WHO POLICY GUIDANCE ON INTEGRATED ANTIMICROBIAL STEWARDSHIP ACTIVITIES

World Health Organization

HANDLE ANTIMICROBIALS WITH CARE

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Antivirals
Antifungals
Antiparasitics

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Contents

List of Abbreviations

AWaRe	Access, Watch, Reserve	INNs	International Nonproprietary Names
AMC	antimicrobial medicines consumption	M&E	monitoring and evaluation
AMU	antimicrobial medicines use	NRA	national regulatory authority
CPD	continuous professional development	PHC	primary health care
EML	WHO essential medicines list	TB	tuberculosis
GLASS	Global Antimicrobial Resistance Surveillance System	TOR	terms of reference
HAI	health-care-associated infection	UHC	universal health coverage
IPC	infection prevention and control	WAAW	World Antimicrobial Awareness Week
IT	information technology	WASH	water, sanitation and hygiene

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1. Background

Universal access to high-quality and affordable antimicrobials is an essential component of universal health coverage (UHC). Antimicrobials include antibiotics, antivirals, antifungals and antiparasitic medicines that are used to prevent and treat infections in humans, animals and plants. Access to high-quality and affordable antimicrobials to combat communicable diseases is a challenge in many settings affecting the quality of health care.

On the other hand, inappropriate use of antimicrobial agents across human, animal and environmental sectors is among the main drivers of antimicrobial resistance (AMR) *(1).* AMR occurs when bacteria, viruses, fungi and parasites change over time and no longer respond to medicines, making infections harder to treat and increasing the risk of disease spread, severe illness and death. AMR also makes lifesaving medical procedures riskier to perform and has a broader societal and economic impact which threatens the achievement of UHC and the Sustainable Development Goals. The coronavirus disease (COVID-19) pandemic has further demonstrated the challenges of AMR.

Tackling AMR requires a comprehensive set of interventions. A study conducted by the Organisation for Economic Co-operation and Development (OECD) suggests that simple measures to prevent infections such as vaccinations, promoting hand hygiene and better hygiene in health-care facilities more than halves the risk of death and decreases the health burden of AMR. Similarly, integrated delivery of policies that promote hospital hygiene, antimicrobial stewardship (AMS), and the use of diagnostic tests to differentiate bacterial vs. viral infections and mass media campaigns could significantly reduce the burden of drug-resistant infection and could save 1.6 million lives by 2050 in the 33 countries included in the analysis *(2).* This study also estimated investment in these policies would pay for themselves within a year and save up to US$ 4.8 billion per year.

Optimizing the use of antimicrobial medicines across human, animal and plant health is a cornerstone of the Global Action Plan for Antimicrobial Resistance *(3).*

WHO defines AMS as a coherent set of integrated actions which promote the responsible and appropriate use of antimicrobials to help improve patient outcomes across the continuum of care. Responsible and appropriate use of antimicrobials includes prescribing only when needed, selection of the optimal drug regimen, drug dosing, route of administration and duration of treatment following proper and optimized diagnosis. These actions are complemented by access to affordable and quality antimicrobials and interventions that prevent health-care-associated infections and community-acquired infections, including the implementation of core components of infection prevention and control (IPC), enhancing water, sanitation and hygiene (WASH), and optimizing vaccination coverage *(4–6).*

The WHO Thirteenth General Programme of Work (GPW 13) has identified AMR as a priority with significant relevance to its Triple Billion targets of achieving UHC, addressing health emergencies and promoting healthier populations *(7).* WHO has developed tools to assist AMS activities at health-care facility level in low- and middle-income countries, which have helped to advance implementation at national level as well as within health-care facilities and clinical practice *(8).* However, effective implementation of AMS activities in health-care facilities requires a comprehensive approach, beyond the facilities, at national policy and programme levels.

2. Purpose of the policy guidance

Member States have requested WHO policy guidance on how to facilitate the implementation of national AMS activities in an integrated and programmatic approach. This policy guidance responds to that demand from Member States and is anchored in public health guiding principles in the human health sector. It aims to provide a set of evidence-based and pragmatic recommendations to drive comprehensive and integrated AMS activities under the purview of a central national coordination unit, National AMR steering or coordinating committees or other equivalent national authorities. The policy guidance complements the Global Action Plan, the WHO practical toolkit for AMS programmes in health-care facilities in low- and middle-income countries and other WHO guidance in surveillance, IPC and WASH.

3. Target audience of the policy guidance

The primary target audiences of this guidance are national policy-makers at ministries of health, national AMR coordinating bodies such as national AMR steering or coordinating committees or other equivalent national authorities who are responsible for the development, implementation and monitoring of the national action plans, policies and standards for mitigating AMR in the human health sector. Subnational authorities and decision-makers, technical experts and stakeholders supporting such programmes at all levels are also target audiences for the policy guidance. The considerations included in this policy have important implications and relevance for the strategic direction and human health sector-related activities of other sectors or ministries, such as those working on quality of care in the human health sector, WASH, IPC, animal and plant health as well the environment.

4. Principles of integrated AMS activities

The policy promotes an integrated approach to preserve antimicrobials and seeks synergy and efficiency for the implementation of comprehensive interventions across essential areas of the human health sector at all levels.

The following are the guiding principles:

- Give due consideration to national and local context and the structure of the health system in carrying out AMS activities.
- Focus on prioritizing implementation of activities that are likely to provide the greatest benefits based on national and facility needs assessment.
- Strengthen and use existing national and subnational platforms and coordinating mechanisms and resources to implement integrated AMS activities.
- Ensure strong and effective linkages and synergies between the relevant areas and disciplines related to AMR, including national infectious diseases and infection prevention programmes such as HIV, tuberculosis (TB), malaria, sexual, reproductive, maternal, newborn, child and adolescent health, and the UHC agenda at all levels.

5. Package of integrated AMS activities

The implementation of integrated AMS interventions and activities requires a programmatic approach anchored in public health principles. The following 12 interventions and activities organized in five pillars represent the key package that needs to be considered to commence and implement comprehensive and integrated AMS activities (Table 1). IPC and WASH are complementary activities needed to tackle AMR effectively.

TABLE 1.
Integrated AMS activities

PILLAR 1: **Establish and develop national coordination mechanisms for antimicrobial stewardship and develop guidelines**
1. Establish and maintain a national coordinating mechanism for AMS that is functional at national, subnational and district levels.
2. Develop national treatment and stewardship guidelines, standards and implementation tools.
PILLAR 2: **Ensure access to and regulation of antimicrobials**
3. Improve access to essential, quality-assured, safe, effective and affordable antimicrobials.
4. Regulate social triggers and remuneration policies that promote responsible antimicrobial prescription and dispensing behaviours.
5. Legislate and regulate responsible and appropriate use and disposal of antimicrobials.
PILLAR 3: **Improve awareness, education and training**
6. Improve awareness and engagement to support behavioural change of antimicrobials use.
7. Strengthen health worker capacity through the provision of tailored education and training packages according to health worker roles and functions.
PILLAR 4: **Strengthen water, sanitation and hygiene and infection prevention and control**
8. Enhance WASH in health facilities and communities.
9. Implement IPC core components in health facilities.
PILLAR 5: **Surveillance, monitoring and evaluation**
10. Surveillance of antimicrobial use and consumption.
11. Surveillance of AMR.
12. Monitoring and evaluation of AMS activities.

5.1.
Establish and develop national coordination mechanisms for AMS and develop guidelines

5.1.1. Establish and maintain a national coordinating mechanism for AMS that is functional at national, subnational and district levels.

