



# Antimicrobial Resistance (AMR): an international perspective

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**18 November 2024**

# What is AMR?

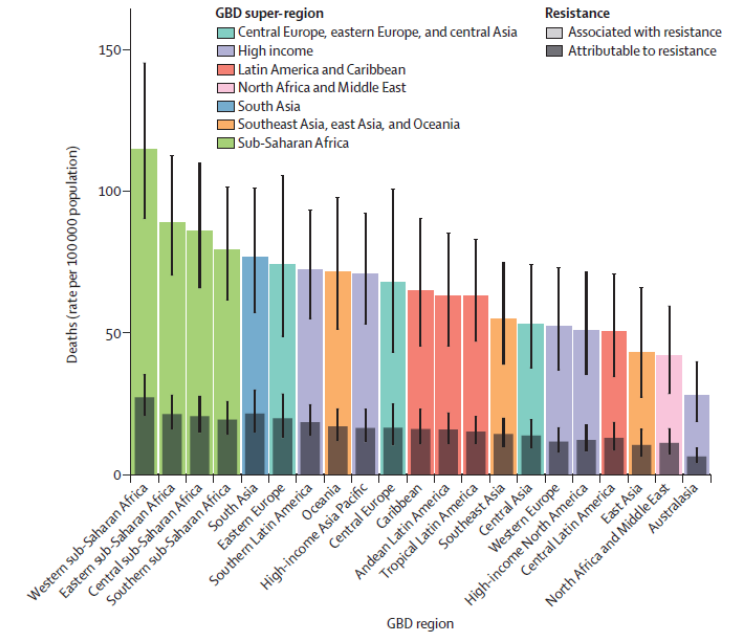
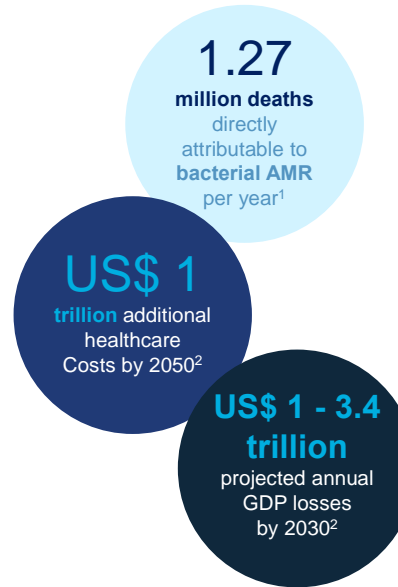


- Antimicrobial Resistance (AMR) occurs when bacteria, viruses, fungi and parasites no longer respond to antimicrobial medicines that were once effective against them.
- As a result of the drug resistance, infections becomes harder to treat therefore increasing the risk of disease spread, severe illness, disability and death.

# What are some of the Key Facts on AMR?



- ❖ AMR – microbes\* no longer respond to medicines
- ❖ AMR is an **urgent global health and socioeconomic crisis**
- ❖ ~ **1.27 million global deaths** attributed to **bacterial AMR** in **2019<sup>1</sup>**.
  - ❖ Largest burden occurred in sub-Saharan Africa
- ❖ Threat to **all age groups** in **all regions** with **low- and middle-income countries** most affected.
- ❖ AMR has significant impacts on human and animal health, food production, the environment, and threatens multiple SDGs.
- ❖ If not controlled, AMR will result in **US\$1-3.4 trillion annual GDP losses** by 2030 & **+ US\$ 1trillion healthcare costs** by 2050<sup>2</sup>
- ❖ Addressing AMR requires **collective global and multisectoral action** informed by **evidence-based research**



**Figure 1:** All-age rate of deaths attributable to and associated with bacterial AMR by GBD region, 2019, Lancet report

<sup>1</sup><https://www.sciencedirect.com/science/article/pii/S0140673621027240?via%3Dihub>

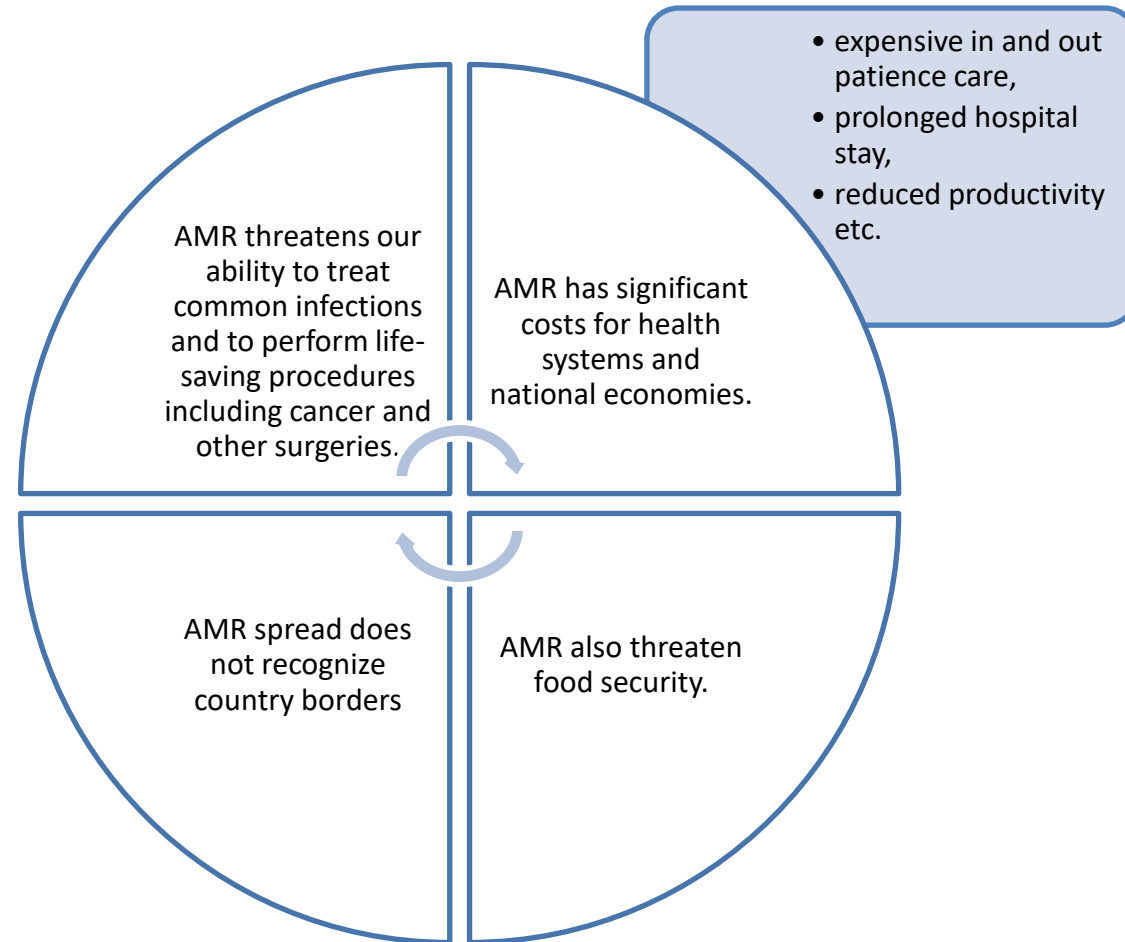
<sup>2</sup> <https://documents1.worldbank.org/curated/en/323311493396993758/pdf/final-report.pdf>

