Sustaining Action Against Antimicrobial Resistance

A CASE SERIES OF COUNTRY EXPERIENCES
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- Sierra Leone: Anna Maruta (WHO, Sierra Leone) and Dr Joseph Sam Kanu (Deputy Manager, National Disease Surveillance Programme, Ministry of Health and Sanitation)
- Burkina Faso: Ruth Sawadogo (Market Surveillance and Quality Control of Health Products, Burkina Faso), Félicité Nana (Quality Care and Patient Safety, Burkina Faso), Zackaria Gansané (Burkinabe Observatory for Quality and Safety of Care, Burkina Faso), Rasmata Ouédraogo (AMR Committee, Burkina Faso)
- Jordan: Lora Alsawalha (WHO, Jordan), Bassim Zayed (WHO, Jordan), Hayaa Banat (Senior Pharmacovigilance Specialist, Jordan Food & Drug Administration), Ala Ben Tareif (Head of IPC department, Ministry of Health and national AMR focal point), Abeer Mowaswis (Head of Health Awareness department), Zina Halsa (Director, Pharmacy and Clinical Pharmacy Directorate, Ministry of Health), Rola Ghanem (GLASS focal point and head of microbiology at Central Public Health Laboratories, Ministry of Health).
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# ACRONYMS

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<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
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<tbody>
<tr>
<td>AFIDEP</td>
<td>African Institute for Development Policy</td>
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<tr>
<td>AMC</td>
<td>Antimicrobial consumption</td>
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<td>AMR</td>
<td>Antimicrobial resistance</td>
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<td>AMU</td>
<td>Antimicrobial use</td>
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<td>AWaRe</td>
<td>Access, watch, reserve (classification of antibiotics)</td>
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<td>CDC</td>
<td>Centers for Disease Control</td>
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<td>COVID-19</td>
<td>Coronavirus Disease 2019</td>
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<td>DRUM</td>
<td>Drivers of Resistance in Uganda and Malawi</td>
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<td>FAO</td>
<td>Food and Agricultural Organization</td>
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<td>GLASS</td>
<td>Global Antimicrobial Resistance and Use Surveillance System</td>
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<td>IDA</td>
<td>International Development Association</td>
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<td>IPC</td>
<td>Infection prevention and control</td>
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<td>JARSS</td>
<td>Jordan National Antimicrobial Resistance Surveillance System</td>
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<td>JFDA</td>
<td>Jordan Food and Drug Administration</td>
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<td>KOICA</td>
<td>Korea International Cooperation Agency</td>
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<td>NAP</td>
<td>National Action Plan</td>
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<td>NCC</td>
<td>National Coordinating Committee</td>
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<td>REDISSE</td>
<td>Regional Disease Surveillance Systems Enhancement</td>
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<td>TrACSS</td>
<td>Tripartite Antimicrobial Resistance Country Self-Assessment Survey</td>
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<td>UK</td>
<td>United Kingdom</td>
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<td>UNEP</td>
<td>United Nations Environment Programme</td>
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<td>USD</td>
<td>United States dollar</td>
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<td>WAAW</td>
<td>World Antimicrobial Awareness Week</td>
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<td>WASH</td>
<td>Water, sanitation, and hygiene</td>
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<td>WHO</td>
<td>World Health Organization</td>
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<td>WOAH</td>
<td>World Organisation for Animal Health</td>
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Antimicrobial medications, including antibiotics, have saved millions of lives worldwide since the early 1900s when the first modern antimicrobials were discovered. Since then, antimicrobials have become more central in medicine, underpinning our ability to not only respond to infectious disease but also to conduct a host of medical procedures, including life-enhancing surgeries, cancer chemotherapy, and organ transplantation. Alarmingly, however, many antimicrobials have lost their effectiveness due to antimicrobial resistance (AMR). AMR refers to the ability of microbes – bacteria, viruses, fungi, and parasites – to evolve in ways that protect them from the medications intended to eliminate them. While AMR is a naturally occurring evolutionary process, human-led behaviors have rapidly increased its emergence and spread. The main drivers of AMR include: (1) the misuse and overuse of antimicrobials; (2) lack of access to clean water and adequate sanitation for people and animals; (3) poor infection prevention and control measures in healthcare facilities and farms; (4) limited access to quality, affordable medicines, vaccines, and diagnostics; and (5) lack of awareness and knowledge about AMR. The impact has been drastic: infections are harder to treat, and the risk of severe illness and death is rising. In 2019, 4.95 million deaths were associated with AMR, with the highest burden in western Sub-Saharan Africa at an estimated 27.3 deaths per 100,000.1

In recognition of the threat posed by AMR, countries around the world endorsed the World Health Organization’s (WHO) Global Action Plan on AMR and committed to developing and implementing their own national action plans (NAPs) on AMR.2 While countries are at various stages of progress, very few have fully implemented all the activities outlined in their NAPs. Only 32 out of 163 countries reporting to the Tripartite3 AMR Country Self-Assessment Survey (TrACSS) in 2021 have NAPs on AMR that are currently being implemented and actively monitored, and only six are low- and lower-middle-income countries.4 This is partly due to the complex nature of AMR, which calls for a multisectoral approach that engages stakeholders in human, animal, and plant health; food and feed production; and the environment—the One Health approach. Financial challenges also pose a significant barrier to sustainable implementation of NAP activities. Facing many competing priorities, countries, particularly those in low- and middle-income settings, must make smart tradeoffs in favor of the most cost-effective and impactful AMR actions.

The WHO and the World Bank recognize the need to better support countries as they strive to address the growing threat of AMR. The two organizations are united as technical and operational partners, ready to draw upon their comparative advantages to collectively provide countries with comprehensive support. The WHO provides technical support to countries as they develop and implement their NAPs on AMR, a process which contains six major steps: (1) strengthening governance, (2) prioritizing activities, (3) costing the operational plan, (4) mobilizing resources, (5) accessing financial resources, and (6) engaging stakeholders.

3 The Tripartite refers to the Food and Agricultural Organization (FAO), the World Organisation for Animal Health (WOAH), and the World Health Organization (WHO). In March 2022, the United Nations Environment Programme (UNEP) formally joined the partnership – hereafter called the “Quadripartite.”
(5) implementing prioritized activities, and (6) monitoring and evaluating progress (Figure 1). The newest addition to the WHO’s catalogue of support tools, which includes templates, checklists, resource packs, handbooks, webinars, and e-learning modules, is the WHO Costing and Budgeting Tool for NAPs on AMR. The tool aims to assist countries to cost prioritized AMR activities from their NAPs and mobilize resources. It utilizes a modular approach that allows various government ministries to independently cost the components of the NAP that are relevant to their respective sector. The tool then consolidates all the modules to provide a fully costed NAP on AMR. If funding gaps exist, the World Bank stands ready to support through established financing mechanisms, including investment project financing, development policy financing, and program-for-results.

