Ethiopia's AMR Surveillance and Challenges

2nd Global Networking in Antimicrobial Resistance and Infection Prevention Symposium

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AMR Surveillance ….. Introduction

- AMR continues to be one of the most significant public health threats facing the world today.
- AMR is an increasing threat to global health security that threatens economic, social and political ramifications globally and puts an extra burden on resource-poor countries.

- In Ethiopia, various reports indicated that there are wide practices of misuse of antimicrobials by
  - Health care providers,
  - Unskilled practitioners animal husbandry operation, and
  - Drug users.
- These, coupled with rapid spread of resistant bacteria and inadequate surveillance, contributed to the problem.

- Bacterial infections are the major causes of death in Ethiopia.
- Studies on AMR and bacterial infections have shown that emerging AMR threatens the management of bacterial infections;
- However, the prevention and containment has received thus far too little attention.
- The consequences of these states of affairs include increased mortality, morbidity, costs of treatment, and loss of production in animals (*Drug Administration and Control Authority-DACA, 2009*).

- A five-year baseline Ethiopian survey in 2009 revealed increasing resistance in many pathogens, including ***Streptococcus pneumoniae, Salmonella*** species, and ***Staphylococcus aureus***.
- Some organisms have also shown high level of multidrug resistance (MDR).
- ***Shigella dysentriae***, for example, showed an overall resistance of 31.8% to Chloramphenicol, 43.8% to Cotrimoxazole, 81% to Ampicillin, and 89.5% to Tetracycline over the five-year period (*DACA, 2009*).

- In recognition of this problem, strengthening AMR surveillance system is one of the priority action by FMOH
- In 2015, WHO released the Global Action Plan on Antimicrobial Resistance.

- That same year, the FDRE released a Strategy for the Prevention and Containment of Antimicrobial Resistance for Ethiopia comprises

✓Promotion of optimized use of antimicrobials in human and animal health through effective stewardship practices

✓Strengthening the knowledge and evidence on antimicrobial use and resistance through One Health surveillance and research

- Ethiopia's AMR Surveillance Plan was developed and launched by the EPHI under the FMOH with the support from international partners in 2017.
- The surveillance started in four sites with rapid plan of expansion to additional facilities.

Ethiopia Antimicrobial Resistance Surveillance Plan

The Surveillance of Antimicrobial Resistance Using Public Health Laboratory-Based Sentinel Sites in Ethiopia2016–2020

March 2017

EPHI: National reference laboratory providing clinical testing services to multiple healthcare facilities including St. Paul Hospital and AeBET Hospital

Tikur Anbessa Specialized Hospital: Federal specialized referral hospital serving patients from Addis Ababa and other regions

Amhara Public Health Institute: Regional reference laboratory based in Dessie serving healthcare facilities in the Amhara Region including Dessie Referral Hospital

Ayder Specialized Referral Hospital: Federal specialize referral hospital serving patients in Mekelle. In-house microbiology also conducts testing for Seame Clinic

Figure 1. Approximate location of Phase 1 surveillance sites (stars) — Ethiopia AMR Surveillance System 2017

- GHSA and FMOH joint external evaluation, using the WHO's IHR Joint External Evaluation (JEE) tool, declared that in Ethiopia both the animal and public health sectors have AMR testing capacity.

The priority actions are

1. Strengthen AMR surveillance systems;
    - Increase AMR laboratory capacity,
    - Improve infection prevention and control activities in the health facility,
    - Foster inter-sectoral collaboration, AMR networking and
    - Continuous stakeholder communication,

