Communicable Diseases Intelligence

2025 • Volume 49 • Electronic publication date: 30.07.2025

Quarterly report

# Australian Gonococcal Surveillance Program, 1 October to 31 December 2024

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 amoxycillin, 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.

Australian Government
Department of Health, Disability and Ageing

Interim Australian Centre for Disease Control

doi.org/10.33321/cdi.2025.49.036
**cdc.gov.au/cdi**

# Results

Table 1 provides a summary of the proportion of *Neisseria gonorrhoeae* isolates resistant to azithromycin, ciprofloxacin and penicillin for Quarter 4, 2024.

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

| | Resistance[a] | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Number of isolates tested | Azithromycin | | Number of isolates tested[b] | Ciprofloxacin | | Penicillin | |
| Jurisdiction | Q4 2024 | n | % | Q4 2024 | n | % | n | % |
| Australian Capital Territory | 43 | 0 | 0 | 38 | 25 | 65.8 | 4 | 10.5 |
| New South Wales | 736 | 31 | 4.2 | 35 | 23 | 65.7 | 8 | 22.9 |
| Queensland | 318 | 14 | 4.4 | 301 | 213 | 70.8 | 73 | 24.3 |
| South Australia | 175 | 5 | 2.9 | 175 | 101 | 57.7 | 40 | 22.9 |
| Tasmania | 14 | 2 | 14.3 | 14 | 8 | 57.1 | 3 | 21.4 |
| Victoria | 718 | 56 | 7.8 | 700 | 456 | 65.1 | 197 | 28.1 |
| Northern Territory non-remote | 17 | 0 | 0 | 15 | 4 | 26.7 | 2 | 13.3 |
| Northern Territory remote | 22 | 0 | 0 | 22 | 0 | 0 | 0 | 0 |
| Western Australia non-remote | 238 | 23 | 9.7 | 238 | 110 | 46.2 | 54 | 22.7 |
| Western Australia remote | 18 | 0 | 0 | 18 | 3 | 16.7 | 4 | 22.2 |
| **Australia** | **2,299** | **131** | **5.7** | **1,556** | **943** | **60.6** | **385** | **24.7** |

a Resistance as defined by jurisdictional reporting criteria.

b A subset of *N. gonorrhoeae* isolates (1,556/2,299; 67.7%) underwent antimicrobial susceptibility testing to ciprofloxacin and penicillin.

## 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 declined from 0.51% in 2022 to 0.22% in 2023 (Table 2). However, in 2024 the proportion of isolates with ceftriaxone MIC ≥ 0.125 mg/L was reported variably across the quarters (Table 2), with an overall increase to 0.52%, greater than a twofold increase from 2023. There was a total of 55 isolates in 2024 with ceftriaxone MIC ≥ 0.125 mg/L; 15/55 of these were reported in quarter 4, with ceftriaxone MIC values ranging from 0.125 to 0.5 mg/L (Table 2). These were from Victoria (8), New South Wales (2), South Australia (2), Queensland (1), Tasmania (1) and Western Australia (1). Notably, sequencing data has shown most isolates (9/15) carried the mosaic *penA* 60.001 allele (the key target associated with ceftriaxone resistance).[3]

In this quarter, there were four isolates with the extensively drug-resistant (XDR) phenotype (displaying high-level resistance to azithromycin and decreased susceptibility to ceftriaxone), from Victoria (3) and South Australia (1), all were of multilocus sequence type MLST-16406 and harboured the mosaic *penA* 60.001 allele. A total of nine XDR isolates have been reported in 2024 to date, all MLST-16406 and harbouring the mosaic *penA* 60.001 allele, from Victoria (4), non-remote Western Australia (3), Queensland (1) and South Australia (1). There has been a spike in detection of XDR *N. gonorrhoeae* MLST-16406 isolates in Australia, and globally, since 2022.[4]

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%). The proportion continued to fall in 2024, with an overall decrease to 2.28% (Table 2).[5,6]

## 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 fourth quarter of 2024 was 5.7%, and for 2024 overall was 4.8%. The annual proportion resistant in 2024 was higher than reported in 2023 (4.5%) (Table 2). Globally, there have been reports of increased azithromycin resistance in *N. gonorrhoeae*, heightened since dual therapy was introduced.[7] 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 (defined as MIC values ≥ 256 mg/L). In the fourth quarter of 2024, six such isolates (0.26%) were reported (including those with the XDR phenotype), from Victoria (3), New South Wales (2) and South Australia (1). In 2024, a total of 46 such isolates were recorded: 19 in quarter one of 2024, the highest number reported per quarter by the AGSP, 15 in quarter two and six each in quarters three and four, with most such isolates from New South Wales.

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.[8] 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 ≥ 0.125 mg/L and resistance to azithromycin, Australia, 2010 to 2023 and 1 January to 31 March 2024, 1 April to 30 June 2024, 1 July to 30 September 2024 and 1 October to 31 December 2024**

| Year | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 Q1 | 2024 Q2 | 2024 Q3 | 2024 Q4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 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 | 2,859 | 2,628 | 2,299 |
| 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% | 2.24% | 1.67% | 2.31% |
| Ceftriaxone MIC ≥ 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% | 0.73% | 0.38% | 0.65% |
| **Total proportion of isolates with ceftriaxone MIC values ≥ 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%** | **3.19%** | **2.97%** | **2.05%** | **2.96%** |
| 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% | 5.7% | 4.5% | 5.7% |

# Author details

Monica M Lahra[1,2]

Sebastiaan van Hal[3]

Tiffany R Hogan[1]

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

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

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 July 11 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. 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.

4. 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.

5. 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.

6. 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.

7. 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.

8. 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

*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.



### 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**





ISSN: 2209-6051 Online

This journal is indexed by Index Medicus and Medline.