The following case series showcase recent country experiences while developing and implementing their NAPs for AMR. The first case study focuses on Sierra Leone, where the WHO pilot tested the prototype WHO Costing and Budgeting Tool for NAPs on AMR. Sierra Leone gained valuable insights on prioritization, and the lessons learned from this pilot test, along with additional pilots in Jamaica, Paraguay, and Somalia, were instrumental for WHO in finalizing the Costing and Budgeting Tool, which was officially launched in October 2021. The three other case studies focus on countries in which the WHO has a history of strong country engagement on AMR: Burkina Faso, Jordan, and Malawi. These case studies highlight key actions, drawn from the countries’ NAPs on AMR, which have led to meaningful improvements in national capacity to prevent, detect, and respond to AMR. They also outline critical next steps on the path forward to sustained implementation of their NAPs on AMR.

Malawi has strengthened governance - the first step in effective NAP implementation (see Figure 1). To strengthen governance, the WHO recommends that countries establish an overarching multisectoral coordination mechanism for AMR, as well as supportive technical working groups if needed. Malawi has chosen to address AMR through a One Health approach and has smartly defined specific roles for relevant government ministries, implementation partners, and civil society organizations. These stakeholders are provided with overarching governance and coordination through the National Coordinating Committee (NCC), comprised of members from various sectors and backgrounds. Malawi’s strong governance for AMR has enabled success in raising public awareness, ensuring safer prescribing practices, and strengthening infection prevention and control (IPC) measures in health facilities.

Similarly, Burkina Faso has benefited from a One Health governance structure, established in January 2019 by inter-ministerial decree. The country’s AMR Committee sits within a broader National Coordinating Platform on One Health, and has successfully enacted several key actions against AMR, including strengthening surveillance, ensuring safer antimicrobial prescribing practices, and improving water and sanitation. The 2019 inter-ministerial decree was essential for these successes. It defined the country’s governance structure for AMR action and included details on the composition and activities of the AMR Committee by outlining five subcommittees, one for each key objective of the country’s NAP. While Burkina Faso’s NAP was never formally approved by the national government, the country has shown that an organized and dedicated governance structure can support meaningful AMR action, even while NAPs are in the process of development or approval.
**Executive Summary**

**Figure 1** Six steps for sustainable implementation of national action plans (NAPs) on antimicrobial resistance (AMR).

1. **Strengthen governance**
   Establish a functional multisectoral coordinating mechanism and technical working groups with clear terms of reference, budget and an accountability framework.

2. **Prioritize activities**
   Initiate a consultative process to prioritize activities based on an assessment of the current situation, resources available, and the impact and feasibility of activities.

3. **Cost the operational plan**
   Develop, cost and budget an operational plan that includes prioritized activities, who is to do what, when and where, and integrates existing funding sources.

4. **Mobilize resources**
   Map existing and potential funders, advocate to fill the funding gap and where possible leverage domestic financing through other national plans and budgets.

5. **Implement prioritized activities**
   Work with internal and external stakeholders to sustainably implement the prioritized activities.

6. **Monitor and evaluate**
   Periodically monitor and evaluate progress in implementing the plan or activities, communicating progress and lessons learned.

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Sierra Leone served as a pilot testing country for the WHO Costing and Budgeting Tool for NAPs on AMR, and cleverly utilized the opportunity to develop a two-year operational plan for implementing its NAP. With the support of WHO, multisectoral costing coordinators in Sierra Leone embarked on the second step of NAP implementation: prioritizing activities (see Figure 1). In general, the process of prioritization is consultative and based on situational and needs assessments, resource availability, and the feasibility and anticipated impact of activities. In Sierra Leone, coordinators took a pragmatic approach, focusing on prioritizing AMR activities with the largest expected impact and which would be least challenging to implement. Building upon this prioritized list, the costing coordinators developed an operational plan that situated their prioritized activities within the strategic objectives of the NAP, as well as a defined timeframe—two-years, in this case. Sierra Leone then estimated the cost of its operational plan using the WHO Costing and Budgeting Tool, which is step three of NAP implementation (see Figure 1). Now with a fully costed operational plan, the country is well positioned to mobilize resources (step four of NAP implementation) for sustainable implementation of its prioritized AMR activities.

Jordan, through its 2018-2022 NAP, has prioritized surveillance for AMR and antimicrobial consumption (AMC). Surveillance is a cornerstone for assessing the spread and drivers of AMR and for monitoring the impact of policies, regulations, and interventions. In Jordan, the establishment of AMR and AMC surveillance systems (aligned with step five of NAP implementation: implement prioritized activities) have helped the country to identify targeted actions for antimicrobial stewardship interventions, including guidance and regulations aimed at ensuring safer prescribing practices among healthcare workers. Surveillance is also a key tool for step six of NAP implementation: monitoring and evaluation (see Figure 1). Monitoring and evaluation is necessary to track whether responsible stakeholders are appropriately implementing actions under their authority and to assess whether those actions are having the intended effect.

All countries showcased have made good progress in developing and implementing some aspects of their NAPs; however, insufficient and inconsistent financing has posed a major barrier for sustainable and full implementation of their NAPs. The WHO Costing and Budgeting Tool for NAPs on AMR is an excellent resource for catalyzing collaboration, prioritizing AMR activities, and developing operational plans. It also helps to prepare countries for engaging in step four of NAP implementation: resource mobilization (see Figure 1). Given that AMR cannot be positioned as a siloed program, governments should seek to leverage resources across ministerial programs and strategic plans. However, even after pooling resources across ministries, many countries will find that budget gaps still remain. In this case, the World Bank stands ready to support through investment project financing, results-based loans, or development policy loans, which can be targeted toward AMR-specific or AMR-sensitive objectives. In addition to its financing capacity, the World

5 AMR-specific interventions have the reduction of AMR emergence and spread as their primary purpose. AMR-sensitive interventions, on the other hand, have other primary purposes (such as infection prevention in health care, greater access to water and sanitation in the community, or improved animal husbandry practices) but contribute indirectly to addressing the emergence and spread of AMR. AMR-sensitive interventions can be designed and delivered in ways that maximize their impact on AMR (and improve their cost-effectiveness).
Bank has experience operating in every major area of development. The institution is therefore particularly well positioned to support governments as they seek to convene public and private stakeholders across sectors in a coordinated fight against AMR.

