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Australian Gonococcal Surveillance Programme, 1 April to 30 June 2018

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The National Neisseria Network, Australia

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Australian Gonococcal Surveillance Programme

1 April to 30 June 2018

Monica M Lahra, Rodney P Enriquez and CR Robert George for The National Neisseria Network, Australia

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 (minimum inhibitory concentration, MIC 0.06–0.25 mg/L), and the proportions 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 2 2018, is shown in Table 1.

Ceftriaxone

The category of ceftriaxone decreased susceptibility (DS) includes the MIC values 0.06–0.25 mg/L. The breakpoint for ceftriaxone resistance is yet to be determined. In the second quarter of 2018, the proportion of isolates with ceftriaxone decreased susceptibility in Australia was 1.55%, slightly lower than the proportion in the first quarter of 2018, but slightly higher than the annual proportion for 2017. There were no isolates reported in the second quarter of 2018 in Australia with an MIC \geq 0.125 mg/L. Of note, there were two isolates from Queensland that

exhibited DS to ceftriaxone (MIC = 0.064 mg/L) and resistance to azithromycin. One of these was also resistant to penicillin and ciprofloxacin.

The national trend of isolates with ceftriaxone decreased susceptibility (MIC 0.06 and \geq 0.125 mg/L) since 2011 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 2, 2018 by state or territory, and by sex (male/female) is shown in Table 3.

Table 1: Gonococcal isolates showing decreased susceptibility to ceftriaxone, and resistance to azithromycin, penicillin, and ciprofloxacin, Australia, 1 April to 30 June 2018, by state or territory.

| State or territory | Number of isolates tested | Decreased susceptibility | | Resistance | | | | | |
|----------------------------------|---------------------------|-----------------------------------|------------|--------------------------------|------------|---|-------------|---------------------------------|-------------|
| | | Ceftriaxone MIC 0.06–0.25 mg/L | | Azithromycin MIC ≥ 1.0 mg/L | | Penicillin ^a MIC ≥ 1.0 mg/L | | Ciprofloxacin MIC ≥ 1.0 mg/L | |
| | | n | % | n | % | n | % | n | % |
| Australian Capital Territory | 50 | 2 | 4.0 | 0 | 0 | 5 | 10.0 | 6 | 12.0 |
| New South Wales | 923 | 3 | 0.3 | 36 | 3.9 | 195 | 21.1 | 235 | 25.5 |
| Queensland | 301 | 2 | 0.7 | 16 | 5.3 | 70 | 23.3 | 93 | 30.9 |
| South Australia | 57 | 0 | 0 | 2 | 3.5 | 25 | 43.9 | 23 | 40.4 |
| Tasmania | 8 | 0 | 0 | 0 | 0 | 3 | 37.5 | 3 | 37.5 |
| Victoria | 670 | 26 | 3.9 | 72 | 10.7 | 137 | 20.4 | 145 | 21.6 |
| Northern Territory urban & rural | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 19.0 |
| Northern Territory remote | 39 | 0 | 0 | 0 | 0 | 2 | 5.1 | 0 | 0 |
| Western Australia urban & rural | 160 | 2 | 1.3 | 5 | 3.1 | 44 | 27.5 | 50 | 31.3 |
| Western Australia remote | 28 | 0 | 0 | 1 | 3.6 | 3 | 10.7 | 3 | 10.7 |
| Australia | 2,257 | 35 | 1.6 | 132 | 5.8 | 484 | 21.4 | 562 | 24.9 |

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

Table 2: Percentage of gonococcal isolates with decreased susceptibility to ceftriaxone (MIC 0.06 and \geq 0.125 mg/L), Australia, 2011 to 2017, 1 January to 31 March 2018, and 1 April to 30 June 2018.

| Ceftriaxone MIC mg/L | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 Q1 | 2018 Q2 |
|----------------------|-------|-------|-------|-------|-------|-------|-------|---------|---------|
| 0.06 | 3.20% | 4.10% | 8.20% | 4.80% | 1.70% | 1.65% | 1.02% | 1.60% | 1.55% |
| \geq 0.125 | 0.10% | 0.30% | 0.60% | 0.60% | 0.10% | 0.05% | 0.04% | 0.10% | 0% |

Azithromycin

In the second quarter of 2018, the proportion of isolates with resistance to azithromycin (MIC \geq 1.0 mg/L) in Australia was 5.8%, slightly lower than the proportion reported nationally in the first quarter of 2018, and lower than for 2017 (9.3%), but three times the level reported in Australia for 2013–2015 (2.1–2.6%).¹ Globally there have been increasing reports of azithromycin resistance in *N. gonorrhoeae* (NG).²

In quarter 2 2018, most states reported isolates with resistance to azithromycin, with the exception of Tasmania, Australian Capital Territory, and Northern Territory. The states that reported an increase in the proportion of NG isolates with resistance to azithromycin when compared with the first quarter of 2018 were Victoria, and both non-remote and remote Western Australia. All other states and territories reported a decrease in proportion of isolates with azithromycin resistance. There were two isolates, from Queensland, that exhibited resistance to azithromycin and DS to ceftriaxone (MIC = 0.064 mg/L). There was one isolate, from New South Wales, 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.

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

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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 extragenital sites, and by sex, Australia, 1 April to 30 June 2018.

| 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 | 2 | 1 | 50 | 1 | 50 | 1 | 50 | 2 | 100 |
| New South Wales | 3 | 1 | 33 | 2 | 67 | 1 | 33 | 0 | 0 |
| Queensland | 2 | 1 | 50 | 0 | 0 | 2 | 100 | 1 | 50 |
| South Australia | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tasmania | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Victoria | 26 | 21 | 81 | 13 | 50 | 13 | 50 | 9 | 35 |
| Northern Territory urban & rural | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Northern Territory remote | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Western Australia urban & rural | 2 | 2 | 100 | 2 | 100 | 0 | 0 | 0 | 0 |
| Western Australia remote | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Australia | 35 | 26 | 74.3 | 18 | 51.4 | 17 | 48.6 | 12 | 34.3 |

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, and 1 April to 30 June 2018.

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