

Quarterly report

Australian Gonococcal Surveillance Program, 1 January to 31 March 2025

Monica M Lahra, Sebastiaan Van Hal, Tiffany R Hogan

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 Australia. Historically, there were substantial geographic differences in susceptibility patterns across the country, 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, increasing reports of penicillin-resistant *N. gonorrhoeae* in the Northern Territory have changed treatment recommendations to align with the majority of Australia.¹ Additional data on other antibiotics are reported in the AGSP Annual Report. The AGSP has a programme-specific quality assurance process.



Results

Table 1 provides a summary of the proportion of *Neisseria gonorrhoeae* isolates resistant to azithromycin, ciprofloxacin and penicillin for Quarter 1, 2025.

Table 1: Gonococcal isolates resistant to azithromycin, ciprofloxacin, and penicillin, Australia, 1 January to 31 March 2025, by state or territory

Jurisdiction	Resistance ^a								
	Number of isolates tested Q1 2025	Azithromycin		Number of Isolates tested ^b Q1 2025	Ciprofloxacin		Number of Isolates tested ^b Q1 2025	Penicillin	
		n	%		n	%		n	%
Australian Capital Territory	49	2	4.1	42	15	35.7	42	11	26.2
New South Wales	892	28	3.1	440	246	55.9	288	82	28.5
Queensland	384	17	4.4	367	245	66.8	367	92	25.1
South Australia	178	7	3.9	178	121	68.0	178	47	26.4
Tasmania	20	1	5.0	20	14	70.0	20	6	30.0
Victoria	833	67	8.0	346	233	67.3	345	82	23.8
Northern Territory non-remote	13	0	0	12	4	33.3	12	3	25.0
Northern Territory remote	19	0	0	19	1	5.3	19	2	10.5
Western Australia non-remote	237	29	12.2	237	102	43.0	237	45	19.0
Western Australia remote	26	2	7.7	25	10	40.0	25	5	20.0
Australia	2,651	153	5.8	1,686	991	58.8	1,533	375	24.5

a Resistance as defined by jurisdictional reporting criteria.

b A subset of *N. gonorrhoeae* isolates underwent antimicrobial susceptibility testing with ciprofloxacin (63.6%; 1,686/2,651) and penicillin (57.8%, 1,533/2,651)

Ceftriaxone

The AGSP has historically reported the category of ceftriaxone decreased susceptibility (DS) at minimum inhibitory concentration (MIC) values ≥ 0.064 mg/L, and has further differentiated those isolates with a MIC ≥ 0.125 mg/L in line with the 2012 World Health Organization criteria.² The proportion of *N. gonorrhoeae* with ceftriaxone MIC values ≥ 0.125 mg/L more than doubled from 0.22% in 2023 to 0.51% in 2024 (Table 2). In the first quarter of 2025, the proportion of these isolates was 0.60% (16/2,651), almost twice the proportion reported in the corresponding period of 2024 (0.31%) and consistent with the proportion reported annually in 2024 (0.51%; Table 2).³ There were 16 isolates in quarter one of 2025 with ceftriaxone MIC values ranging from 0.125 to 1 mg/L; these were reported from Victoria (8), New South Wales (6), South Australia (1) and non-remote Northern Territory (1). Notably, of the 16 isolates with ceftriaxone MIC ≥ 0.125 mg/L, eight (50%) carried the mosaic *penA* 60.001 allele, the key target associated with ceftriaxone resistance.⁴

In this quarter, there were three isolates with the extensively drug-resistant (XDR) phenotype (displaying high-level resistance to azithromycin and decreased susceptibility to ceftriaxone), from New South Wales (2) and Victoria (1). Available data showed two XDR isolates harboured the mosaic *penA* 60.001 allele and were multi locus sequence type (MLST-) 16406. There has been a spike in detection of XDR *N. gonorrhoeae* MLST-16406 isolates in Australia, and globally, since 2022, most associated with travel to the Asia Pacific. Genomic analysis has shown limited diversity amongst the XDR isolates reported to date in Australia.⁵

The AGSP has traditionally monitored *N. gonorrhoeae* isolates with ceftriaxone MIC values of 0.064 mg/L; the proportion of these has decreased since 2022 (5.05%) and 2023 (3.29%).^{6,7} The proportion continued to fall in 2024 (2.29%) and remains stable at 2.53% in the first quarter of 2025 (Table 2).