# Drivers of AMR



- Systematic misuse and overuse of antimicrobials in human medicine & food production
  - Self prescribing , OTC & nonadherence to treatment
- Lack of awareness & knowledge; and lack of enforcement of legislation
- Lack of access to safe, good quality, and affordable health services
- Poor access to quality, affordable medicines, vaccines and diagnostics
- Unhealthy environments that favor infections spread
  - Lack of access to clean water, sanitation and hygiene (WASH)
  - Poor Infection Prevention and Control (health-care facilities & farms)

# AMR as a Global Concern



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<https://www.who.int/news-room/fact-sheets/detail/antimicrobial-resistance>

Global antimicrobial resistance and use surveillance system (GLASS) report 2022



# Drug resistance in bacteria



Median reported rates in 76 countries of 42% for third-generation cephalosporin-resistant *E. coli* and 35% for methicillin-resistant *Staphylococcus aureus*.

For urinary tract infections caused by *E. coli*: 1 in 5 had reduced susceptibility to standard antibiotics (ampicillin, co-trimoxazole, and fluoroquinolones) in 2020.

Bacterial AMR alone is the direct cause of more than **1.25 million** global deaths and contributes to approximately **five million** deaths per year.

*Klebsiella pneumoniae* also showed elevated resistance levels against critical antibiotics.



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# Drug resistance in fungi



- Fungal infections can be difficult to treat, including due to drug-drug interactions for patients with other infections (e.g., HIV).
- Multi-drug-resistant *Candida auris* is of particular concern.

# Drug resistance in HIV, TB & Malaria



- **HIV drug resistance (HIVDR)** is caused by changes in the HIV genome that affect the ability of antiretroviral (ARV) drugs to block the replication of the virus.
  - HIVDR can either be transmitted at the time of infection or acquired because of inadequate adherence to treatment or drug-drug interactions.
  - HIVDR can lead to increased HIV infections and HIV-associated morbidity and mortality.
  - WHO recommends HIVDR surveys.
- **Tuberculosis (TB)** is a major contributor to antimicrobial resistance.
  - MDR-TB is a form of TB caused by bacteria that do not respond to isoniazid and rifampicin.
    - MDR-TB is treatable and curable by using second-line drugs, but these medicines are expensive and toxic, and in some cases more extensive drug resistance can develop.
    - MDR-TB is a public health crisis and threat to health security-*Only about 2 in 5 people with drug resistant TB accessed treatment in 2022.*
- Resistance to **antimalarial drugs** is a major threat to **malaria** control.
  - Mutations linked to artemisinin partial resistance have been observed in several countries East Africa .
  - Improved surveillance for the resistance is crucial.



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# Drug resistance in neglected tropical diseases (NTDs)



- A threat to the control, elimination and eradication of NTDs
  - Resistance has been reported in:
    - leprosy medicines (dapsones, rifampicin and clofazimine)
    - several anti-helminthics (in animals)
    - medicines used to treat human African trypanosomiasis (melarsoprol) and leishmaniasis (pentavalent antimonial, miltefosine)
- It is important to monitor resistance and drug efficacy.

# Coordinated Action - Global AMR Framework



- ❖ **Multisectoral Global Action Plan on AMR (GAP-AMR)** was adopted by the World Health Assembly in 2015
- ❖ Defines **5 broad** Global AMR objectives
- ❖ MS urged to develop and implement **NAP AMR**
- ❖ All **quadrupartite** partners (WHO, FAO, WOA, UNEP) **endorsed the plan &** implementation underway

**Global Action Plan on Antimicrobial Resistance**

**GET INFORMED**

**GATHER DATA**

**PREVENT INFECTIONS**

**REGULATE MEDICINES**

**INVEST NOW**

Our time with antibiotics is running out.  
**CHANGE CAN'T WAIT**

ANTIBIOTICS World Health Organization

- Vision:** Control and reverse the urgent public health and socioeconomic crisis due to drug-resistant infections in humans
- Aim:** Slow the emergence and spread of drug-resistant bacterial infections and preserve effective antibiotics for future generations
- Strategic priority 1:** **PREVENTION OF INFECTIONS**
- Strategic priority 2:** **UNIVERSAL ACCESS** to affordable, quality diagnosis and appropriate treatment of infections
- Strategic priority 3:** **STRATEGIC INFORMATION AND INNOVATION**
- Operational priorities (1):** **THE PEOPLE-CENTRED APPROACH AND CORE PACKAGE OF COUNTRY-LEVEL INTERVENTIONS**
- Core package of 13 interventions for integration in PHC and HEPR
- Operational priorities (2):** **ENABLING ACTIONS TO SUPPORT MEMBER STATES**
- Technical assistance + coordination of global or regional action and partnerships
- ❖ WHO has set out priorities for an accelerated human health response to AMR
    - ❖ WHO Strategic and operational priorities to address bacterial AMR, 2025-2035
    - ❖ The framework will guide national and global actions – along **3 urgent strategic** and **2 operational priorities** for accelerated health sector AMR response
    - ❖ MS to include these priorities into their AMR national action plans



