

Gonococcal antimicrobial resistance in the Western Pacific Region



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Key messages:

1. Ciprofloxacin and penicillin resistance are highly prevalent in the Western Pacific Region, with the exception of remote areas in Australia and New Caledonia.
2. Multidrug-resistant and extensively drug-resistant strains of *Neisseria gonorrhoeae* and spread of resistance have been reported globally.
3. Increasing the coverage of antimicrobial resistance surveillance in the Western Pacific Region is critical to inform treatment guidelines and to monitor antimicrobial resistance.

Neisseria gonorrhoeae is a human pathogen that causes gonorrhoea. Most commonly transmitted through sexual contact, the infection also can be passed from a mother to her baby during childbirth causing gonococcal eye disease. The World Health Organization estimates that there were 87 million new *N. gonorrhoeae* infections globally in persons aged 15–49 years in 2016, with 27% of the global burden of this disease estimated to be in the Western Pacific Region (1). As there is currently no vaccine to prevent gonococcal infection, disease control strategies are based on effective treatment of patients and their partners with antibiotics. Antimicrobial resistance (AMR) is a longstanding and serious problem in *N. gonorrhoeae*. The emergence of resistance to all classes of antibiotics used in first-line therapy has been reported globally (2) since antibiotics were first introduced for the treatment of gonorrhoeae in the 1930s (3). Antibiotic classes that have been in first-line clinical use for gonorrhoeae and for which resistance has emerged include the sulphonamides, penicillins, tetracyclines, macrolides, fluoroquinolones and early-generation cephalosporins. The combination of widespread AMR and the high variability of circulating strains of *N. gonorrhoeae* continues to compromise gonococcal disease control (2).

In the Western Pacific Region and elsewhere, ciprofloxacin and penicillin resistance in *N. gonorrhoeae* is high and widespread. The current first-line treatment in most countries and areas is ceftriaxone or cefixime, plus azithromycin, which is in line with the 2016 WHO guidelines for the treatment of gonorrhoea (<https://www.who.int/reproductive-health/publications/rtis/gonorrhoea-treatment-guidelines/en/>).

Isolates with decreased susceptibility to ceftriaxone and azithromycin have been widely reported (<http://iris.wpro.who.int/handle/10665.1/14324>).

WHO recommendation for treatment of *N. gonorrhoeae*

Ceftriaxone 250 mg, IM once plus
azithromycin 1 g, PO once

OR

Cefixime 400 mg, PO once plus
azithromycin 1 g, PO once

IM, intramuscular injection; PO, oral administration; g, gram; mg, milligram;

WHO definition of decreased susceptibility to the extended spectrum cephalosporins

Extended spectrum cephalosporin	MIC value mg/L
Cefixime	≥ 0.25
Ceftriaxone	≥ 0.125

MIC, minimum inhibitory concentration; mg/L, milligram per litre

Source: WHO global action plan to control the spread and impact of antimicrobial resistance in *Neisseria gonorrhoeae*. Geneva: World Health Organization; 2012.

In early 2018, one infection with a gonorrhoea strain resistant to ceftriaxone (MIC value 0.5 mg/L) and with high-level resistance to azithromycin (MIC value > 256 mg/L), as well as to most other antibiotics, was reported in the United Kingdom of Great Britain and Northern Ireland (4). Two such strains were also reported in Australia (4). Two of the three cases were travel-associated, and both acquired gonorrhoea in the South-East Asia Region. Antimicrobial susceptibility data are lacking in many countries and areas in this Region.

Table 1. Gonococcal AMR in selected countries and areas in the Western Pacific Region, 2015–2016

GASP 2015–2016 participating countries and areas	Ceftriaxone DS % (range)	Azithromycin % (range)	Penicillin % (range)	Ciprofloxacin % (range)
Australia - urban	0.1–5	0.1–5	16–30	16–30
Australia - non-urban	0	0	0.1–5	0.1–5
China	6–15	16–30	71–100	71–100
China, Hong Kong SAR	0.1–5	6–15	31–70	71–100
Japan	16–30	16–30	31–70	71–100
Mongolia (2015)	NA	6–15	31–70	31–70
New Caledonia	NA	NA	0.1–5	6–15
New Zealand	0.1–5	6–15	16–30	31–70
Philippines	0	0	71–100	71–100
Republic of Korea	6–15	0	31–70	71–100
Singapore	0	0.1–5	31–70	71–100
Viet Nam	6–15	0	31–70	71–100

GASP, WHO Gonococcal Antimicrobial Surveillance Programme; DS, decreased susceptibility (MIC value ≥ 0.125 mg/L).

Data are for 2016 unless otherwise stated.

