Australian Gonococcal Surveillance Programme

1 April to 30 June 2021

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 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 to ceftriaxone (minimum inhibitory concentration, MIC ≥ 0.06 mg/L); and the proportion resistant to azithromycin (MIC ≥ 1.0 mg/L), penicillin (MIC ≥ 1.0 mg/L), and ciprofloxacin (MIC ≥1.0 mg/L) for Quarter 2 2021 is shown in Table 1.

Table 1: Gonococcal isolates showing decreased susceptibility to ceftriaxone, and resistance to azithromycin, penicillin and ciprofloxacin, Australia, 1 April to 30 June 2021, by state or territory

| State or territory | Number of isolates tested | Decreased susceptibility | | Resistance | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Q2, 2021 | Ceftriaxone | | Azithromycin | | Penicillina | | Ciprofloxacin | |
| n | % | n | % | n | % | n | % |
| Australian Capital Territory | 60 | 0 | 0.0 | 0 | 0.0 | 19 | 31.7 | 19 | 31.7 |
| New South Wales | 599 | 2 | 0.3 | 62 | 10.4 | 274 | 45.7 | 401 | 66.9 |
| Queensland | 287 | 1 | 0.3 | 1 | 0.3 | 109 | 38.0 | 132 | 46.0 |
| South Australia | 80 | 2 | 2.5 | 2 | 2.5 | 22 | 27.5 | 34 | 42.5 |
| Tasmania | 11 | 1 | 9.1 | 0 | 0.0 | 3 | 27.3 | 6 | 54.5 |
| Victoria | 557 | 10 | 1.8 | 4 | 0.7 | 234 | 42.0 | 320 | 57.5 |
| Northern Territory non-remote | 14 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 1 | 7.1 |
| Northern Territory remote | 33 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 |
| Western Australia non-remote | 124 | 0 | 0.0 | 6 | 4.8 | 49 | 39.5 | 54 | 43.5 |
| Western Australia remote | 22 | 0 | 0.0 | 0 | 0.0 | 1 | 4.5 | 2 | 9.1 |
| **Australia** | **1,787** | **16** | **0.9** | **75** | **4.2** | **711** | **39.8** | **969** | **54.2** |

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

## Ceftriaxone

For the AGSP, monitoring of ceftriaxone decreased susceptibility (DS) includes the MIC values ≥ 0.06 mg/L and is further differentiated by those isolates with MIC value 0.06 mg/L, and those isolates with MIC values ≥ 0.125 mg/L. In the second quarter of 2021, the proportion of isolates with ceftriaxone DS in Australia was 0.9%, lower than the proportion reported annually in 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, 1 January to 31 March 2021 and 1 April to 30 June 2021

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Ceftriaxone MIC mg/L | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 Q1 | 2021 Q2 |
| 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% | 0.90% |
| ≥ 0.125 | 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% |
| **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%** |

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 second quarter of 2021, the proportion of isolates with resistance to azithromycin (MIC ≥ 1.0 mg/L) in Australia was 4.2%, slightly higher than the proportion reported nationally in 2020 (3.9%). Azithromycin resistance peaked in Australia in 2017 and has declined since as shown in Table 3. 1 This will continue to be monitored over the quarters of 2021. Globally there have been reports of increasing azithromycin resistance in N. gonorrhoeae. 2 In the second quarter of 2021, all states reported isolates with resistance to azithromycin, with the exception of the Australian Capital Territory, Tasmania, the Northern Territory and remote regions of Western Australia.

Table 3: Percentage of gonococcal isolates with resistance to azithromycin (MIC ≥ 1.0 mg/L), Australia, 2012 to 2020, 1 January to 31 March 2021 and 1 April to 30 June 2021.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Azithromycin Resistance | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 Q1 | 2021 Q2 |
| MIC ≥ 1 mg/L | 1.3% | 2.1% | 2.5% | 2.6% | 5.0% | 9.3% | 6.2% | 4.6% | 3.9% | 4.8% | 4.2% |

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, remains essential to inform therapeutic strategies, to identify incursion of resistant strains, and to detect instances of treatment failure.

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