# Where are we now?

## Global overview

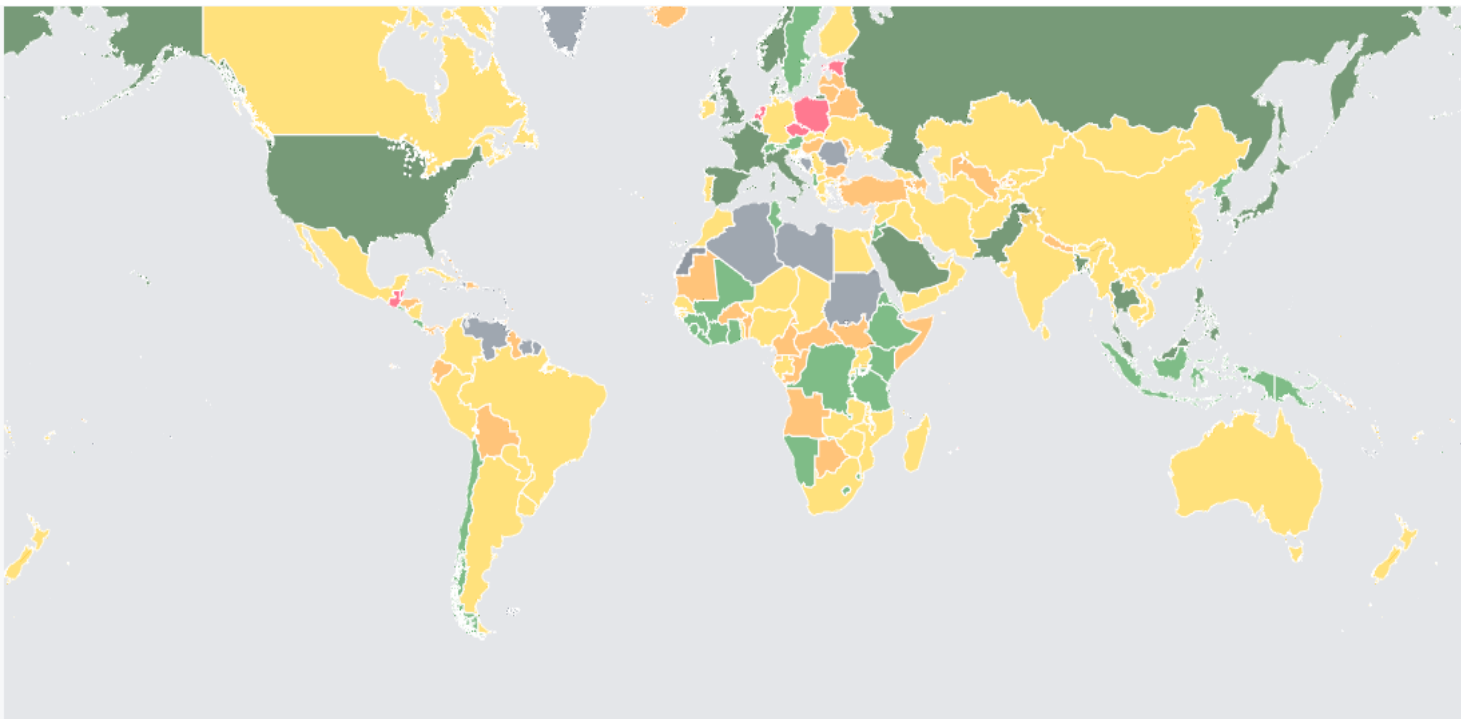


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# Where are we now? Global Overview



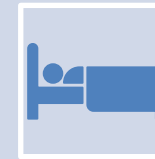
## 2.3 Country progress with development of a national action plan on AMR

- A - No national AMR action plan or plan under development.
- B - National AMR action under development. plan developed.
- C - National AMR action plan approved by government and is being implemented.
- D - National AMR action plan has costed and budgeted operational plan and has monitoring mechanism in place.
- E - Financial provision for the National AMR action plan implementation is included in the national plans and budgets.

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full arrangements. All rights reserved. Copyright - WHO 2018 - 2023  
 The country membership amongst the Quadripartite organizations can differ. Based on the administration of the TrACSS questionnaire, and for consistency, WHO Member States (n=194) and map are used on this website.



As of Nov 2023, **178 countries** had developed multisectoral NAPs on AMR



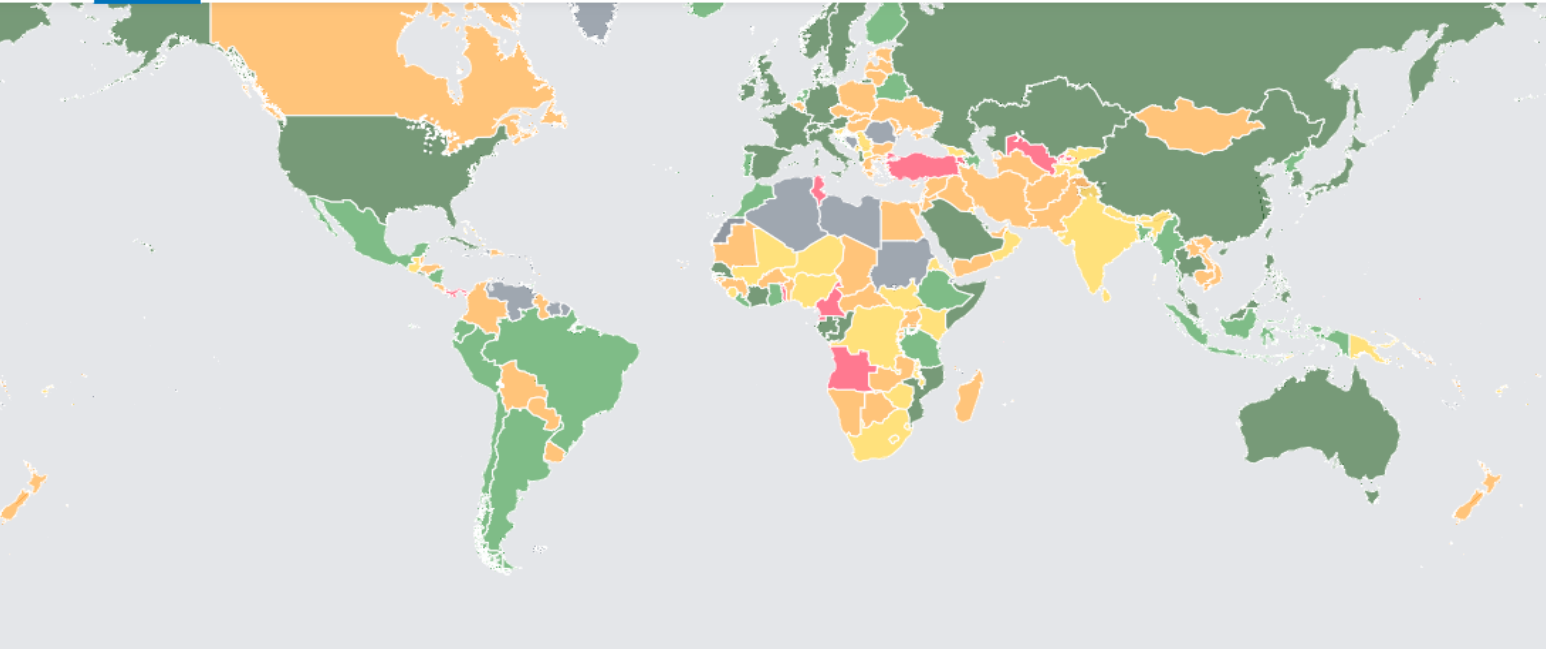
However, in 2023 only **27% of countries** reported implementing their NAPs effectively and



