EAST, CENTRAL AND SOUTHERN AFRICA HEALTH COMMUNITY

Fostering Regional Cooperation For Better Health

Role of Laboratories in Tracking AMR: East Africa Public Health Laboratory Networking Project

2nd Global Network for Antimicrobial Resistance and Infection Prevention Symposium

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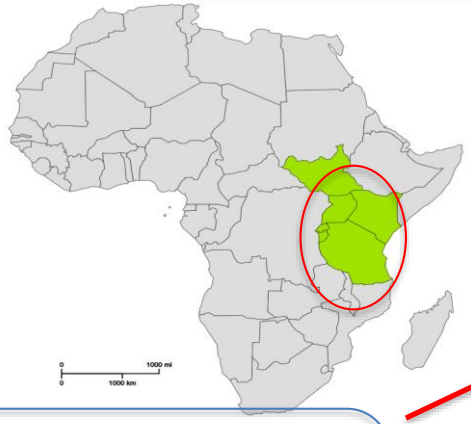
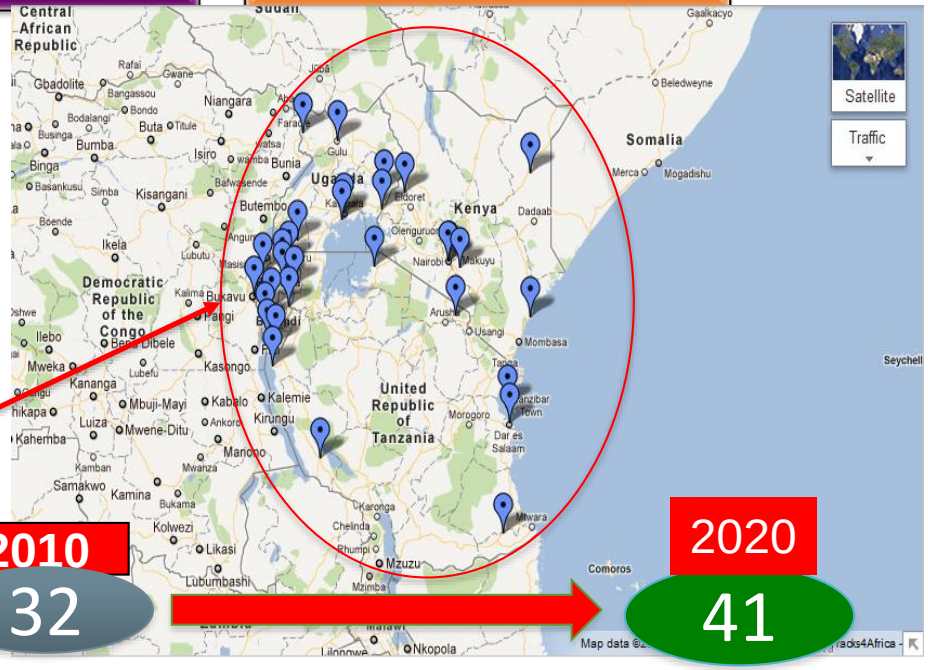
The East Africa Public Health Laboratory Networking project

Establish a network of efficient, high quality, accessible public health laboratories for the diagnosis and surveillance of tuberculosis and other communicable diseases by:

- *Strengthening access to diagnostic services for vulnerable groups*
- *Improving capacity to provide specialized services, and laboratory based disease surveillance*
- *Expanding training and capacity building*
- *Conducting joint research and knowledge sharing*





Majority of laboratories are located in cross border areas to improve access to specialized diagnostic services for vulnerable groups and to contain the spread of diseases across porous borders

