Equity analysis for antimicrobial resistance and antimicrobial use surveillance data

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GEAR up (Gender and Equity in Antimicrobial Resistance) is a consortium of partners funded by the Fleming Fund and led by Liverpool School of Tropical Medicine (UK) in partnership with LVCT Health (Kenya), CeSHHAR (Zimbabwe), UHAS (Ghana), HERD International (Nepal), and JPGSPH (Bangladesh). Our approach is to catalyse action on equity and antimicrobial resistance (AMR) across key areas, including policy, analysis of surveillance data, research, and supporting communities of action. We see these as foundational steps to improve our knowledge and increase awareness of the equity dimensions of AMR, and to guide and inspire action.

The release of WHO's guidance, '*Addressing gender inequalities in national action plans on antimicrobial resistance*',[1] provided an opportunity for GEAR up to translate global recommendations into country-level work. This case study describes how GEAR up worked with Fleming Fund country grantees in Lao PDR, Ghana, Uganda, and Tanzania to undertake sex and age-disaggregated data analysis within AMR and antimicrobial use (AMU) surveillance systems. It takes forward the following recommendation from the WHO guidance[1]:

Recommendation 10
Analyse, interpret and act upon gender-related inequalities identified from disaggregated AMR and AMU data.

The team in discussion

What is the problem/need?

Prescribing practices, antimicrobial access, and patterns of resistance often vary across population groups. Many countries collect AMR and AMU data and share it through participation in the Global Antimicrobial Resistance and Use Surveillance System (GLASS). However, sex, age, and other social stratifiers are inconsistently captured in this data, and rarely analysed and reported. This limits the identification of groups at particular risk of AMR and those most exposed to AMU. National action plans on AMR, therefore, cannot provide targeted responses for specific population groups nor fully support a people-centred approach to addressing gender and social inequities.[2,3]

What steps were taken?

Action 1. Working with country partners, taking steps to analyse AMR and AMU data from an equity lens

GEAR teams and country partners began by identifying available social stratifiers in existing AMR surveillance data, typically sex and age. We mapped data sources such as hospitals and primary care facilities, as each represent different patient population and infection profiles.

We reviewed AMR data by selecting relevant specimen types (e.g., blood, urine, and respiratory samples), and assessing submission patterns across sex and age. We analysed culture results to compare positive, negative, and contaminated specimens and classified isolated pathogens using the WHO GLASS priority list to interpret differences by sex and age.[4]

The analysis then focused on resistance and susceptibility patterns of priority pathogens across sex and age categories. For example, laboratory confirmed urinary tract infections were compared between male and female patients, and across age groups, such as women of childbearing age and other age categories.

To add granularity, specific population groups were compared with broader sex- and age-disaggregated data to identify subgroup differences. Where AMU data were available, these were integrated to determine whether prescribing practices aligned with guidelines and resistance trends, and whether patterns differed across sex, age, or healthcare setting.

Action 2. Developing guidance documents on the steps to analyse AMR and AMU data from equity lens
Following the experience of working with country partners, GEAR up developed a guidance document on analysing bacteriology laboratory and AMU data.[5] This document contains step-by-step explanations of how to analyse AMR and AMU data from an equity lens. This includes:

- Extracting disaggregated data,e.g., sex, age, and location
- Performing analysis to compare relevant aspects of AMR and AMU, e.g., resistance patterns, treatment indications, and quality indicators of prescribing practices
- Interpreting findings in relation to gender and equity, e.g., access to healthcare services and risks of AMR

What are the results?

1. Clearer visibility of gender and equity patterns in AMR and AMU data
Countries identified differences in AMR and AMU patterns across specific population groups that were previously obscured by aggregated reporting. For example, the data suggested that:

- Women of childbearing age in Tanzania and Lao PDR had higher prevalence of microbiology confirmed urinary tract infections in comparison to other age groups
- In data from Lao PDR, one third of surgical antibiotic prophylaxis prescriptions were given to women, with half linked to obstetric and gynaecology procedures

Interpret trends with caution: AMR and AMU data from healthcare facilities may reflect skewed demographics due to differences in disease burden and health-seeking behaviour.

2. Improved technical capacity
Country teams reported improved skills in preparing disaggregated datasets, conducting comparative analyses, and interpreting differences across population groups in AMR and AMU data from an equity lens.

Antibiotic sensitivity and resistance

3. A model for regional and global learning
This experience demonstrate that:

- WHO's recommendations can already be applied to existing datasets, without waiting for further surveillance data collection
- Equity-analysis can lead to peer learning in multicountry collaboration
- The usefulness of transferable guidance and tools for equity analysis of AMR and AMU data

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