin/norfloxacin | 2015 | 10.8 (8,300) | 7.1 (135,751) | 9.8 (5,865) | 7.4 (149,916) |
| 2016 | 10.5 (9,471) | 8.5 (149,892) | 10.5 (7,890) | 8.7 (167,253) |
| 2017 | 12.3 (9,902) | 10.0 (151,449) | 12.2 (7,794) | 10.2 (169,145) |
| Gentamicin | 2015 | 7.2 (8,344) | 4.7 (64,356) | 5.3 (11,192) | 5.0 (83,892) |
| 2016 | 7.1 (9,513) | 4.9 (90,091) | 6.6 (8,575) | 5.2 (108,179) |
| 2017 | 8.0 (10,147) | 5.2 (93,064) | 7.2 (8,312) | 5.6 (111,523) |
| Meropenem | 2015 | 0.0 (7,395) | 0.0 (27,235) | 0.1 (5,573) | 0.0 (40,203) |
| 2016 | 0.0 (8,944) | 0.0 (31,558) | 0.0 (7,287) | 0.0 (47,789) |
| 2017 | 0.0 (8,788) | 0.0 (33,231) | 0.0 (7,201) | 0.0 (49,220) |
| Nitrofurantoin | 2015 | 2.4 (3,017) | 1.3 (153,500) | 2.1 (5,639) | 1.3 (162,156) |
| 2016 | 2.3 (2,987) | 1.2 (161,846) | 2.1 (1,964) | 1.2 (166,797) |
| 2017 | 1.7 (3,326) | 1.1 (165,309) | 2.4 (1,996) | 1.1 (170,631) |
| Norfloxacin | 2015 | nd | 8.9 (73,131) | nd | 8.9 (73,131) |
| 2016 | nd | 9.9 (82,905) | nd | 9.9 (82,905) |
| 2017 | nd | 11.2 (84,224) | nd | 11.2 (84,224) |
| Piperacillin–tazobactam | 2015 | 5.2 (7,431) | 5.2 (27,571) | 7.2 (5,393) | 5.5 (40,395) |
| 2016 | 5.8 (8,579) | 5.2 (34,981) | 7.3 (7,636) | 5.6 (51,196) |
| 2017 | 6.2 (9,243) | 5.3 (37,773) | 8.8 (6,837) | 5.9 (53,853) |
| Tobramycin | 2015 | 7.0 (7,277) | 4.5 (31,191) | 6.1 (5,606) | 5.1 (44,074) |
| 2016 | 6.9 (8,020) | 5.0 (35,413) | 6.7 (5,708) | 5.5 (49,141) |
| 2017 | 8.7 (6,476) | 5.7 (36,604) | 7.1 (4,677) | 6.2 (47,757) |
| Trimethoprim | 2015 | 31.1 (5,203) | 22.0 (164,815) | 21.1 (8,964) | 22.2 (178,982) |
| 2016 | 30.3 (5,537) | 22.8 (175,054) | 23.9 (5,033) | 23.1 (185,624) |
| 2017 | 32.2 (5,953) | 24.1 (177,928) | 25.0 (4,746) | 24.4 (188,627) |
| Trimethoprim–sulfamethoxazole | 2015 | 28.3 (7,255) | 21.5 (27,741) | 20.4 (6,189) | 22.6 (41,185) |
| 2016 | 28.0 (8,263) | 22.3 (32,091) | 21.6 (7,917) | 23.2 (48,271) |
| 2017 | 28.9 (8,779) | 23.5 (33,156) | 22.7 (7,654) | 24.4 (49,589) |

nd = no data (either not tested or tested against an inadequate number of isolates)

Sources: AGAR (national); APAS (NSW, Vic, Qld, SA, WA, Tas, ACT); SNP (Qld, northern NSW)

## Table S4.8: Escherichia coli resistance (blood culture isolates), by state and territory, 2015–2017

| Antimicrobial | Year | NSW, % resistant | Vic, % resistant | Qld, % resistant | SA, % resistant | WA, % resistant | Tas, % resistant | NT, % resistant | ACT, % resistant | Australia, % resistant (n) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Amikacin | 2015 | 0.1 | 0.1 | 0.0 | 0.0 | 0.2 | 0.0 | 0.7 | 0.7 | 0.1 (3,994) |
| 2016 | 0.5 | 0.1 | 0.0 | 0.5 | 0.3 | 0.0 | 0.0 | 0.0 | 0.2 (4,096) |
| 2017 | 0.3 | 0.4 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 (4,355) |
| Amoxicillin–clavulanic acid | 2015 | 9.1 | 10.6 | 7.8 | 6.2 | 8.6 | 12.7 | 13.1 | 3.4 | 8.7 (3,995) |
| 2016 | 6.2 | 10.7 | 8.6 | 7.7 | 9.5 | 5.4 | 8.5 | 9.1 | 8.3 (4,060) |
| 2017 | 8.9 | 8.9 | 10.3 | 5.6 | 7.4 | 5.2 | 5.7 | 7.6 | 8.4 (4,354) |
| Ampicillin | 2015 | 57.6 | 59.8 | 53.1 | 45.5 | 55.7 | 45.6 | 59.9 | 51.0 | 55.1 (3,992) |
| 2016 | 54.7 | 60.5 | 53.0 | 48.6 | 56.1 | 48.8 | 65.4 | 57.1 | 55.2 (4,089) |
| 2017 | 56.9 | 55.5 | 52.9 | 43.8 | 57.5 | 42.0 | 59.6 | 50.6 | 54.4 (4,353) |
| Cefazolin | 2015 | 25.1 | 24.7 | 20.1 | 18.1 | 19.0 | 10.2 | 21.9 | 18.8 | 21.8 (3,764) |
| 2016 | 25.2 | 25.1 | 22.4 | 23.2 | 26.8 | 12.1 | 25.5 | 21.4 | 24.2 (3,991) |
| 2017 | 25.5 | 23.3 | 20.2 | 15.6 | 24.9 | 22.0 | 19.1 | 20.3 | 22.8 (4,307) |
| Cefepime | 2015 | 8.4 | 5.0 | 1.3 | 4.6 | 3.5 | 0.0 | 1.5 | 4.7 | 4.8 (3,994) |
| 2016 | 7.9 | 4.2 | 2.3 | 7.2 | 3.7 | 1.8 | 2.0 | 2.6 | 4.7 (4,094) |
| 2017 | 6.7 | 3.4 | 2.7 | 3.8 | 3.5 | 2.3 | 3.5 | 1.9 | 4.1 (4,354) |
| Cefoxitin | 2015 | 9.2 | 7.6 | 4.6 | 4.2 | 6.2 | 5.1 | 8.8 | 6.0 | 6.8 (3,994) |
| 2016 | 6.8 | 7.1 | 6.9 | 4.2 | 5.0 | 6.0 | 5.9 | 7.1 | 6.3 (4,091) |
| 2017 | 7.3 | 7.1 | 6.9 | 4.5 | 6.4 | 3.4 | 5.7 | 7.6 | 6.6 (4,353) |
| Ceftazidime | 2015 | 9.9 | 6.3 | 3.2 | 4.4 | 4.8 | 0.0 | 3.6 | 5.4 | 6.1 (3,994) |
| 2016 | 9.7 | 8.0 | 4.6 | 7.2 | 5.2 | 1.8 | 2.0 | 7.1 | 6.7 (4,095) |
| 2017 | 9.1 | 5.7 | 5.2 | 2.1 | 6.6 | 4.0 | 4.3 | 3.8 | 6.3 (4,355) |
| Ceftriaxone | 2015 | 15.2 | 12.1 | 6.1 | 7.3 | 9.4 | 0.0 | 8.8 | 10.7 | 10.5 (3,994) |
| 2016 | 14.9 | 13.4 | 7.8 | 11.6 | 11.2 | 6.0 | 9.2 | 9.1 | 11.5 (4,096) |
| 2017 | 13.5 | 14.0 | 9.4 | 4.2 | 11.3 | 5.2 | 9.2 | 11.4 | 11.2 (4,355) |
| Ciprofloxacin | 2015 | 17.7 | 14.4 | 8.7 | 9.0 | 16.2 | 7.6 | 9.5 | 10.7 | 13.6 (3,994) |
| 2016 | 17.3 | 15.7 | 9.0 | 13.3 | 15.7 | 10.7 | 9.8 | 13.6 | 14.0 (4,094) |
| 2017 | 16.3 | 15.6 | 12.9 | 8.3 | 16.2 | 5.7 | 15.6 | 12.0 | 14.4 (4,353) |
| Gentamicin | 2015 | 9.4 | 6.9 | 6.7 | 7.3 | 9.2 | 2.5 | 8.8 | 4.7 | 7.9 (3,994) |
| 2016 | 7.3 | 6.8 | 7.3 | 6.7 | 10.8 | 3.6 | 10.5 | 5.8 | 7.6 (4,095) |
| 2017 | 8.3 | 9.6 | 7.5 | 5.2 | 10.1 | 3.4 | 9.9 | 12.7 | 8.5 (4,353) |
| Meropenem | 2015 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 (3,993) |
| 2016 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 (4,095) |
| 2017 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 0.1 (4,353) |
| Piperacillin–tazobactam | 2015 | 6.3 | 7.4 | 7.5 | 4.6 | 5.7 | 5.1 | 6.6 | 3.4 | 6.3 (3,974) |
| 2016 | 5.0 | 7.8 | 6.8 | 4.4 | 9.2 | 4.8 | 7.2 | 3.3 | 6.5 (4,083) |
| 2017 | 6.3 | 4.3 | 7.3 | 4.2 | 7.1 | 2.9 | 3.5 | 5.1 | 5.9 (4,345) |
| Ticarcillin–clavulanic acid | 2015 | 25.3 | 22.2 | 19.4 | 20.9 | 18.0 | 13.9 | 19.7 | 14.1 | 21.1 (3,871) |
| 2016 | 25.8 | 20.2 | 18.2 | 24.4 | 22.9 | 18.5 | 21.6 | 18.3 | 21.7 (3,827) |
| 2017 | 24.5 | 15.1 | 18.8 | 10.7 | 18.6 | 14.9 | 17.0 | 13.9 | 18.4 (3,878) |
| Tobramycin | 2015 | 10.2 | 9.2 | 6.8 | 7.5 | 10.2 | 2.5 | 11.7 | 4.0 | 8.8 (3,982) |
| 2016 | 7.8 | 7.9 | 7.3 | 9.5 | 12.9 | 5.4 | 11.1 | 7.1 | 8.7 (4,095) |
| 2017 | 9.4 | 10.3 | 8.4 | 5.9 | 11.3 | 3.4 | 11.3 | 12.0 | 9.4 (4,355) |
| Trimethoprim | 2015 | 34.8 | 33.0 | 30.2 | 24.4 | 30.6 | 15.2 | 35.0 | 30.9 | 31.3 (3,982) |
| 2016 | 35.5 | 33.0 | 28.5 | 28.1 | 31.9 | 24.4 | 50.3 | 31.2 | 32.3 (4,091) |
| 2017 | 33.7 | 34.6 | 35.1 | 25.0 | 35.4 | 16.8 | 46.1 | 33.5 | 33.6 (4,353) |
| Trimethoprim–sulfamethoxazole | 2015 | 33.0 | 30.9 | 28.5 | 23.0 | 26.5 | 15.2 | 32.8 | 30.2 | 29.2 (3,990) |
| 2016 | 34.4 | 31.7 | 26.6 | 27.0 | 30.3 | 23.8 | 45.8 | 28.6 | 30.7 (4,094) |
| 2017 | 32.1 | 32.1 | 32.7 | 22.3 | 32.3 | 13.8 | 41.1 | 31.6 | 31.1 (4,350) |

Notes:

1. Not all isolates were tested against all agents.

2. The numbers of isolates for each state and territory are in the following table.

| Year | NSW | Vic | Qld | SA | WA | Tas | NT | ACT | Australia |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2015 | 1,107 | 727 | 691 | 454 | 651 | 79 | 137 | 149 | 3,995 |
| 2016 | 993 | 709 | 811 | 431 | 677 | 168 | 153 | 154 | 4,096 |
| 2017 | 1,170 | 794 | 858 | 289 | 771 | 174 | 141 | 158 | 4,355 |

Source: AGAR (national)

## Table S4.9: Klebsiella pneumoniae resistance, by specimen source, 2015–2017

| Antimicrobial | Year | Blood, % resistant (n) | Urine, % resistant (n) | Other, % resistant (n) | Total, % resistant (n) |
| --- | --- | --- | --- | --- | --- |
| Amikacin | 2015 | 0.3 (339) | nd | nd | 0.3 (339) |
| 2016 | 0.6 (320) | nd | nd | 0.6 (320) |
| 2017 | 0.9 (327) | nd | nd | 0.9 (327) |
| Amoxicillin–clavulanic acid | 2015 | 6.0 (1,705) | 4.9 (19,467) | 7.3 (2,821) | 5.2 (23,993) |
| 2016 | 5.6 (1,702) | 4.3 (20,614) | 7.6 (2,475) | 4.7 (24,791) |
| 2017 | 6.9 (1,815) | 6.2 (14,047) | 9.1 (2,661) | 6.7 (18,523) |
| Cefalexin | 2015 | nd | 5.6 (4,358) | 16.0 (94) | 5.9 (4,452) |
| 2016 | nd | 5.2 (4,264) | 11.4 (79) | 5.3 (4,343) |
| 2017 | 14.3 (35) | 6.2 (4,314) | 11.9 (67) | 6.4 (4,416) |
| Cefazolin | 2015 | 8.4 (1,208) | 7.3 (5,023) | 11.0 (2,065) | 8.4 (8,296) |
| 2016 | 9.4 (961) | 7.1 (5,698) | 10.2 (1,396) | 7.9 (8,055) |
| 2017 | 11.6 (1,046) | 7.6 (6,168) | 11.1 (1,341) | 8.6 (8,555) |
| Cefepime | 2015 | 3.4 (438) | nd | nd | 3.4 (438) |
| 2016 | 2.9 (417) | nd | nd | 2.9 (417) |
| 2017 | 3.9 (409) | nd | nd | 3.9 (409) |
| Cefoxitin | 2015 | 7.4 (339) | 3.3 (7,176) | nd | 3.5 (7,515) |
| 2016 | 7.5 (320) | 3.7 (8,056) | nd | 3.9 (8,376) |
| 2017 | 8.6 (327) | 4.2 (8,060) | nd | 4.4 (8,387) |
| Ceftazidime | 2015 | 4.7 (1,461) | 4.3 (4,598) | 5.3 (1,482) | 4.6 (7,541) |
| 2016 | 4.7 (1,158) | 3.7 (5,424) | 5.7 (1,446) | 4.2 (8,028) |
| 2017 | 6.8 (1,217) | 4.5 (5,584) | 6.2 (1,498) | 5.1 (8,299) |
| Ceftriaxone/cefotaxime | 2015 | 5.1 (3,156) | 5.0 (14,054) | 6.2 (5,495) | 5.3 (22,705) |
| 2016 | 5.1 (3,209) | 4.3 (16,791) | 5.6 (5,075) | 4.7 (25,075) |
| 2017 | 6.6 (3,370) | 5.2 (17,993) | 7.6 (5,372) | 5.9 (26,735) |
| Ciprofloxacin/norfloxacin | 2015 | 4.9 (1,799) | 4.5 (18,172) | 4.7 (1,997) | 4.6 (21,968) |
| 2016 | 4.2 (1,817) | 4.7 (20,384) | 4.1 (2,618) | 4.6 (24,819) |
| 2017 | 7.0 (1,899) | 6.0 (20,395) | 6.1 (2,735) | 6.1 (25,029) |
| Gentamicin | 2015 | 3.9 (1,808) | 3.1 (9,432) | 3.9 (3,110) | 3.4 (14,350) |
| 2016 | 3.5 (1,834) | 2.6 (11,027) | 3.7 (2,842) | 2.9 (15,703) |
| 2017 | 4.1 (1,906) | 2.9 (11,725) | 4.2 (2,972) | 3.3 (16,603) |
| Meropenem | 2015 | 0.2 (1,754) | 0.2 (4,599) | 0.4 (1,780) | 0.2 (8,133) |
| 2016 | 0.2 (1,730) | 0.2 (5,428) | 0.6 (2,310) | 0.3 (9,468) |
| 2017 | 0.4 (1,820) | 0.2 (5,683) | 0.6 (2,584) | 0.3 (10,087) |
| Nitrofurantoin | 2015 | 64.9 (353) | 40.1 (17,679) | 51.7 (725) | 41.1 (18,757) |
| 2016 | 61.6 (297) | 37.1 (17,152) | 63.7 (553) | 38.3 (18,002) |
| 2017 | 59.2 (272) | 37.0 (17,750) | 48.9 (560) | 37.7 (18,582) |
| Norfloxacin | 2015 | nd | 5.2 (11,038) | nd | 5.2 (11,038) |
| 2016 | nd | 5.5 (12,369) | nd | 5.5 (12,369) |
| 2017 | nd | 6.5 (12,368) | nd | 6.5 (12,368) |
| Piperacillin–tazobactam | 2015 | 5.3 (1,633) | 8.3 (4,758) | 7.5 (1,756) | 7.5 (8,147) |
| 2016 | 7.1 (1,683) | 7.8 (6,055) | 8.1 (2,572) | 7.8 (10,310) |
| 2017 | 7.7 (1,860) | 8.2 (6,522) | 9.5 (2,697) | 8.4 (11,079) |
| Tobramycin | 2015 | 4.2 (1,607) | 3.5 (5,452) | 3.7 (1,788) | 3.7 (8,847) |
| 2016 | 4.3 (1,584) | 2.9 (6,152) | 4.3 (1,791) | 3.4 (9,527) |
| 2017 | 5.1 (1,680) | 3.1 (6,471) | 5.5 (1,802) | 3.9 (9,953) |
| Trimethoprim | 2015 | 13.1 (1,181) | 12.5 (19,508) | 10.1 (1,691) | 12.4 (22,380) |
| 2016 | 14.4 (1,130) | 11.7 (21,549) | 9.3 (1,573) | 11.6 (24,252) |
| 2017 | 15.7 (1,194) | 12.7 (22,179) | 11.0 (1,606) | 12.7 (24,979) |
| Trimethoprim–sulfamethoxazole | 2015 | 11.2 (1,608) | 8.1 (4,821) | 7.5 (1,986) | 8.6 (8,415) |
| 2016 | 12.2 (1,627) | 8.3 (5,521) | 7.7 (2,520) | 8.8 (9,668) |
| 2017 | 12.3 (1,738) | 9.1 (5,791) | 9.8 (2,640) | 9.8 (10,169) |

nd = no data (either not tested or tested against an inadequate number of isolates)

Note: Klebsiella pneumoniae is considered intrinsically resistant to amoxicillin/ampicillin.