2010 — 32

2020 — 41

Project focus and investments

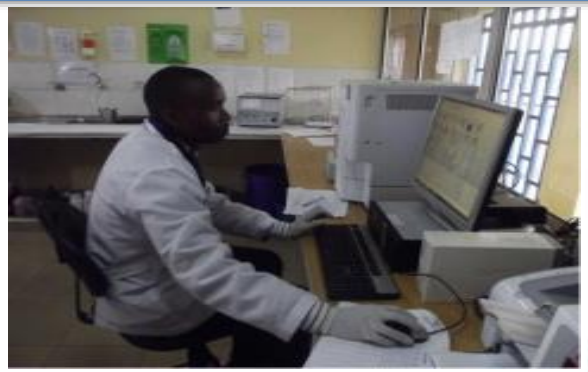
Phase 1 – 2010/2016

- Diagnostics
- Disease surveillance
- Training and Capacity building
- Operational Research
- Knowledge sharing/exchange

Phase 2– 2010/2016

- AMR
- NCD integration (cancer support)

Includes service delivery innovations, knowledge sharing, joint research, and evidence-based approaches



Introduction:

- **AMR in the five EAC member states is of growing concern to policymakers** as basic antibiotics are losing their effectiveness and health systems are ill-equipped to deal with these issues.
  - A study in the region found substantial levels of resistance to antibiotics commonly used to treat enteric pathogens

SUMMARY OF EVIDENCE

1

COMMON AND EMERGING ENTERIC BACTERIAL PATHOGENS CAUSING DIARRHEA AND THEIR ANTIMICROBIAL RESISTANCE PATTERNS IN THE EAST AFRICAN REGION

- The main cause of bacterial diarrhea was pathogenic E.coli at 18% in Uganda and Kenya, followed by shigella at 8% in Kenya, and salmonella at 3% in Kenya.
- Common prescribed antibiotics such as ampicillin and sulphur-trimethoprim showed resistance ranging (88-100%) in Uganda and Kenya.
- Emerging resistance to last options antibiotics such as fluoroquinolones (Ciprofloxacin at 25%-35%) in Uganda and Kenya, and to third generation cephalosporin (Cefotaxime at 15%) in Kenya was noted.

2) Strengthen surveillance and monitoring of antimicrobial agents under the Universal Health Coverage (UHC) guided by the global and national antimicrobial resistance (AMR) action plan.

Table 2
Resistance profiles of enteric pathogenic *Escherichia coli* and *Shigella* to commonly prescribed antibiotics at the network facilities

	Amp % (95% CI)	Chl % (95% CI)	Cip % (95% CI)	Tc % (95% CI)	Nal % (95% CI)	Fur % (95% CI)	Gen % (95% CI)	Ery % (95% CI)	Ctx % (95% CI)	Stx % (95% CI)
E coli										
Kenya (n = 232)	88 (83–92)	25 (19–31)	15 (10–19)	73 (67–79)	29 (23–35)	14 (9–18)	14 (9–18)	86 (81–90)	19 (18–24)	93 (90–96)
Shigella										
Kenya (n = 99)	88 (81–94)	42 (33–52)	26 (18–35)	77 (68–85)	55 (45–64)	23 (15–32)	30 (21–39)	88 (81–94)	21 (13–29)	89 (83–95)
Rwanda (n = 82)	67 (57–77)	—	—	76 (67–85)	4 (0–8)	—	—	—	—	61 (50–72)

Abbreviations: Amp, ampicillin; Chl, chloramphenicol; Cip, ciprofloxacin; Ctx, cefotaxime; Ery, erythromycin; Fur, furazolidone; Gen, gentamicin; Nal, nalidixic acid; Stx, sulfamethoxazole; Tc, tetracycline.

