iAHO Integrated African Health Observatory

World Health Organization African Region

75 HEALTH FOR ALL

Analytical Fact Sheet

August 2023

AMR Team

Antimicrobial resistance surveillance... more data needed for better action.

Rationale

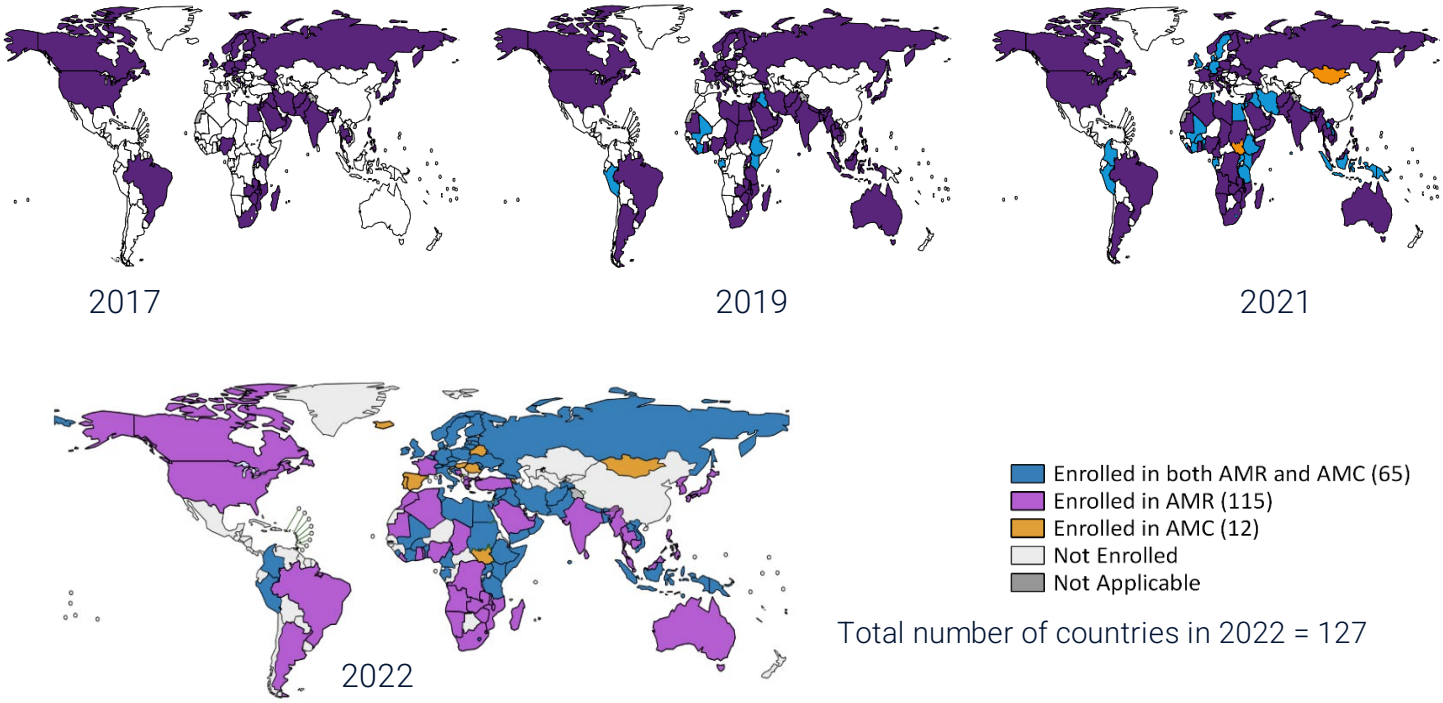
AMR is one of the top ten global public health threats. Surveillance is essential for monitoring AMR trends, detecting the emergence and spread of resistance, informing AMR burden estimates, mitigating the spread, and generating data to inform policies and decision-making. In 2015, upon adopting the Global Action Plan on AMR, the World Health Organization established the Global AMR and Use Surveillance System (GLASS) to provide a standardized approach to collecting, analyzing, and sharing AMR data by countries. GLASS also aims to build the capacity of Member States and provide a platform for monitoring, documenting, and strengthening existing or newly developed AMR surveillance systems.

Key messages

- Globally, AMR caused more deaths than HIV/AIDS or malaria. In 2019, 4.95 million deaths were associated with drug-resistant bacterial infections
- The most significant burden occurred in the sub-Saharan Africa Region, where 1.07 million people died because of bacterial antimicrobial resistance.
- The most recent 5th GLASS report (December 2022) revealed a global increased rate of AMR rates by more than 15% in 2020 compared with 2017 in pathogens causing bloodstream infections (Klebsiella pneumoniae and Acinetobacter spp.), calling for efforts to strengthen infection prevention and control measures in hospital settings
- In the WHO African Region (AFRO), 45 (96%) countries developed a national action plan (NAP) on AMR.
- As of June 2023, 37 (79%) AFRO countries are enrolled in Global AMR and Use Surveillance System (GLASS)
- Among gram-negative bacteria, Escherichia coli isolates reported a high resistance percentage for recommended first- and second-line antibiotics
- Among gram-positive bacteria, Streptococcus pneumoniae shows high resistance percentages against the key tested antibiotics

