

**AUSTRALIAN COMMISSION
ON SAFETY AND QUALITY IN HEALTH CARE**



CARAlert data update 3

1 September 2017–31 October 2017

December 2017

Published by the Australian Commission on Safety and Quality in Health Care
Level 5, 255 Elizabeth Street, Sydney NSW 2000

Phone: (02) 9126 3600

Fax: (02) 9126 3613

Email: caralert@safetyandquality.gov.au

Website: www.safetyandquality.gov.au

© Australian Commission on Safety and Quality in Health Care 2017

All material and work produced by the Australian Commission on Safety and Quality in Health Care (the Commission) is protected by copyright. The Commission reserves the right to set out the terms and conditions for the use of such material.

As far as practicable, material for which the copyright is owned by a third party will be clearly labelled. The Commission has made all reasonable efforts to ensure that this material has been reproduced in this publication with the full consent of the copyright owners.

With the exception of any material protected by a trademark, any content provided by third parties and where otherwise noted, all material presented in this publication is licensed under a [Creative Commons Attribution–NonCommercial–NoDerivatives 4.0 International licence](https://creativecommons.org/licenses/by-nc-nd/4.0/).



Enquiries about the licence and any use of this publication are welcome and can be sent to communications@safetyandquality.gov.au.

The Commission's preference is that you attribute this publication (and any material sourced from it) using the following citation:

Australian Commission on Safety and Quality in Health Care. CARAlert update 1
September 2017–31 October 2017. Sydney: ACSQHC; 2017

Disclaimer

The content of this document is published in good faith by the Commission for information purposes. The document is not intended to provide guidance on particular healthcare choices. You should contact your healthcare provider for information or advice on particular healthcare choices.

The Commission does not accept any legal liability for any injury, loss or damage incurred by the use of, or reliance on, this document.

Summary

The Australian Government funded the Australian Commission on Safety and Quality in Health Care (the Commission) to establish the National Alert System for Critical Antimicrobial Resistances (CARAlert) in March 2016 as part of the Antimicrobial Use and Resistance in Australia (AURA) Surveillance System.

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

This data update is one of a series produced by the AURA National Coordination Unit (NCU) to provide regular data updates and six-monthly detailed analyses of CARAlert data. This summary report includes information about isolates collected between 1 September 2017 and 31 October 2017, and the results reported into CARAlert by 30 November 2017.

Azithromycin resistant (low-level resistance, MIC \leq 256 mg/L) *Neisseria gonorrhoeae* and carbapenemase-producing Enterobacteriaceae (CPE) are the most commonly reported in CARAlert.

The two-month report provides data on the number and distribution of critical antimicrobial resistance isolates, by state and territory. The majority of reported cases were from the three most populous states.

Figures 3 to 5 show details of carbapenemase type and the species of CPE, and Figure 6 the distribution of azithromycin resistant *Neisseria gonorrhoeae*, by state and territory.

The findings regarding CPE highlight the importance of implementation of the Commission's 2017 [CPE control guidelines](#). The findings regarding azithromycin non-susceptible *N. gonorrhoeae* will assist states and territories in relation to their sexually transmitted infection control guidelines, and inform national and local treatment guidelines.

The next six-month report will provide more detailed analyses of each of the CARs and trends for each of the CARs, across all states and territories.

Background

The Australian Commission on Safety and Quality in Health Care (the Commission) established the National Alert System for Critical Antimicrobial Resistances (CARAlert) in March 2016 as part of the Antimicrobial Use and Resistance in Australia (AURA) Surveillance System.

Critical antimicrobial resistances (CARs) are defined as resistance mechanisms, or profiles, known to be a serious threat to the effectiveness of last-line antimicrobial agents. They can result in significant morbidity and mortality in healthcare facilities, and in the community. The CARs reported under CARAlert are listed in Table 1. The CARs were drawn from the list of high-priority organisms and antimicrobials which are the focus of the AURA Surveillance System.¹

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

- Collection and routine testing – the isolate is collected from the patient and sent to the originating laboratory for routine testing
- 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
- 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.

Table 1: List of critical antimicrobial resistances

Species	Critical Resistance
Enterobacteriaceae	Carbapenemase-producing, and/or ribosomal methyltransferase-producing
<i>Enterococcus</i> species	Linezolid non-susceptible
<i>Mycobacterium tuberculosis</i>	Multidrug-resistant – resistant to at least rifampicin and isoniazid
<i>Neisseria gonorrhoeae</i>	Ceftriaxone 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

¹ 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.

As there is a time-lag in confirmation for some isolates, the cut-off date for data that are included in updates and reports will be four weeks after the end of each reporting period. The data in each update and report are based on the date that the isolate with a confirmed CAR was collected.

This report provides a brief update, and complements previous analyses of and updates on [CARAlert data](#).

The AURA National Coordination Unit will produce both regular data updates and six-monthly reports that will include more detailed analyses of CARAlert data.

