

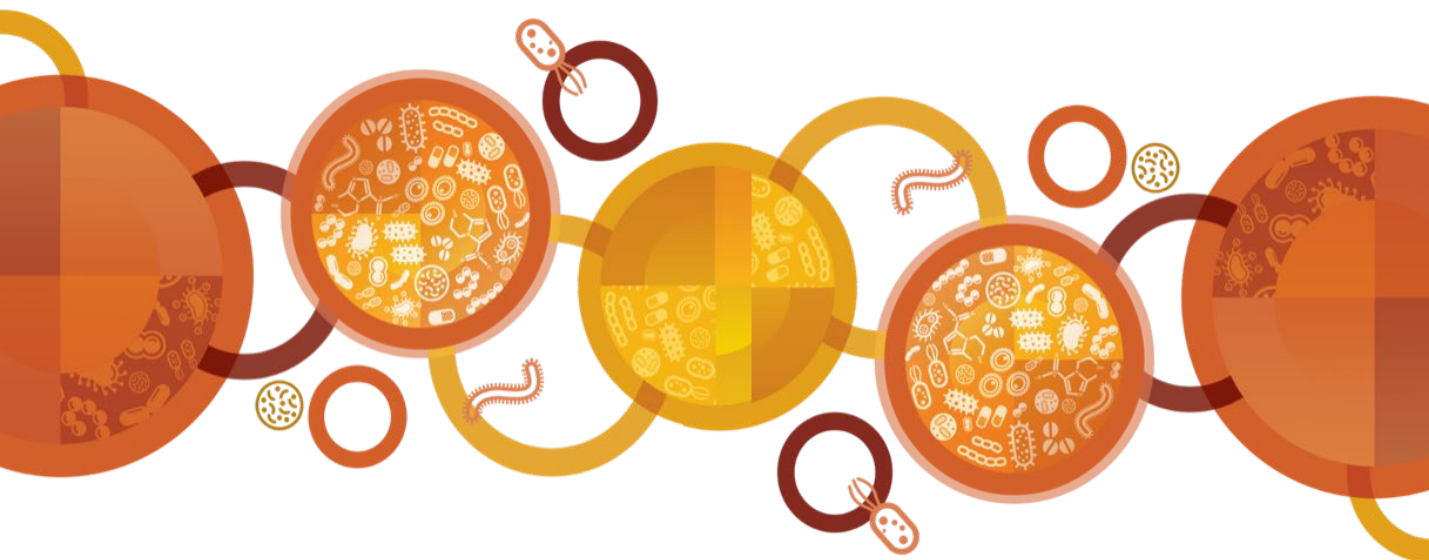
AUSTRALIAN COMMISSION  
ON SAFETY AND QUALITY IN HEALTH CARE



# CARAlert data update 17

1 March 2020–30 April 2020

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## Data Summary

This report provides an update on data submitted to CARAlert for the reporting period: 1 March 2020 to 30 April 2020, and complements previous analyses of and updates on [CARAlert data](#).

### National overview:

- There was an 40.0% decrease in critical antimicrobial resistances (CARs) reported compared to the previous two-month reporting period ( $n = 375$ )
- Carbapenemase-producing Enterobacterales (CPE) (including those with ribosomal methyltransferase or transmissible resistance to colistin) remains the most frequently reported CAR ( $n = 98$ , 43.6%), followed by multidrug-resistant *Shigella* species ( $n = 41$ , 18.2%)
- The total number of CPE (either alone or in combination with other CARs) reported this year to date, compared to the same period last year, decreased by 24.7% ( $n = 232$  versus  $n = 308$ ). The proportion of CPE reported from South Australia (3.1%; 3/98) increased compared to the previous two-month period (0.7%; 1/134)
- The number of multidrug-resistant *Shigella* species ( $n = 41$ ) decreased by 61.3% compared to the previous two-month reporting period
- Azithromycin non-susceptible (low-level resistance, MIC  $\leq 256$  mg/L) *Neisseria gonorrhoeae* decreased by 46.3% ( $n = 37$  versus 66)
- The majority of CARs, excluding those from *N. gonorrhoeae*, were reported from public hospitals ( $n = 107$ , 57%). There were 37 from community settings, and 17 from private hospitals. There were no reports from aged care homes.

### Carbapenemase-producing Enterobacterales:

- IMP (54.1%), NDM (31.6%), and OXA-48-like (10.2%) types accounted for 95.9% of all CPE reported during this period
- The total number of CPE declined ( $n = 98$ , down 26.9%), with decreases in the number of IMP-types and NDM-types (IMP:  $n = 53$  versus  $n = 71$ ; NDM:  $n = 31$  versus  $n = 37$ ) compared to the previous two-month period
- No NDM types were reported from Tasmania, Northern Territory or the Australian Capital Territory
- One IMP-4 producing *Enterobacter cloacae* complex reported from New South Wales also harboured transmissible colistin resistance (mcr-9.1)
- There were no reports of KPC-producing *Enterobacterales*
- One SME-producing *Serratia marcescens* was reported from New South Wales
- Excluding CARs for which the setting was unknown, 24% (22/92) of CPE were reported from settings other than public hospitals; 15.2% ( $n = 14$ ) and 8.7% ( $n = 8$ ) respectively from private hospitals, and the community
- Six hospitals had more than two notifications of IMP-types; these institutions were in New South Wales ( $n = 4$ ), Victoria ( $n = 1$ ) and Queensland ( $n = 1$ )
- Another hospital in New South Wales also had more than two notifications of NDM-types.

### Salmonella and Shigella species:

- Ceftriaxone non-susceptible *Salmonella* species were reported from Queensland ( $n = 2$ ), Victoria ( $n = 1$ ), and Western Australia ( $n = 1$ )
- The majority of multidrug-resistant *Shigella* species were reported from New South Wales ( $n = 20$ , 49%) and Victoria ( $n = 12$ , 29%); other reports were from Queensland ( $n = 7$ ), and Western Australia ( $n = 2$ ). The vast majority (93%, 38/41) were *S. sonnei*
- ESBL types were detected in 83% (10/12) of multidrug-resistant *Shigella* reported from Victoria and 65% (13/20) from NSW. Where ESBL type was known, the vast majority (91%,  $n = 21/23$ ) were CTX-M-27 *S. sonnei*.

**Azithromycin non-susceptible (low-level resistance, MIC ≤ 256 mg/L) *N. gonorrhoeae*:**

- The total number of reports of this CAR decreased ( $n = 36$ , down 46%). There were decreases in the numbers from New South Wales ( $n = 22$  versus  $n = 35$ ), Victoria ( $n = 4$  versus  $n = 16$ ), and Western Australia ( $n = 1$  versus  $n = 6$ ); and, there was an increase from Queensland ( $n = 9$  versus  $n = 7$ ) compared to the previous two-month reporting period
- The majority of cases were reported from New South Wales ( $n = 22$ , 61%).

**Ceftriaxone non-susceptible or azithromycin non-susceptible (high-level resistance, MIC ≥ 256 mg/L) *N. gonorrhoeae*:**

- There was one ceftriaxone non-susceptible *N. gonorrhoeae* from New South Wales, and one azithromycin non-susceptible *N. gonorrhoeae* (high-level resistance, MIC > 256 mg/L) reported from Queensland.

**Daptomycin non-susceptible *Staphylococcus aureus***

- The total number of reports of this CAR increased ( $n = 29$ , up 3.6%). There was an increase in the numbers from New South Wales ( $n = 4$  versus  $n = 3$ ), Victoria ( $n = 7$  versus  $n = 5$ ) and Western Australia ( $n = 6$  versus  $n = 3$ ) compared to the previous two-month reporting period; and a decrease in the number from Queensland ( $n = 12$  versus  $n = 16$ )

**Carbapenemase-producing *Acinetobacter baumannii* complex and *Pseudomonas aeruginosa*:**

- Five *A. baumannii* complex were reported; four from New South Wales (OXA-23-like [ $n = 2$ ], NDM+OXA-23-like [ $n = 2$ ]), and one OXA-23-like from Victoria
- Four carbapenemase-producing *Pseudomonas aeruginosa* were reported during this period; two from Victoria (VIM [ $n = 1$ ], IMP+NDM [ $n = 1$ ]), and two from New South Wales (NDM).

**Linezolid resistant *Enterococcus***

- Three *Enterococcus faecalis* from Western Australia was reported with linezolid resistance.

***Candida auris*:**

- Two *Candida auris* were reported from New South Wales during this period.

**Transmissible colistin resistance (other than that seen in combination with CPE)**

- No cases of transmissible colistin resistance, other than that seen in combination with CPE, were reported during this period.

***Streptococcus pyogenes* with reduced susceptibility to penicillin:**

- No cases of *S. pyogenes* with reduced susceptibility to penicillin were reported during this period.