Facts and Figures

Figure 1: Country enrolment progress

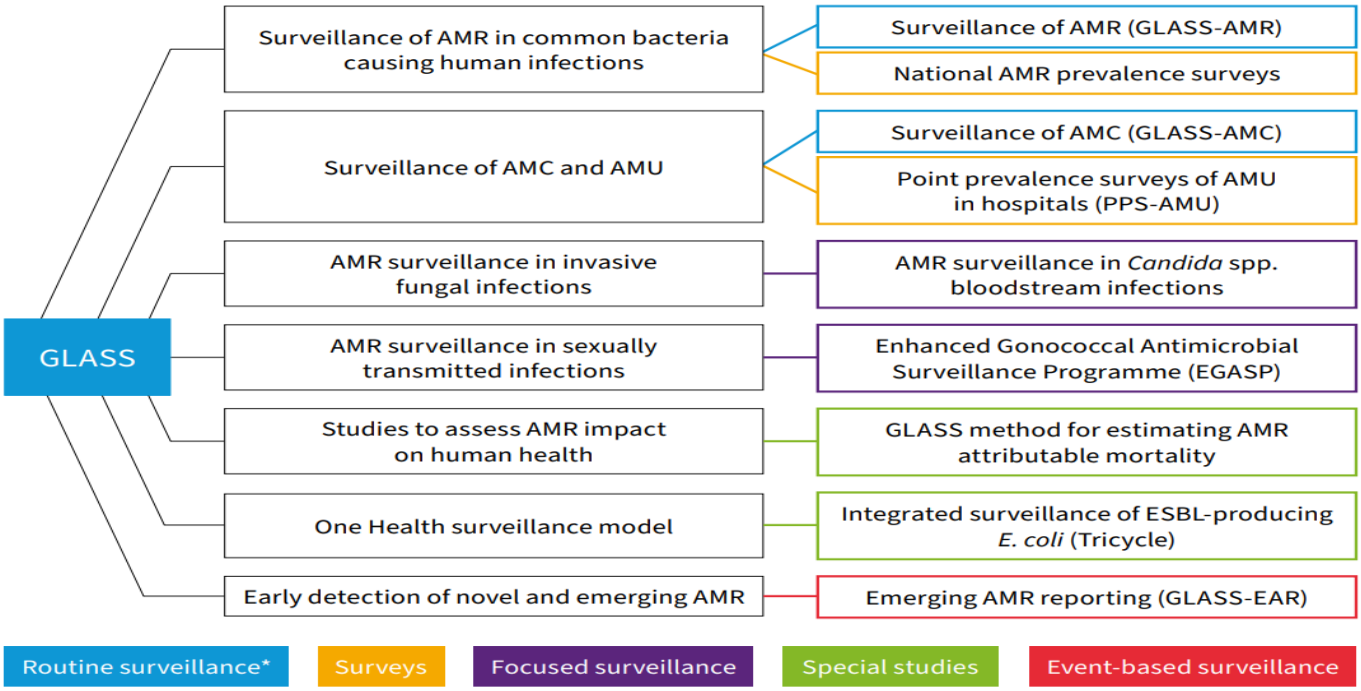


Total number of countries in 2022 = 127

- Data in this factsheet are from the 5th GLASS report launched in December 2022. It reflects data from 2020 collected during the 2021 data call.
- Since 2017, the number of countries enrolling in GLASS has increased. For AFRO, the number of countries enrolled moved from 10 in 2017 to 37 in 2023.

GLASS
Global Antimicrobial Resistance and Use Surveillance System

Figure 2: GLASS Technical modules



* CTAs report national data to WHO annually.

Note: AMR prevalence surveys were not implemented during the first phase of GLASS-AMR. The next phase will involve adopting this complementary approach to address knowledge gaps on the magnitude, distribution and diversity of AMR in LMICs.

- GLASS's early implementation began with surveillance of AMR in bacteria causing common acute human infections. However, the system evolved to include other data types, new approaches, modules addressing specific AMR/AMU issues, and One Health surveillance.
- In 2020, GLASS incorporated the antimicrobial consumption (AMC) surveillance component. AMC monitoring is expected to strengthen the knowledge on the use of antimicrobial medicines and provide information on the uptake of newly developed antimicrobials.

Figure 3: GLASS-AMR core component and data flow

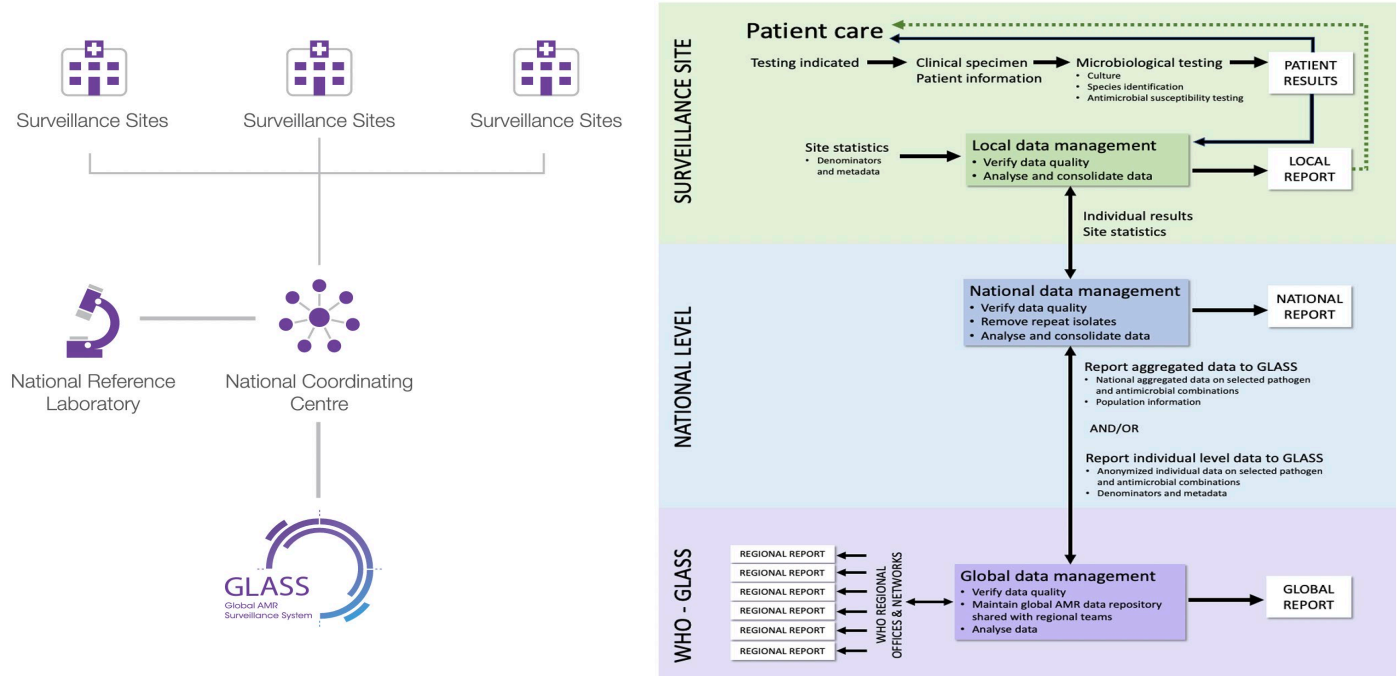
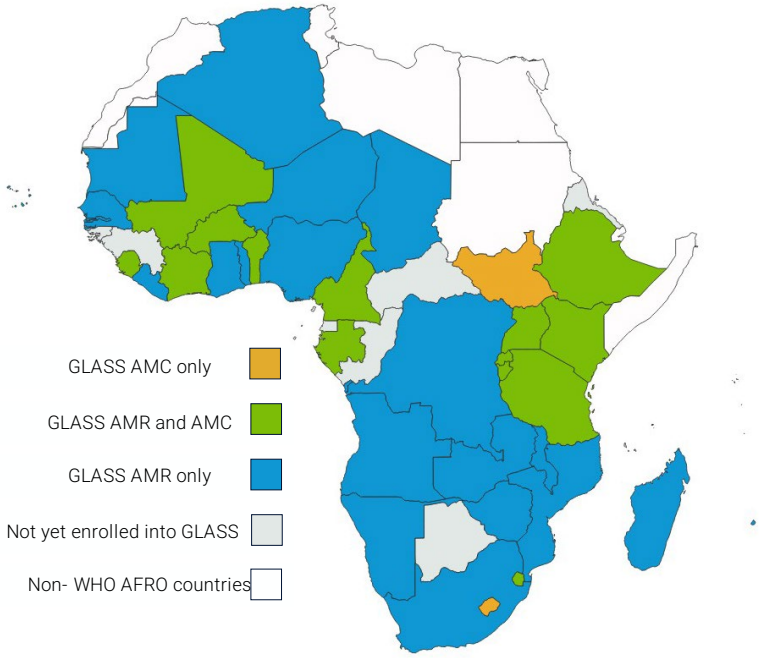


