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Perspectives of men who have sex with men on management of gonorrhoea and risk of antibiotic resistance: a reflexive thematic analysis

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Abstract

Background

Antimicrobial resistance (AMR) in *Neisseria gonorrhoeae* threatens treatment and is a public health concern. Men who have sex with men (MSM) are disproportionately affected by gonorrhoea, yet little is known about how they perceive gonorrhoea-related AMR or respond to potential future changes in testing and treatment.

Methods

Six semi-structured individual interviews were conducted between 10/2020 to 03/2021 with MSM who had experienced one or more gonorrhoea infections. Open-ended questions explored participants' experiences with gonorrhoea, followed by information on current Swiss gonorrhoea management and two diagnostic and treatment scenarios designed to facilitate reflection on AMR and its implications for care. Interviews were audio-recorded, transcribed verbatim, and analysed using reflexive thematic analysis.

Results

Participants described gonorrhoea as unpleasant but manageable infection because effective treatment was readily available (*gonorrhoea infection troubles life but is curable*). Previous experiences led to pragmatic management strategies, including temporary sexual abstinence, regular STI testing, and timely treatment, without fundamentally changing sexual behaviour (*gonorrhoea infection restricts sex but is manageable*). AMR was not spontaneously discussed, although some participants expressed uncertainty about whether antibiotics would remain effective. More explicit reflections on AMR emerged after participants received information and discussed the scenarios. They recognised AMR as a serious future threat but largely trusted medical advances to maintain effective treatment options (g*onorrhoea-related AMR threatens the future but medical progress should be achievable*). Participants identified regular testing, appropriate antibiotic use, and partner communication as their realistic personal contributions to antimicrobial stewardship, whereas substantial changes in sexual behaviour were considered unrealistic. Additional susceptibility testing was generally acceptable to participants themselves, but they anticipated that higher costs, treatment delays, and additional clinic visits could reduce uptake among other MSM (g*onorrhoea-related AMR testing means personal effort but integration should be feasible*).

Conclusions

Gonorrhoea-related AMR remained largely abstract in the absence of direct or indirect experience with resistant infections. Responses to the information and scenarios highlighted treatment preferences, practical burden, and individual and public health considerations. These findings may inform person-centred communication and future AMR-informed diagnostic and treatment approaches, but effects on behaviour, engagement, or uptake require prospective evaluation.

Background

Antimicrobial resistance (AMR) in *Neisseria gonorrhoeae* threatens the effectiveness of the last recommended empirical treatments for gonorrhoea and has become a growing global public health concern (1–3). In 2024, more than 106,000 confirmed gonorrhoea cases were reported in the European Union and European Economic Area, the highest number recorded in more than a decade. Men who have sex with men (MSM) are disproportionately affected by gonorrhoea. In 2024, they accounted for 62% of reported cases with available information on mode of transmission in EU/EEA countries (4). Sustaining effective diagnosis, treatment and AMR surveillance is therefore a public health priority (2, 3, 5).

To slow the emergence and spread of resistance, international and national guidelines recommend microbiological confirmation, culture whenever feasible, antimicrobial susceptibility surveillance, and evidence-based antimicrobial prescribing (2, 5–8). More recently, the potential contribution of frequent asymptomatic screening to antimicrobial use and selection pressure has also prompted debate about optimal screening strategies in MSM using HIV pre-exposure prophylaxis (PrEP) (9). While these recommendations primarily target healthcare professionals and health systems, their successful implementation also depends on patients' willingness to undergo diagnostic procedures, accept waiting times before treatment, and participate in surveillance efforts.

From a patient perspective, gonorrhoea management involves important trade-offs. The few studies that have examined the patient perspective have focused primarily on the impact of gonorrhoea on health-related quality of life. For example, a recent qualitative study described substantial psychological and emotional burden associated with gonorrhoea infection (10). Less is known about how patients perceive AMR, weigh trade-offs between rapid empirical treatment and additional diagnostic procedures, or value care strategies that primarily support antimicrobial stewardship and population health. Existing research among people with sexually transmitted infections (STIs) in general suggests that AMR is a relevant patient concern and identifies patient perspectives on AMR, diagnostic testing, and surveillance as an important evidence gap (11, 12).

In Switzerland, these trade-offs also have a financial dimension. Testing for STIs for people without symptoms was not covered by health insurance at the time of the study. Despite compulsory health insurance, part of the cost was shared between patient and insurance company until a contractually agreed maximum amount (deductible) is reached (min. Swiss francs (CHF) 300/year; max CHF 2500/year). The scale of out-of-pocket expenses could influence STI testing decisions. Management strategies that improve antimicrobial stewardship and surveillance, including additional antimicrobial

susceptibility testing or delayed targeted treatment, may increase costs or require additional clinic visits. These strategies have substantial public health value but provide limited immediate individual benefit (13). MSM represent a key population for gonorrhoea prevention and surveillance because of their disproportionate burden of infection and frequent engagement with STI testing services (4, 5, 14). Addressing gaps in evidence about MSM patients' perceptions of AMR-gonorrhoea is essential for designing AMR-informed management strategies that are both clinically effective and acceptable to patients.

