



Laidlaw Scholars Undergraduate Leadership and Research Programme
Research Report

**Antimicrobial resistance (AMR) and the World Health Organization (WHO)'s
recommendations for a gender-inclusive and gender-transformative
approach to global health policy**

Rebecca Liu

Research Advisor: Professor Amaya Perez-Brumer

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1. Introduction

Antimicrobial resistance (AMR) is one of the greatest threats to global public health. By 2030, it is projected that AMR will cost at least 1 trillion USD per year and force 24 million people into extreme poverty globally.^{1,2} The human impact of AMR is significant, as drug-resistant infections (DRIs) lead to longer hospitalization times, costlier treatment, painful recovery, and higher mortality rates.^{3,4} The cost of treatments and loss of potential income caused by DRIs creates an immense financial burden, particularly felt in low- and middle-income countries (LMICs).⁵ With the emergence of multidrug-resistant (MDR) infections, there is concern that when last-resort antimicrobials fail, patients infected with highly resistant strains of tuberculosis (TB), pneumonia, gonorrhea, and other widespread infections will no longer have effective treatments available.^{4,6}

Considering the immense global burden of AMR, it should not be approached as a purely biomedical issue. Resistance is socially mediated and influenced by sociocultural, economic, political, and structural factors.^{7,8} Without recognizing existing vulnerabilities and healthcare disparities, AMR policy might unintentionally reinforce or reproduce inequities.⁹ Emerging literature focused on sociological analyses of AMR has argued that the drivers and barriers of AMR and inequality are the same.^{8,10} Therefore, without an intersectional, deliberate policy approach, interventions will create unequal benefits, burdens, and outcomes, reinforcing the same barriers that drive resistance.^{9,10}

In recent years, gender has been increasingly recognized as a crucial sociocultural factor that shapes AMR outcomes. According to the Canadian Institute of Health (2017), gender is defined as “socially constructed roles, behaviours, expressions and identities” which determine societal expectations, responsibilities, and access to power and resources.¹¹ This is in contrast to sex, which only refers to biological features, such as differences in reproductive genitalia and hormones.¹² While sex and gender are both important considerations that can be interrelated, recognizing only sex will lead to gaps in understanding the contextual and social realities that influence AMR.¹³

Global policy efforts have begun to recognize AMR inequities and the need to address them. Building upon the commitment to develop national action plans (NAPs) addressing AMR in 2015, the WHO published the report *Addressing gender inequalities in national action plans on antimicrobial resistance* in 2024.¹⁴ The report provides 20 direct recommendations for how policymakers can improve their NAPs with more gender-responsive interventions and approaches. The need for this report was evident: only 11% of NAPs as of 2023 mentioned the term “gender,” and most narrowly focused on UTIs or maternal health.¹⁰

The WHO’s 2024 report represents a significant step towards more inclusive AMR policy. Across the 20 recommendations, the WHO succeeds in covering multiple dimensions of gender while providing a conceptual push towards the development of gender-responsive NAPs. However, further attention could focus on understanding and developing interventions that can challenge the sociocultural and structural factors that produce underlying gender inequalities.

While the relationship between gender and AMR has been examined before, this report contributes to existing literature by focusing on the underlying mechanisms that drive gender inequality and their policy implications using a rapid scoping review. After the review, the key findings informed a structured analysis of the WHO’s 20 recommendations. Finally, the results informed specific policy recommendations and the development of a framework for designing more context-specific, intersectional, and sustainable AMR policy responses.

2. Methodology

This study used a multi-stage design that included a rapid scoping review, thematic synthesis, and structured policy analysis.

2.1 Rapid scoping review

To guide the rapid scoping review, the primary guiding question used was: “*What are the policy implications of gender as a sociocultural determinant of AMR?*” Following this question, two objectives emerged: (1) understand how gendered AMR realities manifest and impact different populations and (2) identify the policy interventions and initiatives that either exist or have been proposed. This review used the Population, Concept, Context (PCC) framework to help define the eligibility criteria.

Table 1. Definitions of Population, Concept, Context (PCC)

PCC	Definition
Population	Populations affected by or at risk of AMR
Concept	Gender as a sociocultural determinant of AMR, with a focus on policy/intervention implications
Context	AMR and antimicrobial stewardship in human and/or public health contexts

The scoping review included articles published from January 1, 2019, to July 2026, the month the search was conducted. This time horizon was chosen to maintain feasibility while ensuring that captured articles were as relevant and representative of the current global AMR policy landscape as possible. The search used CINAHL, PubMed, and Scopus based on the reviewer’s existing access to databases and their inclusion of journals related to health science, public

health, and other relevant disciplines. The study excluded non-peer-reviewed literature, protocols, letters, and conference abstracts. The search included only English-language articles, reflecting the reviewer's language restrictions. There was no geographic limit.

Studies were only eligible if they centrally or substantially examined both (1) gender and its related gender determinants as social constructs and (2) AMR pathways, outcomes and/or stewardship efforts. Furthermore, studies had to, at minimum, refer to proposed policies and interventions designed to address AMR gender disparities to be considered eligible. Notably, while gender was treated as the primary sociocultural determinant, sexuality, life-course, and intersectionality were also considered during the review. However, this was only if they complemented the overall analytical understanding of gendered AMR experiences and policy implications. Purely or predominantly microbiological or laboratory studies were ineligible. Animal, agricultural, or environment-focused studies were also ineligible unless they were directly and substantially linked to gendered human contexts. Additionally, studies that incorrectly conflated gender with sex or referred to gender without considering its socially created dimensions were not included.

After importing the CINAHL, PubMed, and Scopus results, Covidence collated and deduplicated the articles to prepare for screening. After title and abstract screening, the remaining articles' full texts were assessed and all exclusion results recorded. A single reviewer conducted all of the screening. Due to the time-limited nature of this study, the review focused on identifying a coherent synthesis of qualitative evidence above all else.

The search strategies can be found in the Appendix.

2.2 Thematic synthesis

Data extraction of the included studies occurred on Covidence. Extracted information included key study details, overall conceptual themes, reported dimensions of gender and AMR, and proposed policy and interventions. After extraction, the findings on gendered AMR realities and policy interventions were separately exported to Dedoose. This separation allowed the study to identify how consistently practical evidence on gendered disparities in AMR translated into varied and specific policy approaches. Moreover, it made it possible to recognize potential gaps in policy recommendations and gender disparities.