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 in the first quarter of 2025 was 5.8%, higher than for the first quarter of 2024 (3.3%) and for 2024 overall (4.6%).³ The annual proportion resistant has remained stable since 2019 in the range 3.9–4.7% (Table 2). Globally, there have been reports of increased azithromycin resistance in *N. gonorrhoeae*, heightened since dual therapy was introduced.⁸ The AGSP trend data for azithromycin resistance since 2010 are shown in Table 2.

Of concern since 2022 has been the rising number of *N. gonorrhoeae* isolates reported by the AGSP with high-level azithromycin resistance (MIC value ≥ 256 mg/L). In the first quarter of 2025, three such isolates (0.11%) were reported, and all were of the XDR phenotype. This number of *N. gonorrhoeae* isolates with high-level resistance to azithromycin is markedly reduced from the 19 reported in quarter one of 2024, the highest reported per quarter by the AGSP.³

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.⁹ 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 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 2024 and 1 January to 31 March 2025

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025 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	10,702	2,651
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%	2.29%	2.53%
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%	0.51%	0.60%
Total proportion of isolates with ceftriaxone MIC values \geq 0.064 mg/L	4.90%	3.30%	4.40%	8.80%	5.40%	1.80%	1.70%	1.06%	1.73%	1.30%	0.94%	0.86%	5.56%	3.51%	2.80%	3.13%
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%	4.6%	5.8%

Author details

Monica M Lahra^{1,2}

Sebastiaan van Hal³

Tiffany R Hogan¹

1. The World Health Organization Collaborating Centre for STI and AMR and Neisseria Reference Laboratory, NSW Health Pathology, Microbiology, Prince of Wales Hospital, Randwick, NSW 2031, Australia
2. School of Medical Sciences, Faculty of Medicine, University of New South Wales, Kensington, NSW 2052, Australia
3. Molecular Microbiology, Royal Prince Alfred Hospital, Camperdown, NSW 2050, Australia

Corresponding author

Professor Monica M Lahra

World Health Organization Collaborating Centre for STI and AMR and Neisseria Reference Laboratory, Microbiology Department, NSW Health Pathology, Prince of Wales Hospital, Randwick, NSW 2031, Australia

