ASLM
AFRICAN SOCIETY FOR LABORATORY MEDICINE

ADVANCING THE LABORATORY PROFESSION AND NETWORKS IN AFRICA

ANTIMICROBIAL RESISTANCE (AMR) COMMUNITY OF PRACTICE (CoP)

Optimising the use of antimicrobial medicines based on antimicrobial resistance surveillance data in Tanzania

Prof. Jeremiah Seni

Catholic University of Health and Allied Sciences & Bugando Medical Center, Mwanza, Tanzania

National Chairperson – AMS TWG & Member of MCC, Tanzania

Reuben Abednego

National Public Health Laboratory, Dar Es Salaam, Tanzania

GLASS Focal Person, Tanzania

EQuAFRICA
External Quality Assessment for AMR Testing

28th October 2022

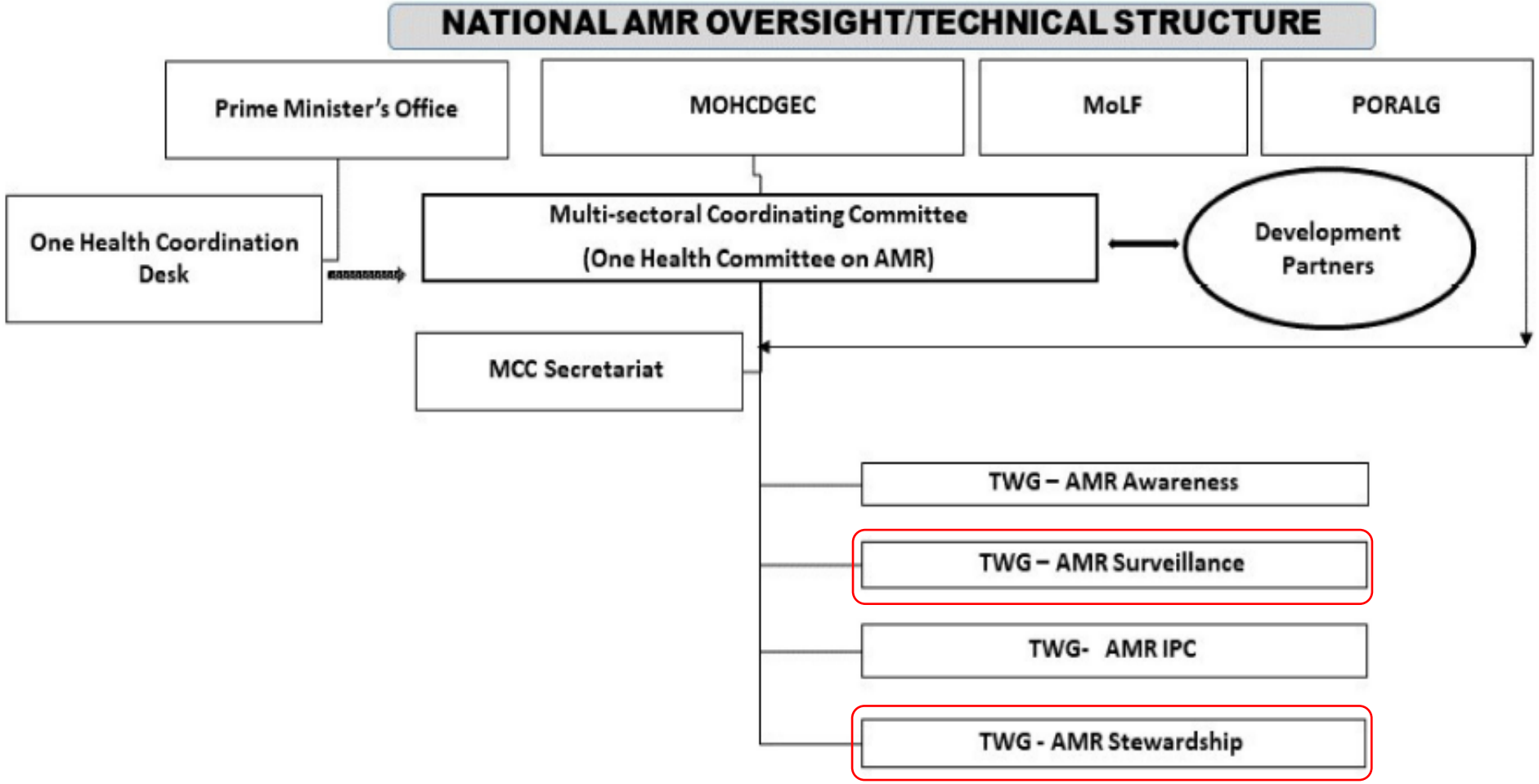
UKaid
from the British people

The Fleming Fund

Outlines

- Tanzania NAP-AMR overview
- NAP-AMR milestones
- NAP-AMR implementation status
    - ✓ Antimicrobial stewardship
    - ✓ Antimicrobial surveillance
    - ✓ From AMR surveillance to optimal use of antimicrobials
- Success stories and Challenges

