Building Local Coalitions for Containing Drug Resistance: A Guide

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About RPM Plus

RPM Plus works in more than 20 developing and transitional countries to provide technical assistance to strengthen pharmaceutical and health commodity management systems. The program offers technical guidance and assists in strategy development and program implementation both in improving the availability of health commodities—pharmaceuticals, vaccines, supplies, and basic medical equipment—of assured quality for maternal and child health, HIV/AIDS, infectious diseases, and family planning, and in promoting the appropriate use of health commodities in the public and private sectors.

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As part of its Infectious Disease Initiative, the U.S. Agency for International Development (USAID) supports efforts to raise awareness of drug resistance and to limit its emergence and spread by decreasing the use of antimicrobial medicines when they are not required, improving their use when they are required, and improving the quality and supply of medicines. A key first step was supporting the development of the World Health Organization Global Strategy for the Containment of Antimicrobial Resistance. The Global Strategy provides a comprehensive set of evidence- and consensus-based recommendations for antimicrobial resistance (AMR) containment through interventions targeting various stakeholders, including health providers, patients, governments, and health systems. This guide builds on the Global Strategy by offering a practical approach to operationalize the strategy at the local level and by making tools and approaches readily available to support advocacy and coalition building around the issue and act accordingly.

The first version of this guide (Workbook for Building Local Support for Containing Drug Resistance) was developed in 2004 by the Academy for Educational Development (AED) through the CHANGE Project, the Harvard Drug Policy Research Group through the Applied Research on Child Health Project, Management Sciences for Health (MSH) through the Rational Pharmaceutical Management (RPM) Plus Program, and the Alliance for the Prudent Use of Antibiotics funded through RPM Plus.

This current version of the guide is based largely on the initial version and modified based on feedback from users; it was prepared by the RPM Plus Program. RPM Plus works in more than 20 developing countries to provide technical assistance to strengthen drug and health commodity management systems. The program offers technical guidance and assists in strategy development and program implementation both in improving the availability of quality assured health commodities—pharmaceuticals, vaccines, supplies, and basic medical equipment—for maternal and child health, HIV/AIDS, infectious diseases, and family planning and in promoting the appropriate use of health commodities in the public and private sectors.

Anthony F. Boni (USAID) provided the initial vision for this effort and continuous support for the overall approach described in this guide. The main contributors to this guide were Nancy Pollock (AED/CHANGE) and Maria Miralles, Nick Nelson, and Mohan P. Joshi (MSH/RPM Plus). Special thanks to those who reviewed this document, especially Anthony F. Boni and Marni Sommer (USAID); Susan Zimicki (AED); Marisabel Sanchez (Links Media); Chifumbe Chintu (AMR Advocacy Working Group in Zambia); and Beth Yeager, Wonder Goredema, and Oliver Hazemba (MSH/RPM Plus).
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<th>Acronym</th>
<th>Definition</th>
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<tbody>
<tr>
<td>AED</td>
<td>Academy for Educational Development</td>
</tr>
<tr>
<td>AIDS</td>
<td>acquired immunodeficiency syndrome</td>
</tr>
<tr>
<td>AMR</td>
<td>antimicrobial resistance</td>
</tr>
<tr>
<td>APUA</td>
<td>Alliance for the Prudent Use of Antibiotics</td>
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<tr>
<td>ARI</td>
<td>acute respiratory infection</td>
</tr>
<tr>
<td>AWG</td>
<td>advocacy working group</td>
</tr>
<tr>
<td>CCM</td>
<td>country coordinating mechanism</td>
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<tr>
<td>CDC</td>
<td>U.S. Centers for Disease Control and Prevention</td>
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<tr>
<td>CHANGE</td>
<td>State-of-the-art Behavior Change Project</td>
</tr>
<tr>
<td>DFID</td>
<td>Department for International Development (UK)</td>
</tr>
<tr>
<td>DTC</td>
<td>Drug and Therapeutics Committee</td>
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<tr>
<td>EML</td>
<td>essential medicines list</td>
</tr>
<tr>
<td>GFATM</td>
<td>Global Fund to Fight AIDS, Tuberculosis and Malaria</td>
</tr>
<tr>
<td>HIV</td>
<td>human immunodeficiency virus</td>
</tr>
<tr>
<td>ICC</td>
<td>Infection Control Committee</td>
</tr>
<tr>
<td>JICA</td>
<td>Japanese International Cooperation Agency</td>
</tr>
<tr>
<td>M&amp;E</td>
<td>monitoring and evaluation</td>
</tr>
<tr>
<td>MoH</td>
<td>Ministry of Health</td>
</tr>
<tr>
<td>MSH</td>
<td>Management Sciences for Health</td>
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<tr>
<td>NGO</td>
<td>nongovernmental organization</td>
</tr>
<tr>
<td>RPM Plus</td>
<td>Rational Pharmaceutical Management Plus Program</td>
</tr>
<tr>
<td>Sida</td>
<td>Swedish International Development Cooperation</td>
</tr>
<tr>
<td>STGs</td>
<td>standard treatment guidelines</td>
</tr>
<tr>
<td>STI</td>
<td>sexually transmitted infection</td>
</tr>
<tr>
<td>SWOT</td>
<td>strengths, weaknesses, opportunities, threats</td>
</tr>
<tr>
<td>TB</td>
<td>tuberculosis</td>
</tr>
<tr>
<td>TOR</td>
<td>terms of reference</td>
</tr>
<tr>
<td>UNAIDS</td>
<td>Joint United Nations Programme on HIV/AIDS</td>
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<tr>
<td>UNICEF</td>
<td>United Nations Children’s Fund</td>
</tr>
<tr>
<td>USAID</td>
<td>U.S. Agency for International Development</td>
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<tr>
<td>WHO</td>
<td>World Health Organization</td>
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Building Local Coalitions for Containing Drug Resistance
1. INTRODUCTION

Overview of the Problem of Drug Resistance

Drug resistance is not new, but there is a new urgency for containing it. Resistance occurs when microbes causing infections develop the ability to withstand the effects of the medicines used to disable them. This becomes a particularly threatening challenge when alternate medicines are not available or not affordable to treat such infections. Drug use is the key driver of drug resistance. Misuse of medicines through overuse, underuse, and unnecessary use accelerates the development of resistance.

Drug resistance, also known as antimicrobial resistance (AMR) (Box 1), is complicating the treatment of major infectious diseases such as pneumonia, gonorrhea, cholera and dysentery, malaria, tuberculosis (TB), and HIV/AIDS and undermining disease control efforts. Lifesaving medicines used to treat malaria, TB, and AIDS are at risk of losing effectiveness due to drug resistance. Compounding the problem is that finding new medicine to replace those that are no longer effective is a long, expensive process with no guarantee of success, so the pipeline for such new medicines is often empty.

Drug resistance is a complex problem. Contributing factors include pharmaceutical management and medicine supply, medicine use behaviors, drug resistance information and surveillance capacity, and stakeholder interest and support. Containing drug resistance requires strengthening within these systems and coordination across these factors. Stakeholders are needed from a wide variety of sectors to gather and use information on these factors and coordinate a response.

Although drug resistance is a global problem, it requires local solutions. Because the various factors just noted are context-specific, local solutions must be found. Known interventions can target these different factors, but coordination among them is necessary to achieve the critical mass of activity required to contain resistance. For example, providing treatment guidelines and supporting training in their use will not change prescribing practices if the appropriate medicines are not available. Similarly, changing medicine treatment policy and ensuring the supply of the
appropriate treatment may not result in appropriate treatment if prescribers are not familiar with the corresponding treatment guidelines.

<table>
<thead>
<tr>
<th>Box 1. Drug Resistance Terminology</th>
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In this workbook, the terms drug resistance and antimicrobial resistance are used interchangeably.

Antimicrobial resistance: AMR is the ability of a microbe to withstand the killing or disabling effect of an antimicrobial agent.

Antimicrobials: Antimicrobials are medicines that specifically kill or inhibit the growth of disease-causing microbes (including bacteria, viruses, fungi, and protozoa). The terminology is a generic one and includes antibiotics and other antibacterials, antivirals, antiprotozoals, and anthelmintic medicines. Antimalarials, anti-TB agents, and antiretrovirals are specific terms for antimicrobials used to treat malaria, TB, and HIV/AIDS.

In 2001, the World Health Organization (WHO) published the WHO Global Strategy for Containment of Antimicrobial Resistance, a document that represents global consensus on proven interventions, research gaps, and appropriate approaches for containing drug resistance. At the country level, these interventions involve consumers, prescribers, dispensers, and other stakeholders; hospitals; national governments; and health systems (Annex 1). Table 1.1 lists examples of the types of interventions that support the different factors of drug resistance.

Table 1.1 Examples of Interventions Supporting the Different Factors of Drug Resistance

<table>
<thead>
<tr>
<th>Factors of Drug Resistance</th>
<th>Possible Interventions</th>
</tr>
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</table>
| Pharmaceutical management and infection control | • Develop, disseminate, and implement standard treatment guidelines (STGs)  
• Develop formularies and essential medicines lists (EMLs)  
• Develop Drug and Therapeutic Committees (DTCs)  
• Strengthen pharmaceutical management practices  
• Develop and implement infection control programs |
| Medicine use behaviors | • Develop preservice education to address AMR training for future health care providers  
• Develop an in-service training program on appropriate use of antimicrobials and AMR  
• Develop printed education materials for drug sellers on appropriate dispensing of antimicrobials  
• Prepackage medicines to improve the case management of infectious diseases  
• Educate the public through information campaigns |
| Drug resistance information and AMR surveillance capacity | • Strengthen AMR surveillance infrastructure  
• Improve AMR surveillance capacity |

Who has a stake in containing AMR? Those with a stake in AMR containment include individuals affected by AMR and people whose actions contribute to its spread. They include physicians, nurses, pharmacists, and other health professionals in the public and private sector; professional societies, researchers, pharmaceutical companies, consumers and community

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members, academics, the government, journalists, donors, and nongovernmental organizations (NGOs). AMR stakeholders can be interested in one specific condition, such as malaria, tuberculosis, acute respiratory infections (ARIs), sexually transmitted infections (STIs), diarrhea, or AIDS; in one aspect of AMR, such as irrational drug use or infection control; or in antimicrobial resistance in general.

**Purpose of the Guide**

This guide aims to help AMR stakeholders organize a collaborative effort to address drug resistance locally. The priority interventions outlined in the WHO Global Strategy are coupled with advocacy efforts to achieve the critical mass of activity needed for a coordinated, multidisciplinary coalition-based approach to containing drug resistance.

The guide is based on the following observations and guiding principles—

- Much is already known about the causes of AMR and what can be done to contain and prevent it; there is no need to wait for more information to act immediately.

- Action must focus on realistic local strategies that capitalize on existing initiatives, resources, and activities while generating a catalyst for new ones.

- In many countries, little information exists about the nature of the AMR problem in their specific context; when information is available, it is not widely shared and discussed among stakeholders.

- Mobilizing local stakeholders around the common issue of drug resistance is important for coordinated and collaborative action.

- The initiative to contain and prevent AMR must be seen as adding value to existing health programs, such as programs to control malaria, HIV/AIDS, and TB, and not as a competing vertical program.

This guide shows users how to—

- Mobilize local support around drug resistance

- Gather credible evidence to guide decision making

- Build consensus among AMR stakeholders on the nature of the problem and form a coalition; find feasible solutions in their context; and then formulate, implement, and evaluate a plan to address the problem
A Coalition-Based Approach

Coalition building is the foundation of the approach. It begins with a core working group of stakeholders and grows as more stakeholders are drawn into the process during the different phases. While initial efforts will focus on strengthening the coalition, over time the coalition will be able to turn outward to focus on its mission of containing AMR. The coalition’s role is not strictly to implement containment interventions, but also to coordinate and advocate for their implementation by other key stakeholders.

- Mobilize Support—The first step is to mobilize support among key stakeholders. Initial investigations include determining who these people, institutions, and agencies are and initiating a dialogue about the need for a concerted effort to address AMR. A small group of committed stakeholders will emerge to lead the stakeholders toward coalition building.

- Understand the Local Situation—During this phase, stakeholders focus on compiling information to guide the development of strategies for advocacy, intervention, and research, using existing information and key informant interviews to understand the local context and to determine what data needs to be collected about antimicrobial resistance surveillance capacity and drug policy management.

- Formulate a Plan—Convene a stakeholder meeting to increase awareness of drug resistance, review local information compiled on AMR, and develop a collaborative plan for addressing drug resistance.

- Implement an Action Plan—Implement interventions, mobilize interest and resources, and conduct necessary research to fill critical information gaps.

- Monitor and Evaluate—Evaluate the effect of advocacy and containment efforts and disseminate findings; use evaluation findings to reassess the containment strategy and make changes to increase effect and reach.

- Continue the Cycle—The process will continue as the coalition gains firm footing. With increased resources and support and successful activities, the coalition will shift and expand to focus on different dimensions of antimicrobial resistance. This effort will require renewed and focused attention to each element above.

Why Focus on Coalition Building?

Because AMR is complex, one organization or group cannot tackle it alone. Efforts must be synergized to maximize the effectiveness of all available resources. Additionally, in successful coalitions, participation benefits members as well as the overall coalition. When coalition members collaborate, activities can be prioritized and coordinated to increase their effect, address strategic gaps in coverage, and mutually reinforce existing activities. Potential advantages and achievements for different types of coalition members include the following.
1. Introduction

- For consumers
  - New, improved services are delivered to more consumers
  - Consumers are empowered to take action on their own behalf to ensure access to appropriate treatment recommendations and medicines
  - Enhanced treatment effectiveness occurs as a result of better prescribing practices and increased availability of recommended medicines
- For organizations
  - Coordination across programs adds value to existing activities
  - Information access and use is increased
  - Organizational reach is increased through collaboration with other groups
  - Collaborating with other groups achieves the critical mass of activity needed to achieve program objectives
- For coalitions
  - Information base to inform advocacy, coalition building, and intervention development is expanded
  - Technical expertise and best practices are enlarged

The goal of collaboration is shared decision making through a knowledge-sharing process that leads to the development of lasting and positive relationships among diverse AMR stakeholders. These relationships are developed through communication and can be hindered by issues stemming from power struggles and lack of trust. If the collaboration is not successful, the potential for change is less and the work therefore has less value.

What Are the Advantages of This Approach?

Key advantages of this coalition-building approach are that it is—

- Sustainable—Coalition-building activities increase the momentum around the issue of drug resistance and provide opportunities and resources for expanding the scope and breadth of activities.
- Synergistic—Broad-based coalitions provide a forum for the multidisciplinary collaboration necessary to build activities that increase impact, reduce costs, and add value to programs.
• Multifaceted—A behavior-change approach helps build strategies across the drug-resistance factors that provide an enabling environment for behavior change through policy, management, and educational activities tailored to the local situation.