Sources: AGAR (national); APAS (NSW, Vic, Qld, SA, WA, Tas, ACT); SNP (Qld, northern NSW)

## Table S4.10: Klebsiella pneumoniae resistance (blood culture isolates), by state and territory, 2015–2017

| Antimicrobial | Year | NSW, % resistant | Vic, % resistant | Qld, % resistant | SA, % resistant | WA, % resistant | Tas, % resistant | NT, % resistant | ACT, % resistant | Australia, % resistant (n) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Amikacin | 2015 | 0.0 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 (974) |
| 2016 | 0.4 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 (953) |
| 2017 | 0.4 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 3.3 | 0.0 | 0.3 (997) |
| Amoxicillin–clavulanic acid | 2015 | 5.1 | 5.6 | 3.7 | 2.4 | 2.1 | 5.6 | 4.3 | 8.6 | 4.2 (974) |
| 2016 | 6.7 | 8.0 | 3.7 | 2.5 | 3.4 | 5.7 | 0.0 | 0.0 | 4.9 (947) |
| 2017 | 4.5 | 6.6 | 4.5 | 5.6 | 5.9 | 4.5 | 6.7 | 7.4 | 5.3 (995) |
| Cefazolin | 2015 | 10.6 | 16.7 | 9.0 | 8.2 | 8.5 | 11.1 | 17.0 | 8.6 | 10.9 (916) |
| 2016 | 13.4 | 16.1 | 7.4 | 8.9 | 10.6 | 5.9 | 10.5 | 3.0 | 11.2 (930) |
| 2017 | 11.2 | 21.3 | 8.1 | 16.4 | 9.9 | 6.3 | 10.0 | 14.8 | 12.5 (990) |
| Cefepime | 2015 | 3.8 | 3.4 | 1.6 | 2.4 | 0.5 | 0.0 | 2.1 | 0.0 | 2.3 (974) |
| 2016 | 5.4 | 2.2 | 1.6 | 2.5 | 2.3 | 2.9 | 2.6 | 0.0 | 2.8 (953) |
| 2017 | 4.1 | 4.1 | 1.2 | 7.1 | 4.6 | 4.5 | 6.7 | 3.7 | 3.7 (997) |
| Cefoxitin | 2015 | 11.0 | 6.2 | 4.8 | 4.7 | 4.3 | 0.0 | 4.3 | 5.7 | 6.4 (974) |
| 2016 | 6.7 | 9.4 | 5.8 | 6.3 | 4.0 | 0.0 | 5.3 | 6.1 | 6.2 (953) |
| 2017 | 6.7 | 8.6 | 5.7 | 3.6 | 9.9 | 0.0 | 3.3 | 7.4 | 6.9 (996) |
| Ceftazidime | 2015 | 6.8 | 9.6 | 3.2 | 2.4 | 2.1 | 5.6 | 2.1 | 2.9 | 4.9 (974) |
| 2016 | 6.7 | 11.1 | 2.6 | 3.8 | 2.9 | 2.9 | 2.6 | 3.0 | 5.4 (953) |
| 2017 | 6.0 | 12.7 | 1.6 | 1.8 | 3.9 | 4.5 | 6.7 | 11.1 | 5.8 (997) |
| Ceftriaxone | 2015 | 6.8 | 10.2 | 3.7 | 3.5 | 3.7 | 5.6 | 6.4 | 2.9 | 5.7 (974) |
| 2016 | 8.9 | 10.6 | 3.7 | 6.3 | 5.7 | 5.7 | 2.6 | 3.0 | 6.8 (953) |
| 2017 | 7.9 | 19.8 | 3.3 | 7.1 | 5.9 | 4.5 | 6.7 | 14.8 | 8.8 (997) |
| Ciprofloxacin | 2015 | 7.2 | 11.9 | 6.3 | 4.7 | 5.9 | 5.6 | 4.3 | 5.7 | 7.2 (974) |
| 2016 | 8.0 | 13.3 | 4.2 | 6.3 | 2.9 | 5.7 | 2.6 | 3.0 | 6.7 (953) |
| 2017 | 6.0 | 17.8 | 6.1 | 3.6 | 6.6 | 0.0 | 6.7 | 11.1 | 8.3 (996) |
| Gentamicin | 2015 | 5.9 | 4.0 | 3.2 | 5.9 | 2.7 | 5.6 | 10.6 | 2.9 | 4.5 (974) |
| 2016 | 5.8 | 5.0 | 3.7 | 2.5 | 4.6 | 2.9 | 0.0 | 3.0 | 4.3 (953) |
| 2017 | 4.9 | 9.1 | 2.4 | 5.5 | 3.9 | 4.5 | 0.0 | 7.4 | 4.9 (996) |
| Meropenem | 2015 | 0.0 | 0.6 | 0.0 | 1.2 | 0.0 | 0.0 | 0.0 | 2.9 | 0.3 (974) |
| 2016 | 0.0 | 0.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 (953) |
| 2017 | 0.4 | 1.0 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 (995) |
| Piperacillin–tazobactam | 2015 | 6.4 | 7.4 | 7.1 | 4.7 | 4.3 | 5.6 | 12.8 | 5.7 | 6.4 (966) |
| 2016 | 8.1 | 10.7 | 5.3 | 3.8 | 6.9 | 0.0 | 10.5 | 3.0 | 7.1 (948) |
| 2017 | 7.5 | 8.2 | 6.1 | 9.1 | 7.3 | 4.5 | 3.3 | 11.1 | 7.3 (990) |
| Ticarcillin–clavulanic acid | 2015 | 10.8 | 13.0 | 7.9 | 10.6 | 8.0 | 11.1 | 8.5 | 11.4 | 10.0 (951) |
| 2016 | 15.6 | 17.2 | 9.0 | 7.5 | 10.3 | 8.6 | 7.9 | 6.1 | 12.0 (909) |
| 2017 | 9.7 | 15.2 | 8.9 | 17.2 | 9.2 | 4.5 | 13.3 | 11.1 | 10.9 (898) |
| Tobramycin | 2015 | 6.8 | 6.8 | 3.8 | 5.9 | 3.2 | 5.6 | 10.6 | 2.9 | 5.5 (969) |
| 2016 | 5.8 | 10.0 | 3.7 | 3.8 | 5.1 | 2.9 | 2.6 | 3.0 | 5.6 (953) |
| 2017 | 5.2 | 14.2 | 3.3 | 5.4 | 3.3 | 4.5 | 6.7 | 11.1 | 6.4 (997) |
| Trimethoprim | 2015 | 15.3 | 19.8 | 15.2 | 14.1 | 11.8 | 22.2 | 17.0 | 31.4 | 16.1 (969) |
| 2016 | 18.3 | 26.1 | 14.3 | 20.3 | 8.6 | 11.4 | 10.5 | 12.1 | 16.6 (953) |
| 2017 | 18.0 | 25.9 | 14.6 | 12.7 | 13.2 | 9.1 | 23.3 | 25.9 | 17.9 (996) |
| Trimethoprim–sulfamethoxazole | 2015 | 12.3 | 16.4 | 14.8 | 9.4 | 6.4 | 16.7 | 14.9 | 28.6 | 12.9 (974) |
| 2016 | 14.3 | 22.8 | 13.8 | 15.2 | 6.9 | 11.4 | 10.5 | 15.2 | 14.3 (953) |
| 2017 | 15.7 | 23.9 | 13.0 | 9.3 | 10.5 | 9.1 | 23.3 | 18.5 | 15.7 (995) |

Notes:

1. Klebsiella pneumoniae is considered intrinsically resistant to amoxicillin/ampicillin.

2. Not all isolates were tested against all agents.

3. The numbers of isolates for each state and territory are in the following table.

| Year | NSW | Vic | Qld | SA | WA | Tas | NT | ACT | Australia |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2015 | 236 | 177 | 189 | 85 | 187 | 18 | 47 | 35 | 974 |
| 2016 | 224 | 180 | 189 | 79 | 175 | 35 | 38 | 33 | 953 |
| 2017 | 267 | 197 | 246 | 56 | 152 | 22 | 30 | 27 | 997 |

Source: AGAR (national)

## Table S4.11: Mycobacterium tuberculosis resistance to first-line antimycobacterial agents, 2008–2017

| Isolates and resistance patterns | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Total TB cases notified to NNDSS\* | 1,220 | 1,307 | 1,362 | 1,386 | 1,315 | 1,260 | 1,343 | 1,248 | 1,370 | 1,446 |
| Total number of laboratory isolates† | 942 | 974 | 1,033 | 1,058 | 985 | 938 | 1,035 | 975 | 1,035 | 1,066 |
| Fully susceptible | 826 | 831 | 910 | 940 | 853 | 814 | 904 | 839 | 906 | 945 |
| Resistant to isoniazid only§ | 62 | 94 | 68 | 65 | 75 | 68 | 73 | 66 | 70 | 69 |
| Resistant to rifampicin only§ | 2 | 6 | 3 | 1 | 2 | 3 | 6 | 7 | 3 | 2 |
| Resistant to isoniazid and rifampicin (susceptible to ethambutol and pyrazinamide) | 12 | 15 | 13 | 19 | 15 | 10 | 8 | 11 | 12 | 11 |
| Resistant to isoniazid, rifampicin and ethambutol (susceptible to pyrazinamide) | 7 | 1 | 1 | 2 | 2 | 4 | 1 | 2 | 3 | 6 |
| Resistant to isoniazid, rifampicin and pyrazinamide (susceptible to ethambutol) | 3 | 8 | 16 | 2 | 1 | 2 | 3 | 9 | 1 | 3 |
| Resistant to isoniazid, rifampicin, ethambutol and pyrazinamide | 1 | 0 | 1 | 4 | 3 | 7 | 6 | 7 | 9 | 1 |
| Total MDR strains (resistant to at least isoniazid and rifampicin; sum of above 4 rows) | 23 | 24 | 31 | 27 | 21 | 23 | 18 | 29 | 25 | 21 |
| Percentage of all laboratory isolates that are MDR-TB | 2.4 | 2.5 | 3.0 | 2.6 | 2.1 | 2.5 | 1.7 | 3.0 | 2.4 | 2.0 |
| XDR-TB (resistant to at least isoniazid and rifampicin, plus fluoroquinolone and an injectable agent) | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 2 | 0 | 0 |

MDR = multidrug-resistant; MDR-TB = multidrug-resistant tuberculosis; NNDSS = National Notifiable Diseases Surveillance System; TB = tuberculosis; XDR-TB = extremely drug-resistant tuberculosis

\* Clinically diagnosed cases of tuberculosis are reported to the NNDSS.

† Some laboratory isolates may have been tested against agents other than first-line agents.

§ Notified cases may have reported resistance to antimicrobials other than first-line agents.

Note: Some numbers for 2008–2017 differ from those published in AURA 2017 because of additional data received.

Source: NNDSS snapshot 580 and 581 (31 July 2018)

## Table S4.12: Mycobacterium tuberculosis notifications and resistance, by state and territory, 2016

| State or territory | Total TB cases notified to NNDSS | Total isolates tested | Isoniazid\*, % resistant (n) | Rifampicin\*, % resistant (n) | Ethambutol\*, % resistant (n) | Pyrazinamide\*, % resistant (n) | Fluoroquinolones†§, % resistant (n) | Kanamycin†, % resistant (n) | Capreomycin†, % resistant (n) | Amikacin†, % resistant (n) | Ethionamide/prothionamide†, % resistant (n) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NSW | 533 | 364 | 11.1 (40) | 1.4 (5) | 0.8 (3) | 1.4 (5) | 18.2 (2) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 40.0 (2) |
| Vic | 366 | 299 | 9.2 (27) | 3.4 (10) | 1.4 (4) | 1.4 (4) | 7.1 (2) | 6.9 (2) | 3.6 (1) | 0.0 (0) | 27.6 (8) |
| Qld | 188 | 163 | 7.1 (11) | 3.7 (6) | 2.6 (4) | 3.2 (5) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 55.6 (5) |
| SA | 85 | 58 | 5.3 (3) | 3.4 (2) | 1.7 (1) | 100.0 (1) | 0.0 (0) | 0.0 (0) | 33.3 (1) | 0.0 (0) | 0.0 (0) |
| WA | 143 | 107 | 8.4 (9) | 2.8 (3) | 0.0 (0) | 2.8 (3) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 50.0 (1) |
| Tas | 9 | 8 | 25.0 (2) | 12.5 (1) | 25.0 (2) | 12.5 (1) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.0 (0) |
| NT | 22 | 18 | 11.8 (2) | 5.9 (1) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.0 (0) |
| ACT | 24 | 18 | 5.6 (1) | 5.6 (1) | 5.6 (1) | 5.6 (1) | 100.0 (1) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.0 (0) |
| **Australia** | **1,370** | **1,035** | **9.4 (95)** | **2.8 (29)** | **1.5 (15)** | **2.1 (20)** | **9.1 (5)** | **4.9 (2)** | **4.3 (2)** | **0.0 (0)** | **33.3 (16)** |

NNDSS = National Notifiable Diseases Surveillance System; TB = tuberculosis

\* Routinely tested agents

† Selectively tested agents

§ Fluoroquinolones include ciprofloxacin, ofloxacin, moxifloxacin and levofloxacin.

Source: NNDSS snapshot 580 and 581 (31 July 2018)

## Table S4.13: Mycobacterium tuberculosis notifications and resistance, by state and territory, 2017

| State or territory | Total TB cases notified to NNDSS | Total isolates tested | Isoniazid\*, % resistant (n) | Rifampicin\*, % resistant (n) | Ethambutol\*, % resistant (n) | Pyrazinamide\*, % resistant (n) | Fluoroquinolones†§, % resistant (n) | Kanamycin†, % resistant (n) | Capreomycin†, % resistant (n) | Amikacin†, % resistant (n) | Ethionamide/prothionamide†, % resistant (n) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NSW | 544 | 374 | 8.9 (32) | 2.2 (8) | 0.6 (2) | 2.0 (7) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 57.1 (4) |
| Vic | 444 | 336 | 6.7 (22) | 0.9 (3) | 0.3 (1) | 0.6 (2) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 15.4 (4) |
| Qld | 202 | 169 | 10.5 (17) | 3.6 (6) | 0.6 (1) | 3.1 (5) | 6.3 (1) | 6.3 (1) | 7.1 (1) | 6.3 (1) | 71.4 (10) |
| SA | 70 | 47 | 12.8 (6) | 4.3 (2) | 2.1 (1) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 20.0 (1) | 0.0 (0) | 0.0 (0) |
| WA | 132 | 96 | 8.3 (8) | 1.1 (1) | 1.1 (1) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.0 (0) |
| Tas | 10 | 10 | 30.0 (3) | 20.0 (2) | 10.0 (1) | 10.0 (1) | 50.0 (1) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 50.0 (1) |
| NT | 21 | 18 | 5.6 (1) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 100.0 (1) |
| ACT | 23 | 16 | 18.8 (3) | 6.3 (1) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 100.0 (1) |
| **Australia** | **1,446** | **1,066** | **8.9 (92)** | **2.2 (23)** | **0.7 (7)** | **1.5 (15)** | **3.2 (2)** | **2.3 (1)** | **3.6 (2)** | **2.0 (1)** | **41.2 (21)** |

NNDSS = National Notifiable Diseases Surveillance System; TB = tuberculosis

\* Routinely tested agents

† Selectively tested agents

§ Fluoroquinolones include ciprofloxacin, ofloxacin, moxifloxacin and levofloxacin.