## National summary

**Table 1: Number of critical antimicrobial resistances, by state and territory, 1 March 2020–30 April 2020, and 2019**

Species	Critical resistance	State or Territory								Bi-monthly			Year to date		
		NSW	Vic	Qld	SA	WA	Tas	NT	ACT	2020 Jan-Feb	2020 Mar-Apr	Relative change*	2019	2020	Relative change*
<i>Acinetobacter baumannii</i> complex	Carbapenemase-producing <sup>†</sup>	4	1	0	0	0	0	0	0	12	5	▼ 58.3%	–	17 <sup>†</sup>	–
<i>Candida auris</i>	– <sup>†</sup>	2	0	0	0	0	0	0	0	0	2	–	–	2	–
Enterobacterales	Carbapenemase-producing	41	23	18	3	6	0	0	1	121	92	▼ 24.0%	290 <sup>§</sup>	213	▼ 26.6%
	Carbapenemase and ribosomal methyltransferase-producing	3	1	1	0	0	0	0	0	7	5	▼ 28.6%	18	12	▼ 33.3%
	Carbapenemase-producing and transmissible resistance to colistin <sup>†</sup>	1	0	0	0	0	0	0	0	6	1	▼ 83.3%	–	7	–
	Ribosomal methyltransferase-producing	1	0	0	0	0	0	0	0	0	1	–	3	1	▼ 66.7%
	Transmissible resistance to colistin <sup>†</sup>	0	0	0	0	0	0	0	0	0	0	–	–	0	–
<i>Enterococcus</i> species	Linezolid non-susceptible	0	0	0	0	3	0	0	0	7	3	▼ 57.1%	6	10	▲ 66.7
<i>Mycobacterium tuberculosis</i>	Multidrug-resistant – at least rifampicin- and isoniazid-resistant strains	0	0	0	0	0	0	0	0	0	0	–	11	0	▼ 100%
<i>Neisseria gonorrhoeae</i>	Azithromycin non-susceptible (LLR < 256 mg/L)	22	4	9	0	1	0	0	0	67	36	▼ 46.3%	177	103	▼ 41.8%
	Azithromycin non-susceptible (HLR > 256 mg/L)	0	0	1	0	0	0	0	0	0	1	–	0	1	–
	Ceftriaxone non-susceptible	1	0	0	0	0	0	0	0	1	1	0.0%	2	2	0.0%
	Ceftriaxone non-susceptible and azithromycin non-susceptible (LLR < 256 mg/L)	0	0	0	0	0	0	0	0	0	0	–	0	0	–
	Ceftriaxone non-susceptible and azithromycin non-susceptible (HLR > 256 mg/L)	0	0	0	0	0	0	0	0	0	0	–	0	0	–

HLR = high-level resistance; LLR = low-level resistance; – = not applicable; <sup>†</sup> = new CAR reported from July 2019

**Table 1 (continued)**

Species	Critical resistance	State or territory								Bi-monthly			Year to date		
		NSW	Vic	Qld	SA	WA	Tas	NT	ACT	2020	2020	Relative change*	2019	2020	Relative change*
										Jan-Feb	Mar-Apr				
<i>Pseudomonas aeruginosa</i>	Carbapenemase-producing <sup>†</sup>	2	2	0	0	0	0	0	0	7	4	▼ 42.9%	–	11 <sup>†</sup>	–
<i>Salmonella</i> species	Ceftriaxone non-susceptible	0	1	2	0	1	0	0	0	13	4	▼ 69.2%	14	17	▲ 21.4%
<i>Shigella</i> species	Multidrug-resistant	20	12	7	0	2	0	0	0	106	41	▼ 61.3%	127	147	▲ 15.7%
<i>Staphylococcus aureus</i>	Daptomycin non-susceptible	4	7	12	0	6	0	0	0	28	29	▲ 3.6%	46	57	▲ 23.9%
	Daptomycin and vancomycin non-susceptible	0	0	0	0	0	0	0	0	0	0	–	0	0	–
	Linezolid non-susceptible	0	0	0	0	0	0	0	0	0	0	–	0	0	–
	Vancomycin non-susceptible	0	0	0	0	0	0	0	0	0	0	–	0	0	–
<i>Streptococcus pyogenes</i>	Penicillin reduced susceptibility	0	0	0	0	0	0	0	0	0	0	–	0	0	–
	<b>Total (reported by 10 June 2020)</b>	<b>101</b>	<b>51</b>	<b>50</b>	<b>3</b>	<b>19</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>375</b>	<b>225</b>	<b>▼ 40.0%</b>	<b>694</b>	<b>600</b>	<b>▼ 13.5%</b>

570<sup>§</sup> ▼ 17.9%

HLR = high-level resistance; LLR = low-level resistance; – = not applicable

\* Relative change = absolute change between period in 2019 and same period in 2020, for each CAR, expressed as a percentage of 2019 base

<sup>†</sup> = new CAR reported from July 2019 (retrospective data in 2019 included if available)

<sup>§</sup> = 2020 total minus new CARS introduced in 2019

Note: The number of CARs for 2019 have been updated to include additional submissions received after previous publication date

**Table 2: Number of critical antimicrobial resistance isolates, by setting, national, 1 March 2020–30 April 2020**

Species	Critical resistance	Setting					Total
		Public hospital	Private hospital	Aged care home	Community	Unknown	
<i>Acinetobacter baumannii</i> complex	Carbapenemase-producing	5	0	0	0	0	5
<i>Candida auris</i>	–	2	0	0	0	0	2
Enterobacterales	Carbapenemase-producing	67	14	0	6	5	92
	Carbapenemase and ribosomal methyltransferase-producing	2	0	0	2	1	5
	Carbapenemase-producing and transmissible resistance to colistin	1	0	0	0	0	1
	Ribosomal methyltransferase-producing	1	0	0	0	0	1
	Transmissible resistance to colistin	0	0	0	0	0	0
<i>Enterococcus</i> species	Linezolid non-susceptible	3	0	0	0	0	3
<i>Mycobacterium tuberculosis</i>	Multidrug-resistant – at least rifampicin- and isoniazid-resistant	0	0	0	0	0	0
<i>Neisseria gonorrhoeae</i>	Azithromycin non-susceptible (low-level)	9	0	0	26	1	36
	Azithromycin non-susceptible (high-level)	0	0	0	1	0	1
	Ceftriaxone non-susceptible	0	0	0	1	0	1
	Ceftriaxone non-susceptible and azithromycin non-susceptible (low-level)	0	0	0	0	0	0
	Ceftriaxone non-susceptible and azithromycin non-susceptible (high-level)	0	0	0	0	0	0
<i>Pseudomonas aeruginosa</i>	Carbapenemase-producing	3	0	0	0	1	4
<i>Salmonella</i> species	Ceftriaxone non-susceptible	2	0	0	1	1	4
<i>Shigella</i> species	Multidrug-resistant	11	0	0	20	10	41
<i>Staphylococcus aureus</i>	Daptomycin non-susceptible	10	3	0	8	8	29
	Daptomycin and vancomycin non-susceptible	0	0	0	0	0	0
	Linezolid non-susceptible	0	0	0	0	0	0
	Vancomycin non-susceptible	0	0	0	0	0	0
<i>Streptococcus pyogenes</i>	Penicillin reduced susceptibility	0	0	0	0	0	0
	<b>Total (reported by 9 May 2020)</b>	<b>116</b>	<b>17</b>	<b>0</b>	<b>65</b>	<b>27</b>	<b>225</b>

\* Information on setting for *Neisseria gonorrhoeae* is often not available

High-level = azithromycin MIC > 256 mg/L; Low-level = azithromycin MIC < 256 mg/L

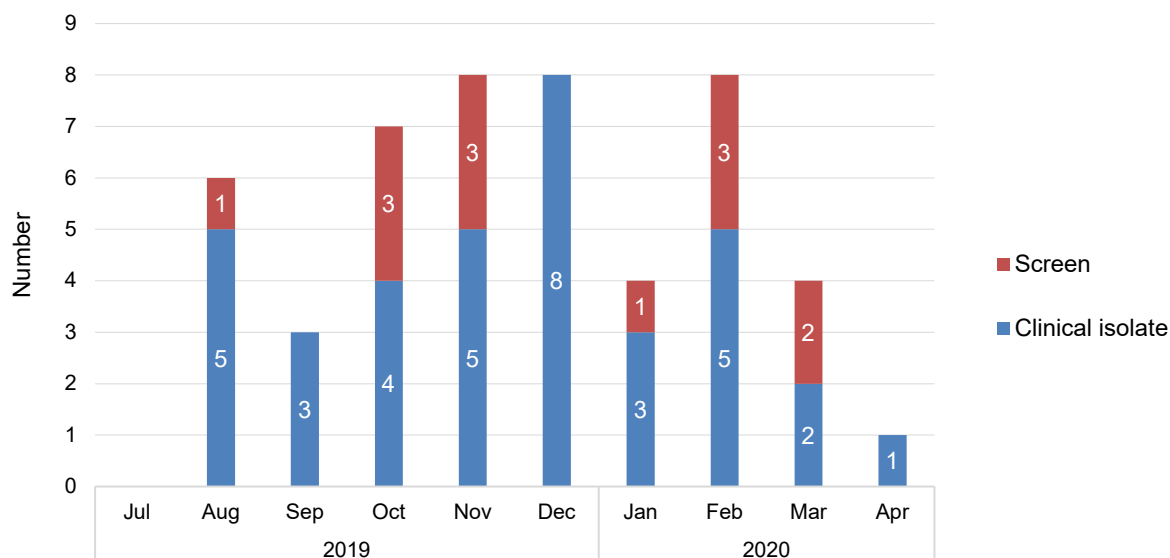


## Summary by CAR

### *Acinetobacter baumannii* complex

#### National data

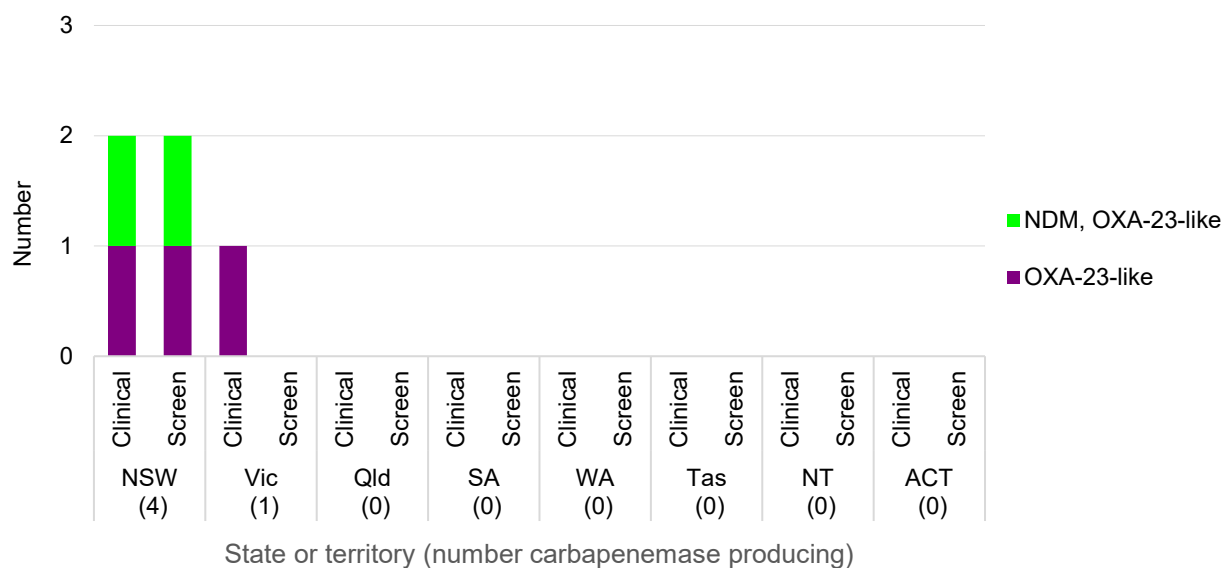
**Figure 1: Carbapenemase-producing *Acinetobacter baumannii* complex\*, monthly number reported by specimen type, national, July 2019–30 April 2020**