• Manageable—Intervention planning keeps the focus on feasibility, effectiveness, and available resources.

• Flexible—Implementation strategy is tailored to the local context to increase impact.

Who Should Use This Guide?

Anyone concerned about drug resistance can use this guide, such as—

• Medical, pharmaceutical, or other health professionals
• Nongovernmental organizations
• Disease control programs
• Academic institutions
• Service facilities (for example, hospitals and clinics)
• Ministries of Health (MoH)
• Consumer advocacy groups

How Should This Guide Be Used?

This guide is organized according to the phases of coalition building, activity planning, and implementation. The user should become familiar with all the sections before initiating any activity. As the coalition building progresses, the user(s) may wish to share the concepts and methods with the other stakeholders. The individuals who eventually form the core working group should also be provided with this guide.

Each section is structured in a similar way and begins with an overview of the purpose and contents. Because each section involves some activity, tools are provided to help guide the activity. Users should keep in mind that the tools provided at the end of this guide are meant to serve as examples that should be recreated and adapted to the local context as necessary. For example, if computers and people with database skills are readily available, some of the tools developed for manual use may be adapted and automated.

The initial launch of the AMR advocacy and containment approach that is detailed in the following pages was implemented in Zambia and led to the formation of an AMR Advocacy Working Group (AWG). Many of the lessons learned from Zambia’s experiences have shaped this guide. Likewise, the AWG used many of the assessment tools offered in this guide to conduct a rapid appraisal of the AMR situation in the country, and were able to get a clear picture of the existing gaps and priority areas for intervention.
Overview

The first step is to mobilize support. During this initial phase, stakeholders are identified and informed of the intent of the initiative. From these stakeholders, a core group will organize into a working group to plan and begin building the coalition. If the interest and concern are not sufficient to catalyze the group or engage the stakeholders you consider critical, you may need to conduct advocacy activities to form the core group or to reduce barriers to progress.

In sections two through six, the **Tools, Knowledge and Skills, and Products chart** is found near the beginning of each section. It lists—

- The tools (forms) available in this guide that can be used to perform the activities described in the section (the forms are found in the Forms section at the end of the document)
- The skills helpful in carrying out the activity
- A list of products that can be developed either during the training or in the future

Remember, the tools should be adapted for local use and can be used by either individuals or groups.

*Also, coalition building and AMR containment are ongoing activities with short- and long-term goals. The products mentioned in this guide can be produced in any order you wish and as time and resources allow.*

Keep in mind that new coalitions benefit from structure early on. Developing terms of reference (TOR), a document that describes the purpose and structure of a project and a scope of work, will provide a sense of shared and clear purpose. As the coalition begins to form, you will also need to be explicit about how decisions are made and roles and responsibilities assigned. As your coalition grows and you add new members, you will need to nurture continued consensus on your mission and vision.
This section presents guidance on how to identify stakeholders and mobilize an AWG to address the multifaceted factors that affect AMR. The steps include the following—

- Identify key stakeholders
- Kick off the initiative
- Organize an AWG
- Establish group procedures and begin defining the key issues
- Move the advocacy process forward

### Tools, Knowledge and Skills, and Products

<table>
<thead>
<tr>
<th>Tools</th>
<th>Form 1. Stakeholder Identification Worksheet (page 49)</th>
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<tbody>
<tr>
<td></td>
<td>Form 2. Stakeholder Contact List (page 51)</td>
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<td></td>
<td>Form 3. Stakeholder Interview Guide (page 52)</td>
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<td></td>
<td>Form 4. Sample Invitation for Kickoff Meeting (page 54)</td>
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<td></td>
<td>Form 5. Sample Agenda for Kickoff Meeting (page 55)</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Knowledge and Skills</th>
<th>Understanding AMR and ability to articulate related issues</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Understanding AMR containment in both local and global contexts</td>
</tr>
<tr>
<td></td>
<td>Ability to articulate goals of initiative and benefits of coalitions as opposed to individual actions.</td>
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</table>

<table>
<thead>
<tr>
<th>Products</th>
<th>List of drug resistance stakeholders and their contact information</th>
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<tbody>
<tr>
<td></td>
<td>Terms of Reference for AWG</td>
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### Identify Key Stakeholders

Develop an initial list of stakeholders. Brainstorming with colleagues who have different expertise and networks is an efficient way to develop your initial list of stakeholders. Drug resistance stakeholder groups come from multiple sectors and disciplines.

**Box 2. Who Are AMR Stakeholders?**

AMR stakeholders are key players affecting or impacted by drug resistance. They include WHO; MoH; donors; public, private, and mission health sectors; NGOs; consumers; professional societies; the pharmaceutical industry; academics; and the media. AMR stakeholders can be interested in one condition, such as malaria, TB, ARIs, STIs, diarrhea, or AIDS; in one aspect of AMR, such as irrational medicine use or infection control; or in AMR in general.

Contact key potential stakeholders (Box 2) either through visits or by telephone or e-mail to explain the initiative. If they express interest, follow up with further information about the initiative and, if possible, set up an interview to discuss their possible participation in the AMR coalition (Form 3).

Use **Form 1. Stakeholder Identification Worksheet** as a guide to ensure that stakeholders represent a broad spectrum of AMR interests and concerns. The form helps identify which of five AMR-related areas a stakeholder may best represent—pharmaceutical management, drug use, laboratory services and surveillance, infection control and disease prevention, and advocacy.
2. Mobilize Support

Determine whether groups with compatible goals already exist. Professional societies representing physicians, pharmacists, nurses, public health professionals, or infectious disease specialists and those societies with a broad membership, including the local chapter of the International Network for the Rational Use of Drugs or the Alliance for the Prudent Use of Antibiotics, might be interested in initiating the process.

Use Form 2. Stakeholder Contact List for follow-up and reference purposes. It can also be distributed to the group to encourage information sharing among stakeholders.

Use Form 3. Stakeholder Interview Guide to facilitate the flow of discussion during the interview. The guide is designed to ensure that you obtain basic information on stakeholders’ knowledge, thoughts, and concerns about AMR. This information will help you gauge their interest and potential participation level in the AWG. It will also help you begin to get ideas about priority AMR issues in your country.

During the interview, bring up current or pressing AMR issues or changing circumstances to catalyze action. Examples of potential catalysts are the introduction of a new drug policy or new medicines, availability of funding, or the occurrence of deaths attributed to resistant organisms.

Kick Off the Initiative

Start with the people already working on drug resistance issues. Invite them to participate in an AWG kickoff meeting and ask them for names of others who may want to participate. You can do this during the round of visits and contacts made in the previous step.

Use Form 4. Sample Invitation for Kickoff Meeting to guide you in drafting an invitation letter to potential participants.

Form 5. Sample Agenda for Kickoff Meeting will give you an idea of the structure and content of a kick off meeting for AMR stakeholders. The stakeholders’ meeting will kick off the AMR coalition initiative and motivate them to participate in the AWG. The objectives of the meeting should be clear—

- Review the goals of the AMR initiative
- Introduce stakeholders and their concerns
- Confirm the need for action
- Identify other potential stakeholders and partners
- Achieve consensus on the approach to be taken
- Plan for next steps, such as forming a working group and developing its TOR
Organize an AMR Working Group

The working group should include people who bring technical expertise in a variety of AMR areas and people who have authority and influence in key stakeholder institutions. Stakeholders may self-select to participate in the AWG or may be nominated during the kickoff meeting.

The TOR for the working group will help define the group members. The TOR may be drafted in advance of the kickoff meeting and finalized as part of that meeting, or they may be drafted following a series of meetings to develop them. Box 3 shows a sample TOR.

One of the initial responsibilities of the AWG is to compile, update, and use information about AMR in the local context (Section 3: Understand the Local Situation). The information should then be used at a stakeholders’ meeting to reach consensus on the priorities for containing and preventing AMR. Then a Call-to-Action document can be prepared that represents the consensus among stakeholders (Section 4: Formulate a Plan).

<table>
<thead>
<tr>
<th>Box 3. Sample Terms of Reference for the AMR Working Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Move forward AMR advocacy process over the next ___ months.</td>
</tr>
<tr>
<td>• Participate in meetings and workshops (about one per month) at crucial decision-making points in the process.</td>
</tr>
<tr>
<td>• Review and provide comments on tools, collected information, and data analysis, as needed, to formulate a Call to Action to guide stakeholder actions.</td>
</tr>
<tr>
<td>• Identify potential new stakeholders and implementation partners.</td>
</tr>
<tr>
<td>• Demonstrate leadership in promoting the initiative.</td>
</tr>
</tbody>
</table>

Establish Group Procedures and Begin Defining the Key Issues

• Convene a meeting in which AWG members decide how they plan to work and begin to define the key issues.

• Establish how decisions are made, what is considered confidential, how information is distributed, and other procedural guidelines.

• Through discussion and sharing of experiences, begin to create a common vision and agree on the direction of the group.

• Obtain agreement on the next steps, including information gathering, followed by a consensus workshop and assignment of roles and responsibilities.

• Develop a timetable for activities and products, including preparing and presenting results from information collection efforts, drafting and finalizing a Call-to-Action document, and holding a public event to present the Call to Action (Section 4: Formulate a Plan).
Move the Advocacy Process Forward

Organize advocacy activities and provide relevant information to promote active participation in the planned stakeholder meetings. Some advocacy and coalition-building materials are included in this guide. Annexes 2 and 3 contain a WHO fact sheet and sample slides on antimicrobial resistance. Possible activities/strategies include the following—

- Organize a national AMR stakeholders Call-to-Action meeting with other key individuals or groups, such as the MoH, to increase participation and credibility (Section 4: Formulate a Plan). Not all AMR stakeholders may have been identified initially. This meeting is an opportunity to get all stakeholders on board, commit to action against AMR, and raise the visibility of the initiative.

- Develop a contact list of stakeholders (Form 2) and disseminate information on drug resistance and relevant activities to them. Include interested community leaders and invite them to join. Although they may not be able to actively participate, their support is important.

- Convene a workshop to sensitize donors. Mobilizing funding for coalition support and AMR interventions is important (Section 5: Implement the Action Plan). Making sure various donors are aware of the problem of AMR and how it will impact their existing programs will help rouse their support. Framing AMR interventions as “value added” to their programs is one way of demonstrating their potential role in AMR containment activities.

- Sponsor events to increase awareness of AMR and the initiative. These activities will involve working with the media. See the “Media Presence and Communication Channels” activity in Section 3: Understand the Local Situation for more on how to identify media partners.

- Capitalize on opportunities to provide an AMR perspective to existing and planned information and education activities.

- Provide technical expertise in the area of AMR to local groups.

- Facilitate transfer of information among different groups

- Interact with stakeholders during the evidence-gathering phase (Section 3: Understand the Local Situation) to engage them in the process.
A Note on Building and Sustaining a Coalition

As with other coalition-building efforts, AMR coalition building involves a certain amount of activism and requires certain leadership skills. Working with the media is a valuable skill as well. The following references may be useful for people lacking experience with advocacy or coalition-building activities and may also serve to improve the activities of those people with previous experience. These documents can be found for free on the internet at the website listed below.

- Community Anti-Drug Coalitions of America Website. Available at [http://cadca.org/CoalitionResources/Funding.asp#CoalitionSustainability](http://cadca.org/CoalitionResources/Funding.asp#CoalitionSustainability) [http://www.coalitioninstitute.org/Coalition_Resources/CoalitionResourcesHome.asp](http://www.coalitioninstitute.org/Coalition_Resources/CoalitionResourcesHome.asp)


3. UNDERSTAND THE LOCAL SITUATION

Overview

Local information is critical for understanding the drug resistance problem, identifying solutions, and capitalizing on opportunities. It can inform advocacy and communication strategies and can help prioritize and design containment interventions for drug resistance.

This section describes methods and tools that can be used to compile, analyze, and present information about the local AMR situation. Information gaps should be assessed to determine whether additional research is needed. This information-gathering and analysis activity can start during the creation of AWG and then be completed by the group as the primary users and sharers of the results.

This section provides guidance on exploring and documenting information on the following AMR initiative topics—

1. Pharmaceutical Management Information
2. Medicine Use Behaviors
3. Surveillance Capacity
4. Stakeholder Analysis
5. Media Presence and Communication Channels

The first three deal with analyzing the AMR situation and identifying gaps in containment activities. The last two examine stakeholders and the media, which will provide insight into how to advocate for the priority issues identified by the first set of topics.

These topics are interrelated; therefore, information about several of them may be found in the same source. Although information on all the preceding areas is necessary for a complete picture, the AWG may need to prioritize what it can do initially based on available resources. The results from an initial attempt to collect information can help leverage more resources to collect remaining information.
Gathering information may be delegated to different individuals or agencies, or to a single individual, provided he or she has the required skills. The methodology used for these information-gathering exercises consists of document reviews and key informant interviews. Basic guidance on these methods is presented in Annex 4. Potential sources of AMR information can be found in Figure 2 of Annex 4.

**Pharmaceutical Management Information**

Information about AMR and how it relates to the pharmaceutical management system includes examining health and pharmaceutical policies and the supporting legal framework for selecting medicines to be used in the health system, procurement and drug quality practices, and prescribing and dispensing practices.

### Tools, Knowledge and Skills, and Products

|       | Form 7. Document Review Template (page 57)  
|       | Form 8. Questions for Document Review and Interviews (page 58) to guide collecting information on pharmaceutical management issues that relate to AMR |
| Knowledge and Skills | • Experience and skill in conducting key informant interviews  
|                     | • Adequate depth of knowledge of the pharmaceutical sector  
|                     | • Creating a comfortable environment that will allow senior MoH staff to feel comfortable sharing information |
| Products | A report summarizing findings, including gaps and priority areas for action |

Most of the information is obtained through review of existing documents and key informant interviews. Key interviewees should include representatives from MoH, including National Drug Regulatory Authority, and local health management teams; infection control specialists; managers of infectious disease control and essential medicine programs; members of professional organizations, academic institutions, and pharmaceutical manufacturers associations; representatives of private health care facilities; and any other country-specific players in the pharmaceutical arena.

**Guidance for Data Collection**

Use **Form 8. Questions for Document Review and Interviews**. Note that some information may not be readily available and you may need to complete the collection effort in phases as information becomes available. Also note when information is not available—in itself, that may be an important finding!