2 Efficacy of artemether-lumefantrine and dihydroartemisinin-piperaquine in treatment of uncomplicated *Plasmodium falciparum* malaria

Table 3
Adequate clinical and parasitologic response to dihydroartemisinin-piperaquine and artemether-lumefantrine at day 42

Country (ITT Population)	Arm A % (95% CI)	Arm B % (95% CI)	Expected (%)
Kenya	77 (72.2–81.3)	68 (62.0–72.5)	>90
Rwanda	83 (77.8–87.2)	78 (72.4–82.7)	
Tanzania	79.1 (73.5–83.9)	56.3 (49.9–62.4)	
Overall	79.7 (76.9–82.4)	67.5 (55.7–79.4)	

SUMMARY OF EVIDENCE

Both AL and DHAP are still efficacious, Kenya (64% AL ,75% DHAP, Uganda (51.3%AL , DHAP 71.2%,) and Tanzania (50% AL),76.5% DHAP) although below the WHO threshold of adequate clinical and parasitological response of 95%.In Kenya ,cases of early treatment have been reported and there has been emerging trend of early recurrences during the study period.

More ever, molecular information from the Ugandan study is showing some evidence of the emergence of resistance markers in circulation of 2.2% (AL) and 1.1 % (DHAP) though this is still below the 5% threshold required for policy change.

Building Cross-Country Networks for Laboratory Capacity and Improvement

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POLICY OPTIONS

1) Prioritize and strengthen malaria surveillance and routine antimalarial drug efficacy monitoring within the AMR regional strategy

Introduction: Laboratories in East Africa

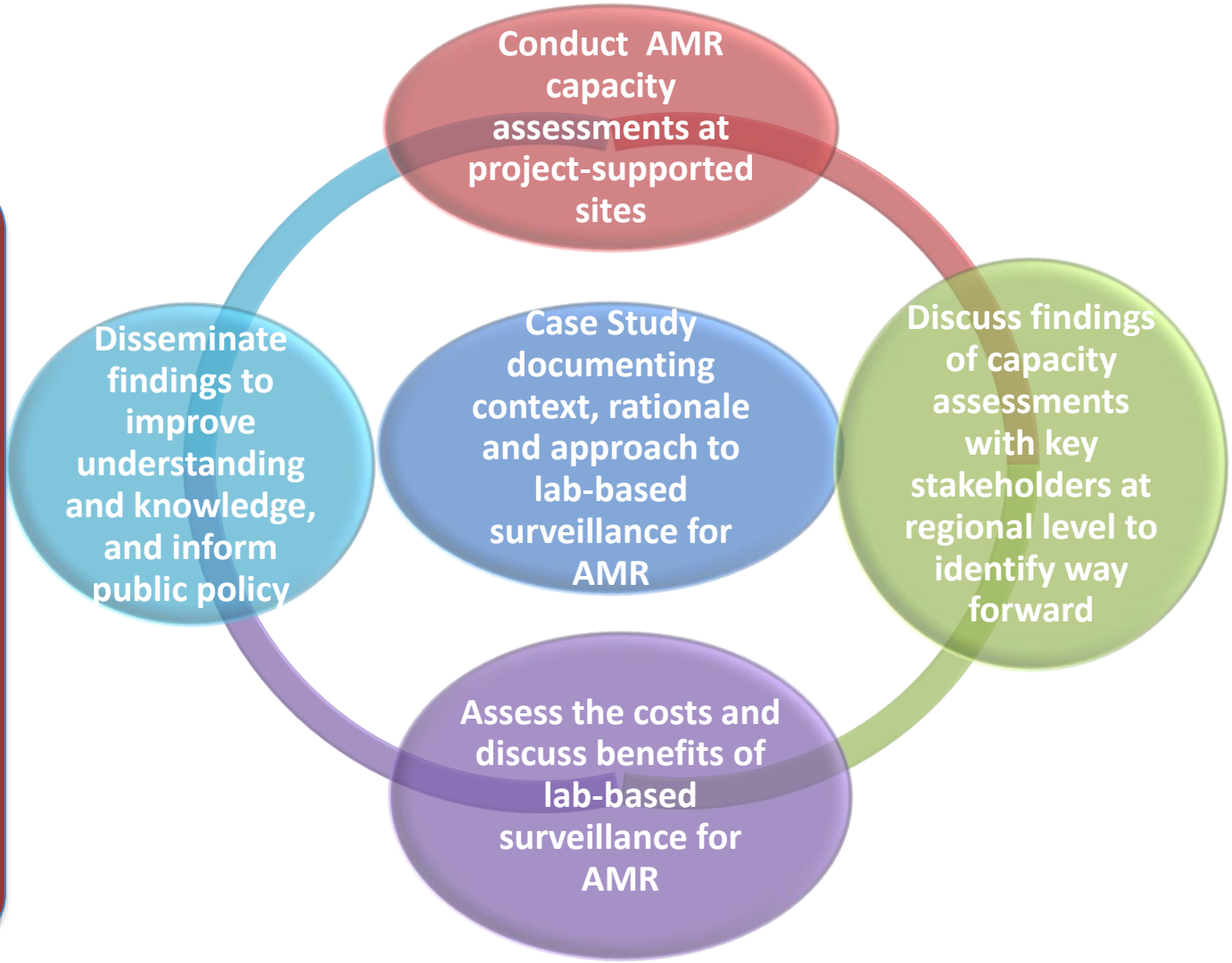
- **Initiatives are underway to establish national AMR surveillance systems** with the support of several partners (WHO, CDC), in line with the AMR Global Action Plan.