\* New CAR reported from July 2019

#### State and territory data

**Figure 2: Carbapenemase-producing *Acinetobacter baumannii* complex, number reported by carbapenemase type and specimen type, by state and territory, 1 March 2020–30 April 2020**



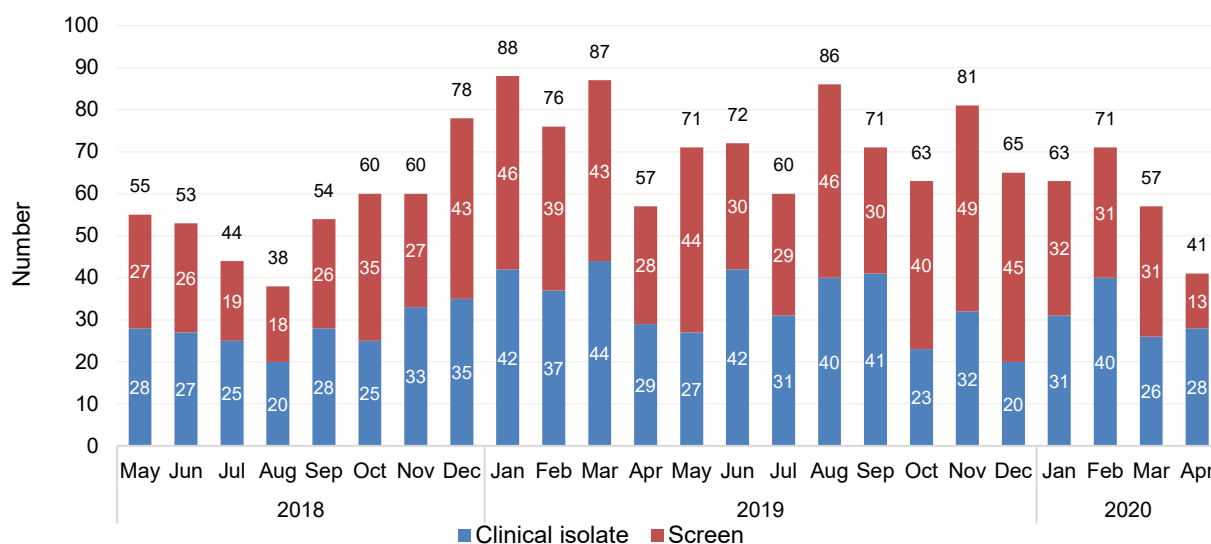
**Table 3: Carbapenemase-producing *Acinetobacter baumannii* complex, number reported by setting, by state and territory, 1 March 2020–30 April 2020**

Setting	State or territory								Total
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
<b>Total</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>
Public hospital	4	1	0	0	0	0	0	0	5
Private hospital	0	0	0	0	0	0	0	0	0
Aged care home	0	0	0	0	0	0	0	0	0
Community	0	0	0	0	0	0	0	0	0

## Enterobacterales

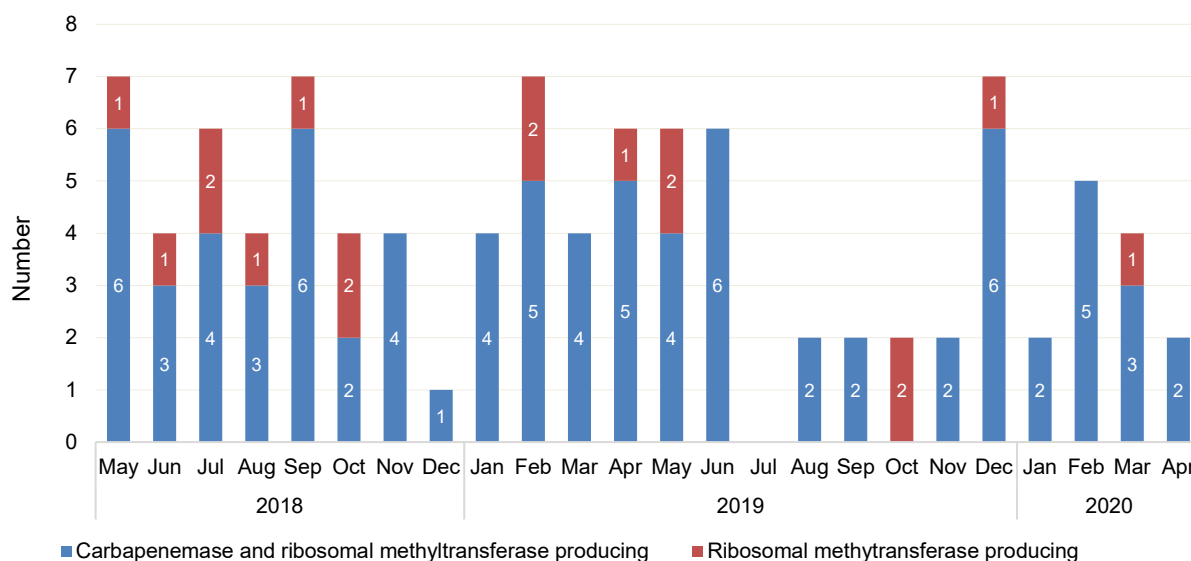
### National data

**Figure 3: Carbapenemase-producing Enterobacterales\*, twenty-four-month trend by specimen type, national, 1 May 2018–30 April 2020**



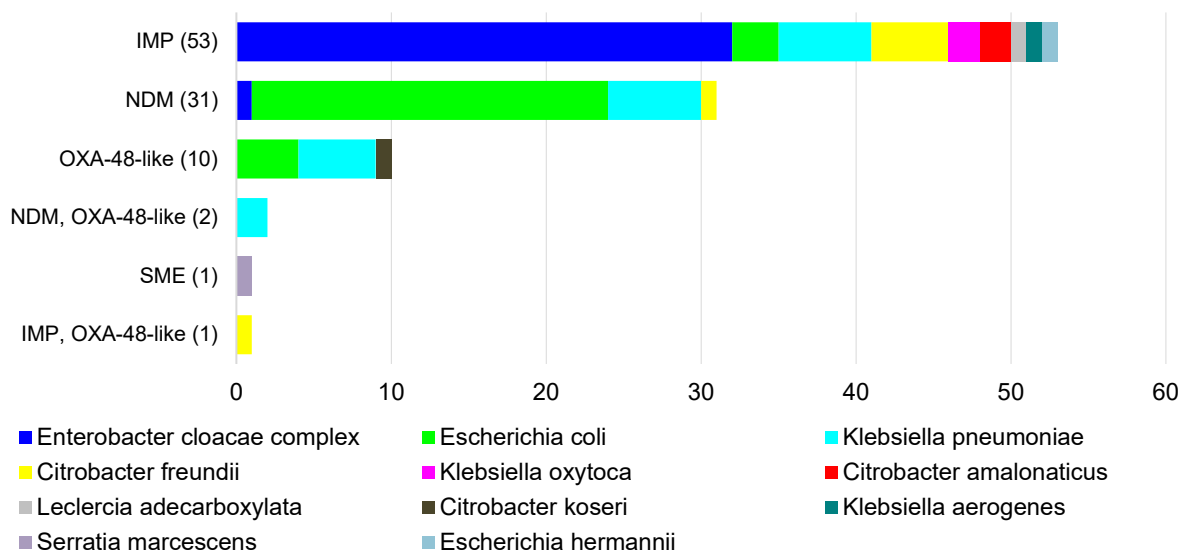
\* Carbapenemase-producing alone or in combination with ribosomal methyltransferases

**Figure 4: Ribosomal methyltransferase-producing Enterobacterales\*, twenty-four-month trend, national, 1 May 2018–30 April 2020**