Sources vary for information on the various subtopics within pharmaceutical management. Use **Form 6. List of Documents for Review** and **Form 7. Document Review Template** to find and organize existing data. Keep in mind that informants are likely to be spread over various institutions and agencies. Therefore, the list of questions in **Form 8** should be used as a question bank from which you can take questions on different topics to create your own document review or interview guides for specific topics.
**Product Preparation**

Use **Form 8** as a guide to structure a report (covering the main areas of pharmaceutical management—selection, procurement, use, and policy and legal framework). Highlight potential opportunities for action. These opportunities may be further differentiated according to the following categories—

- Easy to address, with little or no additional resources or discussion
- Requires some discussion with stakeholders, with little or no additional resources
- Will take more time and resources to address
- Not feasible to address in the short or medium term but should not be forgotten

Distribute the report among all the AWG members for review and discussion. The findings should guide thinking on priorities and next steps.

The next steps are elaborated in *Section 4: Formulate a Plan.*

Table 3.1 presents the key concepts, rationale, and broad outline of the topics covered by the pharmaceutical management and supply assessment.
### Table 3.1 Key Pharmaceutical Management Concepts, Rationales, and Common Factors

<table>
<thead>
<tr>
<th>Key Concept</th>
<th>Rationale</th>
<th>Common Factors Relevant to the Key Concept</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug policy</td>
<td>Drug policies, particularly treatment and medicine selection guidelines, are a core component of any AMR containment strategy. The policies should accurately reflect local resistance levels and trends.</td>
<td>Existence of—</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• National Drug Policy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• National STGs, including mechanisms for updating STGs; guidelines for treatment failures and drug resistance; guidelines prepared for different levels of care</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• National EML</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Information sources used in developing drug policies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Stakeholders involved in the developing drug policies</td>
</tr>
<tr>
<td>Regulatory environment</td>
<td>Legislation and regulatory authorities support and enforce implementation of the drug policy.</td>
<td>• Existence of legislation or regulations covering selection, procurement, use, and promotion of medicines</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Agencies enforcing regulations and evidence of enforcement</td>
</tr>
<tr>
<td>Selection and procurement</td>
<td>The selection of medicines influences medicine supply; medicine quality influences treatment effectiveness.</td>
<td>• Whether the national EML is based on national STGs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Whether a policy limits pharmaceutical procurement in the public and private sectors to medicines based on the EML</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Whether recommended first-line medicines for treatment of key infections are included in the EML</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Whether the recommended second-line medicines for treatment of key infections are included in the EML</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Drug quality assurance strategies</td>
</tr>
<tr>
<td>Management support</td>
<td>Management support enhances pharmaceutical management capacity.</td>
<td>• Existence and function of a separate body or committee (national or ad hoc) for containment of AMR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Existence of infection control strategies in primary care settings</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Existence and functions of DTCs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Existence and functions of drug information center(s)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Existence and functions of adverse drug reaction monitoring systems</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Existence and functions of infection control committees in hospitals</td>
</tr>
<tr>
<td>Education and training on use</td>
<td>Education can promote appropriate medicine use. Education and the availability of unbiased information on medicines may counteract inappropriate drug promotion activities.</td>
<td>• Whether continuing education is provided for health professionals and whether antimicrobial use and resistance issues are addressed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Whether rational antimicrobial use and AMR topics are adequately addressed in the curricula for medical, pharmacy, pharmacy assistants, nurses, and health workers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Whether and what types of provisions exist for public education on antimicrobial use, AMR, and the link between the two</td>
</tr>
</tbody>
</table>
3. Understand the Local Situation

**Medicine Use Behaviors (Prescribers, Dispensers, Consumers)**

Medicine use is the key driver of drug resistance. Antimicrobial medicines are used to treat a range of infections that are managed in different ways and in different settings in the health system. These include common infections, such as ARIs, diarrhea, malaria, STIs, and TB managed at health facilities and specialized clinics, and more serious infections that may require hospitalization, such as sepsis, severe malaria, and pneumonia. Now that antiretrovirals are becoming more available, these infections also include HIV/AIDS. The dynamics and determinants of AMR differ across the spectrum of infections. It is important to understand these dynamics to design effective strategies to contain AMR.

**Tools, Knowledge and Skills, and Products**

<table>
<thead>
<tr>
<th>Tools</th>
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</thead>
<tbody>
<tr>
<td>• Form 3. Stakeholder Interview Guide (page 52)</td>
<td>• Form 7. Document Review Template (page 57)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Knowledge and Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Experience collecting data (conduct interviews, review documents), analyzing data, and writing reports</td>
</tr>
<tr>
<td>• An understanding of medicine use behavior, assessing behavior, and identifying inappropriate behaviors</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>A report on medicine use behaviors of prescribers, dispensers, and consumers</td>
</tr>
</tbody>
</table>

Five main behaviors must occur to achieve appropriate treatment with antimicrobials and reduce the potential for developing AMR. They include prescriber, dispenser, and consumer/caretaker behaviors.

- Prescriber assesses treatment and counsels patient/caretaker appropriately.
- Dispenser keeps appropriate medicines available and accessible (right medicine, good quality) and counsels patient/caretaker while dispensing.
- Consumer acquires/purchases correct medicine.
- Consumer/caretaker follows/administers the appropriate regimen (dose, frequency, duration).
- Consumer/caretaker seeks appropriate referral/follow-up for treatment failure.

These behaviors are built on the following factors—

- Resources, services, and supervision
- Availability/access/quality of medicines and health services
- Consumption of antimicrobials
- Knowledge/training and attitudes
- Price/economic incentives
- Industry/marketing
- Regulation/enforcement
Although the pharmaceutical management and supply assessment addressed many of these factors, they may not have been examined from the perspective of influence on medicine use behavior per se. Table 3.2 presents key concepts in understanding medicine use behavior, their relevance, and the corresponding factors that commonly contribute to the behaviors.

**Guidance for Data Collection**

Use **Form 9. Document Review Guide for Drug Use Behaviors and Underlying Causes** to categorize relevant information from the documents and interviews already conducted. Identify gaps in the information for follow-up.

**Product Preparation**

Summarize the information in **Form 9** to answer the following questions—

- For each of the five behaviors, what factors are influencing medicine use behavior positively? What factors are negatively affecting medicine use behavior?

- What are the information gaps? Are there behaviors for which there is insufficient or no data? Is enough known about important population groups?

- Where possible, make distinctions for type of prescriber and sector and infection/condition treated to better frame the AMR picture in your context.

- From the data you have, do any trends suggest that some behaviors play a more important role than others regarding the AMR situation? Which behaviors? What roles? What does this information imply in terms of an AMR strategy?

- Discuss limitations of the data: for example, by conditions represented, by sectors represented, by level of care represented (including self-medication), by geographical location represented, by age group, and by population represented. Which information was available but not sufficient? Summarize the recommendations found in studies that you reviewed.

- Does the synthesis of reviewed studies’ information give a different impression than the individual studies or the disease-specific studies?
### Table 3.2 Key Medicine Use Behavior Concepts, Rationales, and Common Factors

<table>
<thead>
<tr>
<th>Key Concepts</th>
<th>Rationale</th>
<th>Common Factors Relevant to the Key Concept</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drug use behaviors</td>
<td>Assessing the way that actual patterns of treatment for the target infections differ from recommended or reported treatments can highlight key problem areas.</td>
<td>• Antimicrobial treatment reported as usually used for patients with a common symptom or for the target infections</td>
</tr>
<tr>
<td></td>
<td>All health providers who treat the target infections should know the recommended treatments.</td>
<td>• Reported frequency of use of STGs, formulary, generic medicines, and recommended antimicrobials for target infections</td>
</tr>
<tr>
<td></td>
<td>Antimicrobials are often available without prescription. Staff in private retail outlets should know and recommend appropriate treatments.</td>
<td>• Lab tests and antimicrobial treatment used for a sample of cases seen with each common diagnosis or symptom scenario for the target infections</td>
</tr>
<tr>
<td>Resources and services</td>
<td>Lack of availability of certain resources (supervision, key committees, EML, formulary, STGs) or lab services will limit the likelihood of adequate treatment in health facilities.</td>
<td>• Presence of infectious disease specialist, and availability and frequency of meeting of infection control and DTC committees</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Availability of EML, formulary, STGs, and appropriate lab services for the target conditions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Supervision of prescribing practices</td>
</tr>
<tr>
<td>Availability of key antimicrobials</td>
<td>Unreliable availability of the antimicrobials for target infections in health facilities and pharmacies can lead to inappropriate treatment.</td>
<td>• Current availability of recommended first-line and other antimicrobials commonly used to treat the target infections</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Recent availability of key recommended antimicrobials</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Common sources for antimicrobials</td>
</tr>
<tr>
<td>Consumption of key antimicrobials</td>
<td>Data on relative volumes of use of different antimicrobials can point to problems in underuse or overuse of specific medicines.</td>
<td>• Volume used in previous year</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Relative purchase levels in previous week</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Most commonly sold antimicrobial for treating target infections</td>
</tr>
<tr>
<td>Knowledge and attitudes about AMR</td>
<td>All health providers and staff in private retail outlets should have a basic knowledge about the existence, causes, and consequences of antimicrobial resistance.</td>
<td>• Awareness of AMR, attitude about its importance, opinion about causes, and perceptions about treatment failure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Prior training on appropriate antimicrobial use and AMR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Communication channels</td>
</tr>
</tbody>
</table>
Examples of Potential Action Points

These potential action points may be seen as long-term projects, such as—

- Develop and implement a Continuing Medical Education program on appropriate use of antimicrobials and antimicrobial resistance
- Develop printed educational materials for medicine sellers on appropriate antimicrobial dispensing
- Prepack medicines to improve case management of infectious diseases

Surveillance Information and Capacity Assessment

Functioning AMR surveillance systems provide data that guide development of treatment guidelines and signal the need for changing treatment guidelines as they identify potential epidemics involving resistance infections. AMR levels are locality specific, so it is important to know what local AMR levels are for key infections.

The key concepts relevant to AMR containment and prevention from the perspective of surveillance are presented in Table 3.3.

Tools, Knowledge and Skills, and Products

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge and Skills</td>
<td>• Understand and interpret information on AMR levels and trends. • Familiarity with which pathogens are being tested for resistance and which laboratories are conducting the susceptibility testing. • Knowledge of sources of local surveillance data and surveillance methodologies.</td>
</tr>
<tr>
<td>Products</td>
<td>A report that briefly describes antimicrobial resistance surveillance activities in your country</td>
</tr>
</tbody>
</table>

Guidance for Data Collection

Transfer the results of your literature search on AMR levels and trends of key pathogens to Form 10. Antimicrobial Resistance Levels and Trends. Note that the pathogens may vary by country, so be sure to replace the ones on the form with the ones that are appropriate to your context.

Conduct interviews with surveillance and laboratory experts. You may start by asking WHO staff, university teaching hospital faculty, the chief microbiologist at the government’s central laboratory, and the directorate of clinical and diagnostic services to determine who would be the best persons to meet.

### Table 3.3 Key Surveillance Information and Capacity Concepts, Rationale, and Common Factors

<table>
<thead>
<tr>
<th>Key Concept</th>
<th>Rationale</th>
<th>Common Factors Relevant to the Key Concept</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMR levels and trends</td>
<td>Correct treatment and appropriate medicine selection guidelines should reflect local resistance levels.</td>
<td>• AMR levels and trends (published and unpublished sources) for key infections</td>
</tr>
<tr>
<td>Laboratory capacity</td>
<td>The ability to generate quality data is necessary to support AMR surveillance.</td>
<td>• Availability of public and private laboratories conducting antimicrobial susceptibility testing on key pathogens</td>
</tr>
<tr>
<td>Reference laboratory</td>
<td>Reference laboratories are important for coordinating data collection and ensuring data quality across laboratories; these efforts provide data that can be used for decision making.</td>
<td>• Existence of reference laboratories for key pathogens</td>
</tr>
<tr>
<td>Use of data</td>
<td>If data are collected, they should be used to reinforce future data collection activities. Data utility can be improved through improved data quality or presentation.</td>
<td>• Quality and use of AMR data • Aggregation of data from other laboratories</td>
</tr>
</tbody>
</table>

**Product Preparation**

Prepare a report that briefly describes AMR surveillance activities in your country. Include important contributions as well as limitations. Also include whether the role of antimicrobial surveillance is changing because of new concerns about resistance. The report should cover laboratory and surveillance structure, process, and outcome/impact.

**Structure:** Discuss the existence and role of reference laboratories. Include information on laboratories participating in surveillance activities (public and private). Note whether there are laboratories that are not currently part of these networks (public and private) but that could potentially become part of the networks. Discuss laboratory policies or guidelines and their implementation by public and private microbiology laboratories.

**Process:** Discuss participation in internal and external quality control programs by microbiology laboratories in the public and private sector. Describe the programs. Discuss the training providers and their capacity to train laboratory workers, trainings held, and training needs. Discuss problems that laboratories in the public and private sector have maintaining equipment and supplies.

**Outcome/impact:** Document and summarize data on the type, volume, and quality of data generated from reference and other laboratories. Document and summarize data on quality assurance activities. Discuss kinds of surveillance data generated, dissemination strategies (data type, mechanisms, and target audiences), and whether and how the data are used.
In addition to the above, provide an overall impression about local antimicrobial surveillance information and capacity (diagnostic capacity, surveillance capacity, quality assurance, training, and supplies and equipment). Discuss existing strengths and opportunities and existing weaknesses/constraints and their underlying factors. Mention any critical information gaps that currently exist, and outline possible strategies to gather further information to narrow these gaps.

**Examples of Potential Action Points**

- Strengthen AMR surveillance infrastructure
- Improve AMR surveillance capacity

These potential action points are discussed further in *Section 4: Formulate a Plan*, Table 4.1

**Stakeholder Analysis**

Understanding your stakeholders is required for strategic planning for advocacy and building a strong coalition. Start by reviewing the list of stakeholders that has already been developed and the interviews that have already been conducted. If additional stakeholders have been identified during the interview process, they should be added to the list of potential interviewees.

**Tools, Knowledge and Skills, and Products**

<table>
<thead>
<tr>
<th>Tools</th>
<th>Form 1. Stakeholder Identification Worksheet (page 49)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form 3. Stakeholder Interview Guide</td>
<td>(page 52)</td>
</tr>
<tr>
<td>Form 14. Stakeholder Prioritization Worksheet</td>
<td>(page 76)</td>
</tr>
<tr>
<td>Knowledge and Skills</td>
<td>Experience extracting information from documents and reports</td>
</tr>
<tr>
<td></td>
<td>In-depth interviewing skills (ability to probe for information)</td>
</tr>
<tr>
<td></td>
<td>A broad perspective of drug resistance</td>
</tr>
<tr>
<td>Products</td>
<td>A report that describes the main characteristics of key stakeholders</td>
</tr>
</tbody>
</table>

**Guidance for Data Collection**

Insights on stakeholders can be obtained by “mapping” them according to important characteristics or qualities. Using the information you have already collected as part of the stakeholder identification exercise (Form 1) and the interviews already conducted (Form 3), you can begin to identify individuals who directly affect or are affected by AMR and who have significant resources or influence that could be applied to AMR containment activities.

