Australian Gonococcal Surveillance Programme, 1 January to 31 March 2019

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# Introduction

The National Neisseria Network (NNN), Australia, comprises reference laboratories in each state and territory that report data on susceptibilities for an agreed group of antimicrobial agents for the Australian Gonococcal Surveillance Programme (AGSP). The antibiotics are penicillin, ceftriaxone, azithromycin and ciprofloxacin and 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.

Keywords: Gonorrhoea, gonococcal, antimicrobial resistance, surveillance

# Results

A summary of the proportion of isolates with decreased susceptibility to ceftriaxone (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 1 2019 are 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 2019, by state or territory.

| State or territory | Number of isolates tested | Decreased susceptibility | | | | Resistance | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Q1, 2019 | Ceftriaxone MIC  ≥0.06 mg/L | | Azithromycin MIC  ≥1.0 mg/L | | Penicillina MIC  ≥1.0 mg/L | | Ciprofloxacin MIC  ≥1.0 mg/L | |
| n | % | n | % | n | % | n | % |
| ACT | 45 | 0 | 0 | 4 | 8.9 | 9 | 20.0 | 12 | 26.7 |
| NSW | 938 | 22 | 2.3 | 71 | 7.6 | 273 | 29.1 | 309 | 32.9 |
| Qld | 425 | 4 | 0.9 | 6 | 1.4 | 86 | 20.2 | 115 | 27.1 |
| SA | 112 | 5 | 4.5 | 7 | 6.3 | 20 | 17.9 | 41 | 36.6 |
| Tas | 11 | 1 | 9.1 | 0 | 0.0 | 2 | 18.2 | 2 | 18.2 |
| Vic | 725 | 10 | 1.4 | 59 | 8.1 | 122 | 16.8 | 184 | 25.4 |
| NT non-remote | 11 | 0 | 0 | 0 | 0 | 2 | 18.2 | 1 | 9.1 |
| NT remote | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| WA non-remote | 212 | 6 | 2.8 | 2 | 0.9 | 43 | 20.3 | 54 | 25.5 |
| WA remote | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 7.4 |
| Australia | 2531 | 48 | 1.9 | 149 | 5.9 | 557 | 22.0 | 720 | 28.4 |

a Penicillin resistance includes 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 first quarter of 2019, the proportion of isolates with ceftriaxone DS in Australia was 1.89%, slightly higher than the annual proportion for 2018 as shown in Table 2. There were 3 isolates reported in the first quarter of 2019 in Australia with MIC ≥0.125 mg/L, and of these, 2 isolates had an MIC of 0.50 mg/L, which is the highest ceftriaxone MIC reported in the country since 2018.1 There were 48 isolates with ceftriaxone DS (MIC value ≥0.06 mg/L), and of these 77.1% were resistant to penicillin and ciprofloxacin but susceptible to azithromycin, as shown in Table 3. There were three isolates, all from New South Wales, with ceftriaxone MIC values of 0.06 mg/L that were resistant to azithromycin, penicillin and ciprofloxacin.

Table 2: Percentage of gonococcal isolates with decreased susceptibility to ceftriaxone (MIC 0.06 and ≥0.125 mg/L), Australia, 2012 to 2018, and 1 January to 31 March 2019.

| Ceftriaxone MIC mg/L | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 Q1 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0.06 | 4.10% | 8.20% | 4.80% | 1.70% | 1.65% | 1.02% | 1.67% | 1.78% |
| ≥0.125 | 0.30% | 0.60% | 0.60% | 0.10% | 0.05% | 0.04% | 0.06% | 0.11% |

Table 3: Percentage of gonococcal isolates with decreased susceptibility to ceftriaxone (MIC ≥0.06 mg/L) and that were penicillin (Pen) and ciprofloxacin (Cip) resistant (R), isolated from extragenital sites, and by sex, Australia, 1 January to 31 March 2019.

