

Operational
approach to
**antimicrobial
stewardship**
in the WHO Eastern
Mediterranean
Region

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Background

Antimicrobial stewardship (AMS) and appropriate use of antimicrobials is the fourth objective of the World Health Organization's (WHO) **global action plan on antimicrobial resistance**, adopted by Member States at the 68th World Health Assembly in 2015. To support the implementation of AMS programmes in the human health sector in low- and middle-income countries, WHO released a **practical toolkit** in 2019. Based on further requests by Member States, WHO also issued **policy guidance** on how to facilitate the implementation of national AMS activities through an integrated and programmatic approach in 2021. These documents complement other WHO guidance, such as a **technical brief on water, sanitation, hygiene (WASH) and wastewater management to prevent infections and reduce the spread of antimicrobial resistance (AMR)** (2020), an action framework on **leveraging vaccines to reduce antibiotic use and prevent antimicrobial resistance** (2021), and the **global action plan and monitoring framework on infection prevention and control (IPC), 2024–2030**, which was endorsed by Member States at the 77th World Health Assembly in 2024.

Member States also endorsed WHO's **strategic and operational priorities to address drug-resistant bacterial infections in the human health sector, 2025–2035**, at the 77th World Health Assembly. One of the strategic priorities focuses on ensuring universal access to affordable, quality diagnosis and appropriate treatment of infections.

While global guidance on implementing AMS programmes exists, no comprehensive, tailored guidance for implementing AMS programmes in the WHO Eastern Mediterranean Region has been developed to date.

Data suggest that antibiotic consumption rates are higher in the Eastern Mediterranean Region than in any other WHO region. In addition, stewardship approaches in the Region are less well developed than other components of the AMR response, such as IPC and surveillance. Although AMR national action plans have been developed in all countries, with AMS being an integral part of every plan, implementation is weak and effective hospital AMS programmes need to go to scale. Stewardship programmes are much more effective when implemented in conjunction with IPC.

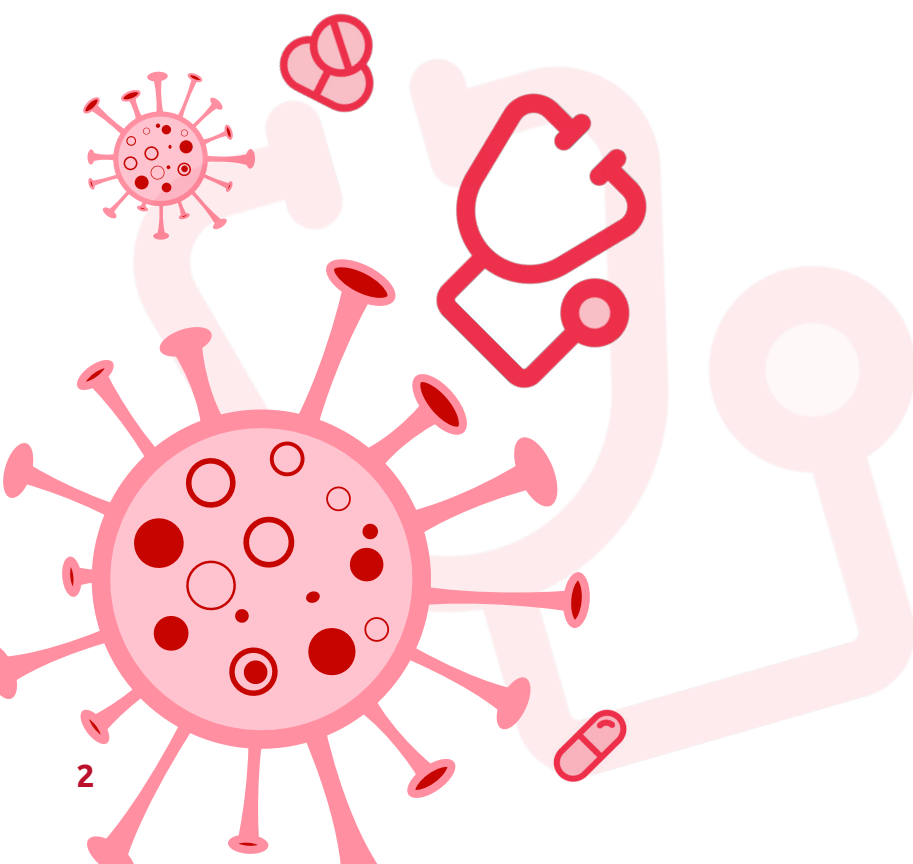
In general, the quality and scope of AMS programmes are better in the formal private sector, where the need for accreditation, reputational issues and cost saving are all drivers. Implementation in the public sector is patchier, with isolated examples of good practice, training and capacity-building, but few countries have effective programmes at scale.