Tanzania NAP – AMR Overview



Mdegela et al., 2021 Apr 16;10(4):454. doi: 10.3390/antibiotics10040454.

Tanzania NAP – AMR Overview

STRATEGIC OBJECTIVES:

1. Create Awareness and Understanding of Antimicrobial Resistance through Effective Information, Education and Communication
2. Strengthen the Knowledge and Evidence Based through Surveillance and Research
3. Reduce the Incidence of Infection through Effective Sanitation, Hygiene and Infection Prevention Measures
4. Optimize the Use of Antimicrobial Agents in Human and Animal Health
5. Develop the Economic Case for Sustainable Investment that Takes Account of the Needs of all Countries and to Increase Investment in New Medicines, Diagnostic Tools, Vaccines and other Interventions

Tanzania NAP – AMR Milestones

2015

Global Antimicrobial Resistance Partnership (GARP) Tanzania Working Group Situational analysis

2016

Joint external evaluation (JEE) report

2017

National Action Plan on Antimicrobial Resistance (NAP- AMR) launched + Multisectoral Coordinating Committee & 4 Technical Working Groups

2017 & 2019

Enrollment in Global antimicrobial resistance and use surveillance system (GLASS)

2017-2020

Submitted yearly National AMC data to GLASS

2018-2021

Conducted WHO Point Prevalence Surveys in 16 hospitals (2018-2020)

2018-2022

Tripartite AMR Country Self-Assessment Survey (TrACSS),

2020-2021

Submitted AMR data to GLASS

2021

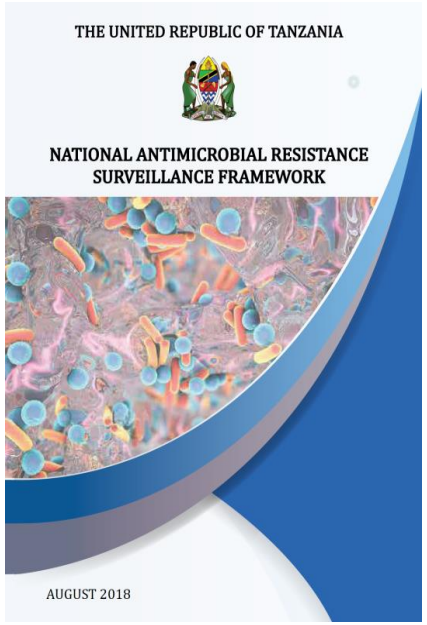
Standard Treatment Guidelines and National Essential Medicines List (STG/NEMLIT) 2021 edition included AWaRe categorization

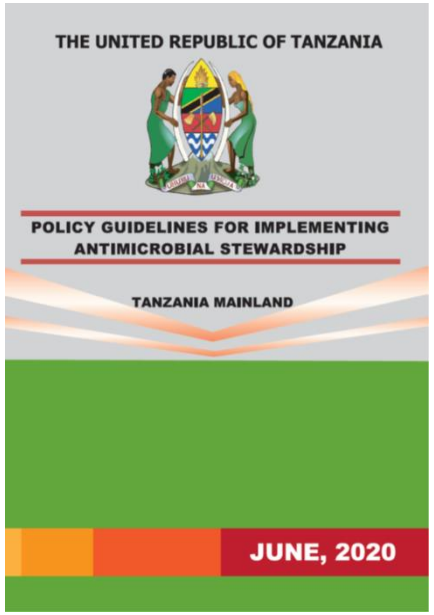
2022

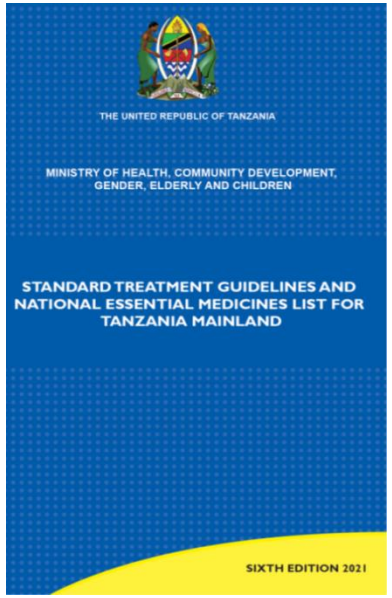
Standard Treatment Guidelines for Animal Diseases