Only **11% countries** had allocated national budgets to implement their plans



# Where are we now? Global Overview



As of Nov 2023, **159 countries** had a multisectoral coordination mechanism on AMR with Government leadership

## 2.1 Multi-sector and One Health collaboration/coordination

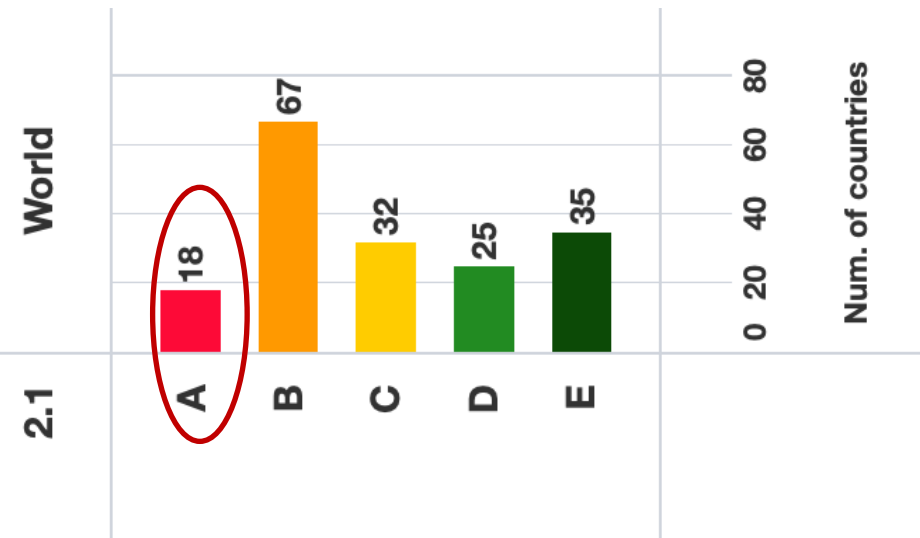
**A - No formal multi-sectoral governance or coordination mechanism on AMR exists.**

**B - Multi-sectoral working group(s) or coordination mechanism committee on AMR established with Government leadership.**

**C - Formalized Multisector coordination mechanism with technical working groups established Multi-sectoral working group(s) is (are) functional, with clear terms of reference, regular meetings, and funding for working group(s) with activities and reporting/accountability arrangements defined.**

**D - Joint working on issues including agreement on common objectives.**

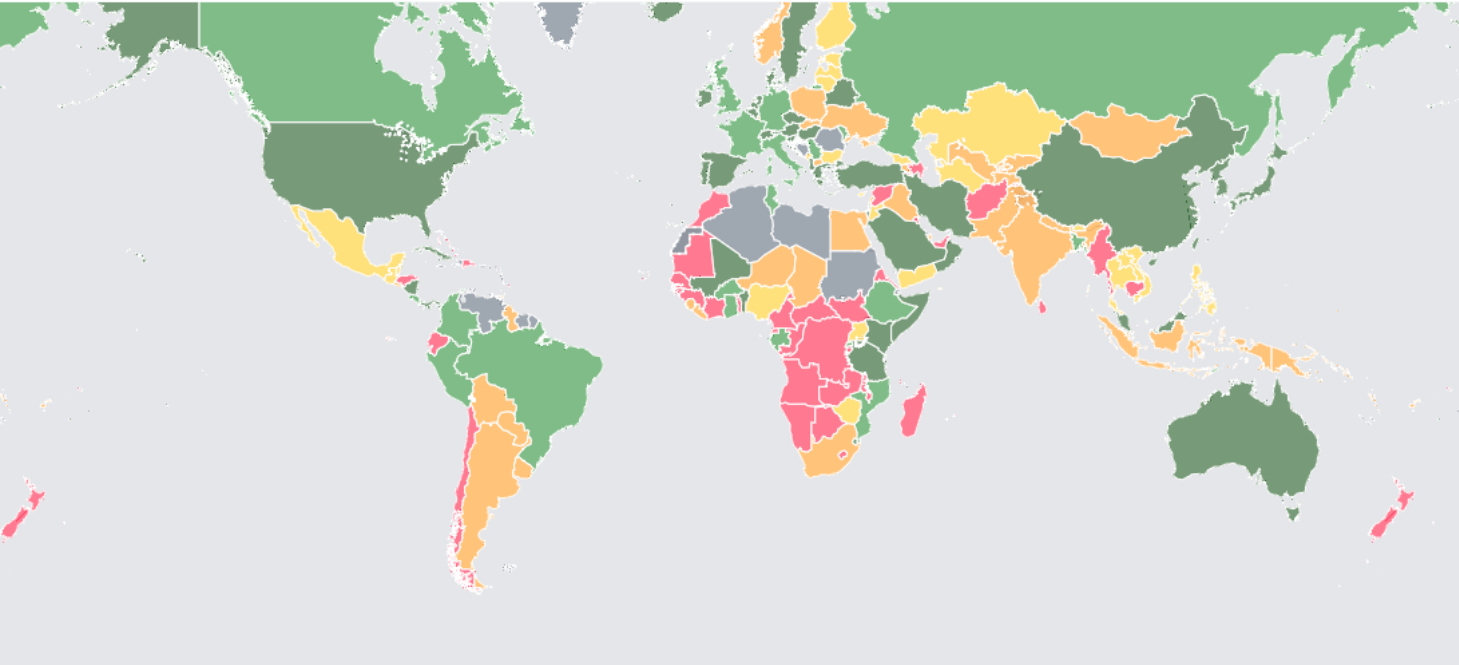
**E - Integrated approaches used to implement the national AMR action plan with relevant data and lessons learned from all sectors used to adapt implementation of the action plan.**



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## 3.2 National monitoring system for consumption and rational use of antimicrobials in human health