This case series is intended for policymakers in low- and middle-income countries who are interested in advancing their countries' capacity to fight AMR. Using recent country experiences, this case series aims to showcase some relatively easy entry points for AMR action and to highlight how the WHO and the World Bank can provide support to countries as they strive to develop and implement their NAPs for AMR.

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6 The World Bank has 18 global practices, including several with particular relevance for AMR: agriculture; environment & natural resources; health, nutrition & population; human development; social sustainability and inclusion; and water.
INTRODUCTION
Antimicrobial resistance (AMR) occurs when microbes – bacteria, viruses, fungi, and parasites – evolve in ways that reduce medicine’s ability to fight them. AMR has made many infections, particularly bacterial infections, increasingly difficult or even impossible to treat. Without effective medicines, the number of people with severe microbial infections will increase, as will the number of people who die from these infections. In 2019, 4.95 million deaths were associated with AMR, with the highest AMR-attributable death rates occurring in western sub-Saharan Africa. While AMR is a natural evolutionary process that occurs over time, many human-led behaviors have increased its occurrence. The main drivers of AMR include: (1) the misuse and overuse of antimicrobials; (2) lack of access to clean water and adequate sanitation for people and animals; (3) poor infection prevention and control measures in healthcare facilities and farms; (4) limited access to quality, affordable medicines, vaccines, and diagnostics; and (5) lack of awareness and knowledge about AMR.

AMR is a complex problem that requires a multisectoral approach. The One Health approach brings together multiple sectors and stakeholders engaged in human, animal, and plant health; food and feed production; and the environment to work together in the design and implementation of programs, policies, legislation, and research to attain better public health outcomes. During the 2015 World Health Assembly, countries around the world endorsed the Global Action Plan on AMR and committed to developing and implementing their own national action plans (NAPs) on AMR. Eighty-six percent (140 of 163 countries) responding to the Tripartite AMR Country Self-Assessment Survey (TrACSS) have developed their own NAPs. However, only 50 percent (82) of countries have functional AMR coordination committees (or multisectoral working groups) for delivering their plans, and even fewer (20%; 32 countries) are implementing and actively monitoring their plans.

A key barrier to implementation is costing; policymakers must first know how much their policies will cost before they can be financed and put into action. To support countries in costing their NAPs, the World Health Organization (WHO) developed the WHO Costing and Budgeting Tool for NAPs on AMR. (https://www.who.int/teams/surveillance-prevention-control-AMR/who-amr-costing-and-budgeting-tool). The tool utilizes a modular approach that allows various ministries to independently cost the components of the national action plan that are relevant to their respective sectors. Afterwards, the tool then consolidates all the modules to provide a fully costed NAP on AMR. The first case study in this series highlights the lessons learned by Sierra Leone (and the WHO) as they pilot tested the Costing and Budgeting Tool.

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8 Murray et al., “Global Burden of Bacterial Antimicrobial Resistance in 2019.”
11 The Tripartite refers to the Food and Agricultural Organization (FAO), the World Organisation for Animal Health (WOAH), and the World Health Organization (WHO). In March 2022, the United Nations Environment Programme (UNEP) formally joined the partnership – hereafter called the “Quadripartite.”
Additionally, for countries to progress from planning to acting, AMR coordination committees must have a clearly defined role and the remit to develop and implement an operational plan. Operational plans should embed NAP activities into the national development agenda, sectoral strategies, and budgets, and should coordinate an aligned approach to delivering NAP activities across sectors and stakeholders. Creating and empowering AMR coordination committees and comprehensively implementing and monitoring the prioritized activities outlined in their NAPs operational plan takes time; but there are several relatively easy entry points for AMR action that countries can utilize to accelerate their fight against AMR. The remaining case studies in this series showcase successful actions against AMR that three countries – Burkina Faso, Jordan, and Malawi – have taken along their journey to fully operationalizing and implementing their NAPs on AMR.
WHO COSTING AND BUDGETING TOOL FOR NATIONAL ACTION PLANS ON ANTIMICROBIAL RESISTANCE
Sierra Leone: Prioritizing for Impact

Country Context

Recognizing the grave threat AMR poses to humans, animals, and the environment, the Government of Sierra Leone established a multisectoral coordination group in 2017, with officials from the Ministry of Health and Sanitation; the Ministry of Agriculture, Forestry, and Food Security; and the Environmental Protection Agency. The coordination group was tasked with integrating the country’s various AMR initiatives into a single, concerted effort for fighting AMR. They developed the National Strategic Action Plan for Combating AMR (2018–2022). Sierra Leone’s first national policy that specifically focuses on AMR.13 While Sierra Leone’s NAP was well-designed, the government struggled to implement the plan. There was limited knowledge on how much the plan’s activities would cost and uncertainty surrounding which activities to prioritize given limited resources.

Using the WHO AMR Costing and Budgeting Tool

In December 2020, Sierra Leone became the first country to begin pilot testing the WHO Costing and Budgeting Tool for NAPs on AMR (“WHO Tool”). Following the initial meeting of Sierra Leone’s AMR multisectoral coordination group, 12 costing coordinators were nominated from the two ministries and the Environment Protection Agency. The coordinators were tasked with producing a fully costed two-year operational plan for the NAP.

The costing coordinators were initially trained on the WHO Tool during a three-day workshop in January 2021. They met again the following month, along with staff from the WHO Sierra Leone country office, to determine which AMR activities would be included in the operational plan. The coordinators prioritized activities according to their expected impact. Activities with larger expected impact and those considered more feasible – less challenging to implement – were given higher priority. Building upon this prioritized list, the costing coordinators then used the WHO Tool to estimate the cost of their operational plan.

“The costing exercise provided an opportunity for multisectoral stakeholders to have a more granular insight into the NAP leading to prioritization of activities guided by likely impact of the intervention and feasibility in a resource limited setting.”