Dedoose was used to conduct qualitative coding and thematic synthesis on the identified gendered dimensions of AMR and the recommended AMR policy interventions. The coding process used a deductive approach with predetermined codes for gender-analysis domains, AMR dimensions, and policy intervention types. Multiple gender domains or AMR dimensions could be assigned to the same excerpt, but only when they were all centrally important and relevant.

After qualitative coding, Dedoose's built-in analysis features generated code co-occurrence and code application tables. These outputs helped the reviewer identify recurring relationships and potential gaps in the existing evidence, which were later closely examined and synthesized into the final thematic results. With the gendered dimensions of AMR and proposed AMR policy interventions separately coded and analyzed, the underlying gender dimensions and proposed interventions for each AMR dimension were compared, ultimately assessing whether proposed solutions are responsive in correcting the drivers of gender disparity in AMR.

The complete analytical codebook and supplementary qualitative analysis can be found in the Appendix.

2.3 Structured policy analysis

After completing the rapid scoping review and thematic synthesis, a matrix was used to analyze the 20 recommendations from the WHO report *Addressing gender inequalities in national action plans on antimicrobial resistance* (2024).¹⁴ The matrix design used for analysis examined (1) the gender dimension(s) addressed, (2) the degree of gender-responsiveness, (3) the specificity and practicality of implementation guidance, and (4) how well the recommendation aligned with findings from the literature synthesis.

The same gender dimensions from the evidence extraction and coding were carried forward to the structured policy analysis. The degrees of gender-responsiveness were adapted from the Canadian Institutes of Health Research's Sex/Gender-Responsive Assessment Scale for Health Research, with options ranging from gender-blind to gender-transformative.¹⁵ Implementation guidance was evaluated using a scale from 0 to 2: zero meant practically no guidance, one meant guidance but only on issue identification, and two meant guidance on both issue identification and the subsequent practical implementation of a solution. The rapid scoping review and qualitative synthesis results informed the assessment of the recommendations' overall alignment with current literature.

The 20 recommendations and their final assessments were synthesized to identify overall strengths, weaknesses, and opportunities to improve upon the WHO's policy guidance for developing gender-responsive AMR policy and NAPs. These findings helped develop specific recommendations and a framework on designing better AMR interventions and approaches.

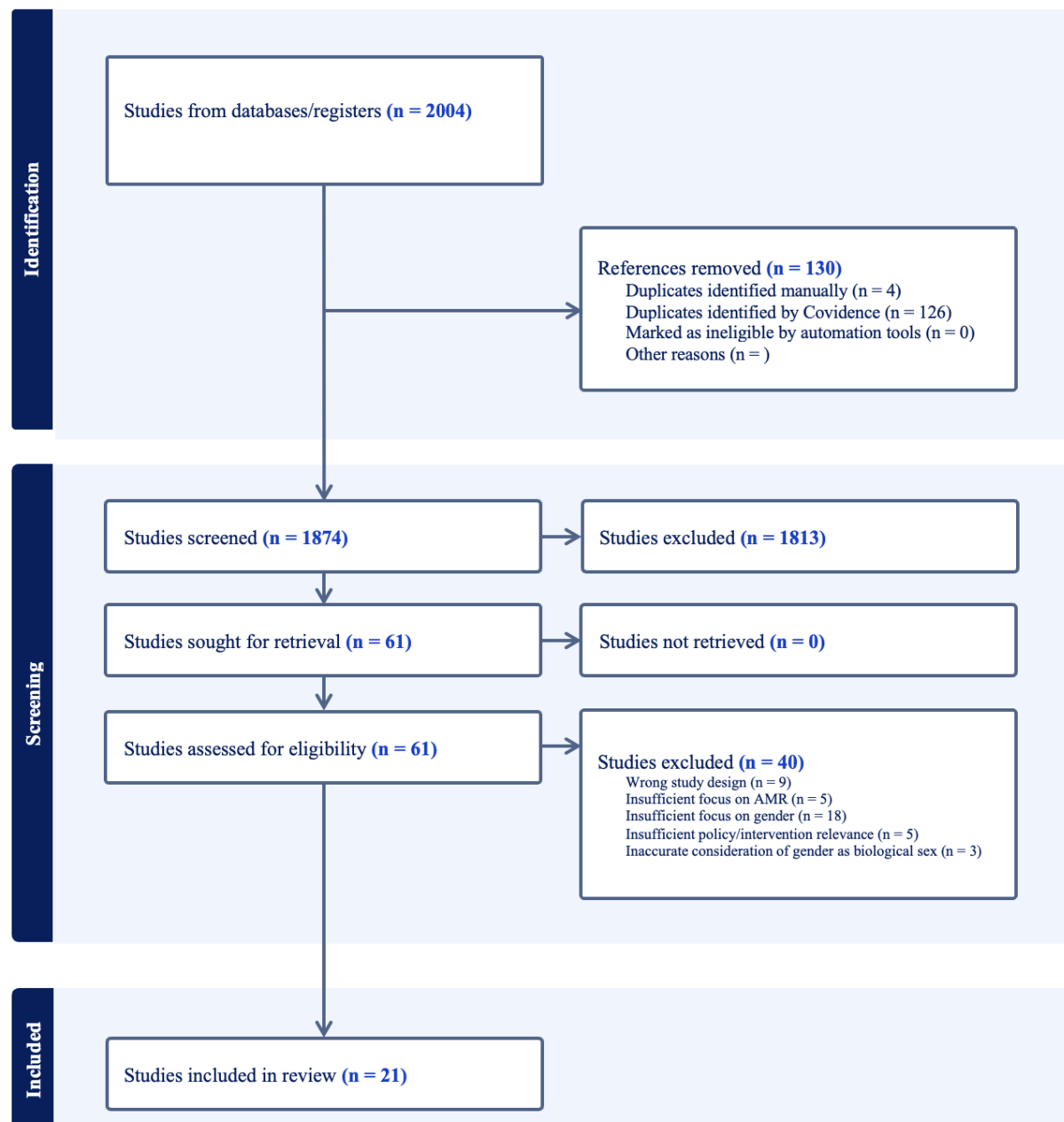
3. Results

3.1 Study selection and characteristics

The rapid scoping review searches identified 2,004 studies from CINAHL, PubMed, and Scopus, which were then imported into Covidence. Deduplication removed 130 studies, leaving 1,874

articles for title and abstract screening. The full-text review included 61 articles, 40 of which were removed. Therefore, the final review included 21 eligible studies.