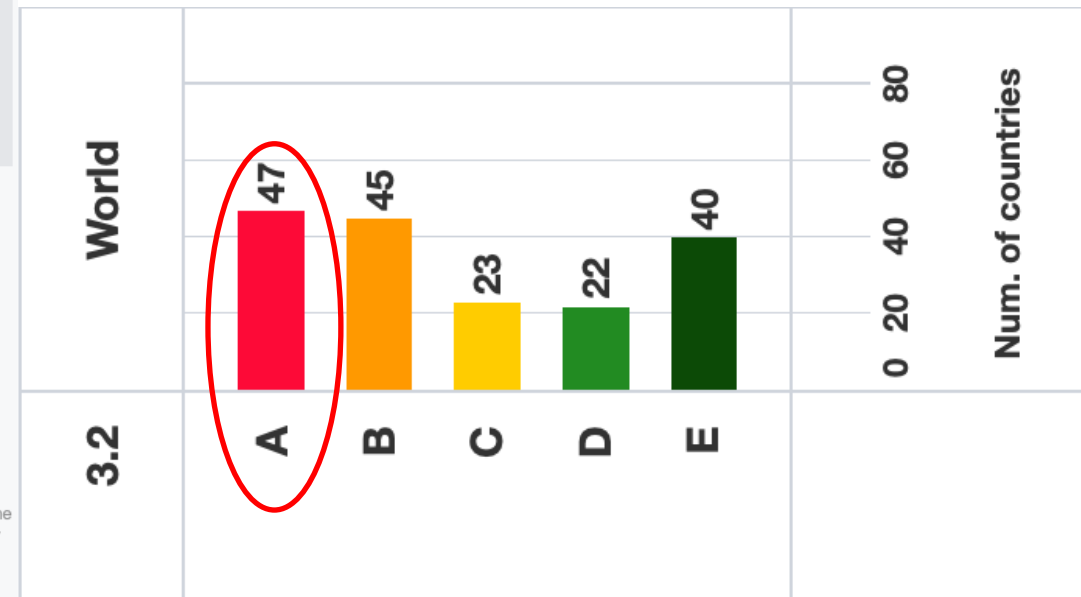
- A - No national plan or system for monitoring use of antimicrobials.
- B - System designed for surveillance of antimicrobial use, that includes monitoring national level sales or consumption of antibiotics in health services.
- C - Total sales of antimicrobials are monitored at national level and/or some monitoring of antibiotic use at sub-national level.
- D - Prescribing practices and appropriate antibiotic use are monitored in a national sample of healthcare settings.
- E - On a regular basis (every year/two years) data is collected and reported on: a) Antimicrobial sales or consumption at national level for human use; and b) Antibiotic prescribing and appropriate/rational use, in a representative sample of health facilities, public and private.

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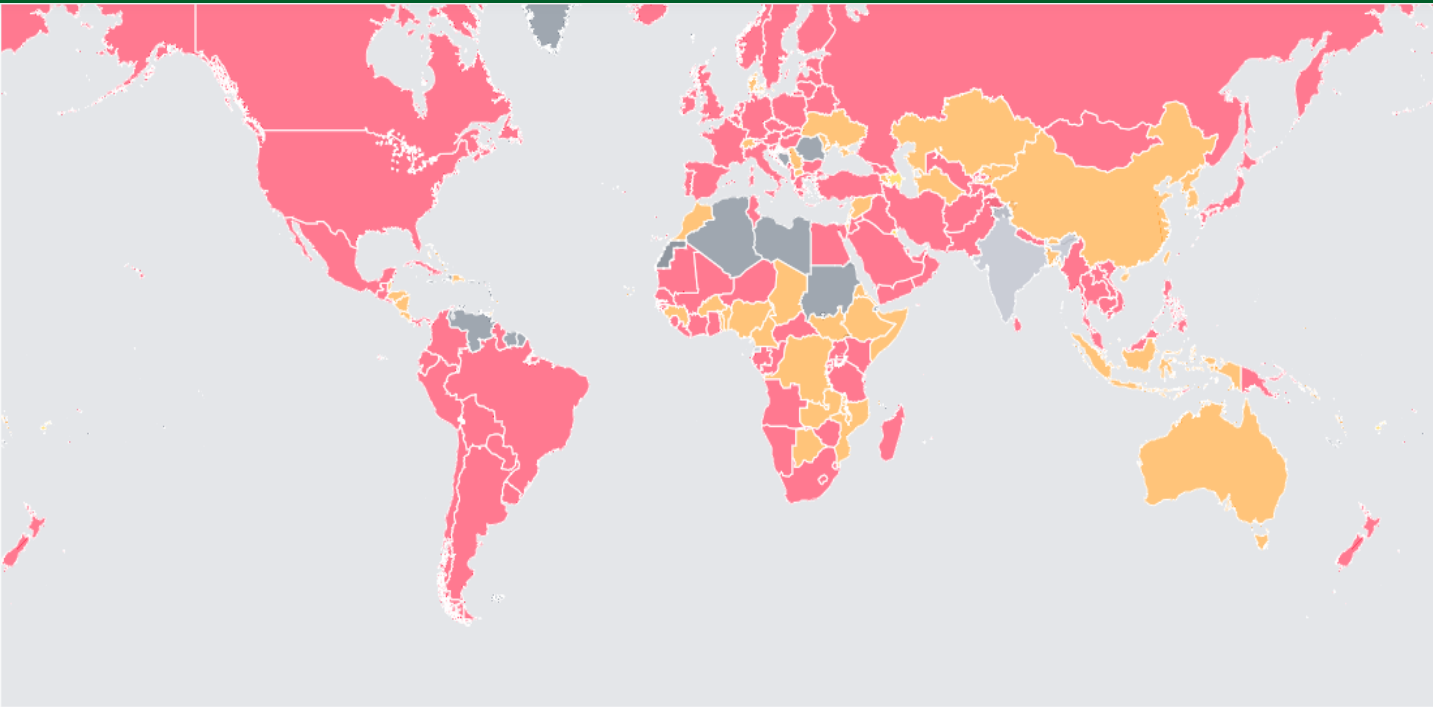
The country membership amongst the Quadripartite organizations can differ. Based on the administration of the TrACSS questionnaire, and for consistency, WHO Member States (n=194) and map are used on this website.



As of Nov 2023, 47 countries had no plan or system for monitoring use of antimicrobials in humans