—Gerald Shambira, Consultant, WHO Sierra Leone Country Office

Results and Lessons Learned

Using the WHO Costing and Budgeting Tool for NAPs on AMR, the Government of Sierra Leone estimated the cost of its two-year operational plan for prioritized activities to be approximately USD 2.15 million, a large but feasible amount. Knowing the level of financing required not only helps with prioritization, but also serves as the first step for identifying funding sources. The International Development Association (IDA) at the World Bank is one such source; the IDA provides investment project financing, results-based loans, and development policy loans to help countries address AMR through both AMR-sensitive – such as strengthening health, water, or agricultural systems – and AMR-specific initiatives. For example, the World Bank is currently supporting Ethiopia in increasing access to safe water supply and sanitation services through the One WASH – Consolidated Water Supply, Sanitation, and Hygiene Account Project. The ongoing project, which aims to improve access to water, sanitation, and hygiene (WASH) facilities in schools and health centers, is intended to complement interventions to improve health impacts, decrease school dropout rates, and reduce the contamination of water bodies. The investments made through this project will also have meaningful, positive impacts on AMR, given that lack of access to clean water and adequate sanitation is a key driver of AMR emergence and spread. By costing their NAPs, countries are better positioned to incorporate priority AMR activities into broader AMR-sensitive projects, like One WASH, or propose financing for key AMR-specific activities in World Bank projects.

Sierra Leone’s National Strategic Action Plan for Combating AMR was developed using a One Health approach; therefore, the country’s decision to engage all relevant ministries in its AMR prioritization and costing activities was key to its success. The country created a multi-sectoral coordination group, with officials from three ministries, to develop and cost a two-year operational plan for AMR. The involvement of several ministries encouraged wider buy-in from stakeholders in the health, agriculture, and environment sectors. Furthermore, expertise on AMR and how to use the WHO Tool, acquired through a dedicated training workshop, is now shared across the government; multiple ministries have officials with knowledge and experience that will be beneficial in future AMR costing and budgeting exercises.

Now that Sierra Leone’s two-year operational plan has been costed, the country is well positioned to mobilize resources and begin implementing its priority AMR activities. The multisectoral coordination group is currently seeking endorsement from the government on the operational plan. In the meantime, the plan is being used to identify funders, such as the World Bank, and to engage with implementing partners, like the WHO, who can support Sierra Leone in its fight against AMR. Sierra Leone could build on the momentum created during costing their national action plan by further strengthening multisectoral collaboration and coordination. In line with its costed operational plan, the focus could be on improving awareness and understanding


\[\text{Ministry of Health and Sanitation, the Ministry of Agriculture and Forestry, and the Ministry of Environment through the Environment Protection Agency.}\]
Sierra Leone: Prioritizing for Impact

of AMR through effective communication, education, and training as well as strengthening the evidence and knowledge base for AMR through designing and implementing an AMR surveillance and antimicrobial consumption system. Such data could further support the implementation of the NAP on AMR.

“We found the tool very easy to use. The costing exercise provided us an opportunity to develop a two-year costed national action plan that highlights key priority activities with high impact. The exercise also assisted with AMR resource allocation and will be used to mobilize additional funding for AMR activities.”

—Dr. Joseph Sam Kanu, Deputy Manager, National Disease Surveillance Program, Ministry of Health and Sanitation and AMR Focal Point
ACCELERATING COUNTRY ACTION ON ANTIMICROBIAL RESISTANCE
Country Context

Burkina Faso’s National Strategic Plan to Combat Antimicrobial Resistance 2017–2020 was developed by the Ministry of Health in collaboration with the Ministry of Animal Resources and Fisheries, the Ministry of Agriculture and Water Facilities, and the Ministry of Environment, Green Economy, and Climate Change. The National Strategic Plan outlines five key objectives: (1) strengthening AMR and antimicrobial use surveillance and research; (2) reducing the incidence of infectious disease through infection prevention and control measures; (3) improving antimicrobial use in the human, animal, and agricultural health sectors; (4) strengthening the regulatory environment; and (5) improving awareness and understanding of AMR through communication, education, and training. The development of Burkina Faso’s first National Strategic Plan represents an important first step in the country’s fight against AMR. But the plan was never formally approved by the national government, which slowed its impact.

Even though progress on the National Strategic Plan stalled, an inter-ministerial decree issued in January 2019 established a One Health Technical Steering Committee, organized to oversee seven thematic One Health Committees, one of which is the AMR Committee. This governance structure is part of a larger National Coordinating Platform on One Health that was established by a presidential decree. Members of the AMR Committee had been working together on AMR objectives well before the decree integrated their efforts within a One Health Framework, which eased the committee’s development and allowed it to quickly become functional. The AMR Committee has since established a reporting mechanism between itself and the One Health Technical Steering Committee and meets regularly to oversee and coordinate the implementation of the National Strategic Plan across and within the sectors.

Key Successes

Burkina Faso’s AMR Committee has been successfully implementing several key actions against AMR: strengthening AMR surveillance; ensuring safer antimicrobial prescribing practices; and improving water, sanitation, and hygiene in hospitals. The 2019 inter-ministerial decree was essential for these successes, as it defined the country’s governance structure for AMR action and included details on the composition and activities of the AMR Committee by outlining five subcommittees respectively responsible for laboratory surveillance; antimicrobial consumption, quality, and rational use; regulation; communication and awareness among the public; and infection prevention and control. The decree also specified 88 representatives.
**Strengthened AMR surveillance**

Surveillance is an essential tool to inform policies and infection prevention and control responses; it is the cornerstone for assessing the spread of AMR and monitoring the impact of local, national, and global strategies. Burkina Faso has established an AMR surveillance system consisting of 15 designated laboratories for the detection of AMR pathogens using international standard operating procedures. The surveillance system is overseen by the Ministry of Health’s Laboratories Directorate, although historically these laboratories have not had sufficient resources such as reagents and culture media to enable them to adequately test for AMR. Following the development of the country’s Strategic Action Plan, the Ministry of Health developed a national guide for laboratory surveillance of AMR, containing a list of antibiotics with high resistance risk for monitoring. In 2019, Burkina Faso established the laboratory at the University Hospital Souro Sanou in Bobo Dioulasso as the national reference laboratory for the detection of AMR pathogens.

**Safer prescribing practices for healthcare workers**

Antibiotic overuse hastens the emergence of AMR. Health systems must ensure access to good-quality antimicrobials when needed, but this must be balanced with robust systems to prevent inappropriate use and overprescribing. Provisions on the rational use of antimicrobials were integrated into Burkina Faso’s National Strategic Plan, and guidelines to enable appropriate use of antimicrobials have been implemented in most health facilities nationwide. In August 2020, the country developed a guide for appropriate antibiotic prescribing to support healthcare workers to adopt rational antibiotic use practices, and the national list of essential medicines integrated the WHO’s AWaRe (Access, Watch, and Reserve) classifications. Monitoring and surveillance results are used to inform action and to update treatment guidelines and the national essential medicines list.

