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## Australian Gonococcal Surveillance Programme, 1 January to 31 March 2024

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# Communicable Diseases Intelligence

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## Introduction

The National Neisseria Network (NNN), Australia, established in 1979, comprises reference laboratories in each state and territory. Since 1981, the NNN has reported data for the Australian Gonococcal Surveillance Programme (AGSP), on antimicrobial susceptibility profiles for *Neisseria gonorrhoeae* isolated from each jurisdiction for an agreed group of agents. The antibiotics reported represent current or potential agents used for the treatment of gonorrhoea, and include ceftriaxone, azithromycin, ciprofloxacin and penicillin. More recently, gentamicin and tetracycline are included in the AGSP Annual Report.

Ceftriaxone, combined with azithromycin, is the recommended treatment regimen for gonorrhoea in the majority of Australia. Historically, there were substantial geographic differences in susceptibility patterns across Australia, with certain remote regions of the Northern Territory and Western Australia having low gonococcal antimicrobial resistance rates. In these regions, an oral treatment regimen comprising amoxicillin, probenecid, and azithromycin was recommended. However, since January 2023, an increase in cases of penicillin-resistant *N. gonorrhoeae* reported in the Northern Territory has led to a change in recommendations to align with the majority of Australia for the treatment of gonorrhoea.<sup>1</sup> Additional data on other antibiotics are reported in the AGSP Annual Report. The AGSP has a programme-specific quality assurance process.

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## Results

Table 1 provides a summary of the proportion of *Neisseria gonorrhoeae* isolates resistant to azithromycin, ciprofloxacin and penicillin for Quarter 1, 2024.

### Ceftriaxone

The AGSP has historically reported the category of ceftriaxone decreased susceptibility (DS) at minimum inhibitory concentration (MIC) values  $\geq 0.064$  mg/L, and has further differentiated those isolates with a MIC  $\geq 0.125$  mg/L in line with the 2012 World Health Organization criteria.<sup>2</sup> The proportion of *N. gonorrhoeae* with ceftriaxone MIC values  $\geq 0.125$  mg/L declined from 0.51% in 2022 to 0.22% in 2023 (Table 2). In the first quarter of 2024, there were nine *N. gonorrhoeae* with MIC values ranging from 0.125 to 1.0 mg/L reported nationally (9/2,920; 0.31%) (Table 2): six from New South Wales, two from Victoria and one from non-remote Western Australia. Notably, five isolates carried the mosaic *penA* 60.001 allele (key target associated with ceftriaxone resistance),<sup>3</sup> reported from New South Wales (4) and non-remote Western Australia (1) and had ceftriaxone MIC values of 0.125 and 0.25 mg/L.

One isolate from non-remote Western Australia had the extensively drug-resistant (XDR) phenotype, displaying high-level resistance to azithromycin and resistance to ceftriaxone, and the multilocus sequence type MLST-16406, similar to recent reports of XDR isolates MLST-16406 detected in Europe and Cambodia,<sup>3-6</sup> one case in Western Australia in 2022,<sup>7</sup> and three cases in 2023 in Victoria.<sup>8</sup>

The AGSP has traditionally monitored *N. gonorrhoeae* isolates with ceftriaxone MIC values of 0.064 mg/L; the proportion of these continues to decrease, with 2.88% reported in the first quarter of 2024, down from 5.05% in 2022 and 3.29% in 2023 (Table 2).<sup>9</sup>

### Azithromycin

Dual therapy using ceftriaxone plus azithromycin has been the recommended treatment for gonorrhoea in Australia since 2014, as a strategy to temper development of more widespread ceftriaxone resistance. The proportion of azithromycin-resistant *N. gonorrhoeae* in Australia was 3.3% in the first quarter of 2024, lower than reported in 2023 (4.5%) (Table 2); this proportion has remained at a relatively stable level (less than 5%) since 2019. Globally, there have been reports of increased azithromycin resistance in *N. gonorrhoeae*, heightened since dual therapy was introduced.<sup>10</sup> The AGSP trend data for azithromycin resistance since 2010 are shown in Table 2.