The WHO Regional Office for the Eastern Mediterranean has therefore developed an operational approach to strengthening AMS programmes at the national and facility level. This operational approach sets out what WHO will do through its Regional and country offices to support the countries of the Region to implement AMS and achieve appropriate use at country level. An indicator of appropriate use is the proportion of Access,¹ or first line, antibiotics used, which should reach a target of 60% or more by 2030. This target is set out in WHO's Thirteenth General Programme of Work and in the Muscat Ministerial

¹ The Access, Watch and Reserve (AWaRe) classification is the WHO classification of antibiotics, introduced in 2017. The classification groups antibiotics into three categories: Access antibiotics have a narrow spectrum of activity and a good safety profile in terms of side-effects; Watch antibiotics are broader-spectrum antibiotics and are recommended as first-choice options for patients with more severe clinical presentations or for infections where the causative pathogens are more likely to be resistant to Access antibiotics; and Reserve antibiotics are last-choice antibiotics used to treat multidrug-resistant infections.

Manifesto on AMR, endorsed by 17 countries and territories of the Region at the Third Inter-ministerial Conference on AMR in Muscat, Oman, in November 2022. These country outcomes require national governments and other stakeholders to commit to, invest in and implement activities.

The operational approach focuses on how WHO will support countries in the human sector and in One Health coordination and collaboration. As it is not the mandate of WHO to work directly with the animal, agriculture, or fisheries sectors, this document does not cover approaches to monitor or decrease inappropriate use in non-human sectors. However, WHO will encourage and facilitate links with its partner organizations the Food and Agriculture Organization of the United Nations (FAO) and the World Organisation for Animal Health (WOAH), which do have this mandate.



GOAL Reduce inappropriate use of antibiotics in the Eastern Mediterranean Region by 2035.

TARGET In each country, at least 60% of the antibiotics consumed in human health are from the Access group of antibiotics.

Specific objectives for countries

- 1 Formulate national policies covering the appropriate availability, quality and use of antimicrobials.
- 2 Adopt the AWaRe classification of antibiotics as a reference point for interventions on stewardship.
- 3 Develop a strategic approach to phasing out over-the-counter sales of antibiotics on the basis of the AWaRe classification.
- 4 Generate robust data on antimicrobial consumption by 2025 to guide stewardship programmes.
- 5 Increase awareness and build capacity of prescribers regarding appropriate use of antibiotics and stewardship programmes.
- 6 Implement AMS programmes in the majority of secondary and tertiary hospitals (both public and private).
- 7 Pilot AMS programmes in primary health care facilities.

Practical implementation

Links with the broader AMR strategy

At the national and facility levels, AMS needs to be an integral part of the broader AMR response. Close collaboration with programmes on IPC, diagnostic stewardship and surveillance of AMR is vital to enhance the appropriate use of antimicrobials and decrease AMR.

Stratified approach

This operational approach covers all 22 countries/territories of the Region, but implementation will vary according to their different resources, capacities and contexts. In fragile, conflict-affected and vulnerable countries, a pragmatic approach must incorporate guidance on appropriate use² into primary and secondary care and emergency programmes.

In the high-income countries of the Gulf Cooperation Council, capacity is much higher, and existing stewardship efforts need to be sustained and scaled up. These countries can also serve as role models for other countries of the Region and share their experiences and lesson learned.