This study aimed to explore MSM's perspectives on gonorrhoea and its medical management. We first explored participants' experiences of gonorrhoea infection and treatment. We then used hypothetical AMR-informed clinical vignettes to examine their awareness of antimicrobial resistance in gonorrhoea and how they evaluated trade-offs relevant to future management decisions.

Methodology and Methods

Design

This study was part of the Antimicrobial Resistance in Gonorrhoea (ARGon) project aimed at better understanding the current practices of healthcare providers and patients. The present manuscript focuses on MSM with previous gonorrhoea infection, whereas the companion paper reports the perspectives of treating physicians (Bogdanovic et al., unpublished manuscript). The two analyses address distinct research questions within the same overarching project.

For this study, we used a qualitative design, applying Braun and Clarke's reflexive thematic analysis approach with a constructivist orientation (15). This approach assumes that knowledge and meaning are actively constructed through the interaction of prior understanding and current experience. Consistent with this epistemological stance, the analysis focused on how MSM made sense of their experiences of gonorrhoea infection and treatment and how they interpreted AMR-related risks.

Setting and sample

Enrolment took place at three specialised centres for HIV and STIs in German-speaking Switzerland. Recruitment coincided with the COVID-19 pandemic, which posed considerable challenges in accessing and recruiting eligible participants. At the time of data collection, regular STI screening was recommended for MSM with frequently changing sexual partners.

Inclusion criteria for the study were as follows 1) aged 18 years or older; 2) self-identified as MSM, 3) diagnosis of gonorrhoea at the current consultation or in the last two years; and 4) able to read and converse in German or English. We purposefully sampled participants with variation regarding HIV-status and centre of care. In total, 28 men were informed about the study and asked for study participation by their health care professional; nine agreed to be contacted by the interviewer, and six provided written

informed consent and were included. Participants were recruited from two of the three participating centres. Three participants were living with HIV and three were receiving PrEP. Every participant received a voucher worth 30 CHF.

Data collection

Data were collected through individual semi-structured interviews using an interview guide developed by the research team in collaboration with clinicians, informed by clinical expertise and the literature. An English translation of the original German-language interview guide is provided in Supplementary File 1.

One researcher (JB) conducted all the interviews by telephone call between October 2020 to March 2021. JB is experienced in conducting qualitative interviews. She was not involved in the participants' clinical care and had no prior clinical relationship with them. The interviews lasted on average 43 minutes (range 33–65 minutes), were audio-recorded and transcribed verbatim. The first part of the interview focused on participants' lived experiences with gonorrhoea and its management. Open-ended questions encouraged participants to share their experiences, perceptions, and treatment journeys in their own words.

The second part aimed to explore participants' perspectives on antimicrobial resistance in gonorrhoea and on AMR-informed management strategies. To establish a common knowledge base, participants first received a brief, plain-language explanation of gonorrhoea management based on the Swiss recommendations used when the study materials were developed. They were then invited to reflect on the information through open-ended prompts, such as, "What are your thoughts after hearing this?"; "What does this mean for you?". The researcher then presented two clinical vignettes describing management scenarios that differed from participants' previous experiences: additional antimicrobial susceptibility testing and future rapid resistance-guided treatment. As participants had no direct experience with these situations, vignettes were used to facilitate reflection on hypothetical scenarios and to explore perceived trade-offs and hypothetical decision-making (16). After each vignette, participants were asked to reflect on its personal relevance, implications for their sexual networks, and possible strategies to prevent AMR in gonorrhoea (Table 1; full interview guide available in the supplementary material). The interview guide also included a potential future gonorrhoea vaccine scenario. This was presented, but participants' responses were limited and did not generate sufficiently developed patterns of shared meaning for to the present analysis. Therefore, these data were not included in the reported thematic findings.

Table 1
Gonorrhoea management according to the Swiss recommendations used when developing the interview vignettes (6)