Figure 1. PRISMA flow diagram



The final studies encompassed a wide range of countries and geographic regions. The 21 studies also included a variety of study designs, but the most common study design was a form of literature review. Most articles were published in either 2025 or 2026, with the oldest articles published in 2021, suggesting the emerging relevance of this research topic. Many articles broadly covered gendered determinants of AMR, while others were focused on specific

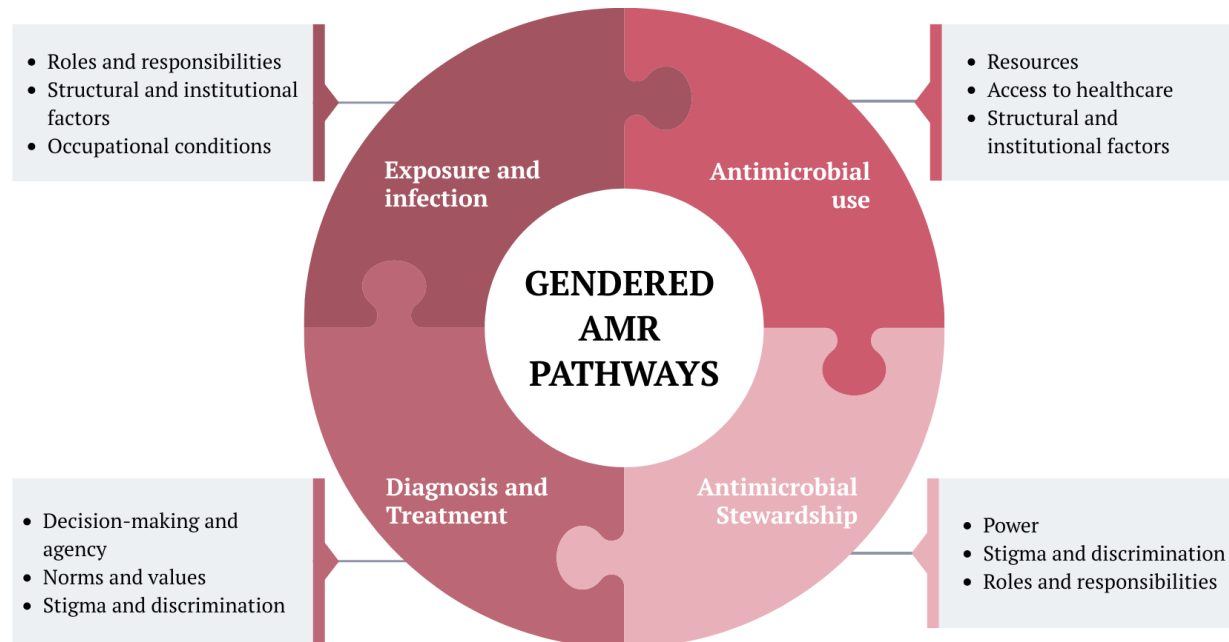
dimensions of antimicrobial use and antimicrobial stewardship. Few studies focused on specific population subsections or singular policy initiatives, such as LGBTQ+ individuals or pushes to disaggregate data.^{7,16}

Table 2. Study characteristics

Author	Year	Country/ region	Study design	Primary focus
Agu et al. ¹⁶	2026	Sub-Saharan Africa	Literature review	Intersectional drivers of antimicrobial use and misuse
Batheja et al. ¹⁷	2025	Global	Text and opinion	Gender and equity in global AMR policy
Batheja et al. ¹⁸	2025	Global	Text and opinion	Gender inequities in AMR susceptibility, access, and care
Batheja et al. ¹⁹	2026	Global	Cross-sectional	Gender inequality and antibiotic consumption
Boriani et al. ¹²	2025	Global	Text and opinion	Gender equality, One Health, and AMR
Chandra et al. ⁴	2026	Australia	Cohort	Antibiotic-resistant STIs and sexual-health infrastructures
Chandra et al. ⁷	2026	Australia	Cohort	GBTQ+ sexual health and antimicrobial resistance
Charani et al. ⁸	2021	Global	Text and opinion	Intersectional sociocultural drivers of AMR
Colpani et al. ²⁰	2026	Global	Literature review	Sex and gender in antibiotic research and use
Davis et al. ⁵	2025	LMICs	Literature review	AMR equity and justice across multiple pathways
Gatsch et al. ¹⁰	2026	Global	Document analysis	Gender integration in AMR national action plans
Gautron et al. ²¹	2023	LMICs	Literature review	Intersectionality, gender, and AMR in LMICs
Khan et al. ²²	2026	Pakistan	Literature review	Gendered determinants of antimicrobial stewardship in Pakistan
Lawry et al. ²³	2023	Global	Text and opinion	Sex- and gender-disaggregated antimicrobial-use surveillance
Lynch et al. ³	2024	Global	Literature review	Gender and equity across AMR pathways
Majekodunmi et al. ²⁴	2025	Nigeria	Literature review	Gendered AMR causes, burden, and workforce in Nigeria
Ngassa Detchaptche et al. ⁹	2026	LICs	Literature review	Gender inequities across AMR pathways in LICs
Pham-Duc and Sriparamanathan ²⁵	2021	Southeast Asia	Literature review	Gender differences in antibiotic knowledge and use
Ruckert et al. ¹³	2025	Global	Literature review	Gendered determinants across AMR care pathways
Sudenkaarne ²⁶	2024	Global	Text and opinion	Queer feminist bioethics, vulnerability, and AMR justice
Tischendorf et al. ²⁷	2025	United States	Cohort	Gender bias and discrimination in antimicrobial stewardship

3.2 Gendered AMR dimensions

Figure 2. Gendered mechanisms and interconnected AMR pathways



During the thematic synthesis, recurring relationships emerged between the gender dimensions and AMR drivers. Each AMR driver interacted with multiple gender dimensions, signifying how multiple mechanisms and dynamics can work together to drive AMR and inequality (Figure 2). After examining these interconnected relationships and pathways, three main thematic takeaways emerged.