Context: Implementing national action plans on AMR, including integrated AMS activities, requires partnering with stakeholders within the health sector and other sectors, including private for-profit organizations and civil society organizations such as professional societies. Coordination is essential for establishing and sustaining an enabling environment to scale up the implementation of integrated AMS activities. These activities need to be coordinated by a central national coordination unit or its equivalent at the ministry of health or in any other designated national agency with sustainable and adequate funding, with technically competent human resources and accountability mechanisms. The shape and structure of such a unit will depend on the national context and the structure of the health system and could be embedded within existing functional national AMR coordinating mechanisms. Experience from other public health programmes, such as TB, HIV/AIDS and maternal and child health, has shown that adequately funded and effective coordinating mechanisms that operate at all levels, inclusive of all stakeholders, including civil society organizations, professional societies, the private sector, patients and communities, are feasible and enable ownership, accountability, broad commitment and scale-up *(9).*

Actions and considerations:

- *Establish and maintain a central national coordination unit at the ministry of health or in any other designated national agency with its own sustainable and adequate funding, with technically competent human resources and accountability mechanisms as well as functionality at all administrative levels to coordinate the design, implementation and monitoring of integrated AMS activities.*
- *The central national coordination unit should establish a specific national AMS coordinating mechanism for integrated AMS activities with diverse membership, including representatives from relevant national programs and departments, the private for-profit sector, professional societies, nongovernmental organizations (NGOs), regulatory bodies, academia and researchers, representatives working with community groups and patients, and representatives from other relevant One Health sectors and national mechanisms.*
- *Facilitate the establishment and functionality of the national AMS coordinating mechanism at subnational and district levels depending on the local context and needs.*
- *The terms of reference of the central national coordination unit at the ministry of health or in any other designated national agency could include:*
  - *i. Providing strategic and programmatic leadership on activities under the national action plan on AMR related to optimizing antimicrobial use, including development of AMS implementation plans aligned with national action plans with well-defined goals and indicators.*
  - *ii. Providing guidance on gap analysis and prioritization to help define a starting point based on available capacities and resources.*
  - *iii. Enhancing integration of AMS activities across multiple levels of the health sector, including national, subnational, district, facility and community levels.*
  - *iv. Coordinating the development and dissemination of guidelines for optimized diagnosis and treatment of infectious diseases, clinical decision support tools, standard operating procedures and implementation tools.*
  - *v. Facilitating the review of guidelines for management of infectious diseases, including neglected tropical diseases, to incorporate AMS activities based on surveillance and other data generated in collaboration with the medicines and therapeutics committees or their equivalents where possible.*
  - *vi. Mobilizing resources dedicated to AMS activities, including through integration into national health sector plans and budgets at all levels.*

vii. *Creating synergies and mainstreaming AMS activities into public health programmes such as TB, HIV, malaria, UHC, primary health care (PHC), health emergencies, WASH and IPC activities.*

viii. *Facilitating cooperation and mechanisms between public, nongovernmental and private for-profit health sector stakeholders to support uptake of AMS activities and policy recommendations.*

ix. *Supporting implementation research, knowledge management and establishing evidence and learning platforms for locally tailored best practices and experiences of successful AMS activity implementation.*

x. *Incorporating AMS into relevant pre- and in-service training curricula for all health professionals.*

xi. *Developing and implementing a monitoring and evaluation framework and national targets for AMS activities based on nationally and internationally agreed indicators, guidelines and tools (10).*

5.1.2. Develop national treatment and stewardship guidelines, standards and implementation tools.

Context: Proper diagnosis and treatment of infectious diseases with appropriate therapeutic agents, facilitated by the existence of diagnostic capacity to rapidly and reliably detect specific pathogens and their antimicrobial susceptibilities, is critical to improve patient outcomes across the continuum of care. National treatment guidelines on infections and infectious diseases should be based on local and global evidence and guidelines, including diagnosis, selection of the optimal drug regimen, dosing, duration and route of administration, and are critical elements of AMS activities. National operational guidelines, standard operating procedures and implementation tools based on internationally and nationally recommended, evidence-based policies and guidelines will facilitate the scale-up of integrated stewardship activities. The availability of proper and optimized diagnosis, including timely and accurate microbiological tests, will help to reduce inappropriate use of antimicrobials and improve patient outcomes. The principles in the WHO Model List of Essential Medicines (EML), Access, Watch, Reserve (AWaRe) classification and the *WHO handbook (11)* on the use of antibiotics for common bacterial infections, including drug resistance, can be used to inform the development of national guidelines. The overall goal of these efforts should be to reduce unnecessary use of antimicrobials, including the inappropriate use of Watch group and Reserve group antibiotics (the antibiotics most crucial for human medicine and at higher risk of resistance), and to increase the use of Access antibiotics where appropriate

Actions and considerations:

- *Develop or adapt and monitor implementation of standard diagnosis and treatment guidelines for infections and infectious diseases of public health depending on local epidemiology and resistance patterns and informed by principles of internationally agreed guidelines or the rigorous assessment of the evidence and in collaboration with professional societies and other relevant in-country stakeholders, including endorsement of the guidelines.*
- *Advocate and coordinate the availability of affordable and appropriate microbiological diagnostics to facilitate proper and optimized diagnosis where appropriate to guide therapeutic decisions and improve patient care and outcomes.*
- *Design easy, scalable, sustainable and context-specific standard operating procedures and standards for AMS activities for health-care facilities (e.g. hospitals and PHC) and community settings (e.g. for community health workers) with inbuilt continuous quality improvement concepts (7).*
- *Incorporate continuous quality improvement concepts into AMS activities to ensure that the interventions and activities are sustainable.*
- *Establish structures and systems for effective linkage and engagement of different departments to support integrated AMS activities.*
- *Facilitate the development and use of electronic platforms and applications to populate AMS guidelines, standards and implementation tools and other relevant information and for sharing experiences, best practice and information on implementation of AMS activities.*
- *Establish mechanisms and activities for the dissemination of guidelines, standards and implementation tools on AMS activities.*

5.2.
Ensure access to and regulation of antimicrobials

5.2.1. Improve access to essential, quality-assured, safe, effective and affordable antimicrobials

Context: Equitable and affordable access to quality-assured, safe and effective antimicrobial medicines and their appropriate use anchor UHC *(12).* In some parts of the world more people die from lack of access to antimicrobials than drug-resistant infections. The EML and AWaRe classification *(13)* provide a selection framework to develop and or update the national EMLs and relevant efforts to strengthen national pharmaceutical supply chains, financing and reimbursement mechanisms and pharmaceutical information management systems that will ensure availability of affordable and culturally acceptable antimicrobial medicines at all levels of care. National diagnosis and treatment guidelines for infections and infectious diseases, as well as national, subnational and district level microbiological data (where it exists), can also inform the prioritization of antimicrobial medicines that require access and affordability. Shortage or unavailability of the first-line treatment often leads to the misuse of broad-spectrum antibiotics and other antimicrobials, contributing to the development of AMR. Tackling substandard and falsified medical products is an important component of ensuring access to quality-assured antimicrobials.

Actions and considerations:

- *Incorporate the WHO EML (where applicable) and AWaRe system into national EMLs, formularies, national and health-care facility treatment guidelines to guide AMS actions.*
- *Ensure the treatment guidelines and formularies are linked to the updated national EML where applicable.*
- *Establish effective national and subnational level antimicrobial (antibiotic, antifungal, antiviral and antiparasitic) demand forecasting depending on local epidemiology and public health priorities.*
- *Establish a robust supply chain and pharmacy information system with capacity to provide advance notice of possible shortages and stock-outs of antimicrobial medicines to allow rapid action.*
- *Leverage pooled procurement mechanisms to ensure the supply of quality-assured medicines, with predictability of demand for manufacturers and promoting sustainable procurement practices.*
- *Simplify the process, requirements and costs of the national drug registration for antimicrobials with integrated measures of AMS and quality assurance mechanisms.*
- *Encourage regulatory agencies to publish the active pharmaceutical ingredients source of registered antimicrobial medicines for transparency and to enable countries to design solutions to maintain predictable supply and mitigate against drug shortages.*
- *Ensure that integrated AMS activities are prioritized within existing structures and mechanisms at national and facility levels such as pharmacy boards or drugs and therapeutic committees.*
- *Ensure availability and affordability of antimicrobial agents based on public health priorities and epidemiology and resistance patterns in both the public and private sector through appropriate regulations, policies, measures and mechanisms.*
- *Develop evidence-based policies, measures and mechanisms to enhance access to alternative therapeutics, repurposed and new antimicrobial medicines, including for those who cannot afford them.*
- *Strengthen national procurement and supply chain management for quality and effective antimicrobials, including new antibiotics.*