Source: NNDSS snapshot 580 and 581 (31 July 2018)

## Table S4.14: Neisseria gonorrhoeae decreased susceptibility and resistance, 2000–2017

| Year | Isolates tested | Ceftriaxone, % decreased susceptibility\* (n) | Ciprofloxacin, % resistant† (n) | Azithromycin, % resistant§ (n) | Penicillin, % resistant# (n) |
| --- | --- | --- | --- | --- | --- |
| 2000 | 3,468 | nd | 17.8 (619) | nd | 19.6 (679) |
| 2001 | 3,641 | nd | 17.5 (638) | nd | 22.9 (832) |
| 2002 | 3,861 | 0.5 (21) | 10.1 (389) | nd | 18.0 (695) |
| 2003 | 3,677 | 0.3 (10) | 12.3 (452) | nd | 17.4 (639) |
| 2004 | 3,542 | 0.7 (24) | 21.4 (757) | nd | 21.7 (770) |
| 2005 | 3,886 | 1.2 (48) | 28.6 (1,113) | nd | 29.5 (1,148) |
| 2006 | 3,850 | 0.6 (23) | 36.7 (1,413) | nd | 33.9 (1,306) |
| 2007 | 3,042 | 0.8 (25) | 47.9 (1,456) | nd | 38.2 (1,163) |
| 2008 | 3,109 | 0.8 (25) | 53.1 (1,651) | nd | 44.0 (1,367) |
| 2009 | 3,157 | 2.0 (64) | 42.6 (1,346) | 1.1 (25)\*\* | 36.2 (1,142) |
| 2010 | 3,997 | 4.8 (192) | 33.7 (1,348) | 1.1 (35)\*\* | 29.0 (1,161) |
| 2011 | 4,133 | 3.2 (134) | 26.6 (1,099) | 1.5 (49)\*\* | 25.5 (1,053) |
| 2012 | 4,718 | 4.4 (207) | 30.3 (1,428) | 1.3 (63) | 32.1 (1,513) |
| 2013 | 4,897 | 8.8 (429)‡ | 34.1 (1,669) | 2.1 (104) | 34.7 (1,700) |
| 2014 | 4,804 | 5.4 (258) | 36.4 (1,750) | 2.5 (119) | 29.5 (1,370) |
| 2015 | 5,411 | 1.8 (98) | 27.2 (1,473) | 2.6 (138) | 22.5 (1,217) |
| 2016 | 6,378 | 1.7 (109) | 30.0 (1,912) | 5.0 (318) | 32.5 (2,076) |
| 2017 | 7,835 | 1.1 (83) | 27.5 (2,154) | 9.3 (726) | 26.1 (2,045) |

nd = no data available

\* Decreased susceptibility to ceftriaxone: minimum inhibitory concentration (MIC) 0.06–0.125 mg/L

† Resistance to ciprofloxacin: MIC ≥1 mg/L

§ Resistance to azithromycin: MIC ≥1 mg/L

# Resistance to penicillin: penicillinase-producing or chromosomal resistance (MIC ≥1 mg/L)

\*\* Excluding Victoria, because azithromycin data are not available

‡ An additional isolate from the Northern Territory in 2013 had an MIC of 0.5 mg/L to ceftriaxone, the highest recorded in Australia (see Lahra et al. N Engl J Med 2014;371:1850–1)

Source: NNN (Australian Gonococcal Surveillance Programme annual reports)

## Table S4.15: Neisseria gonorrhoeae decreased susceptibility and resistance, by state and territory, 2015–2017

| State or territory | Year | Isolates tested | Ceftriaxone, % decreased susceptibility\* (n) | Ciprofloxacin, % resistant† (n) | Azithromycin, % resistant§ (n) | Penicillin, % resistant# (n) |
| --- | --- | --- | --- | --- | --- | --- |
| NSW | 2015 | 1,905 | 2.7 (52) | 35.9 (684) | 2.3 (43) | 30.9 (588) |
| 2016 | 2,268 | 2.0 (45) | 32.5 (738) | 3.6 (82) | 41.8 (949) |
| 2017 | 2,806 | 0.5 (13) | 30.5 (857) | 9.3 (261) | 25.3 (709) |
| Vic | 2015 | 1,695 | 1.5 (25) | 23.0 (383) | 1.8 (30) | 15.2 (257) |
| 2016 | 1,734 | 1.1 (19) | 37.0 (641) | 5.4 (93) | 34.5 (598) |
| 2017 | 2,258 | 2.1 (48) | 30.6 (691) | 13.5 (304) | 29.6 (668) |
| Qld | 2015 | 728 | 1.0 (7) | 25.5 (186) | 5.8 (42) | 27.6 (201) |
| 2016 | 865 | 3.7 (32) | 25.0 (216) | 1.2 (10) | 28.1 (243) |
| 2017 | 1,249 | 0.9 (11) | 21.2 (265) | 4.9 (61) | 26.0 (325) |
| SA | 2015 | 251 | 3.6 (9) | 41.0 (103) | 2.8 (7) | 20.7 (52) |
| 2016 | 349 | 0.6 (2) | 36.4 (127) | 19.5 (68) | 38.7 (135) |
| 2017 | 359 | 0.6 (2) | 37.9 (136) | 12.8 (46) | 41.5 (149) |
| WA: urban and rural | 2015 | 395 | 1.3 (5) | 20.8 (82) | 3.8 (15) | 19.5 (77) |
| 2016 | 672 | 1.3 (9) | 20.5 (138) | 7.6 (51) | 16.7 (112) |
| 2017 | 624 | 1.4 (9) | 18.4 (115) | 6.4 (40) | 20.0 (125) |
| WA: remote | 2015 | 87 | 0.0 (0) | 3.4 (3) | 0.0 (0) | 2.3 (2) |
| 2016 | 132 | 0.0 (0) | 4.5 (6) | 0.8 (1) | 5.3 (7) |
| 2017 | 119 | 0.0 (0) | 5.0 (6) | 3.4 (4) | 6.7 (8) |
| Tas | 2015 | 23 | 0.0 (0) | 0.0 (0) | 4.3 (1) | 8.7 (2) |
| 2016 | 28 | 3.6 (1) | 28.6 (8) | 14.3 (4) | 28.6 (8) |
| 2017 | 59 | 0.0 (0) | 61.0 (36) | 8.5 (5) | 44.1 (26) |
| NT: urban and rural | 2015 | 76 | 0.0 (0) | 10.5 (8) | 0.0 (0) | 14.5 (11) |
| 2016 | 53 | 0.0 (0) | 28.3 (15) | 1.9 (1) | 13.2 (7) |
| 2017 | 58 | 0.0 (0) | 17.2 (10) | 1.7 (1) | 10.3 (6) |
| NT: remote | 2015 | 182 | 0.0 (0) | 3.3 (6) | 0.0 (0) | 2.2 (4) |
| 2016 | 165 | 0.0 (0) | 3.0 (5) | 0.0 (0) | 3.0 (5) |
| 2017 | 158 | 0.0 (0) | 1.3 (2) | 0.6 (1) | 2.5 (4) |
| ACT | 2015 | 69 | 0.0 (0) | 26.1 (18) | 0.0 (0) | 33.3 (23) |
| 2016 | 112 | 0.9 (1) | 16.1 (18) | 7.1 (8) | 10.7 (12) |
| 2017 | 145 | 0.0 (0) | 24.8 (36) | 2.1 (3) | 17.2 (25) |
| **Australia** | **2015** | **5,411** | **1.8 (98)** | **27.2 (1,473)** | **2.6 (138)** | **22.5 (1,217)** |
| **2016** | **6,378** | **1.7 (109)** | **30.0 (1,912)** | **5.0 (318)** | **32.5 (2,076)** |
| **2017** | **7,835** | **1.1 (83)** | **27.5 (2,154)** | **9.3 (726)** | **26.1 (2,045)** |

\* Decreased susceptibility to ceftriaxone: minimum inhibitory concentration (MIC) 0.06–0.125 mg/L

† Resistance to ciprofloxacin: MIC ≥1 mg/L

§ Resistance to azithromycin: MIC ≥1 mg/L

# Resistance to penicillin: penicillinase-producing or chromosomal resistance (MIC ≥1 mg/L)

Source: NNN (Australian Gonococcal Surveillance Programme annual reports)

## Table S4.16: Neisseria gonorrhoeae decreased susceptibility to ceftriaxone (MIC 0.06–0.125 mg/L), by state and territory, 2010–2017

| State or territory | 2010, % of all isolates (n) | 2011, % of all isolates (n) | 2012, % of all isolates (n) | 2013, % of all isolates (n) | 2014, % of all isolates (n) | 2015, % of all isolates (n) | 2016, % of all isolates (n) | 2017, % of all isolates (n) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NSW | 5.6 (74) | 4.4 (58) | 4.5 (76) | 11.8 (183) | 7.1 (119) | 2.7 (52) | 2.0 (45) | 0.5 (13) |
| Vic | 5.7 (52) | 5.3 (50) | 8.4 (105) | 11.8 (181) | 6.6 (95) | 1.5 (25) | 1.1 (19) | 2.1 (48) |
| Qld | 3.2 (26) | 2.3 (18) | 2.4 (17) | 4.9 (33) | 3.2 (21) | 1.0 (7) | 3.7 (32) | 0.9 (11) |
| SA | 11.6 (19) | 0.7 (1) | 0.7 (1) | 1.9 (4) | 1.0 (2) | 3.6 (9) | 0.6 (2) | 0.6 (2) |
| WA: total | 5.2 (17) | 0.7 (3) | 1.2 (6) | 2.7 (13) | – | – | – | – |
| WA: urban and rural | 0.0 (0) | nd | nd | nd | 3.6 (14) | 1.3 (5) | 1.3 (9) | 1.4 (9) |
| WA: remote | 0.0 (0) | nd | nd | nd | 0.9 (1) | 0.0 (0) | 0.0 (0) | 0.0 (0) |
| Tas | 0.0 (0) | 0.0 (0) | 0.0 (0) | 24.4 (11) | 0.0 (0) | 0.0 (0) | 3.6 (1) | 0.0 (0) |
| NT: urban and rural | 0.2 (1) | 0.4 (2) | 0.0 (0) | 1.9 (2) | 3.0 (3) | 0.0 (0) | 0.0 (0) | 0.0 (0) |
| NT: remote | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.8 (2) | 0.8 (1) | 0.0 (0) | 0.0 (0) | 0.0 (0) |
| ACT | 6.7 (2) | 3.1 (2) | 3.6 (2) | 0.0 (0) | 2.7 (2) | 0.0 (0) | 0.9 (1) | 0.0 (0) |
| **Australia** | **4.8 (191)** | **3.2 (134)** | **4.4 (207)** | **8.8 (429)** | **5.4 (258)** | **1.8 (98)** | **1.7 (109)** | **1.1 (83)** |

– = total for state or territory separated into urban and rural, and remote; MIC = minimum inhibitory concentration; nd = no data available

Note: An additional isolate from the Northern Territory in 2013 had an MIC of 0.5 mg/L to ceftriaxone, the highest recorded in Australia (see Lahra et al. N Engl J Med 2014;371:1850–1).

Source: NNN (Australian Gonococcal Surveillance Programme annual reports)

## Table S4.17: Percentage of Neisseria gonorrhoeae isolates with decreased susceptibility to ceftriaxone (MIC 0.06–0.125 mg/L), 2010–2017

| Ceftriaxone MIC (mg/L) | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0.06 | 4.80 | 3.20 | 4.10 | 8.20 | 4.80 | 1.70 | 1.65 | 1.02 |
| 0.125 | 0.10 | 0.10 | 0.30 | 0.60 | 0.60 | 0.10 | 0.05 | 0.04 |

MIC = minimum inhibitory concentration

Note: An additional isolate from the Northern Territory in 2013 had an MIC of 0.5 mg/L to ceftriaxone, the highest recorded in Australia (see Lahra et al. N Engl J Med 2014;371:1850–1).

Source: NNN (Australian Gonococcal Surveillance Programme annual reports)

## Table S4.18: Neisseria gonorrhoeae resistance to ciprofloxacin (MIC ≥1 mg/L), by state and territory, 2010–2017

| State or territory | 2010, % of all isolates (n) | 2011, % of all isolates (n) | 2012, % of all isolates (n) | 2013, % of all isolates (n) | 2014, % of all isolates (n) | 2015, % of all isolates (n) | 2016, % of all isolates (n) | 2017, % of all isolates (n) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NSW | 40.0 (522) | 33.0 (431) | 32.0 (539) | 35.0 (553) | 43.0 (726) | 35.9 (684) | 32.5 (738) | 30.5 (857) |
| Vic | 42.0 (377) | 40.0 (374) | 46.0 (572) | 44.0 (683) | 39.0 (559) | 22.6 (383) | 37.0 (641) | 30.6 (691) |
| Qld | 27.0 (223) | 15.0 (114) | 17.0 (120) | 29.0 (194) | 28.0 (184) | 25.5 (186) | 25.0 (216) | 21.2 (265) |
| SA | 59.0 (59) | 23.0 (35) | 33.0 (49) | 26.0 (56) | 42.0 (86) | 41.0 (103) | 36.4 (127) | 37.9 (136) |
| WA: total | 39.0 (128) | 21.0 (88) | 24.0 (123) | 25.0 (123) | – | – | – | – |
| WA: urban and rural | nd | nd | nd | nd | 30.0 (117) | 20.8 (82) | 20.5 (138) | 18.4 (115) |
| WA: remote | nd | nd | nd | nd | 5.6 (6) | 3.4 (3) | 4.5 (6) | 5.0 (6) |
| Tas | 64.0 (7) | 40.0 (2) | 36.0 (5) | 49.0 (22) | 27.0 (8) | 0.0 (0) | 28.6 (8) | 61.0 (36) |
| NT: total | 3.6 (15) | 3.5 (16) | 2.8 (9) | – | – | – | – | – |
| NT: urban and rural | nd | nd | nd | 23.0 (24) | 27.0 (27) | 10.5 (8) | 28.3 (15) | 17.2 (10) |
| NT: remote | nd | nd | nd | 2.1 (5) | 3.1 (4) | 3.3 (6) | 1.3 (2) | 3.0 (5) |
| ACT | 57.0 (17) | 14.0 (9) | 34.0 (19) | 20.0 (9) | 44.0 (33) | 26.1 (18) | 16.1 (18) | 24.8 (36) |
| **Australia** | **34.0 (1,348)** | **26.0 (1,069)** | **30.0 (1,436)** | **34.0 (1,669)** | **36.0 (1,750)** | **27.2 (1,473)** | **30.0 (1,912)** | **27.5 (2,154)** |

– = total for state or territory separated into urban and rural, and remote; MIC = minimum inhibitory concentration; nd = no data available

Source: NNN (Australian Gonococcal Surveillance Programme annual reports)

## Table S4.19: Neisseria gonorrhoeae resistance to azithromycin (MIC ≥1 mg/L), by state and territory, 2010–2017

| State or territory | 2010, % of all isolates (n) | 2011, % of all isolates (n) | 2012, % of all isolates (n) | 2013, % of all isolates (n) | 2014, % of all isolates (n) | 2015, % of all isolates (n) | 2016, % of all isolates (n) | 2017, % of all isolates (n) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NSW | 0.7 (9) | 0.3 (4) | 0.5 (9) | 0.9 (14) | 2.0 (33) | 2.3 (43) | 3.6 (82) | 9.3 (261) |
| Vic | nd | nd | 2.7 (34) | 2.3 (35) | 2.3 (33) | 1.8 (30) | 5.4 (93) | 13.5 (304) |
| Qld | 1.5 (12) | 2.7 (21) | 2.1 (15) | 5.7 (38) | 3.5 (23) | 5.8 (42) | 1.2 (10) | 4.9 (61) |
| SA | 7.3 (12) | 11.0 (16) | 0.7 (1) | 2.8 (6) | 0.5 (1) | 2.8 (7) | 19.5 (68) | 12.8 (46) |
| WA: total | 0.6 (2) | 0.7 (3) | 0.6 (3) | 1.9 (9) | – | – | – | – |
| WA: urban and rural | nd | nd | nd | nd | 5.3 (21) | 3.8 (15) | 7.6 (51) | 6.4 (40) |
| WA: remote | nd | nd | nd | nd | 0.0 (0) | 0.0 (0) | 0.8 (1) | 3.4 (4) |
| Tas | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 3.3 (1) | 4.3 (1) | 14.3 (4) | 8.5 (5) |
| NT: total | 0.0 (0) | 0.2 (1) | 0.3 (1) | – | – | – | – | – |
| NT: urban and rural | nd | nd | nd | 1.0 (1) | 0.0 (0) | 0.0 (0) | 1.9 (1) | 1.7 (1) |
| NT: remote | nd | nd | nd | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.6 (1) |
| ACT | 0.0 (0) | 6.3 (4) | 0.0 (0) | 2.2 (1) | 9.3 (7) | 0.0 (0) | 7.1 (8) | 2.1 (3) |
| **Australia** | **1.1 (35)** | **1.5 (49)** | **1.3 (63)** | **2.1 (104)** | **2.5 (119)** | **2.6 (138)** | **5.0 (318)** | **9.3 (726)** |

– = total for state or territory separated into urban and rural, and remote; MIC = minimum inhibitory concentration; nd = no data available

Source: NNN (Australian Gonococcal Surveillance Programme annual reports)

## Table S4.20: Neisseria gonorrhoeae resistance to penicillin (MIC ≥1 mg/L; or penicillinase-producing N. gonorrhoeae), by state and territory, 2010–2017

| State or territory | 2010, % of all isolates (n) | 2011, % of all isolates (n) | 2012, % of all isolates (n) | 2013, % of all isolates (n) | 2014, % of all isolates (n) | 2015, % of all isolates (n) | 2016, % of all isolates (n) | 2017, % of all isolates (n) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NSW | 31.0 (408) | 28.0 (371) | 28.0 (482) | 38.0 (593) | 43.0 (725) | 30.9 (588) | 41.8 (949) | 25.3 (709) |
| Vic | 42.0 (382) | 44.0 (410) | 53.0 (666) | 44.0 (678) | 22.0 (322) | 15.2 (257) | 34.5 (598) | 29.6 (668) |
| Qld | 23.0 (185) | 19.0 (144) | 26.0 (183) | 31.0 (209) | 24.0 (153) | 27.6 (201) | 28.1 (243) | 26.0 (325) |
| SA | 34.0 (56) | 17.0 (26) | 35.0 (53) | 18.0 (39) | 11.0 (22) | 20.7 (52) | 38.7 (135) | 41.5 (149) |
| WA: total | 32.0 (104) | 18.0 (73) | 21.0 (106) | 27.0 (133) | – | – | – | – |
| WA: urban and rural | nd | nd | nd | nd | 26.0 (104) | 19.5 (77) | 16.7 (112) | 20.0 (125) |
| WA: remote | nd | nd | nd | nd | 4.6 (5) | 2.3 (2) | 5.3 (7) | 6.7 (8) |
| Tas | 36.0 (4) | 60.0 (3) | 36.0 (5) | 38.0 (17) | 23.0 (7) | 8.7 (2) | 28.6 (8) | 44.1 (26) |
| NT: total | 3.6 (15) | 4.1 (19) | 3.1 (10) | – | – | – | – | – |
| NT: urban and rural | nd | nd | nd | 20.0 (21) | 21.0 (21) | 14.5 (11) | 13.2 (7) | 10.3 (6) |
| NT: remote | nd | nd | nd | 1.3 (3) | 1.5 (2) | 2.2 (4) | 3.0 (5) | 2.5 (4) |
| ACT | 23.0 (7) | 11.0 (7) | 14.0 (8) | 2.2 (7) | 12.0 (9) | 33.3 (23) | 10.7 (12) | 17.2 (25) |
| **Australia** | **29.0 (1,161)** | **26.0 (1,053)** | **32.0 (1,513)** | **35.0 (1,700)** | **29.0 (1,370)** | **22.5 (1,217)** | **32.5 (2,076)** | **26.1 (2,045)** |