# Where are we now? Global Overview




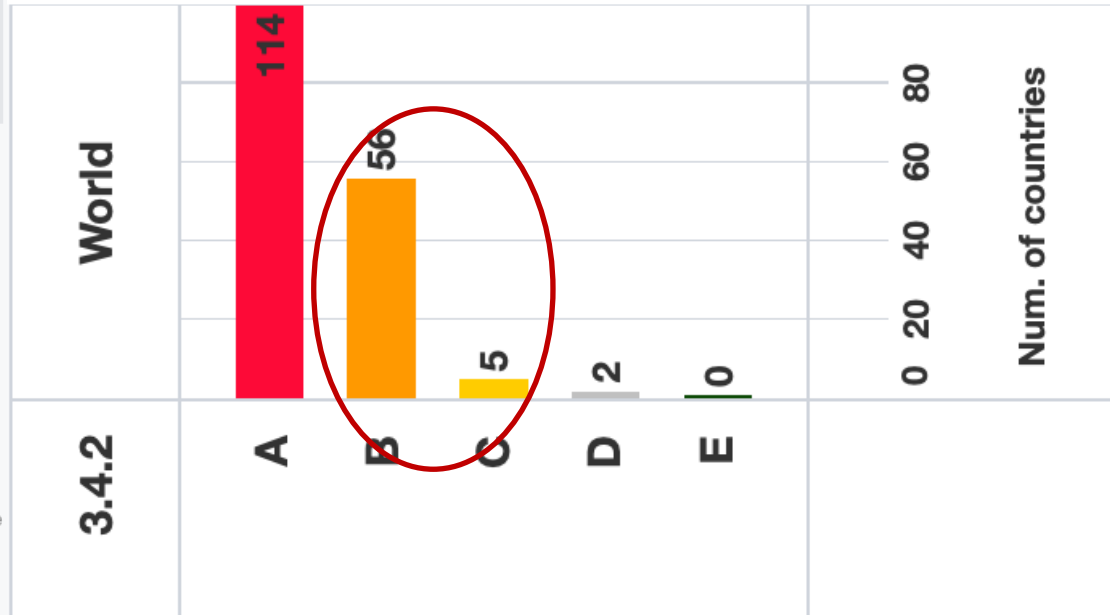
Acinetobacter baumannii, Pseudomonas aeruginosa, Enterobacteriaceae E.coli, Klebsiella, Proteus, Enterococcus faecium, Staphylococcus aureus, Campylobacter spp., Salmonellae, Neisseria gonorrhoeae Streptococcus pneumoniae, Haemophilus influenzae, Shigella spp

### 3.4.2 Does the country have one or more reference labs performing AST/susceptibility testing for the following 11 bacteria

- A - Yes, the country has one or more reference lab/s performing susceptibility testing for ALL the 11 bacteria listed
- B - Yes, the country has one or more reference lab/s performing susceptibility testing for some of the bacteria listed
- C - No, the country does not have a reference lab/s performing susceptibility testing for any of the bacteria
- D - Unknown

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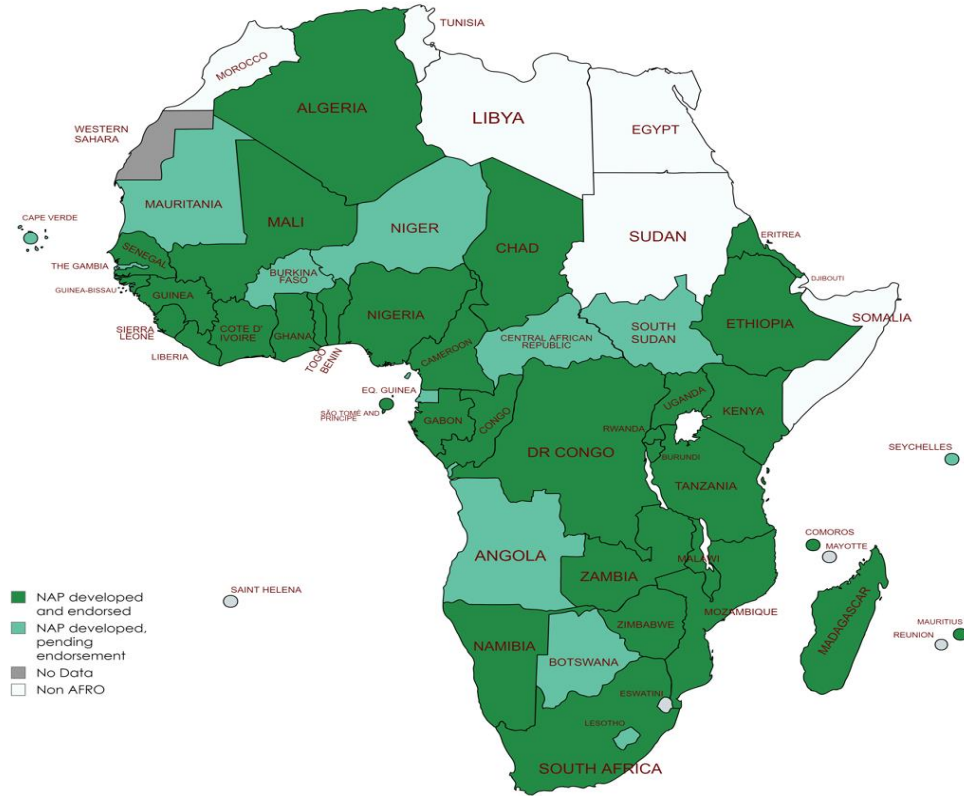
 As of Nov 2023, 61 countries inadequately resourced to to perform AST for the 11 priority AMR bacteria



# Where are we now? Regional Overview

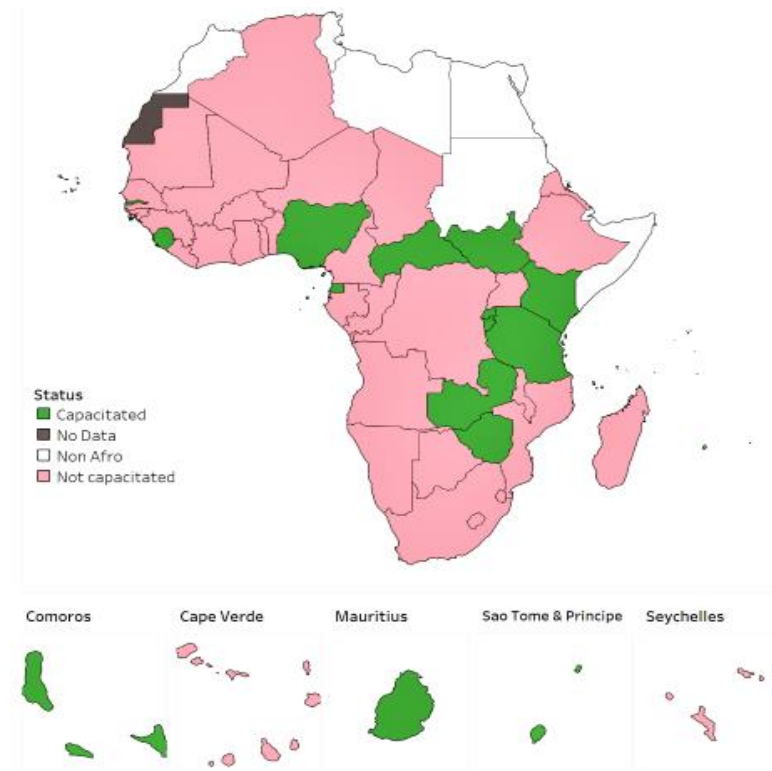


## NAP Development progress



- All Member States (47) have AMR NAPs
- 35 endorsed by national authorities

## WHO costing and budgeting tool for AMR NAPs



- 15 countries including Gambia capacitated on the tool across all sectors



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# Where are we now? Regional Overview