**Improved water, sanitation, and hygiene**

Inadequate water, sanitation, and hygiene (WASH) contributes to the spread of infectious disease and antibiotic use. The Burkina Faso Observatory for Quality and Safety of Care was launched after a United States CDC call for AMR initiatives in 2019. The Observatory aims to monitor and improve the WASH conditions of healthcare facilities across the country. As a result of Burkina Faso’s commitment to improving WASH, 91 percent of the country’s hospitals have basic water service, and 100 percent have hand hygiene stations at the point of care. Figure 2 presents the different health indicators that Burkina Faso is tracking under its National Strategic Plan to Combat Antimicrobial Resistance.

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17 Rational use of medicines means that patients receive medications that are appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community.

Future Opportunities

The Government of Burkina Faso recognizes the threat of AMR and has smartly utilized several key entry points for action against AMR. These AMR actions, and the 2019 inter-ministerial decree that enabled their success, indicate Burkina Faso’s growing political commitment to AMR. While Burkina Faso’s National Strategic Plan to Combat Antimicrobial Resistance 2017–2020 was never endorsed, the government has built upon elements of the plan to develop a new Strategic Plan for 2022–2024. An important next step for the country is to endorse the country’s new NAP and develop a legal, governing framework for its implementation.

Additionally, the government must allocate sufficient financial resources for the implementation of priority AMR activities in its NAP. For many low- and middle-income countries, domestic financing may not be sufficient for comprehensive, nationwide implementation of AMR activities. There are many potential funding sources for supporting NAP implementation. The International Development Association (IDA) at the World Bank, for example, provides investment

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**Figure 2** TrACCS human health indicators for Burkina Faso, 2020–2021

- **Awareness and Education**
  - Raising awareness and understanding of AMR risks and response
  - Training and professional education on AMR in the human health sector

- **IPC**
  - IPC in human health care
  - Multi-sector and One Health collaboration/coordination

- **Optimizing AMU**
  - Adoption of “AWaRe” classification of antibiotics in the National Essential Medicines List
  - Optimizing AMU in human health

- **Surveillance**
  - National monitoring system for consumption and rational use of antimicrobials in human health
  - National surveillance system for AMR in humans

Source: Global Database for the Tripartite Antimicrobial Resistance (AMR) Country Self-assessment Survey (TrACSS)
project financing, results-based loans, and development policy loans to help countries address AMR through both AMR-sensitive initiatives such as strengthening health, water, or agricultural systems, and AMR-specific ones. The World Bank is currently supporting Burkina Faso in improving access to water supply and sanitation services in rural areas of the country, particularly in the southwest region where access is particularly limited. As of February 2021, the Burkina Faso Water Supply and Sanitation Program has helped the Government to provide more than 60,000 people with access to improved sanitation services, which will, in turn, have meaningful, positive impact on AMR. The World Bank is also supporting the region through the Regional Disease Surveillance Systems Enhancement (REDISSE) Project, which aims to support West African countries in establishing an active and functional One Health Platform, enhancing surveillance and information systems, and strengthening laboratory capacity.

Tackling AMR requires sustained and coordinated action at scale across a range of institutions and sectors, including human and animal health, food production, environment, water and sanitation, education, and trade. Many different stakeholders, with different ways of working, need to be brought together to coordinate and scale up their efforts in a way that maximizes their impact on AMR. Clear commitment from the national government, as signaled through an endorsed NAP, is an important first step to be followed by the establishment of a functioning AMR coordination committee with a mandate to deliver on NAP activities. To accelerate the evidence-based implementation of the NAP on AMR, not only in the human health but also in other sectors, Burkina Faso could strengthen multisectoral collaboration and coordination. Building further on its success in improving prescribing practices, the AWaRe classification of antibiotics could be incorporated into treatment guidelines and antimicrobial stewardship strategies to improve antimicrobial use. In addition, the country could focus on expanding the implementation of the IPC program at the national and health facility levels, in line with the second strategic objective of its NAP on AMR.


Country Context

In 2017, a national multisectoral AMR committee was formed and tasked with developing Jordan’s first NAP on AMR and to subsequently coordinate and monitor its implementation. Members of the committee comprised representatives from several sectors and organizations: the Ministry of Health, the Ministry of Agriculture, the Jordan Food and Drug Administration (JFDA), the Procurement and Supply Directorate, public health professionals, pharmacy associations, academics, and representatives from medical, veterinary, pharmaceutical. The resulting NAP, Jordan’s National Action Plan for Combating Antimicrobial Resistance (2018–2022), is now being implemented and monitored. It has five strategic objectives: (1) improving awareness and understanding of AMR through effective communication, education, and training; (2) strengthening knowledge and evidence through surveillance; (3) reducing the incidence of infection through effective IPC; (4) optimizing the use of antimicrobial agents in health, animals, and food; and (5) promoting investment for AMR activities, research, and innovation. The AMR committee also developed an operational plan with an allocated budget for each strategic objective of the NAP.

Key Successes

Under the leadership of the multisectoral AMR committee in charge of NAP implementation, Jordan has been successful at implementing several key actions against AMR. These include strengthening AMR surveillance, strengthening antimicrobial consumption (AMC) surveillance, ensuring safer antimicrobial prescribing practices, and increasing public awareness of AMR.

Strengthened AMR surveillance

Surveillance is an essential tool to inform policies and IPC responses; it is the cornerstone for assessing the spread of AMR and monitoring the impact of local, national, and global strategies. Since 2018, WHO has worked with the Ministry of Health of Jordan to establish a comprehensive and representative national AMR surveillance system and to build the surveillance capacities of national stakeholders. In July 2019, the Minister of Health officially endorsed the “Jordan National Antimicrobial Resistance Surveillance System (JARSS),” which generates quality data based on internationally standardized laboratory methods and interpretation metrics for antimicrobial sensitivity testing. A national coordinating committee oversees the functioning of the surveillance system, and a national reference laboratory provides support, training, and external quality assessment. Data on antimicrobial susceptibility testing are also collected. Currently, JARSS includes 23 sentinel sites (57 percent of tertiary healthcare facilities in Jordan) in the human health sector, and data have been reported annually to the WHO Global Antimicrobial Resistance and Use Surveillance System (GLASS) since 2018. In November 2020, Jordan published their first national AMR surveillance report during World Antimicrobial Awareness Week (WAAW).
Strengthened AMC surveillance