Figure 1 provides an example of what a mapping exercise will look like. It shows that some of the stakeholders with high influence do not consider AMR an urgent problem and that other stakeholders are very concerned about the problem of AMR, but have less influence. Although Form 14 assesses influence and urgency, you can use other variables as well. For example, you may want to look at the stakeholders who were considered essential to see how many of them thought the problem of AMR was urgent. Another topic to map might be degree of motivation by stakeholders and availability of resources (people, funds, materials, etc.).
3. Understand the Local Situation

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Perceive AMR as Low-Urgency Issue</th>
<th>Perceive AMR as High-Urgency Issue</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High-Influence Stakeholder</strong></td>
<td>Pharmaceutical industry</td>
<td>GFATM  MoH CCMs</td>
</tr>
<tr>
<td></td>
<td>Organized Health Insurance</td>
<td>Malaria Control Program</td>
</tr>
<tr>
<td></td>
<td>Private sector</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Media Employers providing health care to their employees</td>
<td>Community activists Professional societies</td>
</tr>
<tr>
<td></td>
<td>Consumer groups</td>
<td></td>
</tr>
</tbody>
</table>

**Low-Influence Stakeholder**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>NGOs</td>
<td></td>
</tr>
<tr>
<td>Patients</td>
<td></td>
</tr>
</tbody>
</table>

GFATM = Global Fund to Fight AIDS, Tuberculosis and Malaria; CCM = country coordinating mechanism; NGO = nongovernmental organization

**Figure 1. Example of stakeholder mapping.**

**Product Preparation**

The result of this activity will be a report that describes the main characteristics of key stakeholders according to important criteria. It should answer the following questions—

- Which groups think AMR is a problem?
- Which consider it an urgent problem?
- Are stakeholders making the link between drug resistance and their activities?
- Who is making the link?
- Who is not?
- What advocacy and information strategies does this suggest?

This report should also—

- Recommend opportunities to build on or strengthen existing initiatives or ongoing activities or those already in the planning stages and suggest strategies for how the project might be able to capitalize on these opportunities
- Identify critical information gaps and suggestions for filling them that could engage additional stakeholders in the process
- Recommend strategies to link stakeholders to strengthen their ability to address AMR

Distribute the report to all AWG members for review and discussion. The findings should guide thinking on priorities and next steps.
Examples of Potential Action Points

- Advocate for preventing and containing AMR in professional meetings, policy discussions, and public events.
- Coordinate and collaborate with other stakeholders on activities relevant to AMR.

Media Presence and Communication Channels

Part of coalition building and mobilizing for action is about being able to inform and inspire present and future stakeholders and partners through effective communications activities and the appropriate use of media. Because the AMR issue has a broad base of stakeholders from diverse backgrounds who have a variety of roles, advocacy activities should follow a strategy that incorporates different modes of communications, matching the message with the intended audience, and use of appropriate technologies. Messages may include general information and educational messages about AMR for professional and laypersons, and communication about what has been done and what is planned for funders, partners, and the general public.

The media can play a large part in effective advocacy. When advocates are in a position to make a pitch to decision makers, the message must still reach the community, especially when the issue takes place in the context of public health and human services. To attain the goal of containing AMR, consumers must be on board because they are the end users of medication. When patients, providers, health systems, and the pharmaceutical industry are involved, issuing edicts from the top down alone does not guarantee that every player will be on board. Education, public engagement, and behavior change are needed as well.

The exercise in Assessment of Media Resources and Information and Communication Channels will help the AMR initiative develop optimal advocacy and communication strategies. Using it, you will identify appropriate communication channels for information dissemination, analyze the role of the media in delivering health information in your country, and understand the information needs of the media if they are to disseminate information. The rationales for examining information and communications channels and including the media are presented in Table 3.4.

Tools, Knowledge and Skills, and Products

<table>
<thead>
<tr>
<th>Tools</th>
<th>Form 3. Stakeholder Interview Guide (page 52)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Form 7. Document Review Template (page 57)</td>
</tr>
<tr>
<td></td>
<td>Form 15. Interview Guide for Media Contacts (page 77)</td>
</tr>
</tbody>
</table>

| Knowledge and Skills | • A public health specialist in information, education, and communication or social marketing |
|                     | • In-depth interviewing capability (ability to probe for information, broad perspective of drug resistance) |
|                     | • Ability to think strategically about the potential role of media for containing and preventing AMR |

| Products | A report that describes the different kinds of communication channels in your country and the audiences they serve |
Table 3.4 Key Concepts in Communications, Rationale, and Common Factors

<table>
<thead>
<tr>
<th>Key Concept</th>
<th>Rationale</th>
<th>Common Factors Relevant to the Key Concept</th>
</tr>
</thead>
</table>
| Information needs and information channels   | Strategies will try to improve the use of existing information on drug resistance and existing information channels to increase the transfer of information and expand its utility. | • Whether stakeholders have enough information on AMR  
• Their information sources  
• Credibility of information  
• Which types of information stakeholders are not getting                           |
| Media presence                               | The media is an important channel for getting the message out.              | • Information needs for the media and interest in health issues in general and drug resistance in particular  
• Populations reached by the media                                                   |

**Guidance for Data Collection**

Review the completed **Form 3. Stakeholder Interview Guide** and **Form 7. Document Review Template**, and extract information relevant for your assessment of the presence of the media and functioning of communications channels. Select media stakeholders with the largest population coverage for interviewing. Also take into account the different target populations they reach. For example, radio tends to have the broadest reach and is a good way to get information to most rural areas; print media will reach only the literate segment of the population. You may want to consider telephone interviews for those organizations located outside your area. Review newspaper articles and radio programs addressing health issues. Most donors and implementing organizations use communication strategies. Look for studies, reports, program and donor documents, and MoH reports and strategies.

**Product Preparation**

- Draft a report that describes the different kinds of communication channels in your country and the audiences they serve. Include information on the role of the media in disseminating health messages by geographic reach, frequency of messages, and type of content. Highlight other successful health communication/advocacy initiatives and the communication strategies they used.

- The report should also discuss the interest by the media in addressing drug resistance issues and their information requirements for doing so.

- Discuss information needs or challenges reported by stakeholders. Identify existing or planned activities to build on by adding an AMR component.

- Discuss the potential role of the media and other communication avenues in disseminating information on drug resistance and the AMR coalition initiative.

- Identify critical information gaps and propose mechanisms for filling them that could engage additional stakeholders in the process.
• Conclude the report by identifying some opportunities for disseminating information about AMR and activities undertaken by the AMR coalition using existing channels. Identify potential strategies for capitalizing on them.

• Share the report with the AWG members to consider when developing a communications strategy, including information and educational campaigns, to support the AMR initiative’s goals and objectives.

**Examples of Potential Action Points**

• Create a communications plan
• Create a media plan
• Create an advocacy strategy

These potential action points are discussed further in *Section 4: Formulate a Plan*. 

**Disseminating the Findings**

The gathering and analysis of information can have no effect unless it gets into the hands of the stakeholders. The reports produced from each of the areas of research must be disseminated to each member of the AWG. *Section 4: Formulate a Plan* describes the process of holding a consensus-building workshop for the AWG to discuss the results presented in the reports and to identify and prioritize interventions and next steps. The reports, however, should be disseminated to all members before the meeting with enough time for them to review the findings. Having the reports (or summaries) or their results appear in the media can also be an effective form of advocacy that will raise awareness of AMR and may spur stakeholders who had been reluctant or skeptical to join the coalition.
4. FORMULATE A PLAN

Overview

Using the information obtained from the exercises carried out with guidance from Section 3: Understand the Local Situation, the AMR AWG can now discuss the findings and plan strategically for what can be done about the identified problems (Box 4). This includes reaching consensus on the key issues; determining priorities and selecting which partners and stakeholders should address them; and discussing concerns about feasibility—all leading to action.

Tools, Knowledge and Skills, and Products

<table>
<thead>
<tr>
<th>Tools</th>
<th>Knowledge and Skills</th>
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</thead>
<tbody>
<tr>
<td>Annex 1. WHO AMR Intervention Prioritization (page 84)</td>
<td>The participation of the entire AWG is critical for this phase of coalition building. The information that will be discussed as part of the priority-setting exercise will need to be defended and challenged. The discussion will benefit from the contributions of various perspectives. Although gaining consensus for these documents within the AWG is important, they should still be circulated to experts and potential stakeholders not yet in the AWG and be discussed and amended at the Call-to-Action Meeting.</td>
</tr>
<tr>
<td>Annex 3. Global AMR Situation PowerPoint Slides (page 92)</td>
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</tr>
<tr>
<td>Form 16. AMR Intervention Prioritization Worksheet (page 80)</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Products</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>• A Call-to-Action document for stakeholders</td>
<td></td>
</tr>
<tr>
<td>• Prioritized action plan of key intervention areas to contain AMR</td>
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</tbody>
</table>

Steps

- Convene a consensus-building workshop for current AWG members
- Develop organizational and advocacy materials
- In advance, be sure that all AWG members have received copies of the various reports obtained from the information-gathering exercises.
- Prepare an agenda that specifies the following activities—
Building Local Coalitions for Containing Drug Resistance

- Reviewing reports
- Identifying key issues
- Prioritizing issues
- Drafting a Call to Action (Annex 6. Zambia AWG’s AMR Call-to-Action Document)
- Planning for next steps

Support Staff

Consider having someone available to assist with note taking and recording the discussions. Also consider inviting a facilitator to help ensure that the discussions cover all the various topics and that all AWG members have an opportunity to make observations, ask questions, and contribute to the development of the product.

Activities

Present findings from the assessments and identify priority issues. Stakeholders discuss and prioritize interventions. Table 4.1 provides information on potential action points that address gaps that may have been identified in the various focus areas of analysis in Section 3. Additionally, the WHO Global Strategy provides detailed descriptions of recommended interventions and the rationale behind their development. Use Form 16. AMR Intervention Prioritization Worksheet to help think through which issues or intervention to address first.

<table>
<thead>
<tr>
<th>Box 4. Guiding Principles for AMR Country-Level Advocacy and Containment</th>
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<tbody>
<tr>
<td>• Act immediately to deal with AMR—waiting for new findings can slow efforts. Generally, what causes, prevents, and contains AMR is known. Use global and available local information to initiate activities. Future research on AMR can be incorporated into ongoing and new efforts.</td>
</tr>
<tr>
<td>• Focus action on realistic local strategies that capitalize on existing initiatives and resources, while at the same time generating new initiatives and resources.</td>
</tr>
<tr>
<td>• Mobilize local stakeholders around the common issue of drug resistance to generate coordinated and collaborative action.</td>
</tr>
<tr>
<td>• Promote the initiative as adding value to existing health programs rather than as a separate, vertical, and competing activity.²</td>
</tr>
</tbody>
</table>

### Table 4.1 Potential Action Points for Containing AMR

<table>
<thead>
<tr>
<th><strong>Pharmaceutical management and infection control</strong></th>
<th><strong>Develop, Disseminate, and Implement Standard Treatment Guidelines</strong>&lt;br&gt;The establishment of standard treatment promotes therapeutically effective and economically efficient prescribing. The goal of STGs is to develop a list of the preferred drug and nondrug treatments for common health problems experienced by people in a specific health system and implement their use.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Develop Formularies and Essential Medicines Lists</strong>&lt;br&gt;The goal of formulary development and management is to develop a list of medicines that an institution will procure and use for the health problems experienced by people treated in those facilities.</td>
</tr>
<tr>
<td></td>
<td><strong>Develop Drug and Therapeutics Committees</strong>&lt;br&gt;DTCs composed of physicians, pharmacists, nurses, and other health officials are formed to improve antimicrobial selection and use in hospitals and clinics through management of medicine formularies and medicine use.</td>
</tr>
<tr>
<td></td>
<td><strong>Strengthen Pharmaceutical Management Capacity</strong>&lt;br&gt;Effective pharmaceutical management is critical for improved availability and use of good-quality antimicrobials. Pharmaceutical management is a specialized professional activity that requires a combination of knowledge, skills, and experience.</td>
</tr>
<tr>
<td></td>
<td><strong>Develop and Implement Hospital Infection Control Programs</strong>&lt;br&gt;Infection control programs provide a link to laboratory data and between physicians, nurses, hospital administrators, quality improvement managers, and pharmacists to facilitate the use of data for action (e.g., improving the use of antimicrobials and responding to outbreaks of hospital infections).</td>
</tr>
<tr>
<td><strong>Medicine use behavior</strong></td>
<td><strong>Develop and Implement a Continuing Medical Education Program on Appropriate Use of Antimicrobials and Antimicrobial Resistance</strong>&lt;br&gt;Interactive Continuing Medical Education programs provide up-to-date knowledge about which antimicrobials are recommended to treat specific infections and about factors that contribute to AMR. They enhance skills to overcome barriers to the appropriate use of antimicrobials.</td>
</tr>
<tr>
<td></td>
<td><strong>Develop Printed Educational Materials for Drug Sellers on Appropriate Dispensing of Antimicrobials</strong>&lt;br&gt;AMR dispensing practices and the rationale for these practices are assessed and a multidisciplinary working group develops printed educational materials for drug sellers to improve these practices.</td>
</tr>
<tr>
<td></td>
<td><strong>Prepackage Medicines to Improve Case Management of Infectious Diseases</strong>&lt;br&gt;Prepackaging medicines for the treatment of infectious diseases increases appropriate prescribing by health workers and enhances the ability of patients to understand and adhere to treatment recommendations.</td>
</tr>
<tr>
<td><strong>Surveillance</strong></td>
<td><strong>Strengthen AMR Surveillance Data</strong>&lt;br&gt;Public and private laboratories performing antimicrobial susceptibility testing can form networks to increase data quality, data representation, and data utility for policy.</td>
</tr>
<tr>
<td></td>
<td><strong>Improve AMR Surveillance Capacity</strong>&lt;br&gt;This intervention aims to improve standards for antibiotic susceptibility testing and provide policy makers and prescribers with access to reliable data on prevalent antibiotic-resistant pathogens.</td>
</tr>
</tbody>
</table>
Develop an Action Plan

An action plan will begin to form at the consensus meeting as issues and the interventions needed to address them are identified. Additional elements should be added to the plan to guide the next steps of the AWG. The plan should have three main elements—

- Prioritized interventions (Form 16)
- Research needed to fill critical research gaps
- An advocacy strategy developed as part of the overall strategy

The following additional coalition-building activities and communication activities can be considered—

- A media strategy
- Forums to exchange ideas
- Sponsoring speakers at local, regional, and international conferences and meetings

Once the plan is finalized, responsible parties should be identified (subgroups may be formed at this point).