- **WHO's Global AMR Surveillance System (GLASS) is enrolling countries**; this represents an important opportunity to access technical support toward building surveillance systems.

- **Investments under the World Bank-funded regional project have been/may be leveraged for rolling out AMR surveillance,** as these facilities have benefited from physical upgrading, training, mentoring, and introduction of quality laboratory systems towards accreditation.

Support for Laboratory-Based Surveillance of AMR

Capacity assessment/ for AMR surveillance - case study

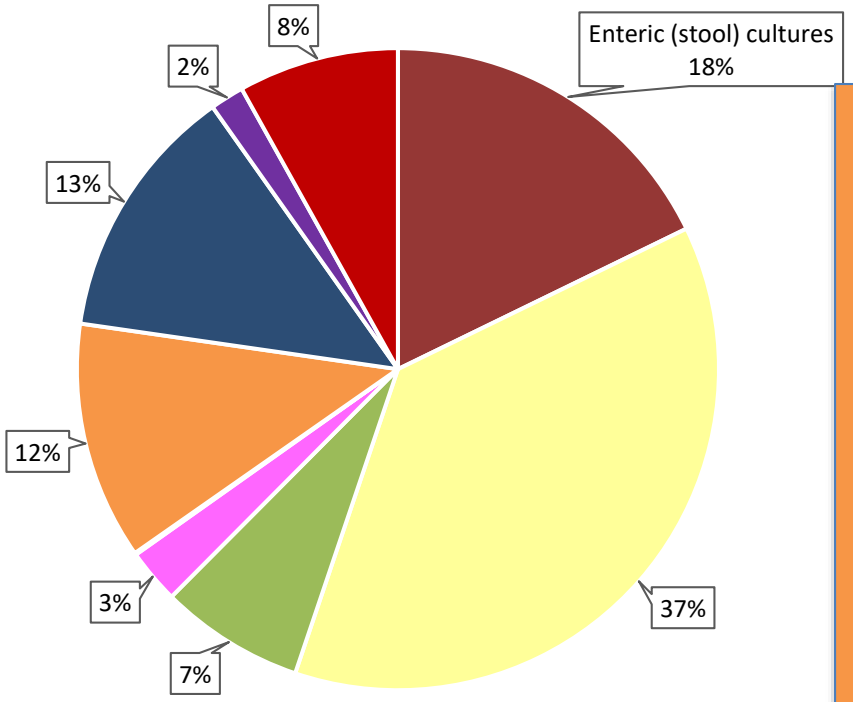


Purpose: Identify gaps and areas of support/intervention to strengthen AMR surveillance & Contribute to a broader report (Drug Resistant Infection: A threat to our Economic future)