Gonorrhoea management information presented to participants	**In Switzerland, gonorrhoea is currently treated with a combination of two antibiotics: an injection of ceftriaxone and oral azithromycin. At present, this regimen is effective against all known gonorrhoea strains in Switzerland. However, increasing use of antibiotics promotes the development of antimicrobial resistance. In several European countries, treatment failures have already been reported because some gonorrhoea strains have become resistant to one or more antibiotics. Such resistant strains are expected to spread further, making gonorrhoea increasingly difficult to treat. In the worst case, gonorrhoea could become untreatable. At present, no alternative antibiotics are recommended for routine treatment.**
Scenario with additional antimicrobial susceptibility testing	The test you received confirmed the presence of gonorrhoea but did not determine whether the infection was resistant to antibiotics. Because resistance was unknown, you were treated with the standard combination therapy (ceftriaxone injection plus azithromycin tablets), which is currently effective against all known gonorrhoea strains in Switzerland. If gonorrhoea is suspected, your doctor could also request an additional laboratory test to identify resistance to several antibiotics. This test requires additional payment and the results are available only after 1–2 extra days, meaning treatment may be delayed. The result may not change your own treatment. However, information on antimicrobial resistance helps clinicians and public health authorities monitor resistance and develop strategies to prevent the spread of resistant gonorrhoea.
Scenario with future rapid resistance-guided treatment	A new laboratory test has recently been developed, although it is not yet widely available. This test has both advantages and disadvantages. **Advantages**: Results are available quickly, so treatment does not need to be delayed. The test can identify whether the infection can be treated with oral tablets alone instead of the current combination of an injection and tablets. **Disadvantages**: The test provides information for only one antibiotic. It is more expensive than the current resistance test, and resistance to the alternative oral treatment is known to develop rapidly. As a result, this treatment option may remain effective for only a limited number of years.

*The wording reflects the information and scenarios presented to participants during data collection (October 2020–March 2021) and should be interpreted in that historical clinical context. Current treatment recommendations, diagnostic approaches, and costs have since changed.

Data analysis

The analysis followed the six iterative phases of reflexive thematic analysis described by Braun and Clarke (15) (Table 2). Our analytical aim was to identify patterns of shared meaning across participants' accounts that captured how they made sense of their experiences with gonorrhoea and its management, and how they reflected on AMR and hypothetical management scenarios. MAXQDA Plus 2024 (Release 24.3.0) was used to support data management and analysis.

Theme development was an iterative and interpretative process. Regular reflexive discussions within the research team supported the development and refinement of themes and encouraged critical reflection on patterns of shared meaning and their interpretation, as summarised in Table 2. Accounts that differed from the developing patterns were revisited to consider how they informed or nuanced the interpretation of themes. The research team included researchers and clinicians with expertise in sexual health, infectious diseases and antimicrobial stewardship. This expertise informed both the development of the interview guide and interpretation of the data. The team recognised that these clinical and stewardship perspectives could shape data generation and interpretation and reflected on these assumptions during the analytic process. Throughout the analysis, we used Braun and Clarke's quality checklist for thematic analysis to critically reflect on the analytic process and the coherence of the final themes (15).

Table 2
Phases of reflexive thematic analysis (15)

Phase	Description of the process
1 Familiarisation	PKH, JB, DN read each transcript, discussed and summarised initial thoughts.
2 Generating codes	PKH, DN started coding the data and collated similar meanings into various codes systematically across the entire data set. The codes helped to organise the data.
3 Constructing themes	PKH and DN summarised the codes into potential themes by regular reflexive discussions, which resulted in the development of some initial themes representing broader patterns of shared meaning.
4 Revising themes	PKH, JB, DN reviewed and further developed the initial themes and adapted them continuously into meaningful patterns. We continuously checked if themes work with coded extracts and the entire data set.
5 Defining themes	PKH and DN consulted the research team (JB, MS, AR, SE, BH, NL) to discuss the meaning of developing patterns and further refine the scope, central organising concepts, definitions and names of themes.
6 Producing the report	We produced the report, while continuously reflecting the thematic construct, to give it the final storyline and complement it with compelling extract samples (PKH, JB, MS, AR, SE, BH, NL, DN).

All interviews were conducted and analysed in German. Quotations selected for publication were translated into English by the research team.

Results

Of the six participating MSM, three were living with HIV, the remaining three were taking PrEP. All had experienced at least one gonorrhoea infection in the last two years, three reported multiple infections.

Participants initially described their lived experiences of gonorrhoea without explicitly referring to AMR, despite being informed that the study addressed this topic. Their narratives centred on the infection itself, resulting in two themes (Fig. 1): **(a) gonorrhoea infection troubles life but is curable**, describing

how men categorised symptoms of an infection and how they experienced testing and treatment, and **(b)gonorrhoea infection restricts sex but is manageable**, illustrating the temporary impact of infection on sexual life and how the men dealt with it. After receiving information on gonorrhoea management as presented at the time of data collection and discussing the two scenarios, participants articulated more explicit reflections on AMR and its implications for care. These elicited accounts resulted in two additional themes (Fig. 1): **(c)gonorrhoea-related AMR threatens the future but medical progress should be achievable**, *describing participants' perceptions of AMR as a distant but concerning threat that they hoped would be overcome through medical advances, and***(d)gonorrhoea-related AMR testing means personal effort but integration should be feasible**, reflecting participants' responses to the proposed scenarios and the trade-offs they anticipated between individual burden and broader public health benefits.

a) Gonorrhoea infection troubles life but is curable

Participants described why they sought testing for gonorrhoea, how they reacted to the diagnosis, and how they experienced treatment. The circumstances leading to testing varied. For one participant, gonorrhoea was detected incidentally during routine screening while taking PrEP. Two participants were asymptomatic but sought testing after being informed by sexual partners who had tested positive. The remaining three participants reported experiencing symptoms or physical signs, including swollen lymph nodes or a burning sensation in the anus, which prompted them to seek medical care.