Results

This data update includes information about 221 isolates collected between 1 September 2017 and 31 October 2017 and the results reported into CARAlert by 30 November 2017. From 17 March 2016 to 31 October 2017, 2,013 results from 85 originating laboratories across Australia were entered into the CARAlert system. Table 2 and Figure 1 show the number and distribution of critical antimicrobial resistance isolates, by state and territory.

There were 118 azithromycin resistant (low-level resistance, MIC \leq 256 mg/L) *Neisseria gonorrhoeae* and 68 carbapenemase-producing Enterobacteriaceae (CPE) during this two-month period. These two resistances were the most commonly reported (84%). The great majority (87%) of reported cases were from the New South Wales, Victoria and Queensland.

Figure 2 shows the CARs reported by species and month, year on year, 17 March 2016 to 31 October 2017.

Figures 3 to 5 show details of carbapenemase type and the species of CPE, by state and territory, 1 September 2017 to 31 October 2017. IMP (60.0%), NDM (14.7%) and OXA-48 (14.7%) types accounted for 89.3% of all CPE reported during this period, with 80.0% from New South Wales, Victoria and Queensland. Over 50% of CPE reported from New South Wales contained NDM (3/17), OXA-48-like (3/17) or NDM+OXA-48-like (3/17).

The distribution of azithromycin resistant *Neisseria gonorrhoeae*, by state and territory, is shown in Figure 6. An increase in the number of ARNG reported from Queensland was seen in October 2017.

Linezolid non-susceptible *S. aureus*, from a patient residing in Queensland, was reported for the first time in October 2017. An *Enterobacter cloacae* complex producing a FRI carbapenemase type was submitted during this reporting period. The isolate was collected in May 2017, from a patient residing in Tasmania.