Antimicrobial stewardship implementation status

Tanzania AWaRe group classification	Number of antibiotics
Access	19
Watch	15
Reserve	8
Total	42



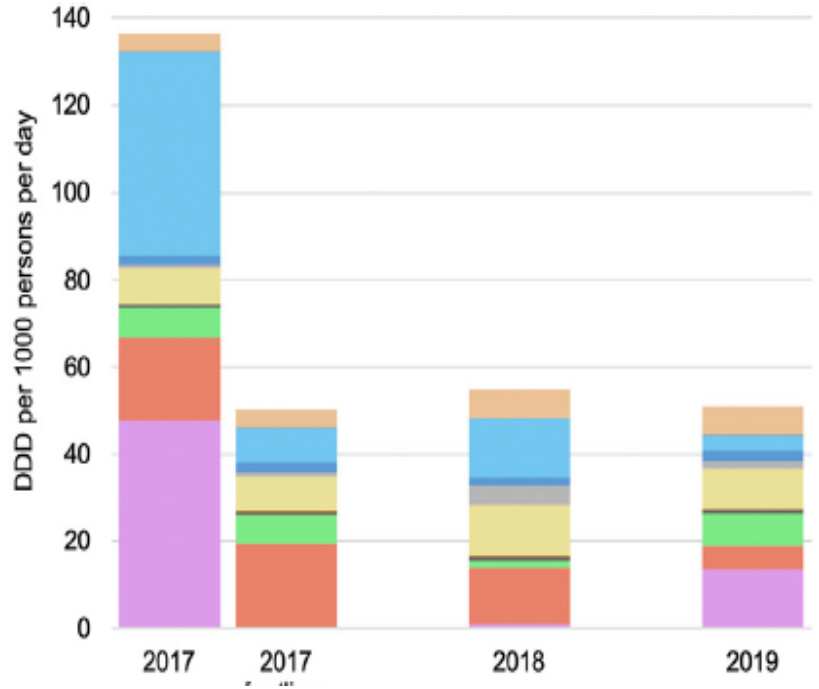




Tanzania participated in the Regional Consultation Workshop to rollout the WHO Policy Guidance on Integrated AMS activities in human health, 27 – 28 July 2021

National Consumption of Antimicrobials in Tanzania: 2017 - 2019

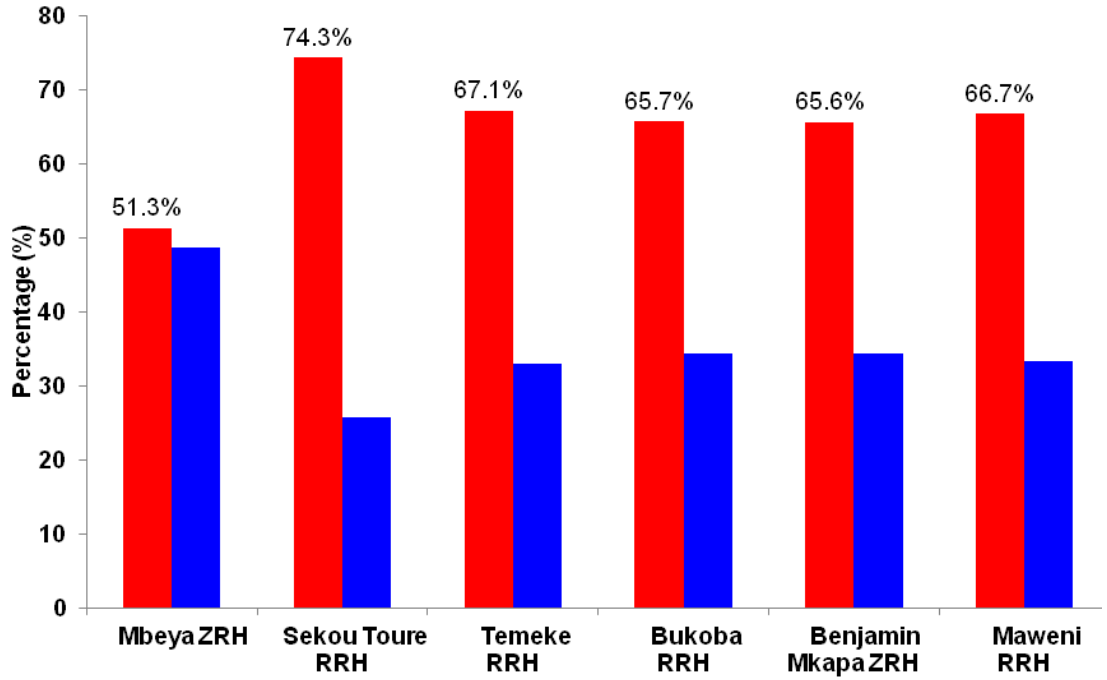
- Antimicrobial consumption is expressed as the number of Defined Daily Doses (DDD) per 1000 inhabitants per day.
- In Tanzania, antimicrobial importation data are obtained from the TMDA and purchasing data are obtained from MSD and local manufacturers