5.2.2. Regulate social triggers and remuneration policies that promote responsible antimicrobial prescription and dispensing behaviours

Context: Health workers' antimicrobial prescribing and dispensing behaviour can often be determined or influenced by systemic factors that may be outside the immediate control of the health worker. These can range from how health workers are remunerated to promotion of antimicrobial products by pharmaceutical companies. At institutional and facility levels mechanisms are needed to reduce the amount of antimicrobials being inappropriately prescribed, dispensed or administered. Pay-for-performance initiatives showed that they helped in some settings to reduce the prescription of broad-spectrum antibiotics by health workers *(14, 15).* However, these initiatives are not a silver bullet and can potentially be harmful when the incentives are not right *(16, 17).*

Actions and considerations:

- *Understand and incorporate health worker behavioural change principles in policies to address optimal diagnostic processes, antimicrobial prescription, dispensing and administration as part of national integrated AMS activities and national plans on AMR.*
- *Institute incentives and policies to address social and economic factors that drive the inappropriate prescription and use of antimicrobials as part of national AMR plans and standard operating procedures.*
- *Strengthen national regulations that promote prescription of antimicrobials using International Nonproprietary Names (18) (generic names) to mitigate undue influence of marketing activities on prescribers.*
- *Encourage and empower individual champions, institutions and facilities to implement innovative measures or rewards (as appropriate for the local context) to reduce the inappropriate diagnosis of infectious disease as well as the inappropriate prescription, dispensing, administration and use of antimicrobials.*
- *Acknowledge and empower individual and institutional champions and incentivize appropriate stewardship activities.*

5.2.3. Legislate and regulate responsible and appropriate use and disposal of antimicrobials

Context: Enforced legal and regulatory instruments, frameworks and oversights at every step in the life cycle of antimicrobials constitute critical steps in ensuring effective AMS activities. The life cycle of antimicrobials includes: research and development; production; marketing authorization and registration; selection, procurement and supply; prescribing, dispensing and administration; responsible and appropriate use; post-marketing surveillance; and the disposal by the end user or producer. The process of implementing integrated AMS activities should entail a comprehensive review of the needs for legal and regulatory systems. The gaps in existing legal and regulatory instruments and frameworks should be identified and addressed. New regulations should be developed and enforced. These steps require developing an enabling environment through liaising with stakeholders involved in the development, production, marketing, prescription, sale and use of antimicrobials, including in the human, animal and plant sectors, to harmonize rules and regulation to preserve antimicrobials of human health importance. Proper regulatory oversight requires enforcement mechanisms by national regulatory authorities (NRAs) and strong partnerships with other stakeholders.

Actions and considerations:

- *Develop and enact efficient regulatory systems to provide oversight of the development, production, marketing, importation, supply, prescribing, dispensing, administration and disposal of quality-assured antimicrobials.*
- *Enact and enforce regulations to restrict over-the-counter and internet or online sale of antibiotics and other antimicrobials intended for systemic use without a prescription from a qualified health-care provider.*
- *Enact and enforce regulations to promote regulatory requirements for prescribers and dispensers as well as advertisers of antimicrobial agents.*

- *Establish and implement robust and effective post-market surveillance and pharmacovigilance systems to ensure quality-assured and safe antimicrobials are available.*
- *Establish regulatory mechanisms and enforce their implementation through NRAs to stem the sale and distribution of substandard and falsified drugs in close consultation with professional societies and associations.*
- *In collaboration with NRAs and veterinary medicines directorates or equivalents, develop and enact legal and regulatory frameworks to preserve medically important antimicrobials for human medicine (19) from inappropriate use in the animal and plant sectors.*
- *Design an enabling environment to engage professional societies and the private sector to support responsible use of antimicrobials as well as enforcement of legal and regulatory instruments and frameworks.*
- *Develop context-specific national accreditation programmes with AMS standards that could be used for relevant levers such as inspection, quality assurance and improvement frameworks for health-care facilities across all levels as feasible and appropriate.*
- *Develop standards and criteria for responsible manufacturing and disposal of antimicrobial drugs in procurement and import frameworks in close collaboration with NRAs.*

5.3. Improve awareness, education and training

5.3.1. Improve awareness and engagement to support behavioural change of antimicrobials use

Context: Improving awareness and understanding of AMR through effective communication, education and training is an important component of the Global Action Plan. National authorities need to prioritize measures that are useful to raise awareness of AMR and the appropriate use of antimicrobials and promote change of behaviour. Tailored public communication activities that target different audiences using communication and behaviour change strategies are important. Audiences may include the general public, children and young people, teachers and educators, journalists and communication experts, social media influencers, community and religious leaders, and all health workers as well as stakeholders and service providers in animal health and agriculture, such as veterinarians, farmers and consumers, and professionals in environmental sciences

To promote better understanding and awareness of the AMR among the public, it is important to include within schools' curricula the appropriate use of antimicrobial agents, IPC and drug-resistant infections from an early age. Engagement of communities and families has shown effectiveness in other successful public health programmes, such as HIV, TB and malaria, which embraced the formation of a robust alliance to undertake local action *(20),* the lessons of which can be harnessed to advance integrated AMS activities.

Actions and considerations:

- *Support the design and implementation of studies to understand level of awareness and determinants of behaviour to drive change in health professionals, the general public, consumers and other stakeholders.*
- *Conduct regular and continuous awareness and engagement creation campaigns on threat of drug-resistant infections and measures to contain them using data generated and taking into consideration local contexts and language. Campaigns should in particular include preventive actions such as hand hygiene and vaccinations, discourage self-medication and promote responsible and appropriate use of antimicrobials as well as the importance of proper and optimized diagnosis.*
- *Organize and coordinate highly visible and regular national advocacy activities, such as during World Antimicrobial Awareness Week, to raise the political and public profile of AMS and encourage best practices among the general public, health workers and policy-makers to prevent the emergence and spread of drug-resistant infections and scale up integrated AMS activities.*

- *Integrate tailored AMS messages into broader national health promotion, prevention, treatment and rehabilitation initiatives such as World Water Day, World Toilet Day, World Children's Day, immunization campaigns, World AIDS Day, World TB Day, World Malaria Day and World Nutrition Week and other national multisectoral risk communication initiatives of governments.*
- *Develop tools and conduct regular assessment and evaluation of the impact of education and awareness campaigns on knowledge attitudes and behaviours of health workers and the general public.*
- *Establish and maintain a national knowledge management hub as appropriate for AMR to support continuous information generation and dissemination across all levels, including among children and young people, through cooperation with the ministries of education and health and other relevant government agencies and stakeholder groups, including civil society organizations leveraging existing work.*
- *Develop or tailor existing educational toolkits and materials to national and local contexts to provide effective models to improve knowledge and practice among the general population and among all health workers (e.g. in hospitals and PHC facilities) and working in the public and private sectors, and to enhance community engagement.*
- *Develop joint communication strategies with stakeholders in animal, agriculture and environmental sectors to raise the awareness of antimicrobial use and resistance from a One Health approach.*
- *Produce documentaries, testimonials and impact stories based on individuals affected by drug-resistant infections using a One Health approach in collaboration with relevant bodies for dissemination through local, print and social media.*
- *Conduct regular surveys and analysis to understand knowledge, attitudes and behaviour towards antimicrobial use and resistance of health workers, general public, consumers and other stakeholders to define the best methods and areas for communication and behaviour change strategies, and also to employ a baseline data set for monitoring of progress and impact.*

5.3.2. Strengthen health worker capacity through the provision of tailored education and training packages according to health worker roles and functions

Context: To ensure full understanding and awareness among health workers, it is also important to make AMR a core component of undergraduate and postgraduate professional education, in-service trainings and certifications, and other continuing education programmes in the human health, veterinary and agricultural practice sectors. Health-care workers should undergo competency-based training in AMS tailored to their local context and needs. Trainings can take different forms, including through case-based learning modules with multiple points of departure, allowing for tailored, experiential learning cycles and interprofessional networking experiences. This provides for the foundation for a strong and effective health workforce able to respond to the relevant needs *(21).*

WHO's *Health workers' education and training on AMR: curricula guide (22)* and the AMS core competency course *(23)* for health-care providers, among other tools and resources, provide overarching guidance for the development and implementation of educational programmes for health workers. These tools incorporate the linkages between AMS principles and treatment algorithms, ensuring an intricate and comprehensive approach to stewarding antimicrobials. Basic principles of antimicrobial use and IPC should be included for health workers alongside communication skills. Managing patient expectations on antimicrobial prescriptions is a key challenge that health workers face, and they must be fully supported to undertake this task, including the availability of functional laboratories to investigate infections be made readily available.