Data on AMC provide an important basis for understanding the patterns and amount of antimicrobial consumption and use, which can inform policies, regulations, and interventions to optimize their use and minimize the AMR risk. Since 2017, the JFDA has been responsible for collecting data on imported and locally manufactured antimicrobials and has set up a national surveillance system for monitoring AMC. In addition to its successful implementation at the national level, the department of Pharmacy and Clinical Pharmacy at the Ministry of Health established AMC surveillance in eight hospitals. In 2019, approximately 59 percent of the antibiotics consumed nationally were from the WHO’s AWaRe classification Access group, in accordance with the WHO’s target of Access group antibiotics comprising at least 60 percent of total antibiotic consumption. Antibiotics from the Watch group represented roughly 41 percent total consumption, and Reserve group antibiotics comprised less than 0.05 percent. However, AMC data from 2020 has shown the unfortunate impact of the COVID-19 pandemic on national consumption patterns. The proportion of antibiotics consumed in the Access group fell to 49 percent and the proportion in the Watch group increased to 51 percent.

Safer prescribing practices for healthcare workers

Antibiotic overuse hastens the emergence of AMR. Health systems must therefore ensure access to good-quality antimicrobials when needed, but this must be balanced with robust systems to prevent inappropriate use and overprescribing. Based on the data generated through the AMR and AMC surveillance systems, Jordan was the first low- or middle-income country in the WHO’s Eastern Mediterranean region to develop a national antimicrobial stewardship policy and national clinical guidelines for priority infections. The AMR and AMC data also inform targeting of antimicrobial stewardship interventions at national and health facility levels. The JFDA has incorporated the WHO AWaRe classification of antibiotics in local treatment guidelines and has reclassified antibiotics in the Reserve group to “hospital use only,” so that they are not accessible from community pharmacies. Additionally, to help prevent over-the-counter dispensing, a new law in Jordan prohibits pharmacists from prescribing antibiotics to patients. Jordan was also among the first countries in the region to develop a national IPC program, with national guidelines which were updated in 2017.

21 As defined by the WHO’s AWaRe classifications, antibiotics in the Access group are effective against wide range of common pathogens and have lower resistance potential. Antibiotics in the Watch group have higher resistance potential and should be used sparingly and with caution; antibiotics in the Reserve group are considered “last resort” options and should be reserved for treating infections due to multi-drug-resistant organisms.


Greater public awareness of AMR

To address some of the knowledge gaps and behaviors that drive unnecessary antibiotic use, Jordan implemented two important initiatives. The first initiative, the Tailoring Antimicrobial Resistance Program (TAP), aimed to reduce patient demand for antibiotics as treatment for mild upper respiratory tract infections, which are often viral and therefore not affected by antibiotic treatments. The initiative was successfully implemented in six primary healthcare centers. The second initiative, launched in November 2018, aimed at increasing AMR awareness among medicine, pharmacy, and veterinary undergraduate students from three universities. Students were mobilized to use their smart phones to make informational videos on behaviors linked to AMR. Over 100 students participated in a two-day training, which was followed by a competition for the best video. Approximately 30 video clips, shared widely on social media, were awarded a prize for their clever presentation of hygienic behaviors and appropriate antibiotic use.

Future Opportunities

Jordan has made great progress in recognizing and responding to the threat of AMR, in surveillance for example, but there remains a need to review the NAP and expand implementation to other areas. The strategic objectives outlined in the current Jordan NAP (2018–2022) are well-aligned with the Global Action Plan on AMR. Jordan’s capacity to implement is well demonstrated by its development of robust surveillance systems for AMR and AMC. The surveillance systems have helped the country identify targeted actions for antimicrobial stewardship interventions. However, Jordan should consider reviewing, updating, and prioritizing NAP activities and their time frame. Additionally, few domestic resources have been mobilized to support the implementation of the NAP. Furthermore, the use of AMR and AMC surveillance data is mostly limited to the human health sector, and decision-makers in other sectors should also consider generating and using data in planning their activities to address AMR for a truly comprehensive One Health approach.

Key areas for improvement in Jordan include: (1) strengthening multisectoral and One Health collaboration and coordination, (2) expanding training and professional education on AMR, (3) improving IPC measures, and (4) increasing public awareness of AMR. An important first step in strengthening multisectoral and One Health collaboration and coordination at the national level is to promptly resume meetings of the AMR committee, which were deferred due to COVID-19, and to link Jordan’s NAP with existing action plans in other sectors. To expand training and professional education on AMR, Jordan could consider focusing efforts on physicians. A recent study found that one-third of physicians reported no knowledge of any initiatives on antibiotic awareness and resistance and nearly 90 percent were unaware or unsure of the existence of a NAP on AMR. Additionally, IPC compliance and effectiveness could be regularly assessed in health facilities, and Jordan could also strive to improve hygienic and IPC practices in animal husbandry and in food

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processing. In line with the first strategic objective of its NAP on AMR, Jordan could further improve its efforts to promote awareness and understanding of AMR by regularly implementing targeted, nationwide, government-supported activities to change the behavior of key stakeholders – policy makers, healthcare professionals and the public – with regular monitoring of their impact.

### Insufficient and inconsistent financing is a threat to the sustainable implementation of AMR actions in Jordan.

For many low- and middle-income countries, domestic financing may not be sufficient for comprehensive, nationwide implementation of AMR activities. There are many potential funding sources for supporting NAP implementation. The World Bank provides investment project financing, results-based loans, and development policy loans to help countries address AMR through both AMR-sensitive initiatives such as strengthening health, water, or agricultural systems and AMR-specific ones. For example, in Serbia the World Bank supported the government in reducing antibiotic consumption, decreasing the systematic use of antibiotics from a defined daily dose per thousand inhabitants from 36.5 to 30.0 from 2015 to 2016, respectively. At the time, compared with other European countries, Serbia’s consumption rate was high, but through sustained efforts, it became significant lower by 2018. Serbia achieved this improvement through the Second Serbia Health Project. The country’s Ministry of Health launched a concerted campaign and established an expert working group for the rational use of antibiotics. It developed a national program for the control of bacterial resistance and implemented public campaigns for the rational use of antibiotics. The Ministry also established partnerships with over 20 institutions and organizations to improve awareness, education, and improved regulation and oversight of antibiotics.