3.2.1 Gendered roles and structural conditions distribute exposure

Roles, responsibilities, and occupational conditions were prominent determinants of exposure, infection, and prevention distribution. For women, gendered roles of caretaking, food handling, cooking, and water management within the household put them at greater risk of infection.^{3,9,13,22,24} Women of all ages are disproportionately burdened with administering antimicrobials to sick family members, which places them at greater risk of infection while putting pressure on their ability to finish other household responsibilities or maintain employment.³ Food preparation puts women at greater risk of foodborne diseases, especially when handling animal products in constrained resource environments.^{22,23} In homes without proper smoke ventilation, women are at greater risk of developing respiratory infections due to unsafe cooking practices.^{9,22} Specifically, pneumonia contributes to 27% of deaths associated with insufficient ventilation and unsafe cooking practices, raising concerns over the potential

further spread of highly resistant pneumonia.^{6,9,22} Finally, women are often disproportionately tasked with fetching household water, putting them at greater risk of water-borne infection.^{3,9,23}

The risks associated with disproportionate gender roles and responsibilities are exacerbated in resource-limited areas with minimal WASH (water, sanitation, and hygiene) infrastructure or proper housing. Without sufficient water and waste management, water contaminated with feces and urine is common.²² Agricultural and animal antibiotic runoff further exacerbates resistance in water-borne pathogens.²²

In occupational settings, women make up the majority of health care workers, with their work representing 75% of unpaid and 67% of all paid front-line healthcare activities.¹⁸ With a high frequency of exposure to sick patients, front-line health care workers are constantly putting themselves at risk of infection. Despite this high infection risk, women often lack leadership positions with the power to improve working conditions, such as sourcing and providing more inclusive personal protective equipment (PPE) sizes.¹³ Another occupation associated with high risks of infection is sex work. Sex workers are often predominantly represented by women. For example, in Thailand, women make up 62%, transgender individuals make up 25%, and men only make up 13% of all sex workers.⁹ In resource-limited areas or contexts with high gender inequality, sex workers lack the power to negotiate safe sex and condom use, putting them at high risk of contracting drug-resistant gonorrhoea, syphilis, HIV, and other STIs.²²

3.2.2 Resources and agency constrain available AMR-related choices

Insufficient income, education, information, and time all constrain decision-making and lead to worse AMR-related choices. Formal prescriptions and diagnostics at official healthcare institutions are often too expensive or unavailable, leading to self-diagnosis and reliance on informal sources of antimicrobials.^{5,18} Furthermore, the upfront or continued costs of long-term treatment for MDR infections often lead to unfinished treatment and reliance on unofficial antimicrobial sources. In many LMICs, healthcare facilities are heavily concentrated in urban areas, imposing high transportation costs for rural residents to seek official care.⁹

Studies have shown clear associations between education, health literacy, proper navigation of healthcare systems, and safe antimicrobial usage.^{9,23} Literacy and education provide both the resources and agency for individuals to choose, find, and assess care options. Women with lower education and little to no literacy are more likely to fall for misinformation and fail to adhere to treatment, while also being deemed less trustworthy by physicians when they describe their symptoms of illness.²³ Gender inequality in education persists in many LMICs, with boys often favoured over girls for educational opportunities.^{18,20} Notably, even with proper antimicrobial education, awareness, and literacy, severe resource constraints push almost all individuals towards informal and improper usage.²¹

Finally, time is often noted as an underconsidered but crucial resource that constrains AMR-related decisions. Due to the many duties placed upon women, many resort to self-medication rather than take time to seek proper care.¹³ In Nigeria, 24% of women self-medicate antimicrobials to alleviate menstrual cramps, respiratory illness, and other perceived minor ailments, while in Malaysia, this figure is over 80%.^{18,20} Even for other family members, women often quickly obtain antimicrobials from informal clinics to avoid delays.⁹ This is especially true when purchasing for children and the elderly, populations generally perceived as highly vulnerable to infections.²³ For both men and women, travelling to healthcare clinics, taking time off for treatment, and procuring medication took too much time and risked potential income.^{13,23} This vulnerability is deepened for men and women with unstable or informal occupations, ranging from daily labourers and informal workers to temporary migrants.⁵

3.2.3 Norms, stigma and power shape care-seeking and stewardship

The last theme identified diverse contexts and varieties of gender norms and power disparities that shaped health outcomes, care-seeking behaviour, and decision-making power. For many nations, boys may be prioritized over girls for nutrition and medical treatments.²³ This unequal preference often results in malnourishment, higher susceptibility to infection, and substandard treatments for girls.¹³ Norms also constrained health-seeking behaviour, for both men and women. Masculine ideals of strength, self-sufficiency, and resilience would lead to higher risk-taking and delayed treatment.³ Additionally, perceived masculine habits of smoking and drinking increased susceptibility to infection, while also preventing men from seeking diagnosis if they thought treatment would interfere with the continuation of these habits.²¹ For women, norms of modesty and obedience would often reduce their capacity to interact effectively with healthcare services.²³ Women could feel uncomfortable receiving care from male physicians, while norms of obedience prevented them from asking questions or challenging diagnoses.^{3,9,13}

Stigmatization most often resulted in deferred or avoided diagnoses and treatment. For young girls menstruating, stigmas would result in poor and unhygienic period management, creating greater vulnerabilities to vaginal or urinary tract infections (UTIs).²² For young girls in many LMICs, UTIs are also stigmatized as signs of promiscuity and uncleanness, resulting in the usage of informal healthcare providers.¹³ Sex workers, gender-diverse individuals, and people of diverse sexualities avoided treatment due to stigma, shame, or criminalization.^{9,22,25,26} Around half of all Bangladeshi sex workers report feelings of shame when seeking healthcare.⁹

Power disparities heavily impacted agency and decision-making power. Women often require permission or accompaniment by male relatives to receive healthcare, with threats of gender-based violence, stigmatization, and mistreatment used as threats to ensure compliance.^{3,5,17,18,23} In Nigeria, up to 36% of all women did not access healthcare services when ill or pregnant due to not having spousal permission.²⁴ In these situations, the male or senior relative must recognize and acknowledge the woman's illness as serious and worth treatment,

and in many contexts women's health is dismissed as "light diseases" or reduced to only maternal or reproductive health.¹⁸

Finally, norms, stigma, and power manifest in antimicrobial stewardship (AMS) outcomes. Like with the earlier discussion of occupational risk, women typically do not hold healthcare leadership positions that allow them to influence AMS approaches.¹⁸ Female antimicrobial stewards and pharmacists are more likely to have their stewardship recommendations ignored by predominantly male physicians.^{9,21,27} According to Tischendorf et al. (2025), female antimicrobial stewards reported belittlement and verbal harassment from other medical professionals when making recommendations.²⁷ These power disparities in AMS worsen AMR outcomes while decreasing the willingness of women and other vulnerable groups to engage in stewardship efforts.²⁷

3.3 Policy responses in the literature

The separate thematic analysis of policy in the literature identified three main types of interventions. These include empowerment efforts, structural improvements, and context-specific behavioural change to correct gender inequality. Very few interventions challenged issues of hierarchy, power disparity, and stigma in gendered AMR. Notably, different policies targeted various gendered dimensions and provided different levels of specificity.