– = total for state or territory separated into urban and rural, and remote; MIC = minimum inhibitory concentration; nd = no data available

Source: NNN (Australian Gonococcal Surveillance Programme annual reports)

## Table S4.21: Neisseria meningitidis decreased susceptibility and resistance, 2000–2017

| Year | Isolates tested | Penicillin, % decreased susceptibility\* (n) | Penicillin, % resistant† (n) | Ceftriaxone, % decreased susceptibility§ (n) | Ciprofloxacin, % resistant # (n) | Rifampicin, % resistant\*\* (n) |
| --- | --- | --- | --- | --- | --- | --- |
| 2000 | 369 | 68.0 (251) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.0 (0) |
| 2001 | 338 | 67.0 (226) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 1.2 (4) |
| 2002 | 391 | 67.0 (262) | 0.5 (2) | 0.0 (0) | 0.0 (0) | 0.0 (0) |
| 2003 | 300 | 67.0 (200) | 0.3 (1) | 0.0 (0) | 0.0 (0) | 1.0 (3) |
| 2004 | 238 | 62.0 (147) | 0.4 (1) | 0.0 (0) | 0.0 (0) | 0.0 (0) |
| 2005 | 206 | 68.0 (140) | 0.5 (1) | 0.0 (0) | 0.0 (0) | 0.5 (1) |
| 2006 | 164 | 67.0 (109) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.6 (1) |
| 2007 | 151 | 77.0 (116) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 2.0 (3) |
| 2008 | 150 | 73.0 (109) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.7 (1) |
| 2009 | 137 | 72.0 (98) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.0 (0) |
| 2010 | 122 | 83.0 (101) | 0.8 (1) | 0.0 (0) | 0.0 (0) | 0.0 (0) |
| 2011 | 125 | 86.0 (108) | 0.8 (1) | 0.0 (0) | 0.0 (0) | 0.0 (0) |
| 2012 | 115 | 83.0 (95) | 0.9 (1) | 0.0 (0) | 0.0 (0) | 0.0 (0) |
| 2013 | 93 | 79.0 (73) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 0.0 (0) |
| 2014 | 95 | 88.0 (84) | 0.0 (0) | 0.0 (0) | 0.0 (0) | 2.1 (2) |
| 2015 | 117 | 86.0 (101) | 3.4 (4) | 0.0 (0) | 0.0 (0) | 0.9 (1) |
| 2016 | 189 | 90.0 (170) | 5.8 (11) | 0.5 (1) | 0.0 (0) | 0.0 (0) |
| 2017 | 276 | 89.0 (247) | 5.1 (14) | 0.0 (0) | 0.7 (2) | 0.4 (1) |

\* Decreased susceptibility to penicillin: minimum inhibitory concentration (MIC) >0.03 mg/L

† Resistance to penicillin: penicillinase-producing or chromosomal resistance (MIC ≥1 mg/L)

§ Decreased susceptibility to ceftriaxone: MIC ≥0.06 mg/L. One isolate in 2016 with decreased susceptibility (MIC 0.125 mg/L).

# Two isolates in 2017 were less susceptible to ciprofloxacin: MIC = 0.25 mg/L.

\*\* Resistance to rifampicin: MIC ≥1 mg/L

Source: NNN (Australian Meningococcal Surveillance Programme annual reports)

## Table S4.22: Number of Neisseria meningitidis isolates at each penicillin MIC value, 2006–2017

| Year | Isolates tested | ≤0.008 mg/L | 0.016 mg/L | 0.03 mg/L | 0.06 mg/L | 0.125 mg/L | 0.25 mg/L | 0.5 mg/L | 1.0 mg/L | ≥2.0 mg/L |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2006 | 164 | 2 | 8 | 45 | 57 | 25 | 21 | 6 | 0 | 0 |
| 2007 | 151 | 0 | 2 | 33 | 63 | 18 | 25 | 10 | 0 | 0 |
| 2008 | 150 | 0 | 2 | 39 | 58 | 24 | 20 | 7 | 0 | 0 |
| 2009 | 137 | 0 | 8 | 31 | 41 | 23 | 25 | 9 | 0 | 0 |
| 2010 | 122 | 3 | 1 | 16 | 40 | 20 | 26 | 15 | 1 | 0 |
| 2011 | 125 | 0 | 3 | 13 | 33 | 22 | 40 | 13 | 1 | 0 |
| 2012 | 115 | 0 | 1 | 18 | 36 | 17 | 22 | 20 | 1 | 0 |
| 2013 | 93 | 1 | 2 | 17 | 30 | 14 | 21 | 8 | 0 | 0 |
| 2014 | 95 | 0 | 1 | 10 | 28 | 15 | 26 | 15 | 0 | 0 |
| 2015 | 117 | 0 | 0 | 12 | 37 | 14 | 24 | 26 | 4 | 0 |
| 2016 | 189 | 0 | 2 | 6 | 36 | 26 | 35 | 73 | 11 | 0 |
| 2017 | 274 | 0 | 1 | 13 | 46 | 35 | 56 | 109 | 14 | 0 |

MIC = minimum inhibitory concentration

Source: NNN (Australian Meningococcal Surveillance Programme annual reports)

## Table S4.23: Neisseria meningitidis decreased susceptibility to penicillin (MIC 0.06–0.5 mg/L), by state and territory, 2010–2017

| State or territory | 2010, % (n) | 2011, % (n) | 2012, % (n) | 2013, % (n) | 2014, % (n) | 2015, % (n) | 2016, % (n) | 2017, % (n) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NSW | 93 (40) | 93 (25) | 86 (30) | 49 (24) | 89 (23) | 84 (26) | 93 (51) | 88 (61) |
| Vic | 93 (26) | 89 (25) | 96 (21) | 86 (12) | 100 (21) | 90 (37) | 87 (56) | 90 (63) |
| Qld | 68 (17) | 88 (30) | 79 (22) | 85 (17) | 91 (21) | 91 (19) | 88 (30) | 87 (41) |
| SA | 57 (4) | 85 (11) | 75 (9) | 67 (6) | 100 (6) | 100 (10) | 75 (9) | 100 (12) |
| WA | 71 (10) | 77 (10) | 67 (8) | 82 (9) | 67 (10) | 64 (7) | 100 (17) | 89 (32) |
| Tas | 0 (0) | 67 (4) | 75 (3) | 50 (1) | 100 (2) | 100 (1) | 100 (5) | 87 (13) |
| NT | 100 (3) | 0 (0) | 100 (2) | 100 (2) | 50 (1) | 0 (0) | 100 (2) | 96 (22) |
| ACT | 100 (1) | 100 (3) | 0 (0) | 100 (2) | 0 (0) | 100 (1) | 0 (0) | 100 (2) |
| **Australia** | **83 (101)** | **86 (108)** | **83 (95)** | **79 (73)** | **88 (84)** | **86 (101)** | **90 (170)** | **90 (246)** |

MIC = minimum inhibitory concentration

Source: NNN (Australian Meningococcal Surveillance Programme annual reports)

## Table S4.24: Neisseria meningitidis resistance to penicillin (MIC ≥1 mg/L), by state and territory, 2002–2017

| Year | Isolates tested | State or territory of isolation |
| --- | --- | --- |
| 2002 | 2 | NSW and NT |
| 2003 | 1 | ACT |
| 2004 | 1 | NT |
| 2005 | 1 | NSW |
| 2006 | 0 | n/a |
| 2007 | 0 | n/a |
| 2008 | 0 | n/a |
| 2009 | 0 | n/a |
| 2010 | 1 | Vic |
| 2011 | 1 | Vic |
| 2012 | 1 | NSW |
| 2013 | 0 | n/a |
| 2014 | 0 | n/a |
| 2015 | 4 | NSW (n = 1), Vic (n = 2), Qld (n = 1) |
| 2016 | 11 | NSW (n = 2), Vic (n = 6), Qld (n = 3) |
| 2017 | 14 | NSW (n = 2), Vic (n = 7), Qld (n = 4), NT (n = 1) |

MIC = minimum inhibitory concentration; n/a = not applicable

Note: All isolates had an MIC = 1 mg/L.

Source: NNN (Australian Meningococcal Surveillance Programme annual reports)

## Table S4.25: Neisseria meningitidis resistance to rifampicin (MIC ≥1 mg/L), by state and territory, 2001–2017

| Year | Isolates tested | State or territory of isolation |
| --- | --- | --- |
| 2001 | 4 | Qld (3 with MIC = 1 mg/L; 1 with MIC = 128 mg/L) |
| 2002 | 0 | n/a |
| 2003 | 3 | Qld (MIC = 1 mg/L), SA (MIC = 32 mg/L), WA (MIC = 100 mg/L) |
| 2004 | 0 | n/a |
| 2005 | 1 | Qld (MIC = 1 mg/L) |
| 2006 | 1 | Qld (MIC = 1 mg/L) |
| 2007 | 3 | Qld (all with MIC = 1 mg/L) |
| 2008 | 1 | Qld (MIC = 1 mg/L) |
| 2009 | 0 | n/a |
| 2010 | 0 | n/a |
| 2011 | 0 | n/a |
| 2012 | 0 | n/a |
| 2013 | 0 | n/a |
| 2014 | 2 | WA (1 with MIC = 4 mg/L; 1 with MIC = 16 mg/L) |
| 2015 | 1 | Qld (MIC = 1 mg/L) |
| 2016 | 0 | n/a |
| 2017 | 1 | Qld (MIC = 1 mg/L) |

MIC = minimum inhibitory concentration; n/a = not applicable

Source: NNN (Australian Meningococcal Surveillance Programme annual reports)

## Table S4.26: Pseudomonas aeruginosa resistance (all specimen sources), 2015–2017

| Antimicrobial | 2015, % resistant (n) | 2016, % resistant (n) | 2017, % resistant (n) |
| --- | --- | --- | --- |
| Amikacin | 2.2 (138) | 2.0 (151) | 2.5 (160) |
| Cefepime | 7.2 (138) | 5.3 (151) | 6.3 (160) |
| Ceftazidime | 4.6 (41,417) | 5.1 (42,710) | 5.1 (42,983) |
| Ciprofloxacin/norfloxacin | 6.2 (39,577) | 5.7 (39,095) | 6.4 (40,801) |
| Gentamicin | 5.0 (44,427) | 5.7 (44,967) | 5.7 (46,252) |
| Meropenem | 4.0 (32,435) | 3.6 (35,610) | 3.9 (36,564) |
| Norfloxacin | 4.1 (5,420) | 3.7 (5,602) | 3.1 (6,050) |
| Piperacillin–tazobactam | 6.8 (29,025) | 5.9 (43,911) | 6.1 (45,961) |
| Tobramycin | 1.8 (31,338) | 1.9 (36,192) | 1.8 (38,162) |

Note: Pseudomonas aeruginosa is considered intrinsically resistant to ampicillin, cefazolin and trimethoprim–sulfamethoxazole.

Sources: AGAR (national); APAS (NSW, Vic, Qld, SA, WA, Tas, ACT); SNP (Qld, northern NSW)

## Table S4.27: Pseudomonas aeruginosa resistance, by clinical setting, 2015–2017

| Antimicrobial | Year | Private hospitals, % resistant (n) | Public hospitals, % resistant (n) | Multi-purpose services, % resistant (n) | Aged care homes, % resistant (n) | Community, % resistant (n) |
| --- | --- | --- | --- | --- | --- | --- |
| Amikacin | 2015 | nd | 2.2 (138) | nd | nd | nd |
| 2016 | nd | 2.0 (151) | nd | nd | nd |
| 2017 | nd | 2.5 (160) | nd | nd | nd |
| Cefepime | 2015 | nd | 7.2 (138) | nd | nd | nd |
| 2016 | nd | 5.3 (151) | nd | nd | nd |
| 2017 | nd | 6.3 (160) | nd | nd | nd |
| Ceftazidime | 2015 | 4.7 (3,468) | 6.4 (22,791) | 3.2 (501) | 2.8 (1,597) | 1.6 (12,037) |
| 2016 | 5.1 (3,337) | 6.6 (24,376) | 5.1 (450) | 4.1 (1,520) | 2.3 (12,195) |
| 2017 | 5.6 (3,381) | 6.5 (25,312) | 4.9 (309) | 4.0 (1,436) | 2.4 (12,342) |
| Ciprofloxacin/norfloxacin | 2015 | 5.7 (3,508) | 7.8 (22,308) | 5.1 (430) | 4.8 (1,595) | 3.4 (10,749) |
| 2016 | 5.0 (3,133) | 7.1 (23,075) | 2.9 (454) | 4.3 (1,359) | 3.2 (10,167) |
| 2017 | 5.3 (2,760) | 7.8 (26,390) | 6.1 (440) | 4.9 (283) | 3.3 (10,043) |
| Gentamicin | 2015 | 2.4 (3,556) | 6.8 (25,315) | 4.2 (518) | 1.8 (1,615) | 2.6 (12,333) |
| 2016 | 4.3 (3,414) | 7.0 (26,091) | 4.6 (483) | 4.2 (1,537) | 3.8 (12,426) |
| 2017 | 4.2 (3,469) | 6.9 (27,252) | 3.9 (459) | 5.4 (1,449) | 3.7 (12,624) |
| Meropenem | 2015 | 2.1 (765) | 5.4 (21,885) | 1.5 (332) | 0.3 (289) | 0.9 (8,992) |
| 2016 | 2.0 (685) | 4.7 (25,211) | 2.0 (300) | 1.2 (251) | 0.8 (8,959) |
| 2017 | 2.8 (675) | 5.0 (26,180) | 4.3 (255) | 0.0 (193) | 0.7 (9,052) |
| Norfloxacin | 2015 | 3.7 (464) | 4.6 (3,879) | nd | 3.6 (388) | 2.0 (689) |
| 2016 | 4.0 (378) | 4.1 (4,026) | nd | 3.2 (339) | 1.4 (692) |
| 2017 | 2.0 (398) | 3.8 (3,889) | 4.2 (120) | 2.1 (187) | 1.6 (765) |
| Piperacillin–tazobactam | 2015 | 2.7 (771) | 7.5 (24,747) | 5.2 (387) | 0.5 (412) | 2.0 (2,535) |
| 2016 | 6.6 (3,332) | 7.3 (25,805) | 5.3 (360) | 5.1 (1,488) | 3.3 (12,063) |
| 2017 | 7.1 (3,442) | 7.4 (27,066) | 5.7 (458) | 4.8 (1,446) | 3.5 (12,550) |
| Tobramycin | 2015 | 0.8 (3,285) | 3.0 (15,708) | 0.7 (302) | 0.5 (1,484) | 0.5 (10,396) |
| 2016 | 1.1 (3,109) | 2.6 (20,637) | 0.3 (302) | 0.8 (1,423) | 0.8 (10,524) |
| 2017 | 0.9 (3,376) | 2.5 (22,286) | 1.2 (256) | 1.1 (1,338) | 0.7 (10,701) |

nd = no data (either not tested or tested against an inadequate number of isolates)

Note: Pseudomonas aeruginosa is considered intrinsically resistant to ampicillin, cefazolin and trimethoprim–sulfamethoxazole.