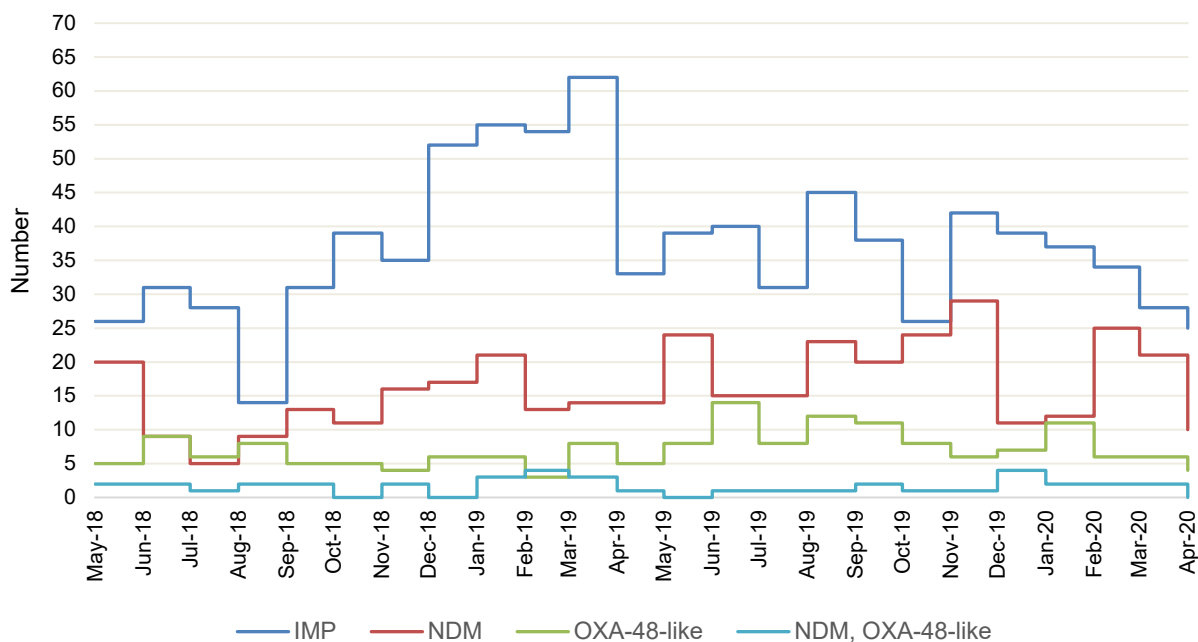
\* Ribosomal methyltransferases alone, or in combination with carbapenemases

**Figure 5: Carbapenemase-producing Enterobacterales\*, number reported by carbapenemase type and species, national, 1 March 2020–30 April 2020**



\* Carbapenemase-producing Enterobacterales ( $n = 92$ ), carbapenemase- and ribosomal methyltransferase-producing Enterobacterales ( $n = 5$ ); carbapenemase-producing and transmissible resistance to colistin Enterobacterales ( $n = 1$ )

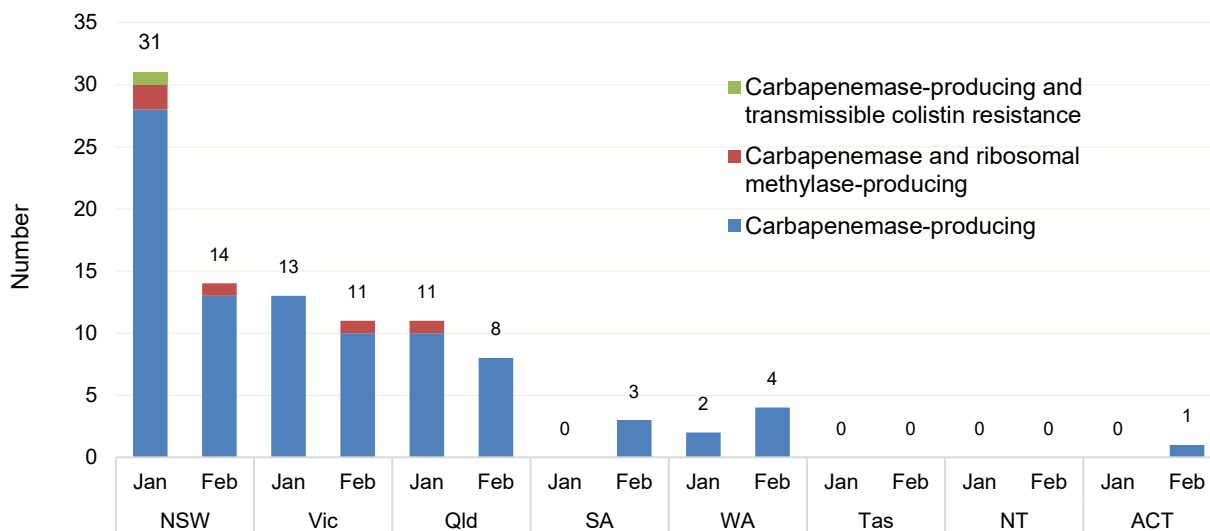
**Figure 6: Top four reported carbapenemase types\*, twenty-four-month trend, national, 1 May 2018–30 April 2020**



\* Alone or in combination with another type for the reporting period indicated

### State and territory data

**Figure 7: Carbapenemase-producing Enterobacterales, number reported by month, state and territory, 1 March 2020–30 April 2020**



**Figure 8: Two-year trend for the top four reported carbapenemase types from Enterobacterales, by state and territory and nationally, (three-month moving average), 1 May 2018–30 April 2020**

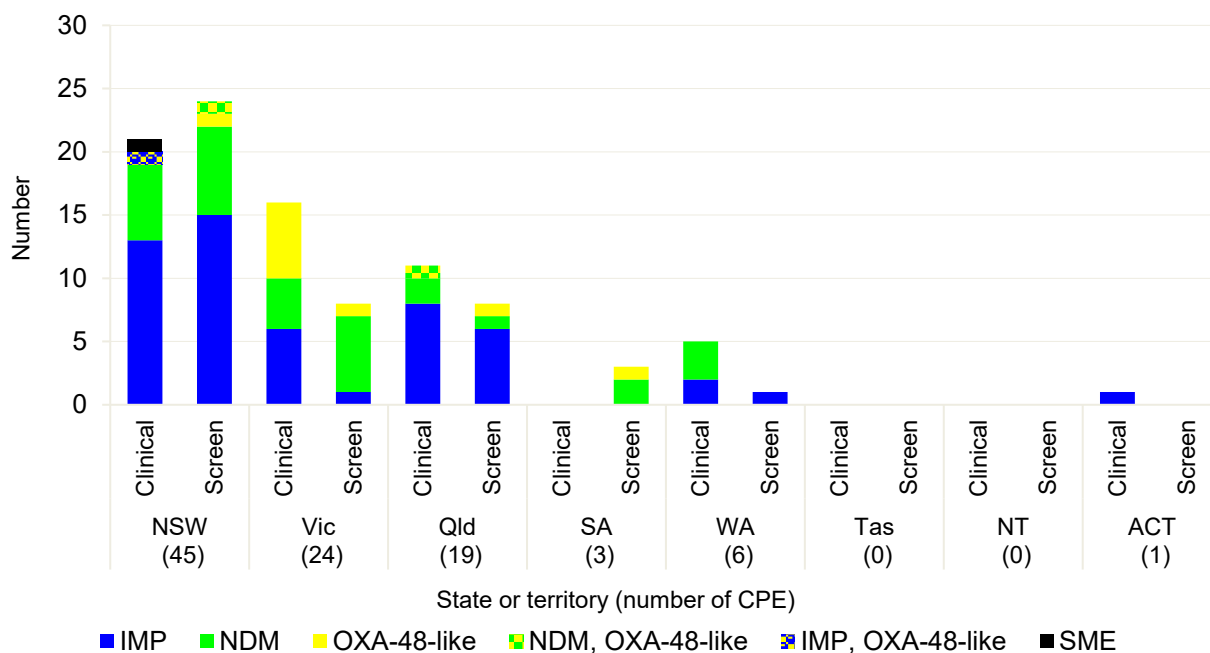
Type	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Australia
IMP	20 8	23 2	17 7	0 0	3 0	0 0	1 0	2 0	57 24
NDM	8 1	9 3	6 0	6 0	2 0	0 0	1 0	1 0	24 8
OXA-48-like	3 1	7 1	2 0	1 0	1 0	0 0	0 0	0 0	11 5
KPC	1 0	3 0	1 0	0 0	0 0	0 0	0 0	0 0	3 0
All types	28 13	35 11	19 11	7 0	6 1	1 0	1 0	2 0	84 45

Line graphs represent three-month moving average for the period 1 March 2018 to 29 February 2020, for each type, where maximum monthly average was greater than one.

Straight green line in cell = no carbapenemase type for that state or territory during the reporting period

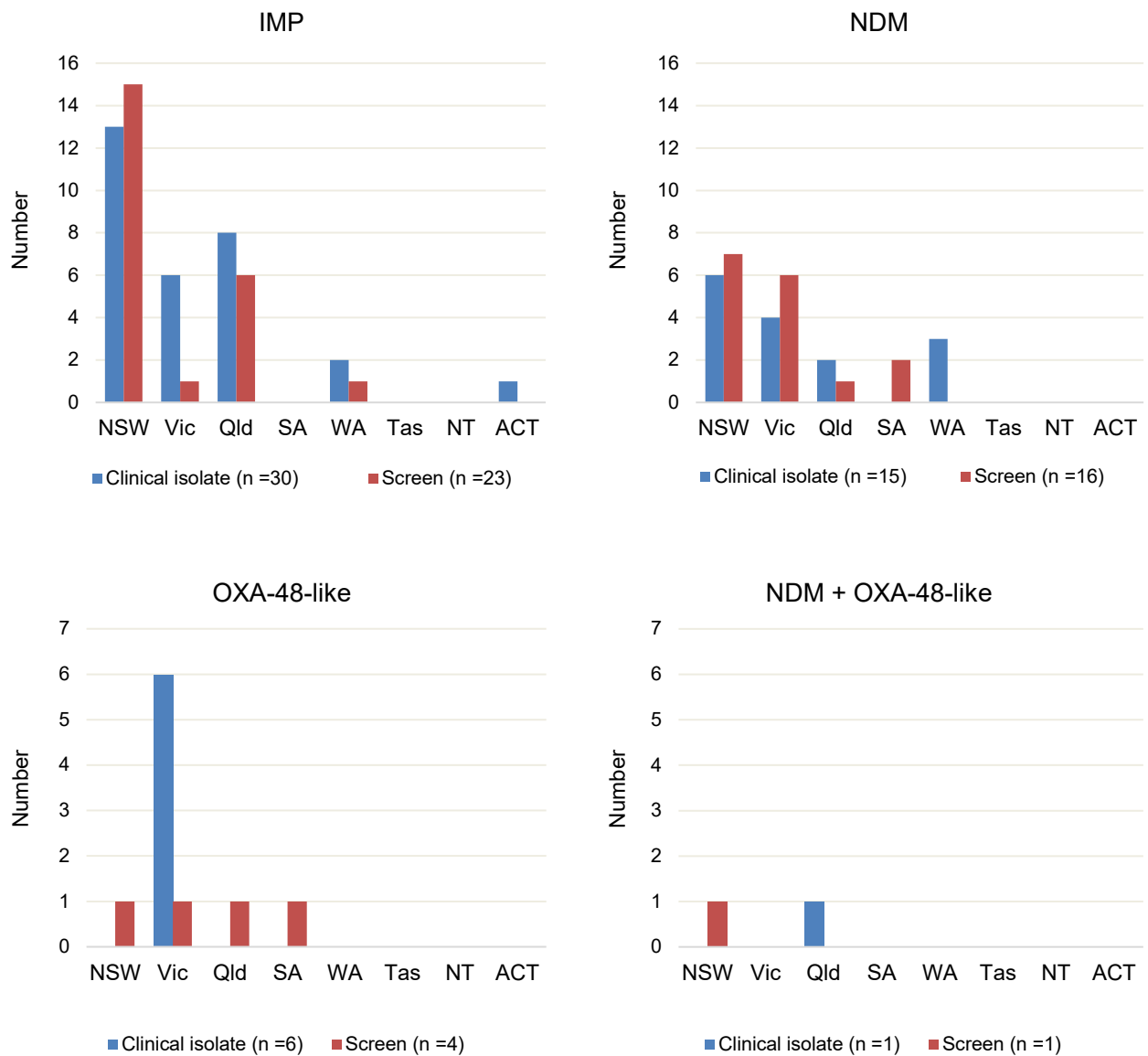
Blank cell = maximum monthly average was one or less