3.3.1 Structural improvements

Most policy recommendations focused on making structural and material changes. This type of intervention was typically clearest in describing potential approaches, successful examples, and actionable implementation steps. Many articles recommended structural improvements in WASH, IPC (infection prevention and control), and overall healthcare infrastructure.^{5,8,9,17–20} The two most common recommendations were increased educational efforts and more inclusive research. Proposed education and awareness initiatives targeted community members, healthcare workers, and workplaces.^{17,19–21,24,25} Initiatives for more inclusive research typically recommended collecting more disaggregated data, having greater female participation in clinical trials, and developing gender-equity-oriented research funding and research environments.^{3,8–10,17–19,22,25}

3.3.2 Empowerment efforts

Almost all papers recognized how gender creates structural disadvantages that feed into AMR disparity. Only some went on to propose policies and interventions aimed at empowering vulnerable individuals financially, economically, and educationally, targeting the underlying barriers and drivers of gender inequality and AMR.^{5,8,17,20,21} Other empowerment efforts included improving equality of representation in key decision-making bodies,⁸ developing and fostering support networks for women,²⁴ and formally endorsing and legitimizing female AMS efforts.²⁷

3.3.3 Context-specific societal change

Only two papers proposed interventions to challenge gender norms, correct misconceptions, and pursue gender power parity. Furthermore, both merely highlighted the policy gap and the need to develop evidence-based approaches. Specifically, Lynch et al. (2024) and Ngassa Detchaptche et al. (2026) focus on the need to develop programs that can challenge rigid gender norms and correct misconceptions.^{3,9}

3.4 Structured analysis of WHO recommendations

The structured analysis of the WHO recommendations for addressing gender inequalities in AMR found clear alignment between its conceptualization of gender and the gendered dimensions identified in the literature review. Within the 20 recommendations, each gender determinant was targeted at least once. Most guidance was gender-sensitive or gender-responsive, but some had the potential to be gender-transformative approaches to policy, depending on implementation and interpretation by policy-makers.

The report is strongest when it recommends practical guidance on correcting structural failings. Specifically, recommendations 11 to 13 provide strong examples and guidance on how diagnostics, IPC, WASH and healthcare infrastructure can be improved to reduce gender disparities and disproportionate burdens. Recommendation 15 clearly outlines the need for better health insurance, benefit packages, and financial support for vulnerable individuals, accurately recognizing and targeting an underlying factor in improper antimicrobial usage. If, like Recommendations 11, 13, and 15, more recommendations included next steps, past examples, and things to avoid, policy-makers might find it easier to translate guidance into actual policy.

The report requires further expansion when recommending practical guidance on sociocultural failings. Within the 20 recommendations, only Recommendation 6 explicitly states the goal to “actively address harmful gender norms and promote gender equality.”¹⁴ All other recommendations and mentions refer to gender inequality in the context of material and economic contexts. There could have been a more central acknowledgement and addressal of gendered determinants relating to power hierarchies, stigma, discrimination, and decision-making agency.

Finally, while the WHO recommendations on improving data collection and representation are an important first step, these efforts could be expanded upon to address underlying mechanisms driving inequality. Recommendations 1 and 9 focus on collecting disaggregated data in formal healthcare settings to inform policy-makers of disparities and contextual realities when building policies. However, disaggregated data does not automatically provide a complete understanding of AMR realities to inform inclusive policy. Often, clinical data does not capture interactions with informal healthcare or disparities created in sociocultural settings. In Recommendations 4 and 5, the WHO encourages promoting equal participation in AMR decision-making and expert

advising. However, like with the disaggregated data, representation does not automatically mean parity in decision-making. Truly equal participation requires addressing the underlying norms and gender biases that shape present imbalances in power, agency, and respect. For greatest impact, interventions that create environments where women and other vulnerable populations' recommendations are equally considered, valued, and respected should be implemented along with the WHO's 2024 recommendations.

The complete structured analysis of WHO recommendations can be found in the Appendix.

4. Discussion and recommendations

The literature covered in this review shows that the relationship between AMR and gendered determinants is increasingly being studied. The evidence suggests that the various, complex, and interconnected drivers of AMR are inextricably linked to gender inequality.^{5,24} These shifting priorities are being reflected in official WHO guidance, with the 2024 report serving as a key step forward towards building inclusive, global, and sustainable AMR policy.

However, the various social determinants of gender have not been evenly analyzed in relation to AMR. In both the qualitative thematic synthesis and the structured WHO analysis, discussions of access, resources, occupational conditions, and structural realities have greater focus, evidence, and specificity. The most common and comprehensive policy interventions across the literature and the WHO report centre around collecting disaggregated data and improving WASH, IPC, diagnostics, and healthcare infrastructure. However, neither policy sufficiently addresses the other determinants of gender, namely, norms, stigma, discrimination, roles and responsibilities, decision-making agency, and power.

Admittedly, installing better infrastructure and collecting data is likely easier than changing entrenched hierarchies of power and gendered expectations. Nevertheless, these mechanisms interact and build upon each other, and breaking this reinforcing loop of gender inequities and AMR requires creating more comprehensive, inclusive, and sustainable AMR approaches.^{9,24} Even if the accessibility of seeking treatment improves, AMR will continue to worsen if individuals still lack agency to seek care, fear discrimination at clinics, or cannot afford to give up time.