The six-month report for the period 1 April 2017 to 30 September 2017, which will be published in the near future, will provide more detailed analyses of trends for each of the CARs, across all states and territories.

Table 2: Number of critical antimicrobial resistance isolates, by state and territory, 1 September 2017 to 31 October 2017

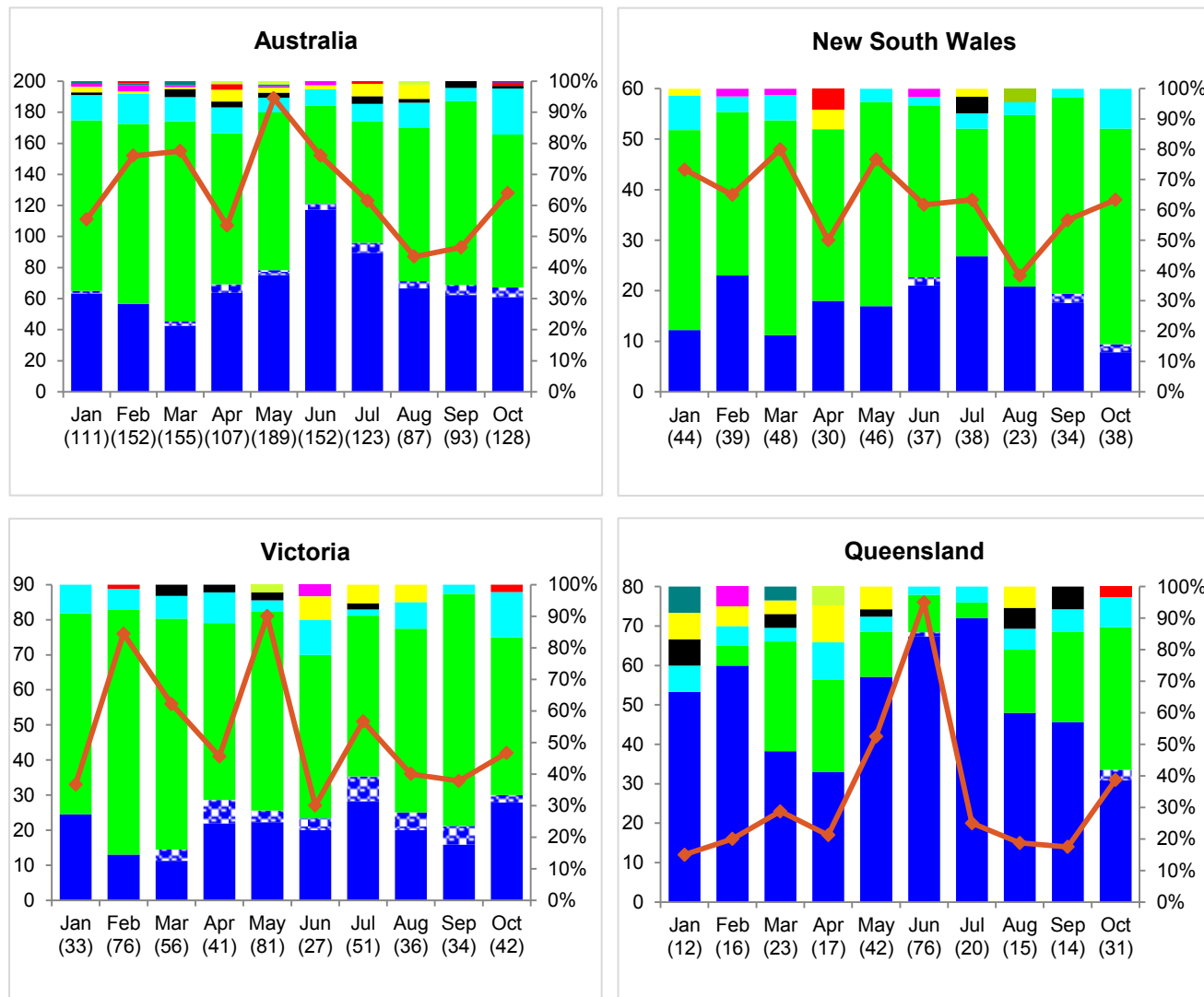
Critical antimicrobial resistance	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	OS	Unk	2017 Sep–Oct	2017 YTD	2016 Sep–Oct	2016 Mar–Dec*	Trend† Nov-16 Oct-17
Azithromycin resistant (LLR < 256 mg/L) <i>Neisseria gonorrhoeae</i>	49	46	18	0	2	1	0	1	1	0	118	654	34	225	
Carbapenemase-producing Enterobacteriaceae	15	19	20	1	5	3	0	3	2	0	68	457	69	312	
Daptomycin non-susceptible <i>Staphylococcus aureus</i>	6	7	4	0	6	0	0	0	0	0	23	99	14	62	
Carbapenemase and ribosomal methyltransferase-producing Enterobacteriaceae	2	3	1	0	0	0	0	0	1	0	7	25	6	21	
Ceftriaxone non-susceptible <i>Salmonella</i> species	0	0	0	0	0	0	0	0	0	0	0	22	4	17	
Ribosomal methyltransferase-producing Enterobacteriaceae	0	0	1	0	1	1	0	0	0	0	3	17	2	16	
Multidrug-resistant <i>Mycobacterium tuberculosis</i>	0	0	0	0	0	0	0	0	0	0	0	5	2	20	
Multidrug-resistant <i>Shigella</i> species	0	0	0	0	0	0	0	0	0	0	0	8	1	15	
Linezolid non-susceptible <i>Enterococcus</i> species	0	1	0	0	0	0	0	0	0	0	1	5	1	9	
Azithromycin resistant (HLR > 256 mg/L) <i>Neisseria gonorrhoeae</i>	0	0	0	0	0	0	0	0	0	0	0	4	1	4	
Ceftriaxone non-susceptible <i>Neisseria gonorrhoeae</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
Vancomycin non-susceptible <i>Staphylococcus aureus</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Linezolid non-susceptible <i>Staphylococcus aureus</i>	0	0	1	0	0	0	0	0	0	0	1	1			
Total (as at 30 November 2017)	72	76	45	1	14	5	0	4	4	0	221	1,297	134	706	

