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Australian Gonococcal Surveillance Programme

1 July to 30 September 2020

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Neisseria Network, Australia

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Introduction

The National Neisseria Network, Australia (NNN) 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, ciprofloxacin and penicillin; 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 (DS) to ceftriaxone (minimum inhibitory concentration, 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 3 2020, is shown in Table 1.

Ceftriaxone

In the third quarter of 2020, the proportion of isolates with ceftriaxone decreased susceptibility in Australia was 0.48%, lower than the proportion in first two quarters of 2020, and cumulatively lower than 2019 (1.3%), as shown in Table 2. The national trend data since 2010, of isolates with ceftriaxone decreased susceptibility (MIC 0.06 and \geq 0.125 mg/L), is shown in Table 2.

Azithromycin

In the third quarter of 2020, the proportion of *Neisseria gonorrhoeae* isolates with resistance to azithromycin (MIC \geq 1.0 mg/L) in Australia was

4.2%, continuing the trend of a lower proportion of azithromycin resistance observed nationally over the first three quarters of 2020, and in recent years as shown in Table 3. 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%).¹ Globally there have been increasing reports of azithromycin resistance in *N. gonorrhoeae*.²

In quarter 3 2020, the eastern jurisdictions of New South Wales, Queensland, Victoria, and the Australian Capital Territory, as well as non-remote regions of Western Australia, reported isolates with resistance to azithromycin. No resistance to azithromycin in gonococcal isolates was reported from Tasmania, South Australia, and remote regions of the Northern Territory. No isolates exhibited high-level resistance to azithromycin (MIC \geq 256 mg/L).

Dual therapy using ceftriaxone plus azithromycin is the recommended treatment for gonorrhoea as a strategy to temper development of more widespread resistance. Patients

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

State or territory	Number of isolates tested Q3, 2020	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	30	0	0.0	1	3.3	7	23.3	6	20.0
New South Wales	636	1	0.2	51	8.0	216	34.0	290	45.6
Queensland	379	3	0.8	12	3.2	78	20.6	151	39.8
South Australia	53	0	0.0	0	0.0	1	1.9	6	11.3
Tasmania	9	0	0.0	0	0.0	1	11.1	0	0.0
Victoria	318	4	1.3	2	0.6	66	20.8	115	36.2
Northern Territory non remote	13	0	0.0	1	7.7	0	0.0	3	23.1
Northern Territory remote	33	0	0.0	0	0.0	0	0.0	0	0.0
Western Australia non remote	149	0	0.0	2	1.3	40	26.7	46	30.7
Western Australia remote	30	0	0.0	0	0.0	2	6.7	3	10.0
Australia	1,650	8	0.48	69	4.2	411	24.9	620	37.6

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 ≥ 0.125 mg/L, Australia, 2010 to 2019, 1 January to 31 March 2020, 1 April to 30 June 2020, and 1 July to 30 September 2020

Ceftriaxone MIC mg/L	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 Q1	2020 Q2	2020 Q3
0.06	4.80%	3.20%	4.10%	8.20%	4.80%	1.70%	1.65%	1.02%	1.67%	1.19%	1.25%	0.84%	0.48%
≥ 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%	0.00%
Total	4.90%	3.30%	4.40%	8.80%	5.40%	1.80%	1.70%	1.06%	1.73%	1.30%	1.37%	0.97%	0.48%

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

Azithromycin resistance	2012	2013	2014	2015	2016	2017	2018	2019	2020 Q1	2020 Q2	2020 Q3
MIC ≥ 1 mg/L	1.3%	2.1%	2.5%	2.6%	5.0%	9.3%	6.2%	4.6%	4.2%	3.1%	4.2%

with infections in extra-genital sites, where the isolate has decreased susceptibility to ceftriaxone, should have cultures collected for a test of cure. 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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