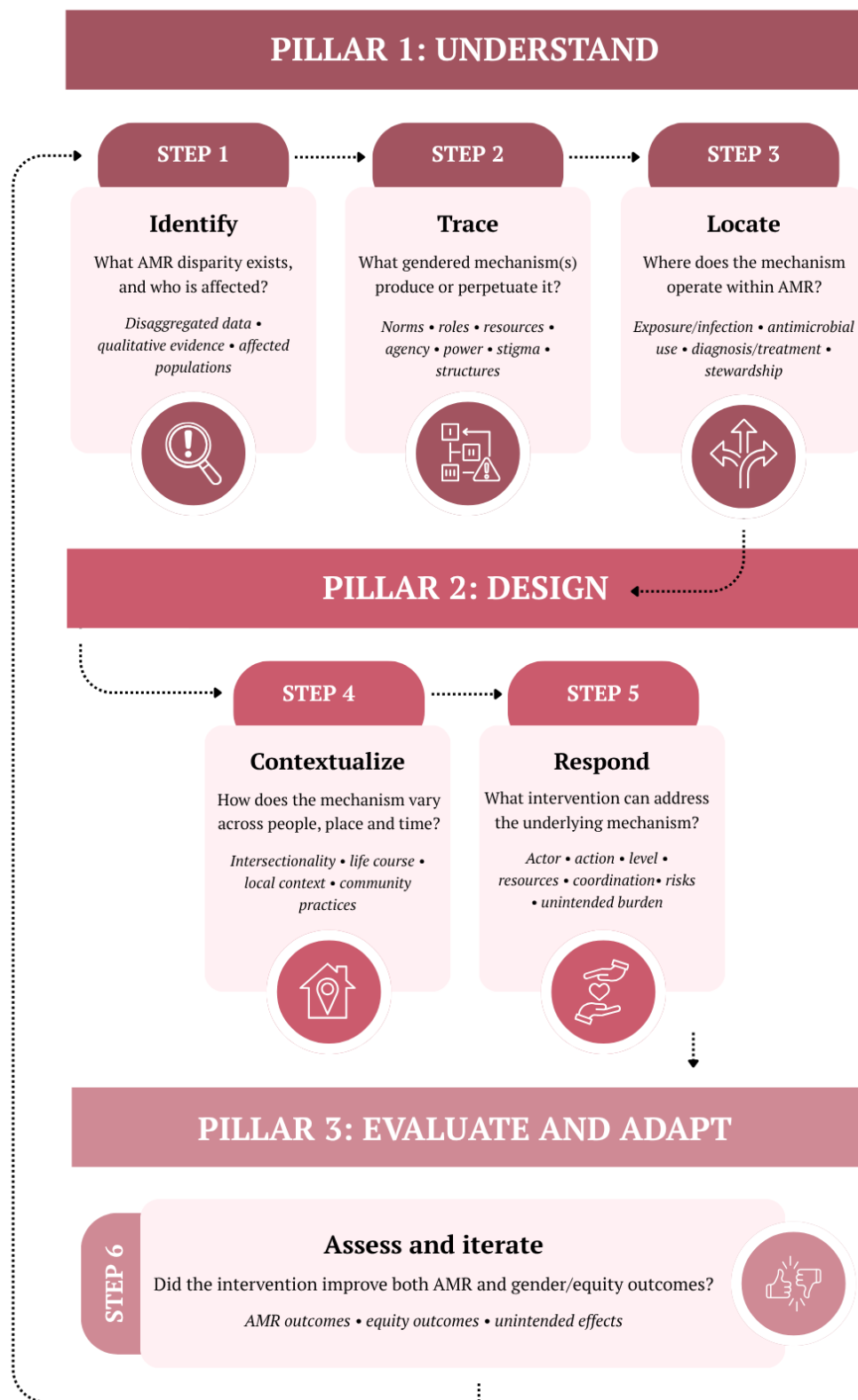
Furthermore, the lack of intersectionality and life-course AMR approaches suggests that they should be more centrally included in discussions of AMR and gender moving forward. AMR disparities share the same patterns, drivers, and barriers with other forms of marginalization and oppression.²⁶ To address AMR inclusively and sustainably, it is crucial to understand the complex underlying risks, power interactions, and overlapping layers of vulnerability that influence AMR in human contexts.^{5,26} Additionally, employing a life-course lens allows

consideration of how AMR manifests, changes, and adapts across individuals' lives. By tracking how gender and other vulnerabilities are repeated, reinforced, or disrupted at various life stages, policy-makers can better understand how AMR drivers evolve and identify optimal points for intervention.

Therefore, AMR policy cannot simply identify a disparity and attempt to address it. It must also understand why the disparity emerged, what underlying mechanisms perpetuate it, and how the interventions can be tailored to a local context. This study proposes a three-pillared framework for building better policy and interventions in response to gendered AMR disparities (Figure 3).

4.1 Proposed framework

Figure 3. Framework for improved AMR policy and interventions



4.2 Recommendations

Existing AMR policy can be improved in three practical ways without requiring substantial change to underlying frameworks, understandings, or assumptions.

Firstly, collecting disaggregated data helps deepen policy-makers' understanding of AMR contexts. However, it is worth reiterating that collecting disaggregated data is only the beginning, with surveillance being primarily used to inform and create better interventions for the future.

Secondly, education and awareness campaigns are also useful, as long as they are used carefully to challenge gendered norms rather than perpetuate stereotypes. For example, awareness campaigns promoting appropriate antimicrobial use for caretakers should avoid only targeting and depicting women in educational materials. Otherwise, the campaign may unintentionally reinforce gendered divisions of roles and responsibilities, while placing greater individual burden on women to address AMR through their individual daily choices.

Thirdly, existing interventions can be expanded to include local, informal, and contextual AMR practices. Rather than focusing primarily on formal healthcare systems, policy-makers should engage with informal and traditional healthcare providers to improve stewardship and data collection. Community consultation and engagement are critical to further understanding of localized beliefs, practices, and misconceptions. While global policy already recognizes the potential for multisectoral coordination in AMR policy, it would be useful to focus more on the value of engaging and collaborating with local leaders, informal organizations, and community networks when designing interventions.

Beyond these practical improvements, this study's overall findings and contribution can be summarized into these five broader recommendations for AMR policy:

1. Rather than only identifying existing disparities, work to understand and address the underlying mechanisms that produce them.
2. Integrate intersectional, equity-oriented, and life-course approaches into policy addressing gendered AMR disparities.
3. Complement expansions to disaggregated AMR data with more qualitative and informal data not captured by official healthcare systems.
4. Research, develop, and evaluate AMR interventions capable of addressing complex social mechanisms (including but not limited to norms, decision-making agency, power hierarchies, stigma, and discrimination).
5. Iteratively evaluate both AMR and gender-equity outcomes to prevent unintended consequences and burdens.

5. Research implications and limitations

5.1 AMR research gaps and future directions

Future AMR research has many important potential directions. Firstly, gendered human AMR experiences should be examined with the One Health concept. Connecting social determinants of AMR with animal husbandry, agriculture, aquaculture, food systems, and the environment raises interesting questions about the interrelated relationship between environmental, sociocultural, and biological AMR drivers. Unfortunately, these discussions were outside of the human and public health scope of this article. Secondly, as noted in the discussion and recommendations, AMR research should focus on and incorporate more sexuality, gender diversity, intersectionality, and life-course considerations. This literature review shows significant gaps in understanding how these concepts interact with AMR to create unique disparities and vulnerabilities.

The most substantial policy direction AMR research needs is developing evidence-based interventions that can challenge and dismantle sociocultural drivers of AMR. Most recent literature clearly recognizes how gender norms, stigma, discrimination, decision-making agency, and power disparity contribute to worsened AMR outcomes. Next steps should include testing approaches that can address these unequal sociocultural realities without unintentionally reinforcing drivers or creating new burdens.

