Australian Gonococcal Surveillance Programme

1 October to 31 December 2020

Monica M Lahra, Masoud Shoushtari, Tiffany R Hogan

# Introduction

The National Neisseria Network (NNN), Australia comprises reference laboratories in each state and territory that report data on Neisseria gonorrhoeae antimicrobial resistance to an agreed group of agents for the Australian Gonococcal Surveillance Programme (AGSP). The antibiotics—ceftriaxone, azithromycin, ciprofloxacin and penicillin—represent current or potential drugs used for the treatment of gonorrhoea. Ceftriaxone combined with azithromycin is the recommended treatment regimen for gonorrhoea in the majority of Australia. However, there are substantial geographic differences in gonococcal susceptibility patterns in Australia, with certain remote regions of the Northern Territory and Western Australia having low antimicrobial resistance rates. In these regions, an oral treatment regimen comprising amoxicillin, 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

A summary of the proportion of isolates with decreased susceptibility (DS) to ceftriaxone (minimum inhibitory concentration, MIC 0.06–0.25 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 2020, is shown in Table 1**.**

Table 1: Gonococcal isolates showing decreased susceptibility to ceftriaxone and resistance to ciprofloxacin, azithromycin and penicillin, Australia, 1 October to 31 December 2020, by state or territory

| State or territory | Number of isolates tested  Q4, 2020 | Decreased susceptibility | | Resistance | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Ceftriaxone  MIC 0.06–0.25 mg/L | | Azithromycin  MIC ≥ 1.0 mg/L | | Penicillina  MIC ≥ 1.0 mg/L | | Ciprofloxacin  MIC ≥ 1.0 mg/L | |
| n | % | n | % | n | % | n | % |
| Australian Capital Territory | 28 | 0 | 0.0 | 4 | 14.3 | 6 | 21.4 | 13 | 46.4 |
| New South Wales | 607 | 3 | 0.5 | 51 | 8.4 | 279 | 46.0 | 318 | 52.4 |
| Queensland | 297 | 7 | 2.4 | 7 | 2.4 | 60 | 20.2 | 114 | 38.4 |
| South Australia | 99 | 0 | 0.0 | 0 | 0.0 | 3 | 3.0 | 8 | 8.1 |
| Tasmania | 4 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| Victoria | 250 | 2 | 0.8 | 0 | 0.0 | 81 | 32.4 | 94 | 37.6 |
| Northern Territory non remote | 24 | 0 | 0.0 | 0 | 0.0 | 1 | 4.2 | 2 | 8.3 |
| Northern Territory remote | 35 | 0 | 0.0 | 0 | 0.0 | 1 | 2.9 | 1 | 2.9 |
| Western Australia non remote | 106 | 0 | 0.0 | 5 | 4.7 | 28 | 26.4 | 33 | 31.1 |
| Western Australia remote | 29 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| **Australia** | **1,479** | **12** | **0.81** | **67** | **4.5** | **459** | **31.0** | **583** | **39.4** |

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

## Ceftriaxone

In the fourth quarter of 2020, the proportion of isolates with ceftriaxone decreased susceptibility in Australia was 0.81%, higher than the previous quarter, but lower than the proportion in first two quarters of 2020, and cumulatively lower than 2019, (1.3%) as shown in Table 2. The national trend data of isolates with ceftriaxone decreased susceptibility (MIC 0.06 and ≥ 0.125 mg/L) since 2010 is shown in Table 2.

Table 2: Percentage of gonococcal isolates with decreased susceptibility to ceftriaxone MIC 0.06 mg/L and ≥0.125 mg/L, Australia, 2010 to 2019, 1 January to 31 March 2020, 1 April to 30 June 2020, 1 July to 30 September, and 1 October to 31 December 2020

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Ceftriaxone MIC mg/L | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 Q1 | 2020 Q2 | 2020 Q3 | 2020 Q4 |
| 0.06 | 4.80% | 3.20% | 4.10% | 8.20% | 4.80% | 1.70% | 1.65% | 1.02% | 1.67% | 1.19% | 1.25% | 0.84% | 0.48% | 0.74% |
| ≥0.125 | 0.10% | 0.10% | 0.30% | 0.60% | 0.60% | 0.10% | 0.05% | 0.04% | 0.06% | 0.11% | 0.12% | 0.13% | 0.00% | 0.07% |
| **Total** | **4.90%** | **3.30%** | **4.40%** | **8.80%** | **5.40%** | **1.80%** | **1.70%** | **1.06%** | **1.73%** | **1.30%** | **1.37%** | **0.97%** | **0.48%** | **0.81%** |

## Azithromycin

In the fourth quarter of 2020, the proportion of N. gonorrhoeae isolates with resistance to azithromycin (MIC ≥ 1.0 mg/L) in Australia was 4.5%, continuing the trend of a lower proportion of azithromycin resistance observed nationally in each quarter of 2020 compared to 2019, and to recent years as shown in Table 3. Whilst the proportion of isolates resistant to azithromycin nationally continues to decline, the current rate remains higher than that reported in Australia for 2013–2015 (2.1–2.6%).1 Globally there have been increasing reports of azithromycin resistance in N. gonorrhoeae.2 In quarter 4 2020, the eastern jurisdictions of New South Wales, Queensland and the Australian Capital Territory, as well as non-remote regions of Western Australia, reported isolates with resistance to azithromycin. No resistance to azithromycin in gonococcal isolates was reported from Tasmania, South Australia, Victoria and all regions of the Northern Territory. No isolates exhibited high-level resistance to azithromycin (MIC ≥ 256 mg/L).

Table 3: Percentage of gonococcal isolates with resistance to azithromycin (MIC ≥ 1.0 mg/L), Australia, 2012 to 2019, 1 January to 31 March 2020, 1 April to 30 June 2020, 1 July to 30 September 2020, and 1 October to 31 December 2020

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Azithromycin resistance | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020  Q1 | 2020  Q2 | 2020 Q3 | 2020 Q4 |
| MIC ≥ 1.0 mg/L | 1.3% | 2.1% | 2.5% | 2.6% | 5.0% | 9.3% | 6.2% | 4.6% | 4.2% | 3.1% | 4.2% | 4.5% |

Dual therapy using ceftriaxone plus azithromycin is the recommended treatment for gonorrhoea as a strategy to temper development of more widespread 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 important to inform therapeutic strategies, to identify incursion of resistant strains, and to detect instances of treatment failure.

# Author details

Monica M Lahra1Masoud Shoushtari 1Tiffany R Hogan1

1. The World Health Organisation Collaborating Centre for STI and AMR and Neisseria Reference Laboratory, New South Wales Health Pathology, Microbiology The Prince of Wales Hospital, Randwick, NSW, 2031

## Corresponding author

Professor Monica M Lahra

World Health Organization Collaborating Centre for STI and AMR, Sydney, and Neisseria Reference Laboratory, Microbiology Department, SEALS, The Prince of Wales Hospital, Randwick, NSW, 2031. School of Medical Sciences, Faculty of Medicine, the University of New South Wales, NSW 2050 Australia

Telephone: +61 2 9382 9054  
Facsimile: +61 2 9382 9310  
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 2019. Commun Dis Intell (2018). 2020;44. doi: https://doi.org/10.33321/cdi.2020.44.58.
2. Unemo M. Current and future antimicrobial treatment of gonorrhoea – the rapidly evolving Neisseria gonorrhoeae continues to challenge. BMC Infect Dis. 2015;15:364.

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

**Editor:** Jennie Hood

**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, 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

© 2021 Commonwealth of Australia as represented by the Department of Health

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’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 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, 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>