Disseminate the Workshop Report and Action Plan

A report on the proceedings, outcomes, and decisions reached at the consensus meeting should be prepared for all stakeholders involved. This report should be disseminated along with the action plan. This information will give stakeholders in the AWG a sense of accomplishment, an idea of where the AWG is in the process, and some idea of where the AWG needs to go.

Plan for AMR Call-to-Action Stakeholders Meeting

A call-to-action meeting is in itself an advocacy activity and a critical step in building the coalition beyond the AWG. The meeting will raise awareness of AMR, mobilize people and resources for containment activities, gain wider consensus for the AMR action plan, and bring commitments from participating organizations to act on specific items. There are no hard and fast rules for call-to-action meetings (Box 5); however, some useful tips include the following—
4. Formulate a Plan

Before the meeting

- Develop an extensive list of stakeholders to invite to the meeting, including representatives from across a wide array of sectors (Box 2).
- Develop a draft Call-to-Action document that can then be revised and amended according to the specific proceedings of the meeting (Annex 6).
- Arrange media coverage of the meeting.
- Invite opinion leaders from various sectors to give short presentations on the impact of AMR in their area and what is being done to contain it.

At the meeting

- Make a strong case for the importance of addressing AMR and the role that everyone must play if it is to be contained. Highlight the global and local AMR situations (see Annex 3 for examples of slides about the global AMR situation).
- Use break-out groups to facilitate discussion of what individual participants can do in their areas to help contain AMR.
- Allow ample time for discussion to encourage stakeholder buy-in.
- Encourage stakeholders to take charge of AMR-related activities in their areas.

After the meeting

- Disseminate the meeting report, the finalized call-to-action document, and an action plan outlining immediate and long-term plans and who the responsible parties are to all stakeholders who attended. Also distribute packets of this information for those unable to attend the meeting.
- Provide regular updates to participants as activities are implemented to encourage the increased participation of others.

Expand AWG Membership

Additional stakeholders may emerge from the AMR call-to-action meeting who may be motivated to take the lead in certain areas. Those who are should be brought into the regular AWG workings. The point at which the AWG changes from a working group to an actual coalition may be hard to determine but will probably take time. Increasing the active membership will be an important step in reaching this point.
Box 5. AMR Call-to-Action Meetings in Zambia and Ethiopia

Zambia
At a planning meeting held in October 2004, the Zambian AWG took several important steps to focus its mission and plan for a Call-to-Action Meeting. Specific planning steps for the meeting included—

- Prioritized specific activities to focus on
- Identified key decision makers to invite to the meeting
- Mapped out resources available for advocacy activities and the Call-to-Action Meeting

The AMR stakeholders Call-to-Action meeting took place in November 2004. Thirty participants attended the one-day meeting; they represented various sectors, including government, service providers, academia, professional societies, pharmaceutical companies, consumers, journalists, media, private sectors, and NGOs. In breakout sessions, the participants discussed how AMR was affecting their professions and what their role could be. At the end of the meeting, the Call-to-Action document, developed by the AWG, was presented to the group for consensus approval. The document called all those concerned with the health and well-being of Zambians to come together to address the problem of the failing effectiveness of medicines.

The meeting was also used to introduce the new STGs developed by the Zambia National Formulary Committee. This was a strategic way to advocate for STG use and galvanize cooperation with the government.

Ethiopia
The AMR Advocacy Coalition formed in March 2006. A task force was formed to plan an AMR Call-to-Action meeting. The task force met regularly over several months, working out the details for the meeting that included objectives, participant list, agenda items, and outputs. The Call-to-Action was held in Adama in November 2006. The Call-to-Action was a three-day meeting with presentations delivered from representatives of major sectors, including national infectious disease programs, academia, regulatory bodies, practitioners, media, and NGOs. Presentations covered—

- The global and local problems of AMR
- The impact of AMR on specific infectious disease programs
- The response of different sectors to AMR
- The gaps in knowledge of AMR

Following the presentations, the participants had a day to work in breakout groups. The groups were to discuss and prioritize the issues and strategies for interventions in their sectors. Each group produced an action plan and recommendations. The task force used the recommendations to create a Call-to-Action document that was approved by all the participants. It highlighted the recommendations and necessary intervention areas. The task force also used the action plans of the various groups to create a national AMR action plan for the AMR Advocacy Coalition to use as a guide.

Section 5: Implement the Action Plan discusses the skills and tools necessary for the AWG to begin drafting specific work plans for items on the action plan and to begin implementing those activities.

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5. IMPLEMENT THE ACTION PLAN

Overview

Action plans are not executed automatically. Moving an activity from a line item on an action plan to an actual program takes planning and organization. Technical and logistical management issues must be considered and planned for. Implementation is the process of managing these factors. Implementation continues throughout the life of the project and cycles through monitoring and progress reviews. This section provides you with some of the tools necessary to effectively implement your plan of AMR advocacy and containment activities formed in Section 4: Formulate a Plan.

Tools, Knowledge and Skills, and Products

<table>
<thead>
<tr>
<th>Tools</th>
<th>Knowledge and Skills</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form 1. Stakeholder Identification Worksheet (page 49)</td>
<td>Budget planning and tracking, environmental analysis, resource mapping, organization</td>
<td>Work plans</td>
</tr>
<tr>
<td>Form 14. Stakeholder Prioritization Worksheet (page 76)</td>
<td></td>
<td>An implementation plan</td>
</tr>
<tr>
<td>Form 17. SWOT Analysis Template (page 81)</td>
<td></td>
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<tr>
<td>Form 18. Gantt Chart Template (page 82)</td>
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<td></td>
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<tr>
<td>Form 19. Implementation Plan Template (page 83)</td>
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<td></td>
</tr>
</tbody>
</table>

Steps

- Assess and describe the AMR working group’s resources and environment.
- Create work plans.
- Develop an implementation plan.
Assess and Describe AWG’s Resources and Environment

Before developing specific work plans and strategizing the intermediate steps toward completing the action plan objectives (developed in the previous section), the working group must clearly understand what resources it has available and the environment in which it will be working. Although some of this information may have been reviewed initially, the situation may have changed since the initiative began as more awareness is raised and more stakeholders are brought in. This assessment does not require complex forms and or surveys, but rather a working group planning meeting and brainstorming session to “map out” these resources.

Mapping Products and Resources

Careful planning and effective resource management will be required for successful implementation. Map out the planned products, financial resources and human resources before initiating the action plan.

Planned Products

- Identify the final deliverable products required to meet the goals and objectives of the action plan.
- Identify the intermediate deliverable products required to progress toward the final deliverable products.
- Set priorities based on feasibility given available resources.

Financial Resources

The main questions to answer are what funding is already available, what is needed, and how additional funding can be procured (Box 6). Then, identify the resources required to produce the products.

- Prepare a budget
- Determine available funding sources for the action items on the plan
- Identify gaps in funding
- Strive for financial sustainability
5. Implement the Action Plan

Human Resources

- Create a detailed breakdown of activities and tasks and subtasks within the activities from the plan developed in Section 4.
- Identify who is most capable to take the lead on these tasks.
- Review who is already in the working group and who or what skills may need to be brought in. You can use Form 1. Stakeholder Identification Worksheet, Form 14. Stakeholder Prioritization Worksheet, and the Stakeholder Mapping exercise in Figure 1 to assist in this review.

Box 6. Planning for Financial Sustainability

Financial sustainability can be defined as the ability to mobilize and efficiently use domestic and supplementary external resources on a reliable basis to achieve current and future targets.6 The four basic questions to ask when planning for financial sustainability are—

- How much does it cost to achieve our targets?
- How much funding is currently available and will be available in the near future?
- How do the funds flow from the source to its use?
- How are the funds used to meet targets?

The long-term success of the working group depends on answering these questions. The main challenges to financial sustainability are—

- The money doesn't reach where it is needed.
- The program doesn't do as much as it could with the money.
- There is not enough money to meet the program’s objectives.7

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Building Local Coalitions for Containing Drug Resistance

Box 7. Lessons Learned in AMR Advocacy and Containment at the Country Level

- To ensure support, promote AMR as value-added rather than competing with existing health programs.

- To sustain activities, seek diversified donor and programmatic support from the beginning; emphasize the continuous nature of the AMR containment process.

- To increase impact, make advocacy a central strategy, but use it to support objectives rather than as an end in itself.

- To ensure results, include respected and influential opinion leaders in the local working group, clearly articulate the group’s objectives from the outset, and have the group play the role of catalyst rather than the “one-and-only action body.”

- To increase effectiveness of messages, consider replacing the term “antimicrobial resistance” with the term “drug resistance” or reframe it in more locally meaningful terms. In Zambia, the term “preserving drug effectiveness” worked as a unifying concept for ownership of a shared vision by stakeholders.

Risk Assessment

You will want all members of the working group to have a sense of “where the AWG is” and where “it wants to go.” Most members will have a clear idea of where the working group is headed; that was made clear in the action plan. Box 7 describes some key lessons learned from implementing country-level AMR containment programs that may be helpful to consider during these exercises. To get a clear picture of where the working group is starting from, try to work through the exercises described below—a strengths, weaknesses, opportunities, threats (SWOT) analysis and identification of barriers and threats.

Strengths, Weaknesses, Opportunities, Threats Analysis

Use Form 17. SWOT Analysis Template to brainstorm with the working group members to clearly understand the group’s current position and environment. Strengths and weaknesses are usually factors of the working group, whereas opportunities and threats to the working group are external and associated with the environment in which the working group operates.

Identify Barriers and Threats

- Using the weaknesses cell and the threats cell from the SWOT analysis, do a more in-depth analysis of possible barriers and threats toward achieving the action plan’s goals and objectives.

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5. Implement the Action Plan

- Create a contingency plan.
- Strategize ways to neutralize the identified threats and barriers.

Documentation

Documentation goes beyond mere record keeping. Logistical decisions will need to be made on who will collect what data or record what information; where the information will be kept; how it will be kept; and how it will be disseminated and used. Some of these issues are covered in more detail in Section 6: Monitor and Evaluate. Information that should be developed, collected, and stored includes the following—

- **Indicators for success of coalition activities**—These carefully crafted statements are used in the monitoring process (Section 6) to determine progress and make judgments on necessary changes to the action plan. Monitoring has a central role in the day-to-day implementation process and should be intentionally planned in conjunction with implementation rather than as an afterthought after the implementation process has already advanced.

- **Meeting minutes**—These will form a historical record of the working group’s activities that can be used to chart progress and serve as evidence of action. Additionally, they can serve as useful reference materials for the coalition.

- **Lessons learned**—As the implementation process continues, lessons learned, both successes and failures, should be recorded to ensure that successes are replicated and failures are not repeated.

Create Work Plans

Work plans differ from the action plan developed in Section 4. Work plans are more specific with respect to outputs, responsibilities, time frames and deadlines, and budget requirements.

Write performance objectives for specific activities in the upcoming year. Performance objectives are the results the AWG hopes to achieve through its planned activities. Writing good objectives for the working group’s activities should be one of the first priorities early in the implementation phase. Significant time should be given to crafting objectives, and it should be done with the working group’s input. A useful guide for creating objectives is the acronym SMART.

SMART objectives are—

- Specific—Objectives should specify exactly what they want to achieve to avoid differences in interpretation.

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• Measurable—You should be able to measure whether you are meeting the objectives or not.

• Achievable—The objectives you set should be achievable and attainable.

• Realistic—The objectives you set should be realistic and feasible given the resources you have.

• Time-related—The objectives you set should have a time element to them to guide implementation and give deadlines to maintain accountability.

Set targets and indicators for each objective. The performance objectives developed will guide the evaluation process (Section 6) and inform the development of program/process indicators. Process indicators in turn play a key role in monitoring activities.

Targets are the measurable intermediate progress points. Indicators help measure change directly or indirectly and assess the extent to which targets and objectives are met.

List major activities for each objective. Prepare an activity-time chart (also known as a Gantt Chart—Form 18). This diagram provides a clear, concise summary that communicates the responsibility and timing to all working group members and is useful in monitoring progress (Box 8).

Review and prepare the annual budget for the final package of immediate activities.

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12 Ibid.
5. Implement the Action Plan

Box 8. Creating a Gantt Chart

A Gantt chart is a planning tool that shows the project activities by length of project and shows what should have been completed at a certain point in time.* Gantt charts can be created at different levels of activity (at working group level or for intermediate steps at the activity level) and at different levels of time detail (monthly by year, quarterly by week, etc). Below is an example of a Gantt chart. See Form 18 for a template.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Responsible Person</th>
<th>2008</th>
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<tr>
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*For more information, visit www.ganttchart.com

Develop an Implementation Plan

Compile the previous information into the implementation plan (Form 19). The implementation plan gives an overall picture of the implementation process and serves as a management tool to help monitor progress. It should include three main sections: introduction, strategic approach, and the implementation plan itself. The sections should contain the following information

- Introduction—Description of the context of the activities and the AMR situation. A summary of the research findings can be presented here.

- Strategic approach (the what, why, and how)
  - Overall objectives
  - Objectives for each activity
  - Strategies being used to contain AMR (interventions)

- Implementation plan (the “what,” “when,” “where,” “who,” and “how much”)
  - Communication and advocacy activities
  - Workplans
  - Management: people responsible for activity/work plan completion

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The implementation plan will serve as a useful reference as you progress in carrying out various AMR advocacy and containment activities.

**Country Case Study—Implementation in Zambia**

In March 2004, a group of key AMR stakeholders met in Zambia to form an advocacy working group (AWG).\(^\text{14}\) The AWG first conducted a rapid appraisal survey to understand the existing situation about issues that affect AMR in Zambia. The rapid assessment followed the guidelines presented in section 3. The final report of the rapid appraisal was disseminated to the AWG members at a meeting held to plan implementation of next steps and circulated among stakeholders to raise awareness of AMR. The results of the rapid appraisal sparked discussion of the major areas for action on AMR in Zambia.\(^\text{15}\)

Following the meeting, a task force of AWG members prepared a Call-to-Action document to be used to mobilize stakeholders and resources for action on AMR. Another task force prepared work plans with time lines for AWG activities, including a large Call-to-Action stakeholders meeting.