**Figure 9: Carbapenemase-producing Enterobacterales\*, number reported by carbapenemase type and specimen type, by state and territory, 1 March 2020–30 April 2020**



\* Carbapenemase-producing Enterobacterales ( $n = 92$ ), carbapenemase- and ribosomal methyltransferase-producing Enterobacterales ( $n = 5$ ); carbapenemase-producing and transmissible resistance to colistin Enterobacterales ( $n = 1$ )

**Figure 10: Top four reported carbapenemase-producing Enterobacteriales type by specimen type, by state and territory, 1 March 2020–30 April 2020**



**Table 4: Top four carbapenemase types from Enterobacterales, number reported by setting, by state and territory, 1 March 2020–30 April 2020**

Carbapenemase type <sup>†</sup>	Setting	State or territory								Total
		NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
IMP	<b>Total</b>	<b>28</b>	<b>7</b>	<b>14</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>53</b>
	Public hospital	25	5	5	0	3	0	0	1	39
	Private hospital	2	2	7	0	0	0	0	0	11
	Aged care home	0	0	0	0	0	0	0	0	0
	Community	0	0	1	0	0	0	0	0	1
	Unknown	1	0	1	0	0	0	0	0	2
NDM	<b>Total</b>	<b>13</b>	<b>10</b>	<b>3</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>31</b>
	Public hospital	12	7	1	2	0	0	0	0	22
	Private hospital	0	2	1	0	0	0	0	0	3
	Aged care home	0	0	0	0	0	0	0	0	0
	Community	1	0	1	0	1	0	0	0	3
	Unknown	0	1	0	0	2	0	0	0	3
OXA-48-like	<b>Total</b>	<b>1</b>	<b>7</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>
	Public hospital	1	3	1	1	0	0	0	0	6
	Private hospital	0	0	0	0	0	0	0	0	0
	Aged care home	0	0	0	0	0	0	0	0	0
	Community	0	3	0	0	0	0	0	0	3
	Unknown	0	1	0	0	0	0	0	0	1
NDM+OXA-48-like	<b>Total</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>
	Public hospital	1	0	0	0	0	0	0	0	1
	Private hospital	0	0	0	0	0	0	0	0	0
	Aged care home	0	0	0	0	0	0	0	0	0
	Community	0	0	1	0	0	0	0	0	1
	Unknown	0	0	0	0	0	0	0	0	0

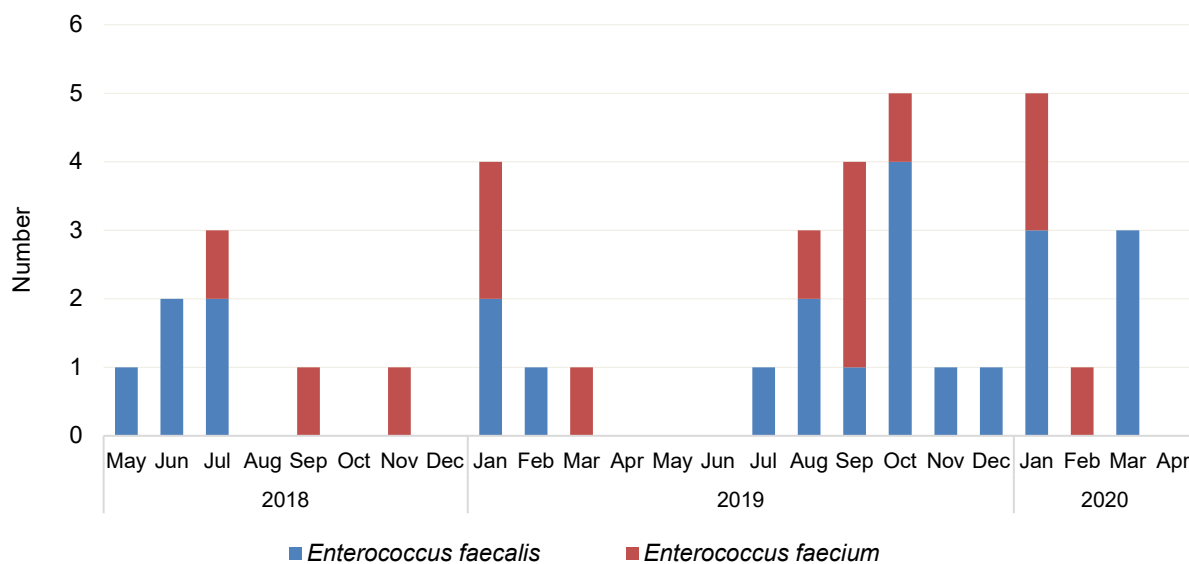
\* Top four carbapenemase types account for 98% (96/98) of all carbapenemase-producing Enterobacterales reported for this period. Other types were IMP, OXA-48 ( $n = 1$ , NSW), and SME ( $n = 1$ , NSW)

† Alone or in combination with another type for the reporting period indicated

## Enterococcus species

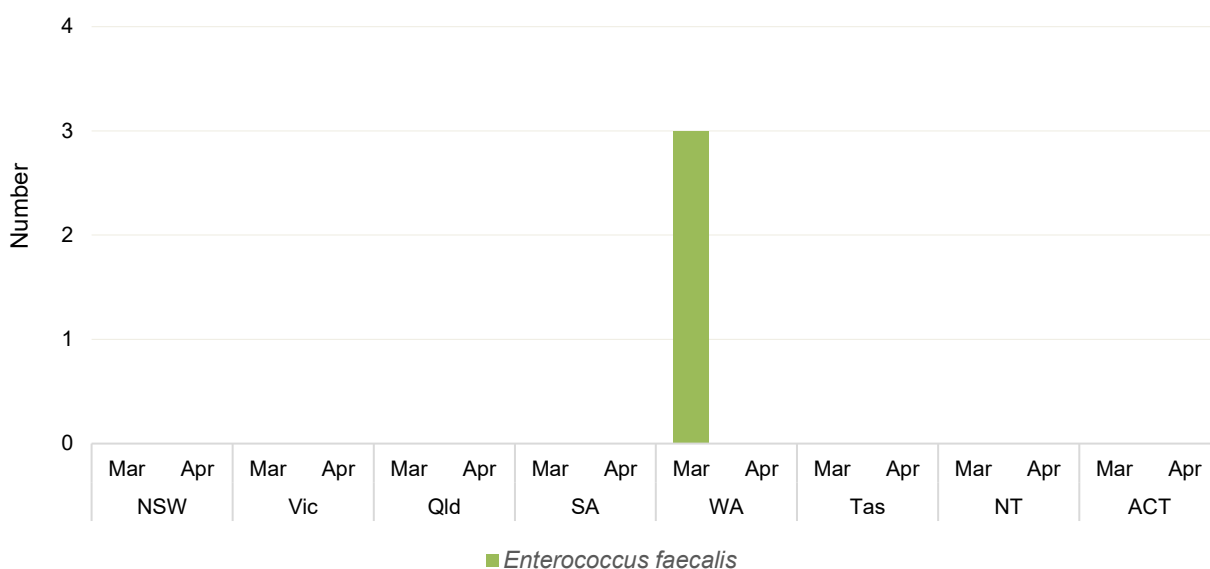
### National data

**Figure 11: Linezolid non-susceptible *Enterococcus* species, twenty-four-month trend, national, 1 May 2018–30 April 2020**



### State and territory data

**Figure 12: Linezolid non-susceptible *Enterococcus* species, number reported by month, state and territory, 1 March 2020–30 April 2020**