| Strains with ceftriaxone decreased susceptibility (CRO DS) | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| State or territory | Total | Pen R + Cip R | | Males | | Females | | Extragenital sites | |
| n | % | n | % | n | % | n | % |
| Australian Capital Territory | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| New South Wales | 22 | 19 | 86 | 14 | 64 | 8 | 36 | 8 | 36 |
| Queensland | 4 | 3 | 75 | 4 | 100 | 0 | 0 | 2 | 50 |
| South Australia | 5 | 1 | 0 | 4 | 80 | 1 | 20 | 1 | 20 |
| Tasmania | 1 | 1 | 100 | 1 | 100 | 0 | 0 | 1 | 100 |
| Victoria | 10 | 8 | 80 | 6 | 60 | 3 | 30 | 4 | 40 |
| Northern Territory non-remote | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Northern Territory remote | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Western Australia non-remote | 6 | 5 | 83 | 4 | 67 | 2 | 33 | 1 | 17 |
| Western Australia remote | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Australia | 48 | 37 | 77.1 | 33 | 68.8 | 14 | 29.2 | 17 | 35.4 |

The national trend of isolates with ceftriaxone decreased susceptibility (MIC 0.06 and ≥0.125 mg/L) since 2012 is shown in Table 2.

A summary of ceftriaxone DS strains that were penicillin and ciprofloxacin resistant, or isolated from extragenital sites (rectal and pharyngeal) for Quarter 1, 2019, by state or territory, and by sex (male/female), is shown in Table 3**.**

## Azithromycin

In the first quarter of 2019, the proportion of isolates with resistance to azithromycin (MIC ≥1.0 mg/L) in Australia was 5.9%, slightly lower than the proportion reported nationally in 2018, but more than double the proportion reported in Australia for 2013–2015 (2.1–2.6%) (Table 4).2 Globally there have been increasing reports of azithromycin resistance in N. gonorrhoeae.3

Table 4: Percentage of gonococcal isolates with resistance to azithromycin (MIC ≥1.0 mg/L), Australia, 2012 to 2018, and 1 January to 31 March 2019.

| Azithromycin Resistance | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 Q1 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| MIC ≥1 mg/L | 1.3% | 2.1% | 2.5% | 2.6% | 5.0% | 9.3% | 6.2% | 5.9% |

In quarter 1 2019, all states reported isolates with resistance to azithromycin, with the exception of Tasmania, Northern Territory and remote Western Australia. The states that reported an increase in the proportion of N. gonorrhoeae isolates with resistance to azithromycin when compared with 2018 were New South Wales and South Australia. As noted above, there were three isolates that exhibited resistance to azithromycin and DS to ceftriaxone (MIC = 0.06 mg/L) and additionally were resistant to penicillin and ciprofloxacin. There were no isolates in this quarter that exhibited high-level resistance to azithromycin (MIC ≥256 mg/L).

The national trend of azithromycin resistance in isolates since 2012 is shown in Table 4**.**

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 repeat testing by nucleic acid amplification test for test of cure.4 Continued surveillance to monitor N. gonorrhoeae with elevated MIC values, coupled with sentinel site surveillance in high-risk populations, remains important to inform therapeutic strategies; to identify incursion of resistant strains; and to detect instances of treatment failure.

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# References

1. European Centre for Disease Prevention and Control. Rapid Risk Assessment: Extensively drug-resistant (XDR) Neisseria gonorrhoeae in the United Kingdom and Australia – 7 May 2018. [Internet.] Stockholm: ECDC, 2018. [Accessed: 16 May 2019.] Available from: https://ecdc.europa.eu/sites/portal/files/documents/RRA-Gonorrhoea%2C%20Antimicrobial%20resistance-United%20Kingdom%2C%20Australia.pdf
2. Lahra MM, Enriquez RP. Australian Gonococcal Surveillance Programme. Annual Report 2016. Commun Dis Intell (2018). 2018;42. pii: S2209-5081(18)00013-1.
3. Unemo M. Current and future antimicrobial treatment of gonorrhoea - the rapidly evolving Neisseria gonorrhoeae continues to challenge. BMC Infect Dis. 2015;15:364.
4. Australasian Sexual Health Alliance. Australian STI management guidelines for use in primary care: Gonorrhoea: Follow up. [Internet.] Australasian Sexual Health Alliance, 2018. [Accessed on: 16 May 2019.] Available from: http://www.sti.guidelines.org.au/sexually-transmissible-infections/gonorrhoea#follow-up

**Communicable Diseases Intelligence**

ISSN: 2209-6051 Online

**Communicable Diseases Intelligence (CDI) is a peer-reviewed scientific journal published by the Office of Health Protection, 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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Health Protection Policy Branch, Office of Health Protection, Australian Government Department of Health  
GPO Box 9848, (MDP 6) CANBERRA ACT 2601

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