Data Collection:
Assessing AMR capacities at national and district levels

- Conducted AMR capacity assessments at 30 sites using facility questionnaires and structured informant interviews. The assessments covered:
  - **Laboratory capacity**
    - Infrastructure
    - Equipment and supplies
    - Human resources
  - **Antibiotic susceptibility testing (AST) capacity and practice**
    - Standard operating procedures (SOPs) and guidelines
    - Quality assurance and control
    - Inventory of ASTs conducted by the labs
  - **Capacity to interpret, use, and disseminate results**
    - Database and specialized software
  - Cost estimates of running an AMR surveillance program

Specimen types processed the EAPHLN district laboratories in 2015/2016



- **Most EAPHLNP facilities culture isolates from some clinical specimens** (e.g. fecal, urine, genital specimen, wound aspirates, and cerebrospinal fluid), but ONLY A FEW satellite laboratories culture isolates from blood.
- Additional training AND supplies are needed to support blood culture in most laboratories.

- Enteric (stool) cultures
- Wound cultures (biopsies, aspirates)
- Sputum cultures
- Cerebrospinal fluid
- Blood cultures
- Urine cultures
- Respiratory (throat, nasopharynx etc)
- Genital (cervical, urethral) cultures
- Other body fluids/aspirates (joint, ascites)

Key issues

- **Most countries in East Africa were an early stage of establishing National AMR surveillance systems**. Limited progress in the implementation of other aspects of NAPs.
- **Laboratories are doing limited AST for clinical care** but have interest and potential to do so with additional support.
- **Facilities had the necessary physical infrastructure and basic equipment for conducting culture and AST**
- **Nevertheless, utilization of bacteriology services remains low** due to:
  - Frequent stock outs of reagents and other consumables;
  - Prescriber concerns over the reliability of results; and/or
  - Inadequate capacity to perform blood cultures needed for life-threatening infections.

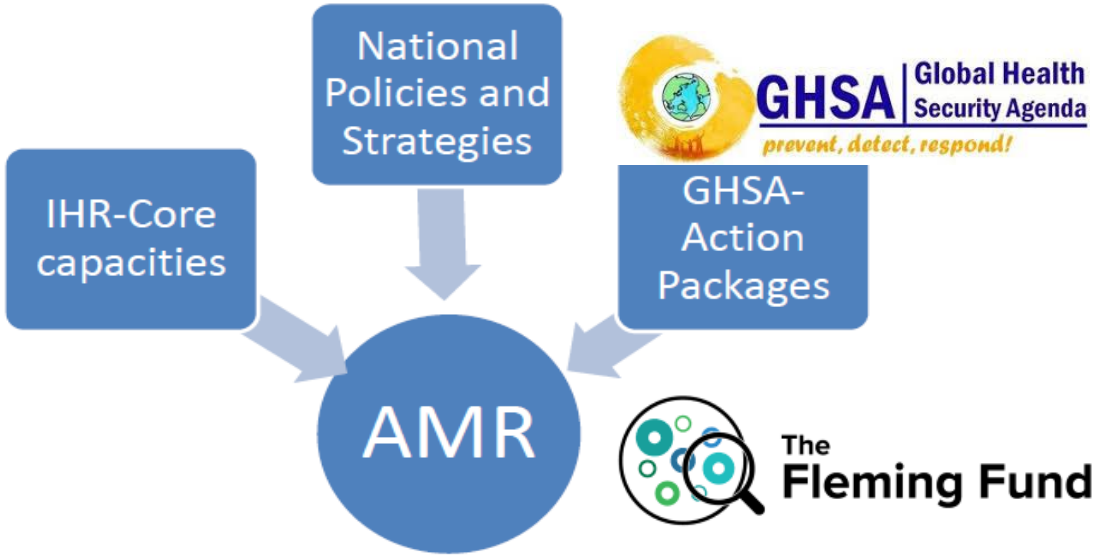
- **Qualified clinical pathologists are in short supply** in East Africa. None of the satellite laboratories had one.