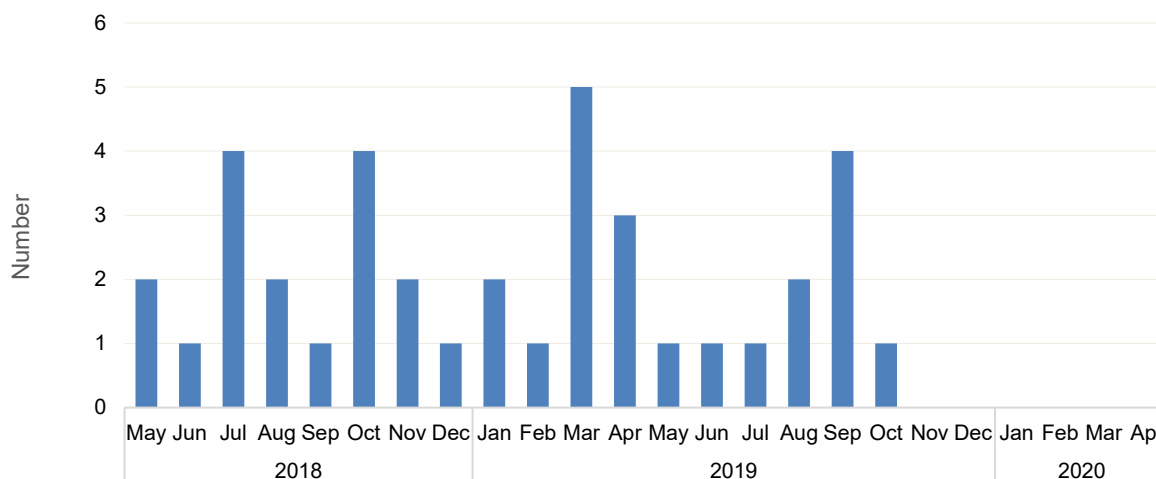




## *Mycobacterium tuberculosis*

### National data

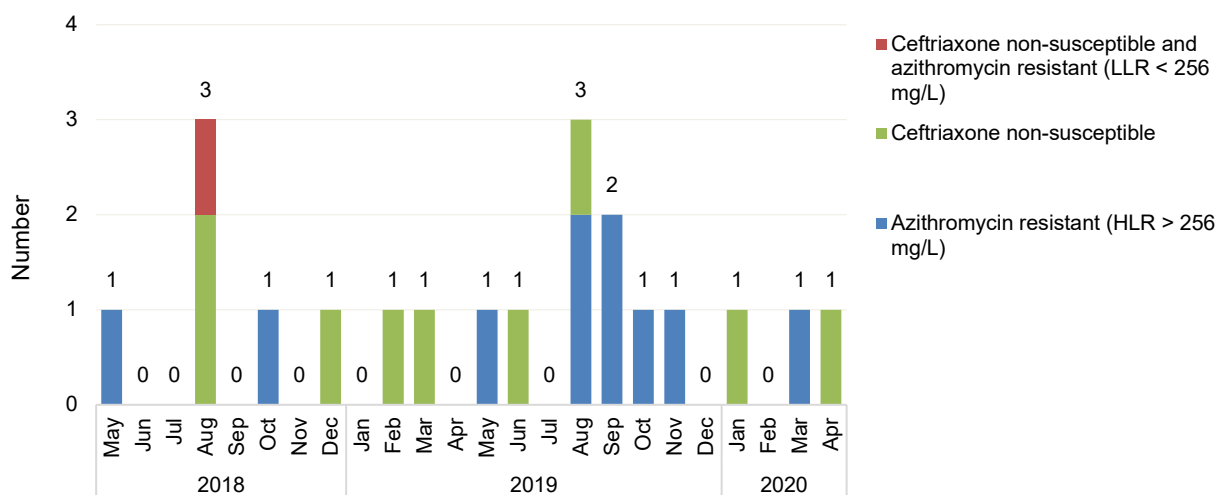
**Figure 13: Multidrug-resistant *Mycobacterium tuberculosis*, twenty-four-month trend, national, 1 May 2018–30 April 2020**



## *Neisseria gonorrhoeae*

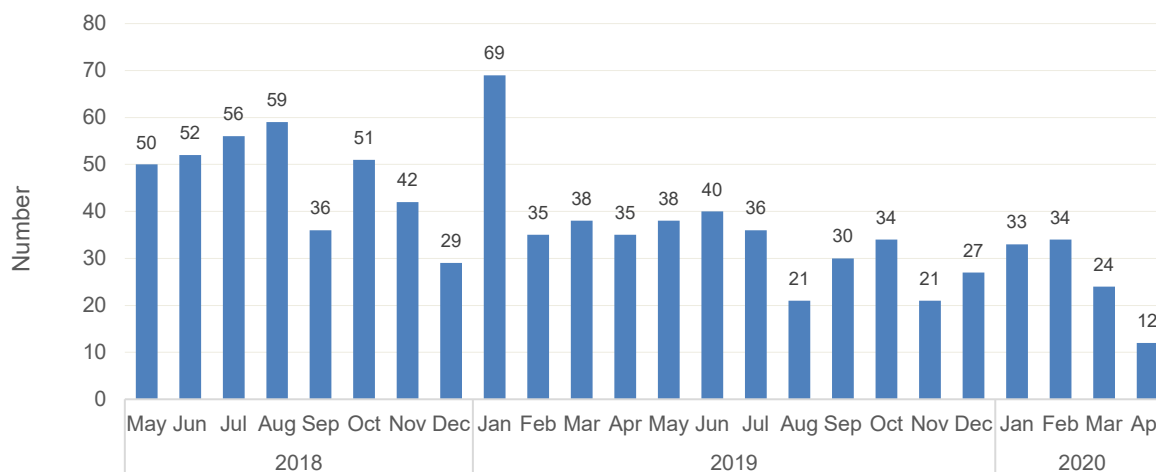
### National data

**Figure 14: Ceftriaxone non-susceptible and/or azithromycin non-susceptible (HLR > 256 mg/L) *Neisseria gonorrhoeae*, number reported by month, national, 1 May 2018–30 April 2020**



LLR: Low level resistance; HLR: High level resistance

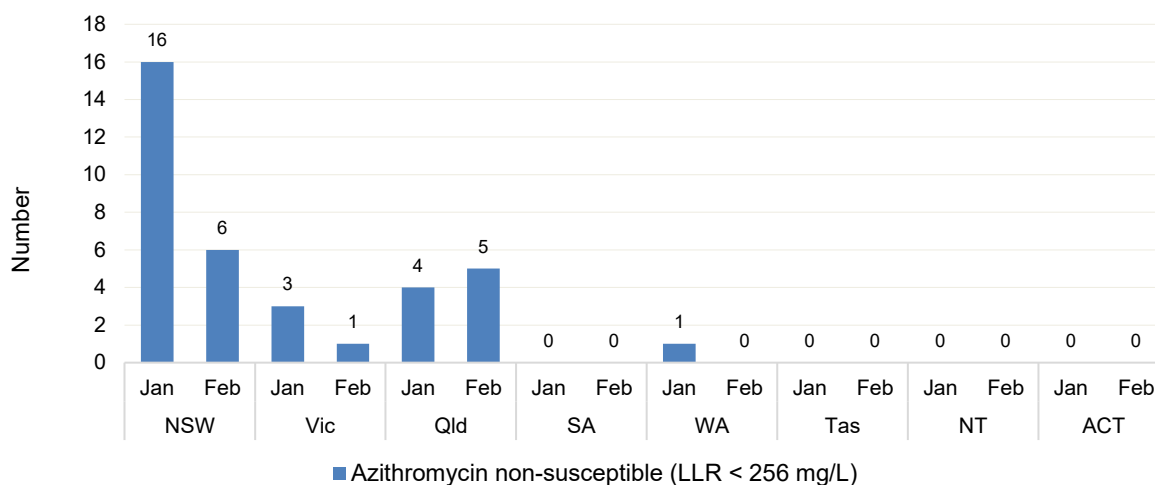
**Figure 15: Azithromycin non-susceptible (LLR < 256 mg/L) *Neisseria gonorrhoeae*, twenty-four-month trend, national, 1 May 2018–30 April 2020**



LLR: Low level resistance

### State and territory data

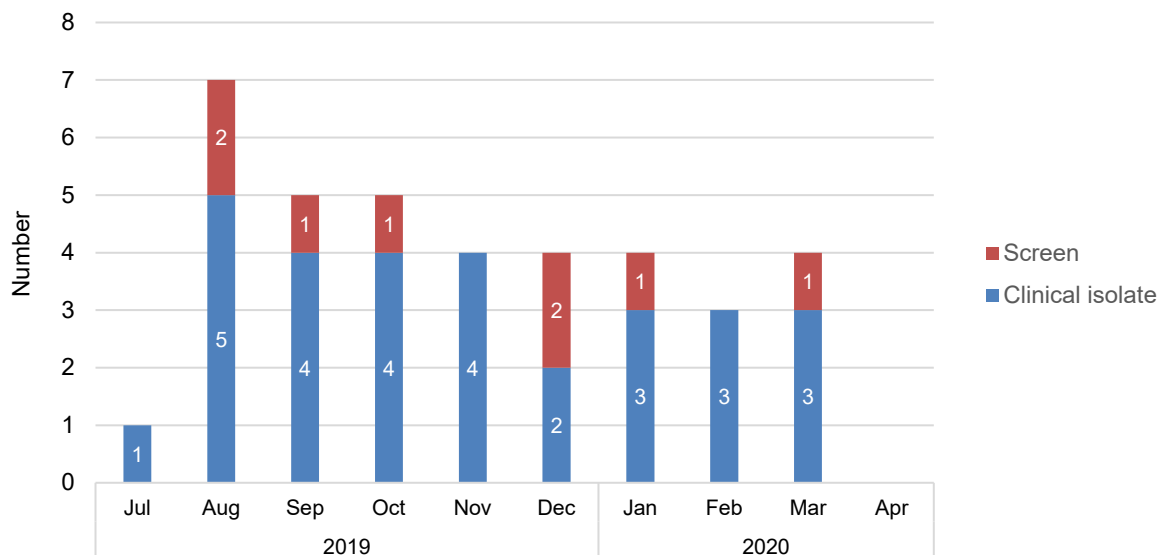
**Figure 16: Azithromycin non-susceptible (LLR < 256 mg/L) *Neisseria gonorrhoeae*, number reported by month, state and territory, 1 March 2020–30 April 2020**



