AUSTRALIAN COMMISSION ON SAFETY AND QUALITY IN HEALTH CARE

AURA Antimicrobial Use and Resistance in Australia

CARAlert THE NATIONAL ALERT SYSTEM FOR CRITICAL ANTIMICROBIAL RESISTANCE

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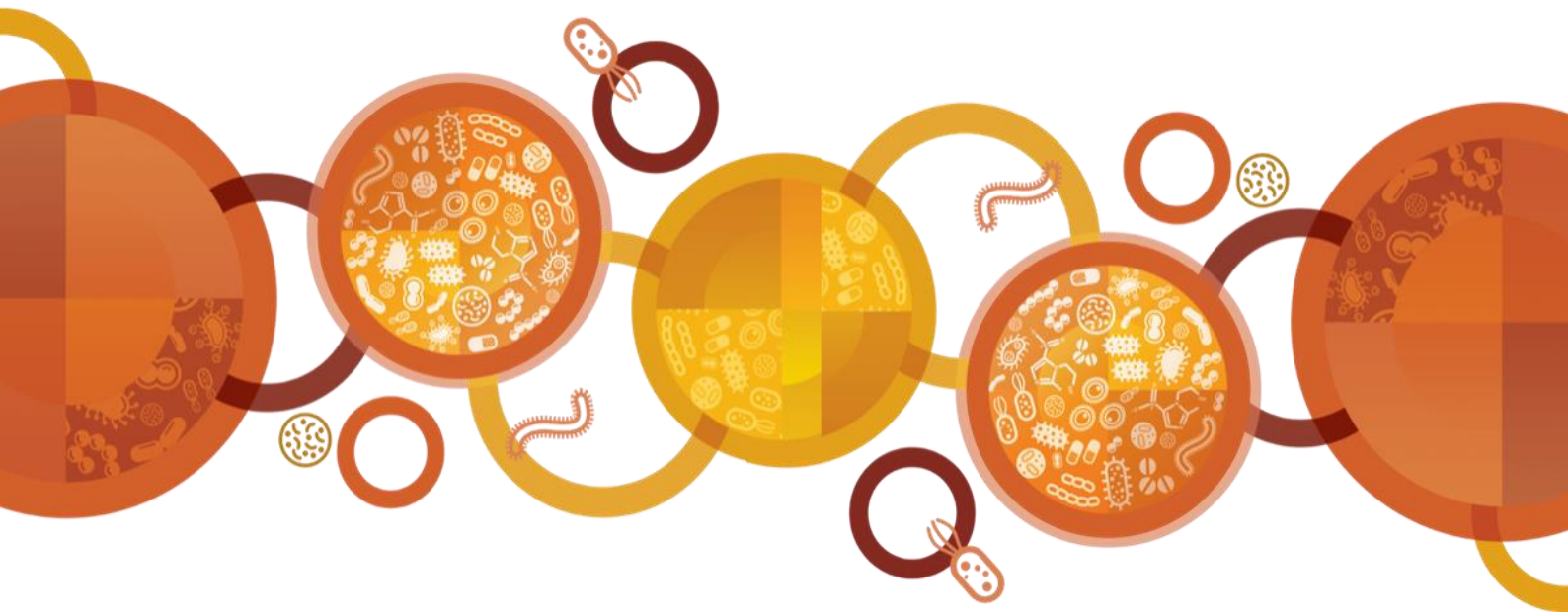
CARAlert data update 26

1 January 2022–28 February 2022

April 2022



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Data Summary

This report provides an update on data submitted to CARAlert for the reporting period: 1 January 2022 to 28 February 2022, and complements previous analyses of and updates on CARAlert data.

National overview:

- The total number of critical antimicrobial resistances (CARs) reported was down slightly compared to the previous two-month reporting period (*n* = 174 versus *n* = 199)
- A little over one-half of the CARs reported were carbapenemase-producing *Enterobacterales* (CPE) (including those with ribosomal methyltransferase and/or transmissible resistance to colistin) (*n* = 105, 60.3%), and 15.5% (*n* = 27) were daptomycin non-susceptible *Staphylococcus aureus*
- The total number of CPE (either alone or in combination with other CARs) reported this year, compared with the same period last year, decreased by 7.1% (*n* = 105 versus *n* = 113)
- The number of ceftriaxone non-susceptible or azithromycin non-susceptible *Neisseria gonorrhoeae* decreased by 64.9% (*n* = 13) compared with the previous two-month reporting period (*n* = 37)
- The majority of CARs, excluding those from *N. gonorrhoeae*, were reported from public hospitals (*n* = 113, 72.4% where setting known). There were 17 reports from community settings, 16 from private hospitals, and 10 from aged care homes.

Carbapenemase-producing *Enterobacterales*:

- IMP (*n* = 69, 65.7%), NDM (*n* = 26, 24.7%), and OXA-48-like (*n* = 7, 6.7%) types accounted for 97.1% of all CPE reported during this period
- The total number of CPE (either alone or in combination with other CARs) increased (*n* = 105, up 22.1%) compared with the previous two-month period (*n* = 86). The total number of IMP-types reported was slightly higher (*n* = 69) during this reporting period compared with the previous reporting period (*n* = 59). There was an increase in reports from New South Wales (*n* = 25 versus *n* = 21) and the Australian Capital Territory (*n* = 4 versus *n* = 0)
- There was an increase in the total number of NDM-types (*n* = 26, up 136%) compared to the previous two-month period (*n* = 11). The increase was mostly seen in the numbers from Queensland (*n* = 13 versus *n* = 6), South Australia (*n* = 5 versus *n* = 0), and New South Wales (*n* = 6 versus *n* = 2)
- One KPC-producing *Klebsiella pneumoniae* was reported from Western Australia
- Excluding CARs for which the setting was unknown, 22.3% (23/103) of CPE were reported from settings other than public hospitals; 11.7% (*n* = 12), 5.8% (*n* = 6), and 4.9% (*n* = 5), respectively from private hospitals, community, and aged care homes
- Six hospitals (Victoria, *n* = 2; Queensland; *n* = 2; New South Wales, *n* = 1; and the Australian Capital Territory, *n* = 1) had more than two reports of IMP-types. A further six institutions had two notifications of IMP-types (Queensland (*n* = 3), and New South Wales (*n* = 3)
- Two hospitals had more than one report of NDM-types; one in Victoria (*n* = 6, five patients), and one in South Australia (*n* = 3, three patients).

***Salmonella* and *Shigella* species:**

- Six ceftriaxone non-susceptible *Salmonella* species (non-typhoidal) was reported during this period, three from Queensland, two from Victoria, and one from New South Wales
- There were six multidrug-resistant *Shigella* species reported in this period, three *S. sonnei* ($bla_{\text{CTX-M-27}}$), two *S. flexneri* ($bla_{\text{DHA-1}}$), and one *S. boydii* ($bla_{\text{CTX-M-15}}$).

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

- The total number of reports of this CAR decreased 73.0% compared with the previous two-month reporting period (*n* = 10 versus *n* = 37). Reports were from New South Wales (*n* = 4), Victoria (*n* = 3) and Queensland (*n* = 3).

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

- There were three ceftriaxone non-susceptible *N. gonorrhoeae* reported from Victoria (*n* = 2) and Queensland (*n* = 1) during this period.
- There were no reports of *N. gonorrhoeae* with high-level resistance to azithromycin.

Daptomycin and vancomycin non-susceptible *Staphylococcus aureus* complex:

- The number of reports of this CAR decreased (*n* = 28) compared with the previous two-month reporting period (*n* = 44). However, the testing for this CAR from one large pathology service in Queensland was discontinued due to changed laboratory protocols.
- The number of reports halved from both New South Wales (*n* = 4 versus *n* = 8) and Victoria (*n* = 5 versus *n* = 10) compared to the previous two-month reporting period; and reports from Western Australia doubled (*n* = 8 versus *n* = 4).
- One linezolid non-susceptible *S. aureus* was reported from Queensland in this period.

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

- One carbapenemase-producing *A. baumannii* complex ($bla_{\text{NDM-1}}$, $bla_{\text{OXA-23}}$) was reported from South Australia during this period
- The number of carbapenemase-producing *P. aeruginosa* reports was the same as the previous two-month reporting period (*n* = 11). Reports were from New South Wales (GES-type, *n* = 6), Victoria ($bla_{\text{NDM-1}}$, *n* = 1; $bla_{\text{VIM-1}}$, *n* = 1; $bla_{\text{VIM-4}}$, *n* = 1; $bla_{\text{IMP-7}}$, *n* = 1), and Queensland (IMP, VIM, *n* = 1).

Linezolid resistant *Enterococcus:*

- Three linezolid-resistant *Enterococcus* species were reported during this period, one each from New South Wales (*E. faecium*), Victoria (*E. faecium*), and Western Australia (*E. faecalis*).

***Candida auris*:**

- One *Candida auris* was reported from South Australia during this period.