Sources: AGAR and APAS (public hospitals); AGAR, APAS (Qld, SA) and SNP (private hospitals); APAS and SNP (community and aged care homes); APAS (multi-purpose services)

## Table S4.28: Salmonella species (non-typhoidal) resistance, by specimen source, 2015–2017

| Antimicrobial | Year | Blood, % resistant (n) | Faeces, % resistant (n) | Other, % resistant (n) | Total, % resistant (n) |
| --- | --- | --- | --- | --- | --- |
| Amoxicillin–clavulanic acid | 2015 | 0.0 (89) | 1.1 (2,199) | 0.8 (120) | 1.0 (2,408) |
| 2016 | 1.9 (104) | 1.3 (1,797) | 1.9 (107) | 1.4 (2,008) |
| 2017 | 1.6 (124) | 1.5 (1,944) | 2.9 (104) | 1.6 (2,172) |
| Ampicillin/amoxicillin | 2015 | 4.5 (89) | 7.2 (3,977) | 2.4 (164) | 7.0 (4,230) |
| 2016 | 2.9 (105) | 7.8 (3,394) | 5.2 (115) | 7.6 (3,614) |
| 2017 | 5.6 (124) | 8.1 (3,256) | 6.0 (117) | 8.0 (3,497) |
| Ceftazidime | 2015 | 0.0 (87) | 0.5 (1,972) | 1.8 (55) | 0.5 (2,114) |
| 2016 | 1.0 (103) | 0.7 (1,563) | 1.8 (56) | 0.8 (1,722) |
| 2017 | 0.8 (122) | 0.5 (1,701) | 1.7 (60) | 0.6 (1,883) |
| Ceftriaxone | 2015 | 0.0 (88) | 0.5 (2,260) | 1.1 (95) | 0.5 (2,443) |
| 2016 | 1.0 (105) | 0.7 (1,820) | 1.6 (62) | 0.8 (1,987) |
| 2017 | 0.8 (124) | 0.8 (1,910) | 1.6 (63) | 0.9 (2,097) |
| Ciprofloxacin | 2015 | 1.1 (87) | 2.4 (2,288) | 0.0 (95) | 2.2 (2,470) |
| 2016 | 1.0 (102) | 2.1 (1,781) | 0.0 (57) | 2.0 (1,940) |
| 2017 | 1.1 (87) | 0.8 (1,463) | 1.7 (59) | 0.8 (1,609) |
| Meropenem | 2015 | 0.0 (89) | 0.0 (2,197) | 0.0 (58) | 0.0 (2,344) |
| 2016 | 0.0 (103) | 0.1 (1,796) | 0.0 (62) | 0.1 (1,961) |
| 2017 | 0.0 (124) | 0.0 (1,939) | 0.0 (63) | 0.0 (2,126) |
| Norfloxacin | 2015 | n/a | 1.1 (1,447) | 1.7 (58) | 1.1 (1,505) |
| 2016 | n/a | 1.3 (1,086) | 1.6 (61) | 1.3 (1,147) |
| 2017 | n/a | 0.8 (1,681) | 3.2 (62) | 0.9 (1,743) |
| Piperacillin–tazobactam | 2015 | 0.0 (89) | 0.4 (2,146) | 1.7 (58) | 0.4 (2,293) |
| 2016 | 1.0 (104) | 0.7 (1,776) | 3.2 (62) | 0.8 (1,942) |
| 2017 | 0.8 (121) | 0.7 (1,909) | 4.8 (63) | 0.8 (2,093) |
| Trimethoprim | 2015 | 4.5 (89) | 2.3 (2,234) | 2.5 (120) | 2.4 (2,443) |
| 2016 | 4.8 (104) | 2.0 (1,811) | 2.7 (112) | 2.2 (2,027) |
| 2017 | 3.3 (123) | 2.1 (1,703) | 2.6 (114) | 2.2 (1,940) |
| Trimethoprim–sulfamethoxazole | 2015 | 4.5 (89) | 2.5 (3,944) | 1.0 (98) | 2.5 (4,131) |
| 2016 | 4.8 (104) | 2.3 (3,370) | 0.0 (62) | 2.3 (3,536) |
| 2017 | 3.2 (124) | 2.2 (3,259) | 3.2 (63) | 2.2 (3,446) |

n/a = not applicable

Sources: AGAR (national); APAS (NSW, Vic, Qld, SA, WA, Tas, ACT); SNP (Qld, northern NSW)

## Table S4.29: Salmonella species (non-typhoidal) resistance, by clinical setting, 2015–2017

| Antimicrobial | Year | Private hospitals, % resistant (n) | Public hospitals, % resistant (n) | Multi-purpose services, % resistant (n) | Community, % resistant (n) |
| --- | --- | --- | --- | --- | --- |
| Amoxicillin–clavulanic acid | 2015 | 0.0 (36) | 1.1 (1,998) | 0.0 (60) | 0.0 (186) |
| 2016 | nd | 1.4 (1,720) | 0.0 (39) | 1.8 (163) |
| 2017 | nd | 1.7 (1,859) | 2.1 (48) | 1.6 (129) |
| Ampicillin/amoxicillin | 2015 | 8.4 (154) | 6.0 (2,130) | 4.8 (62) | 7.9 (1,755) |
| 2016 | 14.4 (111) | 6.1 (1,796) | 0.0 (39) | 9.0 (1,580) |
| 2017 | 14.1 (71) | 7.2 (1,893) | 4.2 (48) | 9.0 (1,349) |
| Ceftazidime | 2015 | 0.0 (36) | 0.5 (1,767) | 0.0 (60) | 0.8 (123) |
| 2016 | nd | 0.8 (1,477) | 0.0 (39) | 0.8 (120) |
| 2017 | nd | 0.7 (1,613) | 0.0 (48) | 0.0 (87) |
| Ceftriaxone/cefotaxime | 2015 | 0.0 (36) | 0.6 (2,094) | 0.0 (60) | 0.8 (124) |
| 2016 | nd | 0.8 (1,770) | 0.0 (39) | 0.0 (120) |
| 2017 | nd | 0.9 (1,879) | 0.0 (47) | 1.1 (88) |
| Ciprofloxacin | 2015 | 0.0 (36) | 1.7 (2,120) | 0.0 (61) | 2.4 (124) |
| 2016 | nd | 1.9 (1,750) | 0.0 (39) | 5.7 (70) |
| 2017 | nd | 0.7 (1,379) | 0.0 (48) | 4.3 (69) |
| Meropenem | 2015 | 0.0 (36) | 0.0 (1,996) | 0.0 (60) | 0.0 (124) |
| 2016 | nd | 0.0 (1,715) | 0.0 (39) | 0.0 (119) |
| 2017 | nd | 0.0 (1,855) | 0.0 (48) | 0.0 (88) |
| Norfloxacin | 2015 | 0.0 (36) | 1.4 (1,438) | 1.7 (60) | 0.0 (60) |
| 2016 | nd | 1.0 (1,141) | 0.0 (39) | 7.0 (71) |
| 2017 | nd | 1.1 (1,598) | 0.0 (48) | 0.0 (87) |
| Piperacillin–tazobactam | 2015 | 0.0 (36) | 0.4 (1,962) | 0.0 (60) | 0.0 (120) |
| 2016 | nd | 0.8 (1,709) | 0.0 (39) | 1.7 (116) |
| 2017 | nd | 0.9 (1,831) | 0.0 (47) | 0.0 (86) |
| Trimethoprim | 2015 | 0.0 (36) | 2.5 (2,032) | 1.7 (60) | 3.2 (186) |
| 2016 | nd | 2.4 (1,732) | 0.0 (39) | 1.8 (169) |
| 2017 | nd | 2.3 (1,617) | 0.0 (48) | 2.1 (140) |
| Trimethoprim–sulfamethoxazole | 2015 | 1.9 (154) | 2.2 (2,093) | 1.6 (62) | 3.2 (1,693) |
| 2016 | 1.8 (111) | 2.1 (1,768) | 0.0 (39) | 2.8 (1,530) |
| 2017 | 1.4 (71) | 2.4 (1,894) | 0.0 (48) | 2.2 (1,297) |

nd = no data (either not tested or tested against an inadequate number of isolates)

Sources: AGAR and APAS (public hospitals); AGAR, APAS (Qld, SA) and SNP (private hospitals); APAS and SNP (community); APAS (multi-purpose services)

## Table S4.30: Salmonella species (typhoidal) resistance (blood culture isolates), 2015–2017

| Antimicrobial | 2015, % resistant (n) | 2016, % resistant (n) | 2017, % resistant (n) |
| --- | --- | --- | --- |
| Amikacin | 0.0 (4) | 0.0 (8) | 0.0 (15) |
| Amoxicillin–clavulanic acid | 0.0 (66) | 0.0 (66) | 1.1 (93) |
| Ampicillin/amoxicillin | 5.0 (80) | 7.9 (76) | 12.1 (99) |
| Azithromycin | 20.0 (5) | 62.5 (8) | 18.2 (11) |
| Ceftazidime | 0.0 (63) | 0.0 (51) | 0.0 (88) |
| Ceftriaxone/cefotaxime | 1.3 (80) | 0.0 (76) | 0.0 (99) |
| Ciprofloxacin | 46.7 (60) | 43.5 (62) | 66.2 (74) |
| Meropenem | 0.0 (66) | 0.0 (65) | 0.0 (90) |
| Nitrofurantoin | 20.7 (29) | 12.5 (24) | 7.7 (52) |
| Piperacillin–tazobactam | 0.0 (53) | 0.0 (69) | 0.0 (92) |
| Trimethoprim | 3.1 (65) | 4.5 (66) | 9.8 (92) |
| Trimethoprim–sulfamethoxazole | 3.9 (77) | 4.1 (73) | 11.5 (96) |

Sources: AGAR (national); APAS (NSW, Vic, Qld, SA, WA, Tas, ACT); SNP (Qld, northern NSW)

## Table S4.31: Shigella species resistance (faecal isolates), 2015–2017

| Antimicrobial | S. flexneri, % resistant (n), 2015 | S. flexneri, % resistant (n), 2016 | S. flexneri, % resistant (n), 2017 | S. sonnei, % resistant (n), 2015 | S. sonnei, % resistant (n), 2016 | S. sonnei, % resistant (n), 2017 |
| --- | --- | --- | --- | --- | --- | --- |
| Amoxicillin–clavulanic acid | 29.4 (17) | 41.7 (24) | 80.7 (140) | 3.4 (116) | 10.9 (64) | 9.0 (177) |
| Ampicillin/amoxicillin | 73.9 (23) | 84.0 (25) | 91.3 (160) | 13.8 (145) | 48.6 (144) | 32.6 (218) |
| Ceftazidime | 0.0 (7) | 14.3 (7) | 0.0 (119) | 2.6 (114) | 3.2 (63) | 0.0 (152) |
| Ceftriaxone/cefotaxime | 0.0 (18) | 4.0 (25) | 1.4 (144) | 3.4 (116) | 6.6 (106) | 0.6 (180) |
| Ciprofloxacin | 10.0 (10) | 15.8 (19) | 10.1 (149) | 12.4 (121) | 16.0 (106) | 6.7 (180) |
| Gentamicin | 44.4 (18) | 28.0 (25) | 25.3 (150) | 17.2 (116) | 30.6 (98) | 23.8 (185) |
| Meropenem | 0.0 (17) | 0.0 (24) | 0.0 (140) | 0.0 (116) | 0.0 (87) | 0.0 (176) |
| Nitrofurantoin | 0.0 (7) | 0.0 (5) | 0.0 (77) | 0.0 (66) | 8.3 (12) | 0.0 (45) |
| Norfloxacin | 6.7 (15) | 33.3 (9) | 8.5 (118) | 10.3 (116) | 22.2 (63) | 6.6 (152) |
| Piperacillin–tazobactam | 0.0 (16) | 0.0 (20) | 0.0 (100) | 1.8 (110) | 1.4 (69) | 0.6 (159) |
| Tobramycin | 47.1 (17) | 26.7 (15) | 22.6 (133) | 17.2 (116) | 20.0 (65) | 19.6 (158) |
| Trimethoprim | 47.1 (17) | 80.0 (15) | 95.1 (122) | 50.0 (116) | 68.8 (93) | 68.2 (170) |
| Trimethoprim–sulfamethoxazole | 36.4 (22) | 33.3 (30) | 24.1 (162) | 55.2 (145) | 68.1 (138) | 70.0 (220) |

Sources: APAS (NSW, Vic, Qld, SA, WA, Tas, ACT); SNP (Qld, northern NSW)

## Table S4.32: Shigella species resistance, by clinical setting, 2015–2017

| Antimicrobial | Year | Private hospitals, % resistant (n) | Public hospitals, % resistant (n) | Multi-purpose services, % resistant (n) | Community, % resistant (n) |
| --- | --- | --- | --- | --- | --- |
| Amoxicillin–clavulanic acid | 2015 | 100.0 (1) | 7.0 (71) | 8.3 (24) | 0.0 (17) |
| 2016 | 0.0 (3) | 26.2 (65) | 0.0 (9) | 0.0 (6) |
| 2017 | nd | 35.4 (237) | 28.6 (14) | 68.6 (35) |
| Ampicillin/amoxicillin | 2015 | 50.0 (4) | 25.7 (74) | 8.3 (24) | 22.2 (45) |
| 2016 | 77.8 (9) | 60.4 (101) | 0.0 (9) | 46.7 (45) |
| 2017 | 100.0 (4) | 57.2 (243) | 37.5 (16) | 59.5 (84) |
| Ceftazidime | 2015 | 0.0 (1) | 1.6 (61) | 8.3 (24) | 0.0 (15) |
| 2016 | 0.0 (3) | 4.2 (48) | 0.0 (8) | 0.0 (6) |
| 2017 | nd | 0.0 (193) | 0.0 (14) | 0.0 (34) |
| Ceftriaxone/cefotaxime | 2015 | 0.0 (1) | 2.8 (72) | 0.0 (24) | 11.8 (17) |
| 2016 | 0.0 (3) | 6.9 (101) | 0.0 (9) | 0.0 (13) |
| 2017 | nd | 1.3 (237) | 0.0 (14) | 0.0 (42) |
| Ciprofloxacin | 2015 | 0.0 (1) | 20.0 (65) | 0.0 (24) | 10.0 (20) |
| 2016 | 33.3 (3) | 17.9 (95) | 11.1 (9) | 0.0 (13) |
| 2017 | nd | 9.6 (239) | 0.0 (16) | 4.7 (43) |
| Gentamicin | 2015 | 100.0 (1) | 30.6 (72) | 4.2 (24) | 17.6 (17) |
| 2016 | 66.7 (3) | 34.4 (96) | 11.1 (9) | 0.0 (10) |
| 2017 | nd | 28.9 (246) | 12.5 (16) | 20.9 (43) |
| Meropenem | 2015 | 0.0 (1) | 0.0 (71) | 0.0 (24) | 0.0 (17) |
| 2016 | 0.0 (3) | 0.0 (90) | 0.0 (9) | 0.0 (5) |
| 2017 | nd | 0.0 (236) | 0.0 (14) | 0.0 (35) |
| Nitrofurantoin | 2015 | 0.0 (1) | 0.0 (39) | nd | 0.0 (15) |
| 2016 | 0.0 (3) | 0.0 (8) | 0.0 (2) | nd |
| 2017 | nd | 0.0 (74) | nd | 0.0 (29) |
| Norfloxacin | 2015 | 0.0 (1) | 18.8 (69) | 0.0 (24) | 0.0 (17) |
| 2016 | 66.7 (3) | 28.0 (50) | 11.1 (9) | 0.0 (6) |
| 2017 | nd | 8.9 (191) | 0.0 (14) | 2.9 (34) |
| Piperacillin–tazobactam | 2015 | nd | 0.0 (69) | 8.7 (23) | 0.0 (15) |
| 2016 | 0.0 (3) | 1.4 (69) | 0.0 (9) | 0.0 (4) |
| 2017 | nd | 0.5 (196) | 0.0 (12) | 0.0 (32) |
| Tobramycin | 2015 | 100.0 (1) | 31.0 (71) | 4.2 (24) | 17.6 (17) |
| 2016 | 66.7 (3) | 22.8 (57) | 11.1 (9) | 0.0 (6) |
| 2017 | nd | 24.6 (203) | 12.5 (16) | 21.4 (42) |
| Trimethoprim | 2015 | 100.0 (1) | 53.5 (71) | 91.7 (24) | 17.6 (17) |
| 2016 | 100.0 (3) | 73.2 (82) | 77.8 (9) | 33.3 (9) |
| 2017 | nd | 81.7 (213) | 71.4 (14) | 82.4 (34) |
| Trimethoprim–sulfamethoxazole | 2015 | 75.0 (4) | 52.1 (73) | 91.7 (24) | 51.1 (45) |
| 2016 | 77.8 (9) | 57.3 (96) | 77.8 (9) | 66.0 (50) |
| 2017 | 50.0 (4) | 58.2 (244) | 50.0 (16) | 46.0 (87) |

nd = no data (either not tested or tested against an inadequate number of isolates)

Sources: AGAR and APAS (public hospitals); AGAR, APAS (Qld, SA) and SNP (private hospitals); APAS and SNP (community); APAS (multi-purpose services)

## Table S4.33: Staphylococcus aureus resistance, by specimen source, 2015–2017

| Antimicrobial | Year | Blood, % resistant (n) | Other, % resistant (n) | Total, % resistant (n) |
| --- | --- | --- | --- | --- |
| Benzylpenicillin | 2015 | 83.5 (4,576) | 87.8 (98,628) | 87.6 (103,204) |
| 2016 | 83.2 (5,020) | 87.5 (105,283) | 87.3 (110,303) |
| 2017 | 83.5 (5,108) | 87.1 (108,726) | 86.9 (113,834) |
| Ciprofloxacin | 2015 | 5.9 (2,574) | 4.8 (55,350) | 4.8 (57,924) |
| 2016 | 6.2 (2,632) | 4.7 (57,284) | 4.7 (59,916) |
| 2017 | 6.2 (2,674) | 4.5 (59,522) | 4.5 (62,196) |
| Clindamycin | 2015 | 11.5 (3,716) | 14.9 (116,673) | 14.8 (120,389) |
| 2016 | 11.0 (3,846) | 14.8 (122,957) | 14.6 (126,803) |
| 2017 | 11.7 (3,843) | 14.7 (125,078) | 14.6 (128,921) |
| Daptomycin | 2015 | 0.2 (2,877) | 0.3 (72,763) | 0.3 (75,640) |
| 2016 | 0.3 (3,052) | 0.2 (86,027) | 0.2 (89,079) |
| 2017 | 0.2 (3,338) | 0.2 (92,213) | 0.2 (95,551) |
| Erythromycin | 2015 | 16.3 (4,582) | 17.1 (137,543) | 17.1 (142,125) |
| 2016 | 16.1 (5,050) | 16.7 (147,612) | 16.7 (152,662) |
| 2017 | 16.3 (5,236) | 16.6 (151,739) | 16.5 (156,975) |
| Fusidic acid | 2015 | 3.7 (3,983) | 7.7 (49,053) | 7.4 (53,036) |
| 2016 | 3.7 (3,468) | 7.4 (55,890) | 7.2 (59,358) |
| 2017 | 4.0 (3,539) | 6.5 (58,853) | 6.4 (62,392) |
| Gentamicin | 2015 | 2.3 (3,331) | 1.3 (47,885) | 1.4 (51,216) |
| 2016 | 2.5 (3,455) | 1.2 (52,743) | 1.3 (56,198) |
| 2017 | 2.4 (3,219) | 1.2 (56,687) | 1.2 (59,906) |
| Linezolid | 2015 | 0.1 (3,251) | 0.1 (72,715) | 0.1 (75,966) |
| 2016 | 0.0 (3,380) | 0.0 (85,949) | 0.0 (89,329) |
| 2017 | 0.0 (3,337) | 0.1 (92,350) | 0.1 (95,687) |
| Oxacillin/methicillin | 2015 | 16.9 (3,611) | 21.8 (96,158) | 21.6 (99,769) |
| 2016 | 17.4 (4,029) | 22.4 (103,145) | 22.2 (107,174) |
| 2017 | 17.5 (4,089) | 22.6 (106,727) | 22.4 (110,816) |
| Rifampicin | 2015 | 0.4 (4,197) | 0.2 (66,938) | 0.2 (71,135) |
| 2016 | 0.4 (4,632) | 0.2 (74,720) | 0.2 (79,352) |
| 2017 | 0.5 (4,547) | 0.2 (75,038) | 0.3 (79,585) |
| Tetracycline/doxycycline | 2015 | 5.1 (4,562) | 4.0 (124,616) | 4.0 (129,178) |
| 2016 | 4.7 (4,957) | 3.9 (136,794) | 3.9 (141,751) |
| 2017 | 4.8 (4,668) | 3.7 (141,145) | 3.8 (145,813) |
| Trimethoprim–sulfamethoxazole | 2015 | 2.6 (4,379) | 3.0 (133,217) | 3.0 (137,596) |
| 2016 | 3.3 (4,960) | 3.1 (145,171) | 3.1 (150,131) |
| 2017 | 3.3 (5,058) | 3.1 (150,299) | 3.1 (155,357) |
| Vancomycin | 2015 | 0.0 (4,245) | 0.0 (51,348) | 0.0 (55,593) |
| 2016 | 0.0 (3,679) | 0.0 (56,738) | 0.0 (60,417) |
| 2017 | 0.0 (3,751) | 0.0 (54,766) | 0.0 (58,517) |

