Australian Gonococcal Surveillance Programme, 1 October to 31 December 2021

Monica M Lahra, Masoud Shoushtari, Tiffany R Hogan

# 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 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 susceptibilities are included in the AGSP Annual Report.

Ceftriaxone, combined with azithromycin, is the recommended treatment regimen for gonorrhoea in the majority of Australia. However, there are substantial geographic differences in susceptibility patterns in 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 amoxycillin, probenecid, and azithromycin is recommended for the treatment of gonorrhoea. 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 with decreased susceptibility (DS) to ceftriaxone (minimum inhibitory concentration, MIC ≥ 0.06 mg/L); and the proportions resistant to azithromycin (MIC ≥ 1.0 mg/L), penicillin (MIC ≥1.0 mg/L), and ciprofloxacin (MIC ≥ 1.0 mg/L) for Quarter 4 2021.

****Table 1: Gonococcal isolates showing decreased susceptibility to ceftriaxone, and resistance to azithromycin, ciprofloxacin and penicillin, Australia, 1 October to 31 December 2021, by state or territory****

| State or territory | Number of isolates tested | Decreased susceptibility | | Resistance | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Q4, 2021 | Ceftriaxone MIC ≥ 0.06 mg/L | | Azithromycin MIC ≥ 1.0 mg/L | | Ciprofloxacin MIC ≥ 1.0 mg/L | | Penicillina MIC ≥ 1.0 mg/L | |
| n | % | n | % | n | % | n | % |
| Australian Capital Territory | 36 | 0 | 0.0 | 5 | 13.9 | 17 | 47.2 | 19 | 52.8 |
| New South Wales | 347 | 11 | 3.2 | 44 | 12.7 | 265 | 76.4 | 91 | 26.2 |
| Queensland | 271 | 0 | 0.0 | 0 | 0.0 | 124 | 45.8 | 90 | 33.2 |
| South Australia | 59 | 0 | 0.0 | 1 | 1.7 | 14 | 23.7 | 21 | 35.6 |
| Tasmania | 13 | 0 | 0.0 | 3 | 23.1 | 5 | 38.5 | 3 | 23.1 |
| Victoria | 432 | 2 | 0.5 | 23 | 5.3 | 316 | 73.1 | 248 | 57.4 |
| Northern Territory non-remote | 9 | 0 | 0.0 | 0 | 0.0 | 3 | 33.3 | 1 | 11.1 |
| Northern Territory remote | 38 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| Western Australia non-remote | 117 | 1 | 0.9 | 2 | 1.7 | 33 | 28.2 | 35 | 29.9 |
| Western Australia remote | 16 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| **Australia** | **1,338** | **14** | **1.05** | **78** | **5.8** | **777** | **58.1** | **508** | **38.0** |

a Penicillin resistance includes a MIC value of ≥ 1.0 mg/L or detection of penicillinase production.

## Ceftriaxone

For the AGSP, the category of ceftriaxone decreased susceptibility (DS) includes MIC values ≥ 0.06 mg/L, and is further differentiated by those isolates with a MIC of 0.06 mg/L, and those isolates with a MIC ≥ 0.125 mg/L. In the fourth quarter of 2021, 1.1% of N. gonorrhoeae isolates tested were ceftriaxone DS. This proportion was higher than that reported in the previous three quarters of 2021 and in 2020 annually (0.94%), as shown in Table 2.1 It should be noted, however, that overall, the number of isolates tested was lower in 2021, coinciding with the public health measures in place during the COVID-19 pandemic.

****Table 2: Percentage of gonococcal isolates with decreased susceptibility to ceftriaxone (MIC 0.06 and ≥ 0.125 mg/L) and resistance to azithromycin (MIC ≥ 1 mg/L), Australia, 2010 to 2020, and 1 January to 31 March 2021, 1 April to 30 June 2021, 1 July to 30 September 2021 and 1 October to 31 December 2021****