HLR = high-level resistance; LLR = low-level resistance; OS = overseas; Unk = unknown; YTD = year to date

* CARAlert commenced on 17 March 2016. Data for 2016 are for the period 17 March 2016 to 31 December 2016

† Trend Nov-16 Oct-17 = 12-month trend, 1 November 2016 to 31 October 2017

Figure 1: Critical antimicrobial resistances (CARs), number and distribution reported nationally, and by state and territory, 1 January 2017 to 31 October 2017



- Carbapenemase-producing Enterobacteriaceae
- Carbapenemase and ribosomal methyltransferase-producing Enterobacteriaceae
- Azithromycin resistant (LLR < 256 mg/L) *Neisseria gonorrhoeae*
- Daptomycin non-susceptible *Staphylococcus aureus*
- Ribosomal methyltransferase-producing Enterobacteriaceae
- Ceftriaxone non-susceptible Salmonella species
- Multidrug-resistant *Shigella* species
- Multidrug-resistant *Mycobacterium tuberculosis*
- Linezolid non-susceptible *Enterococcus* species
- Azithromycin resistant (HLR > 256 mg/L) *Neisseria gonorrhoeae*

Figure 1 (continued): Critical antimicrobial resistances (CARs), number and distribution reported nationally, and by state and territory, 1 January 2017 to 31 October 2017