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

- No *Enterobacterales* with transmissible colistin resistance 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 January 2022 to 28 February 2022, and 2021

Species	Critical resistance	State or Territory								Bi-monthly			Year to date		
										2021	2022				
		NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Nov-Dec	Jan-Feb	Relative change*	2021	2022	Relative change*
Acinetobacter baumannii complex	Carbapenemase-producing	0	0	0	1	0	0	0	0	3	1	▼ 66.7%	4	1	▼ 75.0%
	Carbapenemase and ribosomal methyltransferase-producing	0	0	0	0	0	0	0	0	0	0	–	0	0	–
Candida auris	–	0	0	0	1	0	0	0	0	0	1	–	0	1	–
Enterobacterales	Carbapenemase-producing	34	21	29	7	3	2	0	3	77	99	▲ 28.6%	94	99	▲ 5.3%
	Carbapenemase and ribosomal methyltransferase-producing	0	0	0	0	1	0	0	0	2	1	▼ 50.0%	5	1	▼ 80.0%
	Carbapenemase-producing and transmissible resistance to colistin	0	4	0	0	0	0	0	1	7	5	▼ 28.6%	14	5	▼ 64.3%
	Carbapenemase and RMT-producing and transmissible resistance to colistin	0	0	0	0	0	0	0	0	0	0	–	0	0	–
	Ribosomal methyltransferase-producing	0	0	0	0	0	0	0	0	1	0	▼ 100%	1	0	▼ 100%
	Transmissible resistance to colistin	0	0	0	0	0	0	0	0	3	0	▼ 100%	3	0	▼ 100%
Enterococcus species	Linezolid resistant	1	1	0	0	1	0	0	0	4	3	▼ 25.0%	3	3	0.0%
Mycobacterium tuberculosis	Multidrug-resistant – at least rifampicin- and isoniazid-resistant strains	0	0	0	0	0	0	0	0	0	0	–	2	0	▼ 100%
Neisseria gonorrhoeae	Azithromycin non-susceptible (LLR, MIC < 256 mg/L)	4	3	3	0	0	0	0	0	37	10	▼ 73.0%	56	10	▼ 82.1%
	Azithromycin non-susceptible (HLR, MIC ≥ 256 mg/L	0	0	0	0	0	0	0	0	0	0	–	0	0	–
	Ceftriaxone non-susceptible	0	2	1	0	0	0	0	0	0	3	–	0	3	–
	Ceftriaxone non-susceptible and azithromycin non-susceptible	0	0	0	0	0	0	0	0	0	0	–	0	0	–

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

Table 1 (continued)

Species	Critical resistance	State or territory								Bi-monthly			Year to date		
										2021	2022				
		NSW	Nov-Dec	Jan-Feb	SA	WA	Tas	NT	ACT	Nov-Dec	Jan-Feb	Relative change*	2021	2022	Relative change*
Pseudomonas aeruginosa	Carbapenemase-producing	6	3	1	0	0	0	0	0	11	10	▼ 9.1%	18	10	▼ 44.4%
	Carbapenemase and ribosomal methyltransferase-producing	0	1	0	0	0	0	0	0	0	1	–	0	1	–
Salmonella species	Ceftriaxone non-susceptible	1	2	3	0	0	0	0	0	3	6	▲ 100%	8	6	▼ 25.0%
Shigella species	Multidrug-resistant	3	1	0	0	2	0	0	0	7	6	▼ 14.3%	9	6	▼ 33.3%
Staphylococcus aureus complex	Daptomycin non-susceptible	4	5	8	0	8	0	0	2	44	27	▼ 38.6%	32	27	▼ 15.6%
	Daptomycin and vancomycin non-susceptible	0	0	0	0	0	0	0	0	0	0	–	0	0	▼ 100%
	Linezolid non-susceptible	0	0	1	0	0	0	0	0	0	1	–	0	1	–
	Vancomycin non-susceptible	0	0	0	0	0	0	0	0	0	0	–	0	0	–
Streptococcus pyogenes	Penicillin reduced susceptibility	0	0	0	0	0	0	0	0	0	0	–	0	0	–
	Total (reported by 15 April 2022)	**53**	**43**	**46**	**9**	**15**	**2**	**0**	**6**	**199**	**174**	**▼ 12.6%**	**249**	**174**	**▼ 30.1%**

HLR = high-level resistance; LLR = low-level resistance; MIC = minimum inhibitory concentration; – = not applicable

* Relative change = absolute change between period in 2021 and same period in 2022, for each CAR, expressed as a percentage of 2021 base

Note: The number of CARs for 2021 have been updated to include additional submissions received after the previous publication date

Table 2: Number of critical antimicrobial resistance isolates, by setting, national, 1 January 2022 to 28 February 2022

Species	Critical resistance	Setting					Total
		Public hospital	Private hospital	Aged care home	Community	Unknown	
Acinetobacter baumannii complex	Carbapenemase-producing	1	0	0	0	0	1
	Carbapenemase and ribosomal methyltransferase-producing	0	0	0	0	0	0
Candida auris	–	1	0	0	0	0	1
Enterobacterales	Carbapenemase-producing	74	12	5	6	2	99
	Carbapenemase and ribosomal methyltransferase-producing	1	0	0	0	0	1
	Carbapenemase-producing and transmissible resistance to colistin	5	0	0	0	0	5
	Ribosomal methyltransferase-producing	0	0	0	0	0	0
	Transmissible resistance to colistin	0	0	0	0	0	0
Enterococcus species	Linezolid resistant	3	0	0	0	0	3
Mycobacterium tuberculosis	Multidrug-resistant – at least rifampicin- and isoniazid-resistant	0	0	0	0	0	0
Neisseria gonorrhoeae	Azithromycin non-susceptible (low-level)	0	0	0	9	1	10
	Azithromycin non-susceptible (high-level)	0	0	0	0	0	0
	Ceftriaxone non-susceptible	0	0	0	3	0	3
	Ceftriaxone non-susceptible and azithromycin non-susceptible	0	0	0	0	0	0
Pseudomonas aeruginosa	Carbapenemase-producing	7	2	0	1	0	10
	Carbapenemase and ribosomal methyltransferase-producing	1	0	0	0	0	1
Salmonella species	Ceftriaxone non-susceptible	1	0	0	4	1	6
Shigella species	Multidrug-resistant	4	0	0	1	1	6
Staphylococcus aureus complex	Daptomycin non-susceptible	15	2	4	5	1	27
	Daptomycin and vancomycin non-susceptible	0	0	0	0	0	0
	Linezolid non-susceptible	0	0	1	0	0	1
	Vancomycin non-susceptible	0	0	0	0	0	0
Streptococcus pyogenes	Penicillin reduced susceptibility	0	0	0	0	0	0
	Total (reported by 15 April 2022)	**113**	**16**	**10**	**29**	**6**	**174**

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

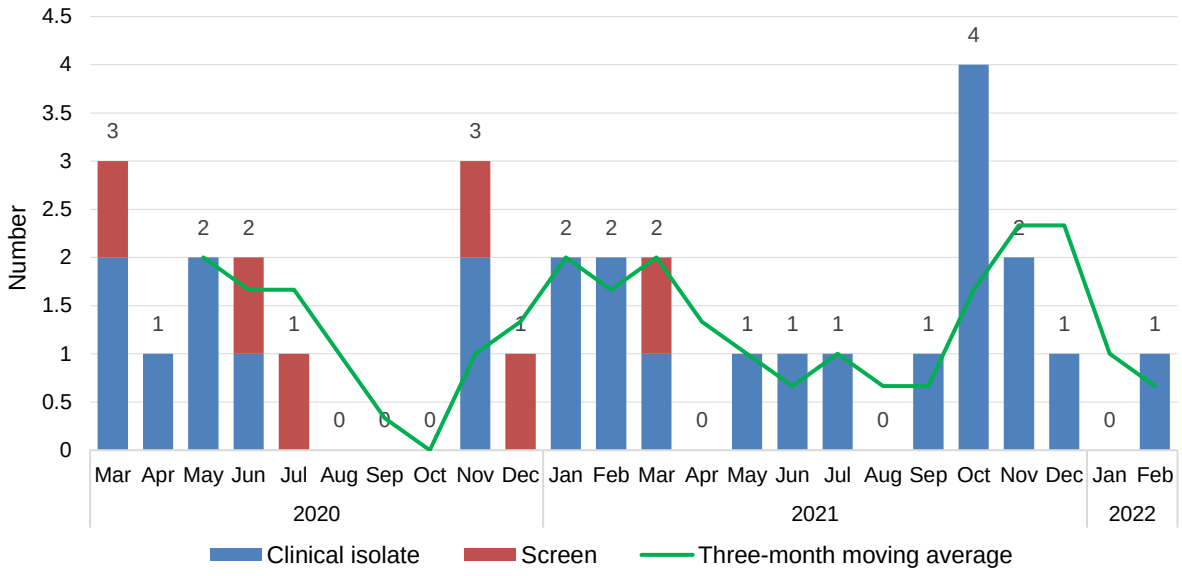
High-level = azithromycin MIC ≥ 256 mg/L; Low-level = azithromycin MIC < 256 mg/L

Summary by CAR

Acinetobacter baumannii complex

National data

Figure 1: Carbapenemase-producing *Acinetobacter baumannii* complex*, twenty-four-month trend by specimen type, national, 1 March 2020 to 28 February 2022



State and territory data

Figure 2: Carbapenemase-producing *Acinetobacter baumannii* complex, number reported by carbapenemase type and specimen type, by state and territory, 1 January 2022 to 28 February 2022