- ✓ Overall DDD DDD per 1,000 inhabitants per day for all antimicrobials was 80.8 ± 39.35, and decreased from 2017 to 2019.
- ✓ Access group of antibiotics dominated (penicillins, tetracycline & TMP-SXT)

Mbwasi et al., Front Pharmacol. 2020 Oct 30;11:585553. doi: 10.3389/fphar.2020.585553.

Optimization of the used of antimcirobial agents throgh AMS programs: WHO-PPS in Six Regional Referral Hospitals



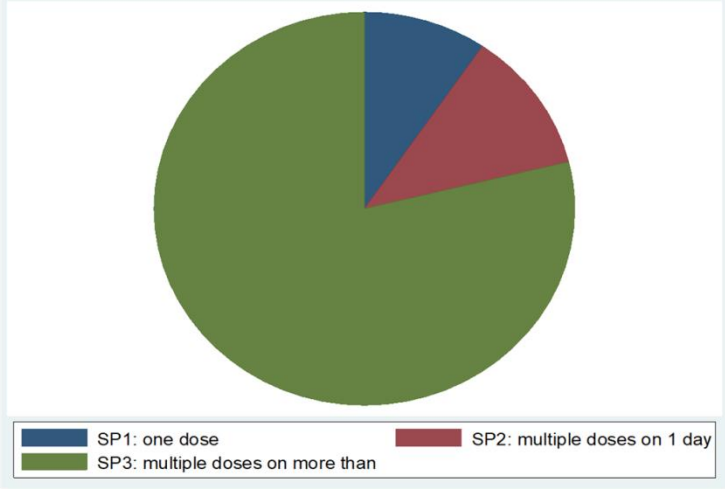
- Approx 62.3% of admitted patients were prescribed antibiotics in this PPS (esp in children and surgical patients)
- STG/NEMLIT adherence on prescribing antibiotic was 84.0%
- Antimicrobial therapies guided by laboratory results were surprisingly low !

Prescriptions by AWaRe	Hospital						
	Bukoba RRH, n (%)	BMK ZRH, n (%)	Maweni RRH, n (%)	Mbeya ZRH, n (%)	Sekou Toure RRH, n (%)	Temeke RRH, n (%)	Total, n (%)
Access	131 (99.2)	66(97.0)	63 (96.9)	289 (97.6)	235 (97.1)	208 (99.0)	992 (97.9)
Watch	1 (0.8)	1 (1.5)	2 (3.1)	5 (1.7)	7 (2.9)	2 (1.0)	18 (1.8)
Reserve	0 (0.0)	1 (1.5)	0 (0.0)	2 (0.7)	0 (0.0)	0 (0.0)	3 (0.3)
Total	132 (100.0)	68 (100.0	65 (100.0)	296 (100.0)	242 (100.0)	210 (100.0)	1,013 (100.0)

Seni et al., 2020; BMJ Open. DOI 10.1136/bmjopen-2020-042819 (accepted)

Preliminary Findings on the WHO-Tanzania Ministry of Health Point Prevalence Survey – 2022