- **Challenge with regular access to up-to-date standards** (e.g., Clinical Laboratory Standards Institute, CLSI) **and Proficiency testing (EQA) materials** which are needed for reliable AST.

Costs of AMR Surveillance

- **AMR surveillance activities are built upon an existing network of laboratories**.
- **Costs attributable to surveillance include**:
  - A principal investigator/administrator for the network
  - Training laboratory staff to enter AST results (or import them from an existing laboratory information system), produce monthly reports for the hospital or local facilities, and transmit data regularly to the national network
  - Computer with WHONET* (or other appropriate) software for each laboratory
    - WHONET is a free data management software developed specifically for managing and analyzing AST results.
- **Based on current expenses in Kenya, establishing and running an AMR surveillance network with eight satellite (or county) laboratories would cost about $160,000 USD per year**. *This estimate does not include any costs of bringing the laboratories up to acceptable clinical standards.*

Actions/Interventions: Policy actions



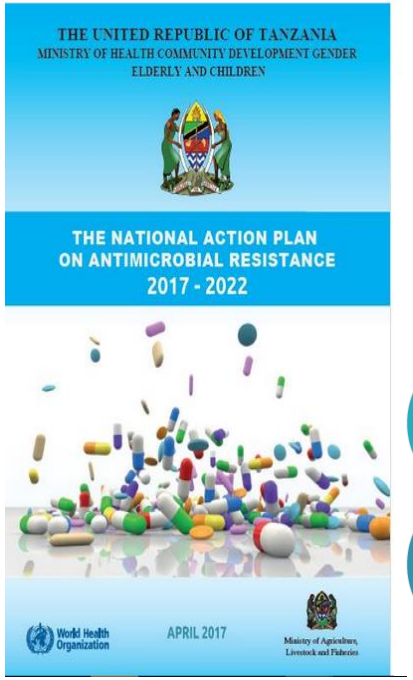
Resolutions of the 67th Ministers Conference

Urges the Member States to:-

- **ECSA/HMC65/R2 (2018)** urging Member states to develop and/or strengthen multisectoral National Action Plans on AMR in line with the Global Action Plan;

Direct the Secretariat to: -

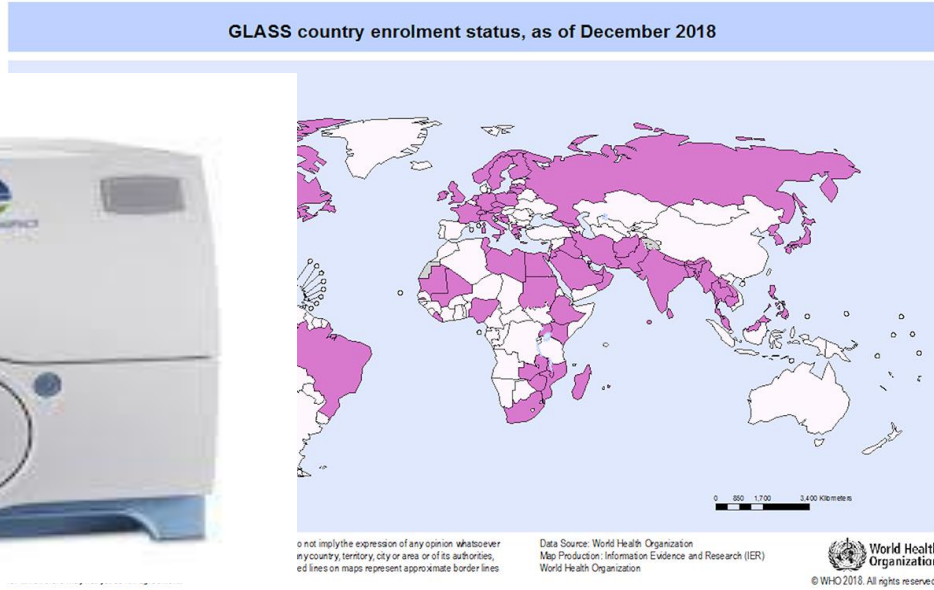
1. Support the Member States to implement the above resolutions.
2. Mobilize resources to support the Member States to implement the NAPs on AMR.
3. Facilitate knowledge sharing on implementation of AMR strategies, best practices and data on resistance to inform countries and cross-border interventions among the Member States.