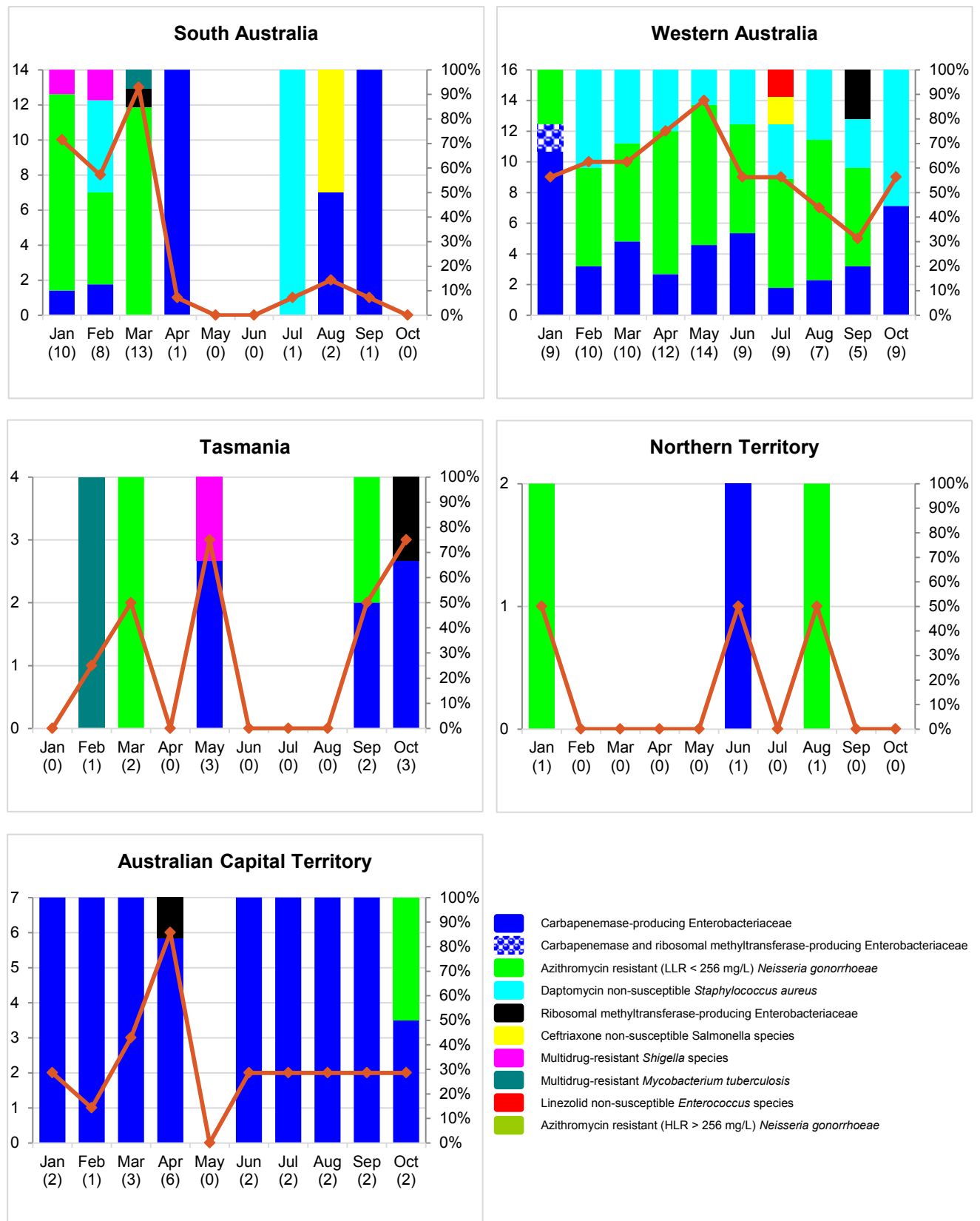
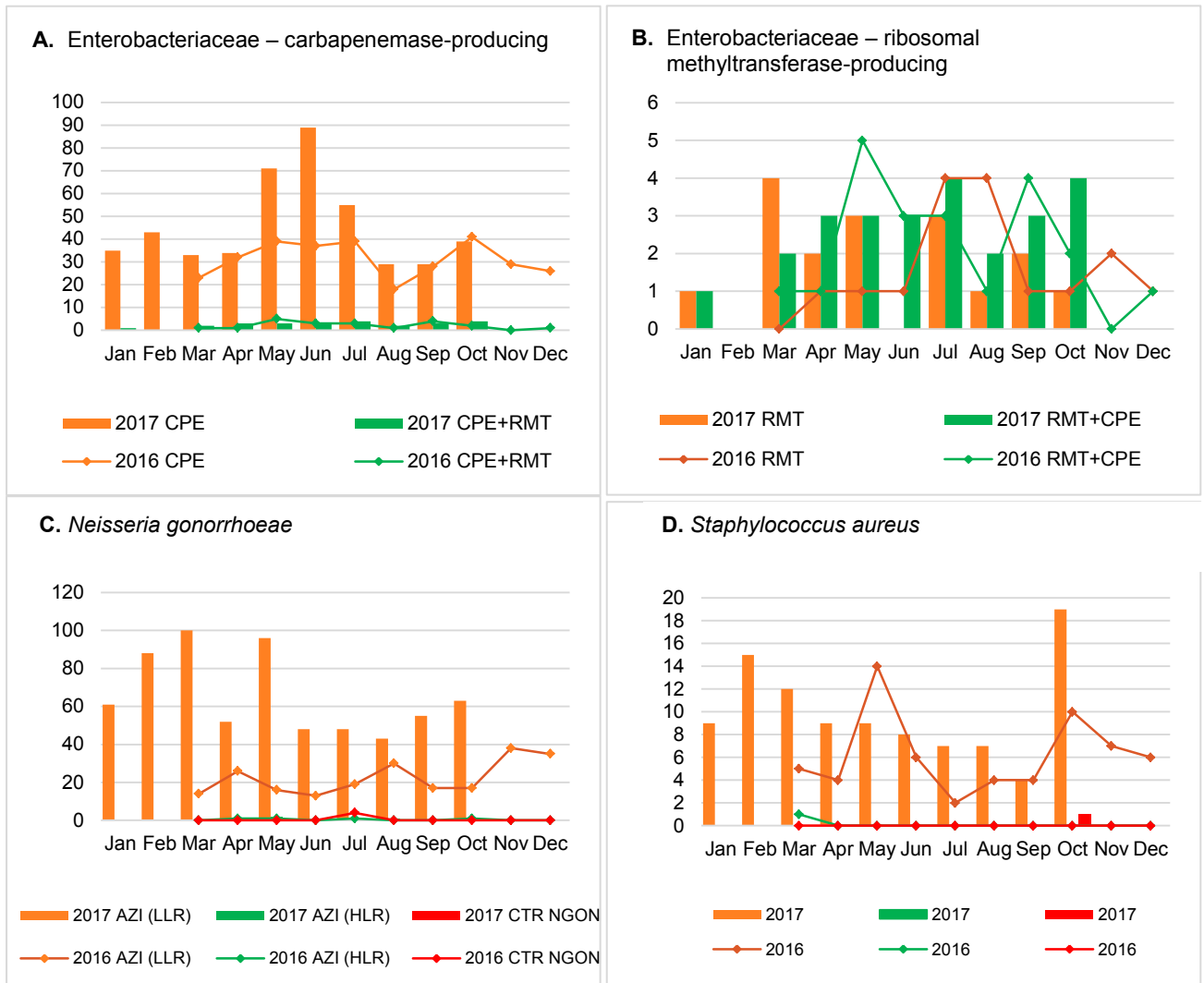