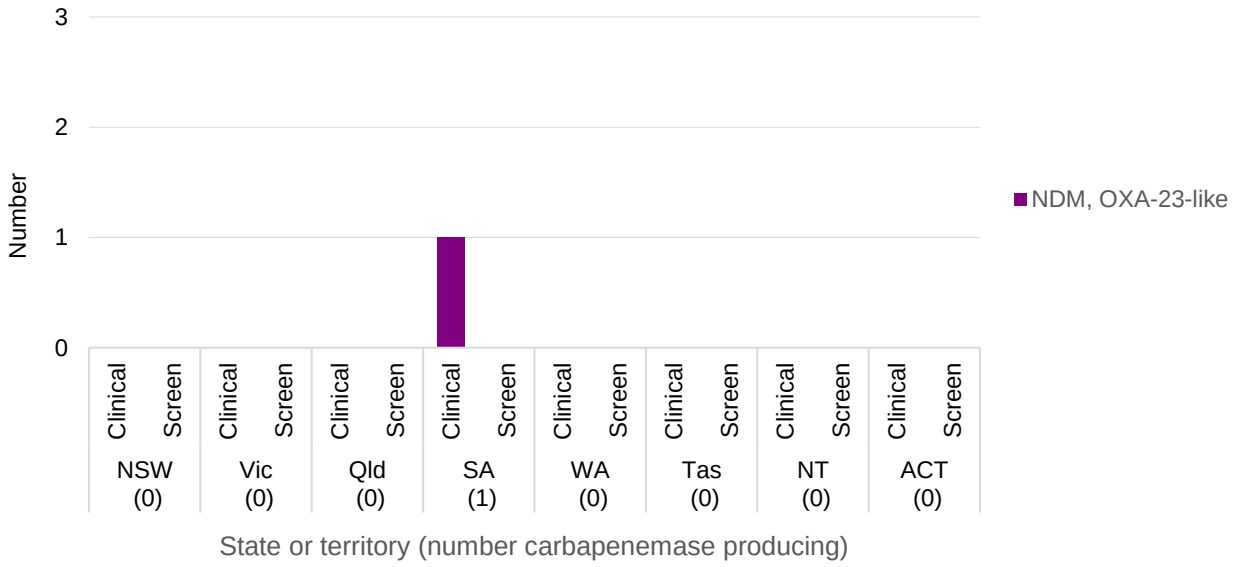


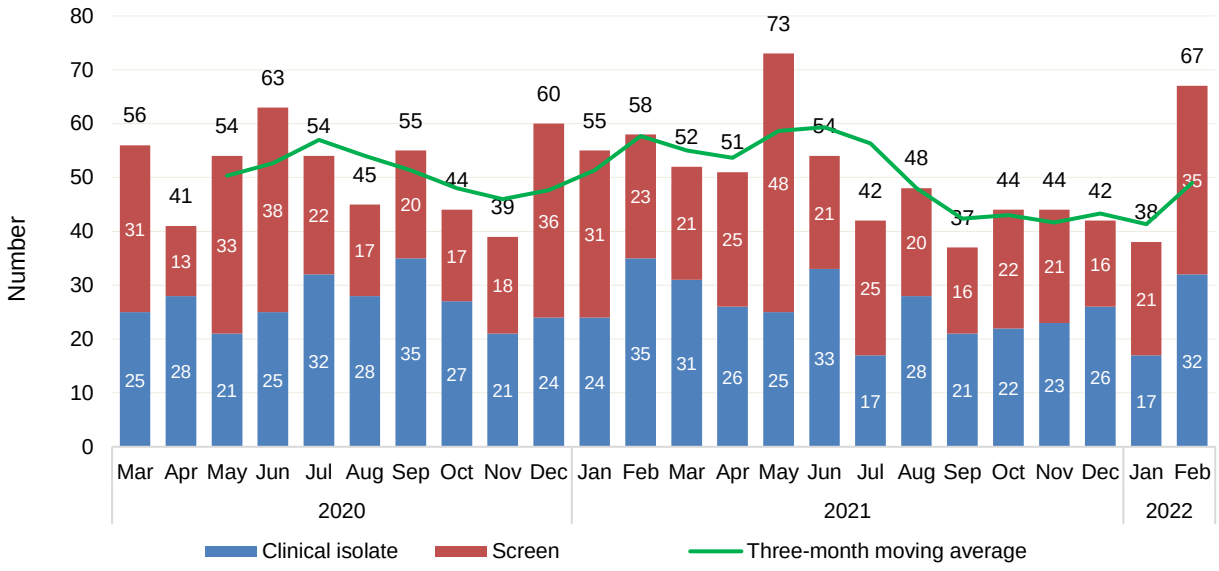
Table 3: Carbapenemase-producing *Acinetobacter baumannii* complex, number reported by setting, by state and territory, 1 January 2022 to 28 February 2022

Setting	State or territory								Total
	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
Total	0	0	0	1	0	0	0	0	1
Public hospital	0	0	0	1	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	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0

Enterobacterales

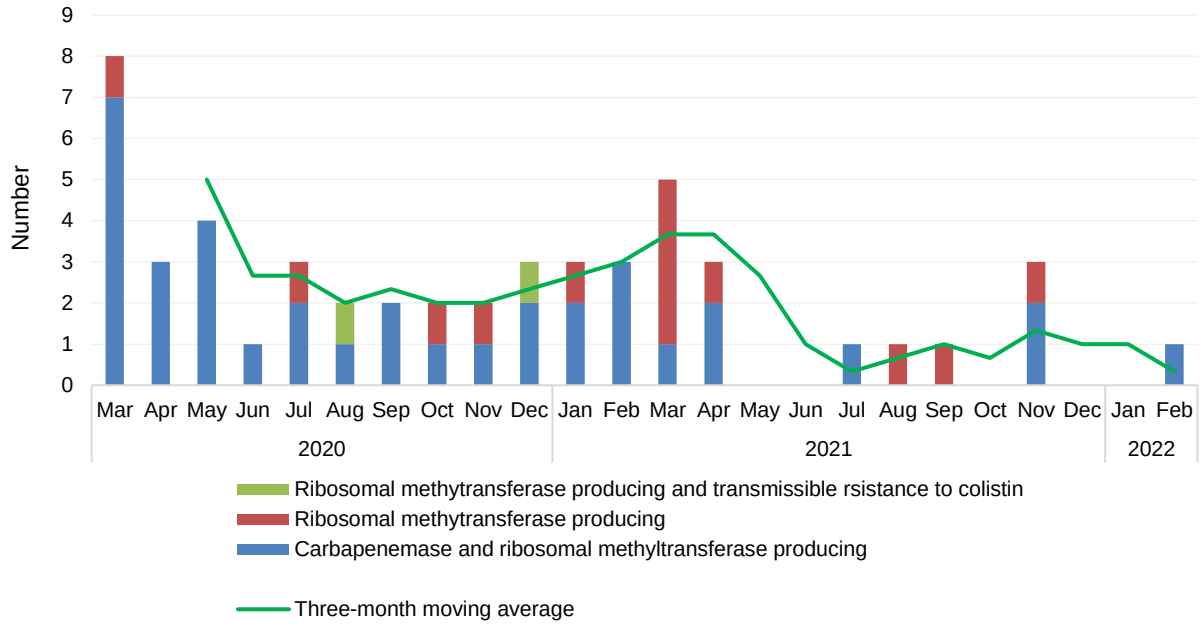
National data

Figure 3: Carbapenemase-producing *Enterobacterales**, twenty-four-month trend by specimen type, national, 1 March 2020 to 28 February 2022



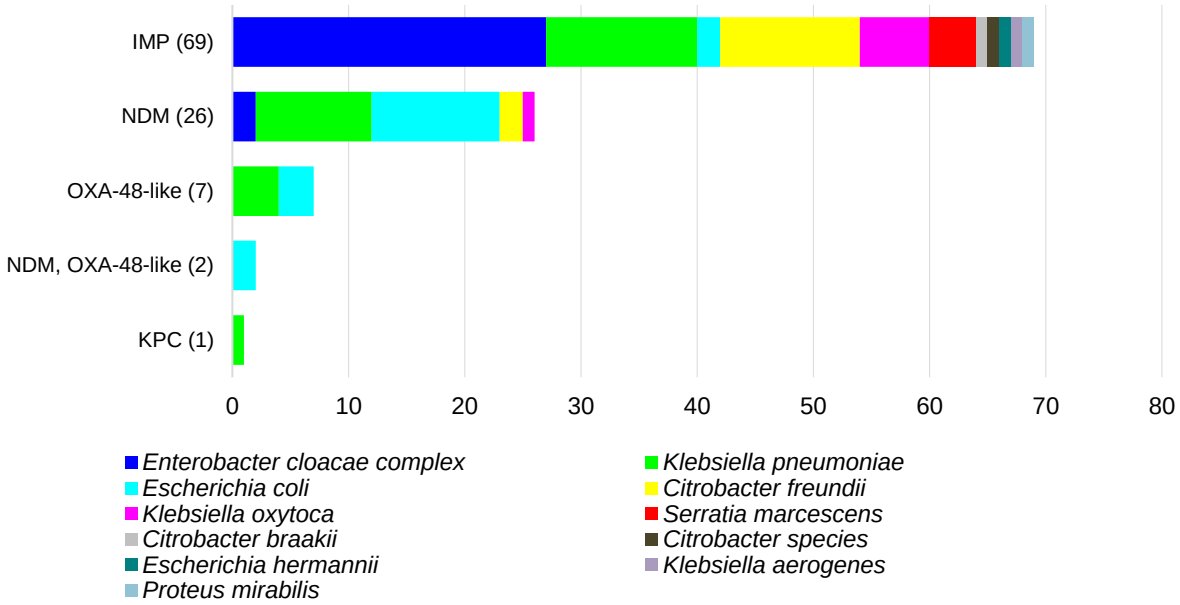
* Carbapenemase-producing alone or in combination with ribosomal methyltransferases

Figure 4: Ribosomal methyltransferase-producing *Enterobacterales**, twenty-four-month trend, national, 1 March 2020 to 28 February 2022



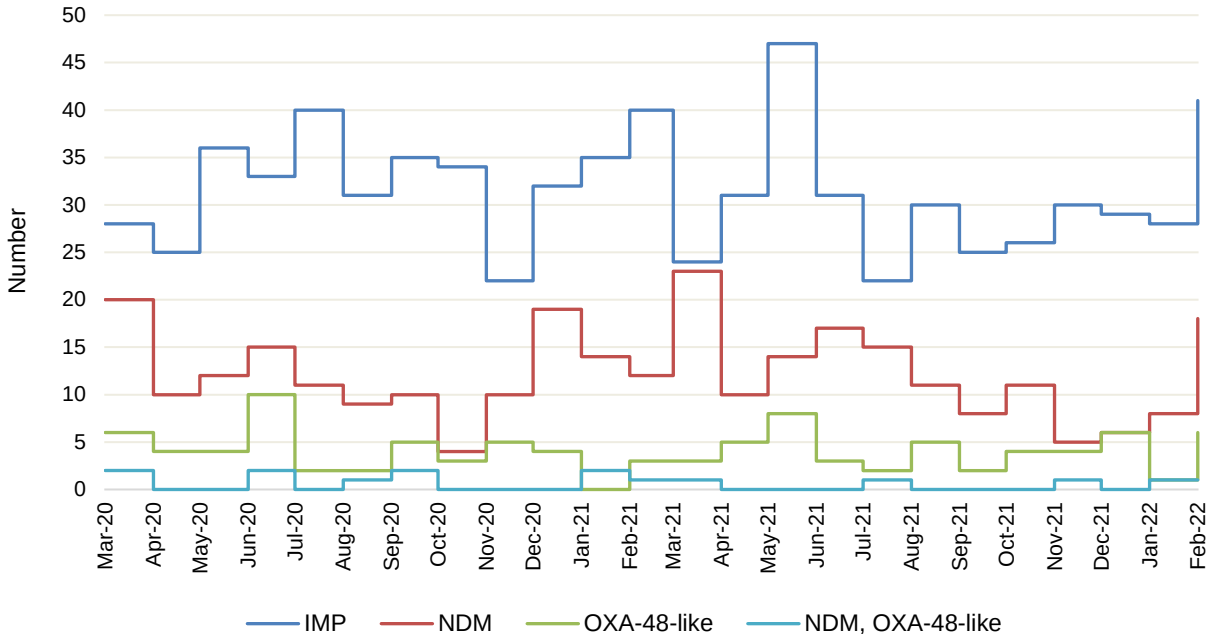
* Ribosomal methyltransferases alone, or in combination with carbapenemase(s)