- Included patients 592 (59.0% female; 41.0% male)
- Dodoma Regional Referral Hospital (n=194), Mwananyamala Regional Referral Hospital (n=138), and Muhimbili National Hospital (n=260).
  - ✓ Patients on antibiotic were 69.6% (18% encountered one antibiotic, 59% two antibiotics, 16% three antibiotics, 7% ≥four antibiotics
  - ✓ **Culture and sensitivity 7.3% (N=592)**



Surgical Prophylaxis

AMR surveillance annual report (January – December 2021

- From **January to December 2021**, a total of **30,295 samples** were recorded in WHONET at the National Public Health Laboratory from 9 sentinel sites (versus **8999 samples** from **July to December 2020**):
  - ✓ Male: 15,566 (51.4%)
  - ✓ Children <5y: 10074 (33.3%)
  - ✓ Urine: 13,767 (45.44%) & Blood: 16,529 (54.6%)

- Of these samples, 1,022 (7.4%) urine samples and 2,119 (12.8%) blood samples were excluded because of repetitions and/or contamination

- **Therefore, the proportion of UTI and BSI were 27.4% and 16.0%, respectively**

AMR surveillance in Tanzania

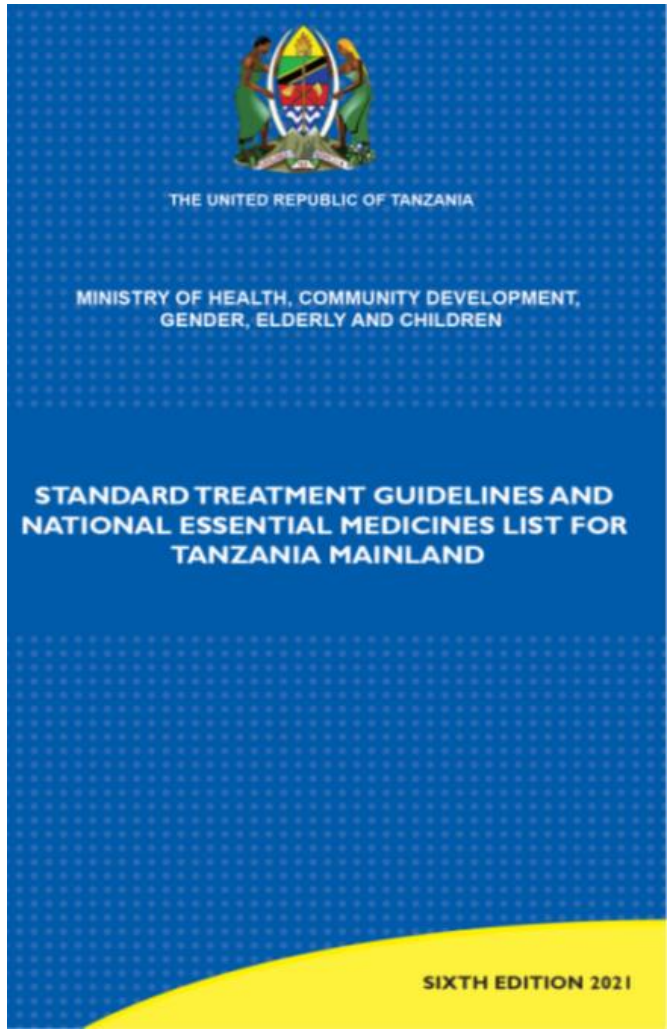
Hospital	July – December 2020				January – December 2021			
	Blood		Urine		Blood		Urine	
	N	%	N	%	N	%	N	%
Bugando	2369	48.9	2317	47.8	5398	37.5	5225	41.5
MNH	857	17.7	1069	22.1	3398	23.6	2060	16.4
KCMC	1271	26.2	751	15.5	3157	21.9	1681	13.4
Mbeya ZRH	99	2.0	221	4.6	722	5.0	682	5.4
MMH-Zanzibar	NA	NA	NA	NA	360	2.5	728	5.8
BMH	117	2.4	299	6.2	810	5.6	1255	10.0
Maweni RRH	44	0.9	63	1.3	254	1.8	527	4.2
Temeke RRH	16	0.3	1	0.0	59	0.4	157	1.2
Morogoro RRH	73	1.5	123	2.5	252	1.7	275	2.2
Total	**4846**	**100.0**	**4844**	**100.0**	**14410**	**100.0**	**12590**	**100.0**