Sources: AGAR (national); APAS (NSW, Vic, Qld, SA, WA, Tas, ACT); SNP (Qld, northern NSW)

## Table S4.34: Staphylococcus aureus resistance, by clinical setting, 2015–2017

| Antimicrobial | Year | Private hospitals, % resistant (n) | Public hospitals, % resistant (n) | Multi-purpose services, % resistant (n) | Aged care homes, % resistant (n) | Community, % resistant, (n) | Other\*, % resistant (n) |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Benzylpenicillin | 2015 | 83.8 (4,616) | 87.5 (73,358) | 91.8 (3,602) | 88.4 (861) | 87.0 (15,154) | 93.1 (592) |
| 2016 | 83.8 (4,738) | 87.0 (79,616) | 92.5 (4,039) | 88.8 (851) | 87.1 (15,774) | 95.7 (723) |
| 2017 | 82.2 (4,996) | 86.8 (83,128) | 91.9 (4,033) | 90.7 (734) | 86.6 (15,664) | 94.0 (713) |
| Ciprofloxacin | 2015 | 5.8 (684) | 5.4 (44,712) | 1.7 (2,686) | 17.5 (440) | 2.9 (4,428) | 1.3 (528) |
| 2016 | 5.3 (641) | 5.3 (46,201) | 1.3 (3,004) | 21.0 (405) | 2.8 (4,836) | 0.3 (639) |
| 2017 | 4.8 (751) | 5.1 (48,435) | 0.8 (3,057) | 15.2 (310) | 3.0 (4,755) | 0.7 (605) |
| Clindamycin | 2015 | 16.8 (4,402) | 13.4 (54,513) | 6.7 (3,401) | 21.8 (2,618) | 16.2 (50,066) | 20.6 (533) |
| 2016 | 16.0 (4,373) | 13.4 (56,791) | 6.5 (3,851) | 22.2 (2,596) | 15.9 (54,026) | 19.0 (646) |
| 2017 | 15.4 (4,586) | 13.7 (58,209) | 6.1 (3,870) | 22.0 (2,441) | 15.7 (54,613) | 21.9 (617) |
| Daptomycin | 2015 | 0.4 (3,557) | 0.3 (32,681) | nd | 0.6 (2,092) | 0.2 (36,683) | 0.0 (440) |
| 2016 | 0.3 (3,608) | 0.2 (43,131) | nd | 0.7 (2,083) | 0.1 (39,512) | 0.0 (565) |
| 2017 | 0.3 (4,031) | 0.2 (45,554) | nd | 0.8 (1,938) | 0.1 (40,159) | 0.0 (521) |
| Erythromycin | 2015 | 17.6 (5,063) | 17.1 (72,650) | 11.0 (3,585) | 23.6 (2,723) | 17.1 (52,549) | 21.6 (592) |
| 2016 | 17.4 (5,169) | 16.8 (79,229) | 9.0 (4,026) | 23.6 (2,691) | 16.7 (56,314) | 17.8 (715) |
| 2017 | 17.2 (5,438) | 16.7 (82,974) | 8.7 (3,986) | 23.1 (2,532) | 16.5 (56,816) | 20.3 (711) |
| Fusidic acid | 2015 | 1.6 (747) | 7.9 (44,850) | 11.1 (2,100) | 1.1 (441) | 3.1 (4,170) | 2.2 (508) |
| 2016 | 5.1 (701) | 8.1 (46,412) | 8.0 (2,427) | 2.3 (665) | 4.1 (4,679) | 2.1 (634) |
| 2017 | 5.1 (898) | 7.1 (48,831) | 7.6 (2,996) | 3.2 (309) | 3.4 (4,649) | 2.3 (597) |
| Gentamicin | 2015 | 0.8 (747) | 1.5 (44,280) | 0.6 (2,656) | 2.7 (440) | 0.6 (2,394) | 0.2 (480) |
| 2016 | 1.1 (701) | 1.4 (46,678) | 0.4 (3,088) | 3.5 (405) | 0.7 (4,368) | 0.0 (591) |
| 2017 | 1.8 (897) | 1.3 (48,819) | 0.4 (3,129) | 6.8 (309) | 1.2 (2,435) | 0.2 (570) |
| Linezolid | 2015 | 0.0 (3,564) | 0.1 (32,932) | nd | 0.1 (2,101) | 0.1 (36,710) | 0.0 (440) |
| 2016 | 0.1 (3,616) | 0.0 (43,342) | nd | 0.1 (2,085) | 0.1 (39,540) | 0.0 (566) |
| 2017 | 0.1 (4,039) | 0.1 (45,427) | nd | 0.1 (1,941) | 0.1 (40,201) | 0.0 (521) |
| Oxacillin/methicillin | 2015 | 14.3 (1,575) | 21.6 (72,870) | 28.5 (3,604) | 33.2 (873) | 17.2 (15,220) | 43.8 (591) |
| 2016 | 15.4 (1,656) | 21.7 (79,379) | 33.4 (4,045) | 35.1 (866) | 19.0 (15,888) | 50.9 (723) |
| 2017 | 14.8 (1,790) | 22.1 (83,056) | 31.1 (4,039) | 33.0 (743) | 19.1 (15,841) | 46.2 (712) |
| Rifampicin | 2015 | 0.4 (1,396) | 0.3 (59,992) | 0.1 (2,100) | 0.0 (542) | 0.1 (6,168) | 0.5 (560) |
| 2016 | 0.1 (902) | 0.3 (66,217) | 0.1 (2,428) | 0.3 (358) | 0.2 (4,898) | 0.0 (699) |
| 2017 | 0.0 (183) | 0.3 (68,879) | 0.1 (2,996) | nd | 0.1 (2,854) | 0.2 (597) |
| Tetracycline/doxycycline | 2015 | 4.5 (5,022) | 4.8 (70,410) | 1.5 (2,410) | 5.3 (2,716) | 2.8 (47,650) | 2.1 (559) |
| 2016 | 4.3 (5,030) | 4.8 (75,695) | 2.4 (2,743) | 6.3 (2,683) | 2.8 (51,198) | 0.7 (695) |
| 2017 | 4.6 (5,216) | 4.5 (78,787) | 1.6 (3,335) | 5.8 (2,522) | 2.7 (51,219) | 1.0 (688) |
| Trimethoprim–sulfamethoxazole | 2015 | 2.5 (4,990) | 3.4 (69,246) | 1.3 (3,160) | 4.4 (2,709) | 2.1 (51,988) | 7.3 (592) |
| 2016 | 2.3 (5,084) | 3.6 (77,798) | 1.3 (3,562) | 4.8 (2,681) | 2.3 (55,726) | 7.5 (717) |
| 2017 | 2.4 (5,376) | 3.5 (81,977) | 1.7 (3,994) | 3.9 (2,525) | 2.4 (56,176) | 3.8 (712) |
| Vancomycin | 2015 | 0.0 (966) | 0.0 (49,017) | 0.0 (2,094) | 0.0 (441) | 0.1 (2,389) | 0.0 (466) |
| 2016 | 0.0 (907) | 0.0 (51,116) | 0.0 (2,416) | 0.0 (662) | 0.0 (4,359) | 0.0 (580) |
| 2017 | 0.0 (1,092) | 0.0 (47,998) | 0.0 (2,491) | 0.0 (308) | 0.0 (2,420) | 0.0 (531) |

nd = no data (either not tested or tested against an inadequate number of isolates)

\* Refers predominantly to corrections health services

Sources: AGAR and APAS (public hospitals); AGAR, APAS (Qld, SA) and SNP (private hospitals); APAS and SNP (community and aged care homes); APAS (multi-purpose services); APAS (other)

## Table S4.35: Staphylococcus aureus resistance (blood culture isolates), by state and territory, 2015–2017

| Antimicrobial | Year | NSW, % resistant | Vic, % resistant | Qld, % resistant | SA, % resistant | WA, % resistant | Tas, % resistant | NT, % resistant | ACT, % resistant | Australia, % resistant (n) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Benzylpenicillin | 2015 | 82.5 | 77.9 | 80.1 | 80.1 | 80.2 | 86.3 | 90.0 | 80.2 | 80.9 (2,397) |
| 2016 | 83.0 | 80.1 | 79.3 | 86.0 | 80.3 | 72.5 | 95.6 | 80.2 | 81.6 (2,535) |
| 2017 | 81.7 | 82.1 | 79.4 | 84.9 | 83.9 | 72.5 | 88.9 | 73.7 | 81.5 (2,509) |
| Ciprofloxacin | 2015 | 19.7 | 12.3 | 4.2 | 6.9 | 8.1 | 2.0 | 8.2 | 8.6 | 10.6 (2,398) |
| 2016 | 17.5 | 10.5 | 4.3 | 15.1 | 8.3 | 11.0 | 2.2 | 9.9 | 10.9 (2,535) |
| 2017 | 16.7 | 11.8 | 4.7 | 13.3 | 6.5 | 8.8 | 4.0 | 6.3 | 10.0 (2,505) |
| Clindamycin | 2015 | 5.8 | 2.9 | 2.0 | 2.7 | 1.0 | 2.0 | 7.3 | 2.5 | 3.3 (2,398) |
| 2016 | 5.2 | 3.4 | 2.2 | 5.0 | 3.2 | 0.0 | 2.2 | 2.0 | 3.5 (2,535) |
| 2017 | 6.7 | 3.3 | 3.1 | 4.2 | 2.6 | 2.2 | 3.0 | 1.1 | 3.9 (2,509) |
| Daptomycin | 2015 | 0.5 | 0.2 | 0.2 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.3 (2,397) |
| 2016 | 0.5 | 0.2 | 0.4 | 0.4 | 0.0 | 0.9 | 0.0 | 0.0 | 0.3 (2,537) |
| 2017 | 0.7 | 0.3 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.3 (2,515) |
| Erythromycin | 2015 | 20.3 | 11.8 | 9.5 | 10.7 | 11.7 | 3.9 | 26.4 | 8.6 | 13.7 (2,398) |
| 2016 | 19.8 | 12.0 | 10.3 | 19.1 | 14.8 | 16.5 | 26.7 | 15.8 | 15.7 (2,536) |
| 2017 | 19.2 | 16.4 | 11.6 | 21.1 | 16.6 | 11.0 | 30.3 | 7.4 | 16.4 (2,511) |
| Fusidic acid | 2015 | 2.9 | 2.5 | 5.4 | 1.9 | 2.3 | 3.9 | 4.5 | 6.2 | 3.3 (2,398) |
| 2016 | 2.4 | 2.6 | 5.9 | 3.2 | 1.9 | 4.6 | 2.2 | 2.0 | 3.2 (2,536) |
| 2017 | 3.4 | 1.6 | 6.3 | 2.4 | 1.3 | 1.1 | 6.1 | 3.2 | 3.3 (2,511) |
| Gentamicin | 2015 | 9.7 | 3.2 | 1.4 | 3.1 | 0.5 | 0.0 | 7.3 | 2.5 | 4.0 (2,398) |
| 2016 | 8.5 | 1.2 | 1.6 | 4.3 | 1.2 | 0.0 | 6.7 | 5.0 | 3.7 (2,538) |
| 2017 | 8.7 | 3.0 | 2.0 | 2.4 | 1.1 | 1.1 | 8.1 | 3.2 | 4.1 (2,511) |
| Linezolid | 2015 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 (2,397) |
| 2016 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 (2,538) |
| 2017 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 (2,515) |
| Oxacillin | 2015 | 22.6 | 14.7 | 13.3 | 15.3 | 16.8 | 3.9 | 37.3 | 14.8 | 17.6 (2,396) |
| 2016 | 24.8 | 15.3 | 12.8 | 21.9 | 19.7 | 11.0 | 42.2 | 11.9 | 19.3 (2,537) |
| 2017 | 19.5 | 16.4 | 14.7 | 19.9 | 19.4 | 15.6 | 42.4 | 9.5 | 18.4 (2,508) |
| Rifampicin | 2015 | 1.7 | 0.2 | 0.2 | 0.0 | 0.8 | nd | 0.0 | 0.0 | 0.6 (2,347) |
| 2016 | 1.3 | 0.2 | 0.2 | 0.0 | 1.0 | 3.9 | 0.0 | 0.0 | 0.6 (2,479) |
| 2017 | 0.6 | 1.4 | 1.3 | 0.6 | 0.0 | 0.0 | 1.0 | 0.0 | 0.7 (2,464) |
| Teicoplanin | 2015 | 0.2 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.1 (2,398) |
| 2016 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 | 0.0 (2,537) |
| 2017 | 0.1 | 0.3 | 0.2 | 0.0 | 0.4 | 0.0 | 0.0 | 0.0 | 0.2 (2,511) |
| Tetracycline/doxycycline | 2015 | 11.2 | 4.2 | 3.2 | 2.7 | 3.6 | 2.0 | 6.4 | 4.9 | 5.5 (2,398) |
| 2016 | 9.5 | 3.6 | 2.8 | 3.6 | 1.9 | 1.8 | 3.3 | 4.0 | 4.6 (2,535) |
| 2017 | 11.6 | 4.7 | 2.9 | 7.9 | 3.9 | 3.3 | 3.0 | 3.2 | 5.5 (2,244) |
| Trimethoprim–sulfamethoxazole | 2015 | 4.7 | 2.5 | 1.4 | 7.3 | 4.3 | 0.0 | 6.4 | 3.7 | 3.8 (2,398) |
| 2016 | 4.1 | 3.1 | 4.0 | 4.3 | 3.4 | 0.9 | 8.9 | 5.9 | 3.9 (2,538) |
| 2017 | 3.7 | 3.6 | 4.0 | 4.9 | 4.7 | 1.1 | 3.0 | 2.1 | 3.8 (2,508) |
| Vancomycin | 2015 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 (2,397) |
| 2016 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 | 0.0 (2,535) |
| 2017 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 (2,511) |

nd = no data (either not tested or tested against an inadequate number of isolates)

Notes:

1. Not all isolates were tested against all agents.

2. The numbers of isolates for each state and territory are in the following table.

| Year | NSW | Vic | Qld | SA | WA | Tas | NT | ACT | Australia |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2015 | 590 | 407 | 503 | 262 | 394 | 51 | 110 | 81 | 2,398 |
| 2016 | 636 | 418 | 494 | 278 | 412 | 109 | 90 | 101 | 2,538 |
| 2017 | 679 | 365 | 553 | 167 | 466 | 91 | 99 | 95 | 2,515 |

Source: AGAR (national)