Competency-based training in AMS requires effective engagement of students, active professionals, decision-makers and other professional groups from academic and research institutions; professional associations; certification bodies; NGOs; domestic and international partner organizations; the private sector; civil society; mass media; and ministries of education, health, agriculture and environment. Finally, educational interventions, when provided, should be sustainable, timely, cost-effective, efficient, pragmatic, high quality and should address the needs of recipient health workers according to national and subnational contexts.

Actions and considerations:

- *Integrate AMS principles, including appropriate antimicrobial use, quality improvement cycle, AMS activities/interventions and other IPC and WASH principles into pre- and in-service training of all health-care workers' groups.*
- *Develop or adapt facility-based (hospital and primary health-care) training materials and standard operating procedures on AMS activities based on national and internationally recommended tools (8) and adapted to the local context for use by health workers.*
- *Develop or adapt in-service training packages for policy-makers and health services managers to improve their understanding and strengthen their decision-making roles in implementing AMS activities.*
- *Integrate AMS concepts and principles within the curriculum of other complementary disciplines, for example the curriculum for IPC (24).*
- *Train and deploy appropriate human resources to support implementation of integrated AMS activities with expert-level skills and accountability.*

5.4. Strengthen water, sanitation and hygiene and infection prevention and control

5.4.1. Enhance WASH in health-care facilities and communities

Context: WASH and safe waste management complement AMS activities by reducing the incidence of infection and the need for antimicrobials. They also help by reducing release of excreted resistant genes, antimicrobial compounds and their metabolites carried in untreated wastewater into the environment *(25).* Ensuring every health facility has safely managed WASH and waste management facilities and implements effective, evidence-based interventions and practices to prevent infections in health workers, patients and all facilities users is important. In low- and middle-income countries almost 40% of health-care facilities do not have a reliable water supply, 19% do not provide adequate sanitation and 35% do not have hand hygiene facilities *(26).*

Globally hundreds of millions of cases of diarrhoea are treated each year with antibiotics. Globally at least 2 billion people use a contaminated drinking water source, 2 billion people still do not have basic sanitation facilities, and excreta and wastewater from 60% of the population are not safely managed *(27).* Safe WASH in communities can prevent infection and avoid 60% of WASH-related antibiotic use *(28).* Infection prevention and AMS activities build on WASH infrastructure and management of WASH services to succeed *(29).*

Actions and considerations:

- *Collaborate and advocate for the implementation of internationally recommended guidance and tools to support WASH activities in health-care facilities and communities as part of integrated AMS activities (30).*
- *In collaboration with the relevant programmes employ the WHO WASH Facility Improvement Tool (31) to assess WASH in health-care facilities, as part of integrated AMS activities to make the necessary improvements and sustain quality WASH services.*
- *Exercise health sector leadership for strengthened governance and investment in community WASH services (with a focus on sanitation) and capacity for sustained service delivery (32–34) as part of integrated AMS activities.*

5.4.2. Implement IPC core components in health facilities

Context: Poor IPC practices in communities and health-care facilities increase the incidence of health-care-associated infections, use of antimicrobials and transmission of drug-resistant infections. To improve quality of care and prevent the emergence and transmission of drug-resistant infections, proper IPC interventions should be in place. IPC, WASH and AMS activities are interdependent and require coordinated efforts towards a resilient health system and infrastructure to tackle AMR efficiently. The WHO core components for effective IPC programmes should be promoted, including multimodal approaches for their implementation, and ensure that at least the minimum requirements are in place *(35).* Similar tools are available for the facility level and national level *(36, 37).* National authorities can start identifying areas for improvement by using available assessment tools *(38)* that allow gathering data for a situation analysis and understanding where the country stands with regard to the recommended core components for effective IPC programmes. All health workers should be incentivized to incorporate IPC and AMS measures into their routine work *(39).* Vaccination services also play an important role in preventing infection and minimizing the use of antimicrobials.

Actions and considerations:

- *Collaborate and advocate for the implementation of the WHO IPC minimum requirements, core components and multimodal strategies as complementary components of integrated AMS activities.*
- *In collaboration with the relevant programmes coordinate and promote implementation of IPC interventions based on a multimodal strategy at the facility level (40).*
- *Establish formal multidisciplinary structures and mechanisms for management and interaction between the governance of IPC and the integrated AMS central unit at all levels of the health-care system.*
- *In collaboration with the relevant programmes develop, review and update legal frameworks relevant for the implementation of IPC interventions at all levels of the health system.*
- *Develop systems for linking the monitoring and reporting of health-care-associated infections, antimicrobial use, AMR, patient outcomes and quality of care.*

5.5. Surveillance, monitoring and evaluation

5.5.1. Surveillance of antimicrobial use and consumption

Context: Documentation and reporting of antimicrobial use and consumption have multiple uses: helping to relate the exposure to antimicrobials with the development of AMR; identifying and providing early warning of problems relating to the pharmaceutical market, access to effective treatment under UHC, exposure to and utilization of antimicrobials and developing interventions to address problems identified; monitoring shortage or stock-outs of antimicrobials, and monitoring the outcomes of interventions aimed at changing behaviour; assessing quality of prescribing against practice guidelines; and raising awareness among health professionals, consumers and policy-makers about AMR and the contribution of inappropriate use of antimicrobials in humans *(41).* Generation of good-quality evidence and awareness of the magnitude of the problem takes time. The methodologies for monitoring antimicrobial use and consumption vary according to the monitoring objectives and the maturity of the surveillance systems. Collected data on consumption and use each serve specific purposes and complement rather than replace each other.

Antimicrobial use data refer to estimates derived from patient-level data, mostly collected by surveys and audits but also through reimbursement processes. These data may allow disaggregation of data based on patient characteristics (gender, age), or indication for which the medicine is being used. Depending on the source of information, it may be possible to determine the patients' symptoms, physician diagnoses and medications ordered. Such patient-level data will facilitate assessment of patient treatments, compliance of clinical practice with agreed protocols and treatment guidelines, identify populations at risk, inform policy-making and stewardship strategies towards more optimal antimicrobial use and assess the effect of targeted interventions.

Antimicrobial consumption refers to estimates derived from aggregated data sources such as import, production or wholesaler data, or aggregated health insurance data in a specific setting (country, district, health facility). As such these consumption data are a proxy for actual use at patient level. Consumption data do not provide information on the patients who are receiving the medicines or why the antimicrobials are being used. Rather, the antimicrobial consumption data provide information on the types and quantities of consumed antimicrobials and are often used to inform routine surveillance and AMS programmes.

Regular measurement and sharing of consumption information to prescribers and policy-makers are a first step in increasing the awareness and importance of optimal antimicrobial use. Over time, such aggregated data on the volume and pattern of antimicrobial consumption provide a more complete picture of the trends in antimicrobials use. The aggregated consumption data could also help to identify areas that could be investigated further, and therefore devise ways to increase access to antimicrobials where needed, including policy decisions regarding investment in surveillance, antimicrobial licensing, selection and supply, reimbursement, prescribing guidelines and formularies. The consumption data could also be used to monitor the impact of such decisions and follow-up interventions.

These activities on surveillance of use and consumption of antimicrobials should be adapted to the objectives and target audience who will use these data for action.