Of concern since 2022 has been a rising number of *N. gonorrhoeae* isolates reported by the AGSP with high-level azithromycin resistance (defined as MIC values  $\geq 256$  mg/L). In the first quarter of 2024, nineteen such isolates (0.65%) were reported, with the majority reported in New South Wales (14) and the remainder in Queensland (3), Victoria (1) and non-remote Western Australia (1). This is the highest number of such detections per quarter so far and all have been from male patients with urogenital and extragenital sites of isolation. Where genomic data is available, most are of sequence type (MLST) 11200 (15/19) with resistance to ciprofloxacin but susceptibility to ceftriaxone.

Patients with extragenital gonococcal infections, and those with infections with *N. gonorrhoeae* with raised MIC values to ceftriaxone, should have test of cure cultures collected following treatment.<sup>11</sup> Continued surveillance to monitor *N. gonorrhoeae* with elevated MIC values, coupled with sentinel site surveillance in high-risk populations, remain essential to inform therapeutic strategies, to identify incursion of resistant strains, and to detect instances of treatment failure.

**Table 1: Gonococcal isolates resistant to azithromycin, ciprofloxacin, and penicillin, Australia, 1 January to 31 March 2024, by state or territory**

Jurisdiction	Number of isolates tested Q1, 2024	Resistance <sup>a</sup>					
		Azithromycin		Ciprofloxacin		Penicillin	
	n	%	n	%	n	%	
Australian Capital Territory	77	2.6	39	50.6	16	20.8	
New South Wales	1,069	2.6	641	60.0	318	29.7	
Queensland	422	3.3	254	60.2	113	26.8	
South Australia	136	2.2	68	50.0	36	26.5	
Tasmania	21	0	14	66.7	8	38.1	
Victoria	847	1.7	516	60.9	323	38.1	
Northern Territory non-remote	30	3.3	8	26.7	7	23.3	
Northern Territory remote	27	0	1	3.7	1	3.7	
Western Australia non-remote	271	11.8	153	56.5	80	29.5	
Western Australia remote	20	5.0	7	35.0	6	30.0	
<b>Australia</b>	<b>2,920</b>	<b>3.3</b>	<b>1,701</b>	<b>58.3</b>	<b>908</b>	<b>31.1</b>	

<sup>a</sup> Resistance as defined by jurisdictional reporting criteria.

**Table 2: The national number of gonococcal isolates and proportion of *N. gonorrhoeae* with ceftriaxone MIC values 0.064 and  $\geq 0.125$  mg/L and resistance to azithromycin, Australia, 2010 to 2023 and 1 January to 31 March 2024**

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024 Q1
Number of isolates tested nationally	4,100	4,230	4,718	4,897	4,804	5,411	6,378	7,835	9,006	9,668	7,222	6,254	8,199	10,105	2,920
Ceftriaxone MIC 0.064 mg/L	4.80%	3.20%	4.10%	8.20%	4.80%	1.70%	1.65%	1.02%	1.67%	1.19%	0.87%	0.83%	5.05%	3.29%	2.88%
Ceftriaxone MIC $\geq 0.125$ mg/L	0.10%	0.10%	0.30%	0.60%	0.60%	0.10%	0.05%	0.04%	0.06%	0.11%	0.07%	0.03%	0.51%	0.22%	0.31%
<b>Total proportion of isolates with ceftriaxone MIC values <math>\geq 0.064</math> mg/L</b>	<b>4.90%</b>	<b>3.30%</b>	<b>4.40%</b>	<b>8.80%</b>	<b>5.40%</b>	<b>1.80%</b>	<b>1.70%</b>	<b>1.06%</b>	<b>1.73%</b>	<b>1.30%</b>	<b>0.94%</b>	<b>0.86%</b>	<b>5.56%</b>	<b>3.51%</b>	<b>3.19%</b>
Azithromycin resistance	n/a	1.1%	1.3%	2.1%	2.5%	2.6%	5.0%	9.3%	6.2%	4.6%	3.9%	4.7%	3.9%	4.5%	3.3%

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