Those with symptoms or signs had experienced gonorrhoea several times before and reported that previous infections enabled them to recognise the symptoms early and seek testing promptly. As a result, they were not particularly surprised by the diagnosis but were relieved that it was confirmed and treated quickly. In contrast, participants with less prior experience described the diagnosis as worrying. One participant referred to it as "a big deal."

Across participants, the availability and effectiveness of antibiotic treatment were perceived as reassuring, with several describing it as a "stroke of luck." At the same time, some expressed concerns about whether antibiotics would remain effective in the future. Although they did not explicitly refer to AMR, some statements suggested an implicit awareness that antibiotic treatment might not always be effective. These concerns were generally vague and not based on specific knowledge, as illustrated by the following quote:

"But I wasn't too worried because I had read beforehand that it can be treated, to a certain extent, if the antibiotics work." (participant 6, pos. 20–22)

Participants also described their experiences with diagnostic testing. All recalled that swabs had been taken to confirm the diagnosis, although none knew whether antimicrobial susceptibility testing had been performed. Four participants reported receiving antibiotic treatment immediately after the swabs had been taken. One had explicitly requested immediate treatment because waiting for the test result seemed too time-consuming. Two of these participants were surprised that they were not subsequently

informed of the swab result and therefore assumed that the absence of further communication indicated a positive test result. In contrast, two participants reported returning to the clinic for treatment only after a positive test result had been confirmed.

Antibiotic treatment was generally well tolerated. However, one participant reported an adverse reaction to the treatment. Three of the six participants recalled receiving additional information about gonorrhoea from healthcare professionals during the diagnostic process. Those experiencing their first infection particularly valued clear, comprehensive, and respectful communication. For some, the diagnosis was accompanied by feelings of embarrassment and reluctance to disclose it to others, as illustrated by one participant:

“it’s actually a bit awkward and embarrassing for me. And I’ve only told one other person, I mean, a good friend, and apart from that, the only other person who knows is the person who infected me. I mean, it’s not something I talk about openly.” (Participant 6, pos. 34)

Several participants also sought additional information online. All participants understood that successful treatment does not provide immunity against future gonorrhoea infections and that reinfection remains possible. At the same time, they perceived gonorrhoea as a readily treatable infection, resulting in a generally pragmatic attitude towards the disease. Overall, participants described gonorrhoea as a recurrent but manageable infection, largely because effective antibiotic treatment was readily available.

"Because in the end, the thought is that it can happen again, but it's a curable disease and I'm under control." (Participant 4, pos. 48)

b) Gonorrhoea infection restricts sex but is manageable

Participants described how experiencing one or more gonorrhoea infections influenced their sexual relationships and how they managed the associated risks. All participants vividly described the temporary impact of a gonorrhoea infection on their sex lives. Once they experienced symptoms or received the diagnosis, they deliberately abstained from sexual activity to avoid transmitting the infection to their sexual partners. The reported duration of this period of abstinence varied considerably, ranging from 10 days to three weeks. After completing treatment and the self-imposed period of abstinence, participants resumed their usual sexual activity. Overall, they reported that the experience of gonorrhoea had not resulted in lasting changes to their sexual behaviour. As one participant explained:

“Of course, it's an issue (protection against STIs) that people talk about. Some people always use condoms, others don't. It varies greatly. It's an issue that people are aware of. There are diseases, and if you catch one, it's stupid. But people still have sex. At least, that's my experience.” (Participant 2, pos. 44)

Participants also described how they informed their sexual partners about the infection. Informing partners was often perceived as uncomfortable and, for some, associated with feelings of shame,

particularly when partners were not really known. In contrast, disclosure was described as easier with regular or known sexual partners, as illustrated by one participant:

"With people you know, there's more dialogue afterwards. And you're perhaps more likely to say to someone you've met several times: 'Sorry, because I'm out of order at the moment, I've got this and that...' And they usually know it: 'Ah, okay. Have you had that injection again? Do you have to wait another three weeks until your next date?' And with anonymous people you just don't know." (Participant 3, pos. 18)

Several participants broadened the discussion to STIs more generally. Participants living with HIV described STIs such as syphilis, gonorrhoea, or hepatitis C as more disruptive to their sexual lives than HIV itself. One participant even referred to these infections as "the biggest enemy on a sex date" (Participant 3, pos. 32). In contrast, participants taking PrEP were less likely to describe STIs as substantially limiting. They valued the greater sexual freedom associated with PrEP, including condomless anal intercourse, and accepted a higher risk of acquiring STIs. They considered regular STI testing—preferably every three months—as an important strategy for taking responsibility and reducing the risk of onward transmission to sexual partners. Participants described regular testing as easy to incorporate into their routine, whereas negotiating preventive measures, such as condom use, was perceived as more challenging.

