

Gonorrhoea: rising cases and antimicrobial resistance

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Novel interventions are needed to tackle this public health crisis

Annually, there are more than 82 million cases of gonorrhoea worldwide.¹ In 2023, England recorded more than 85 000 gonorrhoea diagnoses—the highest annual incidence since records began in 1918 and a threefold increase since 2012.² This dramatic rise in case numbers is not limited to the UK: in Europe notification rates increased by more than 300% between 2014 and 2023,³ and cases reported in Australia have doubled in the past decade.⁴ Men who have sex with men are at high risk for gonorrhoea infection, but cases are also notably rising in heterosexual individuals, with some European countries reporting >70% increases in cases in young heterosexual women aged 20–24 years.^{3,5} While increased testing may contribute to higher case numbers, the rising incidence indicates a public health crisis, confirmed in high income countries and likely also present in low- and middle income countries, where gaps in surveillance data may mask the true scale of the problem.⁶

Antimicrobial resistance (AMR) in gonorrhoea poses a significant global threat,⁷ with resistance shown to all antimicrobial classes recommended for treatment. Extensively drug-resistant (XDR) strains are increasingly reported internationally, heightening the risk of untreatable infection.⁸ In Europe, azithromycin resistance exceeds 25% of isolates.³ Worryingly, cephalosporin resistance is growing too. UK surveillance shows a marked increase in ceftriaxone resistant cases, which appears to be accelerating in 2025.⁹ Vietnam reported that 27% of isolates were resistant to ceftriaxone and another 31% were resistant to

cefixime in 2025.¹⁰ As a result of AMR, *Neisseria gonorrhoeae* is designated a global “priority pathogen” by WHO and an urgent threat to public health by the US Centers for Disease Control¹¹ and UK Health Security Agency,¹² emphasising the need for urgent research and interventions.

Amid these challenges are promising developments in the diagnosis, treatment, and prevention of gonorrhoea. Advances in point-of-care testing (POCT) for sexually transmitted infections (STIs) are progressing rapidly.¹³ These innovations have the potential to enhance timely diagnosis, enabling personalised rather than syndromic treatment approaches that can minimise unnecessary antimicrobial use. Rapid diagnosis can also shorten the interval between testing and treatment, thereby reducing the risk of transmission, diminishing the community reservoir of infection, and decreasing the need for patients to return to clinic for results.¹⁴ However, implementation of POCT for gonorrhoea remains more than five years away even in well-resourced settings, and modelling studies suggest it must include *N gonorrhoeae* resistance testing to prevent the propagation of antimicrobial resistant strains.¹⁵

After decades without new antibiotics for gonorrhoea, encouraging results have been reported for two topoisomerase inhibitors in phase 3 trials: zoliflodacin and gepotidacin. These oral antibiotics utilise a novel inhibition mechanism and have shown non-inferiority to ceftriaxone plus azithromycin in treating uncomplicated gonorrhoea.^{16 17} However, there are concerns regarding their ability to treat extragenital infections and the potential to promote tetracycline resistance.^{18 19} Therefore, continued investment in the development of novel treatments remains urgent.

Increased service provision for HIV pre-exposure prophylaxis (PrEP) has not only reduced HIV transmission and engaged high-risk communities but also created infrastructure that could support broader STI screening and preventive measures in some settings.²⁰ A meta-analysis conducted in 2024 suggests doxycycline post-exposure prophylaxis (Doxy-PEP) may reduce bacterial STIs, including gonorrhoea, in certain populations.²¹ However, unlike the use of antivirals for PrEP and HIV post-exposure prophylaxis, the effectiveness of Doxy-PEP against gonorrhoea infection is unclear and may be associated with an increased rate of tetracycline resistant *N gonorrhoeae* infections.¹⁹ Unanswered questions remain regarding the long term effects of Doxy-PEP, including a potentially adverse impact on the human microbiome and AMR among bacterial STIs, other pathogens, and commensals that warrant careful surveillance.²²

Perhaps most exciting is the serendipitous finding that vaccines targeting serogroup B *Neisseria meningitidis* have shown modest effectiveness in preventing *N gonorrhoeae*

infection. Two meta-analyses show that 4CMenB vaccination is associated with 32-41% effectiveness against gonorrhoea,^{23 24} and multiple prospective studies are ongoing to confirm this finding. Modelling suggesting that targeted implementation of even a modestly efficacious vaccine could have a significant public health impact,²⁵ led the UK Joint Committee for Vaccines and Immunisation to recommend 4CMenB vaccination for high risk individuals.²⁶ This proposal is yet to be implemented by the UK government, and is currently prohibitively expensive outside high income settings. Although the effectiveness of 4CMenB has reinvigorated gonorrhoea vaccine development, with numerous candidates close to assessment in humans,²⁷ roll-out of an efficacious gonorrhoea specific vaccine remains, unfortunately, some years away.

In the meantime, healthcare workers must be mindful of the soaring incidence of gonorrhoea and reinforce the importance of behavioural interventions including condom use, comprehensive contact tracing, and test of cure in high-risk cases to minimise onward transmission. We must remember the societal context within which gonorrhoea infection occurs; as a highly stigmatised disease, disproportionately affecting vulnerable populations, it can be challenging for individuals to seek diagnosis and treatment or even participate in gonorrhoea research.²⁸ To address rising cases and AMR, we need to prioritise gonorrhoea as an important public health problem, accelerate implementation of new evidence-based technologies and management strategies, petition for gonorrhoea research, advocate for those affected by STIs, and promote informed public discussion of STIs and sexual health.

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