Actions and considerations:

- *Establish or enhance national surveillance programmes for antimicrobial use and consumption with defined structures, governance and work objectives (i.e. data collection, validation, analysis, reporting and data sharing with all stakeholders).*
- *Develop national, subnational and facility level antimicrobial use and consumption surveillance methodology based on standardized international methodologies, including the WHO Global Antimicrobial Resistance and Use Surveillance System (GLASS) (42, 43) and the ATC/DDD (Anatomic Therapeutic Chemical/Defined Daily Dose) system (44).*
- *Develop or adapt tools to support a standardized and harmonized national system for documenting and reporting use of antimicrobials intended for systemic use in accordance with internationally agreed guidelines, data sets, data sources in both primary and secondary care settings and use the information to inform integrated AMS activities.*
- *Introduce and use the antimicrobial consumption tool (AMC Tool) (45) (an open-source program to calculate antimicrobial consumption) to compute antimicrobial consumption from packages data into DDDs.*
- *Conduct surveys of antibiotic use in health-care facilities (primary health-care settings and hospitals) based on internationally agreed guidelines, including WHO Point Prevalence Survey methodology (46), and enhance the utility of the data to inform programmatic decisions in integrated AMS activities locally and nationally.*
- *Promote and facilitate data sharing to optimize antimicrobial use and establish a system for routine support supervision, audit, and feedback of prescribing and dispensing practices based on antimicrobial use data.*
- *Include a periodic identification of the percentage of health-care facilities that have a core set of relevant antibiotics available and affordable on a sustainable basis (47).*

5.5.2. Surveillance of AMR

Context: Drug resistance surveillance is essential to inform the planning and implementation of integrated AMS activities. National authorities may fulfil this requirement through building laboratory capacity, standardization of methodology and operating procedures, internal and external quality assurance, and participation in GLASS *(48, 49)* and other established surveillance systems. Quality and representative data on both the etiology of infections and the AMR profile should be collected routinely or periodically and utilized to inform AMS activity implementation and progress. Laboratory strengthening efforts should ensure that there is adequate infrastructure for conducting quality microbiological practices, including isolation, identification and susceptibility testing.

Actions and considerations:

- *Conduct and facilitate national surveillance of antimicrobial consumption and use and AMR to inform the planning, implementation and monitoring of progress of integrated AMS activities and for better patient outcomes. The surveillance strategies to obtain quality and representative data to inform empiric treatment and the integrated AMS activities should be designed by the responsible national body for AMR surveillance.*
- *Strengthen laboratory capacities, processes and procedures to optimize diagnosis of infectious diseases and to improve pathogen identification and antimicrobial susceptibility testing.*
- *Facilitate the linkage of surveillance data on AMR, antimicrobial use and consumption with similar surveillance data in the animal sector to inform relevant policy decisions to contain AMR.*

5.5.3. Monitoring and evaluation of AMS activities

Context: Regular monitoring and evaluation help to assess the quality, effectiveness, coverage and delivery of integrated AMS activities and to make the necessary adjustment following a continuing quality improvement cycle. It promotes a learning culture within and across the programmes and ensures continuous quality improvement of individual and joint activities of AMS. Implementing internationally agreed standardized indicators for AMS activities *(10)* and establishing standardized national reporting and recording formats to capture these indicators are essential.

The following are internationally agreed indicators for integrated AMS activities in human health, which can be used to define core indicators and targets depending on the national context *(47):*

- *total human consumption of antibiotics for systemic use (ATC J01) in DDDs per 1000 population (or inhabitants) per day;*
- *proportion of Access antibiotics for systemic use, relative to total antibiotic consumption in DDDs;*
- *relative proportion of AWaRe (Access: Watch: Reserve) antibiotics for paediatric formulations;*
- *percentage of hospital patients (adult and paediatric) receiving antibiotics according to AWaRe categories;*
- *percentages of health facilities that have a core set of relevant essential antibiotics available and affordable on a sustainable basis;*
- *percentage of inpatient surgical procedures with appropriate timing and duration of surgical antimicrobial prophylaxis; and*
- *presence of legislation or regulation requiring that antimicrobials are only dispensed with a prescription from an authorized health worker.*

National authorities should avail resources and evaluate the capacity in implementing these indicators and also introducing other optional process and outcome indicators based on the development of the health infrastructure and their national context to facilitate the implementation, monitoring and evaluation of integrated AMS activities. This can be facilitated by applying the WHO AMS assessment tools at the national, subnational and health-care facility level (Annex).

Actions and considerations:

- *Establish a national monitoring and evaluation framework, including internationally agreed core indicators for integrated AMS activities in human health (24). Other optional process and outcome indictors can be included based on national context.*
- *The national monitoring and evaluation framework should also define mechanisms to:*
  a. *use national, subnational and facility AMR and antimicrobial use and consumption data for continuous improvement of integrated AMS activities;*
  b. *ensure accountability procedures are put in place at the national, subnational and facility levels and facilitative supervision is promoted and local leadership and best practices recognized;*
  c. *undertake a baseline assessment of national, subnational and facility AMS activities;*
  d. *integrate AMS monitoring and evaluation activities with monitoring of IPC and WASH indicators;*
  e. *Identify risks and enablers to the implementation process and propose appropriate actions, including through implementation science, behaviour change and continuous quality improvement principles.*
- *Develop national and subnational quality-of-care measures using integrated surveillance data to demonstrate change in patient management and outcomes as a result of implementation of stewardship activities, including antibiograms and locally tailored AMS plans.*
- *Consider conducting periodic post-market surveillance for antimicrobial agents for quality assurance.*

6. Implementation considerations

Context: Multiple factors influence implementation of public health policies, and additional steps are needed to facilitate the implementation of the policy. AMS activities are best implemented in an integrated manner to optimize antimicrobial prescribing and ensure patient and public safety. It is important that the central coordination unit takes the lead, involving all relevant stakeholders in national policy development and strategic planning processes to identify the priority objectives, inputs and resources required and, finally, to implement the policy.

Monitoring and evaluation are important to assess progress and the efficient use of resources. The national monitoring and evaluation framework needs to be developed to guide a standard way of monitoring and evaluating implementation and to provide a clear channel for compiling progress reports and documenting the success and challenges experienced with each of the proposed actions. Best practices should be continuously harvested and used for expanding learning opportunities.

The following are critical steps to support the implementation and scale-up of integrated AMS activities that need to be considered and tailored to the national, subnational and local context of the country.

6.1. Develop national policy on integrated AMS activities

- *The development of national policy on integrated AMS activities should include adapting or endorsing this WHO guidance to best suit the national, subnational and local context with nationally agreed goals and performance indicators.*
- *The national level policy and programmatic decisions should determine prioritized activities and the best country-specific alignment with existing national plans on AMR and the development and structure of the health sector.*
- *The national policy, goals and performance indicator development process should be inclusive and consultative and coordinated by the central national unit. The participants should include representatives of the heath sector from all levels (national, subnational and district, including private sector and faith based); professional societies; NGOs; civil society organizations; community groups, patient representatives, regulatory, academia other critical stakeholders (e.g. animal and environmental health stakeholders) depending on the context of the country and the need for the policy.*

6.2. Conduct baseline assessment and situational analysis

- *A situational analysis or baseline assessment of the status of AMS activities and to identify challenges and opportunities for the implementation of the policy needs to be conducted. If there is a need depending on the context of the country, this situational analysis and baseline assessment can precede and inform the development of the national policy.*
- *Assess the current status of AMS activities at all levels of health care using developed tools such as the WHO AMS assessment tools (Annex) and current status of IPC activities using the WHO IPC assessment tool for national/subnational and health-care facility levels (38). This allows for baseline and gap identification and to develop a stepwise implementation plan based on local needs and enhances ownership of actions proposed in locally developed or adapted policies.*
- *Conduct stakeholder mapping to identify who is involved and who has potential interest in engagement. This entails identifying the individuals, organizations or institutions that will lead implementation of the policy, with clear roles and responsibilities of partners and stakeholders involved.*