Figure 4: AFRO- countries enrolled into GLASS-AMR and GLASS-AMC as of June 2023



As of June 2023, 37 AFRO countries (79%) were enrolled into GLASS

21 countries are enrolled in GLASS – AMR only. 2 countries are enrolled in GLASS AMC only

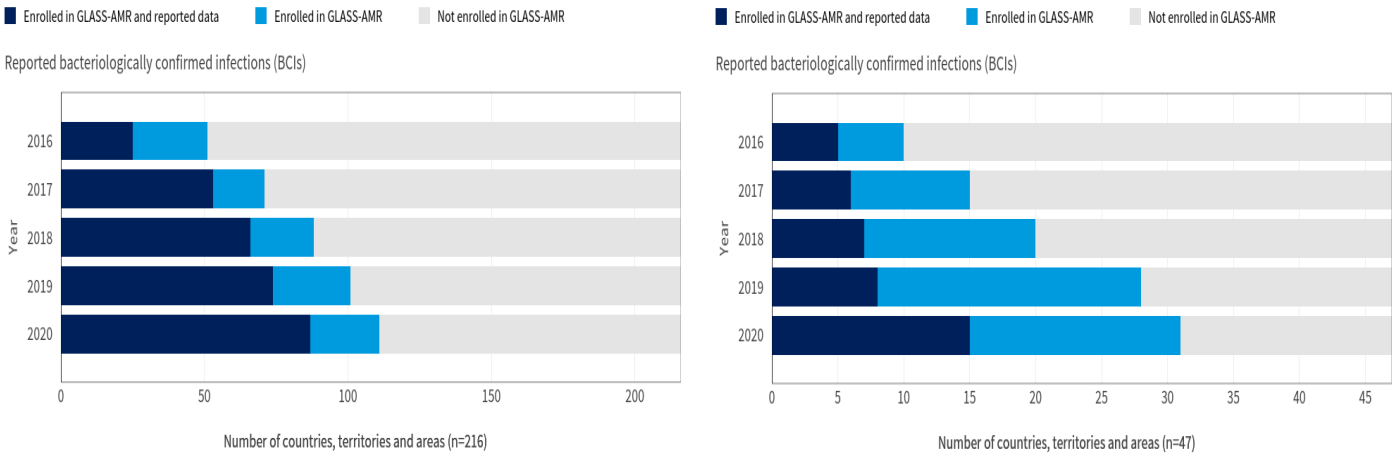
14 are enrolled both in GLASS– AMR & AMC

One Health Surveillance model - The Extended-spectrum beta-lactamase (ESBL) Ec Tricycle AMR surveillance project

Figure 5: Countries with ESBL

- AMR's complex and multi-faceted nature requires a One Health approach in human, animal, and environmental interventions. An integrated multisectoral surveillance is paramount for generating data to inform policies and actions.
- The WHO Advisory Group on Integrated Surveillance of Antimicrobial Resistance developed a standardized protocol for the AMR surveillance model to assess the occurrence of an emerging type of AMR (extended-spectrum beta-lactamase [ESBL]-producing E. coli) across the human, environmental, and animal sectors.
- This "Tricycle" model has been implemented in several countries, including 8 AFRO Member States.
- A policy brief released by Ghana revealed that about 7% of all Extended-spectrum beta-lactamase (ESBL)-producing E. coli from humans, the environment, and animals are interrelated, i.e., spreading from the environment to the food chain and causing infections in humans, and vice-versa. Such findings solidify the importance of integrated surveillance for generating data that can inform appropriate action against the emergence and spread of resistance across the sector.

Figure 6: Countries, Territories and Areas (CTAs, herein referred to as "countries") enrolled in GLASS-AMR that reported 2016-2020 bacterial identification results and/or antimicrobial Susceptibility Testing (AST) results for bacteriologically confirmed infectious syndromes under surveillance in 2017-2021 data calls



By 31 December 2021, 111 out of 216 Countries, Territories, and Areas (CTAs), including 32 from the AFRO Region, were enrolled in GLASS-AMR (n=109 Member States plus two territories or areas). CTAs enrolled during the early implementation years (2016-2017) were mainly from the European region (39% [20/51]), while those enrolled in recent years (2020- 2021) were primarily from the African Region (48% [11/23]). However, only 50% of AFRO member States registered to GLASS-AMR reported data 2020 bacterial identification results.

Figure 7: Antimicrobial Susceptibility Testing (AST) results reported to GLASS-AMR per 1 million population

- Most countries reporting higher numbers of bloodstream Bacteriogical Confirmed Infections (BCIs) with AST results per million population in 2020 (that is, ≥ 70.2) were from the European region (56%). In contrast, most countries reporting higher numbers of urinary tract BCIs with AST results were from the Eastern Mediterranean Region (36%).

- The number of AFRO countries reporting Bloodstream and Urinary Tract BCIs with Antimicrobial ASTs has increased over the years; however, it remains less than 70 BCI per million population.