Figure 2: Critical antimicrobial resistances, number reported by species and month, year on year, 17 March 2016 to 31 October 2017

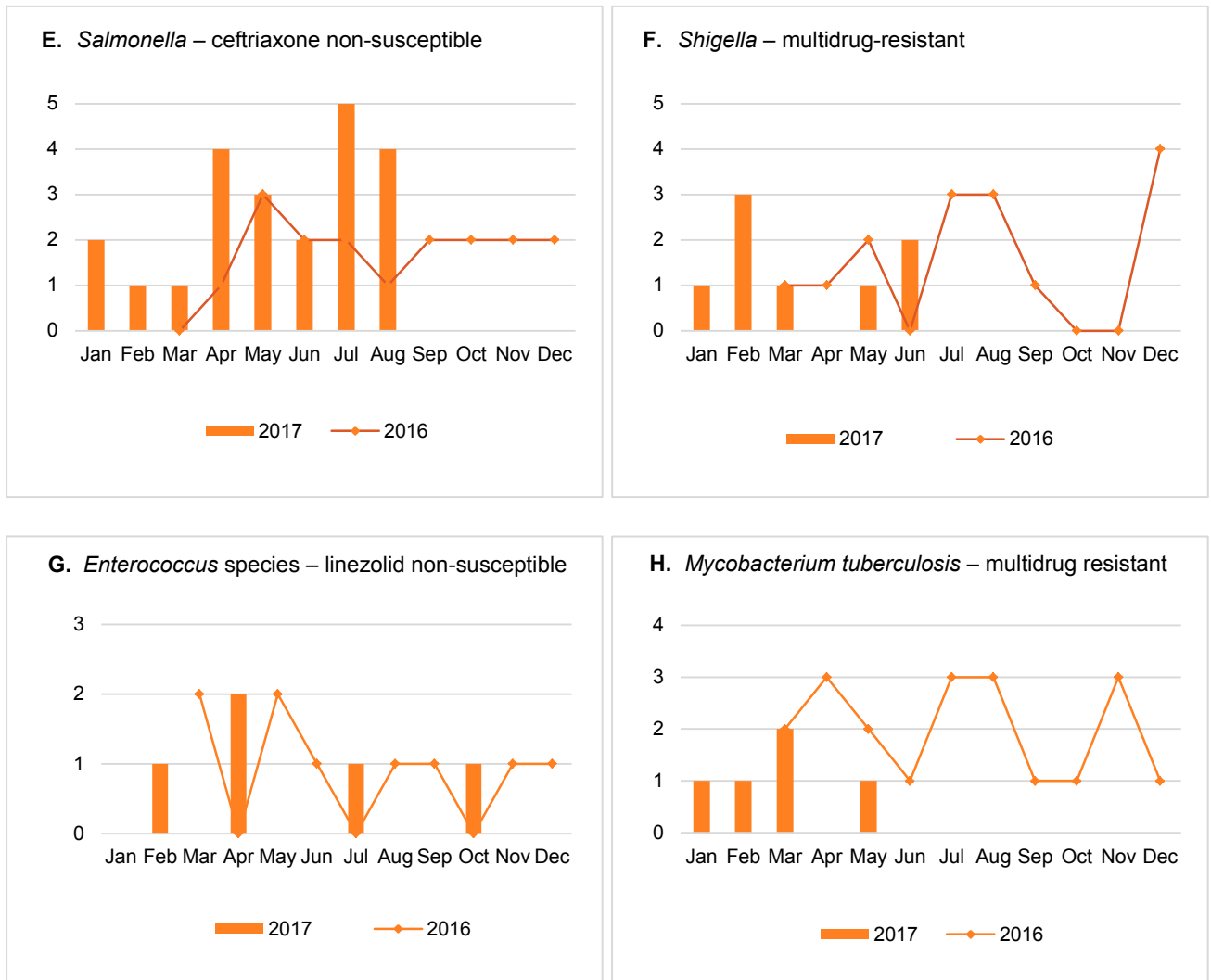


Bars: number of each CAR for 2017 (January to August)

Lines: number of each CAR for 2016 (March to December)

AZI (LLR) = azithromycin resistant, low level resistance (LLR, MIC < 256 mg/L) *Neisseria gonorrhoeae*; AZI (HLR) = HLR =azithromycin resistant, high level resistance (HLR, MIC > 256 mg/L) *Neisseria gonorrhoeae*; CPE =carbapenemase-producing Enterobacteriaceae; CPE+RMT = carbapenemase- and ribosomal methyltransferase-producing Enterobacteriaceae; CTR NGON = ceftriaxone non-susceptible *Neisseria gonorrhoeae*; DAP = daptomycin non-susceptible *Staphylococcus aureus*; LNZ = linezolid non-susceptible *Staphylococcus aureus*; RMT = ribosomal methyltransferase-producing Enterobacteriaceae; VAN = vancomycin non-susceptible *Staphylococcus aureus*;

Figure 2 (continued): Critical antimicrobial resistances, number reported by species and month, year on year, 17 March 2016 to 31 October 2017

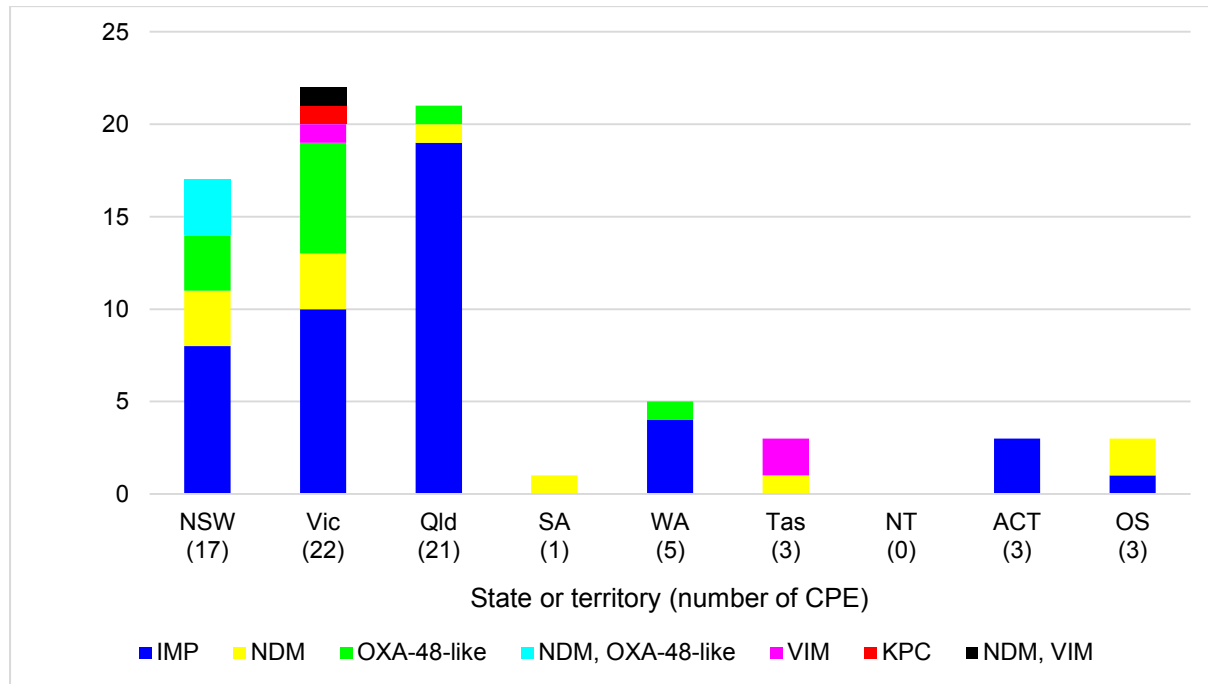


Bars: number of each CAR for 2017 (January to August)