6.3.
Establish and strengthen coordination and reporting mechanisms at all levels

- *Identify and strengthen existing national/subnational coordinating mechanisms on AMS or develop a new mechanism if non-existent.*
- *Build and sustain collaborations with all stakeholders through consultative meetings, workshops and various fora to enhance leadership buy-in, find synergies with other programmes, development of clear structures for communication, coordination, workflow, reporting and feedback mechanisms and management of diverse influences and interests.*
- *Identify champions and relevant national and subnational multidisciplinary networks to scale up the implementation of integrated AMS activities.*
- *In collaboration with other stakeholders such as professional associations strengthen a bottom-up approach to the policy implementation to initiate and sustain processes and actions across all levels.*

6.4.
Develop costed implementation plan

- *Develop a time-bound implementation plan that is costed for rolling out integrated AMS activities at the national, subnational, facility and community levels (including the private health-care sector) based on the national policy, the baseline assessment and situational analysis and available opportunities.*
- *The plan should include specific activities, timelines, performance indicators, sustainable budget and responsible actors for implementation of each activity with accountability mechanisms.*
- *Identify opportunities and processes for collaboration to ensure efficient use of resources and minimize duplication of efforts.*

6.5.
Human and financial resources

- *Mobilize resources that will ensure the implementation of all the recommended policy actions. This includes sustainable, dedicated funding, staffing and infrastructural investments to scale up integrated AMS activities.*
- *Countries should ensure mobilization and adequate deployment of sufficient qualified human resources to implement the integrated activities in accordance with country-specific situations as identified in the baseline assessment.*
- *Promote joint planning across programmes to optimize existing resources and synergies with definition of roles and responsibilities of each stakeholder or programme in implementing specific AMS activities at national and subnational levels.*
- *Continuously identify longer-term improvement needs of human resources (e.g. after the baseline assessments) and develop a step-by-step improvement plan at all levels to drive scale-up of integrated AMS activities.*

6.6. Advocacy and awareness raising

- *Conduct advocacy and awareness activities to disseminate the new policy and implementation plan at all levels to all stakeholders through various platforms, such as workshops, meeting training sessions, social media and internet.*
- *Develop shared vision and goals with stakeholders, including professional societies, civil society and local champions, which is necessary for successful implementation of the policy.*
- *Conduct advocacy explicitly for political leadership, professional societies and other stakeholders to garner support for the policy and its implementation, including through availing sustainable human and financial resources.*
- *Integrated AMS advocacy activities should be jointly planned with the relevant stakeholders to ensure coherence and consistency between messages and should be targeted at key stakeholders and decision-makers. These should be carried out at national, subnational, facility and local levels.*

6.7. Capacity building

- *Develop or adapt training packages and conduct training to build capacity for all stakeholders on the policy and its intended outcomes.*
- *Conduct training of trainers to assist the nationwide scale-up of implementation of the policy. This could be done in collaboration with professional societies.*
- *Develop and encourage facilitative supervision, coaching or mentoring efforts to support capacity building across multiple levels and cadres of the health workers using existing platforms and synergies.*

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Annex:
Periodic National and Health-Care Facility Assessment Tools

Introduction

Purpose

Antimicrobial stewardship (AMS) programmes are successfully implemented when specific structures are in place at the national and health-care facility levels. WHO has developed a list of essential national and health-care facility core elements to assist countries in developing and strengthening the necessary structures at the national and health-care facility level to enable implementation of effective integrated AMS programmes within their local context.

The WHO Periodic National and Health-Care Facility Assessment Tools aim to help countries and health-care facilities identify their AMS preparedness in terms of their national and health-care facility core elements, to develop a stepwise implementation plan, and to monitor progress in implementing AMS programmes and activities over time.

Intended users

The intended users of the assessment tools are national and subnational health-care authorities and health-care facility managers.

For the National Assessment Tool, the intended users are national and/or regional health authorities responsible for the implementation of national policies on integrated AMS activities in human health and other partners supporting national and regional AMS efforts.

For the Health-Care Facility Assessment Tool, the intended users are health-care facility managers/leadership, AMS committees/teams or AMS champions responsible for the overall coordination and implementation of health-care facility AMS programmes.

Users are encouraged to fill out the checklist (national or health-care facility) based on their function, to identify core elements that are already in place and their level of implementation as well as core elements that require accelerated implementation by addressing identified gaps. This will provide the user with baseline information on implementation status and a visual tool that can assist the development of a plan to address core elements that are missing or strengthen the implementation of existing core elements. The user is also encouraged to periodically (e.g. quarterly, annually) reassess their AMS programme with the assessment tools to monitor and evaluate progress over time and to disseminate these reports.

When and how to conduct the assessment

The tool may be used as an annual/quarterly activity or integrated into a larger and existing review of the national AMR response. Responses may be gathered from desk reviews, individual or group interviews, observations in health-care facilities, focus group discussions among policy-makers and data collection from health-care facility records and documents. A verifier section has been provided to serve as a guide.

It is recommended to consult the *WHO policy guidance on integrated antimicrobial stewardship activities and the practical toolkit for Antimicrobial stewardship programmes in health-care facilities in low- and middle-income countries* (https://apps.who.int/iris/bitstream/handle/10665/329404/9789241515481-eng.pdf) when necessary.

To complete the assessment tool, the user should provide one response per question based on the following options:

1. **No** – the core element is not in place and is not a priority.
2. **No, but a priority** – the core element is a priority but there is no plan in place to initiate it.
3. **Planned but not started** – the core element is planned but no action has taken place.
4. **Partially implemented** – the core element is in place, but it is only partially implemented requiring further strengthening.
5. **Fully implemented** – the core element is in place and is fully implemented without requiring strengthening but needing to be sustained.

Periodic National and Health-Care Facility Assessment Tool

Country	
National health authority*	

Details of person responding to the questionnaire

Name	
Title/position	
Institution	
E-mail	

Details of person completing the questionnaire (leave blank if self-assessment)

Name	
Title/position	
Institution	
E-mail	

Date(s) of assessment	
Date(s) of previous assessment	

Assessment mode:

- ❑ Self-assessment
- ❑ Interview

This tool is based on the ***WHO policy guidance on integrated antimicrobial stewardship activities in human health*** and the ***WHO practical toolkit for antimicrobial stewardship programmes in health-care facilities in low- and middle-income countries*** (https://apps.who.int/iris/bitstream/handle/10665/329404/9789241515481-eng.pdf).

The tool helps to assess the status of implementation of core elements needed at national/subnational level and at health-care facilities.

*National health authority can be replaced with national AMR steering committee, technical working group on optimizing use, health-care facility manager or AMS committee/AMS programme assessor in the health-care facility.

National Assessment Tool

Components for assessment ● No ● No, but a priority ● Planned but not started ● Partially implemented ● Fully implemented		Baseline	Period 1	Period 2	Period 3	Period 4	Verifiers
PILLAR 1: **Establish and develop national coordination mechanisms for antimicrobial stewardship and develop guidelines**							
1	**Establish and maintain a national coordinating mechanism for antimicrobial stewardship (AMS) that is functional at national, subnational and district levels.**						
1.1	Is there a national policy on integrated AMS activities?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Approved national policy on integrated AMS activities*
1.2	Is there a central national coordination unit at the ministry of health or designated agency or institution focused on AMS?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Central national coordination unit formally identified e.g. through a formal letter or within institution's organogram*
1.3	Has the central national coordination unit established a national coordination mechanism for integrated AMS activities with diverse membership, including civil society and the private sector?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Meeting reports and developed AMS work plans at all levels*
1.4	Have similar coordination mechanisms with diverse members, including from civil society and the private sector, been established at subnational and district levels?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Meeting reports and developed AMS work plans at all levels*
1.5	Are there clear reporting lines and feedback mechanisms from subnational mechanisms to the national coordination mechanism on integrated AMS activities?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Documented reporting and feedback mechanisms; evidence of dissemination of reports*