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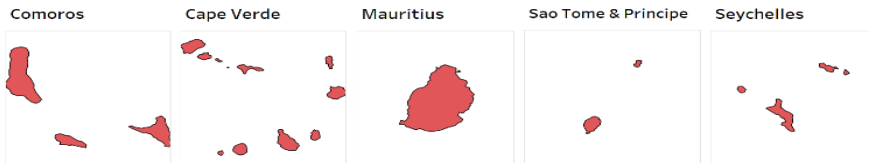
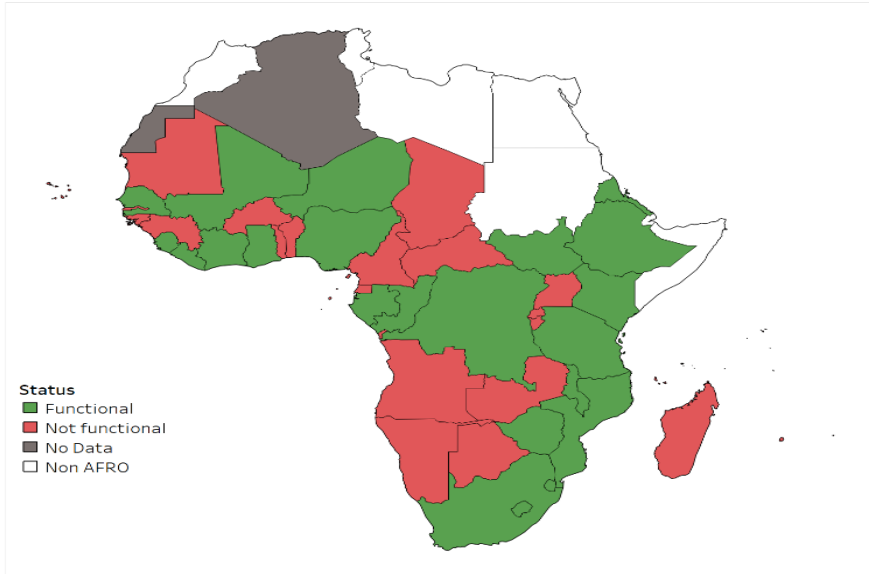
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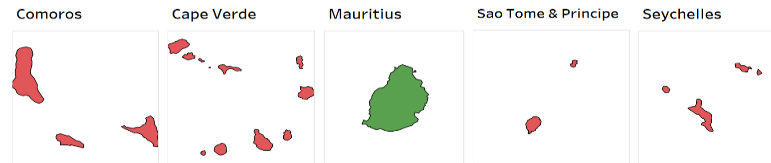
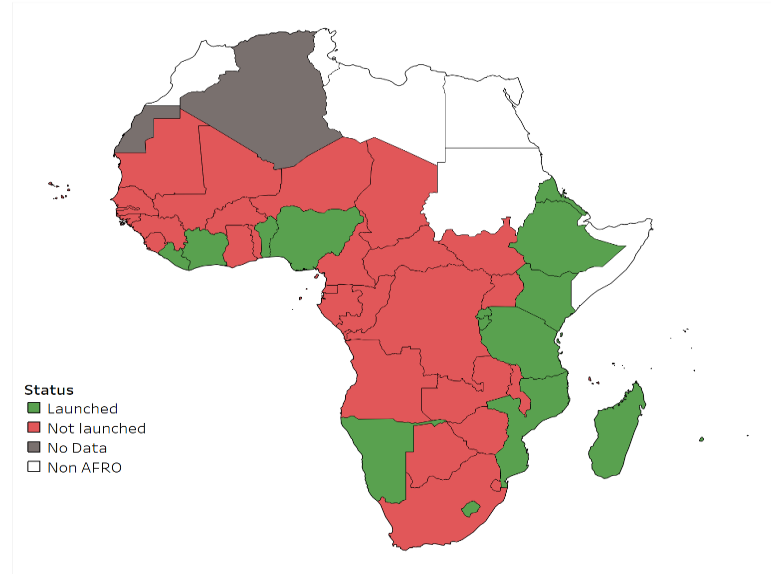


## Governance and Coordination



- **24 countries** have functional multisector coordination mechanisms

## Awareness and understanding on AMR

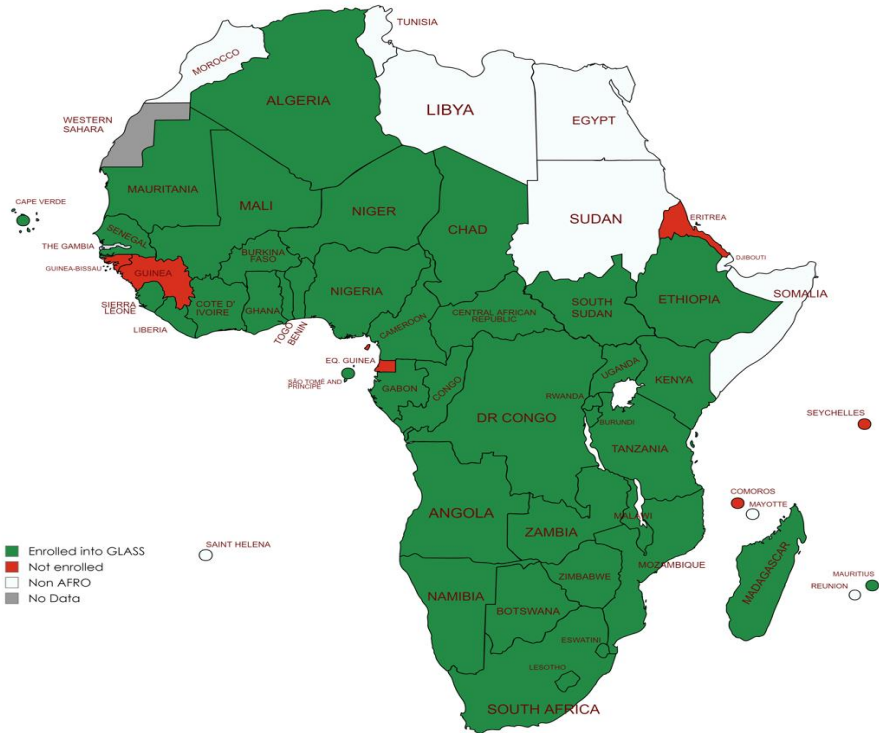


- **Nineteen countries** have launched nationwide government-supported AMR awareness-raising campaigns targeting most priority stakeholder groups.

