Australian Gonococcal Surveillance Programme, 1 January to 31 March 2021

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# Introduction

The National Neisseria Network (NNN), Australia, comprises reference laboratories in each state and territory that report data on susceptibility profiles for clinical Neisseria gonorrhoeae isolates from each jurisdiction for an agreed group of antimicrobial agents for the Australian Gonococcal Surveillance Programme (AGSP). The antibiotics—ceftriaxone; azithromycin; ciprofloxacin; and penicillin—represent current or potential agents 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 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

A summary of the proportion of 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 1 2021, is shown in Table 1.

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

| State or territory | Number of isolates tested | Decreased susceptibility | | Resistance | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Q1, 2021 | Ceftriaxone | | Azithromycin | | Penicillina | | Ciprofloxacin | |
| n | % | n | % | n | % | n | % |
| Australian Capital Territory | 53 | 0 | 0.0 | 1 | 1.9 | 18 | 34.0 | 24 | 45.3 |
| New South Wales | 587 | 3 | 0.5 | 60 | 10.2 | 297 | 50.6 | 368 | 62.7 |
| Queensland | 294 | 2 | 0.7 | 10 | 3.4 | 94 | 32.0 | 119 | 40.5 |
| South Australia | 86 | 2 | 2.3 | 2 | 2.3 | 17 | 19.5 | 20 | 23.3 |
| Tasmania | 19 | 0 | 0.0 | 0 | 0.0 | 5 | 26.3 | 11 | 57.9 |
| Victoria | 493 | 8 | 1.6 | 6 | 1.2 | 174 | 35.3 | 221 | 44.8 |
| Northern Territory non-remote | 23 | 0 | 0.0 | 1 | 4.3 | 0 | 0.0 | 2 | 8.7 |
| Northern Territory remote | 32 | 0 | 0.0 | 0 | 0.0 | 1 | 3.1 | 1 | 3.1 |
| Western Australia non-remote | 120 | 0 | 0.0 | 3 | 2.5 | 29 | 24.2 | 43 | 35.8 |
| Western Australia remote | 28 | 0 | 0.0 | 0 | 0.0 | 1 | 3.6 | 1 | 3.6 |
| **Australia** | **1,735** | **15** | **0.86** | **83** | **4.8** | **636** | **36.7** | **810** | **46.7** |

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

## Ceftriaxone

For the AGSP, monitoring of ceftriaxone DS includes the MIC values ≥ 0.06 mg/L and is further differentiated by those isolates with MIC 0.06 mg/L, and those isolates with MIC ≥ 0.125 mg/L. In the first quarter of 2021, the proportion of isolates with ceftriaxone DS in Australia was 0.86%, lower than the annual proportion for 2020, as shown in Table 2.

****Table 2: Percentage of gonococcal isolates with decreased susceptibility to ceftriaxone (MIC 0.06 and ≥ 0.125 mg/L), Australia, 2010 to 2020, and 1 January to 31 March 2021****

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Ceftriaxone MIC mg/L | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 Q1 |
| 0.06 | 4.80% | 3.20% | 4.10% | 8.20% | 4.80% | 1.70% | 1.65% | 1.02% | 1.67% | 1.19% | 0.87% | 0.86% |
| ≥ 0.125 | 0.10% | 0.10% | 0.30% | 0.60% | 0.60% | 0.10% | 0.05% | 0.04% | 0.06% | 0.11% | 0.06% | 0.00% |
| **Total** | **4.90%** | **3.30%** | **4.40%** | **8.80%** | **5.40%** | **1.80%** | **1.70%** | **1.06%** | **1.73%** | **1.30%** | **0.93%** | **0.86%** |

The national trend of isolates with ceftriaxone decreased susceptibility (MIC 0.06 and ≥ 0.125 mg/L) since 2010 is shown in Table 2.

## Azithromycin

In the first quarter of 2021, the proportion of isolates with resistance to azithromycin (MIC ≥ 1.0 mg/L) in Australia was 4.8%. This was higher than the proportion reported nationally in 2020 and higher also the proportion reported in Australia for 2013–2015 (2.1–2.6%), as shown in Table 3.1 This will continue to be monitored over the quarters of 2021. Globally, there have been reports of increasing of azithromycin resistance in N. gonorrhoeae.2 In the first quarter of 2021, all states and territories reported isolates with resistance to azithromycin, with the exceptions of Tasmania and of remote regions of the Northern Territory and Western Australia.

****Table 3: Percentage of gonococcal isolates with resistance to azithromycin (MIC ≥ 1.0 mg/L), Australia, 2012 to 2020, and 1 January to 31 March 2021****

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Azithromycin resistance | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 Q1 |
| MIC ≥ 1.0 mg/L | 1.3% | 2.1% | 2.5% | 2.6% | 5.0% | 9.3% | 6.2% | 4.6% | 3.9% | 4.8% |

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, to identify incursion of resistant strains, and to detect instances of treatment failure.

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**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.**

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

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