Figure 5: Carbapenemase-producing *Enterobacterales**, number reported by carbapenemase type and species, national, 1 January 2022 to 28 February 2022



* Carbapenemase-producing (*n* = 99), carbapenemase-producing plus transmissible resistance to colistin (*n* = 5), carbapenemase and ribosomal methyltransferase-producing (*n* = 1)

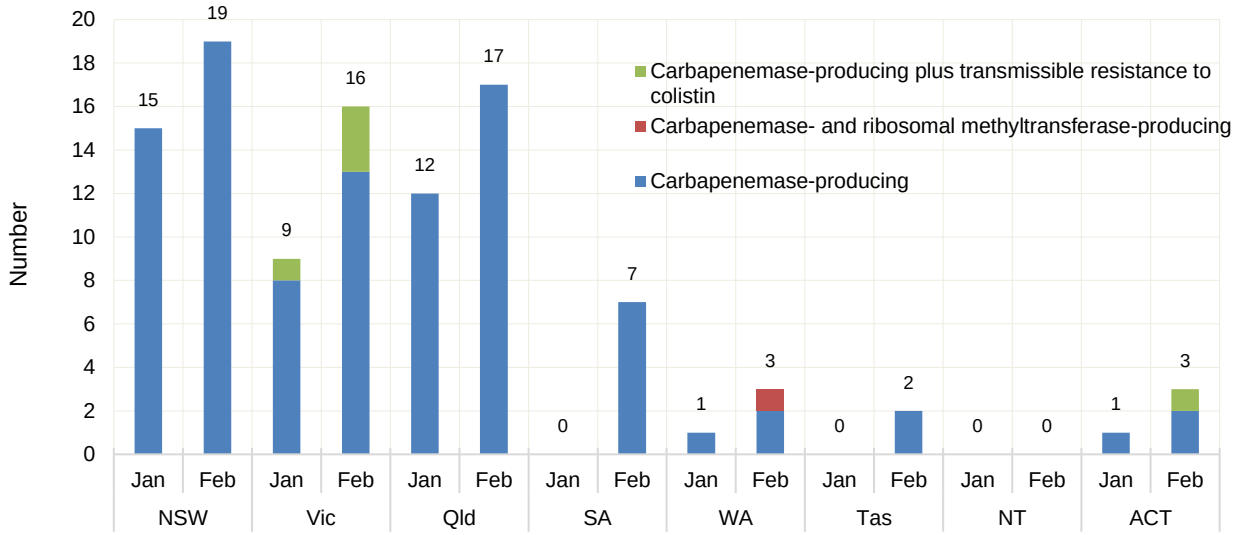
Figure 6: Top four reported carbapenemase types*, twenty-four-month trend, national, 1 March 2020 to 28 February 2022



* 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 January 2022 to 28 February 2022



* Carbapenemase-producing (*n* = 99), carbapenemase-producing plus transmissible resistance to colistin (*n* = 5), carbapenemase and ribosomal methyltransferase-producing (*n* = 1)

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 March 2020 to 28 February 2022

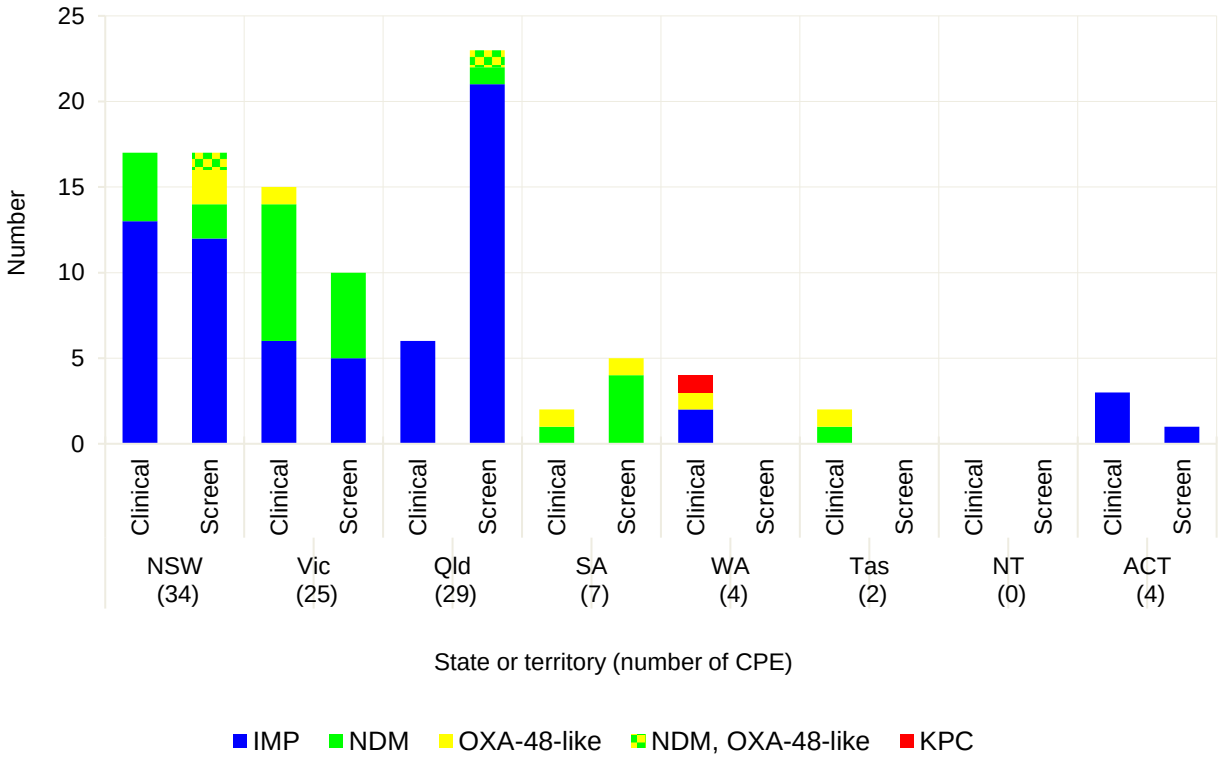
Type	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Australia
IMP	43 13	12 2	14 4	0 0	2 0	0 0	0 0	1 0	36 26
NDM	7 1	9 3	3 1	3 0	1 0	0 0	1 0	0 0	19 6
OXA-48-like	3 0	4 0	2 0	1 0	1 0	0 0	0 0	1 0	8 2
KPC	0 0	1 0	0 0	0 0	0 0	0 0	0 0	0 0	1 0
All types	28 14	25 8	16 5	5 0	4 1	1 0	1 0	2 0	63 41

Line graphs represent three-month moving average for the period 1 March 2020 to 28 February 2022, 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

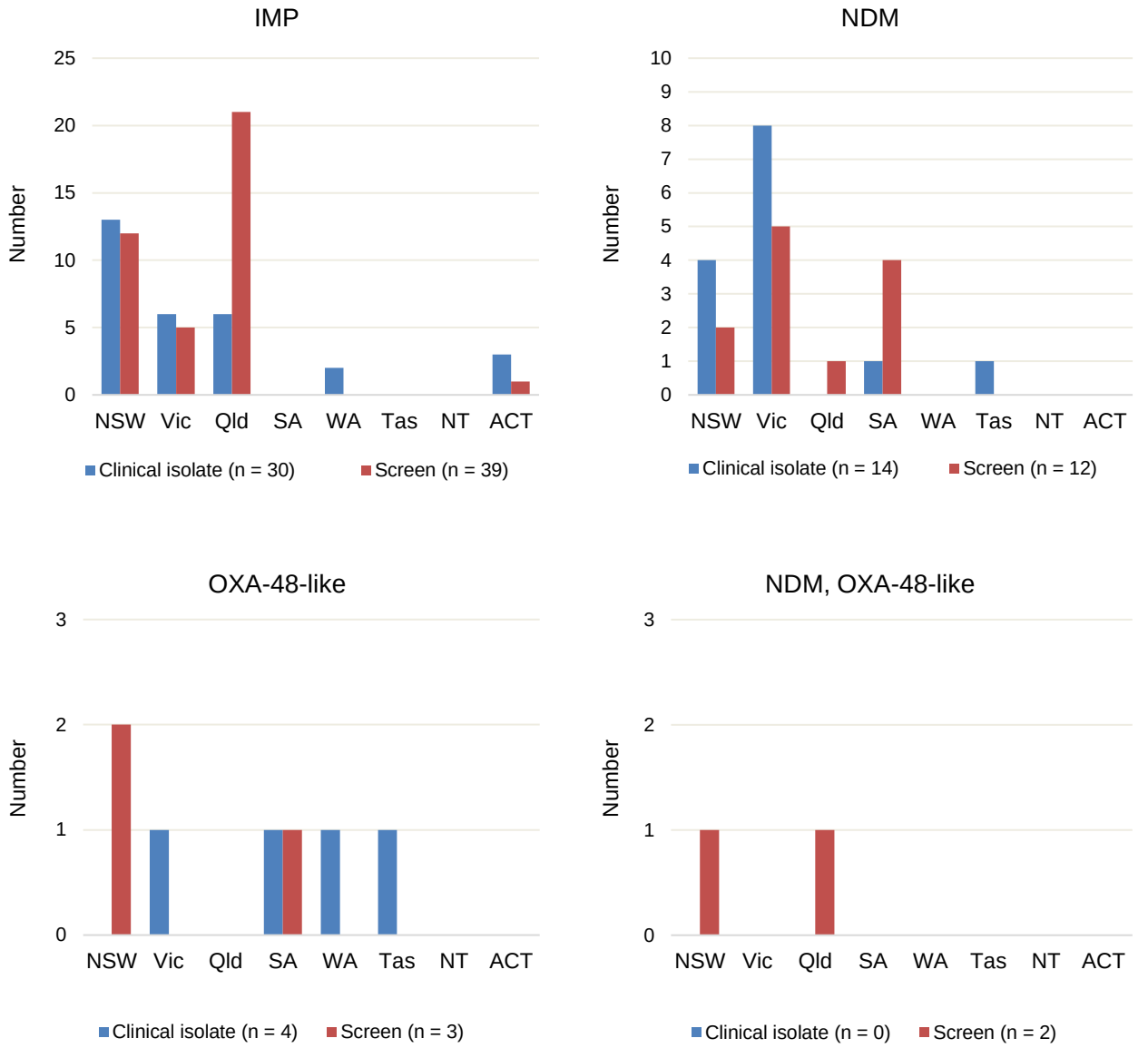
Blank cell = maximum monthly average was one or less