5.2 Study limitations

This study contains several key limitations. A single reviewer conducted the rapid scoping review, which encompasses the search process, screening, extraction, coding, and analysis. This raises the potential for biased interpretations throughout the research process. Additionally, the literature only included English peer-reviewed articles from 2019 to July 2026 from three databases. The search strategy could not capture non-English peer-reviewed articles, earlier approaches to gendered AMR policy, and relevant articles from other sources.

5.3 Notes on variation from proposal

This report slightly differs from the original proposal. The original methodology included a document analysis and comparative assessment of selected NAPs that were updated after the WHO's 2024 report on gender-responsive AMR policy. Because of feasibility constraints in accessing and comparing updated NAPs, the document analysis and comparative assessment had to be removed, and NAPs deprioritized. Therefore, the project was shifted to focus more on the rapid scoping review, with an added focus on proposed policy interventions. The original plan for qualitative analysis was moved to the WHO's report and its recommendations.

6. Conclusion

This study's results show that AMR literature and approaches have been, and continue to be, shifting towards more sociocultural understanding of AMR outcomes and their drivers. Gender has gradually been recognized as a core determinant and concept when assessing AMR. Despite this growing recognition, this review noted inconsistent prioritization and focus in proposed policy interventions addressing the sociocultural determinants of gender disparity. Literature and policy guidance underaddress the norms, stigma, discrimination, decision-making agency, and power disparities, with few concrete, targeted policy recommendations. The proposed three-pillared framework offers one approach to better understanding current AMR disparities and responding with comprehensive, inclusive, and sustainable policy.

As AMR worsens globally, research into new antimicrobials, diagnostic techniques, treatment plans for MDR infections, surveillance, and policy will only become more important. Examining the intersectional and complex factors underlying AMR is more important than ever, especially when considering recent trends of reduced public health budgets, deprioritized DEI initiatives, and rising global tensions.¹⁹ AMR emerges, worsens, and can be mediated by human actions. Future AMR policy guidance and subsequent NAPs must centre sociocultural determinants as much as structural determinants if we hope to break the cyclical and self-perpetuating cycles of AMR and gender inequality globally.

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9. Appendix

9.1 Appendix A - Search strategies

The complete database search strategies used for the rapid scoping review are presented below. Searches were conducted in July 2026.

Table A1. CINAHL search strategy

Concept	Search
Search strategy	TX ("antimicrobial resistance" OR "antibiotic resistance" OR "antibacterial resistance" OR "drug-resistant infection*" OR "multidrug resistant" OR "multi-drug resistant" OR "antimicrobial stewardship") AND TX (gender OR "gender inequ*" OR "gender equal*" OR "gender equit*" OR "gender norm*" OR "gender-responsive" OR "gender responsive" OR "gender-transformative" OR "gender transformative" OR intersectional* OR sexualit* OR "sexual minorit*" OR LGBTQ* OR transgender*)
Limits	Publication date: January 1, 2019 to July 2026 Language: English Peer reviewed

Table A2. PubMed search strategy

Concept	Search
Search strategy	((("antimicrobial resistance" OR "antibiotic resistance" OR "antibacterial resistance" OR "drug-resistant infection*" OR "multidrug resistant" OR "multi-drug resistant" OR "antimicrobial stewardship") AND (gender OR "gender inequ*" OR "gender equal*" OR "gender equit*" OR "gender norm*" OR "gender-responsive" OR "gender responsive" OR "gender-transformative" OR "gender transformative" OR intersectional* OR sexualit* OR "sexual minorit*" OR LGBTQ* OR transgender*))
Limits	Publication date: January 1, 2019 to July 2026 Language: English

Table A3. Scopus search strategy

Concept	Search
Search strategy	TITLE-ABS-KEY("antimicrobial resistance" OR "antibiotic resistance" OR "antibacterial resistance" OR "drug-resistant infection*" OR "multidrug resistant" OR "multi-drug resistant" OR "antimicrobial stewardship") AND TITLE-ABS-KEY(gender OR "gender inequ*" OR "gender equal*" OR "gender equit*" OR "gender norm*" OR "gender-responsive" OR "gender responsive" OR "gender-transformative" OR "gender transformative" OR intersectional* OR sexualit* OR "sexual minorit*" OR LGBTQ* OR transgender*)
Limits	Publication date: January 1, 2019 to July 2026 Language: English

9.2 Appendix B - Analytical codebook

Table B1. Gendered mechanisms codes

Code	Definition
Norms and values	Social expectations, beliefs, ideals, or behavioural norms related to gender
Roles and responsibilities	Gendered allocation of household, caregiving, reproductive, or social responsibilities
Resources	Availability or control of financial, educational, informational, material, or temporal resources
Decision-making and agency	Capacity to make and act upon decisions concerning health, treatment, or antimicrobial use
Power	Unequal authority, influence, hierarchy, or control within interpersonal or institutional relationships
Stigma and discrimination	Stigmatization, exclusion, prejudice, mistreatment, or discriminatory practices related to gender or sexuality
Structural and institutional factors	Broader institutional, economic, political, infrastructural, or systemic conditions shaping AMR experiences
Occupational conditions	Gendered divisions of labour, workplace exposures, protections, hierarchies, or employment conditions
Sexuality and gender identity	Mechanisms related to sexual orientation, sexuality, gender identity, or gender diversity

Table B2. AMR dimensions codes

Code	Definition
Exposure and infection	Factors affecting exposure, infection risk, transmission, or infection prevention
Antimicrobial use	Access to, acquisition of, adherence to, misuse of, or other patterns of antimicrobial use
Diagnosis and treatment	Access to or experiences of diagnosis, formal/informal care, and treatment
Antimicrobial stewardship	Practices, institutions, relationships, or decision-making relating to appropriate antimicrobial use
AMR outcomes	Resistant infection, morbidity, mortality, treatment failure, or other consequences of AMR

Table B3. Policy response codes

Codes	Definition
Surveillance and data	Collection, disaggregation, monitoring, or analysis of AMR and gender-related data
Research	Research priorities, inclusive research practices, clinical research, or evidence generation
Awareness and knowledge	Education, communication, awareness, training, or knowledge-building interventions
Structural and social policy	Changes to social, institutional, infrastructural, economic, or other structural conditions
Resources and access	Improving availability, affordability, accessibility, or distribution of healthcare and other resources
Community/context-specific approaches	Locally tailored, participatory, community-based, or context-specific interventions
Stewardship	Interventions directly supporting appropriate antimicrobial use or stewardship
Laws and regulation	Legislative, regulatory, legal, or formal governance interventions
Policies and NAPs	National or jurisdictional policy plans outlining coordinated strategies, priorities, commitments, or actions for addressing AMR.