In middle-income countries, the rate of change in consumption has been the highest. A 114% increase in median per capita consumption was recorded in these countries

² As outlined in: The WHO AWaRe (access, watch, reserve) antibiotic book. Geneva: World Health Organization; 2022 (<https://iris.who.int/handle/10665/365237>, accessed 9 July 2024). License: CC BY-NC-SA 3.0 IGO.

between 2000 and 2018, compared to 62% in fragile, conflict-affected and vulnerable states, and 42% in high-income countries. The risk of inaction in these countries is high. While there are some capacities and infrastructure for AMS, these vary substantially, and investment and action need to be prioritized in these settings.

Collaboration with partners

The cornerstone of the operational approach is partnership and collaboration. To go to scale in all countries, collaboration with other partners will be needed, including developing and rolling out training and supporting countries with data analysis and use.

WHO will encourage and collaborate with other partners to work in the critical areas of their expertise, such as mass communication with the general public or school children, hospital and programme accreditation, and work in non-human health sectors.

Operational research

WHO will frame an operational research agenda for all partners to engage with. This includes the generation of new knowledge to support implementation of effective AMS interventions adapted to different contexts.

Interventions

Based on existing infrastructure, technical capacity and available resources, countries are encouraged to select the interventions that are most feasible to implement. To identify suitable interventions, countries may need to undertake a quick situation analysis of their AMS efforts to establish a baseline and identify suitable targets.

Table 1 provides a core list of interventions across nine domains. The list is not exhaustive, and countries are encouraged to further tailor interventions to their respective country context.

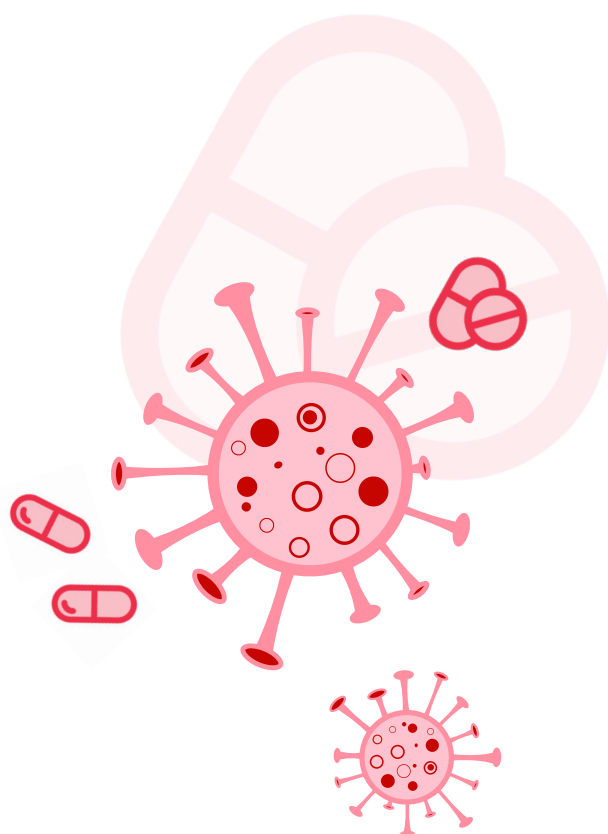


Table 1. AMS core interventions

Domain	Regional Office outputs	Country office outputs	Country outcomes
Governance structures	<ul style="list-style-type: none"> • Policy advice on core functions and options for delivery of AMS interventions 	<ul style="list-style-type: none"> • Policy advice to governments to align AMR governance with the One Health approach and enhance multisectoral coordination 	<ul style="list-style-type: none"> • AMS committees as an integral part of AMR and One Health coordination • Policy oversight of AMS activities
Political leadership	<ul style="list-style-type: none"> • High-quality, timely advocacy materials and information, e.g. to support engagement in regional and global events, such as the United Nations General Assembly High-Level Meeting on AMR in September 2024 • A model country-level policy brief on antibiotic use and AMS 	<ul style="list-style-type: none"> • High-level policy dialogue and appropriate timely advocacy that results in meaningful political engagement and system strengthening to address AMR • A country-specific policy brief on antibiotic use and AMS 	<ul style="list-style-type: none"> • High-level political engagement and financial support for AMS, as part of AMR programmes
National drug regulation policies and practices	<ul style="list-style-type: none"> • A collaborative network of countries working to harmonize regulations to restrict over-the-counter sales 	<ul style="list-style-type: none"> • A draft plan for phasing out over-the-counter sales of antibiotics, based on the AWaRe classification • Policy notes on substandard and falsified antimicrobials • Policy notes on the regulation of medicine/antibiotic promotion and pricing • A technical document to support the adoption of the AWaRe classification within the national Essential Medicines List 	<ul style="list-style-type: none"> • National guidelines on optimizing antimicrobial use (AMU) in place for all major syndromes • National policy for over-the-counter sales based on the AWaRe classification and risks of resistance • Increased awareness and reporting of substandard and falsified antimicrobials • Regulations on medicine/antibiotic promotion • The AWaRe classification adopted in the national Essential Medicines List and the management and reporting of antibiotic use • A mechanism to monitor over-the-counter sales