Figure 9: Carbapenemase-producing *Enterobacterales**, number reported by carbapenemase type and specimen type, by state and territory, 1 January 2022 to 28 February 2022



* Carbapenemase-producing (*n* = 99), carbapenemase-producing plus transmissible resistance to colistin (*n* = 5), carbapenemase and ribosomal methyltransferase-producing (*n* = 1)

Figure 10: Top four reported carbapenemase-producing *Enterobacterales* types by specimen type, by state and territory, 1 January 2022 to 28 February 2022



Other types: KPC (*n* = 1, WA [clinical]

Table 4: Top four carbapenemase types from *Enterobacterales*, number reported by setting, by state and territory, 1 January 2022 to 28 February 2022

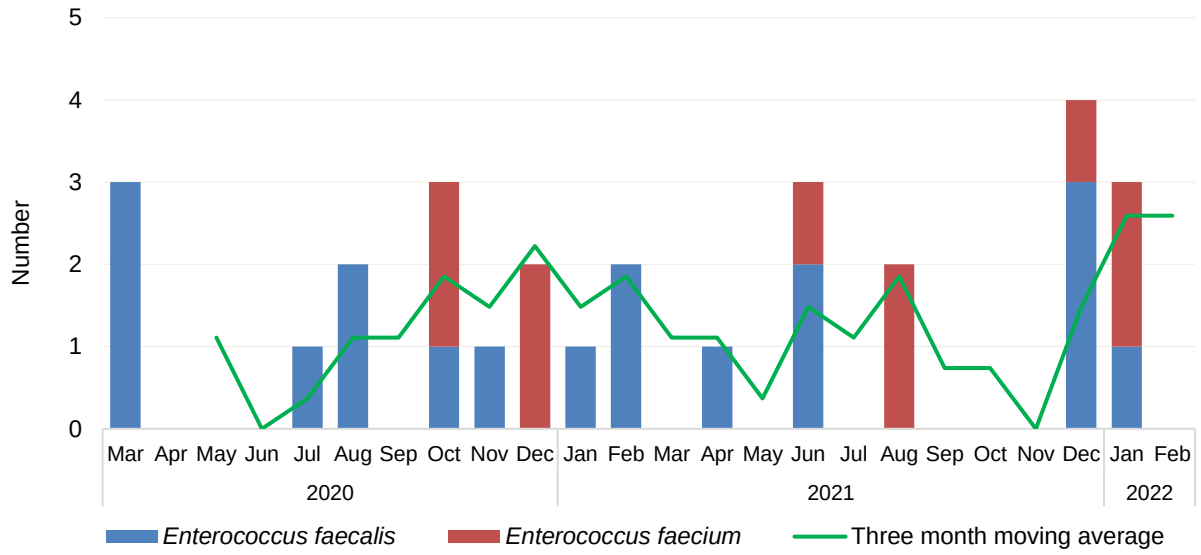
Carbapenemase type	Setting	State or territory								Total
		NSW	Vic	Qld	SA	WA	Tas	NT	ACT	
IMP	**Total**	25	11	27	0	2	0	0	4	69
	Public hospitals	20	11	18	0	0	0	0	4	53
	Private hospitals	1	0	7	0	1	0	0	0	9
	Aged care homes	1	0	0	0	1	0	0	0	2
	Community	3	0	2	0	0	0	0	0	5
	Unknown	0	0	0	0	0	0	0	0	0
NDM	**Total**	6	13	1	5	0	1	0	0	26
	Public hospitals	5	9	1	5	0	0	0	0	20
	Private hospitals	1	1	0	0	0	0	0	0	2
	Aged care homes	0	2	0	0	0	1	0	0	3
	Community	0	0	0	0	0	0	0	0	0
	Unknown	0	1	0	0	0	0	0	0	1
OXA-48-like	**Total**	2	1	0	2	1	1	0	0	7
	Public hospitals	2	0	0	1	0	1	0	0	4
	Private hospitals	0	0	0	0	1	0	0	0	1
	Aged care homes	0	0	0	0	0	0	0	0	0
	Community	0	0	0	1	0	0	0	0	1
	Unknown	0	1	0	0	0	0	0	0	1
NDM, OXA-48-like	**Total**	1	0	1	0	0	0	0	0	2
	Public hospitals	1	0	1	0	0	0	0	0	2
	Private hospitals	0	0	0	0	0	0	0	0	0
	Aged care homes	0	0	0	0	0	0	0	0	0
	Community	0	0	0	0	0	0	0	0	0
	Unknown	0	0	0	0	0	0	0	0	0

* Top four carbapenemase types account for 99% (104/105) of all carbapenemase-producing *Enterobacterales* reported for this period. Other types were KPC (*n* = 1, WA)

Enterococcus species

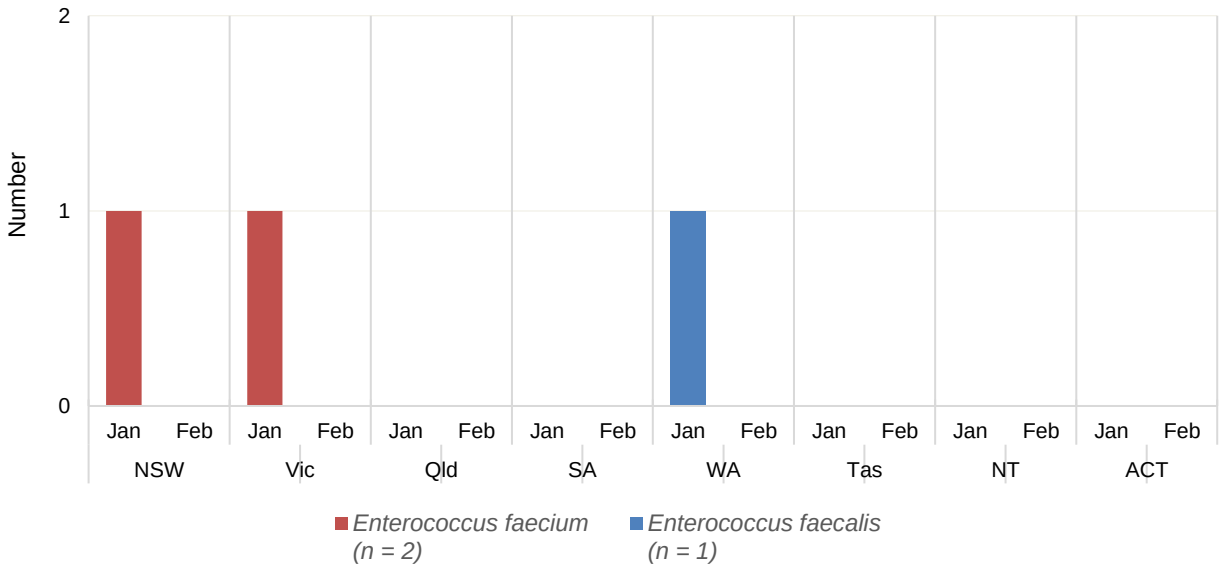
National data

Figure 11: Linezolid non-susceptible *Enterococcus* species, twenty-four-month trend, national, 1 March 2020 to 28 February 2022



State and territory data

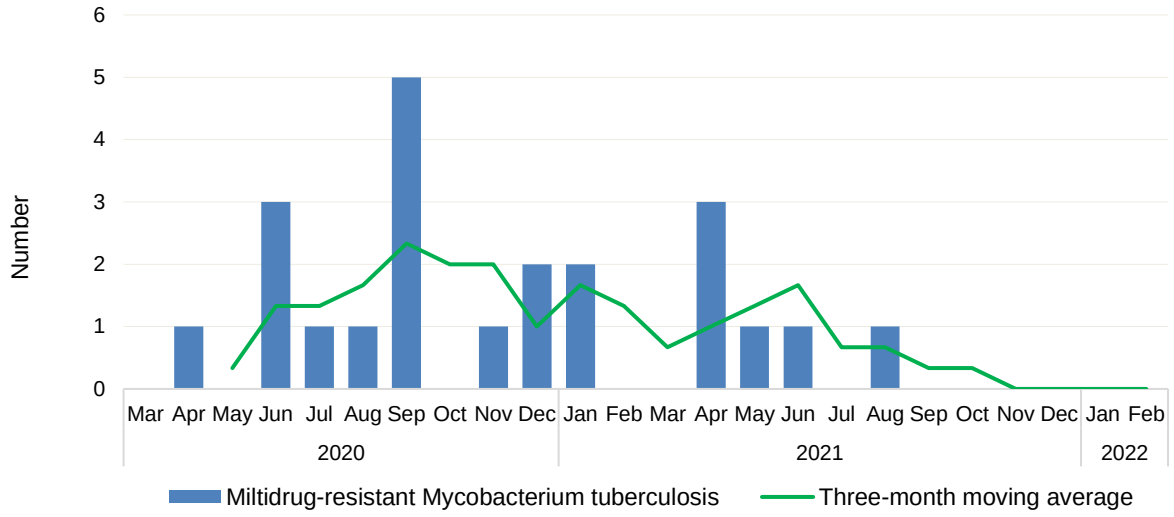
Figure 12: Linezolid non-susceptible *Enterococcus* species, number reported by state and territory, 1 January 2022 to 28 February 2022