Telephone: +61 2 9382 3678

Facsimile: +61 2 9382 3720

Email: monica.lahra@health.nsw.gov.au

References

1. Northern Territory Government Department of Health (NT Health) Centre for Disease Control. Penicillinase-producing *Neisseria gonorrhoeae* (PPNG) and treatment recommendations for gonorrhoea. Darwin: NT Health; 11 March 2024. [Accessed on 11 July 2024.] Available from: https://health.nt.gov.au/__data/assets/pdf_file/0008/1356146/health-alert-ppng-240311.pdf.
2. World Health Organization (WHO). Global action plan to control the spread and impact of antimicrobial resistance in *Neisseria gonorrhoeae*. Geneva: WHO; 2012. Available from: <https://apps.who.int/iris/handle/10665/44863>.
3. Lahra MM, Van Hal S, Hutabarat, SN, Hogan TR. Australian Gonococcal Surveillance Programme 1 January to 31 March 2024. *Commun Dis Intell* (2018). 2025;49. doi: <https://doi.org/10.33321/cdi.2025.49.001>.
4. Day M, Pitt R, Mody N, Saunders J, Rai R, Nori A et al. Detection of 10 cases of ceftriaxone-resistant *Neisseria gonorrhoeae* in the United Kingdom, December 2021 to June 2022. *Euro Surveill*. 2022;27(46):2200803. doi: <https://doi.org/10.2807%2F1560-7917.ES.2022.27.46.2200803>.
5. van Hal SJ, Sherry N, Coombs G, Mowlaboccus, S, Whiley DM, Lahra MM. Emergence of an extensively drug-resistant *Neisseria gonorrhoeae* clone. *Lancet Infect Dis*. 2024;24(9):e547–8. doi: [https://doi.org/10.1016/S1473-3099\(24\)00486-9](https://doi.org/10.1016/S1473-3099(24)00486-9).
6. Lahra MM, Van Hal S, Hogan TR. Australian Gonococcal Surveillance Programme Annual Report, 2022. *Commun Dis Intell* (2018). 2023;47. doi: <https://doi.org/10.33321/cdi.2023.47.45>.
7. van Hal SJ, Whiley DM, Le T, Ray S, Kundu RL, Kerr E et al. Rapid expansion of *Neisseria gonorrhoeae* ST7827 clone in Australia, with variable ceftriaxone phenotype unexplained by genotype. *J Antimicrob Chemother*. 2023;78(9):2203–2208. doi: <https://doi.org/10.1093/jac/dkad221>.
8. Unemo M. Current and future antimicrobial treatment of gonorrhoea – the rapidly evolving *Neisseria gonorrhoeae* continues to challenge. *BMC Infect Dis*. 2015;15:364. doi: <https://doi.org/10.1186/s12879-015-1029-2>.
9. Ong JJ, Bourne C, Dean JA, Ryder N, Cornelisse VJ, Murray S et al. Australian sexually transmitted infection (STI) management guidelines for use in primary care, 2022 update. *Sexual Health*. 2023;20(1):1-8. doi: <https://doi.org/10.1071/SH22134>.



Communicable Diseases Intelligence (CDI) is a peer-reviewed scientific journal published by the interim Australian Centre for Disease Control within the Department of Health, Disability and Ageing.

The journal aims to disseminate information on the epidemiology, surveillance, prevention and control of communicable diseases of relevance to Australia and the near region.

Editor

Christina Bareja

Deputy Editor

Simon Petrie

Design and Production

Lisa Thompson

Editorial Advisory Board

David Durrheim, Mark Ferson, Clare Huppatz, John Kaldor, Martyn Kirk and Meru Sheel

Submit an Article

Submit your next communicable disease related article to CDI for consideration.

Guidelines for authors and details on how to submit your publication is available on our website, or by email to the CDI Editor.

Contact us

Communicable Diseases Intelligence (CDI)
interim Australian Centre for Disease Control,
Department of Health, Disability and Ageing
GPO Box 9848, Canberra ACT 2601

Website: cdc.gov.au/cdi

Email: cdi.editor@health.gov.au

© 2025 Commonwealth of Australia as represented by the Department of Health, Disability and Ageing

ISSN: 2209-6051 Online

This journal is indexed by Index Medicus and Medline.

Creative Commons Licence

This publication is licensed under a Creative Commons Attribution-Non-Commercial-NoDerivatives 4.0 International Licence (Licence). You must read and understand the Licence before using any material from this publication.

Restrictions

The Licence does not cover, and there is no permission given for, use of any of the following material found in this publication (if any):

- the Commonwealth Coat of Arms (by way of information, the terms under which the Coat of Arms may be used can be found on the Department of Prime Minister and Cabinet website);
- any logos (including the interim Australian Centre for Disease Control and the Department of Health, Disability and Ageing's logos) and trademarks;
- any photographs and images;
- any signatures; and
- any material belonging to third parties.

Disclaimer

Opinions expressed in *Communicable Diseases Intelligence* are those of the authors and not necessarily those of the Australian Government, the interim Australian Centre for Disease Control or the Department of Health, Disability and Ageing. Data may be subject to revision.

Enquiries

Enquiries regarding any other use of this publication should be addressed to the CDI Editor.