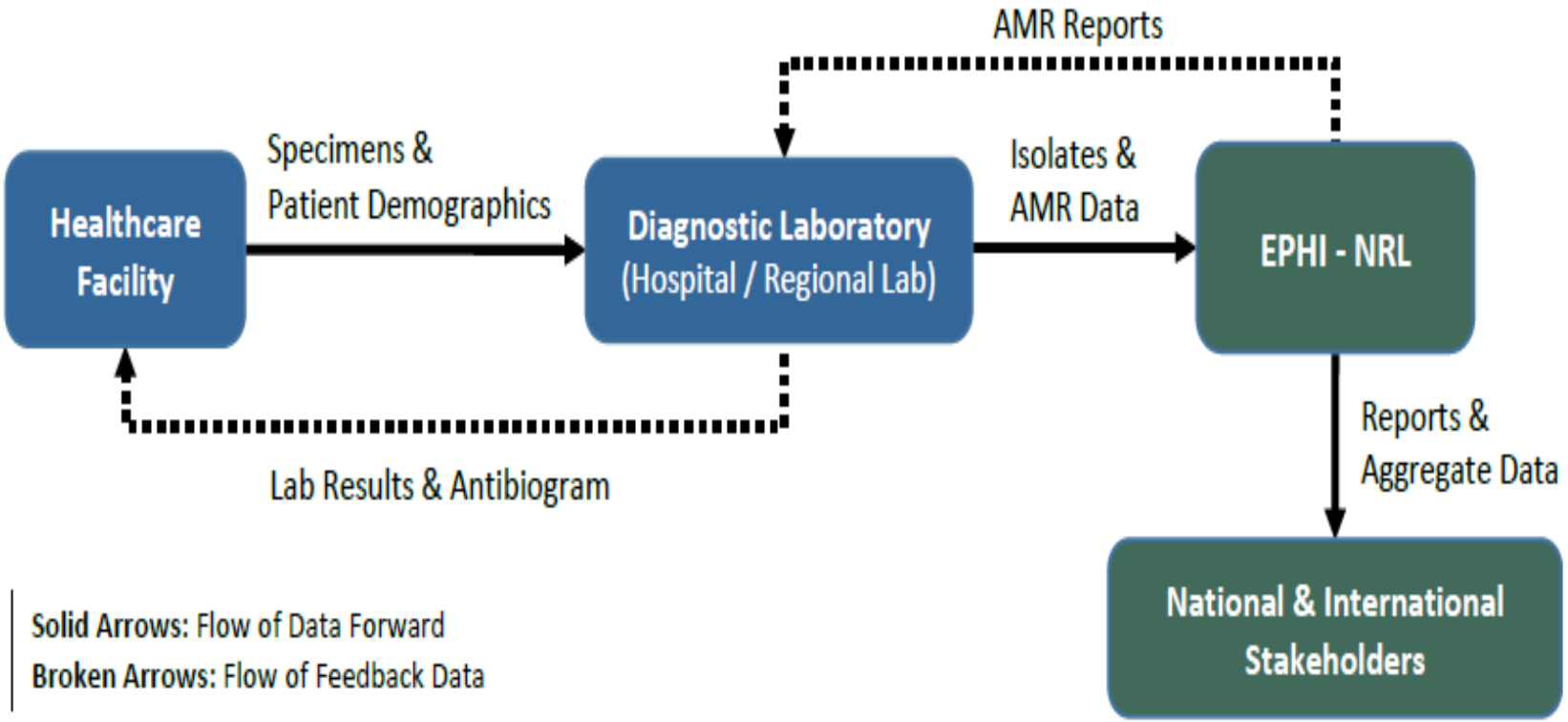
2. Implement an AMR stewardship program within the animal health and public health sectors.

Ethiopian Public Health Laboratory Based AMR Surveillance Plan

The objectives of the present AMR surveillance plan are;

1. Asses and support in building the capacity (antimicrobial susceptibility testing, AST, AMR) of identified AMR surveillance sentinel laboratories
2. Establish a nationwide surveillance network
3. Estimate the extent and burden of priority AMR pathogens
4. Analyze and report national data on a regular bases
5. Detect emerging resistance and characterize national spread
6. Generate evidence to inform the implementation of targeted prevention and control programs
7. Eventually transfer the AMR surveillance data to the national One Health system.

Figure 2. Ethiopian AMR Surveillance System Overview



Major activities AMR surveillance plan

1. Identify and prioritize sites for AMR surveillance
2. Develop and implement manuals, standard operating procedures and forms
3. Standardize antimicrobial susceptibility testing across the network
4. Conduct training
5. Strengthen the laboratory supply chain system
6. Create national and site level databases for AMR
7. Establish systems for the regular reporting of AST results
8. Develop and implement a national repository system for AMR isolates
9. Prepare and disseminate AMR annual reports.