## Table S4.36: Methicillin-resistant Staphylococcus aureus resistance, by specimen source, 2015–2017

| Antimicrobial | Year | Blood, % resistant (n) | Other, % resistant (n) | Total, % resistant (n) |
| --- | --- | --- | --- | --- |
| Benzylpenicillin | 2015 | 99.8 (615) | 100.0 (15,668) | 100.0 (16,283) |
| 2016 | 99.7 (720) | 100.0 (17,297) | 100.0 (18,017) |
| 2017 | 99.7 (695) | 100.0 (17,927) | 100.0 (18,622) |
| Ciprofloxacin | 2015 | 42.5 (445) | 25.5 (14,408) | 26.0 (14,853) |
| 2016 | 42.2 (502) | 24.0 (16,082) | 24.6 (16,584) |
| 2017 | 46.3 (518) | 23.0 (16,876) | 23.7 (17,394) |
| Clindamycin | 2015 | 31.1 (582) | 23.8 (19,031) | 24.0 (19,613) |
| 2016 | 29.5 (677) | 18.9 (16,700) | 19.3 (17,377) |
| 2017 | 29.9 (659) | 21.8 (21,066) | 22.0 (21,725) |
| Daptomycin | 2015 | 0.6 (351) | 0.5 (10,592) | 0.5 (10,943) |
| 2016 | 0.3 (370) | 0.3 (11,485) | 0.3 (11,855) |
| 2017 | 0.3 (363) | 0.4 (11,870) | 0.4 (12,233) |
| Erythromycin | 2015 | 44.4 (611) | 29.5 (19,727) | 30.0 (20,338) |
| 2016 | 42.6 (709) | 26.9 (21,829) | 27.4 (22,538) |
| 2017 | 41.3 (688) | 25.5 (22,590) | 26.0 (23,278) |
| Fusidic acid | 2015 | 5.0 (604) | 4.5 (19,951) | 4.5 (20,555) |
| 2016 | 3.6 (700) | 4.3 (21,960) | 4.3 (22,660) |
| 2017 | 3.4 (683) | 3.5 (22,730) | 3.5 (23,413) |
| Gentamicin | 2015 | 14.3 (595) | 7.9 (13,874) | 8.2 (14,469) |
| 2016 | 17.0 (683) | 8.9 (15,631) | 9.3 (16,314) |
| 2017 | 18.3 (662) | 9.0 (16,476) | 9.3 (17,138) |
| Linezolid | 2015 | 0.0 (411) | 0.1 (13,050) | 0.1 (13,461) |
| 2016 | 0.0 (431) | 0.0 (14,142) | 0.0 (14,573) |
| 2017 | 0.2 (422) | 0.1 (14,441) | 0.1 (14,863) |
| Rifampicin | 2015 | 1.6 (607) | 0.8 (19,941) | 0.8 (20,548) |
| 2016 | 1.1 (701) | 0.6 (21,367) | 0.6 (22,068) |
| 2017 | 1.5 (686) | 0.6 (22,184) | 0.6 (22,870) |
| Teicoplanin | 2015 | 0.0 (501) | 0.0 (7,408) | 0.0 (7,909) |
| 2016 | 0.0 (577) | 0.0 (8,243) | 0.0 (8,820) |
| 2017 | 0.3 (369) | 0.0 (8,492) | 0.0 (8,861) |
| Tetracycline/doxycycline | 2015 | 22.5 (614) | 10.2 (19,770) | 10.5 (20,384) |
| 2016 | 19.8 (702) | 9.7 (21,294) | 10.0 (21,996) |
| 2017 | 18.9 (625) | 9.3 (21,776) | 9.6 (22,401) |
| Trimethoprim–sulfamethoxazole | 2015 | 10.4 (584) | 6.6 (19,550) | 6.7 (20,134) |
| 2016 | 9.7 (712) | 6.6 (22,207) | 6.6 (22,919) |
| 2017 | 9.7 (691) | 6.4 (22,849) | 6.5 (23,540) |
| Vancomycin | 2015 | 0.0 (608) | 0.0 (20,107) | 0.0 (20,715) |
| 2016 | 0.0 (714) | 0.0 (22,128) | 0.0 (22,842) |
| 2017 | 0.0 (688) | 0.0 (22,866) | 0.0 (23,554) |

Sources: AGAR (national); APAS (NSW, Vic, Qld, SA, WA, Tas, ACT); SNP (Qld, northern NSW)

## Table S4.37: Methicillin-resistant Staphylococcus aureus resistance, by clinical setting, 2015–2017

| Antimicrobial | Year | Private hospitals, % resistant (n) | Public hospitals, % resistant (n) | Multi-purpose services, % resistant (n) | Aged care homes, % resistant (n) | Community, % resistant (n) |
| --- | --- | --- | --- | --- | --- | --- |
| Benzylpenicillin | 2015 | 100.0 (578) | 100.0 (12,778) | 100.0 (862) | 100.0 (281) | 100.0 (1,751) |
| 2016 | 100.0 (613) | 100.0 (14,033) | 100.0 (1,150) | 100.0 (292) | 100.0 (1,891) |
| 2017 | 100.0 (583) | 100.0 (14,727) | 100.0 (1,076) | 100.0 (242) | 100.0 (1,897) |
| Ciprofloxacin | 2015 | 30.2 (179) | 28.4 (11,832) | 4.2 (859) | 48.9 (276) | 16.6 (1,707) |
| 2016 | 26.1 (207) | 27.4 (13,094) | 2.0 (1,149) | 47.1 (280) | 14.8 (1,823) |
| 2017 | 30.5 (223) | 26.3 (13,967) | 0.8 (1,072) | 44.8 (230) | 14.2 (1,812) |
| Clindamycin | 2015 | 37.7 (525) | 25.3 (12,034) | 5.0 (857) | 40.4 (804) | 20.3 (5,362) |
| 2016 | 35.9 (541) | 19.2 (8,946) | 2.2 (1,115) | 40.7 (811) | 18.2 (5,928) |
| 2017 | 32.3 (526) | 24.6 (13,375) | 2.6 (1,079) | 41.7 (676) | 16.8 (6,014) |
| Daptomycin | 2015 | 1.1 (472) | 0.6 (5,882) | nd | 0.9 (632) | 0.3 (3,957) |
| 2016 | 0.4 (508) | 0.3 (6,236) | nd | 1.0 (674) | 0.3 (4,437) |
| 2017 | 0.6 (501) | 0.4 (6,655) | nd | 1.1 (550) | 0.1 (4,527) |
| Erythromycin | 2015 | 41.1 (645) | 32.9 (12,297) | 7.8 (862) | 44.5 (847) | 23.6 (5,687) |
| 2016 | 40.0 (677) | 30.6 (13,613) | 3.1 (1,148) | 43.8 (845) | 21.3 (6,224) |
| 2017 | 35.7 (664) | 29.1 (14,424) | 3.5 (1,079) | 44.7 (711) | 19.8 (6,308) |
| Fusidic acid | 2015 | 5.7 (646) | 3.8 (12,457) | 0.9 (860) | 9.1 (889) | 5.8 (5,670) |
| 2016 | 7.6 (683) | 3.6 (13,677) | 1.2 (1,147) | 11.5 (906) | 5.0 (6,209) |
| 2017 | 5.1 (665) | 3.1 (14,518) | 0.6 (1,079) | 6.3 (763) | 4.6 (6,293) |
| Gentamicin | 2015 | 3.4 (177) | 9.1 (11,798) | 1.1 (822) | 7.1 (283) | 5.5 (1,389) |
| 2016 | 4.8 (208) | 10.5 (13,130) | 0.5 (1,117) | 6.6 (288) | 5.9 (1,540) |
| 2017 | 7.2 (222) | 10.7 (13,827) | 0.7 (1,076) | 7.1 (225) | 5.1 (1,702) |
| Linezolid | 2015 | 0.0 (475) | 0.1 (7,171) | nd | 0.1 (740) | 0.2 (5,075) |
| 2016 | 0.0 (508) | 0.0 (7,609) | nd | 0.1 (790) | 0.1 (5,666) |
| 2017 | 0.0 (504) | 0.1 (7,941) | nd | 0.2 (650) | 0.1 (5,723) |
| Rifampicin | 2015 | 1.1 (645) | 0.8 (12,499) | 0.2 (860) | 0.5 (884) | 0.8 (5,627) |
| 2016 | 1.5 (612) | 0.7 (13,559) | 0.2 (1,116) | 0.5 (775) | 0.4 (5,968) |
| 2017 | 0.9 (576) | 0.8 (14,398) | 0.2 (1,077) | 0.3 (669) | 0.4 (6,055) |
| Teicoplanin | 2015 | 0.0 (73) | 0.0 (6,627) | 0.0 (819) | 0.0 (130) | 0.0 (260) |
| 2016 | 0.0 (78) | 0.0 (7,206) | 0.0 (1,108) | 0.0 (136) | 0.0 (292) |
| 2017 | 0.0 (93) | 0.0 (7,362) | 0.0 (1,044) | 0.0 (94) | 0.0 (268) |
| Tetracycline/doxycycline | 2015 | 12.4 (643) | 12.9 (12,693) | 0.9 (859) | 11.0 (842) | 6.0 (5,314) |
| 2016 | 10.9 (658) | 12.5 (13,571) | 2.5 (1,140) | 13.0 (844) | 5.1 (5,783) |
| 2017 | 13.5 (639) | 12.0 (14,093) | 0.7 (1,075) | 12.2 (712) | 4.8 (5,842) |
| Trimethoprim–sulfamethoxazole | 2015 | 7.7 (648) | 7.3 (12,094) | 1.9 (864) | 6.7 (841) | 6.0 (5,687) |
| 2016 | 6.5 (680) | 7.2 (13,990) | 1.0 (1,149) | 8.5 (843) | 6.1 (6,219) |
| 2017 | 5.8 (667) | 6.6 (14,682) | 2.4 (1,078) | 7.2 (712) | 7.0 (6,304) |
| Vancomycin | 2015 | 0.0 (647) | 0.0 (12,615) | 0.0 (848) | 0.1 (887) | 0.0 (5,685) |
| 2016 | 0.0 (686) | 0.0 (13,820) | 0.0 (1,138) | 0.0 (908) | 0.0 (6,252) |
| 2017 | 0.0 (668) | 0.0 (14,612) | 0.0 (1,067) | 0.0 (764) | 0.0 (6,346) |

nd = no data (either not tested or tested against an inadequate number of isolates)

Sources: AGAR and APAS (public hospitals); AGAR, APAS (Qld, SA) and SNP (private hospitals); APAS and SNP (community and aged care homes); APAS (multi-purpose services)

## Table S4.38: Methicillin-resistant Staphylococcus aureus resistance (blood culture isolates), by state and territory, 2015–2017

| Antimicrobial | Year | NSW, % resistant | Vic, % resistant | Qld, % resistant | SA, % resistant | WA, % resistant | Tas, % resistant | NT, % resistant | ACT, % resistant | Australia, % resistant (n) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Benzylpenicillin | 2015 | 100.0 | 98.4 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 99.8 (443) |
| 2016 | 100.0 | 97.0 | 100.0 | 100.0 | 98.8 | 100.0 | 100.0 | 100.0 | 99.4 (506) |
| 2017 | 98.6 | 100.0 | 97.7 | 100.0 | 99.0 | 86.7 | 97.8 | 100.0 | 98.4 (488) |
| Ciprofloxacin | 2015 | 73.6 | 62.5 | 18.8 | 27.9 | 32.9 | 33.3 | 19.0 | 50.0 | 46.5 (443) |
| 2016 | 63.4 | 50.0 | 13.2 | 54.8 | 24.1 | 75.0 | 4.9 | 61.5 | 42.9 (506) |
| 2017 | 67.6 | 56.3 | 20.7 | 55.9 | 17.7 | 40.0 | 8.9 | 44.4 | 40.5 (489) |
| Clindamycin | 2015 | 18.6 | 14.1 | 13.0 | 14.0 | 5.7 | 0.0 | 16.7 | 8.3 | 14.0 (443) |
| 2016 | 19.1 | 15.2 | 7.5 | 19.4 | 9.6 | 0.0 | 4.9 | 7.7 | 13.6 (506) |
| 2017 | 23.0 | 14.3 | 13.8 | 17.6 | 4.2 | 13.3 | 4.4 | 0.0 | 13.7 (488) |
| Daptomycin | 2015 | 0.7 | 1.6 | 1.4 | 0.0 | 1.4 | 0.0 | 0.0 | 0.0 | 0.9 (442) |
| 2016 | 0.6 | 1.5 | 0.0 | 1.6 | 0.0 | 8.3 | 0.0 | 0.0 | 0.8 (506) |
| 2017 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 (494) |
| Erythromycin | 2015 | 60.0 | 42.2 | 29.0 | 27.9 | 31.4 | 33.3 | 31.0 | 25.0 | 41.1 (443) |
| 2016 | 56.2 | 30.3 | 22.1 | 45.2 | 33.7 | 58.3 | 36.6 | 46.2 | 41.4 (507) |
| 2017 | 48.6 | 43.8 | 27.6 | 61.8 | 31.3 | 46.7 | 44.4 | 22.2 | 40.8 (490) |
| Fusidic acid | 2015 | 4.3 | 3.1 | 5.8 | 9.3 | 2.9 | 0.0 | 7.1 | 0.0 | 4.7 (443) |
| 2016 | 3.1 | 1.5 | 8.8 | 0.0 | 1.2 | 0.0 | 4.9 | 7.7 | 3.2 (507) |
| 2017 | 3.6 | 4.7 | 6.9 | 0.0 | 2.1 | 0.0 | 8.9 | 0.0 | 4.1 (490) |
| Gentamicin | 2015 | 37.9 | 14.1 | 2.9 | 9.3 | 2.9 | 0.0 | 16.7 | 8.3 | 17.6 (443) |
| 2016 | 31.5 | 6.1 | 7.4 | 12.9 | 3.6 | 0.0 | 9.8 | 30.8 | 15.6 (507) |
| 2017 | 32.9 | 14.1 | 9.2 | 11.8 | 3.1 | 6.7 | 13.3 | 22.2 | 16.1 (490) |
| Linezolid | 2015 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 (442) |
| 2016 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 (507) |
| 2017 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 (494) |
| Rifampicin | 2015 | 5.7 | 1.6 | 1.4 | 0.0 | 4.3 | nd | 0.0 | 0.0 | 3.0 (440) |
| 2016 | 4.3 | 1.5 | 0.0 | 0.0 | 3.6 | 20.0 | 0.0 | 0.0 | 2.6 (505) |
| 2017 | 0.7 | 4.7 | 3.4 | 2.9 | 0.0 | 0.0 | 2.2 | 0.0 | 1.9 (483) |
| Teicoplanin | 2015 | 0.7 | 0.0 | 0.0 | 0.0 | 1.4 | 0.0 | 0.0 | 0.0 | 0.5 (443) |
| 2016 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.3 | 0.0 | 0.0 | 0.2 (507) |
| 2017 | 0.0 | 1.6 | 1.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 (490) |
| Tetracycline/doxycycline | 2015 | 38.6 | 17.2 | 14.5 | 9.3 | 2.9 | 0.0 | 16.7 | 8.3 | 20.1 (443) |
| 2016 | 31.1 | 9.1 | 4.4 | 12.9 | 1.2 | 8.3 | 4.9 | 23.1 | 14.6 (506) |
| 2017 | 33.3 | 15.6 | 10.3 | 25.0 | 3.1 | 6.7 | 6.7 | 11.1 | 15.0 (434) |
| Trimethoprim–sulfamethoxazole | 2015 | 15.0 | 12.5 | 2.9 | 23.3 | 18.6 | 0.0 | 14.3 | 25.0 | 14.2 (443) |
| 2016 | 11.1 | 6.1 | 10.3 | 12.9 | 7.2 | 0.0 | 19.5 | 23.1 | 10.7 (507) |
| 2017 | 10.8 | 12.5 | 12.6 | 18.2 | 13.5 | 6.7 | 6.7 | 0.0 | 11.7 (488) |
| Vancomycin | 2015 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 (443) |
| 2016 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.3 | 0.0 | 0.0 | 0.2 (506) |
| 2017 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 (490) |

nd = no data (either not tested or tested against an inadequate number of isolates)

Notes:

1. Not all isolates were tested against all agents.

2. The numbers of isolates for each state and territory are in the following table.

| Year | NSW | Vic | Qld | SA | WA | Tas | NT | ACT | Australia |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2015 | 140 | 64 | 69 | 43 | 70 | 3 | 42 | 12 | 443 |
| 2016 | 162 | 66 | 68 | 62 | 83 | 12 | 41 | 13 | 507 |
| 2017 | 142 | 64 | 87 | 35 | 97 | 15 | 45 | 9 | 494 |

Source: AGAR (national)

## Table S4.39: Methicillin-resistant Staphylococcus aureus resistance, by community-associated and healthcare-associated clones (blood culture isolates), 2015–2017

| Antimicrobial | Year | Community-associated, % resistant (n) | Healthcare-associated, % resistant (n) | Total, % resistant (n) |
| --- | --- | --- | --- | --- |
| Benzylpenicillin | 2015 | 99.6 (282) | 100.0 (144) | 99.8 (426) |
| 2016 | 99.4 (338) | 100.0 (130) | 99.6 (468) |
| 2017 | 99.7 (342) | 100.0 (116) | 99.8 (458) |
| Ciprofloxacin/norfloxacin | 2015 | 20.9 (282) | 98.6 (144) | 47.2 (426) |
| 2016 | 20.5 (337) | 97.7 (130) | 42.0 (467) |
| 2017 | 22.8 (342) | 94.0 (117) | 41.0 (459) |
| Clindamycin | 2015 | 5.7 (282) | 31.3 (144) | 14.3 (426) |
| 2016 | 9.2 (338) | 23.1 (130) | 13.0 (468) |
| 2017 | 9.4 (342) | 25.6 (117) | 13.5 (459) |
| Daptomycin | 2015 | 0.4 (282) | 1.4 (144) | 0.7 (426) |
| 2016 | 0.6 (338) | 1.5 (130) | 0.9 (468) |
| 2017 | 0.0 (343) | 0.8 (118) | 0.2 (461) |
| Erythromycin | 2015 | 30.9 (282) | 62.5 (144) | 41.5 (426) |
| 2016 | 33.4 (338) | 62.3 (130) | 41.5 (468) |
| 2017 | 35.4 (342) | 56.8 (118) | 40.9 (460) |
| Fusidic acid | 2015 | 6.7 (282) | 1.4 (144) | 4.9 (426) |
| 2016 | 3.8 (338) | 0.8 (130) | 3.0 (468) |
| 2017 | 4.7 (342) | 1.7 (118) | 3.9 (460) |
| Gentamicin | 2015 | 14.5 (282) | 24.3 (144) | 17.8 (426) |
| 2016 | 12.1 (338) | 21.5 (130) | 14.7 (468) |
| 2017 | 13.7 (342) | 22.0 (118) | 15.9 (460) |
| Linezolid | 2015 | 0.0 (282) | 0.0 (144) | 0.0 (426) |
| 2016 | 0.0 (338) | 0.0 (130) | 0.0 (468) |
| 2017 | 0.0 (343) | 0.0 (118) | 0.0 (461) |
| Rifampicin | 2015 | 1.4 (280) | 6.3 (143) | 3.1 (423) |
| 2016 | 1.2 (336) | 6.9 (130) | 2.8 (466) |
| 2017 | 1.5 (340) | 2.6 (117) | 1.8 (457) |
| Teicoplanin | 2015 | 0.4 (282) | 0.0 (144) | 0.2 (426) |
| 2016 | 0.0 (338) | 0.8 (130) | 0.2 (468) |
| 2017 | 0.3 (342) | 0.0 (118) | 0.2 (460) |
| Tetracycline/doxycycline | 2015 | 17.0 (282) | 27.1 (144) | 20.4 (426) |
| 2016 | 12.8 (337) | 20.0 (130) | 14.8 (467) |
| 2017 | 13.8 (312) | 20.0 (95) | 15.2 (407) |
| Trimethoprim–sulfamethoxazole | 2015 | 10.6 (282) | 20.8 (144) | 14.1 (426) |
| 2016 | 7.4 (338) | 19.2 (130) | 10.7 (468) |
| 2017 | 8.8 (341) | 19.7 (117) | 11.6 (458) |
| Vancomycin | 2015 | 0.0 (282) | 0.0 (144) | 0.0 (426) |
| 2016 | 0.0 (338) | 0.8 (130) | 0.2 (468) |
| 2017 | 0.0 (342) | 0.0 (118) | 0.0 (460) |