At a planning meeting held in October 2004, the AWG took several important steps to focus its mission including\(^\text{16}\)—

- Prioritized specific activities
- Conducted a stakeholder analysis and identified key decision makers at whom to target advocacy activities
- Defined indicators for successful AWG activities
- Mapped out resources available for advocacy activities and the Call-to-Action meeting
- Mapped out strategic approach to advocacy by defining the target audiences for the short, medium, and long term; and describing what their message was going to be to different stakeholders


5. Implement the Action Plan

- Conducted a SWOT analysis and discussed how to minimize weaknesses and neutralize threats

Through this process, the AWG was able to develop locally relevant and powerful solutions to fill gaps identified in the appraisal.

The Call-to-Action meeting took place in November 2004. Seventy participants attended the meeting representing various sectors including government, service providers, academia, professional societies, pharmaceutical companies, consumers, journalists, media, private sectors, and NGOs. In breakout sessions, the participants discussed how AMR was affecting their professions and what their role could be. At the end of the meeting, the Call-to-Action document, developed by the AWG, was presented to the group for consensus approval. The document called all those concerned with the health and well-being of Zambians to come together to address the problem of the failing effectiveness of medicines.

The AWG’s advocacy strategy focused on targeting decision makers, promoting use by prescribers of new integrated treatment guidelines, encouraging prescribers to adhere to recommended treatments, and including drug resistance topics in health professionals training curricula. To further this strategy, the AWG held a series of workshops to develop messages, media, and materials related to these issues. A total of six advocacy strategies were developed along with two radio spots targeting the consumer, two print materials and one radio spot targeting the prescriber, and one print piece for the provider to display.

The AWG also sponsored a workshop for physicians on implementing and using STGs for infectious diseases of major public health importance. From this workshop came recommendations for revising and implementing standard treatment guidelines. This inspired the support of the Zambia National Formulary Committee to review the infectious disease components of the National STG to promote rational use of antimicrobials to preserve their efficacy. The AWG will work with the committee to provide technical assistance to support the strategic planning and implementation of the guidelines.

In 2006, the AWG took time to do an interim monitoring assessment of its activities. Through RPM Plus, Links Media conducted a rapid assessment of AWG program achievements and provided recommendations for future advocacy strategies.  

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The AWG has continued to meet periodically to review progress on work plans. It has succeeded in galvanizing other groups, adding value to their work by advocating the importance of AMR. Additional successes include—

- Collaboration with the Ministry of Health and other partners including the Alliance for the Prudent Use of Antibiotics country chapter.

- In collaboration with RPM Plus, the AWG organized local consultants to review and assess AMR content in both in-service and pre-service training curricula for health professionals and identify gaps and make recommendations for improving coverage of AMR topics in these training programs.22,23,24

The AWG disseminated these findings and has successfully advocated making AMR a priority issue in the subsequent medical school curriculum review at the University of Zambia (UNZA) School of Medicine. At an interactive curriculum review workshop focused on the basic sciences and AMR at UNZA, the participants identified discipline-specific AMR related areas to be proposed to the higher bodies as part of the MBChB basic sciences curriculum map to form a basis for more detailed content development.25

The AWG collaborated with the Zambian Pharmaceutical Regulatory Authority and other key stakeholders to strengthen the pharmaceutical quality assurance system in Zambia.26 The AWG also collaborated on producing three TV segments on AMR and rational use of medicines for a MoH program called “Your Health Matters.” The AWG leveraged funding from a partner organization and used the existing program to create these awareness messages which were broadcast over the course of two months during primetime TV.

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6. MONITOR AND EVALUATE

Overview

Monitoring and evaluation (M&E) are the final considerations in the coalition building cycle. While often overlooked by program planners, M&E is nevertheless an integral part of the growth and survival of a coalition. The M&E process is the link between planning and implementation. Monitoring is the ongoing review of the degree to which program activities are completed and objectives are being met. Evaluation is the periodic analysis of a program’s progress towards meeting goals and objectives.

Although often used interchangeably, the terms monitoring and evaluation refer to different processes with different purposes.

- **Monitoring** is the continuous review process which determines the degree to which activities are completed and targets and deadlines have been met.
- **Evaluation** is an activity which takes place at a certain point in time to analyze progress towards goals and objectives. It provides feedback on reasons for success and failure and direction for future action.

Although an in-depth discussion of the “how to” of M&E is beyond the scope of this guide, numerous materials on it exist. This section will focus mainly on the monitoring activities which will be part of the day to day management of the working group and play a role in the implementation process. This section will provide you with the basic information and tools to—

- Determine if activities are being carried out as planned
- Measure achievements of targets
- Identify implementation problems
- Identify and reinforce good performance
• Identify and strengthen weak performance

• Assess whether activities are having their expected effect

• Periodically review and revise the priorities and plans of the overall drug resistance containment strategy

• Disseminate findings and use them to inform actions and future iterations of the process

• Engage additional stakeholders through involvement in these processes

Steps

Monitoring—Designing the System

The principles for designing a monitoring system are—

• Focus on key indicators
• Keep data collection to a minimum
• Develop practical procedures for managing the information
• Use information for timely feedback and follow-up

The biggest failures in routine monitoring reporting are over-design and under-implementation. An overwhelming amount of data often results in too little analysis. Likewise, overly complex reporting systems can result in poor compliance with reporting protocol.

Crafting and Using Indicators

Reliable monitoring depends on having standards to judge performance and progress. To determine if these targets have been achieved, the working group must know what is expected. Indicators are direct or indirect measures to assess the extent to which the coalition’s targets are met.

Examples of performance indicator monitoring include—

• Monitoring program plans and work plans implementation
• Evaluating achievement of long-term goals
• Assessing the individual units’ performance
• Identifying relative strengths and weaknesses
• Measuring impact of policies or systems
• Self-monitoring to improve performance
• Demonstrating needs to donors and funders
• Reporting on progress to the working group, donors, and other stakeholders

28 Ibid.
Criteria for good indicators are—

- Clarity—Indicator must be easily understood and calculated
- Usefulness—Indicator must reflect an important dimension of performance
- Measurability—Indicator must be defined in quantitative or qualitative term
- Reliability—Indicator must provide consistent assessment over time and among different observers
- Validity—Indicator must be a true measure of what it is meant to measure

Monitoring is applied to the implementation process by looking at inputs, processes, and outputs associated with specific implementation activities. Indicators link the action and work plans with implementing these plans. Incorporating suitably selected indicators right from the outset and periodically measuring them will help monitor longitudinal progress and also offer valuable evidence in the longer term for evaluation of the program.

**Implementing Monitoring**

Periodically review the overall AMR containment plan to determine whether it is necessary to—

- Revise priorities and budget allocations
- Seek additional information to clarify and focus intervention and advocacy priorities
- Define potential methods for obtaining additional information
- Focus on strengthening specific recommendations in the plan
- Review program implementation information to inform the planning process and revise priorities, e.g., progress reports, program evaluations, surveys, or annual reports. These reviews may result in additional objectives for the working group and an updated AMR containment plan.

Program monitoring, evaluation data and other relevant data can be used to improve the next round of planning, and to update the AMR plan as needed. Findings from M&E activities can be disseminated for advocacy and resource mobilization activities.

---

30 Ibid
**Evaluation**

While monitoring is an ongoing process during implementation, evaluation takes place at a point in time and looks at the big picture. Monitoring typically focuses on program activities that are completed; evaluation focuses on objectives that are fulfilled (Box 9). There are two types of evaluation—

- **Formative** evaluation takes place during the implementation phase and assesses progress towards objectives so that mid-course corrections and improvements can be made in a program.

- **Summative** evaluation takes place when the program is completed and measures its impact and success by looking at outcomes.

<table>
<thead>
<tr>
<th>Box 9. Questions for Formative and Summative Evaluations</th>
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<tbody>
<tr>
<td>- Is the program relevant and appropriate to the in-country context?</td>
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<tr>
<td>- Is the program effective? (Is it achieving its objectives? Why or why not?)</td>
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<tr>
<td>- Do the results from the monitoring system represent the actual situation?</td>
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<tr>
<td>- Is the program efficient?</td>
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<td>- Is the program sustainable?</td>
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<tr>
<td>- Is the program having the intended impact?</td>
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<tr>
<td>- What future changes should be made?</td>
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</table>

**Outcome Indicators for Advocacy**

There are six categories of outcomes what represent the changes in lives, health sector conditions, institutions, and health systems that result from advocacy work.  

- Shifts in social norms
- Strengthened organizational capacity
- Strengthened alliances
- Strengthened base of support
- Improved policies
- Changes in impact

Box 10 contains a “menu of outcomes” for AMR advocacy and containment work based on these six categories. These may help you think about appropriate outcomes for the AWG activities which can be evaluated.

---


Evaluation Resources

Evaluation will often take more time, money and staff than the normal monitoring efforts. Like research projects, evaluations often require the usual considerations of design and collecting and analyzing data. Also, if complete objectivity is desired, an outside evaluator might be needed. Funds should be included in the initial budget to cover evaluation costs. If funds are included only as an afterthought, the evaluation quality may suffer.

Continuing the Cycle

Over time, the AMR coalition will grow, expand, and shift its focus. As the initial priority areas are addressed, others will come to the forefront. This will require renewed effort at mobilizing resources and perhaps even further research to understand the problems in that area.

Whereas the first turn of the cycle is focused mostly on building the coalition and getting organized, subsequent turns will be more outward focused because the coalition itself will be stabilized. But ensuring the coalitions’ sustainability will require continued attention to funding sources, advocacy and communication to maintain public visibility, and stakeholder involvement to maintain momentum and relevance in the field of AMR.

Since AMR is a multi-faceted, complex, and overarching problem, it requires consistent vigilance, multi-disciplinary and multi-faceted approach, and long-term commitment. All too often AMR is pushed to the back of minds and agendas when seemingly more immediate threats arise. However the coalition can motivate, guide and coordinate to synergize the efforts of stakeholders. Therefore, it is the coalition’s charge to keep it in the public’s eye and on the radar of all stakeholders.

---

### Box 10. A Menu of Outcomes for AMR Advocacy and Containment Work*

<table>
<thead>
<tr>
<th>Shift in Social Norms</th>
<th>Strengthened Base of Support</th>
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<tbody>
<tr>
<td><strong>Examples of Outcomes</strong></td>
<td><strong>Examples of Outcomes</strong></td>
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<tr>
<td>Changes in awareness of AMR and related issues</td>
<td>Increased public involvement in AMR issues</td>
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<tr>
<td>Changes in beliefs about medicine use</td>
<td>Increased level of actions by champions of AMR issues</td>
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<td>Changes in attitudes about medicine use</td>
<td>Increased breadth of partners supporting AMR related activities</td>
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<tr>
<td>Changes in values about medicine use</td>
<td>Increased media coverage</td>
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<tr>
<td>Increased alignment of AWG objectives and core societal values</td>
<td>Increased awareness of AMR and AWG messages among key groups of people</td>
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<td>Changes in public behavior</td>
<td>Increased visibility of AWG activities</td>
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<table>
<thead>
<tr>
<th>Strengthened Organizational Capacity</th>
<th>Improved Policies</th>
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<tr>
<td><strong>Examples of Outcomes</strong></td>
<td><strong>Examples of Outcomes</strong></td>
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<tr>
<td>Improved management of AWG organizational capacity</td>
<td>Policy development</td>
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<td>Improved strategic abilities</td>
<td>Policy implementation</td>
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<tr>
<td>Improved capacity to communicate and promote AMR advocacy messages</td>
<td>Policy enforcement</td>
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<td>Improved stability of the AWG</td>
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<table>
<thead>
<tr>
<th>Strengthened Alliances</th>
<th>Changes in Impact</th>
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<tr>
<td><strong>Examples of Outcomes</strong></td>
<td><strong>Examples of Outcomes</strong></td>
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<tr>
<td>Increased number of AWG stakeholders</td>
<td>Improved AMR levels and containment practices</td>
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<tr>
<td>Increased level of collaboration and coordination on AMR issues</td>
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<tr>
<td>Improved alignment of partnership efforts (shared priorities, objectives, etc)</td>
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<td>Strategic alliances with important partners</td>
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<tr>
<td>Increased ability of the AWG to work towards policy change and other AMR containment issues</td>
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</table>

Form 1. Stakeholder Identification Worksheet

Use this worksheet to identify key stakeholder groups and assess representation across key AMR related areas. Some groups may address more than one contributing factor. The types of potential stakeholder groups are listed, but their identification as a key stakeholder in this area will depend on their focus and how influential they are.

The main AMR related areas to consider are pharmaceutical management (PHM), medicine use (USE), laboratory services and AMR surveillance (LAB), and infection control and disease prevention, and advocacy (ADV). Once you have identified stakeholders and stakeholder groups, get individual names and contact information, and record the information onto the Stakeholder Identification Worksheet.
## Stakeholder Identification Worksheet

<table>
<thead>
<tr>
<th>Stakeholder Category</th>
<th>Potential Stakeholder Groups within these Categories (examples)</th>
<th>Stakeholder Groups Identified</th>
<th>Dimension</th>
</tr>
</thead>
</table>
| **Decision makers and politicians**   | Ministries of Health, Finance, Education, Agriculture Regulatory Bodies  
Program Managers (HIV/AIDS/STIs, Malaria, TB, Integrated Management of Childhood Illnesses, control of diarrheal diseases, Essential Drugs, ARI, Expanded Program on Immunization, reproductive health, Health Services) |                              |           |
| **Donor**                             | Multilateral (e.g., UNAIDS, WHO, World Bank, UNICEF)  
Bilateral (USAID, Sida, DFID, JICA, etc.)                                                                 |                              |           |
| **Global Partnerships**               | Roll Back Malaria, Stop TB, GFATM CCM, etc.                                                                                   |                              |           |
| **NGOs/private voluntary organizations (local and international)** | Relief organizations  
Health and development organizations  
Community activists |                              |           |
| **Health practitioners and providers (public and private sector)** | Organized health/insurance systems  
Professional organizations (medical, microbiology, pharmacy, nursing—local and international affiliates)  
Employers providing health care for employees |                              |           |
| **Laboratory services and antimicrobial resistance surveillance** | National reference laboratory  
Academic institutions  
Public and private laboratories |                              |           |
| **Educators**                         | Research institutions  
Professional training institutions/Councils  
Health education and training organizations |                              |           |
| **Pharmaceutical Industry**           | Multinational and local pharmaceutical industry  
Pharmaceutical importers/retailers |                              |           |
| **General public**                    | Consumer groups                                                                                                               |                              |           |
| **News media and journalists**        | Health reporters  
Radio stations  
Newspapers/columnists  
Television  
Foreign correspondents |                              |           |
Form 2. Stakeholder Contact List

Add names and contact information as new stakeholders are identified through document reviews and interviews.