Overall, participants viewed gonorrhoea as a temporary interruption to their sexual lives rather than a lasting threat. They relied on regular testing, timely treatment, and temporary abstinence to manage the risk of transmission.

c) Gonorrhoea-related AMR threatens the future, but medical progress is expected to provide solutions

While some participants had expressed concerns that antibiotics might not always remain effective, AMR itself was not spontaneously discussed. In response to the two clinical vignettes, participants articulated more explicit views about the possibility of treatment failure and about what increasing resistance might mean for themselves and for public health.

Participants considered themselves fortunate not to have experienced antimicrobial-resistant gonorrhoea personally. At the same time, the lack of personal experience made AMR an abstract concept that many found difficult to fully comprehend. Nevertheless, all participants regarded the prospect of gonorrhoea-related AMR as serious and alarming. They described it as "bad", "terrible", or "dangerous" and worried that resistance could lead to severe health problems, reduced quality of life, restrictions in their sexual lives, or even death if gonorrhoea became untreatable. As one participant explained:

That has great significance. Well, I'm worried that I've been getting it so often now. Multi-resistant germs are a big issue for me. (...) I know it's a big problem, and if at some point antibiotics stop working, then I'll have

a problem. And I don't really want to let it get that far. It also scares me. (Participant 2, pos. 58)

Although some participants had encountered information about AMR in the media, they generally perceived it as a future rather than an immediate problem. They expressed confidence that scientific and pharmacological advances would lead to new treatment options before resistance became widespread and therefore called for greater investment in research and stronger incentives for pharmaceutical companies to develop new antibiotics.

Participants also reflected on their own contribution to preventing AMR. They considered regular STI testing, appropriate antibiotic use, and open communication with sexual partners to be important personal responsibilities. In contrast, most regarded fundamental changes in sexual risk behaviour as unrealistic and difficult to sustain over time, as illustrated by one participant:

The best thing would be for everyone to consistently protect themselves. But I don't think that's realistic. It's perhaps comparable to coronavirus interventions. A lot of people were very disciplined during the first lockdown. And now it's becoming less and less, even though it would be important now to consistently enforce these interventions in order to perhaps get down to 'no infection'. But I think everyone knows that this is somehow not feasible for the entire population. (Participant 5, pos. 50)

Overall, participants described AMR as a serious future threat and identified medical progress, regular testing and optimized treatment practices, rather than substantial changes in sexual behaviour, as the approaches they regarded as most realistic pathway to addressing it.

d) Gonorrhoea-related AMR-testing means personal effort but integration should be feasible

When discussing the two scenarios, participants reflected on additional antimicrobial susceptibility testing and resistance-informed treatment approaches. Within these scenarios, they generally described such approaches as beneficial and feasible. However, when considering the practical implications, participants tended to distinguish between their own anticipated response and how they thought other members of their community might respond.

Participants perceived clear advantages of combining diagnostic testing with AMR testing at the initial consultation. They expected greater reassurance from receiving targeted and effective antibiotic treatment and understood that early detection of resistance is essential to limit its spread. As one participant explained:

"Of course, the more such resistance develops, the more this should actually be part of the basic concept of the test... Because otherwise there is simply a risk that resistant gonorrhoea could somehow spread without being detected." (Participant 4, pos. 62)

Participants acknowledged that additional resistance testing could involve extra costs, a longer waiting time, or an additional clinic visit. However, when reflecting on their own situation, most regarded these inconveniences as acceptable. Those with previous symptomatic infections considered waiting somewhat uncomfortable, whereas asymptomatic participants mainly anticipated the inconvenience of returning to the clinic. Nevertheless, they generally felt that a short delay in treatment would have little impact on their daily lives or sexual behaviour because they would abstain from sexual activity after diagnosis anyway.

In contrast, participants expressed greater concern about the potential consequences for others. They worried that higher costs, additional appointments, or delayed treatment could discourage some people from seeking testing, resulting in fewer diagnoses and continued transmission of infection. They therefore argued that additional testing to determine whether the infection would respond to available antibiotics should be integrated into routine care in ways that minimise practical barriers and encourage uptake. As one participant commented:

I can imagine that the one or two days of having more severe symptoms are a barrier for some people, as is the price. In my opinion, this is definitely a barrier for some people. (Participant 1, pos. 62)

Overall, within the scenarios discussed, participants considered such additional AMR testing acceptable for themselves but anticipated that practical barriers might reduce uptake among others. Their reflections thus extended beyond their own willingness to undergo testing to considerations of how feasible such approaches might be in routine care.