Components for assessment ● No ● No, but a priority ● Planned but not started ● Partially implemented ● Fully implemented		Baseline	Period 1	Period 2	Period 3	Period 4	Verifiers
1.6	Is there funding allocated for the national coordinating unit and the national, subnational and district coordination mechanisms?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Evidence of budgetary allocation*
1.7	Does the national coordination unit have clear terms of reference (TOR)?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Approved TOR for the unit*
1.8	Is there a linkage to other relevant stakeholders e.g. from tuberculosis (TB), infection protection and control (IPC), water, sanitation and hygiene (WASH) or universal health coverage (UHC)?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*List of appointed members*
1.9	Is there a monitoring and evaluation (M&E) framework and have national targets been set for AMS activities based on nationally and internationally agreed indicators?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*M&E plan that includes monitoring AMS activities*
1.10	Have other programmes, such as IPC, WASH, TB, malaria, HIV, UHC and primary health care (PHC), integrated AMS activities within their action plans?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Programme work plans with AMS activities*
2	**Develop national treatment and stewardship guidelines, standards and implementation tools**						
2.1	Have the national treatment guidelines for the management of infections been updated within the last 3–5 years?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Updated treatment guidelines for the management of infections available*
2.2	Do the national treatment guidelines include AMS principles?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*AMS principles included in treatment guidelines*
2.3	Is there monitoring of implementation and compliance to treatment guidelines?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Reports or audits on compliance to treatment guidelines*

Components for assessment ● No ● No, but a priority ● Planned but not started ● Partially implemented ● Fully implemented		Baseline	Period 1	Period 2	Period 3	Period 4	Verifiers
2.4	Is there coordinated guidance and interventions to improve availability and appropriate use of diagnostics to guide therapeutic decisions?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Guidance on availability and appropriate use of diagnostics for therapeutic decisions, interviews with relevant stakeholders, evidence of laboratory support*
2.5	Are there specific standard operating procedures for AMS activities in health-care facilities and in community settings?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Standard operating procedures manuals*
2.6	Are there mechanisms and activities for the dissemination of guidelines, standards and implementation tools on AMS activities?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Evidence of mechanisms and activities*
PILLAR 2: **Ensure access to and regulation of antimicrobials**							
3	**Improve access to essential, quality-assured, safe, effective and affordable antimicrobials**						
3.1	Has the WHO Model List of Essential Medicines (EML) and Access, Watch, Reserve (AWaRe) system been incorporated into the national EML formulary and health-care facility treatment guidelines?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*WHO EML ad AWaRe system integrated into national EML formulary and treatment guidelines*
3.2	Is there a system in place to monitor access to essential, quality-assured, safe, effective and affordable antimicrobials?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Reporting mechanism for substandard and falsified antibiotics*
3.3	Is there a system to periodically identify availability of affordable antibiotics at health-care facilities?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Reports on availability and affordability of relevant antibiotics in health-care facilities*

Components for assessment ● No ● No, but a priority ● Planned but not started ● Partially implemented ● Fully implemented		Baseline	Period 1	Period 2	Period 3	Period 4	Verifiers
3.4	Is there a mechanism in place to report shortages and stock-outs of antibiotics in the country?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*System established to track antibiotic stock status at country level*
3.5	Is there a mechanism to report the antibiotics used by patients?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Point prevalence survey on antibiotic use in hospitals*
3.6	Is there a process to report the antibiotics used in the AWaRe system?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*The proportion of Access antibiotics for systemic use relative to total antibiotic consumption in defined daily doses*
4	**Regulate social triggers and remuneration policies that promote responsible antimicrobial prescription and dispensing behaviours**						
4.1	Are health worker behavioural change principles incorporated into policies addressing diagnosis, prescription, dispensing and administration of antimicrobials?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Behaviour change principles incorporated into relevant policies*
5	**Legislate and regulate responsible and appropriate use and disposal of antimicrobials**						
5.1	Is there a regulation on prescription-only sale/ dispensing of antibiotics?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Presence of legislation or regulation requires that antimicrobials are only dispensed with a prescription from an authorized health worker*
5.2	Are regulations on dispensing antibiotics by prescription only being enforced (where access is not an issue)?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Systems in place for penalties or checks and balance*
5.3	Is there an enforceable regulatory mechanism to prohibit sale of substandard and falsified drugs?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Regulation in place prohibiting sale of substandard and falsified drugs*

Components for assessment ● No ● No, but a priority ● Planned but not started ● Partially implemented ● Fully implemented		Baseline	Period 1	Period 2	Period 3	Period 4	Verifiers
5.4	Are there standards and criteria for responsible manufacturing and disposal of antimicrobial agents?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Standards and criteria for responsible manufacturing and disposal of antimicrobial agents*
PILLAR 3: **Improve awareness, education and training**							
6	**Improve awareness and engagement to support behavioural change of antimicrobials use**						
6.1	Have studies on determinants of behaviour in health professionals and other stakeholders, including the general public, been completed to support design of awareness campaigns?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Availability of completed studies of determinants of behaviour among various stakeholders*
6.2	Does the country hold World Antimicrobial Awareness Week (WAAW) activities annually?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Reports of annual WAAW activities*
6.3	Does the country have regular public awareness campaigns on the responsible and appropriate use of antibiotics?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Reports and schedule of public awareness campaigns*
6.4	Are tailored AMS messages integrated into broader health promotion, prevention, treatment and rehabilitation services and initiatives such as World Water Day, World Toilet Day, World Children's Day, immunization campaigns, World AIDS Day, World TB Day, World Malaria Day and World Nutrition Week for sustained action?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Integration of tailored AMS messages into broader health promotion messages*

Components for assessment ● No ● No, but a priority ● Planned but not started ● Partially implemented ● Fully implemented		Baseline	Period 1	Period 2	Period 3	Period 4	Verifiers
6.5	Is regular assessment/evaluation of the impact of education and awareness campaigns on knowledge attitudes and behaviours of health workers and the public conducted?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Assessment/evaluation reports on the impact of education and awareness campaigns on knowledge attitudes and behaviours of health workers and the public*
7	**Strengthen health worker capacity through the provision of tailored education and training packages according to health worker roles and functions**						
7.1	Are AMS principles and strategies included in the educational curriculum of pre-service health-care professionals?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Presence of educational curriculum for pre-service health-care professionals with AMS principles*
7.2	Is there access to in-service training, including continuous professional development (CPD) on antimicrobial prescribing and AMS for all health-care professional groups in the country?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*In-service training programmes, CPD curriculum for each health-care professional group OR can be generic*
7.3	Are AMS concepts and principles incorporated within the curriculum of other complementary disciplines e.g. the curriculum for IPC professionals?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Presence of AMS concepts incorporated into curriculum for other disciplines*
PILLAR 4: **Strengthen water, sanitation and hygiene and infection prevention and control**							
8	**Enhance WASH in health facilities and communities**						
8.1	Is there representation of the AMS coordinating unit on the WASH programmes and vice versa?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Composition of WASH and AMS committees*

Components for assessment ● No ● No, but a priority ● Planned but not started ● Partially implemented ● Fully implemented		Baseline	Period 1	Period 2	Period 3	Period 4	Verifiers
8.2	Is the WHO WASH Facility Improvement Tool (FIT) being promoted to assess WASH in health-care facilities?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*WASH assessment reports based on the WHO WASH FIT tool*
9	**Implement IPC core components in health facilities**						
9.1	Is there representation of the AMS coordinating unit on the IPC programmes and vice versa?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Composition of IPC and AMS committees*
9.2	Are there systems linking the monitoring and reporting of health-care-associated infections (HAIs), antimicrobial use, AMR, patient outcomes and quality of care?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Reports linking HAIs and AMR to patient outcomes and quality of care*
PILLAR 5: **Surveillance, monitoring and evaluation**							
10	**Surveillance of antimicrobial use and consumption**						
10.1	Is there a national surveillance programme for AMR, consumption and use with defined structures, governance and work objectives (i.e. data collection, validation, analysis, reporting and data sharing with all stakeholders)?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Reports from the national surveillance programmes*
10.2	Are there guidelines/standard operating procedures for the use of (a) antimicrobial medicines use (AMU), (b) antimicrobial medicines consumption (AMC) and (c) AMR data to inform action for national and institutional decision-making?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Presence of data-sharing and use guidelines*