Domain	Regional Office outputs	Country office outputs	Country outcomes
National procurement practices and supply chain mechanisms	<ul style="list-style-type: none"> • Consensus-building on approaches to monitoring and analysing antibiotic consumption • Capacity-building in data analysis (workshops, training) 	<ul style="list-style-type: none"> • Review of the supply chain to include access to antibiotics as part of supply chain strengthening 	<ul style="list-style-type: none"> • 60% Access group share in overall antibiotic use at the national level • Antibiotics are available as appropriate to the level of care of the facility
Hospital-based stewardship programmes	<ul style="list-style-type: none"> • An agreed-upon regional plan of action for hospital stewardship • Guidance on AMS and IPC standards for accreditation agencies • Criteria for centres of excellence in AMR, including the identification process 	<ul style="list-style-type: none"> • Capacity-building programmes to support hospital stewardship • E-health and data information programmes that facilitate analysis and use of data on antibiotic use in decision-making • Use of AMU data for quality improvement • Guidelines and antibiotic policies based on the AWaRe antibiotic book, and a strategy for dissemination to encourage use 	<ul style="list-style-type: none"> • Increased coverage of stewardship programmes in hospitals • Functioning and accountable multidisciplinary medicines and therapeutic committee/ AMR committee, with enforced antibiotic policies in hospitals • Monitoring and surveillance data are used to update treatment guidelines
Promotion of appropriate use of antibiotics in primary health care	<ul style="list-style-type: none"> • Simplified approaches and practical tools for monitoring antibiotic use and stewardship in primary health care 	<ul style="list-style-type: none"> • A basket of evidence-based and contextualized behaviour-change interventions to improve AMU in primary health care • A technical plan to introduce the AWaRe antibiotic book as reference material in primary health care 	<ul style="list-style-type: none"> • Improved prescription behaviours • Better monitoring of AMU and improved AMU in primary health care • The AWaRe antibiotic book used as reference material in primary health care

Domain	Regional Office outputs	Country office outputs	Country outcomes
Education and awareness about AMS	<ul style="list-style-type: none"> • Tools to assess the needs of new prescribers and primary health care staff, and ongoing continuous professional development • Training packages and tools for hospital AMS identified, adapted and disseminated • Capacity-building of national focal points to collect, compile and analyse national- and facility-level data • Tools to evaluate training effectiveness • A collaborative network of academics to support the incorporation of AMR/rational use in curricula • Community of practice platform for meaningful engagement of students and professionals on AMS 	<ul style="list-style-type: none"> • National stakeholder group for capacity-building and mentorship programmes to underpin effective AMS in hospitals and primary health care • Campaigns on antimicrobial awareness, IPC and appropriate use for health care professionals • Model curricula on AMR and rational use for medical/pharmacy/nursing students in universities • Dissemination of AMR training courses for continuous professional development • An ongoing campaign in universities and health communities • Case studies and stories of effective AMS programmes and AMS champions 	<ul style="list-style-type: none"> • Health care professionals trained across all levels of care • A network of health care professionals sharing AMS experiences and multidrug-resistant organism case management • AMR and rational use integrated into university curricula for medical/pharmacy/nursing students
Monitoring systems for AMU	<ul style="list-style-type: none"> • Consensus approach on mapping and using antibiotic consumption/use data • Adaptation and dissemination of quality standards, checklists and systems for improved AMU data collection, analysis and use for decision-making at national and facility levels 	<ul style="list-style-type: none"> • An antibiotic use country profile • A national consensus plan on the approach to generating and using antibiotic consumption/use data through routine systems and surveys 	<ul style="list-style-type: none"> • Hospitals generate good-quality data on AMU • Hospitals use AMU data for stewardship • AMU data guide medicine procurement • Countries report national AMU data to Global Antimicrobial Resistance and Use Surveillance System (GLASS)

