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## **Australian Gonococcal Surveillance Programme**

1 April to 30 June 2020

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for the National Neisseria Network, Australia

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# Australian Gonococcal Surveillance Programme

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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 ceftriaxone, azithromycin, penicillin and ciprofloxacin; they 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 gonococcal susceptibility patterns in Australia, with certain remote regions of the Northern Territory and Western Australia having low 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 program-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 of 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 2020, 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 2020, the proportion of isolates with ceftriaxone decreased susceptibility in Australia was 1.0%, lower than the proportion in the first quarter of 2020 (1.4%), and cumulatively lower than 2019 on a year-to-date basis (1.4%). There were two isolates reported in the second quarter of 2020 in Australia with a ceftriaxone MIC value  $\geq$  0.125 mg/L, one from NSW and one from Victoria, neither of which was resistant to azithromycin.

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.

### Azithromycin

In the second quarter of 2020, the proportion of isolates with resistance to azithromycin (MIC  $\geq$  1.0 mg/L) in Australia was 3.1%, lower than the proportion reported nationally in the first quarter of 2020 (4.0%), and lower than for 2019 (4.6%) and for 2018 (6.2%). Whilst the proportion of isolates resistant to azithromycin nationally continues to decline, the current rate remains higher than that reported in Australia for 2013–2015 (2.1–2.6%).<sup>1</sup> Globally, there have been increasing reports of azithromycin resistance in *N. gonorrhoeae*.<sup>2</sup>

In quarter 2 2020, the eastern states of NSW, Victoria and Queensland, as well as Western Australia, reported isolates with resistance to azithromycin. No resistance to azithromycin was reported in gonococcal isolates from Tasmania, South Australia, Australian Capital Territory and the Northern Territory.

No isolates 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 3.

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

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Table 1: Gonococcal isolates showing decreased susceptibility to ceftriaxone and resistance to ciprofloxacin, azithromycin and penicillin, Australia, 1 April to 30 June 2020, by state or territory

| State or territory            | Number of isolates tested Q2, 2020 | Decreased susceptibility       |            |           |            |            |             | Resistance                  |             |          |  |          |            |                              |            |  |
|-------------------------------|------------------------------------|--------------------------------|------------|-----------|------------|------------|-------------|-----------------------------|-------------|----------|--|----------|------------|------------------------------|------------|--|
|                               |                                    | Ceftriaxone MIC 0.06–0.25 mg/L |            |           |            |            |             | Azithromycin MIC ≥ 1.0 mg/L |             |          | Penicillin <sup>a</sup> MIC ≥ 1.0 mg/L |          |            | Ciprofloxacin MIC ≥ 1.0 mg/L |            |  |
|                               |                                    | n                              | %          | n         | %          | n          | %           | n                           | %           | n        | %                                      | n        | %          | n                            | %          |  |
| Australian Capital Territory  | 19                                 | 0                              | 0.0        | 0         | 0.0        | 3          | 15.8        | 13                          | 68.4        | 0        | 0.0                                    | 0        | 0.0        | 0                            | 0.0        |  |
| New South Wales               | 462                                | 8                              | 1.7        | 28        | 6.1        | 128        | 27.7        | 167                         | 36.1        | 0        | 0.0                                    | 0        | 0.0        | 0                            | 0.0        |  |
| Queensland                    | 354                                | 3                              | 0.8        | 10        | 2.8        | 66         | 18.6        | 97                          | 27.4        | 0        | 0.0                                    | 0        | 0.0        | 0                            | 0.0        |  |
| South Australia               | 49                                 | 0                              | 0.0        | 0         | 0.0        | 48         | 98.0        | 12                          | 24.5        | 0        | 0.0                                    | 0        | 0.0        | 0                            | 0.0        |  |
| Tasmania                      | 7                                  | 0                              | 0.0        | 0         | 0.0        | 0          | 0.0         | 0                           | 0.0         | 0        | 0.0                                    | 0        | 0.0        | 0                            | 0.0        |  |
| Victoria                      | 436                                | 3                              | 0.7        | 4         | 0.9        | 113        | 25.9        | 179                         | 41.1        | 0        | 0.0                                    | 0        | 0.0        | 0                            | 0.0        |  |
| Northern Territory non remote | 2                                  | 0                              | 0.0        | 0         | 0.0        | 1          | 50.0        | 1                           | 50.0        | 0        | 0.0                                    | 0        | 0.0        | 0                            | 0.0        |  |
| Northern Territory remote     | 11                                 | 0                              | 0.0        | 0         | 0.0        | 0          | 0.0         | 0                           | 0.0         | 0        | 0.0                                    | 0        | 0.0        | 0                            | 0.0        |  |
| Western Australia non remote  | 178                                | 1                              | 0.6        | 4         | 2.2        | 57         | 32.0        | 60                          | 33.7        | 0        | 0.0                                    | 0        | 0.0        | 0                            | 0.0        |  |
| Western Australia remote      | 22                                 | 0                              | 0.0        | 1         | 4.5        | 1          | 4.5         | 0                           | 0.0         | 0        | 0.0                                    | 0        | 0.0        | 0                            | 0.0        |  |
| <b>Australia</b>              | <b>1540</b>                        | <b>15</b>                      | <b>1.0</b> | <b>47</b> | <b>3.1</b> | <b>417</b> | <b>27.1</b> | <b>529</b>                  | <b>34.4</b> | <b>0</b> | <b>0.0</b>                             | <b>0</b> | <b>0.0</b> | <b>0</b>                     | <b>0.0</b> |  |

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

Table 2: Percentage of gonococcal isolates with decreased susceptibility to ceftriaxone MIC 0.06 mg/L and  $\geq 0.125$  mg/L, Australia, 2010 to 2019, 1 January to 31 March 2020 and 1 April to 30 June 2020

| Ceftriaxone MIC mg/L | 2010         | 2011         | 2012         | 2013         | 2014         | 2015         | 2016         | 2017         | 2018         | 2019         | 2020 Q1      | 2020 Q2      |
|----------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| <b>0.06</b>          | 4.80%        | 3.20%        | 4.10%        | 8.20%        | 4.80%        | 1.70%        | 1.65%        | 1.02%        | 1.67%        | 1.19%        | 1.25%        | 0.84%        |
| $\geq 0.125$         | 0.10%        | 0.10%        | 0.30%        | 0.60%        | 0.60%        | 0.10%        | 0.05%        | 0.04%        | 0.06%        | 0.11%        | 0.12%        | 0.13%        |
| <b>Total</b>         | <b>4.90%</b> | <b>3.30%</b> | <b>4.40%</b> | <b>8.80%</b> | <b>5.40%</b> | <b>1.80%</b> | <b>1.70%</b> | <b>1.06%</b> | <b>1.73%</b> | <b>1.30%</b> | <b>1.37%</b> | <b>0.97%</b> |

Table 3: Percentage of gonococcal isolates with resistance to azithromycin (MIC  $\geq 1.0$  mg/L), Australia, 2012 to 2019, 1 January to 31 March 2020, and 1 April to 30 June 2020

| Azithromycin resistance | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 Q1 | 2020 Q2 |
|-------------------------|------|------|------|------|------|------|------|------|---------|---------|
| MIC $\geq 1$ mg/L       | 1.3% | 2.1% | 2.5% | 2.6% | 5.0% | 9.3% | 6.2% | 4.6% | 4.2%    | 3.1%    |