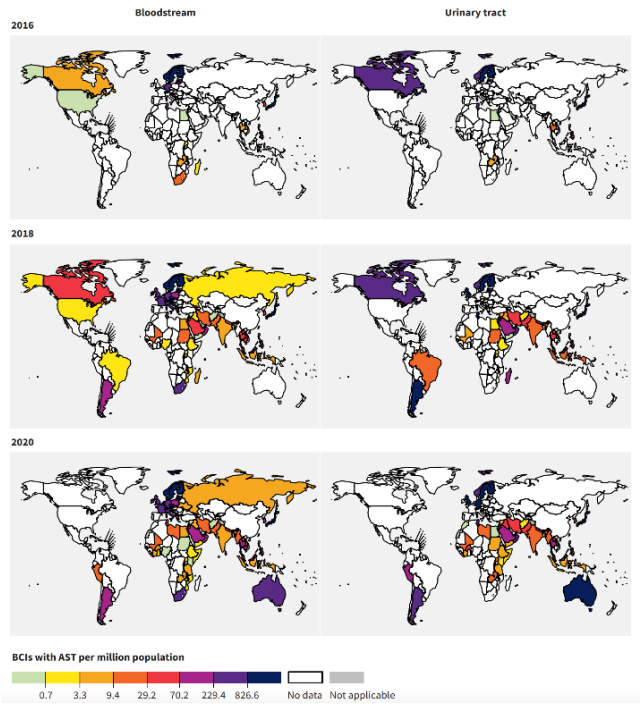
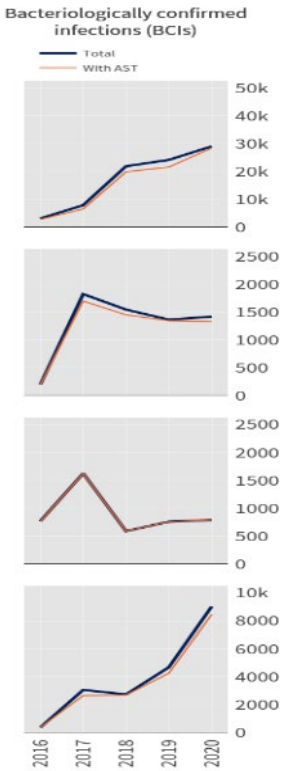


Figure 8: Testing coverage by infectious syndrome in 2020: African region

Infectious syndrome	Number of reporting countries	Total BCIs	Infections with AST for any antibacterial
Bloodstream	15	29017	28401
Gastrointestinal	7	789	788
Gonorrhoea	9	1416	1327
Urinary tract	11	9021	8450
Total		40243	38966



Apart from gonorrhea infections, the testing coverage by infectious syndrome has increased for bloodstream, gastrointestinal, and urinary tract

GLASS informs the progress Sustainable Development Goals

Sustainable Development Goal AMR Indicator

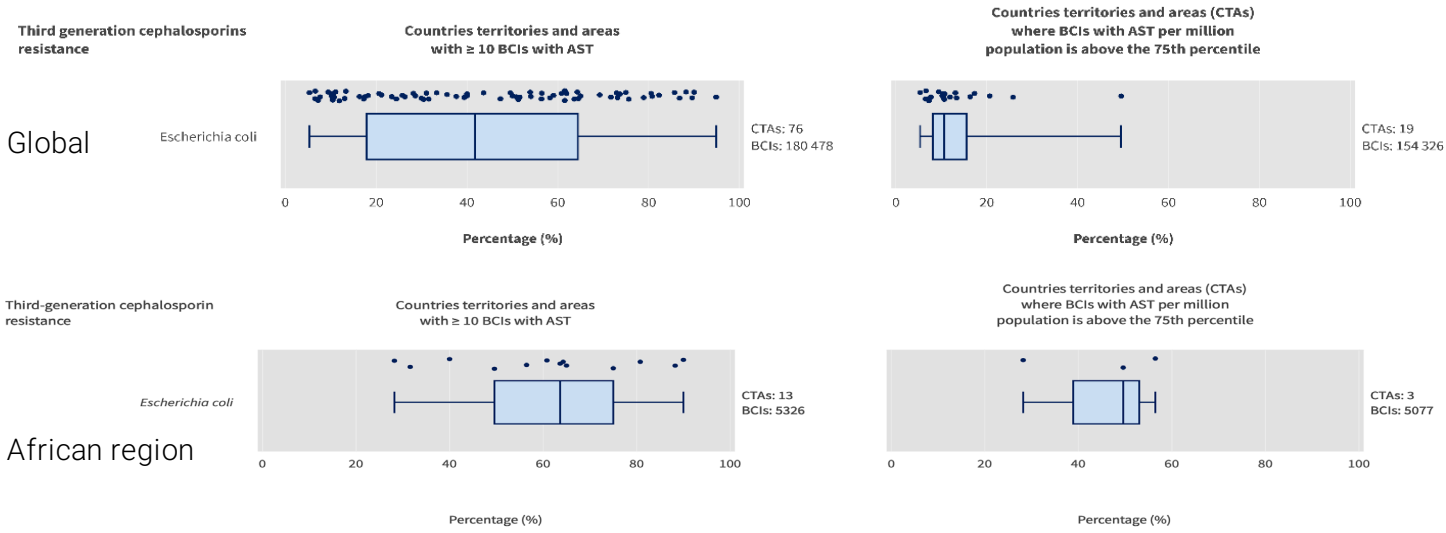
Goal 3: Ensure healthy lives and promote well-being for all at all ages

TARGET 3.d: Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks

INDICATOR 3.d.2: Proportion of bloodstream infections among patients due to

- methicillin-resistant *Staphylococcus aureus* (MRSA)
- *Escherichia coli* resistant to 3rd generation cephalosporins

Figure 9: Findings from 5th GLASS report (2022): Resistance to third generation cephalosporins in E. coli. All countries compared to countries with better testing coverage.



- Results were considered for countries reporting ≥ 10 Bacteriology Confirmed Infections (BCIs) with AST i.e., 76 countries, including 13 from AFRO.
- Among the 76 countries, 19 countries globally (3 from AFRO) were estimated to have good testing coverage. Findings are not yet representative of the region; despite the sample size, findings still show high level of resistance.

Level	Percentage of Resistance to Third generation cephalosporins in E. coli bloodstream infections	Percentage of Methicillin Resistance in S. aureus bloodstream infections
Global Level – All CTAs **(76)**	40%	38%
Global Level – CTAs with good testing coverage **(19)**	10%	8%
AFRO Region – All CTAs **(13)**	65%	50%
AFRO Region –– CTAs with good testing coverage **(3)**	50%	40%

Figure 10: Methicillin resistance in S. aureus bloodstream infections.