<table>
<thead>
<tr>
<th>Stakeholder Name</th>
<th>Organization</th>
<th>Address</th>
<th>Phone</th>
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</table>
Form 3. Stakeholder Interview Guide

Interviewer: ___________________________
Date: _______________________________
Name: ___________________________ Title/Position: ___________________________
Organization: ___________________________

Some countries are experiencing problems treating and controlling infectious diseases. We are interested in learning about these issues in our country. The following questions will help me understand the situation better. Thank you for taking the time to answer them.

1. Can you describe your activities in the field of public health or health care service delivery? (include coverage/membership/sector, as appropriate)

2. What are the most significant concerns that you have with respect to treating infectious diseases in our country? Do you know if anything is being done about these concerns? If so, what?

3. Do you think that drug resistance is a problem in our country? (If no, go to question 11. If yes, ask respondent to describe the problem of drug resistance. Allow respondent to discuss drug resistance. Probe for the following if not mentioned.)

4. How big is the problem of drug resistance?

5. Where does it occur?

6. What do you see as the main causes of drug resistance in our country?

7. What factors contribute to the problem?

8. What is the best solution to the problem of drug resistance? For example, would you say that we need better policies, better supply systems, better training, or more guidelines? What is MOST needed?

9. Who is in a position to implement this solution? And what should be the role of each body/organization involved in the solution?

10. In your view, who is most concerned about the problem of drug resistance? Who is not concerned?

11. If no, do you think drug resistance may become a problem in the future? Explain. (probe)

12. Who will it affect?

13. What will be the main causes?
14. How serious could it become?

15. Is the problem of or prevention of drug resistance specifically addressed in your objectives, strategies or work plans? If yes, please explain in what way.

Now I’d like to ask you a few questions on information sources such as journals, newspapers, columnists, etc.

16. Where do you get information on new medicines and their use?

17. If you had information on new medicines, their use, or drug resistance that you wanted your colleagues to get or thought they needed to know, what are the main ways you would get this information to them?

18. If you had medicine-related information that you wanted the public to get or thought they needed to know, what are the main ways you would get this information to them?

19. What kinds of information regarding new medicines and their use or drug resistance do you need that you are not getting?

20. Do you have any reports (studies, surveys, evaluations, etc.) addressing issues surrounding drug resistance in our country?

21. Is your organization planning trainings, surveys, or public education campaigns on AMR in the next year? If yes, please describe what you have planned.

22. We would like to put your organization on our mailing list to receive information on drug resistance. Can you suggest other names or organizations to add?

23. (Ask this question only of respondents you think you may want to interview again.) We will be reviewing these documents along with others collected. Who would be the best person to meet with if we have more questions on specific items related to (insert area of expertise of respondent)?

Do you have any questions? Thank you for your time.
Form 4. Sample Invitation for Kickoff Meeting

Date:

To:  (refer to stakeholder contact list)

RE:  Invitation to attend a forum to discuss an initiative to contain antimicrobial resistance (AMR) in our country/region/city.

Dear friends and colleagues,

Preserving the effectiveness of antimicrobial medicines is an immediate concern for us all. When medicines are no longer effective, people remain sick for longer periods of time, treatment costs increase, and more people die from otherwise curable diseases.

As you know, the use of antimicrobials is widespread in our country. Many of us have direct involvement with the use of these medicines. We know that resistance to these drugs often develops as a result of inappropriate prescribing and dispensing practices, suboptimal treatment seeking behavior, and poor drug quality. There is evidence of growing resistance in our country to first-line treatments.

Preserving drug effectiveness requires different actions from different stakeholders including our country’s Government, donors and implementing partners, health professionals, media and communications professionals, and consumers—people like you!

It’s important that we all explore how we can work together to promote the containment of antimicrobial resistance in our country. We are inviting you to attend a kickoff meeting on insert day, time, location to discuss the potential of starting an initiative against AMR. Specifically, we hope to—

- Inform stakeholders of the AMR initiative
- Confirm the need for action
- Identify other potential stakeholders and partners
- Achieve consensus on the proposed approach and plan for next steps

Resistance to antimicrobials affects all of us, and each of us has a potential role to contain it. I look forward to seeing you. Please respond with your intention to come—either by telephone at *enter phone number here* or by e-mail at *email address here*

Sincerely,

Attachment: Agenda
Form 5. Sample Agenda for Kickoff Meeting

Initiative to Contain Antimicrobial Resistance Kickoff Meeting

Date/Place

AGENDA

10:30 am to 10:40 am  Welcome  Facilitator: insert name

10:40 am to 11:00 am  Introductions  All

11:00 am to 11:10 am  • Review of objectives of the meeting  Facilitator:
                      • Inform stakeholders of the AMR initiative
                      • Confirm the need for action
                      • Identify other potential stakeholders and partners
                      • Achieve consensus on approach and plan for next steps

11:10 am to 11:30 am  Background: AMR in the world and in our country and why we are here today  Facilitator:

11:30 am to 12:00 pm  Open discussion:
                      • Validity of issue  All
                      • Relevance for stakeholders  Facilitator:
                      • Identification of other stakeholders

12:00 pm to 12:30 pm  Planning for next steps:
                      • Need for a working group  All
                      • Call to action  Facilitator:
                      • Communications strategy
                      • Within groups
                      • Between groups networking
                      • Media

12:30 pm to 1:30 pm  Lunch  All
Form 6. List of Documents for Review

<table>
<thead>
<tr>
<th>Reference</th>
<th>Title</th>
<th>Author(s)</th>
<th>Type of publication or journal name</th>
<th>Brief Description of Contents</th>
<th>Location where archived</th>
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<tbody>
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Form 7. Document Review Template

Use the following template for reviewing documents. Use a separate form for each document reviewed. Be sure to fill in as much information as possible so others can find the publication.

Full Reference [including Name of Author (or Organization who produced the document if no author); Year Published; Title of Document, Book, Journal, Article; Volume and Page Numbers if Journal; Publisher (and location of publisher) if Book, Report, Proceeding or any other type of Document] and web URL if possible.


Key Information Areas: (e.g., drug policy, regulation, selection, procurement, distribution, quality, availability, use, management support, education/training, surveillance, advocacy, media)

Key Findings (briefly summarize the major findings for each key information area)

Comments: (Include any other interesting/relevant notes)

Name of Reviewer:

Date of Review:
Form 8. Questions for Document Review and Interviews

This form provides questions you can use as a resource to help you gather detailed information on pharmaceutical management through document reviews and key informant interviews. The questions are divided by topic (selection, procurement, use, and policy and legal framework). Pharmaceutical management is such a large area that you will be gathering information from several documents and sources; some will focus only on selection, others on pharmaceutical use, etc.; others will have overlap of several areas. Select only those from the following set of questions to create a document review and interview guide that best fits your source, local context, and type of information that is relevant.

Selection

Questions on pharmaceutical selection focus on two important documents—standard treatment guidelines (STGs) and essential medicines lists (EMLs).

**STGs**

1. Do STGs exist for the management of infectious diseases? (Yes/No. If Yes, go on to the STG follow-up questions listed below starting at 1.A. If No, go on to questions about EMLs).

   1.A What was the process of their development?

   1.B How often revised? When last revised?

   1.C Do STGs exist for different levels of health care practice?

   1.D Are prescribers (of different levels) trained on the use of and adherence to the STGs? If yes, training given to what kind of prescribers and how regularly?

   1.E Are health students (medical, pharmacy, nursing, community health workers) trained on the importance of STGs?

   1.F Has the availability of STGs in health facilities been evaluated?

**EMLs**

2. Is there an EML that includes antimicrobials (antimicrobials include antibiotics, antifungals, antivirals, and antiprotozoals)? (Yes/No. If Yes, go on to the EML follow-up questions listed below starting at 2.A. If No, go on to additional questions if any.)

   2.A What was the process of selecting the antimicrobials included in the EML?

   2.B How often is the EML revised? When was it last revised?
2.C Are the antimicrobials listed and applied according to the levels of health care delivery?

2.D Are the antimicrobial medicines included in the EML consistent with those in the STG for infectious diseases?

2.E Are health care providers trained on the concept of EMLs?

2.F Are students of medical, pharmacy, nursing, and other paramedic courses trained on the concept of EMLs?

2.G Any data on the extent of availability of EML in health facilities?

2.H Any survey data on the availability of drugs (including antimicrobials) included in the EML in health facilities?

**Procurement**

For the purposes of this assessment, suggested questions regarding pharmaceutical procurement focus primarily on pharmaceutical product quality and the utilization of EML.

1. What quality assurance mechanisms are in place, in the public sector and in the private sector, to ensure the quality of antimicrobials marketed in the country?

2. How many public and private laboratories are capable of testing antimicrobial quality?

3. Which of the mechanisms listed below are in place to ensure antimicrobial quality?

   - Prequalification of suppliers
   - Supplier submits registration form
   - Physical inspection of drug samples
   - Laboratory analysis of drug samples
   - Specific drug reports requested, such as bioavailability
   - Informal information gathered from other procurement programs
   - Tender/order documents specify which pharmacopeia standards are acceptable
   - Good Manufacturing Procedures certification
   - Monitoring of quality of the marketed product
   - Inspection at the point of importation
   - Inspection at the retail/wholesale pharmacies
   - Lab testing of the samples obtained from drug outlets
   - Supplier performance M&E
   - Others

4. To what extent are the above mechanisms/regulations enforced?
5. Any data on the proportion of inspected antimicrobials that was substandard in the last two years?

6. Any documented report of counterfeit antimicrobials?

7. Is there a policy of using the EML antimicrobial list for procurement of antimicrobials?
   (Yes/No. If Yes, ask the following follow-up questions listed below starting at 7.A. If No, go on to any additional questions)

   7.A Does this policy exist in the public sector (Yes/No)

   7.B Does this policy exist in the private sector (Yes/No)

   7.C Is there any data on the level of adherence to the policies?

**Pharmaceutical Use**

The following questions on pharmaceutical use focus on three key areas— in-service and pre-service training of health professionals and appropriate use by prescriber, dispenser, and patients.

**In-Service Training**

1. Is in-service training/continuing education provided to health professionals on the importance of appropriate antimicrobial use and containment of AMR (ask for both public and private sectors)? (Yes/No. If Yes, go on to the follow up questions listed below starting with 1.A. If No, go on to any additional questions).

   1.A What continuing education activities have been carried out in the medical, nursing, pharmacy, and paramedical sectors during the last two years?

   Please record—

   - Number of prescribers trained
   - Topics included
   - Hours of exposure
   - Methodology of training
   - Organizations providing training
   - Whether counted as a continuing professional development credit
   - Any other relevant information

   1.B Any data on the impact of these trainings on knowledge and practice regarding antimicrobials?
**Pre-service Training**

1. Are separate topics on appropriate antimicrobial use and AMR included in undergraduate and postgraduate curricula (medical, pharmacy, nursing, paramedical)? (Examples—problem of overuse/ irrational use of antimicrobials/antibiotics, problem of drug resistance, strategies to improve antimicrobial use, strategies to contain AMR. Record any other curricular inclusion on appropriate antimicrobial use and AMR.)

2. Which curricula do include topics and which don’t? (Include information on the identified topics, hours of exposure, methodology of teaching-learning. Document any other relevant information.)

3. Any data/impression on how much of what is advised in the curriculum is actually being followed?

4. Are topics on appropriate antimicrobial use included in the examinations?

5. Are topics on AMR included in the examinations?

**Appropriate Use by Prescribers, Dispensers, and Patients**

1. Do any studies/reports on the level of appropriateness of antimicrobial prescribing and dispensing? Record key findings of all the relevant documents available.

2. Have public education campaigns on appropriate antimicrobial/antibiotic use and drug resistance been carried out in the last two years? (Yes/No. If Yes, ask the follow up questions listed below starting with 2.A. If No, go on to next question)

   2.A What kind of campaigns, and how frequent?

   2.B Who conducted these education campaigns?

   2.C Are there education campaigns relating to prevention of infection (e.g., hand hygiene, food hygiene, vector control, immunization)?

   2.D Are there education campaigns relating to appropriate use of antimicrobials/antibiotics and sensitization of AMR issues?

   2.E Any data on the impact of these measures?

3. Are school children educated/informed about infection prevention (e.g., hand hygiene, food hygiene, vector control, immunization) and rational use of medicines, including antibiotics? (Yes/No. If Yes, go to question 3.A. If No, go on to next question.)

   3.A Describe the activities in detail.
3.B Are they already a part of the existing curricula or are they carried out just as additional educational efforts?

3.C Any data on the impact of these measures?

4. Any data on the use of antimicrobials by the public (including level of appropriateness of use)?

**Medicine Use Policies/Regulation**

**STGs**

1. Is there a policy/recommendation guiding the use of STGs? (Try to gather information for all levels of prescribing and for all the different STGs that exist in the country.)

2. What policies/recommendations are in place (e.g., mandatory or voluntary adherence to STGs in a hospital setup, availability of those medicines recommended in the STG in the hospital pharmacy)

3. Is there a mechanism to monitor adherence to STGs?

4. Any data on the level of prescribing adherence to STGs in the public sector and in the private sector?

**DTC, ICC, or AMR Containment Committees**

1. Is there a separate body or committee for containment of AMR (national or ad hoc)? (Yes/No. If Yes, go to 1.A. If No. go on to question 2.)

1.A What are the responsibilities of this body/committee?

1.B What activities has it carried out so far?

1.C Any funding allocated by the government for AMR activities?

1.D Any data on the impact of activities carried out by this body/committee?

2. If no separate body or committee exists for AMR, is there an already existing body that considers resistance issues? (Yes/No. If Yes, go to 2.A. If No, go on to next question).

2.A What body or committee considers resistance issues?

2.B What AMR-related activities has this body carried out so far?

2.C Any data on the impact of activities carried out by this body/committee?
3. Do any of the existing disease-specific programs (HIV/AIDS, TB, malaria and others) in the country have AMR containment program? (Yes/No. If Yes, try to gather more information about their activities/programs, including information about whether recent global efforts such as the Presidential Emergency Plan for AIDS Relief, prevention of mother-to-child transmission, and GFTAM are incorporating or initiating any AMR-related issues within their activities).

4. Do hospitals have infection control committees (ICC)? If yes, what proportion of tertiary and secondary hospitals has ICCs?

5. Do ICCs have developed infection control programs? (Yes/No. If Yes, go to 5.A. In No, go on to next question).

   5.A What is the level of their implementation?

   5.B How many times do the ICCs meet during the year?

   5.C Any data on impact of the ICC activities?

6. Are there infection control/prevention activities at primary care level? (Yes/No. If Yes, describe the plans and activities over the past two years. Document any impact of these activities).