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Country Context

In the Republic of Malawi, analysis of available AMR data suggests that resistance of common pathogens to various antimicrobials has increased since the early 2000s. The government has recognized this threat, and has mobilized resources for its mitigation. Malawi identified AMR as a critical area for intervention in its Health Sector Strategic Plan-II, published in 2017, and further developed a NAP on AMR, the Antimicrobial Resistance Strategy 2017–2022, which outlines health policy and implementation objectives and yearly operational plans and budgetary requirements. Furthermore, the NAP incorporates a One Health approach for addressing AMR and defines specific roles for relevant government ministries, implementation partners, and civil society organizations. Malawi’s AMR strategy is well aligned with the Global Action Plan on AMR and is based on a comprehensive situational analysis conducted as part of the Antibiotic Stewardship and Conservancy in Africa project funded by the Norwegian Agency for Development Cooperation (Norad).

Malawi has functioning governance and coordination mechanisms for AMR with a multisectoral National Coordinating Committee (NCC), technical working groups, and a core group of interdisciplinary stakeholders that oversee and coordinate national and subnational AMR strategy. Malawi’s AMR strategy, outlined in its NAP, has five core objectives: (1) improve awareness and understanding of AMR through effective communication, education, and training; (2) improve knowledge and evidence of AMR through research and surveillance; (3) reduce incidence of infection through effective sanitation, hygiene, and prevention measures; (4) ensure sustainable investment through research and development; and (5) optimize the use of antimicrobial medicines in the agriculture, human, and animal health sectors. A five-year operational plan describes annual output targets including the number and type of activity such as workshops, meetings, training, and deliverables for each core objective. Notably, the NAP also includes detailed annual cost estimates for each objective as well as sources of funding, risks, and assumptions.

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Key Successes

Malawi’s NCC has been successfully implementing several key actions against AMR: increasing public awareness of AMR; ensuring safer antimicrobial prescribing practices; and strengthening infection prevention and control (IPC) measures.

Greater public awareness of AMR

Increased public awareness of AMR helps to encourage best practices among the general public, healthcare workers, farmers, animal health professionals, and policy makers to avoid the continued emergence and spread of drug-resistant infections. The Government of Malawi has set a national target to increase awareness and understanding of AMR among the public and professional stakeholders in the human health, animal health, and agricultural sectors from zero percent in 2016 to 90 percent by 2022. In 2019, the regional nonprofit research policy institute, the African Institute for Development Policy (AFIDEP), in collaboration with the Malawi Ministry of Health, organized “the big walk” in Lilongwe to promote knowledge among the public on the prudent use of antibiotics. Since then, the Drivers of Resistance in Uganda and Malawi (DRUM) consortium has designed and distributed several AMR informational materials during World Antimicrobial Awareness Week. This event emphasized the role of the media in promoting AMR awareness and behavior change regarding prudent antimicrobial use. Members of the press actively participated in the discussion on debunking myths and misconceptions regarding AMR. Engagements around AMR through this event shed light on the challenge of communicating scientific knowledge to the public due to the lack of a vernacular term for “antibiotic” in Chichewa, a language spoken by 70 percent of the population.

Safer prescribing practices for healthcare workers

Antibiotic overuse hastens the emergence of AMR. Health systems must ensure access to good-quality antimicrobials when needed, but this must be balanced with robust systems to prevent inappropriate use and overprescribing. Malawi’s NAP on AMR aims to reduce inappropriate antimicrobial use by 100 percent across the agriculture, human, and animal health sectors by 2022, and the government also aims to ensure uninterrupted access to high-quality antimicrobials by strengthening relevant regulations and legislation. The NCC is tasked with ensuring appropriate antimicrobial use and implementing evidence based antimicrobial stewardship policies, programs, and interventions. Queen Elizabeth Central Hospital, a 1,300-bed hospital in Blantyre that provides free inpatient care, introduced an antimicrobial stewardship program between 2016 and 2018. A prescribing application for smartphones, meant to help healthcare workers appropriately prescribe antibiotics, resulted in a more optimal use of antimicrobials, and highlighted the feasibility of antimicrobial stewardship programs in resource-limited settings. Malawi updated its standard treatment guidelines in 2015 to include antimicrobial treatment recommendations for specific bacterial infections and other medical conditions, and the Ministry of Health is currently revising its national essential medicines list to include the World Health Organization’s (WHO) AWaRE classifications and explicit references to AMR.
**Strengthened infection prevention and control measures and immunization**

IPC measures, including vaccination, hand hygiene, and maintenance of clean, hygienic medical facilities, equipment, and practices can help to limit the spread of infectious diseases and reduce antimicrobial consumption. In Malawi, a strong vaccination program, which includes all WHO-recommended vaccines and boasts coverage rates between 60 and 90 percent, provides a backbone of support for the country’s IPC efforts in the health sector. National IPC guidelines and capacity-building activities have been implemented across the health system, and there is a clear model for improving IPC measures at all healthcare levels. IPC monitoring and capacity-building activities cascade from the Ministry of Health to district-level hospitals which, in turn, are responsible for ensuring and sustaining these capacities at lower-tier health facilities and in the community. During the COVID-19 pandemic, Malawi prioritized IPC and water, sanitation, and hygiene (WASH) efforts in its national pandemic response. A score card was developed to guide quick, one-hour assessments of IPC and WASH and helped the country to document whether facilities had adequate personal protective equipment, standard operations procedures in place, and sufficient educational materials to guide best IPC practices. Figure 3 below presents how Malawi is tracking key health indicators and actions being taken to achieve them.

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**Figure 3 TrACCS human health indicators for Malawi, 2020-2021**

- **Awareness and Education**
  - Raising awareness and understanding of AMR risks and response
  - Training and professional education on AMR in the human health sector

- **IPC**
  - IPC in human health care

- **Optimizing AMU**
  - Adoption of "AWaRe" classification of antibiotics in the National Essential Medicines List
  - Optimizing AMU in human health

- **Surveillance**
  - National monitoring system for consumption and rational use of antimicrobials in human health
  - National surveillance system for AMR in humans

**Source:** Global Database for the Tripartite Antimicrobial Resistance (AMR) Country Self-assessment Survey (TrACSS)
Future Opportunities

Malawi has made great strides in recognizing and responding to the threat of AMR. The country’s NAP is well aligned with the Global Action Plan on AMR and provides a strong foundation for multisectoral action through its One Health perspective. An important enabler of success has been Malawi’s commitment to comprehensive planning. The country’s NAP outlines clear roles and responsibilities for all relevant stakeholders and describes clear objectives, budgetary requirements, and monitoring and evaluation frameworks for implementation. To keep momentum on improving awareness and understanding of AMR and in line with the first strategic objective of Malawi’s NAP, initiatives on improving public awareness could be expanded. At the same time, incorporating AMR and AMS core competencies into pre- and in-service training could enhance the knowledge and understanding of AMR among healthcare professionals. Leveraging the experience and lessons learned through the established national AMR surveillance system, Malawi could further build its evidence base by the implementing a national antimicrobial consumption surveillance system.