Domain	Regional Office outputs	Country office outputs	Country outcomes
One Health approach	<ul style="list-style-type: none"> • Quadripartite One Health approach supports and reviews effective multisectoral collaboration • Institutional review supports multisectoral coordination and collaboration 	<ul style="list-style-type: none"> • AMR included in One Health plans and governance • Quadripartite engagement to support antimicrobial policies across sectors 	<ul style="list-style-type: none"> • One Health coordination mechanisms include an effective committee on antimicrobials • National legislation/regulatory framework for optimizing AMU in non-human health sectors • The country generates, submits to GLASS and ANIMUSE (the global database on animal antimicrobial use), and uses AMU data from the human and non-human sectors • One Health AMR campaigns and advocacy

The use of existing systems is proposed to monitor and evaluate the outlined country outcomes (see Table 2), including the Global Database for Tracking Antimicrobial Resistance (AMR) Country Self- Assessment Survey (TrACSS), Global Antimicrobial Resistance and Use Surveillance System (GLASS), and Joint External Evaluation (JEE).

Table 2. Suggested monitoring and evaluation indicators and data sources to follow up on the implementation of AMS programmes

Domain	Indicator	Data source at the global/regional level
Governance structures	Functional, multisectoral AMR governance mechanism in place, including a technical working group/subcommittee on AMS	TrACSS
	Country is using relevant AMU data to inform operational decision-making and amend policies in the human health sector	TrACSS
Political leadership	Country has endorsed the Political Declaration of the United Nations General Assembly High-level Meeting on Antimicrobial Resistance	WHO
	National AMR action plan has costed and budgeted operational plan and monitoring mechanism in place	TrACSS
National drug regulation policies and practices	Country has national guidelines on optimizing AMU in place that are implemented for all major syndromes, and data on use is systematically fed back to prescribers	TrACSS, JEE
	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 AMS strategies (e.g. treatment guidelines)	TrACSS
	Country is formally part of the Member State Mechanism to address the issue of tackling substandard and falsified medical products and implements its workplan	WHO regional data on Member State Mechanism to address substandard and falsified medical products
	Country has legislation in place which restricts over-the-counter sales of antimicrobials, with appropriate enforcement and controls in place	TrACSS

Domain	Indicator	Data source at the global/regional level
National procurement practices and supply chain mechanisms	60% Access group share in overall antibiotic use at national level	GLASS
Hospital-based stewardship programmes	National guidelines for appropriate use of antimicrobials are available and AMS programmes are being implemented in most health care facilities nationwide	TrACSS
	Monitoring and surveillance results are used to inform action and to update treatment guidelines and essential medicines lists	TrACSS
Promotion of appropriate use of antibiotics in primary health care	60% Access group share in overall antibiotic use at the national level	GLASS
Education and awareness about AMS	AMR is systematically and formally incorporated in pre-service training curricula for all relevant human health cadres	TrACSS
	In-service training or other continuing professional development on AMR is taken up by relevant groups for human health nationwide, in public and private sectors	TrACSS
Monitoring systems for AMU	Submission of quality AMU data to GLASS	GLASS
One Health approach	Country submits AMU data in the veterinary sector to the WOA ANIMUSE platform	TrACSS
	Country has a national plan or system in place for monitoring sales/use of antimicrobials in animals	TrACSS
	Country has national legislation/regulatory framework for optimizing AMU in terrestrial animals in place, with appropriate enforcement and control	TrACSS
	Country has national legislation/regulatory framework for optimizing AMU in aquatic animals in place, with appropriate enforcement and control	TrACSS
	Country regularly implements routine targeted, national government-supported activities/campaigns to raise awareness and change behaviour of key stakeholders within/across priority sectors	TrACSS

Taken from [document EM/RC71/4-Rev.1](#).