Discussion

This study provides new insights into how MSM with previous gonorrhoea experience perceived gonorrhoea management and, after being presented with information and clinical scenarios, reflected on AMR. Participants described gonorrhoea as an unpleasant but manageable infection because effective treatment was readily available. Previous experience shaped pragmatic management strategies without fundamentally changing sexual behaviour. Explicit reflections on AMR emerged after participants had received information and discussed the diagnostic and treatment scenarios. Although they recognised AMR as a serious future threat, it remained abstract because participants lacked direct or indirect experience with antimicrobial-resistant gonorrhoea. When considering future AMR-informed management, specifically additional antimicrobial susceptibility testing and future resistance-guided treatment, participants generally described these approaches as acceptable for themselves within the scenarios discussed, but anticipated that practical barriers might discourage uptake among other members of their community.

Our findings support the view that perceptions of health risks are actively constructed through lived experience and social interaction rather than factual knowledge alone (17). Participants perceived gonorrhoea as troublesome primarily because of its symptoms, partner notification, and temporary sexual abstinence rather than treatment, which was considered simple and effective. Repeated

experience, particularly among MSM using PrEP, appeared to normalise a pragmatic management approach centred on routine STI screening, timely treatment, partner notification, and temporary sexual abstinence without fundamentally changing sexual behaviour. Our findings are consistent with qualitative research suggesting that effective treatment and regular STI testing foster perceptions of bacterial STIs as manageable events integrated into routine sexual health practices (18).

Our findings suggest that, in the absence of direct or indirect experience, AMR may remain an abstract future threat despite awareness of its potential seriousness (17, 19). None of the participants had encountered antimicrobial-resistant gonorrhoea personally or within their social networks, and their reflections therefore represented anticipated rather than lived experiences of AMR. Consistent with Wardley et al. (20) and Lorenc et al. (21), motivation to engage with AMR prevention may increase if treatment-resistant STIs become more prevalent or visible.

The distinction between participants' spontaneous accounts and their responses after receiving information and discussing the scenarios is important for interpreting these findings. These scenarios provided a context in which participants articulated more explicit reflections on the future implications of AMR and on how they might respond to different management approaches. This is consistent with the use of qualitative vignettes to explore reasoning about hypothetical situations (22). For example, one participant who had initially favoured immediate empirical treatment subsequently expressed willingness to wait for susceptibility test results when discussing the scenario. This illustrates how participants' stated preferences could develop within the interview as they considered additional information and hypothetical management decisions. However, these responses do not demonstrate that providing information or facilitating reflection would change behaviour, increase engagement in antimicrobial stewardship, or predict uptake in clinical practice.

Waiting time may nevertheless be an important consideration when assessing the acceptability of diagnostic approaches. In an Australian study, 77% of asymptomatic contacts were willing to wait two days for test results, compared with 53% who were willing to wait seven days (23). This suggests that waiting time and the associated practical burden may influence the acceptability of future diagnostic approaches.

The findings show that AMR was rarely discussed spontaneously but became a more explicit topic after participants received information and considered scenarios. These elicited responses should be understood as situated within the interview context rather than as evidence of an effect of information provision. Previous research suggests that knowledge alone does not necessarily translate into behavioural change (19). Our study cannot determine whether providing AMR information or opportunities for reflection would influence subsequent behaviour. Instead, participants' responses identified issues including personal relevance, treatment preferences, waiting times, practical burden, and perceived public health implications. These issues may be important when developing and evaluating future communication approaches in antimicrobial stewardship (19, 24, 25). Related observations have been reported in counselling interventions among MSM living with HV/HCV co-

infection, where information was experienced as more meaningful when participants were encouraged to relate it to their own lives and relationships (26).

The limited spontaneous discussion of AMR may also suggest that this topic is not routinely addressed in clinical encounters. Addressing AMR in clinical practice requires healthcare professionals not only to have up-to-date knowledge but also the communication skills to provide accurate and patient-centred information (27).

Findings from our parallel qualitative study among treating physicians provide a complementary professional perspective. In that study, only doctors with a broader clinical public health perspective emphasised informing patients about AMR and actively involving them in antimicrobial stewardship (Bogdanovic et al., unpublished manuscript). As both studies form part of the same overarching project, these findings should be interpreted as complementary rather than as independent corroboration. Similar observations have been reported in other preventive contexts. For example, providing written information about the potential impact of doxycycline post-exposure prophylaxis on AMR significantly reduced willingness to use this intervention among Belgian MSM (28).

