

Australian Gonococcal Surveillance Programme,

1 July to 30 September 2018

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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. Azithromycin combined with ceftriaxone 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 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 to ceftriaxone (MIC 0.06-0.25 mg/L), and the proportion resistant to azithromycin (MIC \geq 1.0 mg/L), penicillin (MIC \geq 1.0 mg/L), and ciprofloxacin (MIC \geq 1.0 mg/L) for Quarter 3 2018 are shown in **Table 1**.

Table 1:

| State or Territory | Number of isolates tested | Decreased Susceptibility | | Resistance | | | | | |
|----------------------------------|---------------------------|--------------------------------|------------|----------------------------------|------------|---------------------------------|-------------|-----------------------------------|-------------|
| | | Ceftriaxone MIC 0.06-0.25 mg/L | | Azithromycin MIC \geq 1.0 mg/L | | Penicillin* MIC \geq 1.0 mg/L | | Ciprofloxacin MIC \geq 1.0 mg/L | |
| | Q3, 2018 | n | % | n | % | n | % | n | % |
| Australian Capital Territory | 44 | 2 | 4.5 | 1 | 2.3 | 6 | 13.6 | 5 | 11.4 |
| New South Wales | 950 | 9 | 0.9 | 78 | 8.2 | 218 | 22.9 | 291 | 30.6 |
| Queensland | 352 | 2 | 0.6 | 16 | 4.5 | 67 | 19.0 | 91 | 25.9 |
| South Australia | 48 | 1 | 2.1 | 2 | 4.2 | 9 | 18.8 | 16 | 33.3 |
| Tasmania | 14 | 1 | 7.1 | 1 | 7.1 | 1 | 7.1 | 4 | 28.6 |
| Victoria | 644 | 23 | 3.6 | 61 | 9.5 | 125 | 19.4 | 159 | 24.7 |
| Northern Territory Urban & Rural | 13 | 0 | 0 | 0 | 0 | 1 | 7.7 | 2 | 15.4 |
| Northern Territory Remote | 51 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2.0 |
| Western Australia Urban & Rural | 141 | 3 | 2.1 | 3 | 2.1 | 25 | 17.7 | 31 | 22.0 |
| Western Australia Remote | 32 | 0 | 0 | 0 | 0 | 1 | 3.1 | 0 | 0 |
| AUSTRALIA | 2289 | 41 | 1.8 | 162 | 7.1 | 453 | 19.8 | 600 | 26.2 |

Table 1: Gonococcal isolates showing decreased susceptibility to ceftriaxone, and resistance to azithromycin, penicillin, and ciprofloxacin, Australia, 1 July to 30 September 2018, by State or Territory.

* Penicillin resistance includes MIC value of \geq 1.0 mg/L, or penicillinase production.

| | | | | | | | | | |
|---------------------------------|-----------|-----------|-------------|-----------|-------------|-----------|-------------|-----------|-------------|
| Northern Territory Remote | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Western Australia Urban & Rural | 3 | 2 | 67 | 1 | 33 | 2 | 67 | 1 | 33 |
| Western Australia Remote | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AUSTRALIA | 41 | 30 | 73.2 | 31 | 75.6 | 10 | 24.4 | 13 | 31.7 |

Table 3: Percentage of gonococcal isolates with decreased susceptibility to ceftriaxone (MIC \geq 0.06 mg/L) and that were penicillin (Pen) and ciprofloxacin (Cip) resistant (R), isolated from extra genital sites, and by sex, Australia, Australia, 1 July to 30 September 2018.

Azithromycin

In the third quarter of 2018, the proportion of isolates with resistance to azithromycin (MIC \geq 1.0 mg/L) in Australia was 7.1%, higher than the proportion reported nationally in the first and second quarters of 2018, but lower than for 2017 (9.3%), and three times the level reported in Australia for 2013-2015 (2.1%-2.6%) (Table 4).(1) Globally there have been increasing reports of azithromycin resistance in *N. gonorrhoeae*.(2)

In quarter 3 2018, most states reported isolates with resistance to azithromycin, with the exception of Northern Territory and remote Western Australia. The states that reported an increase in the number and proportion of *N. gonorrhoeae* isolates with resistance to azithromycin when compared with the previous quarter of 2018 were New South Wales, Australian Capital Territory, Tasmania, and South Australia. There were two isolates that exhibited resistance to azithromycin and DS to ceftriaxone (MIC = 0.064mg/L). One of these isolates, from urban Western Australia, was also resistant to penicillin, but sensitive to ciprofloxacin. There were no isolates in this quarter that exhibited high level resistance to azithromycin (MIC \geq 256 mg/L).

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

| Azithromycin Resistance | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 Q1 | 2018 Q2 | 2018 Q3 |
|--------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|----------------|----------------|----------------|
| MIC \geq 1 mg/L | 1.3% | 2.1% | 2.5% | 2.6% | 5.0% | 9.3% | 6.0% | 5.8% | 7.1% |

Table 4: Percentage of gonococcal isolates with resistance to azithromycin (MIC \geq 1.0 mg/L), Australia, 2012 to 2017, 1 January to 31 March 2018, 1 April to 30 June 2018, and 1 July to 30 September 2018.

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 extra genital 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 important to inform therapeutic strategies, to identify incursion of resistant strains, and to detect instances of treatment failure.

References

1. Lahra MM, Enriquez RP. Australian Gonococcal Surveillance Programme. Annual Report 2016. *Commun Dis Intell*. In press.
2. Unemo M. Current and future antimicrobial treatment of gonorrhoea - the rapidly evolving *Neisseria gonorrhoeae* continues to challenge. *BMC Infect Dis*. 2015;15:364.