## Pseudomonas aeruginosa

### National data

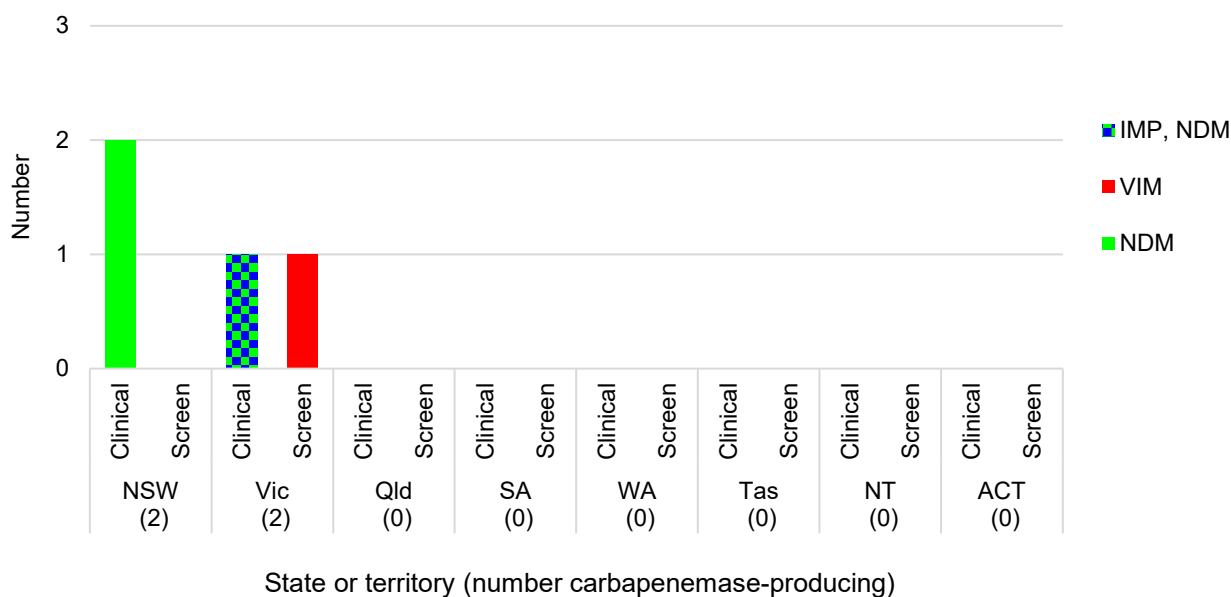
**Figure 17: Carbapenemase-producing *Pseudomonas aeruginosa*\*, number reported by specimen type, national, 1 July 2019–29 February 2020**



\* New CAR reported from July 2019

### State and territory data

**Figure 18: Carbapenemase-producing *Pseudomonas aeruginosa*, number reported by carbapenemase type and specimen type, by state and territory, 1 March 2020–30 April 2020**



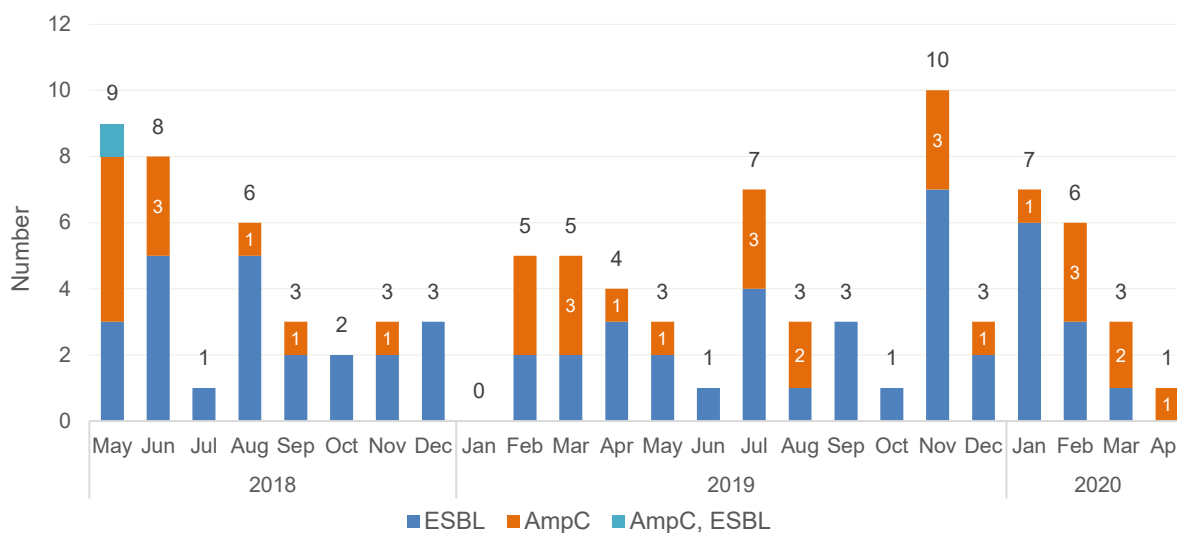
**Table 5: Carbapenemase-producing *Pseudomonas aeruginosa*, number reported by setting, by state and territory, 1 March 2020–30 April 2020**

Setting	State or territory								Total
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
<b>Total</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>
Public hospital	2	1	0	0	0	0	0	0	3
Private hospital	0	0	0	0	0	0	0	0	0
Aged care home	0	0	0	0	0	0	0	0	0
Community	0	0	0	0	0	0	0	0	0
Unknown	0	1	0	0	0	0	0	0	1

## Salmonella species

### National data

**Figure 19: Ceftriaxone non-susceptible *Salmonella* species, twenty-four-month trend, national, 1 May 2018–30 April 2020**



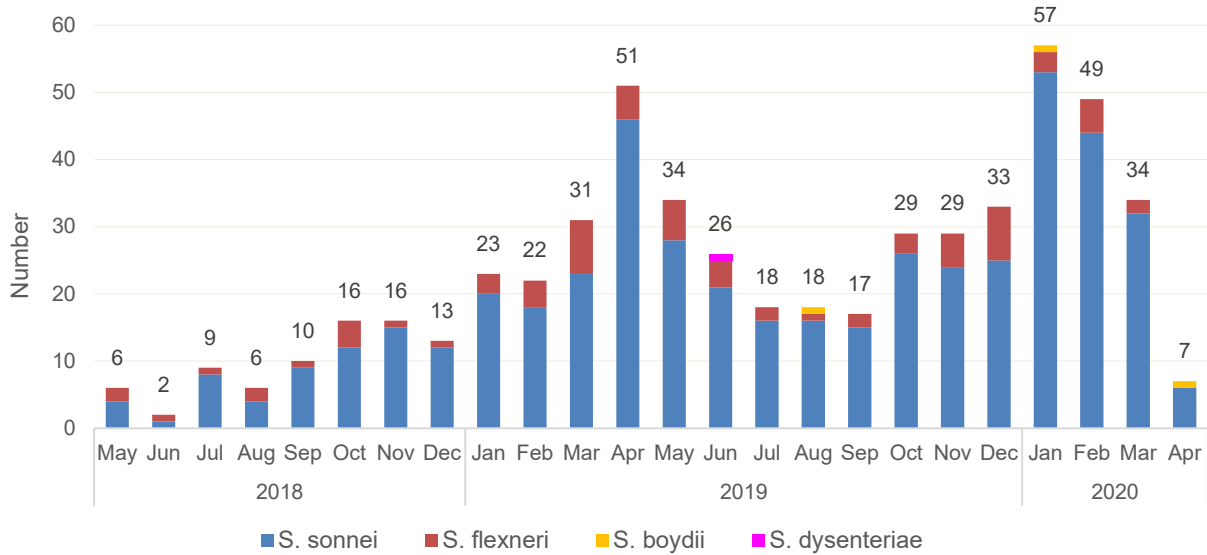
Notes (1 March 2020–30 April 2020)