Components for assessment ● No ● No, but a priority ● Planned but not started ● Partially implemented ● Fully implemented		Baseline	Period 1	Period 2	Period 3	Period 4	Verifiers
11	**Surveillance of AMR**						
11.1	Is there a plan to strengthen laboratory capacity to support accurate diagnosis for decision-making?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Presence of plan to strengthen laboratory capacity; reports on progress made in laboratory capacity strengthening*
12	**Monitoring and evaluation of AMS activities**						
12.1	Is there a national M&E framework, including internationally and locally agreed key performance indicators for integrated AMS interventions and activities in human health?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Presence of an M&E framework with defined indicators for integrated AMS interventions*
12.2	Is there an accountability mechanism put in place at the local level which includes positive feedback and recognition of local leadership?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Presence of an accountability mechanism and reports of feedback to local leadership*

Health-Care Facility Assessment Tool

Components for assessment ● No ● No, but a priority ● Planned but not started ● Partially implemented ● Fully implemented		Baseline	Period 1	Period 2	Period 3	Period 4	Verifiers
Leadership commitment							
1	Is AMS identified as a priority by the health-care facility management/ leadership?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Interviews with health-care facility leadership*
1.a	Are AMS activities included in health-care facility annual plans with key performance indicators?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Annual plans of health-care facility with AMS performance indicators*
1.b	Has the health-care facility management allocated human and financial resources to initiate AMS activities?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Availability of personnel with AMS role in their job description*
2	Is there a health-care facility action plan in place that prioritizes AMS activities?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Health-care facility action plan and AMS progress report*
2.a	Is there a mechanism to regularly monitor and measure the implementation of AMS activities?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Annual/quarterly progress report on the implementation of the health-care facility AMS action plan*
3	Is there dedicated financial support for the health-care facility AMS action plan?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Health-care facility budget line with dedicated funds for AMS*
3.a	Has a budget (e.g. annual) for the implementation of the health-care facility AMS action plan been developed?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Developed health-care facility budget for AMS*

Components for assessment ● No ● No, but a priority ● Planned but not started ● Partially implemented ● Fully implemented		Baseline	Period 1	Period 2	Period 3	Period 4	Verifiers
Accountability and responsibility							
4	Is there a multidisciplinary AMS committee leadership in the health-care facility with clear terms of reference (TOR)?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*AMS committee TOR*
4.a	Does the AMS committee/other relevant committee meet on a regular basis (minimum monthly or quarterly)?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Minutes of last AMS committee meeting*
5	Is there a dedicated AMS leader/ champion identified for the health-care facility?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*AMS champion identified*
5.a	Does the team leader or champion have dedicated staff time for AMS activity in their TOR/job description?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*TOR/job description includes AMS activities*
6	Is there an AMS team with clear terms of reference?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*AMS team TOR*
6.a	Does the AMS team meet on a regular basis?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Last AMS team meeting minutes (minimum weekly)*
7	Are other health-care professionals apart from the AMS team involved in AMS activities?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Evidence of involvement of other health-care professionals in AMS activities*
8	Does the AMS committee/team collaborate with other health-care teams such as drug and therapeutics, infection prevention and control (IPC), HIV/tuberculosis (TB) or quality improvement at the health-care facility?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Evidence to show collaboration or joint meetings*

Components for assessment ● No ● No, but a priority ● Planned but not started ● Partially implemented ● Fully implemented		Baseline	Period 1	Period 2	Period 3	Period 4	Verifiers
9	Does the AMS team/committee produce regular (descriptive) activity reports on the implementation of the AMS programme?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*AMS committee report*
9.a	Is the AMS activity report disseminated to the facility management, other health-care facility team members and appropriate national authority?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Latest AMS activity report, summary report to national AMS technical working group*
AMS actions							
10	Is there a standard treatment guideline at the health-care facility?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Health-care facility standard treatment guideline, including infection prevention management guidelines*
10.a	Are the guidelines reviewed and updated periodically based on the availability of new evidence?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Documentation of guideline review processes*
11	Is there a regular review/audit of specified antibiotic therapy or clinical conditions at the health-care facility?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*AMS audit report*
12	Is the advice/feedback from AMS teams easily accessible/available to prescribers?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Feedback report from AMS team*
13	Does the AMS team conduct regular ward rounds and other AMS interventions in selected departments in the health-care facility?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Ward round reports*
14	Does the health-care facility have a formulary/list of approved antibiotics for use based on the national formulary?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Health-care facility formulary/drug bulletin report*

Components for assessment ● No ● No, but a priority ● Planned but not started ● Partially implemented ● Fully implemented		Baseline	Period 1	Period 2	Period 3	Period 4	Verifiers
14.a	Does the health-care facility formulary specify lists of restricted antibiotics that require approval by a designated team or person (pre-authorization)?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Health-care facility formulary with restrictions*
15	Does the health-care facility have access to laboratory and imaging services (on-site or off-site) that can be used to support AMS interventions?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Sample laboratory report*
16	Are there information technology (IT) services, tally cards or other inventory control tools available that can be used to support data gathering to support AMS activities?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Availability of functional IT services, inventory control tools*
17	Are there standardized prescription charts, medical records/patient folders and transfer notes to support treatment and AMS activities?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Availability of prescription charts and medical records*
17.a	Does the health-care facility have a written policy that requires prescribers to document the indication and antibiotics prescribed in a prescription chart/medical records?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Policies on prescribing*
Education and training							
18	Does the health-care facility include AMS programmes such as optimizing antibiotic prescribing, dispensing and administration in the staff induction training?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Induction training manuals*

Components for assessment ● No ● No, but a priority ● Planned but not started ● Partially implemented ● Fully implemented		Baseline	Period 1	Period 2	Period 3	Period 4	Verifiers
19	Does the health-care facility offer continuous in-service training or continuous professional development on AMS, infection prevention and control (IPC) to staff?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*In-service training manuals/continuous professional development/continuous medical education*
20	Does the health-care facility ensure training for the AMS team on AMS/IPC?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Training reports, interviews with staff*
Monitoring and surveillance							
21	Are regular prescription audits, point prevalence surveys to assess the appropriateness of antibiotic prescribing undertaken at the facility by the AMS committee or relevant team?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Number of audits conducted with report*
22	Does the health-care facility regularly monitor the quantity and types of antibiotic use (purchased/prescribed/dispensed)?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Antimicrobial consumption report*
22.a	Does the health-care facility regularly monitor shortages/stock-outs of essential antimicrobials?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Stock-out report*
22.b	Is there a mechanism to report substandard and falsified medicines and diagnostics at the health-care facility?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Reports of substandard/falsified antimicrobials and diagnostics*
23	Does the AMS team regularly monitor antibiotic susceptibility and resistance rates for a range of key indicator bacteria?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Antimicrobial surveillance report*

Components for assessment ● No ● No, but a priority ● Planned but not started ● Partially implemented ● Fully implemented		Baseline	Period 1	Period 2	Period 3	Period 4	Verifiers
24	Does the AMS team monitor compliance with at least one specific AMS intervention (e.g. indication captured in medical records for patients) at the health-care facility?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*AMS intervention report*
Reporting feedback within the health-care facility							
25	Does the AMS committee/ relevant team analyse and report on the quantities of antibiotics purchased/prescribed/dispensed to prescribers and health-care facility management?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Antimicrobial consumption report*
26	Does the AMS committee/relevant team review, analyse and report on antibiotic susceptibility rates and key findings shared with prescribers?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Evidence of dissemination of susceptibility report*
27	Does the AMS team communicate findings from audits/reviews of the quality/appropriateness of antibiotic use to prescribers along with specific action points?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Reports to prescribers with action points*
28	Does the health-care facility develop and aggregate antibiograms (Annex VIII, page 71 of the WHO AMS toolkit) and regularly update it?	Choose an item	Choose an item	Choose an item	Choose an item	Choose an item	*Availability of antibiogram*

For further information, please contact:

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World Health Organization

HANDLE ANTIMICROBIALS WITH CARE

Antibiotics
Antivirals
Antifungals
Antiparasitics

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