Interventions: technical actions

AMR surveillance

- AMR surveillance strategies
- Selection of laboratories
- Reagents and supplies
- EQA and Standard QC organisms
- Standard guidelines (CLSI)…?EUCAST
- Training (mentoring staff) – onsite, virtual support (zoom/ECHO)
- Database – LIMS
- Quality management systems and accreditation



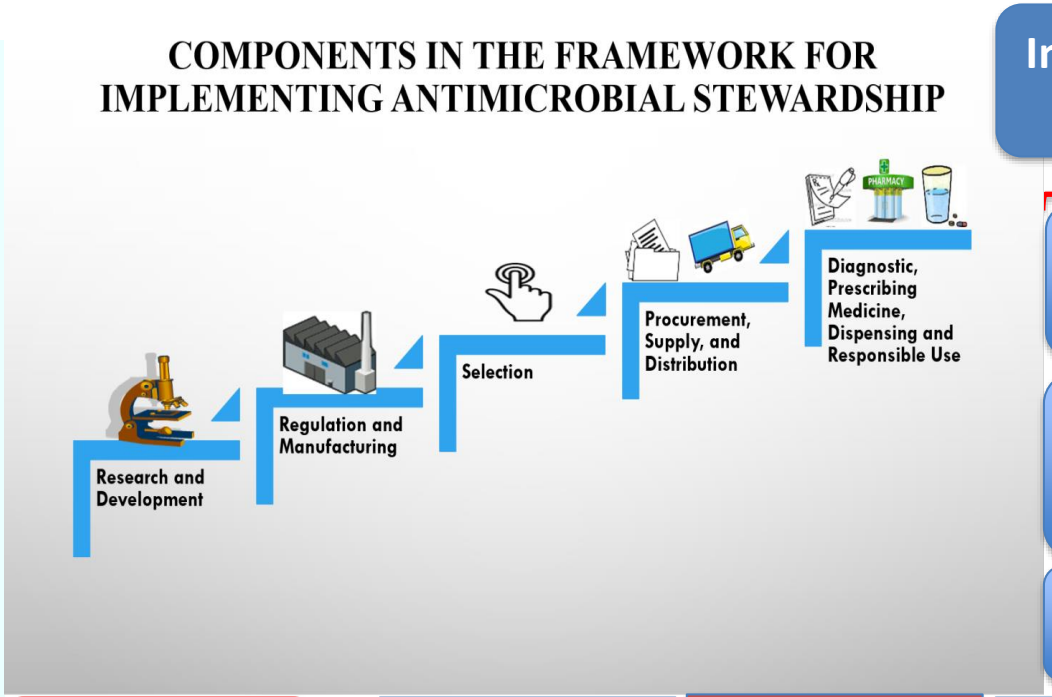
Interventions: technical actions

AMR Stewardship

Regional Guidance document for the development and implementation of Antimicrobial Resistance Stewardship programs

1st Edition

Draft 2



Implementation level

Admin level

Acute care/ Health service level

Community level

Core Elements of AMS Program

- Leadership Commitment
- Governance Structures
- Accountability and Drug Expertise
- Reporting
- Education and Training
- Communication

Next Steps

- Continue enhancing the laboratory capacities to effectively support the AMR surveillance programs in the hospitals –
  - roll out to more laboratories

- Finalize and roll out AMR stewardship guidance document for use by countries to strengthen their programs. *Enhance/interphase stewardship in animal health*

- Identify other critical areas of AMR NAPs for support in collaboration with other stakeholders

Acknowledgements

Thank you