Implementation plan

- Based on existing microbiology laboratories in the country are categorized into three levels:
- Level-1: Laboratory site has microbiologic capability (isolation and identification); AST and EQA participation with enhanced specimen collection and patient clinical data capture.
- Level-2: Laboratory site has microbiologic capability and is regularly performing testing according to established national testing requirements.
- Level-3: Laboratory site has limited microbiologic capability and is not regularly performing AST on patient samples

Figure 3. Number of Urine Specimens Processed by Month, All Healthcare Facilities - Ethiopia AMR Surveillance, March - July 2018

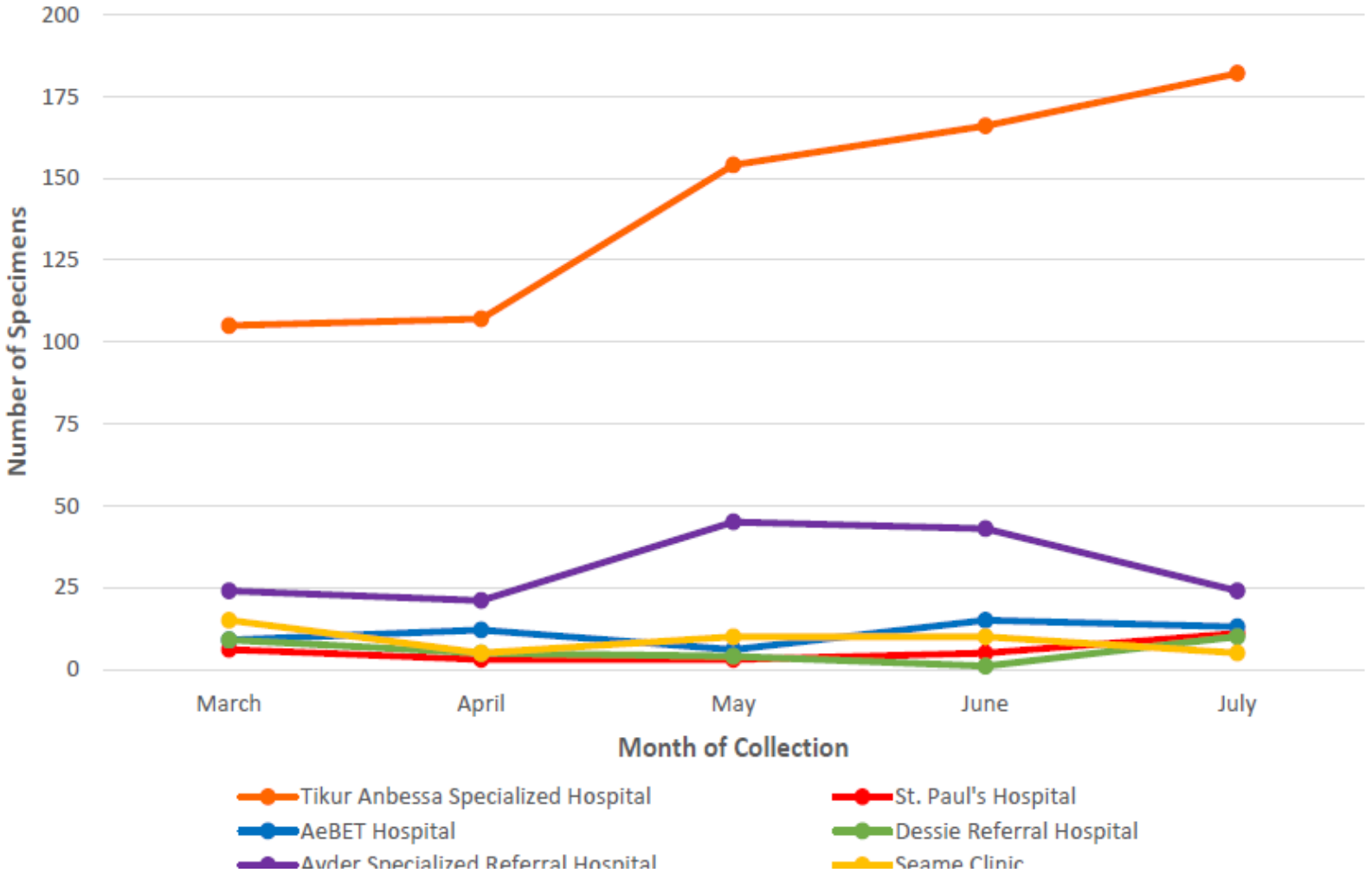
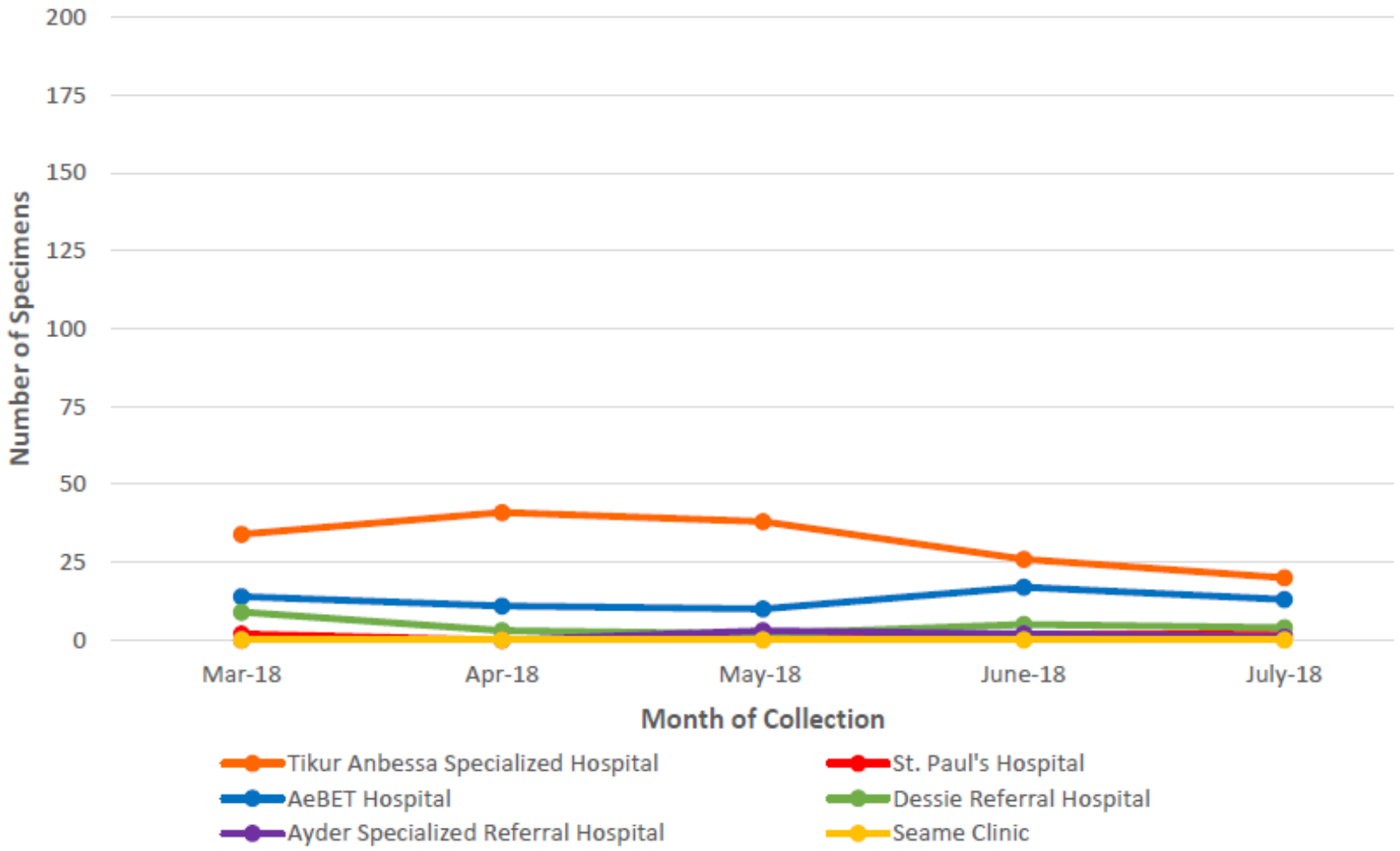
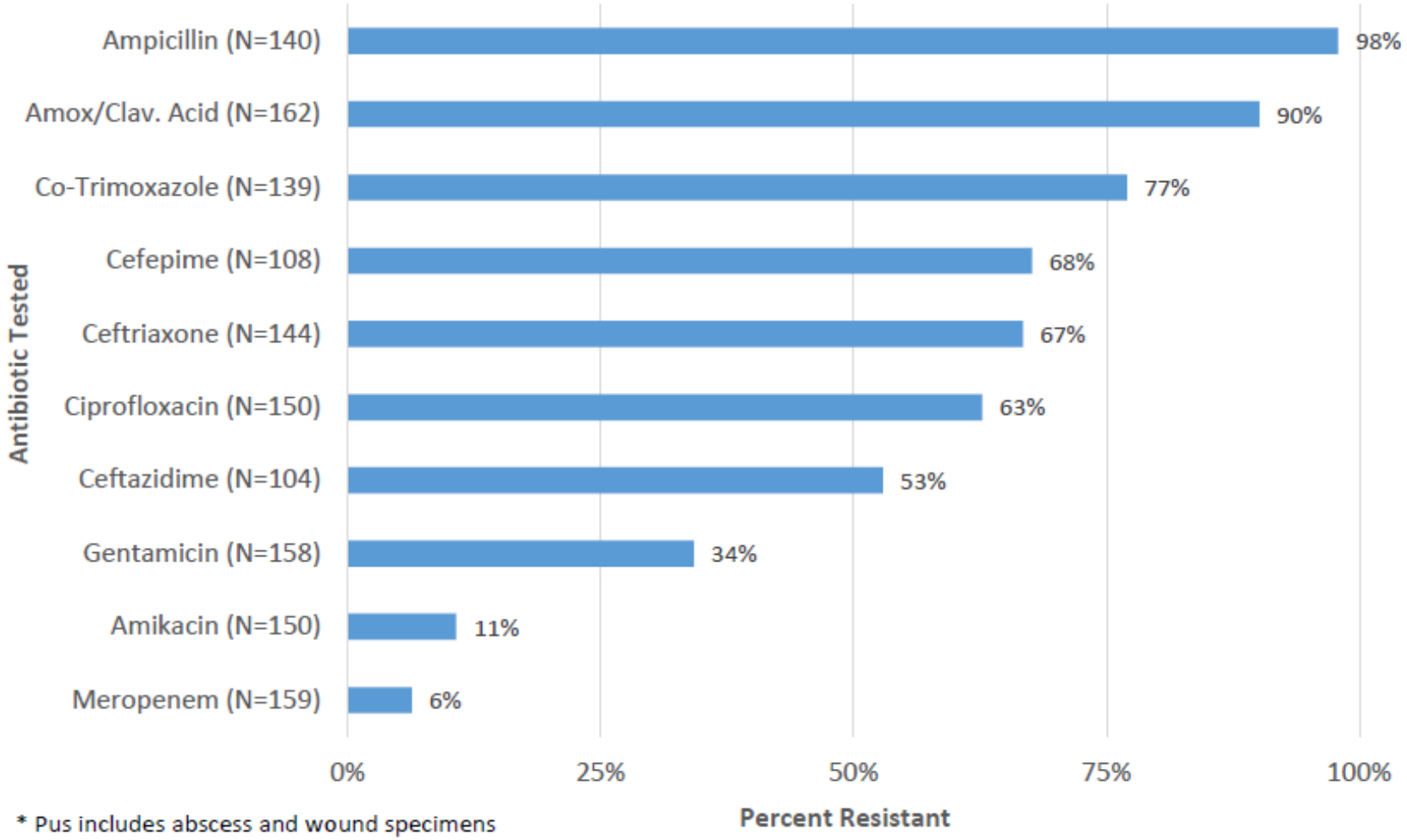


Figure 4. Number of Pus* Specimens Processed by Month, All Healthcare Facilities - Ethiopia AMR Surveillanc
March - July 2018



* Pus includes abscess and wound specimens

Figure 5. Proportion of *E. coli* Isolates (N=184) from Urine and Pus* Showing Resistance by Antibiotic Tested, Tikur Anbessa Specialized Hospital - Ethiopia AMR Surveillance, September 2017 - July 2018



* Pus includes abscess and wound specimens

Challenges

- High staff turn-over and personnel shortages affecting quality of laboratory practices
- Data quality needs to be further assured
- Limited access to quality microbiology laboratory supplies
- Representativeness of system output limited by location and number of samples that are collected

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