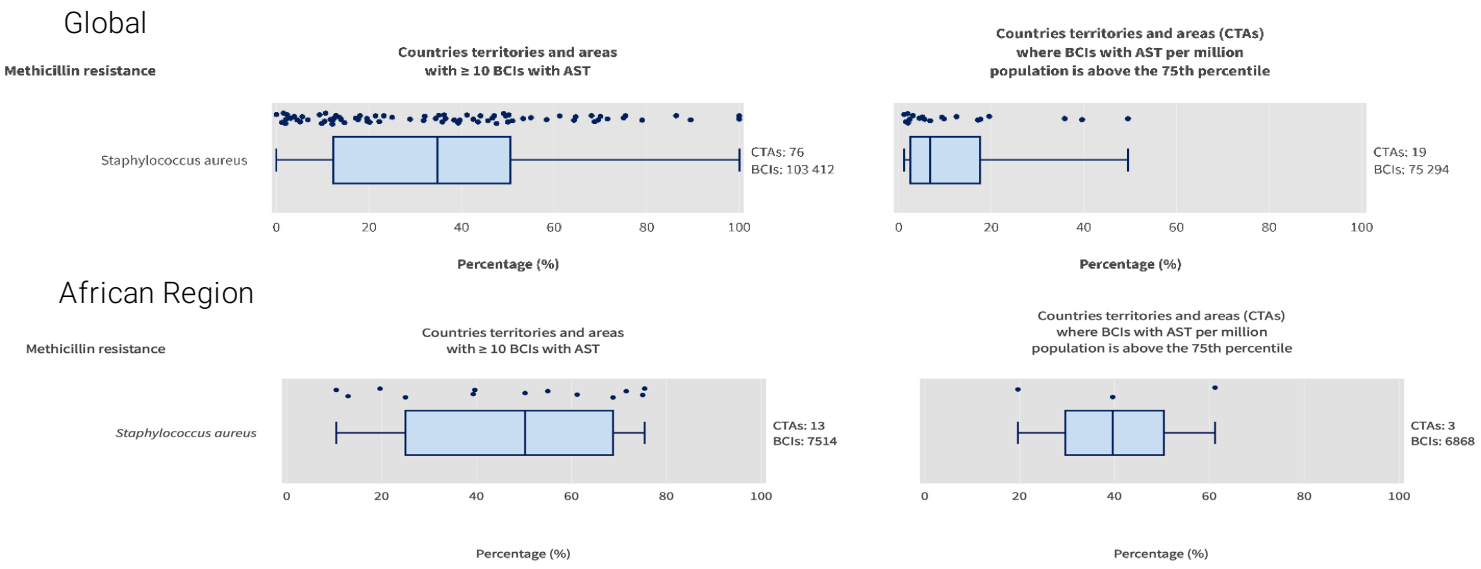
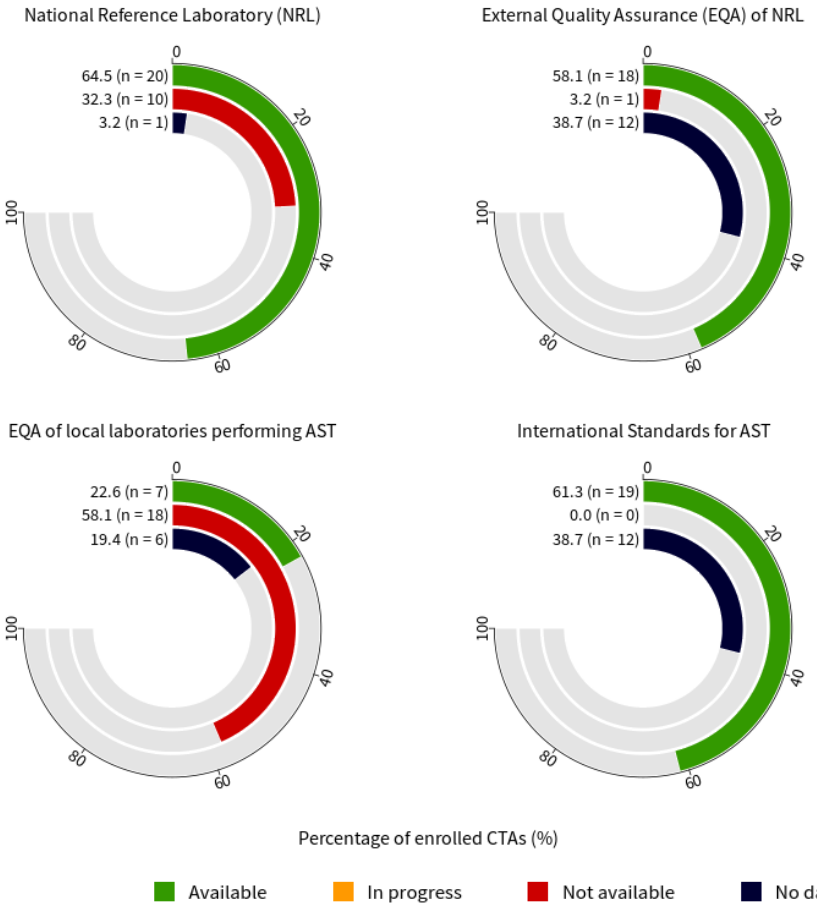
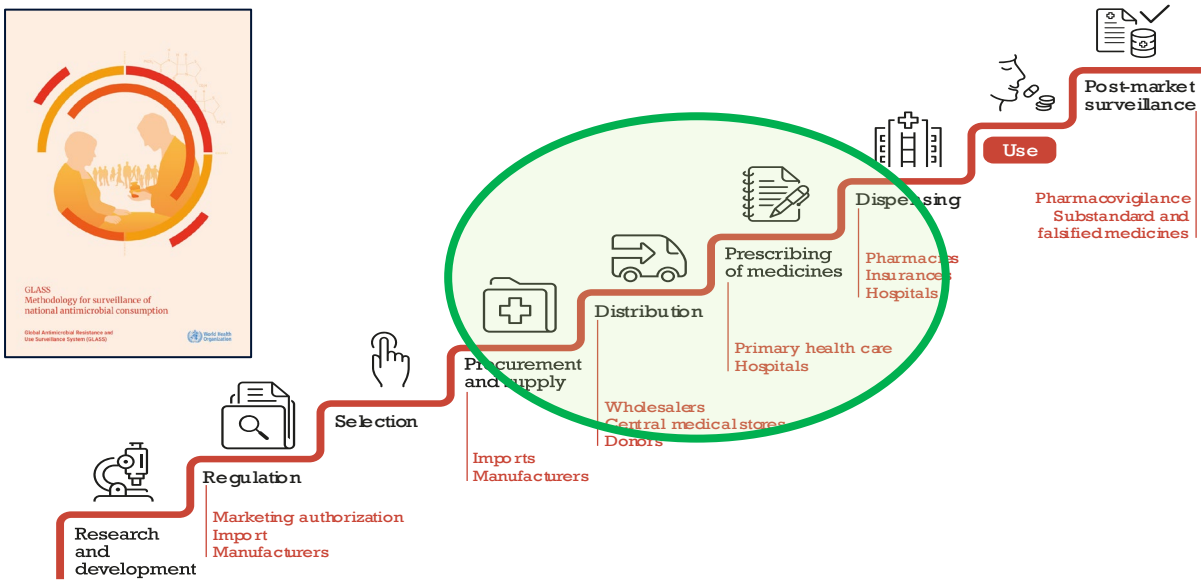