Table 2. Gonococcal AMR in selected countries and areas in the Western Pacific Region, 2017–2019

GASP 2017–2019 participating countries and areas	Ceftriaxone DS % (range)	Azithromycin % (range)	Penicillin % (range)	Ciprofloxacin % (range)
Australia - urban	0.1–5	0.1–5	16–30	16–30
Australia – non urban	0.1–5	0.1–5	0.1–5	0.1–5
China (2017)*	6–15	6–15	71–100	71–100
China, Hong Kong SAR (2018)*	0.1–5	6–15	31–70	71–100
Japan (2018)*	16–30	16–30	31–70	31–70
Mongolia	6–15	6–15	31–70	71–100
New Caledonia (2018)*	0	0.1–5	0.1–5	16–30
New Zealand	0.1–5	6–15	6–15	16–30
Philippines	0	0.1–5	71–100	71–100
Republic of Korea (2018)*	0	0.1–5	31–70	70–100
Singapore	0.1–5	6–15	31–70	71–100
Viet Nam (2017)*	6–15	0.1–5	31–70	71–100

* Most recent data available.

GASP data in the tables have been provided by Member States participating in the WHO GASP. The numbers of isolates tested for each antibiotic may vary. All Member States participate annually in the GASP External Quality Assessment Project.

The Gonococcal Antimicrobial Surveillance Programme

The WHO Gonococcal Antimicrobial Surveillance Programme (GASP) was established in 1992 and is a worldwide laboratory network that is coordinated by regional coordinating centres across the WHO regions. The programme objectives are:

- to ensure adequate sentinel gonococcal AMR surveillance in order to inform treatment guidelines in all countries;
- to establish a strategy to rapidly detect patients with gonococcal infections who experience clinical and/or microbiological treatment failure following treatment with recommended cephalosporin therapy; and
- to ensure the effective clinical management of infected patients and their sexual partners.

The GASP regional focal points and participating countries work together to enable the programme activities. From the Western Pacific Region, Australia, Brunei Darussalam, Cambodia, China, Fiji, Hong Kong SAR (China), Japan, Malaysia, Mongolia, New Caledonia, New Zealand, Papua New Guinea, the Philippines, the Republic of Korea, Singapore, Tonga and Viet Nam have participated in GASP.

For more on GASP, see https://www.who.int/reproductivehealth/topics/rtis/gonococcal_resistance/en/.

At the country level, the aims of GASP include collecting at least 100 representative gonococcal isolates per year, ideally tested for AMR susceptibility using quantitative methods for determination of MIC and using validated and standardized interpretative criteria, to finally inform treatment guidelines (see <https://www.who.int/data/gho/data/themes/topics/who-gonococcal-amr-surveillance-programme-who-gasp>). The regional coordinating laboratories provide technical advice and support and conduct quality assurance activities to support GASP.

Enhanced Gonococcal Antimicrobial Surveillance Programme

The Enhanced Gonococcal Antimicrobial Surveillance Programme (EGASP) is a collaboration between the World Health Organization and the United States Centers for Disease Control and Prevention (CDC) established in 2015. EGASP aims to monitor trends in antimicrobial drug susceptibilities in *N. gonorrhoeae* by using standardized sampling and laboratory protocols to improve quality, comparability and timeliness of gonococcal antimicrobial drug resistance data across multiple countries. It also aims to inform country-specific treatment guidelines by assessing resistance patterns in key populations at highest risk for antimicrobial drug-resistant gonorrhoea. The first EGASP site was established in Thailand in 2015 and the first in the Western Pacific Region was established in the Philippines in 2017, with ongoing development in other Member States.

For more on EGASP, see https://wwwnc.cdc.gov/eid/article/23/13/17-0443_article.

Global Antimicrobial Resistance Surveillance System

The Global Antimicrobial Resistance Surveillance System (GLASS) was launched in October 2015 to support the WHO global action plan on AMR. Its aim is to support global surveillance and research to strengthen the evidence base on AMR, inform decision-making and drive national, regional and global actions.

GLASS initially focused on surveillance data on human priority bacterial pathogens considered to present the greatest threat globally, which include *N. gonorrhoeae*. There is thus overlap between GLASS and GASP, with both systems monitoring AMR in *N. gonorrhoeae*. Ultimately, GASP is a part of GLASS and their consolidated data are incorporated in the WHO Global Health Observatory (see <https://www.who.int/data/gho/data/themes/topics/who-gonococcal-amr-surveillance-programme-who-gasp>).

GLASS is evolving and progressively incorporating data from other surveillance systems related to AMR in humans, including antimicrobial usage, foodborne AMR and surveillance of health care-associated infections.

For more on GLASS, see <https://www.who.int/glass/en/>.

References

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