Source: AGAR (national)

## Table S4.40: Methicillin-resistant Staphylococcus aureus community-associated and healthcare-associated clones (blood culture isolates), by state and territory, 2015–2017

| State or territory | Year | Isolates tested | MRSA, % | Typed, no.\* | Community-associated, % of total (n) | Healthcare-associated, % of total (n) |
| --- | --- | --- | --- | --- | --- | --- |
| NSW | 2015 | 590 | 23.7 | 133 | 11.0 (65) | 11.5 (68) |
| 2016 | 637 | 25.6 | 140 | 14.1 (90) | 7.8 (50) |
| 2017 | 679 | 20.5 | 132 | 10.8 (73) | 8.7 (59) |
| Vic | 2015 | 407 | 15.7 | 62 | 9.6 (39) | 5.7 (23) |
| 2016 | 418 | 15.8 | 63 | 9.8 (41) | 5.3 (22) |
| 2017 | 365 | 17.5 | 61 | 12.9 (47) | 3.8 (14) |
| Qld | 2015 | 503 | 13.7 | 67 | 10.9 (55) | 2.4 (12) |
| 2016 | 494 | 13.8 | 63 | 11.7 (58) | 1.0 (5) |
| 2017 | 553 | 15.0 | 80 | 13.0 (72) | 1.4 (8) |
| SA | 2015 | 262 | 16.4 | 43 | 13.0 (34) | 3.4 (9) |
| 2016 | 278 | 22.3 | 61 | 12.2 (34) | 9.7 (27) |
| 2017 | 167 | 20.4 | 34 | 10.2 (17) | 10.2 (17) |
| WA | 2015 | 394 | 17.8 | 65 | 11.7 (46) | 4.8 (19) |
| 2016 | 413 | 20.3 | 77 | 16.2 (67) | 2.4 (10) |
| 2017 | 466 | 20.4 | 95 | 18.5 (86) | 1.9 (9) |
| Tas | 2015 | 51 | 5.9 | 3 | 3.9 (2) | 2.0 (1) |
| 2016 | 109 | 11.0 | 11 | 2.8 (3) | 7.3 (8) |
| 2017 | 91 | 11.0 | 9 | 3.3 (3) | 6.6 (6) |
| NT | 2015 | 110 | 38.2 | 41 | 30.0 (33) | 7.3 (8) |
| 2016 | 90 | 45.6 | 41 | 43.3 (39) | 2.2 (2) |
| 2017 | 99 | 44.4 | 42 | 39.4 (39) | 3.0 (3) |
| ACT | 2015 | 81 | 14.8 | 12 | 9.9 (8) | 4.9 (4) |
| 2016 | 101 | 12.9 | 12 | 5.9 (6) | 5.9 (6) |
| 2017 | 95 | 9.5 | 9 | 7.4 (7) | 2.1 (2) |
| Australia | 2015 | 2,398 | 18.5 | 426 | 11.8 (282) | 6.0 (144) |
| 2016 | 2,540 | 20.0 | 468 | 13.3 (338) | 5.1 (130) |
| 2017 | 2,515 | 19.0 | 462 | 13.7 (344) | 4.7 (118) |

MRSA = methicillin-resistant Staphylococcus aureus

\* 98% (2015), 94% (2016) and 97% (2017) of MRSA were available for typing to determine sequence type. Based on sequence type, MRSA were classified as either healthcare-associated or community-associated clones.

Source: AGAR (national)

## Table S4.41: Streptococcus agalactiae resistance (all specimen sources), 2015–2017

| Antimicrobial | 2015, % resistant (n) | 2016, % resistant (n) | 2017, % resistant (n) |
| --- | --- | --- | --- |
| Benzylpenicillin | 0.1 (8,421) | 0.1 (10,896) | 0.0 (11,064) |
| Amoxicillin/ampicillin | 0.0 (3,363) | 0.0 (3,591) | 0.0 (3,958) |
| Clindamycin | 23.4 (3,767) | 25.1 (4,036) | 29.4 (3,695) |
| Erythromycin | 25.4 (4,712) | 28.0 (6,665) | 30.7 (7,160) |
| Tetracycline/doxycycline | 77.5 (6,141) | 76.9 (3,674) | 76.8 (3,621) |
| Trimethoprim | 13.9 (1,222) | 11.3 (1,291) | 8.8 (1,364) |
| Trimethoprim–sulfamethoxazole | 1.1 (654) | 1.2 (579) | 0.7 (678) |

Sources: APAS (NSW, Vic, Qld, SA, WA, Tas, ACT); SNP (Qld, northern NSW)

## Table S4.42: Streptococcus agalactiae resistance, by clinical setting, 2015–2017

| Antimicrobial | Year | Public hospitals, % resistant (n) | Private hospitals, % resistant (n) | Community, % resistant (n) | Aged care homes, % resistant (n) |
| --- | --- | --- | --- | --- | --- |
| Benzylpenicillin | 2015 | 0.0 (111) | 0.1 (6,392) | nd | 0.0 (84) |
| 2016 | 0.0 (237) | 0.0 (8,641) | nd | 0.0 (53) |
| 2017 | 0.0 (407) | 0.0 (8,676) | 0.0 (33) | 0.0 (40) |
| Amoxicillin/ampicillin | 2015 | 0.0 (68) | 0.0 (2,099) | 0.0 (82) | 0.0 (0) |
| 2016 | 0.0 (56) | 0.0 (2,245) | 0.0 (52) | 0.0 (0) |
| 2017 | 0.0 (324) | 0.0 (2,180) | 0.0 (40) | 0.0 (0) |
| Clindamycin | 2015 | 33.3 (69) | 22.7 (3,224) | nd | 36.0 (50) |
| 2016 | 33.7 (196) | 22.6 (3,331) | nd | 50.9 (53) |
| 2017 | 34.1 (208) | 28.4 (2,973) | nd | 32.5 (40) |
| Erythromycin | 2015 | 23.1 (108) | 25.5 (4,024) | nd | 35.3 (51) |
| 2016 | 35.5 (228) | 26.9 (5,941) | nd | 47.3 (55) |
| 2017 | 30.9 (372) | 30.3 (6,091) | nd | 32.5 (40) |
| Tetracycline/doxycycline | 2015 | 83.7 (104) | 77.6 (4,724) | nd | 71.6 (81) |
| 2016 | 78.9 (57) | 77.2 (2,308) | nd | 80.4 (51) |
| 2017 | 76.7 (176) | 77.6 (2,230) | nd | 90.0 (40) |
| Trimethoprim | 2015 | nd | nd | nd | 24.4 (78) |
| 2016 | nd | nd | nd | 12.5 (72) |
| 2017 | nd | nd | nd | 13.8 (65) |
| Trimethoprim–sulfamethoxazole | 2015 | 4.5 (67) | 0.0 (312) | nd | 2.0 (50) |
| 2016 | 3.5 (57) | 0.5 (221) | nd | 5.8 (52) |
| 2017 | 0.6 (159) | 0.9 (212) | nd | 2.7 (37) |

nd = no data (either not tested or tested against an inadequate number of isolates)

Sources: APAS (public hospitals); APAS (Qld, SA) and SNP (private hospitals); APAS and SNP (community and aged care homes)

## Table S4.43: Streptococcus pneumoniae resistance, by specimen source, 2015–2017

| Antimicrobial | Year | Blood, % resistant (n) | Other, % resistant (n) | All sources, % resistant (n) |
| --- | --- | --- | --- | --- |
| Penicillin/amoxicillin | 2015 | 4.7 (551) | 4.7 (5,657) | 4.7 (6,208) |
| 2016 | 6.0 (686) | 4.0 (5,957) | 4.2 (6,643) |
| 2017 | 3.9 (837) | 3.5 (5,835) | 3.6 (6,672) |
| Ceftriaxone/cefotaxime | 2015 | 0.0 (87) | 0.4 (235) | 0.3 (322) |
| 2016 | 0.8 (120) | 1.5 (136) | 1.2 (256) |
| 2017 | 1.0 (96) | 0.8 (133) | 0.9 (229) |
| Clindamycin | 2015 | nd | 18.8 (2,175) | 18.8 (2,175) |
| 2016 | 17.1 (35) | 18.2 (2,233) | 18.2 (2,268) |
| 2017 | 12.2 (41) | 19.3 (2,248) | 19.2 (2,289) |
| Erythromycin | 2015 | 12.5 (439) | 23.4 (5,445) | 22.6 (5,884) |
| 2016 | 16.7 (588) | 24.1 (5,792) | 23.4 (6,380) |
| 2017 | 17.4 (656) | 24.6 (5,646) | 23.9 (6,302) |
| Moxifloxacin/levofloxacin | 2015 | nd | 0.7 (403) | 0.7 (403) |
| 2016 | 0.0 (35) | 0.0 (375) | 0.0 (410) |
| 2017 | 0.0 (42) | 0.6 (361) | 0.5 (403) |
| Tetracycline/doxycycline | 2015 | nd | 22.3 (1,434) | 22.3 (1,434) |
| 2016 | 22.9 (35) | 20.2 (1,459) | 20.3 (1,494) |
| 2017 | 11.9 (42) | 21.9 (1,340) | 21.6 (1,382) |
| Trimethoprim–sulfamethoxazole | 2015 | 6.7 (30) | 25.0 (2,984) | 24.8 (3,014) |
| 2016 | 17.1 (35) | 25.0 (3,002) | 24.9 (3,037) |
| 2017 | 2.4 (42) | 24.4 (2,878) | 24.0 (2,920) |
| Vancomycin | 2015 | 0.0 (174) | 0.0 (1,488) | 0.0 (1,662) |
| 2016 | 0.0 (191) | 0.0 (1,476) | 0.0 (1,667) |
| 2017 | 0.0 (220) | 0.1 (1,401) | 0.1 (1,621) |

nd = no data (either not tested or tested against an inadequate number of isolates)

Sources: APAS (NSW, Vic, Qld, SA, WA, Tas, ACT); SNP (Qld, northern NSW)

## Table S4.44: Streptococcus pneumoniae resistance, by clinical setting, 2015–2017

| Antimicrobial | Year | Private hospitals, % resistant (n) | Public hospitals, % resistant (n) | Multi-purpose services, % resistant (n) | Community, % resistant (n) |
| --- | --- | --- | --- | --- | --- |
| Benzylpenicillin/amoxicillin | 2015 | 4.0 (176) | 5.7 (4,056) | 8.5 (59) | 2.7 (1,813) |
| 2016 | 9.0 (178) | 4.5 (4,545) | 2.9 (68) | 3.0 (1,755) |
| 2017 | 9.5 (179) | 3.9 (4,638) | 4.2 (72) | 2.2 (1,709) |
| Ceftriaxone/cefotaxime | 2015 | 0.0 (36) | 0.6 (180) | nd | 0.0 (106) |
| 2016 | nd | 1.8 (167) | nd | 0.0 (89) |
| 2017 | nd | 1.1 (180) | nd | 0.0 (49) |
| Clindamycin | 2015 | 23.8 (122) | 18.6 (618) | nd | 18.4 (1,435) |
| 2016 | 35.5 (93) | 18.7 (694) | nd | 16.9 (1,481) |
| 2017 | 33.0 (88) | 17.0 (742) | nd | 19.5 (1,459) |
| Erythromycin | 2015 | 33.8 (136) | 22.4 (3,889) | 15.4 (65) | 22.8 (1,679) |
| 2016 | 44.4 (133) | 23.7 (4,330) | 14.7 (68) | 22.2 (1,731) |
| 2017 | 38.3 (94) | 24.0 (4,371) | 9.9 (71) | 23.5 (1,668) |
| Moxifloxacin/levofloxacin | 2015 | nd | 0.9 (316) | nd | 0.0 (87) |
| 2016 | nd | 0.0 (342) | nd | 0.0 (68) |
| 2017 | nd | 0.6 (351) | nd | 0.0 (52) |
| Tetracycline/doxycycline | 2015 | 29.8 (131) | 25.0 (713) | 8.5 (59) | 21.4 (407) |
| 2016 | 40.6 (96) | 22.1 (751) | 4.8 (62) | 17.8 (477) |
| 2017 | 36.7 (90) | 23.7 (813) | 8.3 (60) | 16.2 (419) |
| Trimethoprim–sulfamethoxazole | 2015 | 33.1 (136) | 23.2 (1,356) | 25.0 (60) | 26.2 (1,337) |
| 2016 | 35.6 (132) | 25.7 (1,427) | 25.8 (62) | 23.4 (1,299) |
| 2017 | 22.3 (94) | 22.9 (1,421) | 16.2 (68) | 26.0 (1,250) |
| Vancomycin | 2015 | 0.0 (37) | 0.0 (1,450) | 0.0 (65) | 0.0 (110) |
| 2016 | 0.0 (30) | 0.0 (1,501) | 0.0 (65) | 0.0 (71) |
| 2017 | nd | 0.1 (1,499) | 0.0 (69) | 0.0 (53) |

nd = no data (either not tested or tested against an inadequate number of isolates)

Sources: APAS (public hospitals); APAS (Qld, SA) and SNP (private hospitals); APAS and SNP (community); APAS (multi-purpose services)

## Table S4.45: Streptococcus pyogenes resistance (all specimen sources), 2015–2017

| Antimicrobial | 2015, % resistant (n) | 2016, % resistant (n) | 2017, % resistant (n) |
| --- | --- | --- | --- |
| Benzylpenicillin | 0.1 (17,147) | 0.0 (19,980) | 0.0 (21,971) |
| Clindamycin | 3.0 (14,028) | 3.6 (16,135) | 4.1 (17,942) |
| Erythromycin | 3.4 (21,949) | 4.4 (26,243) | 4.9 (29,881) |
| Tetracycline/doxycycline | 14.4 (6,650) | 12.0 (8,220) | 15.5 (10,869) |
| Trimethoprim–sulfamethoxazole | 0.8 (5,208) | 0.6 (6,450) | 0.4 (8,137) |

Sources: APAS (NSW, Vic, Qld, SA, WA, Tas, ACT); SNP (Qld, northern NSW)

## Table S4.46: Streptococcus pyogenes resistance, by clinical setting, 2015–2017

| Antimicrobial | Year | Private hospitals, % resistant (n) | Public hospitals, % resistant (n) | Multi-purpose services, % resistant (n) | Community, % resistant (n) |
| --- | --- | --- | --- | --- | --- |
| Benzylpenicillin | 2015 | 0.0 (85) | 0.1 (9,863) | 0.1 (1,520) | 0.0 (3,227) |
| 2016 | 0.0 (112) | 0.0 (12,059) | 0.0 (1,569) | 0.0 (4,167) |
| 2017 | 0.0 (155) | 0.0 (13,814) | 0.0 (1,721) | 0.0 (4,392) |
| Clindamycin | 2015 | 5.1 (136) | 3.0 (3,608) | 1.5 (261) | 3.5 (7,608) |
| 2016 | 12.2 (156) | 3.7 (3,755) | 0.9 (235) | 4.1 (9,922) |
| 2017 | 5.8 (189) | 3.7 (4,010) | 0.0 (195) | 4.8 (11,663) |
| Erythromycin | 2015 | 3.7 (187) | 3.8 (9,801) | 0.9 (1,513) | 4.2 (8,001) |
| 2016 | 9.5 (221) | 4.6 (11,991) | 0.3 (1,563) | 5.2 (10,399) |
| 2017 | 7.2 (279) | 4.8 (13,735) | 0.6 (1,715) | 6.1 (12,267) |
| Tetracycline/doxycycline | 2015 | 14.4 (146) | 17.1 (3,160) | 8.9 (1,250) | 12.8 (1,893) |
| 2016 | 14.6 (158) | 13.1 (4,160) | 7.1 (1,317) | 12.1 (2,348) |
| 2017 | 10.8 (203) | 16.5 (4,975) | 8.7 (1,478) | 13.5 (2,732) |
| Trimethoprim–sulfamethoxazole | 2015 | 2.0 (102) | 0.3 (326) | nd | 0.8 (4,780) |
| 2016 | 0.9 (110) | 1.3 (80) | nd | 0.6 (6,260) |
| 2017 | 0.0 (128) | 0.9 (114) | nd | 0.4 (7,895) |

nd = no data (either not tested or tested against an inadequate number of isolates)

Sources: APAS (public hospitals); APAS (Qld, SA) and SNP (private hospitals); APAS and SNP (community); APAS (multi-purpose services)

# Abbreviations

| Term | Definition |
| --- | --- |
| ACT | Australian Capital Territory |
| AGAR | Australian Group on Antimicrobial Resistance |
| APAS | Australian Passive AMR Surveillance |
| NNN | National Neisseria Network |
| NSW | New South Wales |
| NT | Northern Territory |
| Qld | Queensland |
| SA | South Australia |
| SNP | Sullivan Nicolaides Pathology |
| Tas | Tasmania |
| Vic | Victoria |
| WA | Western Australia |

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