Bacterial species distribution from urine samples

Bacteria species	Number of isolates	(%)
Escherichia coli	1154	33.0
Klebsiella pneumoniae ss. pneumoniae	341	9.8
Staphylococcus aureus ss. aureus	266	7.6
Enterococcus sp.	252	7.2
Citrobacter freundii	165	4.7
Pseudomonas aeruginosa	162	4.6
Acinetobacter sp.	150	4.3
Candida albicans	148	4.2
Others	855	24.5
	3493	100.0

Example of antimicrobial susceptibility patterns of urine priority pathogen (*Escherichia coli*; N=1154)

Antibiotic name	Number	%R	%I	%S
Ampicillin	796	90.1	1.9	8.0
Amoxicillin/Clavulanic acid	829	28.8	17.1	54.0
Piperacillin/Tazobactam	506	37.0	36.0	27.1
Ceftazidime	920	48.5	9.5	42.1
Ceftriaxone	948	57.7	2.0	40.3
Cefotaxime	247	64.4	5.7	30.0
Cefepime	874	52.5	10.2	37.3
Imipenem	101	5.9	2.0	92.1
Meropenem	866	4.6	2.4	93.0
Amikacin	539	5.2	8.3	86.5
Gentamicin	794	36.9	3.9	59.2
Tobramycin	14	64.3	7.1	28.6
Ciprofloxacin	949	59.6	7.5	32.9
Trimethoprim/Sulfamethoxazole	753	83.0	0.5	16.5
Nitrofurantoin	863	11.4	4.4	84.2
Chloramphenicol	58	37.9	1.7	60.3
Doxycycline	16	50.0	37.5	12.5
Tetracycline	44	59.1	11.4	29.5



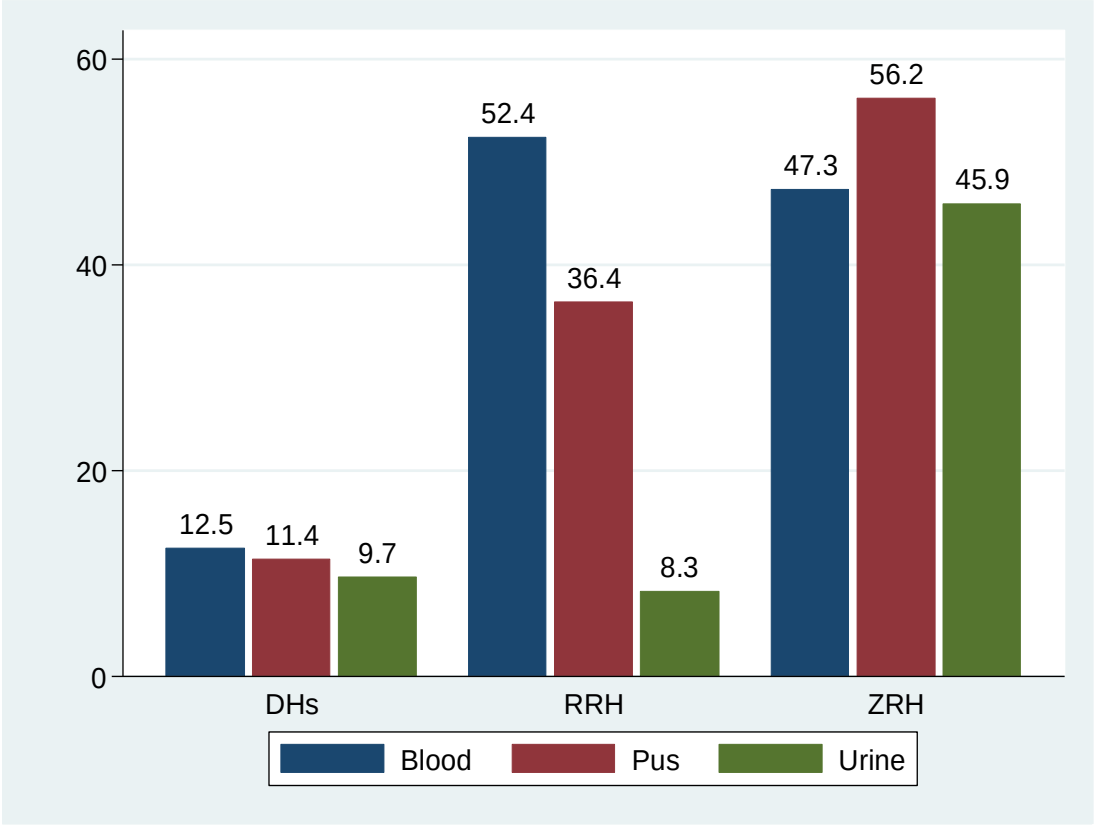
Hospital-based AMR Surveillance in Mwanza: Preliminary findings from SNAP-AMR Project