Mycobacterium tuberculosis

National data

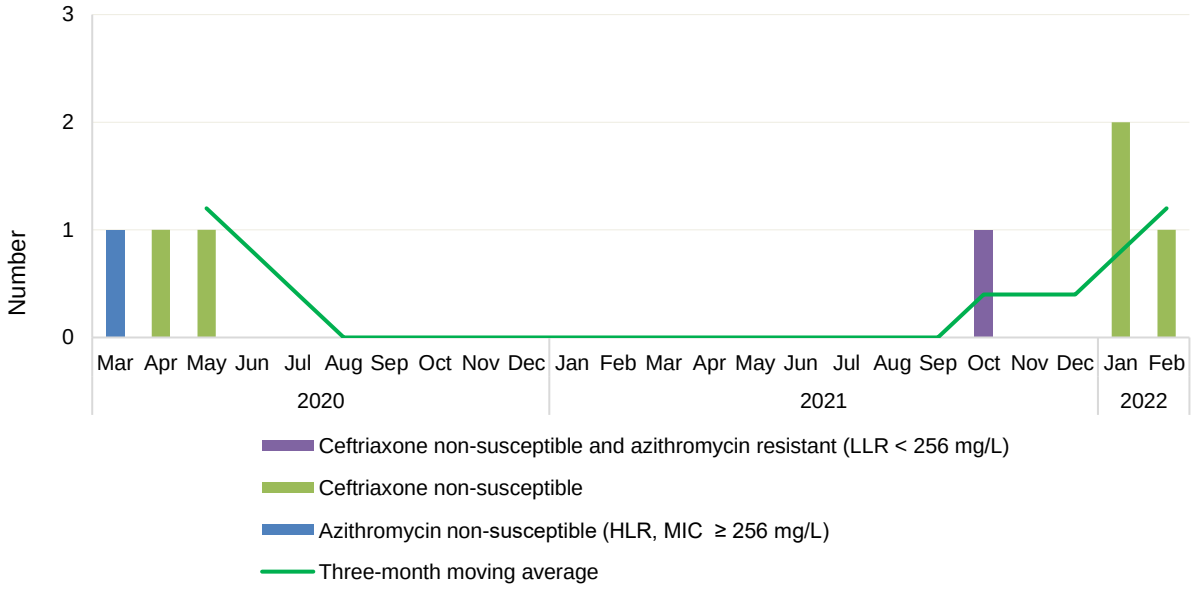
Figure 13: Multidrug-resistant *Mycobacterium tuberculosis,* twenty-four-month trend, national, 1 March 2020 to 28 February 2022



Neisseria gonorrhoeae

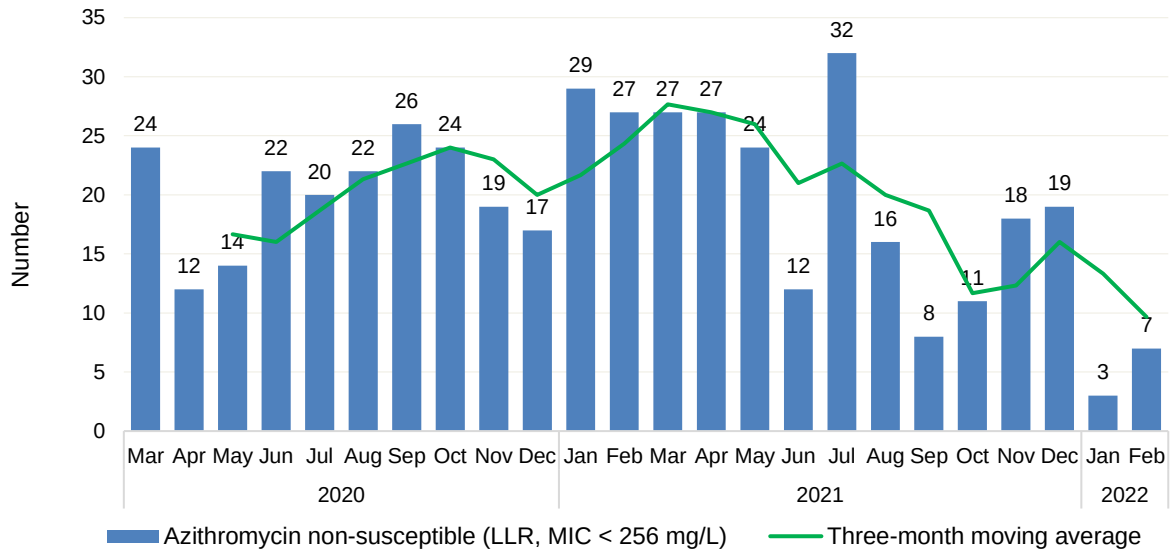
National data

Figure 14: Ceftriaxone non-susceptible and/or azithromycin non-susceptible (HLR, MIC ≥ 256 mg/L) *Neisseria gonorrhoeae,* number reported by month, national, 1 March 2020 to 28 February 2022



HLR: High level resistance; LLR: Low level resistance; MIC = minimum inhibitory concentration

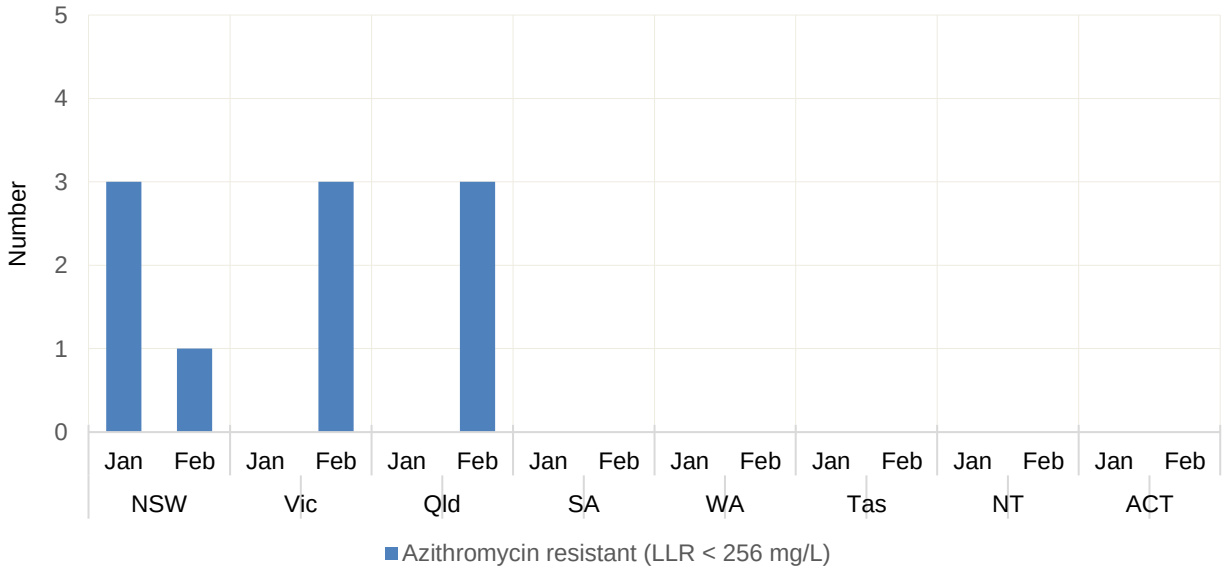
Figure 15: Azithromycin non-susceptible (LLR, MIC < 256 mg/L) *Neisseria gonorrhoeae*, twenty-four-month trend, national, 1 March 2020 to 28 February 2022



LLR: Low level resistance; MIC = minimum inhibitory concentration

State and territory data

Figure 16: Azithromycin non-susceptible (LLR, MIC < 256 mg/L) *Neisseria gonorrhoeae,* number reported by month, state and territory, 1 January 2022 to 28 February 2022

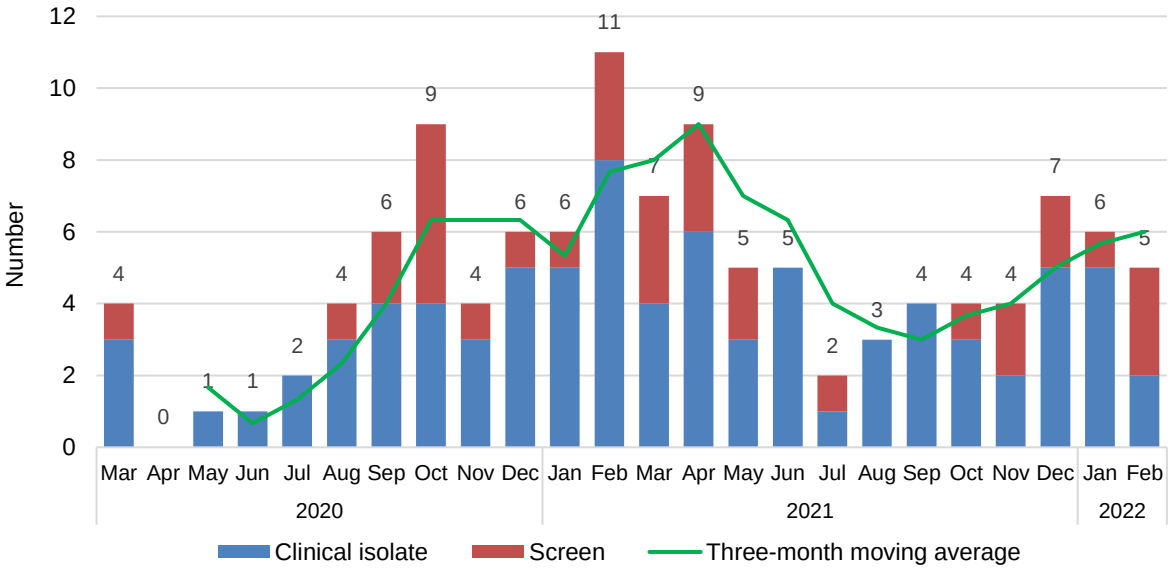


LLR: Low level resistance; MIC = minimum inhibitory concentration

Pseudomonas aeruginosa

National data

Figure 17: Carbapenemase-producing *Pseudomonas aeruginosa**, twenty-four-month trend by specimen type, national, 1 March 2020 to 28 February 2022



State and territory data

Figure 18: Carbapenemase-producing *Pseudomonas aeruginosa*, number reported by carbapenemase type and specimen type, by state and territory, 1 January 2022 to 28 February 2022