Figure 11: Implementation status, quality assurance, and standards of national AMR surveillance systems at the time of the 2021 data call for countries reporting to GLASS-AMR.



- >60% of AFRO countries reporting to GLASS had a National Reference Laboratory (NRL) for AMR
- 58% of NRLs were enrolled in an External Quality Assurance scheme for AMR versus 22% of local laboratories performing Antimicrobial Susceptibility Testing (AST)
- >60% of AFRO countries reporting to GLASS apply international standards for AST

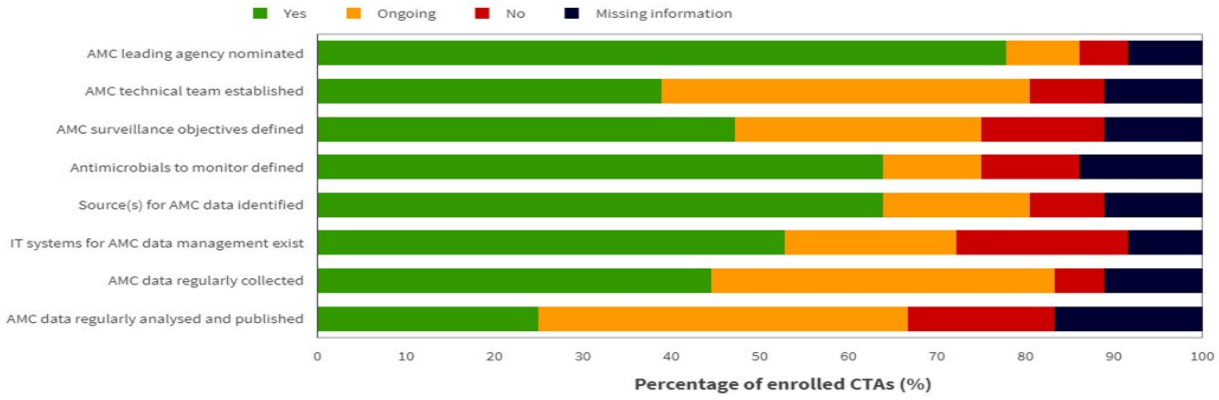
Surveillance of antimicrobial consumption – Findings from 5th GLASS Report (Dec.2022)



AMC data provides handy information for policymakers and healthcare professionals. Although not always complete, national AMC data signals vital issues of concern, such as misuse and poor access to medicines.

- Antimicrobial consumption:
  - Is a proxy for the actual use of antimicrobial medicines in a population
  - It is Based on aggregated data sources from actors along the medicines value chain
  - Allows to estimate which antimicrobials are consumed and in which quantities
- Surveillance of antimicrobial consumption – GLASS-AMC approach:
  - Targets annual national consumption; Disaggregates by public/private and community/hospital; Is Flexible on the choice of data sources
  - Uses the standard ATC/DDD methodology [ATC: Anatomical Therapeutic Chemical (ATC) classification system, DDD: Defined Daily Dose] The ATC/DDD system is a tool for exchanging and comparing data on drug use at international, national, or local levels

Figure 12: Status of implementation of national AMC surveillance Systems at global level.



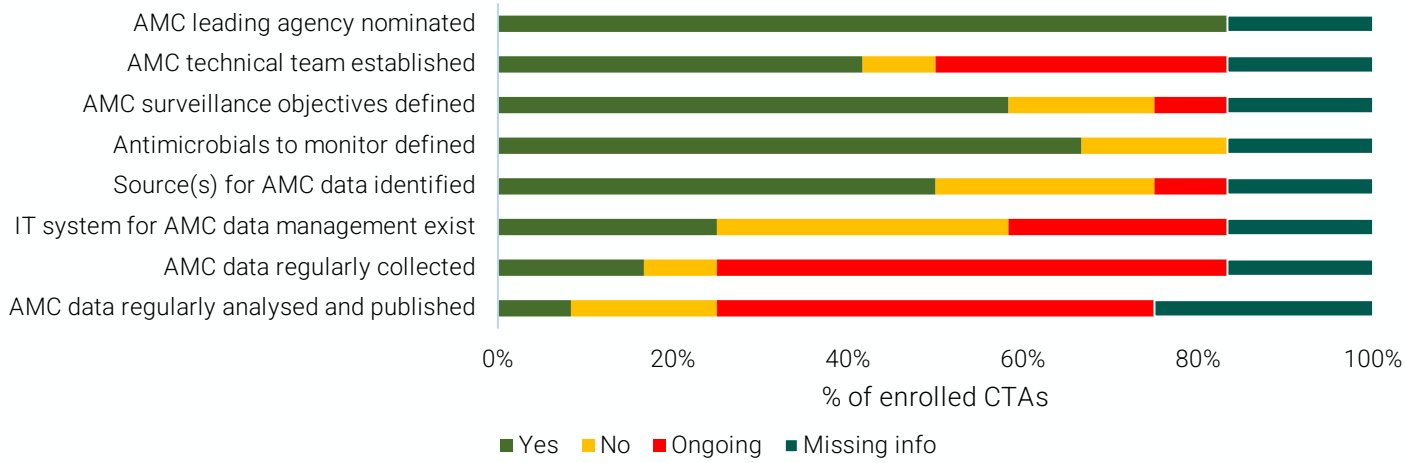
- As of Dec 2021, 36 countries from all WHO regions have enrolled in GLASS AMC, of which 12 are from the AFRO Region.
- 80% of countries have a coordinated body designated for AMC surveillance at national level.
- Overall, countries are at early stages of implementation.

Antimicrobials to be monitored and sources of data is already identified in majority of countries.

Technical team, surveillance objectives, IT solutions are in progress.