The scenarios also provided insight into how participants described their own potential role in preventing resistance. While they expected scientific and pharmacological advances to maintain effective treatment options, they identified regular STI testing, appropriate antibiotic use, and partner communication as realistic actions they could personally take in response to AMR, rather than substantial changes in sexual behaviour. The importance participants attributed to regular STI testing is particularly relevant in light of the ongoing debate about whether routine testing of asymptomatic individuals should be reduced or discontinued, given concerns that frequent testing and subsequent antibiotic treatment may increase antimicrobial use and potentially contribute to AMR without necessarily reducing gonorrhoea incidence (29). Within this sample, participants perceived regular testing as an important strategy for preventing and controlling STIs. This reflects participants' views and should not be interpreted as evidence that a particular screening strategy improves antimicrobial stewardship. Their accounts suggest that changes to established testing recommendations may require careful communication, although the present study cannot predict how MSM more broadly would respond to such changes. Involving community members in the development of alternative testing and prevention strategies before changes to current recommendations are introduced may help explore the acceptability and feasibility of such approaches. Participants also evaluated future AMR-informed management approaches from both an individual and community perspective. Although additional testing, longer waiting times, or extra clinic visits were acceptable for them personally within the scenarios discussed, they were concerned that such demands could discourage testing among other MSM and thereby undermine STI control. These concerns reflect participants' expectations about others rather than evidence of how other MSM would actually respond.

These findings complement antimicrobial stewardship recommendations that distinguish between diagnostic confirmation of gonorrhoea, antimicrobial susceptibility testing to inform treatment where

indicated, and resistance surveillance at the population level (2, 5, 7). They also highlight the importance participants placed on keeping additional diagnostic procedures practical and accessible. The acceptability and feasibility of such procedures should therefore be considered alongside their clinical effectiveness when developing future stewardship approaches.

Strengths and limitations

A major strength of this study was the combination of two complementary qualitative approaches within a single interview. While the first part used open-ended questions to explore participants' lived experiences with gonorrhoea infection and its management, the second part combined information with diagnostic and treatment scenarios designed to facilitate reflection on AMR and its implications for care. This approach enabled us to explore both lived experiences and responses elicited in relation to future-oriented scenarios, consistent with the use of vignettes to explore hypothetical situations and facilitate reflection (16). However, these elicited responses should not be interpreted as evidence that scenarios themselves changed participants' attitudes or behaviour.

The clinical context has changed since the interviews were conducted in 2020–2021. In particular, the interview scenario describing combination treatment with ceftriaxone and azithromycin no longer reflects current local treatment recommendations, and the specific costs and aspects of the diagnostic approaches presented at the time have also changed (30). The rapid resistance-guided treatment approach was presented as a future scenario rather than current routine care. However, several broader issues explored in the scenarios remain relevant to contemporary gonorrhoea management, including the distinction between diagnostic confirmation and antimicrobial susceptibility testing, the potential burden of additional diagnostic procedures, waiting for results, treatment preferences, antimicrobial resistance surveillance, and the distinction between individual benefit and broader public health benefits.

This study also has several limitations. Six of 28 men approached participated in the study. Recruiting MSM with previous gonorrhoea experience for qualitative interviews proved challenging, particularly during the COVID-19 pandemic. However, sample adequacy was considered in relation to the focused research question, the relevance of participants' experiences, and the richness and depth of the interview data rather than sample size alone. The participants' direct experience of gonorrhoea management and the detailed accounts generated in the interviews provided a sufficiently rich dataset to develop patterns of shared meaning relevant to the study aim. Given the potentially stigmatizing nature of gonorrhoea and sexual health, participants who agreed to take part may have been more comfortable discussing STIs, more engaged with sexual healthcare, and more willing to reflect on their experiences than those who declined participation. All participants were engaged in sexual healthcare through HIV care or PrEP services, and some had experienced recurrent gonorrhoea infections and regular STI testing. While this relatively homogeneous sample allowed us to explore the perspectives of men familiar with gonorrhoea management in considerable depth, the views of MSM with first-time infections, less engagement with healthcare, or greater concerns about stigma may be underrepresented. The

findings should therefore be understood as reflecting the perspectives of this specific group rather than MSM more broadly.

Furthermore, participants had neither direct experience with, nor knew anyone affected by, antimicrobial-resistant gonorrhoea. Their reflections therefore represented anticipated rather than lived experiences of AMR. The information provided and the scenarios also shaped the context in which these reflections were elicited, accordingly, they should be interpreted as situated responses generated within the interview rather than as pre-existing preferences or predictions of future behaviour. Nevertheless, using information and hypothetical clinical scenarios enabled exploration of patient perspectives on emerging public health challenges before they become commonplace in clinical practice. To our knowledge, this is one of the first qualitative studies exploring the perspectives of MSM with previous gonorrhoea experience on gonorrhoea-related AMR. Future studies including larger and more diverse populations are needed to examine how these findings transfer to other groups and to prospectively evaluate the acceptability and impact of patient-centred antimicrobial stewardship strategies.