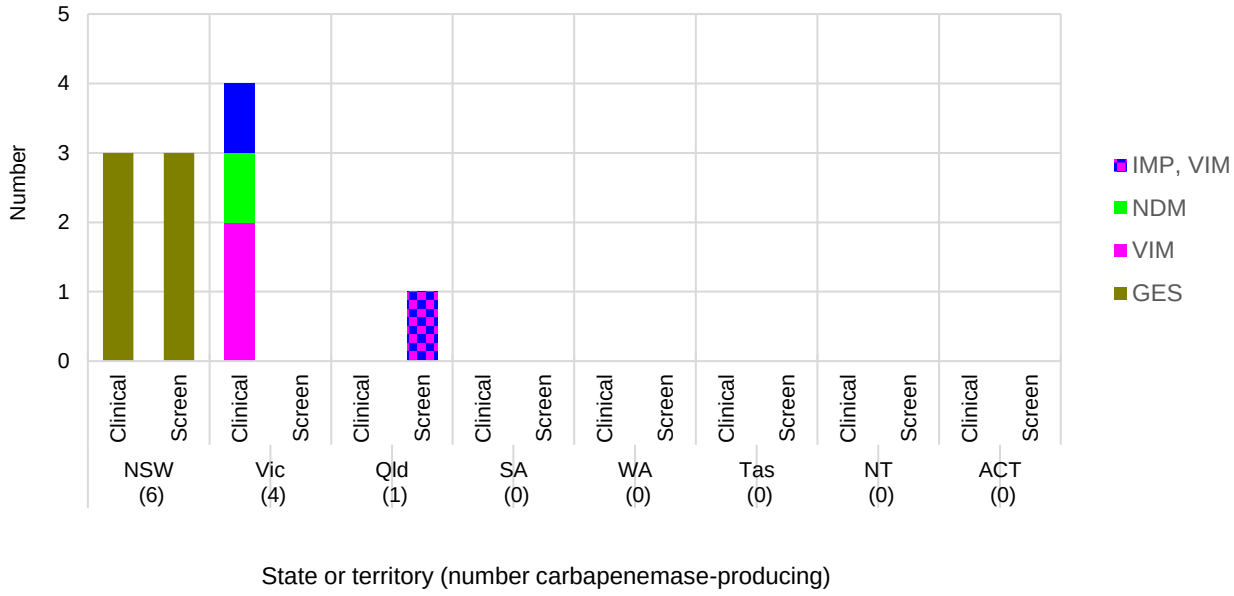


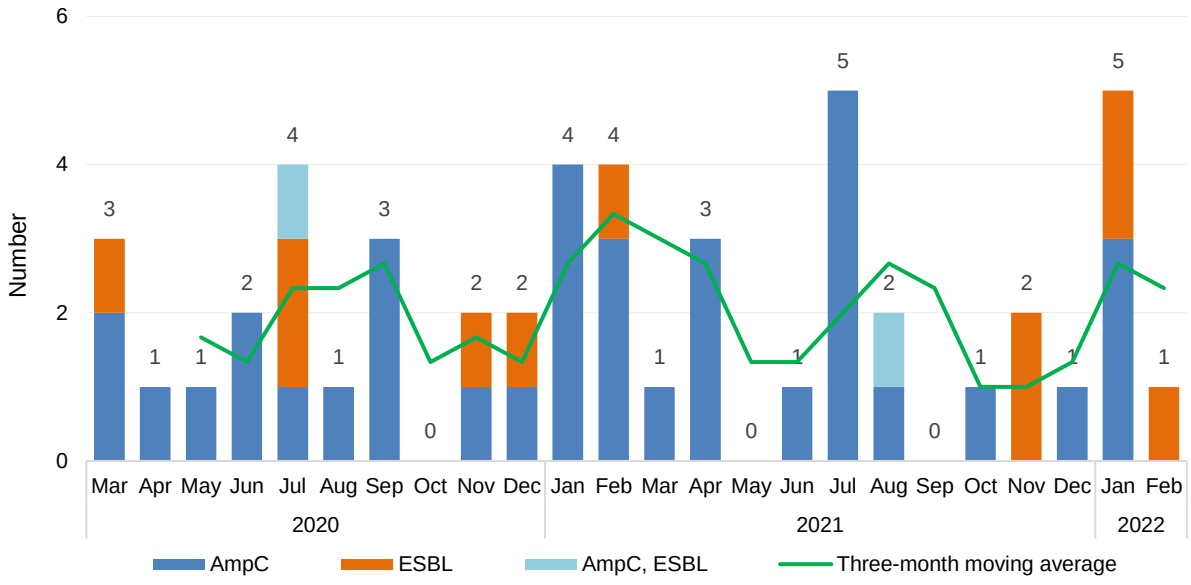
Table 5: Carbapenemase-producing *Pseudomonas aeruginosa*, number reported by setting, by state and territory, 1 January 2022 to 28 February 2022

	State or territory								
Setting	**NSW**	**Vic**	**Qld**	**SA**	**WA**	**Tas**	**NT**	**ACT**	**Total**
Total	**6**	**4**	**1**	**0**	**0**	**0**	**0**	**0**	**11**
Public hospital	5	3	0	0	0	0	0	0	8
Private hospital	0	1	1	0	0	0	0	0	2
Aged care home	0	0	0	0	0	0	0	0	0
Community	1	0	0	0	0	0	0	0	1
Unknown	0	0	0	0	0	0	0	0	0

Salmonella species

National data

Figure 19: Ceftriaxone non-susceptible *Salmonella* species, twenty-four-month trend, national, 1 March 2020 to 28 February 2022



Note: (1 January 2022—28 February 2022)

1. Non-typhoidal *Salmonella* species (*n* = 3) and typhoidal *Salmonella* species (*n* = 0)

Shigella species

National data

Figure 20: Multidrug-resistant *Shigella* species, twenty-four-month trend, national, 1 March 2020 to 28 February 2022

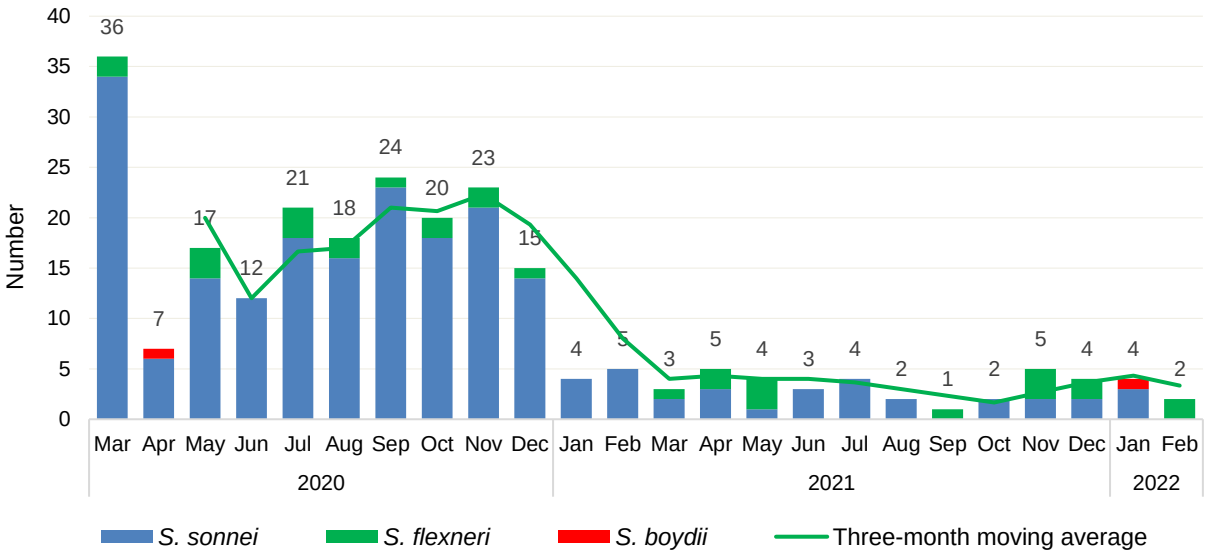
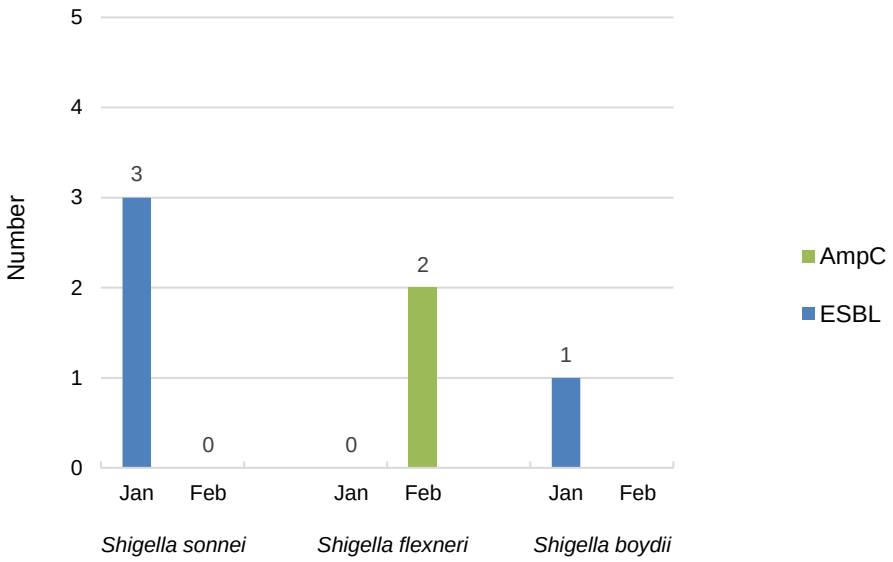
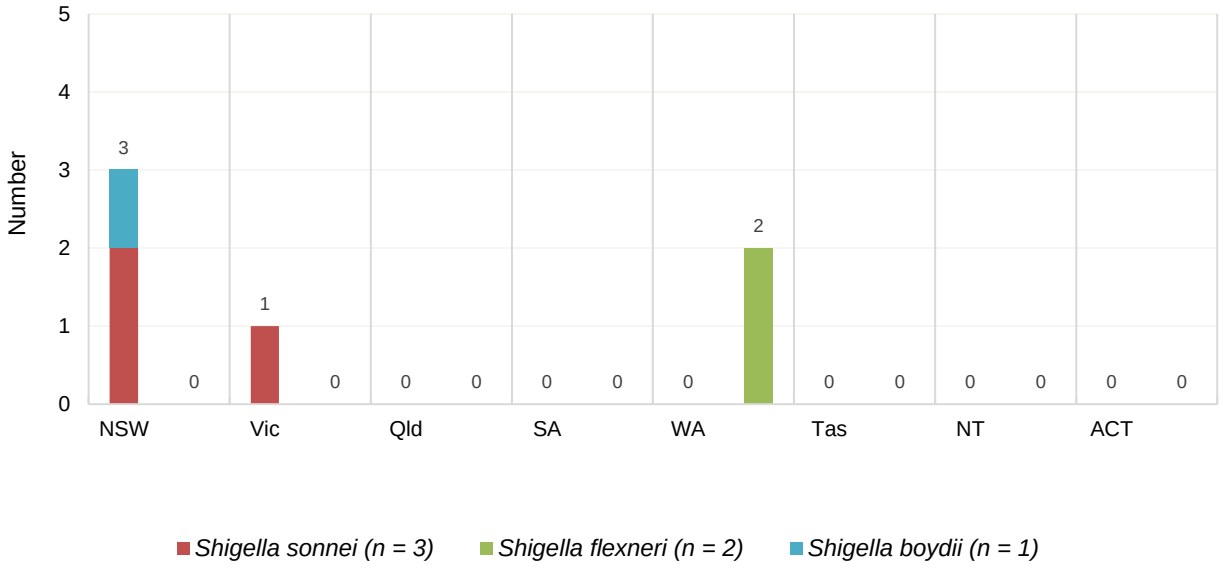