AMC is not yet neither collected regularly nor published regularly.

Figure 13: Status of implementation of national AMC surveillance Systems in WHO AFRO region.



- 12 AFRO countries have enrolled in GLASS AMC as of December 2021 i.e., Benin, Burkina Faso, Côte d'Ivoire, Ethiopia, Gabon, Kenya, Lesotho, Mali, Sierra Leone, South Sudan, Tanzania, Uganda.
- Implementation status is aligned with what is described at the global level.

Table 1: Coverage of AMC data collected by Countries.

CTAs	Year[a]	Population coverage (%)	Data sources	Health care sector[b]	Health care level[c]
African region					
Benin	2020	100	Wholesalers	Pub+Priv	Com+Hos
Burkina Faso	2018	100	Central drug store	Pub+Priv	Com+Hos
Côte d'Ivoire	2020	100	Wholesalers	Pub+Priv	Com+Hos
Ethiopia	2019	80	Production for the domestic market, Import	Pub+Priv	Com+Hos
Gabon	2020	90	Import	Pub+Priv	Com+Hos
Mali	2019	100	Wholesalers, central drug store	Pub+Priv	Com+Hos

8/12 AFRO Countries provided data to WHO.

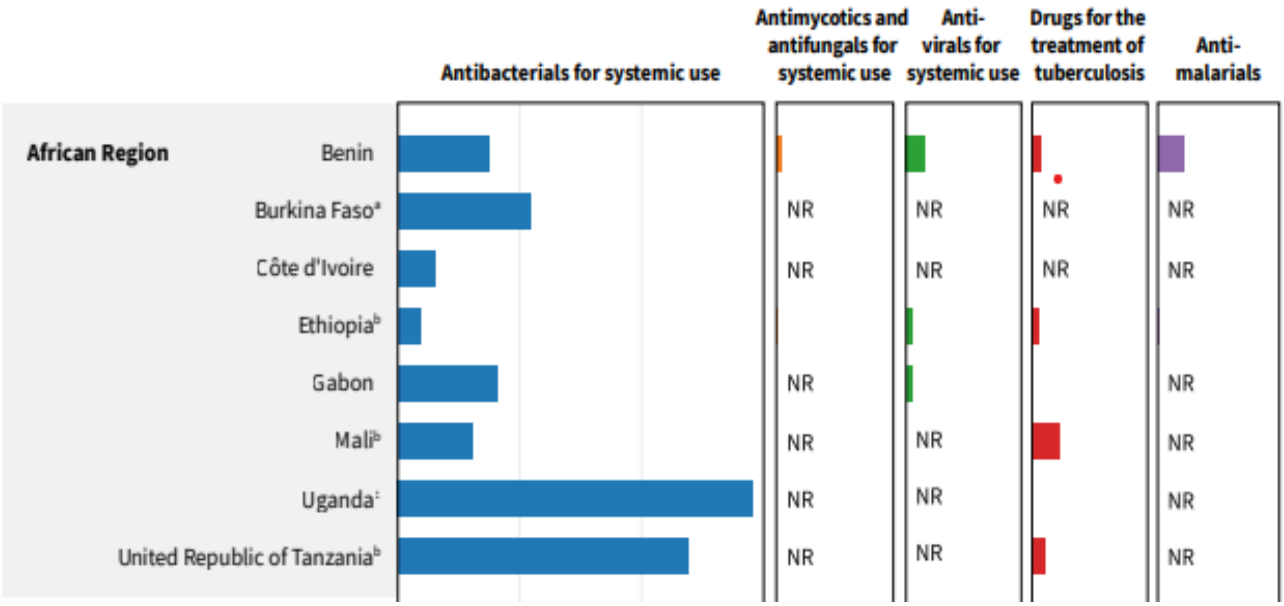
Population coverage:
Varies between 80 and 100%

Health level: Community vs Hospital:
- In the 8 countries, data are from both community and Hospital

Health sectors: Public vs Private
- In 7 countries: data were from both public and private sectors,
- In 1 country: only public sector

Sources of data used to collect AMC data:
- 3/8 countries used wholesalers
- 1/8 used Central drug store
- 4/8 used import/local production,

Figure 14: Total consumption by antimicrobial classes in 8 countries in 2020, expressed as DDD per 1000 inhabitants per day.



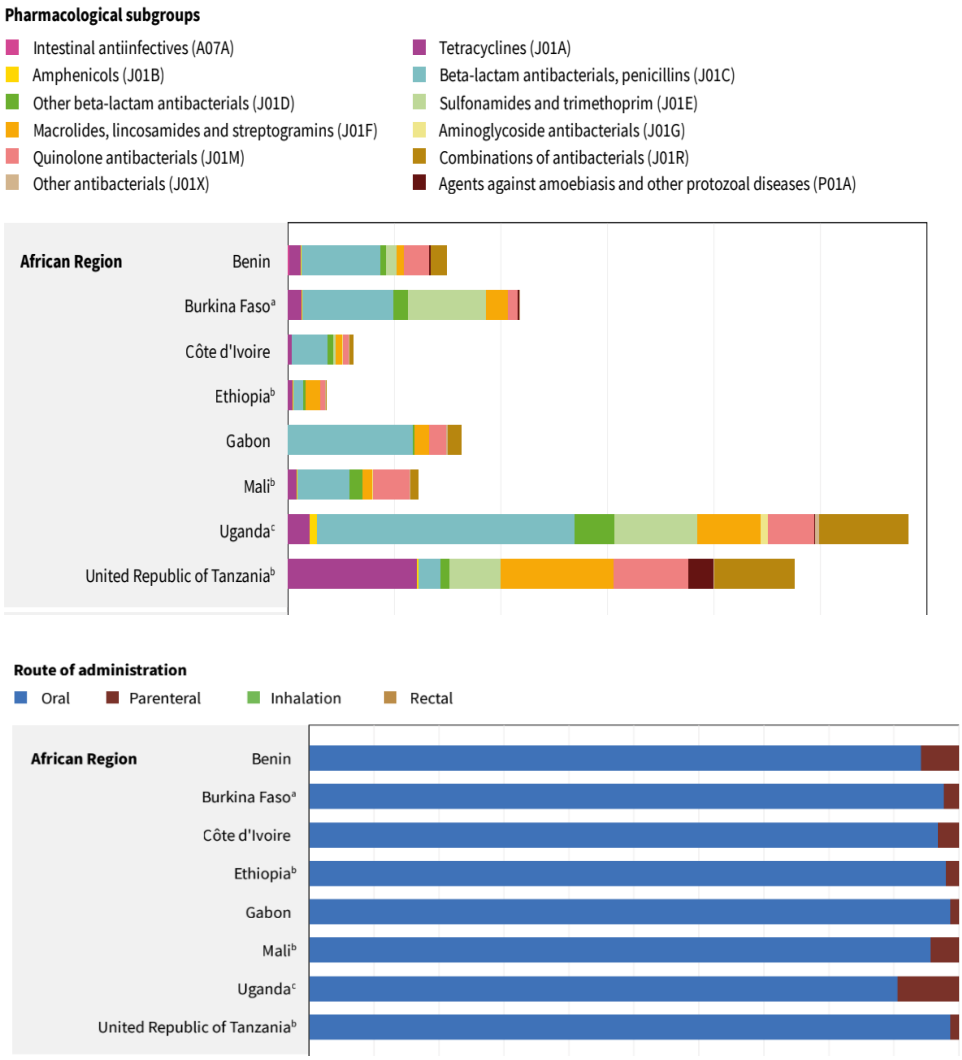
- Only antibacterials are mandatory and reported by all countries.
- Some countries also reported on Antifungals and antimycotics; Antivirals; TB drugs and Antimalarials