9.3 Appendix C - Supplementary qualitative analysis

Figure C1. Dedoose code co-occurrence matrix

Codes	Codes	Norms and values	Stigma and discrimination	Roles and responsibilities	Resources	Access	Decision-making and agency	Power	Structural and institutional factors	Sexuality and gender identity	Occupational conditions	Antimicrobial use	Exposure and infection	Diagnosis and treatment	Antimicrobial stewardship	AMR outcomes	Totals
Norms and values			2	2	1			1			1	3	1	8	2	7	28
Stigma and discrimination				1	2			4	3	3	2	2	3	5	5	1	31
Roles and responsibilities	2			1		1	1					1	6	2	3	2	19
Resources	2	1	1		2	3	1	2			1	14	2	9		3	41
Access	1	2		2				2				4		4		2	17
Decision-making and agency			1	3			3				1	1	1	5	2		17
Power		4	1	1		3					1		2	4	6		22
Structural and institutional factors	1	3		2	2				3		1	4	9	1		8	34
Sexuality and gender identity		3						3					2	1		4	13
Occupational conditions	1	2		1		1	1	1				2	6	1	2	1	19
Antimicrobial use	3	2	1	14	4	1		4			2		3			3	37
Exposure and infection	1	3	6	2		1	2	9	2	2	6	3		1		2	38
Diagnosis and treatment	8	5	2	9	4	5	4	1	1	1			1		1	2	44
Antimicrobial stewardship	2	5	3			2	6				2			1		1	22
AMR outcomes	7	1	2	3	2			8	4	1	3	2	2	2	1		36
Totals	28	31	19	41	17	17	22	34	13	19	37	38	44	22	36		

Figure C2. Dedoose code application matrix

Media	Codes															
	Norms and values	Stigma and discrimination	Roles and responsibilities	Resources	Access	Decision-making and agency	Power	Structural and institutional factors	Sexuality and gender identity	Occupational conditions	Antimicrobial use	Exposure and infection	Diagnosis and treatment	Antimicrobial stewardship	AMR outcomes	Totals
Key Findings.pdf	19	17	13	29	10	8	14	17	8	10	25	25	27	11	20	253
Totals	19	17	13	29	10	8	14	17	8	10	25	25	27	11	20	

9.4 Appendix D - Structured analysis of WHO recommendations

Table D1. Structured analysis of WHO recommendations

Summarized WHO recommendation	Gender dimensions	Gender responsiveness	Practical guidance score (0-2)	Alignment with literature
R1: Disaggregate AMR data	Structural/institutional, Intersectionality	Gender-sensitive	2	Strong alignment, broader gender variables needed, formal healthcare bias
R2: Review existing NAPs for gender equality	Structural/institutional	Gender-sensitive	1	Strong alignment, limited existing gender content in NAPs
R3: Promote gender and AMR research	Structural/institutional	Gender-sensitive	1	Strong alignment, major research gaps, implementation dependent
R4: Promote equal participation in AMR policy and work	Decision-making/agency, Power, Roles/responsibilities	Gender-responsive	1	Strong alignment, representation $\neq$ decision-making power, tokenism risk
R5: Maintain representation of gender experts	Decision-making/agency, Power	Gender-sensitive	1	Partial alignment, expertise useful, tokenism/power limitations
R6: Context-specific awareness addressing harmful norms	Norms/values, Stigma/discrimination, Structural/institutional	Gender-transformative	1	Strong alignment, directly targets norms, limited implementation guidance
R7: Tailor awareness approaches for vulnerable/discriminated groups	Norms/values, Stigma/discrimination, Sexuality/gender identity, Intersectionality	Gender-responsive	1	Strong alignment, context/discrimination recognized, limited implementation guidance
R8: Improve health-worker knowledge through universities/professional associations	Norms/values, Stigma/discrimination, Structural/institutional	Gender-responsive	1	Strong alignment, important institutional actors, limited implementation guidance
R9: Promote reporting of disaggregated surveillance data	Structural/institutional, Intersectionality	Gender-sensitive	1	Strong alignment, broader gender variables needed, formal healthcare bias

Summarized WHO recommendation	Gender dimensions	Gender responsiveness	Practical guidance score (0-2)	Alignment with literature
R10: Improve health-worker knowledge using disaggregated data	Norms/values, Stigma/discrimination, Structural/institutional	Gender-responsive	0	Partial alignment, disaggregation =/= explanation of mechanisms
R11: Invest in diagnostics for infections disproportionately affecting women	Structural/institutional, Resources	Gender-sensitive	2	Strong alignment, overly narrow UTI/reproductive framing
R12: Ensure equitable WASH and waste management	Structural/institutional, Resources, Roles/responsibilities, Occupational conditions	Gender-responsive	2	Strong alignment, WASH/exposure/roles, strong implementation guidance
R13: Reduce gendered risks for healthcare workers	Structural/institutional, Resources, Occupational conditions	Gender-responsive	1	Strong alignment, occupational exposure, limited attention to workplace power
R14: Ensure culturally sensitive and gender-responsive health services	Norms/values, Stigma/discrimination, Resources, Sexuality/gender identity	Gender-responsive	1	Strong alignment, norms/stigma/access recognized, limited operational guidance
R15: Ensure equal access to health insurance/benefit packages	Resources, Decision-making/agency	Gender-responsive	1	Strong alignment, financial/resource barriers, limited implementation guidance
R16: Identify and address inequalities related to substandard antimicrobials	Resources, Structural/institutional	Gender-responsive	1	Strong alignment, affordability/access mechanisms underdeveloped
R17: Update medicine forecasting/procurement using local assessments and sex	Resources	Gender-blind	2	Partial alignment, resource barriers addressed, sex-focused/gender-blind
R18: Review diagnostic services for DRIs for gender inequalities	Structural/institutional	Gender-sensitive	2	Partial alignment, strong service assessment, weak gender-mechanism focus

Summarized WHO recommendation	Gender dimensions	Gender responsiveness	Practical guidance score (0-2)	Alignment with literature
R19: Review prescription audits for gender bias	Stigma/discrimination, Occupational conditions, Power	Gender-responsive	2	Strong alignment, prescribing bias addressed, formal healthcare focus
R20: Assess unintended gender effects of restrictions on OTC sales	Resources, Decision-making/agency, Structural/institutional	Gender-responsive	1	Strong alignment, recognizes unintended inequities, limited implementation guidance