



Australian Government
Department of Health

COMMUNICABLE DISEASES INTELLIGENCE

2020 Volume 44
<https://doi.org/10.33321/cdi.2020.44.37>

Australian Gonococcal Surveillance Programme, 1 April to 30 June 2019

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National Neisseria Network, Australia

Communicable Diseases Intelligence

ISSN: 2209-6051 Online

This journal is indexed by Index Medicus and Medline.

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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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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, ciprofloxacin, and penicillin 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 programme-specific quality assurance process.

Keywords: Gonorrhoea, gonococcal, antimicrobial resistance, surveillance

Results

A summary of the proportion of isolates with decreased susceptibility to ceftriaxone and the proportion resistant to azithromycin, penicillin and ciprofloxacin for Quarter 2 2019 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. Where isolates are detected with ceftriaxone MIC values > 0.25 mg/L, these are also included in this category.

In the second quarter of 2019, the proportion of isolates with ceftriaxone decreased susceptibility in Australia was 0.8%, lower than the proportion in the first quarter of 2019 (1.9%), and cumulatively lower than the 2018 year-to-date value. In the current quarter there were 2 isolates with

ceftriaxone MIC values greater than 0.125 mg/L from South Australia and urban area of Western Australia.

Of note, two isolates from NSW exhibited DS to ceftriaxone (MIC \geq 0.064mg/L) and resistance to azithromycin, of which one isolate showed additional resistance to ciprofloxacin and penicillin. In Victoria, one isolate was found to have DS to ceftriaxone and azithromycin resistance.

The national trend of isolates with ceftriaxone DS (MIC 0.06 and \geq 0.125 mg/L) since 2010 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, 2019, by state or territory, and by sex (male/female) is shown in Table 3.

Azithromycin

In the second quarter of 2019, the proportion of isolates with resistance to azithromycin (MIC ≥ 1.0 mg/L) in Australia was 5.1%, slightly lower than the proportion reported nationally in the first quarter of 2019 (5.9%), and lower than for 2018 (6.3 %). While the data from 2019 shows approximately twice the level of resistance to azithromycin compared with 2013-2015 (2.1–2.6%) data,¹ there is a trend towards declining resistance since 2017 in Australia, despite reports of increasing azithromycin resistance in *Neisseria gonorrhoeae* worldwide.²

In quarter 2 2019, most states reported isolates with resistance to azithromycin, with the exception of Tasmania, remote areas of Western Australia, and the Northern Territory. The states that reported a considerable decrease in the proportion of *N. gonorrhoeae* isolates with resistance to azithromycin when compared with the second quarter of 2018 were Victoria, Western Australia and Queensland. Reports from other states and territories exhibit a similar pattern in the proportion of isolates with azithromycin resistance compared to the second quarter of 2018. There was one isolate, from Victoria, 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 a test of cure culture 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 1: Gonococcal isolates showing decreased susceptibility to ceftriaxone and resistance to ciprofloxacin, azithromycin and penicillin, Australia, 1 April to 30 June 2019, by state or territory.

State or territory	Number of isolates tested Q2, 2019	Decreased susceptibility		Resistance					
		Ceftriaxone MIC 0.06–0.25 ^a mg/L		Azithromycin MIC ≥1.0 mg/L		Penicillin ^b MIC ≥1.0 mg/L		Ciprofloxacin MIC ≥1.0 mg/L	
		n	%	n	%	n	%	n	%
Australian Capital Territory	63	0	0.0	8	13	2	3.2	9	14.3
New South Wales	962	5	0.5	62	6.4	246	25.6	297	30.9
Queensland	355	3	0.8	5	1.4	74	20.8	87	24.5
South Australia	145	1	1	3	2.1	23	15.9	43	29.7
Tasmania	6	0	0	0	0	0	0.0	0	0.0
Victoria	654	7	1.1	41	6.3	121	18.5	185	28.3
Northern Territory urban & rural	18	0	0	0	0	2	11.1	3	16.7
Northern Territory remote	12	0	0	0	0	0	0.0	0	0
Western Australia urban & rural	167	2	1.2	3	1.8	36	21.6	43	25.7
Western Australia remote	18	1	6	0	0.0	2	11.1	2	11.1
Australia	2,400	19	0.8	122	5.1	506	21.1	669	27.9

a Includes 1 strain with MIC values of 0.5 mg/L

b Penicillin resistance includes MIC values 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 2018, 1 January to 31 March 2019 and 1 April to 30 June 2019.

Ceftriaxone MIC mg/L	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019 Q1	2019 Q2
0.06	4.80%	3.20%	4.10%	8.20%	4.80%	1.70%	1.65%	1.02%	1.67%	1.78%	0.67%
≥ 0.125	0.10%	0.10%	0.30%	0.60%	0.60%	0.10%	0.05%	0.04%	0.06%	0.11%	0.13%

Table 3: Percentage of gonococcal isolates with decreased susceptibility (DS) to ceftriaxone (MIC 0.06–0.25 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 2019.

Strains with ceftriaxone decreased susceptibility n = 19									
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	5	1	20	4	80	1	20	1	20
Queensland	3	2	67	3	100	0	0	0	0
South Australia	1	0	0	0	0	1	0	1	0
Tasmania	0	0	0	0	0	0	0	0	0
Victoria	7	5	71	5	71	2	29	4	57
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	1	1	0	1	0	0	0	1	0
Australia	19	11	57.9	15	78.9	4	21.1	7	36.8

Table 4: Percentage of gonococcal isolates with resistance to azithromycin (MIC ≥ 1.0 mg/L), Australia, 2012 to 2018, 1 January to 31 March 2019, and 1 April to 30 June 2019.

Azithromycin Resistance	2012	2013	2014	2015	2016	2017	2018	2019 Q1	2019 Q2
MIC ≥ 1 mg/L	1.3%	2.1%	2.5%	2.6%	5.0%	9.3%	6.3%	5.9%	5.1%