Lines: number of each CAR for 2016 (March to December)

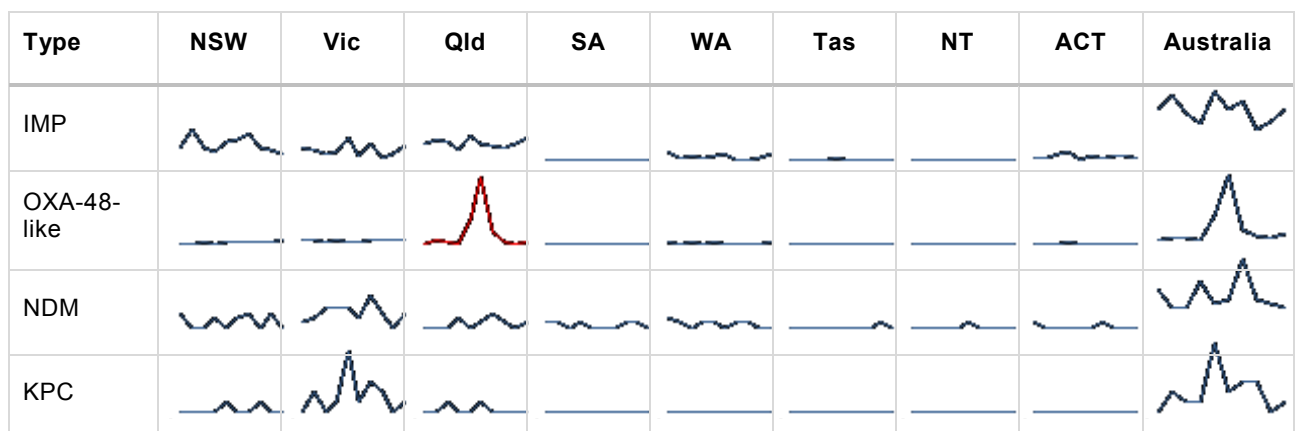
Carbapenemase-producing Enterobacteriaceae type, by state and territory

Figure 3: Carbapenemase-producing Enterobacteriaceae*, by carbapenemase type, number reported by state and territory, 1 July 2017 to 31 October 2017



* Carbapenemase-producing Enterobacteriaceae (n = 68), carbapenemase- and ribosomal methyltransferase-producing Enterobacteriaceae (n = 7)

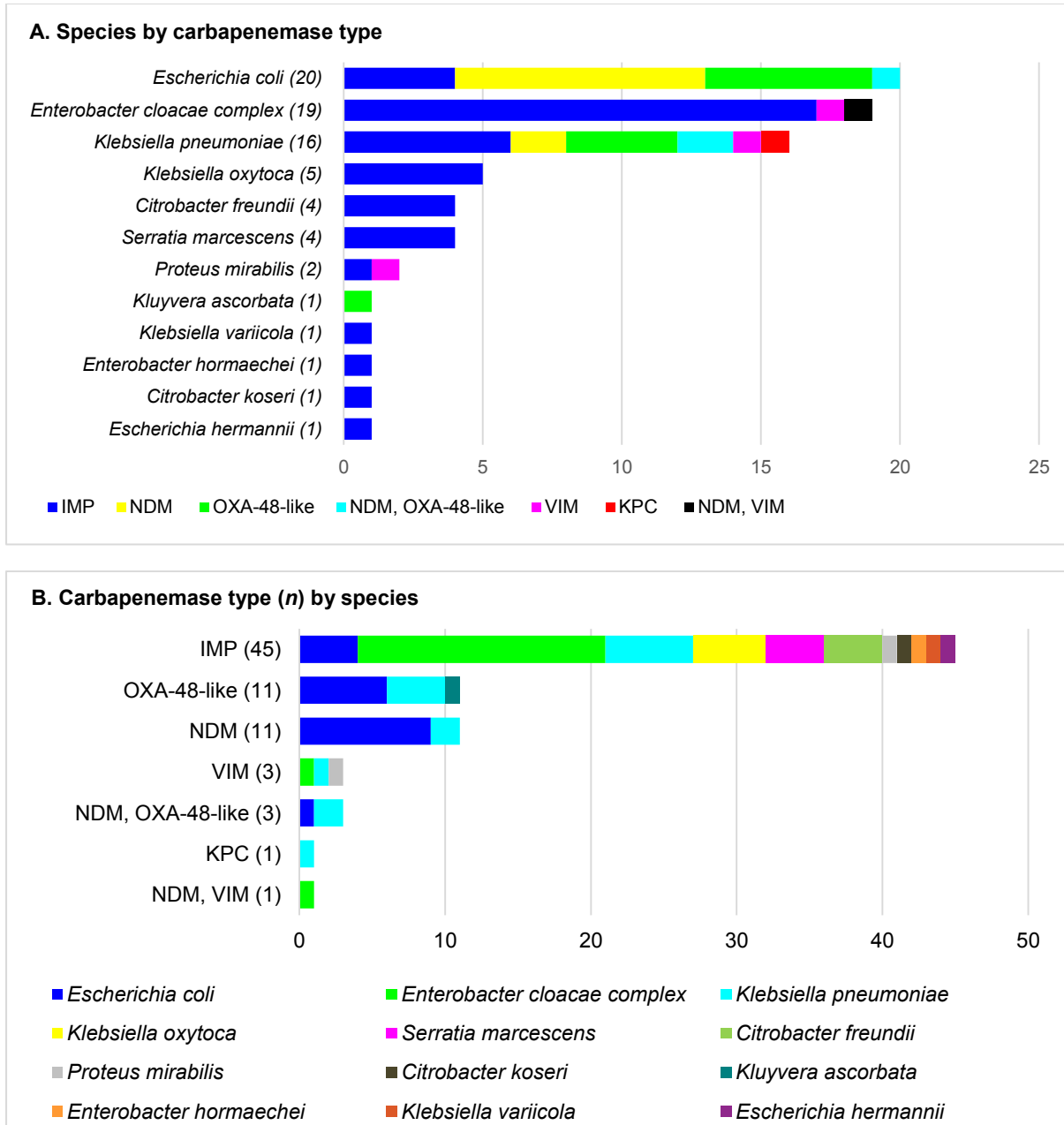
Figure 4: Trend data for the top four carbapenemase types, by state and territory and nationally, 1 January 2017 to 31 October 2017