1. Non-typhoidal *Salmonella* species (n = 4) and typhoidal *Salmonella* species (n = 0)

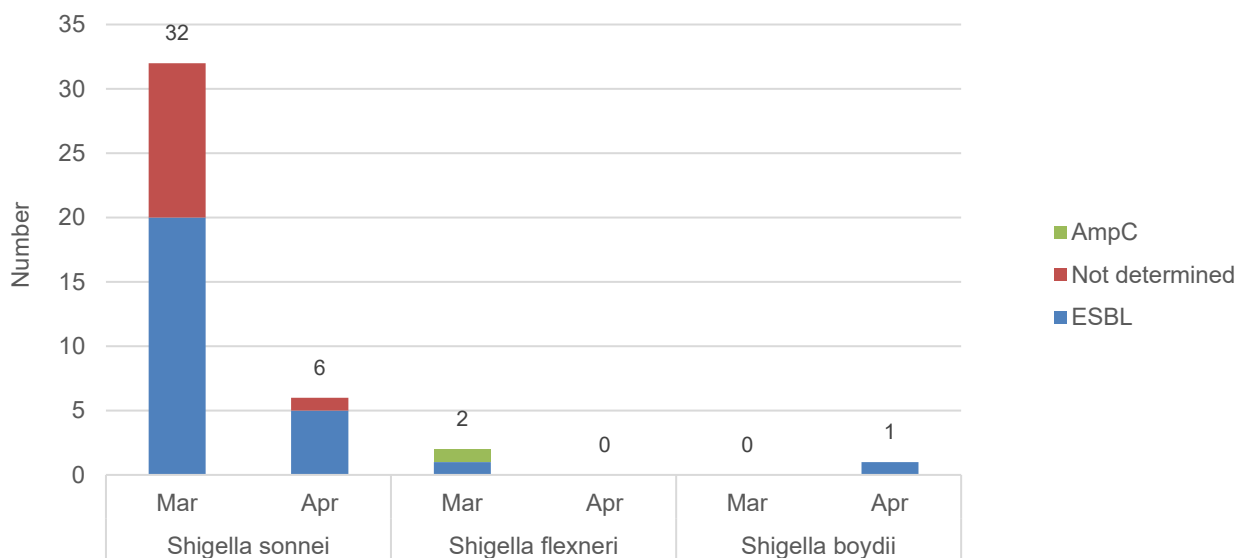
## Shigella species

### National data

**Figure 20: Multidrug-resistant *Shigella* species, twenty-four-month trend, national, 1 May 2018–30 April 2020**



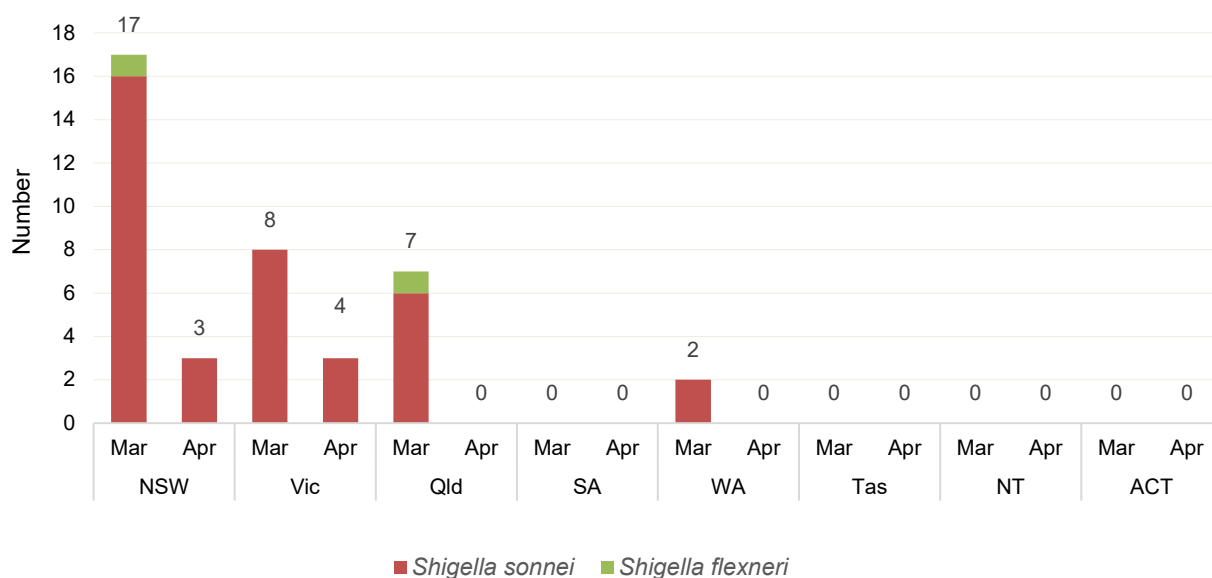
**Figure 21: Multidrug-resistant *Shigella* species, number reported by month, national, 1 March 2020–30 April 2020**



Not determined = multidrug resistant, ceftriaxone susceptible

## State and territory data

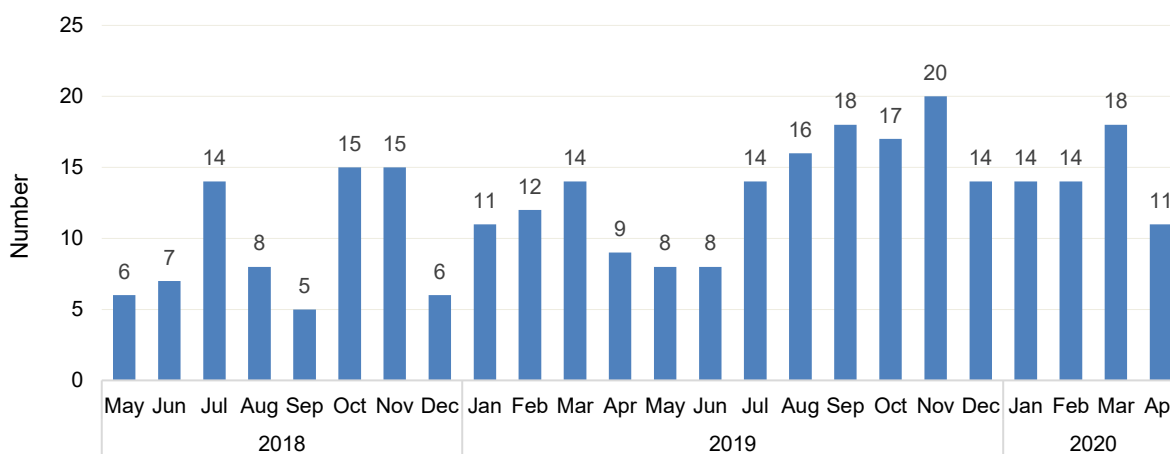
**Figure 22: Multidrug-resistant *Shigella* species, number reported by state and territory, 1 March 2020–30 April 2020**



## Staphylococcus aureus

### National data

**Figure 23: Daptomycin non-susceptible *Staphylococcus aureus*, twenty-four-month trend, national, 1 May 2018–30 April 2020**



Note: No linezolid non-susceptible *S. aureus* or vancomycin non-susceptible *S. aureus* were reported in the two-month period (January–February 2020).

## State and territory data

**Table 6. Daptomycin non-susceptible *Staphylococcus aureus*, number reported by setting and state and territory, 1 March 2020–30 April 2020**

Setting	State or territory								Total
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
<b>Total</b>	<b>4</b>	<b>7</b>	<b>12</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>29</b>
Public hospital	3	3	0	0	4	0	0	0	10
Private hospital	0	0	3	0	0	0	0	0	3
Aged care home	0	0	0	0	0	0	0	0	0
Community	0	4	2	0	2	0	0	0	8
Unknown	1	0	7	0	0	0	0	0	8

# Appendix

## Data Notes

The following are important considerations for interpreting CARAlert data:

1. The data are based on the date that the isolate with the confirmed CAR was collected.
2. States and territories refer to the state or territory where the CAR was detected. If place of residence is unknown or overseas, the state or territory of the originating laboratory is reported.
3. Comparison between reports may be influenced by delayed detection or late submissions of CARs.
4. Number of CARs reported does not always equal the number of patients, as patients may have more than one CAR, or species, detected in a specimen.
5. Cut-off date for data that are included in updates and reports is four weeks after the end of each reporting period.
6. National summary data is provided; comparison across states and territories is provided for organisms where there are large numbers reported and a comparison is meaningful.
7. Authorised officers in each state and territory health department can access the CARAlert web portal directly for further information about their jurisdiction, including the name of the public hospital where a patient with a confirmed CAR was cared for, and to extract reports on their data.

## About CARAlert

CARAlert is a component of the Antimicrobial Use and Resistance in Australia (AURA) Surveillance System. CARAlert was established by the Australian Commission on Safety and Quality in Health Care in March 2016.

The AURA Surveillance System provides essential information to develop and implement strategies to prevent and contain antimicrobial resistance in human health and improve antimicrobial use across the acute and community healthcare settings. AURA also supports the National Safety and Quality Health Service (NSQHS) Standard Preventing and Controlling Healthcare-Associated Infection and Australia's National Antimicrobial Resistance Strategy (2015–2019). Funding for AURA is provided by the Australian Government Department of Health and state and territory health departments.

Critical antimicrobial resistances (CARs) are resistance mechanisms known to be a serious threat to the effectiveness of last-line antimicrobial agents. CARs can result in significant morbidity and mortality.



The CARs reported under CARAlert are listed in Table A1. The CARs were drawn from the list of high-priority organisms and antimicrobials which are the focus of the AURA Surveillance System.<sup>1</sup>

**Table A1: List of critical antimicrobial resistances reported to CARAlert**

Species	Critical Resistance
<i>Acinetobacter baumannii</i> complex	Carbapenemase-producing*
<i>Candida auris</i> *	–
Enterobacterales	Carbapenemase-producing, and/or ribosomal methyltransferase-producing
Enterobacterales	Transmissible colistin resistance*
<i>Enterococcus</i> species	Linezolid resistant
<i>Mycobacterium tuberculosis</i>	Multidrug-resistant – resistant to at least rifampicin and isoniazid
<i>Neisseria gonorrhoeae</i>	Ceftriaxone non-susceptible or azithromycin non-susceptible
<i>Salmonella</i> species	Ceftriaxone non-susceptible
<i>Shigella</i> species	Multidrug-resistant
<i>Staphylococcus aureus</i> †	Vancomycin, linezolid or daptomycin non-susceptible
<i>Streptococcus pyogenes</i>	Penicillin reduced susceptibility
<i>Pseudomonas aeruginosa</i>	Carbapenemase-producing*

\* If the specimen with a confirmed CAR was collected in 2019, it can be submitted retrospectively

† For CARAlert, *S. aureus* includes *S. argenteus*

The CARAlert system is based on the following routine processes used by pathology laboratories for identifying and confirming potential CARs:

1. Collection and routine testing – the isolate is collected from the patient and sent to the originating laboratory for routine testing
2. Confirmation – if the originating laboratory suspects that the isolate is a CAR, it sends the isolate to a confirming laboratory that has the capacity to confirm the CAR
3. Submission to the CARAlert system – the confirming laboratory advises the originating laboratory of the result of the test, and the originating laboratory reports back to the health service that cared for the patient from whom the specimen was collected; the confirming laboratory then submits the details of the resistance and organism into the secure CARAlert web portal.

<sup>1</sup> Australian Commission on Safety and Quality in Health Care (ACSQHC). AURA 2017: Second Australian report on antimicrobial use and resistance in human health. Sydney: ACSQHC; 2017.



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