# Where are we now? Regional Overview



## GLASS enrollment



## Integrated AMR surveillance



- Forty-one (87%) Member States joined the Global Antimicrobial Resistance/Use Surveillance System (GLASS)

- Eight (17%) Member States are implementing integrated AMR surveillance under the One Health approach



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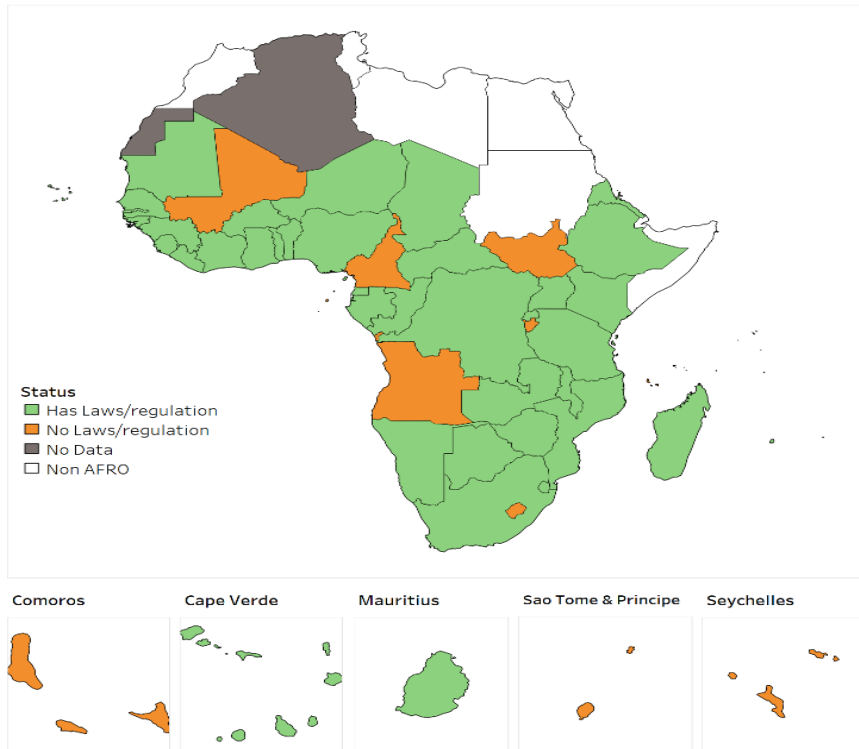
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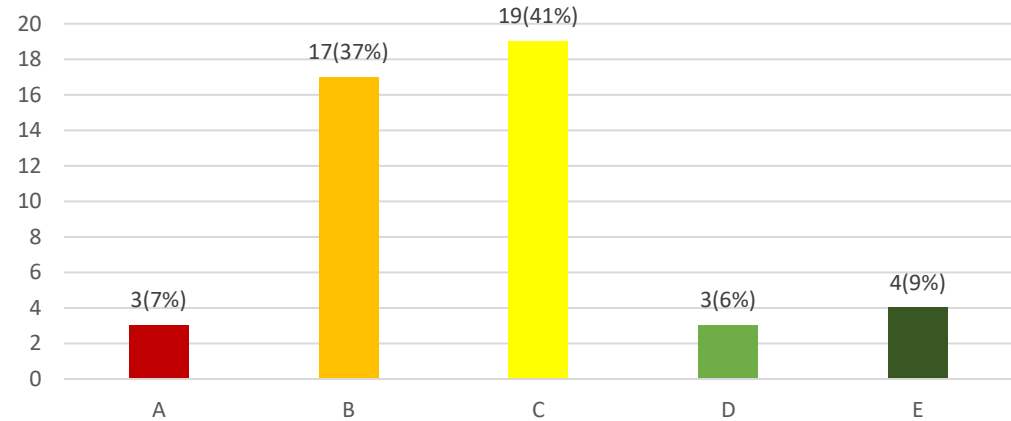


## Optimizing use of antimicrobial medicines



Findings from 2023 TrACSS shows **37 (80%) countries** have laws/regulations on prescription and sale of antimicrobials for human use.

## Adoption of “AWaRe” classification



<b>A</b>	Country has no knowledge or information about the AWaRe classification of antibiotics.
<b>B</b>	Country has knowledge about the AWaRe classification of antibiotics but has not yet adopted it.
<b>C</b>	Country has adopted the AWaRe classification of antibiotics in their National Essential Medicines List.
<b>D</b>	Country has adopted the AWaRe classification of antibiotics in their National Essential Medicines List and is monitoring its antibiotic consumption and reporting it according to the AWaRe classification.
<b>E</b>	Country has adopted the AWaRe classification of antibiotics in their National Essential Medicines List, is monitoring its antibiotic consumption and reporting it according to the AWaRe classification and has incorporated AWaRe into its antimicrobial stewardship strategies (e.g. treatment guidelines).

- Findings from 2023 TrACSS shows, **26 countries (57%)** have adopted the AWaRe classification of antibiotics in their National Essential Medicines List in 2023 (Level C-E) compared to 23 countries in 2022, 5 countries in 2020 and 11 countries in 2021.



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# UNGA High-Level Meeting on AMR- Sept 2024



- Global leaders approved a political declaration at the 79th United Nations General Assembly (UNGA) High-Level Meeting on Antimicrobial Resistance (AMR) and committed to:
  - reducing the estimated 4.95 million human deaths associated with bacterial AMR annually by 10% by 2030.
- The declaration also calls for sustainable national financing and **US\$100 million in catalytic funding**, to help achieve a target of at least 60% of countries having funded national action plans on AMR by 2030.



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<https://www.who.int/news/item/26-09-2024-world-leaders-commit-to-decisive-action-on-antimicrobial-resistance>



# Global actions to reach targets by 2030



## Human health

- At least 70% of antibiotics used for human health globally should belong to the WHO Access group antibiotics.

## Agriculture and animal health

- Meaningfully reduce the quantity of antimicrobials used globally in the agri-food systems by 2030.

## Environment

- Prevent and address the discharge of antimicrobials into the environment.
- Increased research and knowledge on the environmental dimensions of AMR and for catalyzing actions to address key sources of antimicrobial pollution.



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<https://www.who.int/news-room/fact-sheets/detail/antimicrobial-resistance>



# Country AMR response



AMR National Action Plans.

A people-centered approach and WHO core package of interventions.

Antimicrobial stewardship and AWaRe.

Strategic information to inform the AMR response.

Priority-setting for AMR research and product development.



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# THANK YOU!



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