Line graphs for the period 1 January 2017 to 31 August 2017, for each type

Carbapenemase-producing Enterobacteriaceae by species and carbapenemase type

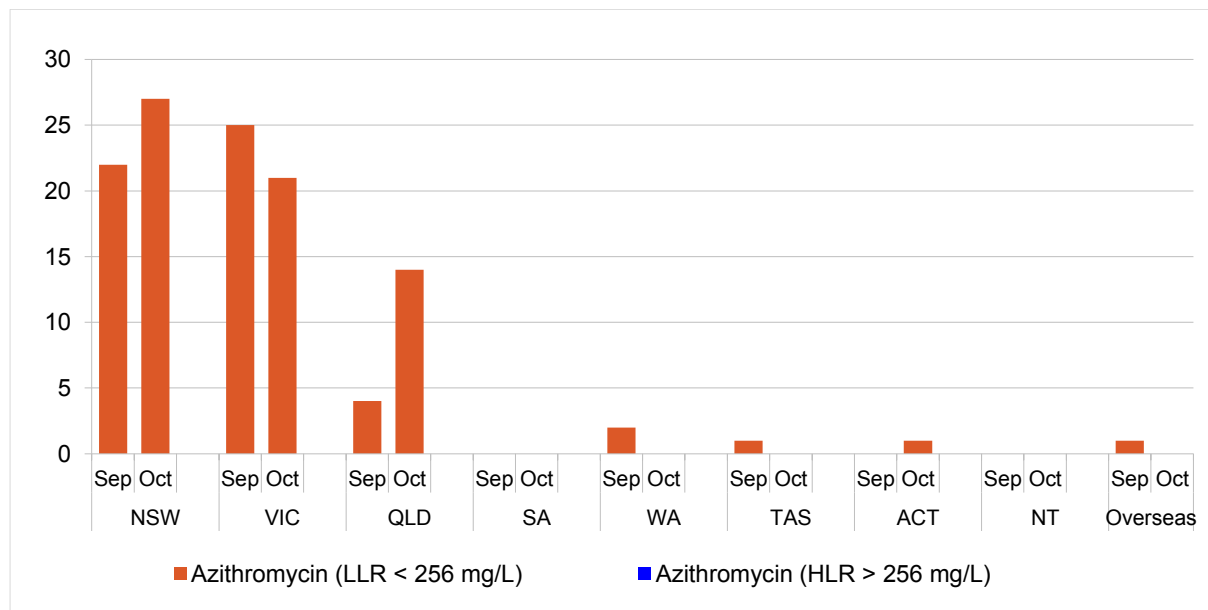
Figure 5: Carbapenemase-producing Enterobacteriaceae, number reported by (A) species and (B) carbapenemase type, 1 July 2017 to 31 October 2017



* Carbapenemase-producing Enterobacteriaceae (n = 68), carbapenemase- and ribosomal methyltransferase-producing Enterobacteriaceae (n = 7)

Neisseria gonorrhoeae by state and territory

Figure 6: *Neisseria gonorrhoeae*, number reported by state and territory, and month of collection*, 1 July 2017 to 31 October 2017



* Where state and territory of residence is unknown, the state of the originating laboratory has been assigned

AUSTRALIAN COMMISSION ON SAFETY AND QUALITY IN HEALTH CARE

Level 5, 255 Elizabeth Street, Sydney NSW 2000
GPO Box 5480, Sydney NSW 20001

Phone: (02) 9126 3600
Fax: (02) 9126 3613

Email: mail@safetyandquality.gov.au
Website: www.safetyandquality.gov.au