Figure 21: Multidrug-resistant *Shigella* species, number reported by month, national, 1 January 2022 to 28 February 2022



State and territory data

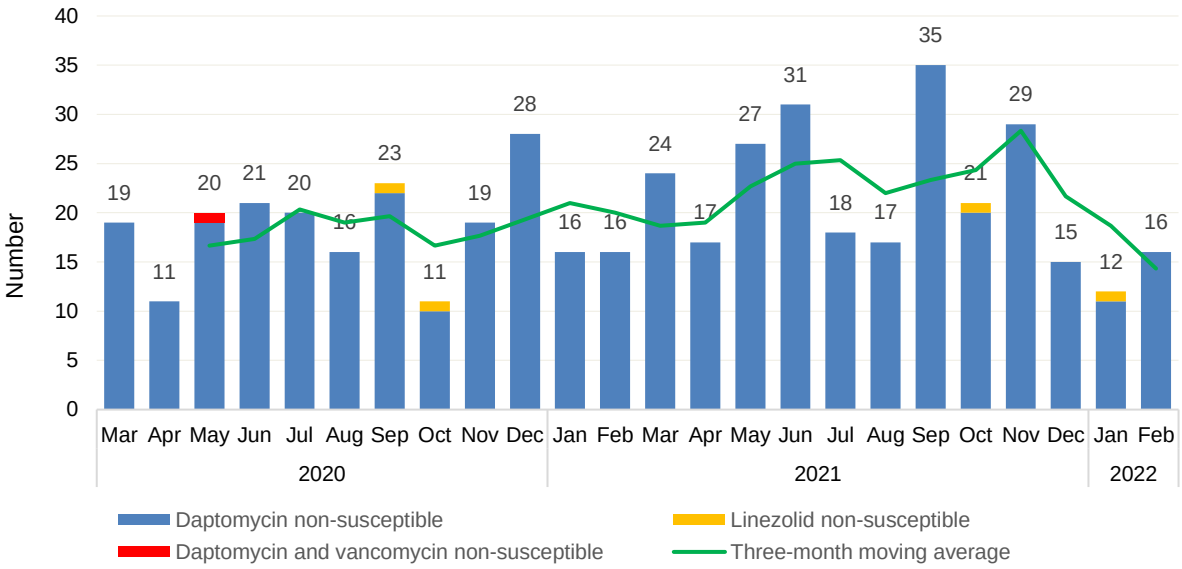
Figure 22: Multidrug-resistant *Shigella* species, number reported by state and territory, 1 January 2022 to 28 February 2022



Staphylococcus aureus

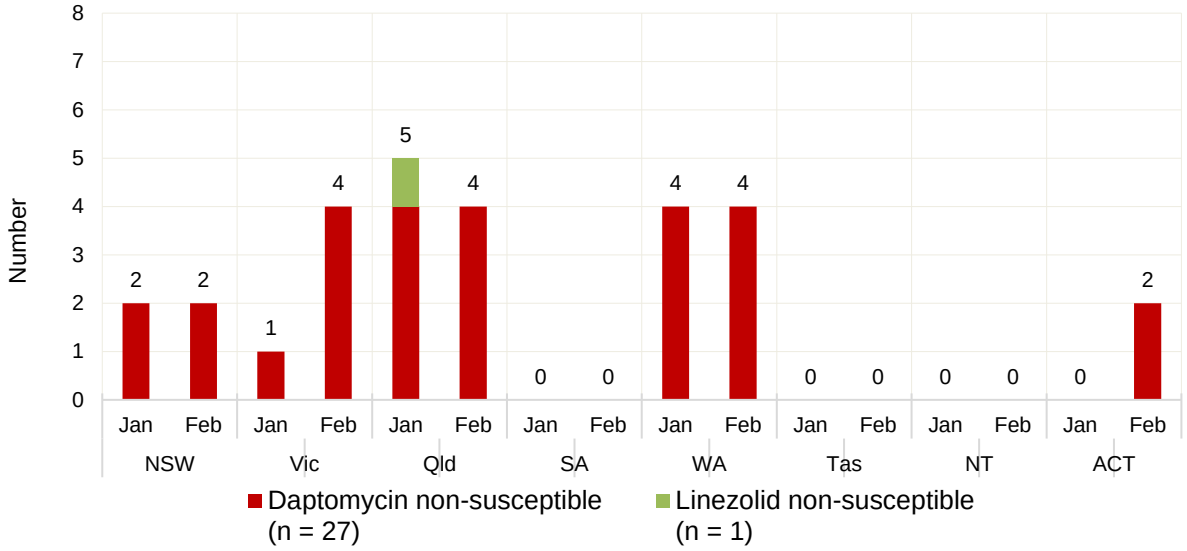
National data

Figure 23: Daptomycin, linezolid or vancomycin non-susceptible *Staphylococcus aureus,* twenty-four-month trend, national, 1 March 2020 to 28 February 2022



State and territory data

Figure 24: Daptomycin, linezolid or vancomycin non-susceptible *Staphylococcus aureus*, number reported by month, state and territory, 1 January 2022 to 28 February 2022



Note: No linezolid non-susceptible or vancomycin non-susceptible *S. aureus* were reported during this period.

Table 6: Daptomycin non-susceptible *Staphylococcus aureus,* number reported by setting and state and territory, 1 January 2022 to 28 February 2022

	State or territory								
Setting	**NSW**	**Vic**	**Qld**	**SA**	**WA**	**Tas**	**NT**	**ACT**	**Total**
Total	**4**	**5**	**9**	**0**	**8**	**0**	**0**	**2**	**28**
Public hospital	2	1	4	0	6	0	0	2	15
Private hospital	0	1	1	0	0	0	0	0	2
Aged care home	0	0	4	0	1	0	0	0	5
Community	2	2	0	0	1	0	0	0	5
Unknown	0	1	0	0	0	0	0	0	1

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) Preventing and Controlling Infections Standard and Australia's National Antimicrobial Resistance Strategy – 2020 and beyond. Funding for CARAlert 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.[1]

Table A1: List of critical antimicrobial resistances reported to CARAlert

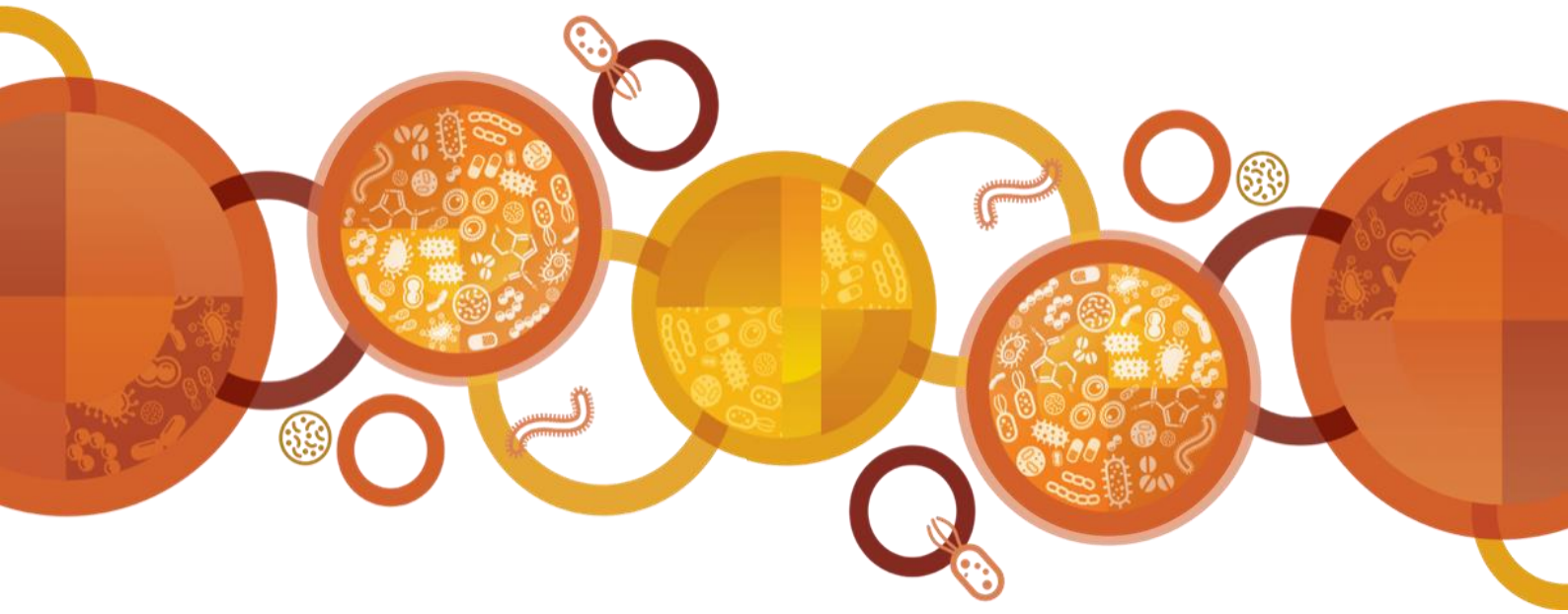
Species	Critical resistance
Acinetobacter baumannii complex	Carbapenemase-producing
Candida auris	–
Enterobacterales	Carbapenemase-producing, and/or ribosomal methyltransferase-producing
Enterobacterales	Transmissible colistin resistance
Enterococcus species	Linezolid resistant
Mycobacterium tuberculosis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

* For CARAlert, *S. aureus* complex includes *S. aureus*, *S. argenteus and S. schweitzeri*

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.

[1] Australian Commission on Safety and Quality in Health Care (ACSQHC). AURA 2019: Third Australian report on antimicrobial use and resistance in human health. Sydney: ACSQHC; 2019.



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