Malawi has made great progress in implementing aspects of its NAP; however, lack of consistent and sufficient financial and human resources for AMR activities has been a major barrier for sustainable implementation. For many low- and middle-income countries, domestic financing may not be sufficient for comprehensive, nationwide implementation of AMR activities. There are many potential funding sources for supporting NAP implementation. The International Development Association (IDA) at the World Bank, for example, provides investment project financing, results-based loans, and development policy loans to help countries address AMR through both AMR-sensitive initiatives such as strengthening health, water, or agricultural systems and AMR-specific programs. For example, from 2015-2021, the World Bank supported countries in West Africa in measuring the prevalence of animal diseases with high AMR risk and vaccinating animals against those diseases.30

The countries in this case series showcase meaningful actions that can be taken to address AMR regardless of a country’s technical capacity or its stage of NAP implementation. Sierra Leone, a country at an early implementation stage, smartly utilized the WHO’s Costing and Budgeting Tool to move towards more effective implementation of its NAP by prioritizing key activities and costing a two-year operational plan. In Jordan, where the country’s NAP has been actively implemented since 2019, the Government focused on strengthening AMR and AMC surveillance to enhance monitoring and evaluation capacities and inform strategic policymaking for the future. Burkina Faso’s organized and dedicated governance structure for AMR succeeded in improving water, sanitation, and hygiene and making prescribing practices for healthcare workers safer, even though formal approval for the country’s NAP stalled. No matter the starting point, there are always a host of impactful actions that countries can take to mitigate the threat of AMR.

While easy entry points for AMR action tend to be single-sector interventions (e.g., strengthening IPC in healthcare settings), AMR is a complex problem that requires both sector-specific actions and multisectoral, One Health approaches. Countries can build the foundation for a multisectoral approach through their AMR governance structure, for which the WHO recommends a dedicated overarching multisectoral coordination mechanism, with supporting technical working groups as needed. Malawi’s AMR governance structure is an excellent example. The country’s National Coordinating Committee, comprised of members from various sectors and backgrounds, defines the roles for government ministries, implementation partners, and civil society organizations and coordinates their AMR actions. Burkina Faso similarly benefits from a One Health governance structure. The country’s AMR Committee, which sits within a broader National Coordinating Platform on One Health, has created five subcommittees, one for each key objective of the country’s NAP.

The WHO and the World Bank recognize the need to better support countries at all stages of NAP implementation as they strive to address the growing threat of AMR. The two organizations are united as technical and operational partners, ready to draw upon their comparative advantages to collectively provide countries with the support they need, spanning the spectrum from implementing easy entry point interventions to operationalizing a comprehensive multisectoral One Health approach. The WHO stands ready to provide guidance and technical assistance. The Costing and Budgeting Tool for NAPs on AMR (showcased by the Sierra Leone case study) is just one of WHO’s many support tools; other resources include global norms and standards, targeted technical assistance, templates, checklists, resource packs, handbooks, webinars, and e-learning modules (see the More Information & Additional Resources section for links to some of these tools). And, if funding gaps exist, the World Bank stands ready to provide financing through established mechanisms, including investment project financing, development policy financing, and program-for-results. In addition to its financing capacity, the World Bank has experience operating in every major area of development, making it particularly well suited to support countries as they seek to convene public and private stakeholders across sectors in a coordinated fight against AMR.

31 The World Bank has 18 global practices, including several with particular relevance for AMR: agriculture; environment & natural resources; health, nutrition & population; human development; social sustainability and inclusion; and water.
MORE INFORMATION AND ADDITIONAL RESOURCES

Technical Guidance

- Antibiotic prescribing and resistance: Views from low- and middle-income prescribing and dispensing professionals [Document].
- Antimicrobial resistance fact sheet [Website].
- Antimicrobial stewardship programmes in health-care facilities in low- and middle-income countries: a WHO practical toolkit [Document].
- GLASS guidance for national reference laboratories [Document].
- Global antimicrobial resistance and use surveillance system (GLASS) report: 2021 [Document].
- Global Database for the Tripartite Antimicrobial Resistance (AMR) Country Self-assessment Survey (TrACSS) [Website].
- Minimum requirements for infection prevention and control programmes [Document].
- Supporting countries with national action plan implementation [Website].
- Technical brief on water, sanitation, hygiene and wastewater management to prevent infections and reduce the spread of antimicrobial resistance [Document].
- The TAP toolbox: exercises, tools and templates to support your tailoring antimicrobial resistance programmes plan [Document].
- The TAP quick guide: a practical handbook for implementing tailoring antimicrobial resistance programmes [Document].
- WHO access, watch, reserve (AWaRe) classification of antibiotics for evaluation and monitoring of use, 2021 [Document].
- WHO AMR Costing and Budgeting Tool [Website].
- WHO costing and budgeting tool for national action plans on antimicrobial resistance: user guide [Document].
- WHO implementation handbook for national action plans on antimicrobial resistance: guidance for the human health sector [Document].
WHO policy guidance on integrated antimicrobial stewardship activities [Document].

World Antimicrobial Awareness Week [Website].

Policy Guidance

Burkina Faso national action plan on antimicrobial resistance: review of progress in the human health sector [Document].

Burkina Faso: National multisectoral strategic plan to combat antimicrobial resistance [Document, French].

Global action plan on antimicrobial resistance [Document].


National action plan for combating antimicrobial resistance in the Hashemite Kingdom of Jordan [Document].


Financing Guidance

Africa CDC Regional Investment Financing Project [Website].

Burkina Faso Water Supply and Sanitation Program [Website].

One WASH - Consolidated Water Supply, Sanitation, and Hygiene Account Project [Website].

Regional Disease Surveillance Systems Enhancement (REDISSE) [Website].

Regional Sahel Pastoralism Support Project [Website].

Second Serbia Health Project [Website].

World Bank financing [Website].
REFERENCES