–A total of 2316 patients admitted in 5 hospitals were enrolled between June 2019 to June 2020

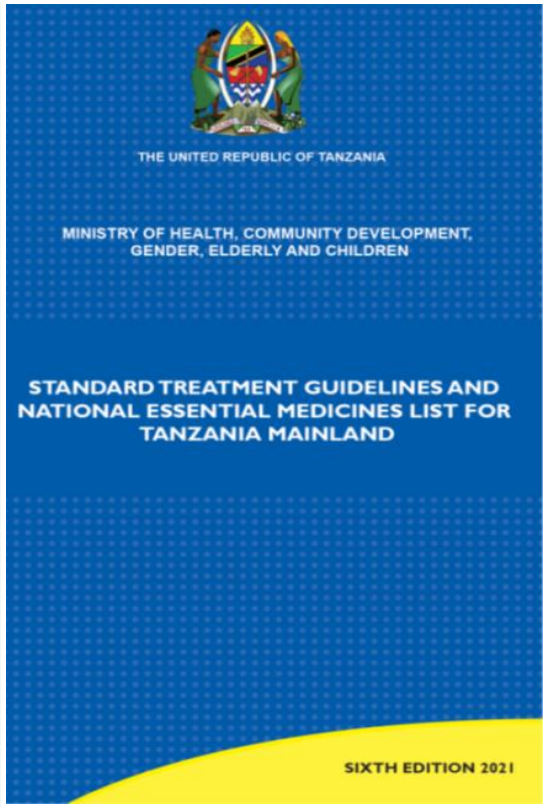
–Blood stream infections : 13.8% (148/1075); Skin and soft tissues infections: 27.8% (119/428) and Urinary tract infections: 21.8% (249/1144)

–Approximately 38% to 54% of these infections were due to *E. coli* and *Klebsiella pneumoniae complex*

–Low resistance of 3rd generation cephalosporin in lower tier like District Hospitals (DH) compared to Regional Referral Hospital (RRH) and Zonal Referral Hospitals (ZRH)



3rd generation cephalosporin (marked by ESBL production) in Gram Negative Bacteria by sample types and level of health care facilities



Challenges and Lessons Learnt

- AMS implementation has been successful in Tanzania and the government is fully supporting these initiatives. However, there are still:

  - ✓ Disproportional sectoral representations **(Public sector >>> Private sector)**
  - ✓ **Initiatives are largely donor-dependent**
  - ✓ **A critical need to envisage local funding mechanisms for sustainability**

- Systematically collected AMR surveillance data has generated evidence based information into the Tanzania Standard Treatment Guidelines and National Essential Medicines List (STG/NEMLIT) E.g. Treatment of UTIs using Nitrofurantoin as the first line

- A need to cascade AMR and AMU surveillance to sub-national levels E.g. more involvement of Regional Referral Hospitals and District Hospitals.

ASLM

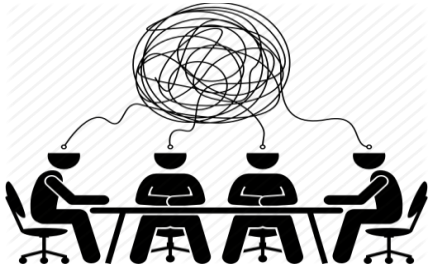
AFRICAN SOCIETY FOR LABORATORY MEDICINE

ADVANCING THE LABORATORY PROFESSION AND NETWORKS IN AFRICA

ANTIMICROBIAL RESISTANCE (AMR) COMMUNITY OF PRACTICE (CoP)

AMR CoP

Thank you



Asanteni

msh Management Sciences for Health | THE NEXT 50 YEARS

USAID MEDICINES, TECHNOLOGIES, AND PHARMACEUTICAL SERVICES (MTaPS) PROGRAM

Improved Access. Improved Services. Better Health Outcomes.

PATH | USAID FROM THE AMERICAN PEOPLE | TANZANIA

SNAP-AMR

UHURU NA UMOJA

The Fleming Fund Fellowship Scheme

World Health Organization

AFRICA CDC Centres for Disease Control and Prevention

Safeguarding Africa's Health

UHURU NA UMOJA