Conclusion

MSM with previous gonorrhoea experience perceived gonorrhoea as a manageable infection and had developed pragmatic strategies for integrating recurrent infections into their sexual health practices. In contrast, AMR remained largely abstract in participants' spontaneous accounts and became more explicit after they received information and discussed the scenarios. Their responses highlighted concerns and preferences related to treatment effectiveness, waiting times, practical burden, and the balance between individual and public health considerations. These findings may inform the development of future patient-centred communication and stewardship approaches, but whether providing information or facilitating reflection influences patient engagement, behaviour, or uptake requires prospective evaluation. Future approaches should therefore combine practical and accessible diagnostic and treatment strategies with communication that addresses both individual and public health implications.

Declarations

Ethics approval and consent to participate

This qualitative interview study was approved by the regional Ethics committee Northwest and Central Switzerland (EKNZ-Nr. 2019 – 00418). The study was conducted in accordance with relevant guidelines and regulations, including the Declaration of Helsinki. Participation was voluntary, and written informed consent was obtained from all participants. The consent covered the use of de-identified study data in scientific publications. All quotations used in the manuscript were anonymised to prevent identification of individual participants.

Consent for publication

None required

Competing interests

PKH the author declares that she has no competing interests

Clinical trial number

not applicable

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Author Contribution

NL, DN and JB made substantial contributions to the conception and design of the work; JB, PKH, NL, DN to the acquisition, analysis, and interpretation of data; PKH, JB, NL, DN, MS, AR, SE, BH, drafted the work or substantively revised it.

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Data Availability

The data set generated and analyzed during the current study is not publicly available due to privacy concerns and the potential for identifying participants, in accordance with the informed consent provided. Anonymized data however are available on reasonable requests.

List of abbreviations

AMR Antimicrobial resistance

CHF Swiss Francs

MSM Men who have sex with men

PrEP Pre-exposure prophylaxis

STI Sexually transmitted infection

WHO World Health Organization

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Figures

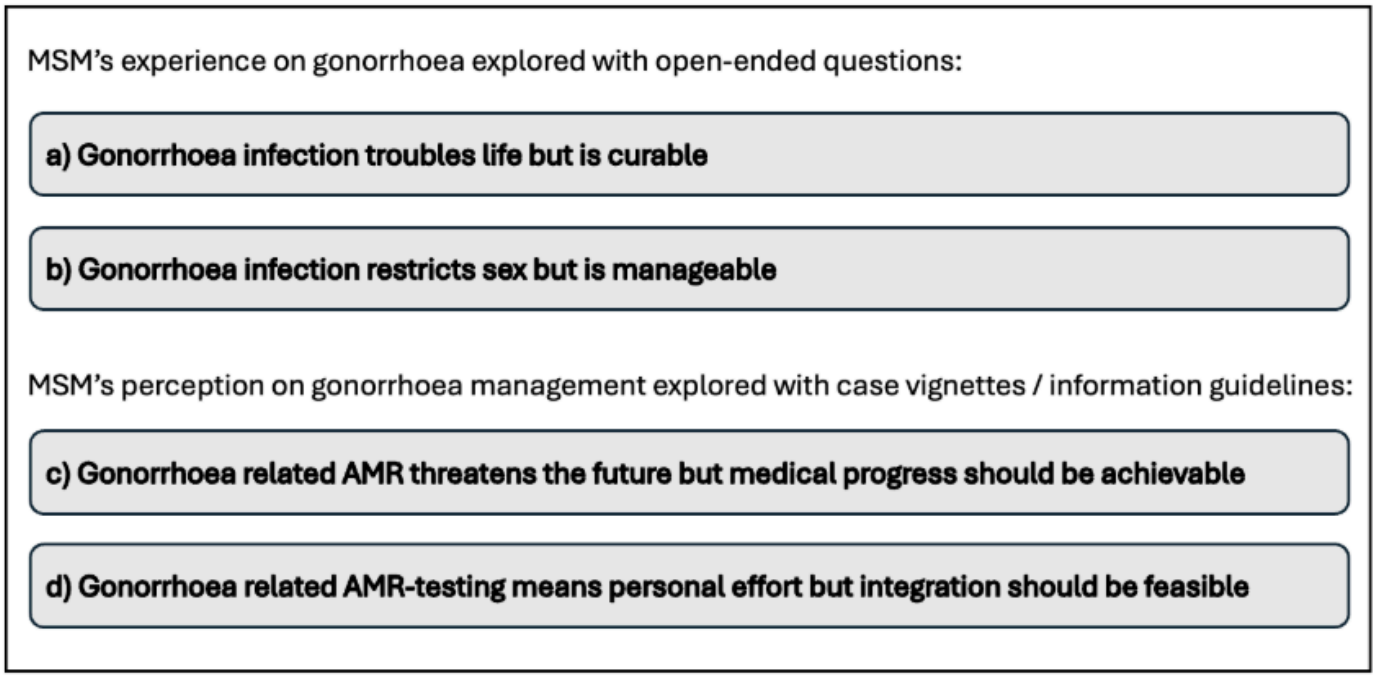


Figure 1

Overview of MSMs experiences and perception about gonorrhoea management in the light of AMR

Supplementary Files

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