Table 2: Total consumption of antibacterials in 8 AFRO countries in 2020, expressed in tonnes

CTAs	Tonnes
Benin	92.2
Burkina Faso	242
Cote D'ivoire	74.9
Ethiopia	122.6
Gabon	16.5
Mali	102.2
Uganda	1528.6
United Republic of Tanzania	1101.9

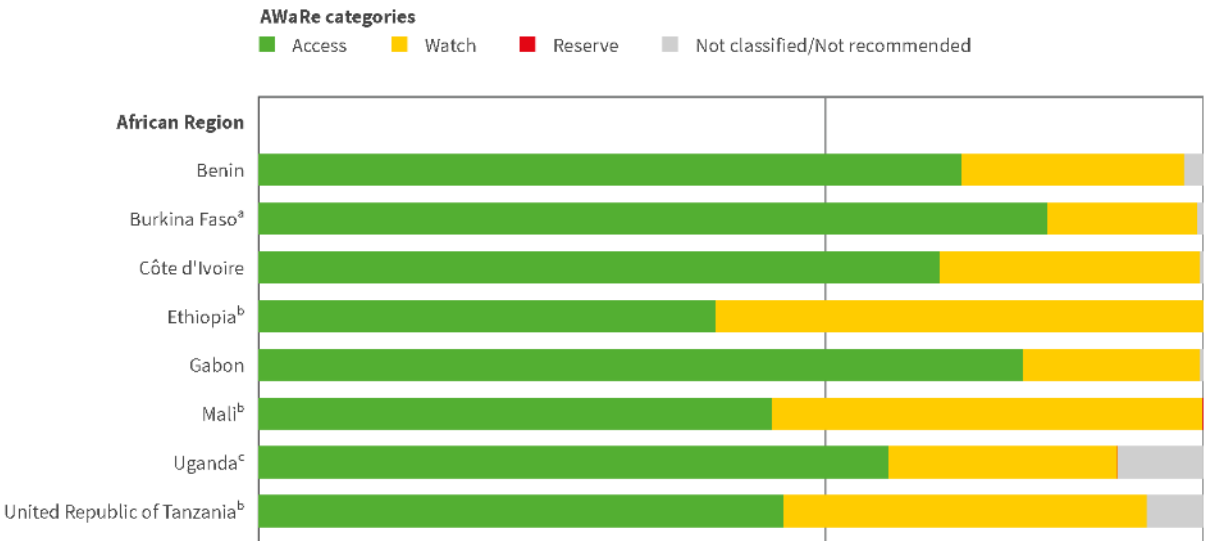
Expressing consumption in tonnes and not in DDD is essential for the One Health approach as it allows direct comparisons with consumption in other sectors, such as the animal and agricultural sectors. The figures provided in tonnes have yet to be adjusted by population, and benchmarking between countries should be done cautiously.

Figure 15: Relative consumption of antibacterial pharmacological subgroups and by route of administration and in 2020



- There is a large variation in Antibacterial consumption among countries
- Penicillins are the top antibacterial group consumed, and Amoxicillin is the most consumed oral substance
- Most of the antibiotics are consumed in the community:
- The median proportion of oral medicines at 95% represents a good proxy for consumption in the community
- At this stage, it is challenging to conclude regional patterns due to a limited number of countries reporting.

Figure 15: Relative consumption of antibacterials by AWaRe classification in 8 AFRO countries in 2020



- The AWaRe (Access, Watch, Reserve) classification is a tool to support antibiotic stewardship efforts at local, national, and global levels. The target for Access antibiotics is 60% of antibiotics consumed.
- In the AFRO region, the majority of antibacterials consumed were Access antibiotics
- Countries need further understanding of their medicines value chain to improve the surveillance systems and translate AMC data into action.

Way forward: Priority actions to support AMR/Use Surveillance

- Continue to advocate for GLASS enrolment and data submission, as well as building capacity to use GLASS platform, guidelines, and tools.

- Capacity building of Member States to expand the use of molecular techniques to enhance AMR surveillance.

- Develop/Update and implement Regional Guides and Training modules on microbiology techniques, Laboratory Quality Assurance, methodologies for monitoring AMC/Use

- Capacity building of Member States to expand the implementation of Integrated Surveillance of AMR under the “One Health” approach.

- Support development and costing of National surveillance strategies/plans for AMR/Use Surveillance to support prioritization of activities and resource mobilization for implementation.

- Support to conduct periodic, national surveys on AMR, to estimated burden of AMR in the region.

- Capacity building of Member States on AMR/AMU data analysis, reporting and use.

- Enhance internal and external collaboration for the implementation of AMR agenda guided by AFRO AMR workstream plan of action; Regional strategy on AMR; alignment with JEE/IHR recommendations.

References

1. WHO, Antimicrobial Resistance in the WHO African Region: a systematic literature review, December 2021.
2. WHO, GLASS global reports, 2022. https://www.who.int/initiatives/glass
3. WHO, GLASS Methodology for surveillance of national antimicrobial consumption, 2020. https://apps.who.int/iris/bitstream/handle/10665/336215/9789240012639-eng.pdf
4. Averting antimicrobial resistance in Ghana: Avenues for policy action. Experience from the WHO Global ESBL-E. coli Tricycle Survey in Ghana. Policy Brief, 15 November 2022

Sources

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