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Year | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 Q1 | 2021 Q2 | 2021 Q3 | 2021 Q4 |
| Ceftriaxone MIC 0.06 mg/L | 4.80% | 3.20% | 4.10% | 8.20% | 4.80% | 1.70% | 1.65% | 1.02% | 1.67% | 1.19% | 0.87% | 0.86% | 0.90% | 0.65% | 0.90% |
| 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% | 0.00% | 0.00% | 0.00% | 0.15% |
| **Ceftriaxone DS Total** | **4.90%** | **3.30%** | **4.40%** | **8.80%** | **5.40%** | **1.80%** | **1.70%** | **1.06%** | **1.73%** | **1.30%** | **0.94%** | **0.86%** | **0.90%** | **0.65%** | **1.05%** |
| Azithromycin MIC ≥ 1 mg/L | n/a | 1.1% | 1.3% | 2.1% | 2.5% | 2.6% | 5.0% | 9.3% | 6.2% | 4.6% | 3.9% | 4.8% | 4.2% | 4.5% | 5.8% |

## Azithromycin

In the fourth quarter of 2021, the proportion of isolates resistant to azithromycin (MIC ≥ 1.0 mg/L) in Australia was 5.8% (Table 2), higher than in the previous three quarters of 2021. The AGSP trend data for azithromycin resistance since 2010 is shown in Table 2.Globally, there have been reports of increased azithromycin resistance in N. gonorrhoeae, heightened since dual therapy was introduced.2 In the fourth quarter of 2021, all states reported isolates with resistance to azithromycin, with the exception of Queensland, Northern Territory and remote regions of Western Australia.

Dual therapy using ceftriaxone plus azithromycin is the recommended treatment for gonorrhoea as a strategy to temper development of more widespread ceftriaxone resistance. Patients with infections in extragenital sites, where the isolate has decreased susceptibility to ceftriaxone, should have test of cure cultures collected. 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, identify incursion of resistant strains, and detect instances of treatment failure.

# Author details

Monica M Lahra1, 2   
Masoud Shoushtari1   
Tiffany R Hogan1

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

## Corresponding author

Professor Monica M Lahra

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

Telephone: +61 2 9382 9054  
Facsimile: +61 2 9382 9098  
Email: monica.lahra@health.nsw.gov.au

# References

1. Lahra MM, Shoushtari M, George CRR, Armstrong BH, Hogan TR. Australian Gonococcal Surveillance Programme Annual Report 2020. Commun Dis Intell (2018). 2021;45. doi: https://doi.org/10.33321/cdi.2021.45.58
2. 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.

**Communicable Diseases Intelligence**

ISSN: 2209-6051 Online

**Communicable Diseases Intelligence (CDI) is a peer-reviewed scientific journal published by the Office of Health Protection and Response, Department of Health and Aged Care. The journal aims to disseminate information on the epidemiology, surveillance, prevention and control of communicable diseases of relevance to Australia.**

**Editor:** Noel Lally

**Deputy Editor:** Simon Petrie

**Design and Production:** Kasra Yousefi

**Editorial Advisory Board:** David Durrheim, Mark Ferson, John Kaldor, Martyn Kirk and Linda Selvey

**Website**: <http://www.health.gov.au/cdi>

**Contacts**CDI is produced by the Office of Health Protection and Response, Australian Government Department of Health and Aged Care, GPO Box 9848, (MDP 6) CANBERRA ACT 2601

**Email:** [cdi.editor@health.gov.au](mailto:cdi.editor@health.gov.au)

**Submit an Article**You are invited to submit your next communicable disease related article to the Communicable Diseases Intelligence (CDI) for consideration. More information regarding CDI can be found at: <http://health.gov.au/cdi>.

Further enquiries should be directed to: [cdi.editor@health.gov.au](mailto:cdi.editor@health.gov.au).

This journal is indexed by Index Medicus and Medline.

Creative Commons Licence - Attribution-NonCommercial-NoDerivatives CC BY-NC-ND

© 2022 Commonwealth of Australia as represented by the Department of Health and Aged Care

This publication is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International Licence from <https://creativecommons.org/licenses/by-nc-nd/4.0/legalcode> (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 at [www.itsanhonour.gov.au](http://www.itsanhonour.gov.au/));
* any logos (including the Department of Health and Aged Care’s logo) 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 Department of Health and Aged Care or the Communicable Diseases Network Australia. Data may be subject to revision.

**Enquiries**Enquiries regarding any other use of this publication should be addressed to the Communication Branch, Department of Health and Aged Care, GPO Box 9848, Canberra ACT 2601, or via e-mail to: [copyright@health.gov.au](mailto:copyright@health.gov.au)

**Communicable Diseases Network Australia**Communicable Diseases Intelligence contributes to the work of the Communicable Diseases Network Australia.  
<http://www.health.gov.au/cdna>