7. Do hospitals have Drug and Therapeutics Committees (DTC)? (Yes/No. If Yes, go to question 7.A. If No, go on to any additional questions).

   7.A What proportion of sampled tertiary and secondary hospitals have DTCs?

   7.B Please indicate what the DTCs have accomplished in the last two years?

   - Selection/formulary management of antimicrobials for use in hospital
   - Reserve antibiotics (e.g., some antibiotics reserved for treating only certain diseases, or restricted to be prescribed only by a certain category or level of prescribers)
   - Prescriber and patient education on antimicrobial use and AMR
   - Antimicrobial use evaluation program
   - Provision of independent drug information service (including information on antimicrobials)
   - Provision of adverse drug reaction monitoring (pharmacovigilance) service, including that on antimicrobials
   - Control of promotion of antimicrobials in the hospital by the drug industry

   7.C Are there any other activities carried out by the DTC in the last two years with regard to antimicrobial use and AMR?

   7.D How many times did the DTC meet during the past 12 months?
7.E Any data on the impact of DTC activities?

7.F Ask whether the respondent feels that the DTC has performed different activities normally expected of such a committee. If the answer is “no,” ask what could be the underlying factors?

**Policy And Legal Framework**

1. Is there a National Drug Policy? If yes, when was it adopted?

2. Is there an antimicrobial/antibiotic policy? (Yes/N). If Yes, ask the follow up questions listed below starting with question 2.A. If No, go on to next question).

   2.A When was the policy adopted?

   2.B Is the policy a part of the National Drug Policy or a separate policy?

   2.C What are the essential elements of the policy?

3. Is there a regulation limiting antimicrobials to prescription-only-medicines status? (Yes/No. If Yes, go to question 3.A. If No, go to next question)

   3.A Are there exceptions?

   3.B What processes are adopted to oversee enforcement of this regulation?

   3.C Any data on the level of enforcement of this policy?

4. Is there a regulation on the use of antimicrobials in food animals? (Although not a mandate for the current activity, this is an important part of the country picture.) (Yes/No. If Yes, ask the follow up questions listed below starting with question 4.A. If No, go on to next question)

   4.A What regulations are in place?

   4.B Are mechanisms in place to monitor implementation of these regulations?

   4.C Are any data available on the level of implementation of the regulation?

   4.D Are any data available on the impact of these regulations?

5. Are there any guidelines to regulate the promotional activities of pharmaceutical companies? (Yes/No. If Yes, ask the follow up questions listed below starting with question 5.A. If No, go on to next question)

   5.A What regulations are in place?
5.B Are any data available on the level of enforcement of the regulations?

5.C Are any data available on impact of the regulations?

6. Is there a policy regarding antibiotic prescribing? (Yes/No. If Yes, ask the follow up questions listed below starting with question 6.A. If No, go on to next question)

6.A Are certain antimicrobials defined and kept as “reserve” agents (e.g., some antibiotics reserved for treating only certain diseases, or restricted to be prescribed only by a certain category or level of prescribers)?

6.B Have levels of antimicrobial prescribing authority been defined?

6.C Which levels of prescribers can prescribe antimicrobials? [Gather information on which antimicrobials nurses can prescribe (if authorized), which clinical officers can prescribe, and which medical officers can prescribe.]

6.D Are any new policies being planned to allow prescribing rights to a wider group of health professionals?

6.E Any other regulations on prescribing of antimicrobials?

6.F What is the level of implementation of these policies?

6.G Are any data available on impact of these policies?

7. Is there a regulation requiring registration of drugs used in the country? If yes, what is the level of enforcement?

8. Is there a regulation requiring registration of pharmacies by the Drug Regulatory Authority? If yes, what is the level of enforcement?

9. Is there a regulation requiring registration of pharmaceutical personnel by the Practitioners Registration Authority? If yes, what is the level of enforcement?

10. Is there a national adverse drug reaction monitoring (pharmacovigilance) service? If yes, describe its activities over the past 12 months. If no, is there any plan to start such a service?

11. Is there a national independent drug information service? If yes, describe its activities over the past 12 months, including the number of enquiries answered. If no, is there any plan to start such a service?

12. What is the number of antimicrobial products registered (including all branded antimicrobials)?
13. What is the number of antimicrobial agents (unique chemical entities, not counting the different brands) registered?

14. What percentage of drugs (in terms of monetary value) used in the country is contributed by the private sector and what percentage by the public sector? What proportion of this is for antimicrobials (find out for both public and private sectors)?

15. What percentage of drugs used in the country are manufactured locally? (If possible, also find out what percentage of antimicrobials used in the country are manufactured locally.)

16. Are any price control or drug financing mechanisms (e.g., cost sharing, insurance schemes) in place? (Ask for both public and private sectors.)

Complete the following worksheet for each desired behavior

1. Prescriber assesses treatment appropriately
2. Dispenser keeps appropriate drugs available and accessible (right drug, good quality)
3. Consumer acquires correct drug
4. Consumer/caretaker follows/administers the appropriate regimen (dose, frequency, duration)
5. Consumer/caretaker seeks appropriate referral/follow-up for treatment failure.
Document Review Guide for Drug Use Behaviors and Underlying Causes (Continued)

<table>
<thead>
<tr>
<th>Behaviors noted (desired and inappropriate)</th>
<th>Contributing factors or causes (positive)</th>
<th>Contributing factors or causes (negative)</th>
<th>Condition/disease studied</th>
<th>Population sample, level of care, etc. (e.g., a sample of 50 patients seeking care at 3 public health facilities)</th>
<th>Where was the population studied?</th>
<th>What are the study recommendations?</th>
<th>Reference from document review list</th>
</tr>
</thead>
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</table>
Form 10. Antimicrobial Resistance Levels and Trends

Transfer the results of your literature search on AMR levels and trends of key pathogens to the table below (pathogens may vary by country). Add more lines as needed. Note key pathogens for which no data were available (insert “NA” in column two).

<table>
<thead>
<tr>
<th>Key pathogen tested</th>
<th>Resistance levels (range)</th>
<th>Record any information on the quality of the data</th>
<th>Date</th>
<th>Population</th>
<th>Location</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Mycobacterium tuberculosis</em></td>
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<tr>
<td><em>Plasmodium falciparum</em></td>
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<td><em>Neisseria gonorrhoeae</em></td>
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<td><em>Streptococcus pneumoniae</em></td>
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<tr>
<td><em>Haemophilus influenzae</em></td>
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<tr>
<td><em>Shigella spp.</em></td>
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<tr>
<td><em>Vibrio cholerae</em></td>
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<tr>
<td>HIV</td>
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<td>Other</td>
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</tbody>
</table>
Form 11. Interview Guide on AMR Surveillance

Name:__________________________________  Position:_________________________________________
Contact information:_________________________________________________________________________

Do guidelines exist regarding the recommended level of microbiological laboratory services for the different levels of hospitals (e.g. secondary, tertiary)?

Is AMR surveillance considered a component of the infectious disease surveillance system?

   If no, are there any plans to incorporate AMR surveillance into the infectious disease surveillance system? If so, describe.

   If yes, which pathogens are tested?

   Is the data being used to inform policy and other actions? Give examples.

What percentage of private sector laboratories in the country conducts antimicrobial susceptibility testing?

   What are the main pathogens tested? List.

   Are data being used to inform policy and other actions? Give examples.

What is the role in AMR surveillance for private-sector laboratories?

Is there a National Medical Laboratory Quality Assessment Scheme? (Get a copy if possible.)

Has there been any antimicrobial surveillance-related training available in the last 2 years?

Are there any surveillance networks in the country or the region that are successful? Which ones? What has helped their success?

Are you aware of any new support for or interest in AMR surveillance activities as a result of Global Initiatives such as the Global Fund to Fight AIDS, Tuberculosis and Malaria and the President’s Emergency Plan for AIDS Relief? What kind of support/interest?

Which donors are supporting AMR surveillance activities?

   Describe the type of support (technical assistance, training, supplies and equipment).

   Do you anticipate any new support for AMR surveillance? From which sources? Why is there this new interest?
Form 12. Interview Guide for Reference Laboratories

Respondent’s name:_____________________________________________________________
Position:______________________________________________________________________
Phone number/email:____________________________________________________________
Address:______________________________________________________________________

Level of Laboratory:
☐ Health Facility
☐ District
☐ Provincial/state/regional
☐ National

Affiliation
☐ Public
☐ Private
☐ Academic Institution
☐ NGO/religious institution
☐ Private research institute

What are your funding sources? What type of funding is most difficult to obtain? Are the trends in funding AMR surveillance changing? In what ways?

Does this laboratory participate in internal or external quality control programs? Why or why not? Describe level of participation.

What are the key problems experienced in obtaining data quality consistently?

Does this reference laboratory have access to a computer?

Which software are you using for the resistance data?

Have your staff members participated in any trainings in the last 2 years? (Describe topics covered, audience, etc.)

Have you sponsored any trainings in the last 2 years? (Describe topics covered, audience, reach, etc.)

Are there any laboratories that you know of that could be submitting isolates to this reference laboratory that are not currently doing so? Why not?

Does this laboratory feed resistance data to relevant bodies? If yes, To whom?
☐ How frequently?
☐ Is the surveillance data routinely published? (list source)
Building Local Coalitions for Containing Drug Resistance

How is it used? Give examples.
If not feeding data to relevant bodies, what are the main barriers?

Do you have contact information for someone at the laboratories that you just mentioned?

Complete the form below.
## Interview Guide for Reference Laboratories (continued)

<table>
<thead>
<tr>
<th>Organism tested for resistance</th>
<th>Is reference laboratory doing primary isolation of the organism?</th>
<th># labs submitting isolates for specific organism (list labs on a separate form)</th>
<th># isolates processed per year by the reference lab</th>
<th># isolates tested for resistance per year</th>
<th>Laboratory method used for testing resistance (for each organism)</th>
<th>Are all isolates received tested or is a sample of isolates tested?</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Mycobacterium tuberculosis</em> (TB)</td>
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<tr>
<td><em>Plasmodium falciparum</em> (Malaria)</td>
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<tr>
<td><em>Neisseria gonorrhoeae</em> (STI)</td>
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<tr>
<td><em>Streptococcus pneumoniae</em></td>
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<tr>
<td><em>Haemophilus influenzae</em></td>
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<tr>
<td>HIV</td>
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<tr>
<td>Other (e.g., <em>Shigella</em> spp., <em>Vibrio cholerae</em>)</td>
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</table>
Form 13. Interview Guide for Microbiology Laboratories

Respondent’s name:_____________________________________________________________
Position:______________________________________________________________________
Phone number/email:____________________________________________________________
Address:______________________________________________________________________

Level of Laboratory:

☐ Health Facility
☐ District
☐ Provincial/state/regional
☐ National

Affiliation

☐ Public
☐ Private
☐ Academic Institution
☐ NGO/religious institution
☐ Private research institute

What are your funding sources? What type of funding is most difficult to obtain? Are the trends in funding AMR surveillance changing? In what ways?

Does this laboratory have access to a computer?

Which software are you using for the resistance data?

Has anyone from this laboratory received training in the last 2 years? What type of training? Who sponsored the training?

Does this laboratory participate in internal or external quality control programs?

What are the key problems experienced in obtaining data quality consistently?

Is this lab currently submitting isolates to a reference laboratory?

How is the data coming out of this laboratory used? Can you give some examples?

Complete the table below.
## Interview Guide for Microbiology Laboratories (continued)

<table>
<thead>
<tr>
<th>Organism tested for resistance</th>
<th>Is this laboratory doing primary isolation of the organism?</th>
<th>Number of isolates processed per year by the reference lab</th>
<th>Number of isolates tested for resistance per year</th>
<th>Laboratory method used for testing resistance (for each organism)</th>
<th>Are all isolates received tested or is a sample of isolates tested?</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Mycobacterium tuberculosis</em> (TB)</td>
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<tr>
<td><em>Plasmodium falciparum</em> (malaria)</td>
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<tr>
<td><em>Neisseria gonorrhoeae</em> (STI)</td>
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<tr>
<td><em>Streptococcus pneumoniae</em></td>
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<td><em>Haemophilus influenzae</em></td>
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<td>Other (e.g., <em>Shigella spp.</em>, <em>Vibrio cholerae</em>)</td>
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Form 14. Stakeholder Prioritization Worksheet

Review the stakeholders identified in Form 1 and map them on the grid below according to “high influence but low urgency,” “high influence and high urgency,” “low influence and low urgency,” and “low influence but high urgency.”

<table>
<thead>
<tr>
<th>High Influence Stakeholder</th>
<th>Perceive AMR as Low Urgency</th>
<th>Perceive AMR as High Urgency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Influence Stakeholder</td>
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</table>
Form 15. Interview Guide for Media Contacts

We are interested in speaking with media people who deal with health and medical issues to get some idea of their needs, sources, and issues. Information from these interviews will help to develop advocacy and communication strategies to generate more interest in particular health and medical issues.

Pre-Interview Information Gathering

Before the interview try to gather as much information about the media source as possible. You can contact the representative or the media station or go to their website if one is available. The following website is one useful tool for gathering information on print resources:

http://advertising.about.com/gi/dynamic/offsite.htm?zi=1/XJ/Ya&sdn=advertising&cdn=money &tm=28&gps=151_4_632_871&f=00&tt=14&bt=0&bts=0&zu=http%3A//www.newspapers.co m/

Useful information to find includes—

- Description your media source (radio/TV station/program)
- How much health and medicine related topics the media source covers (what % of time, articles/programs are related to health/medicine)?
- The main target audience of the health/medical-related work (public, decision-makers, urban, etc.)
- The reach of the column/program (or relevant local area)? What about country-wide?

If this information can not be found from other resources, ask the interviewee.

Interview Questions

1. Tell me a little about what you do.

2. Where do you get your information on health/medical topics that you report on? What other sources? Any others?

3. Which of these sources for health/medical information do you find the most reliable/credible sources? What others? (List first three responses)

4. If no local sources included above, ask: Which are your most reliable local sources for health/medical information? What others? (List first three responses)
5. Why do you consider these sources to be the most credible/reliable?

Now I’m going to ask you for your opinion about how the public finds out about certain topics—that is, their sources of information.

6. How do you think the public finds out about (Read one line from left column of table below) ________________? Record response, and ask:

From what other sources might the public learn of this topic? (Record first three responses in the table below. Repeat above questions for next topic)

<table>
<thead>
<tr>
<th>Source 1</th>
<th>Source 2</th>
<th>Source 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. The new medicines for malaria?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Medical treatment for pneumonia?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. HIV/AIDS drug treatment?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. What particular media do you find to have the most credibility on health/medical issues with the public? Could you please specify names of papers, columnists, radio stations, announcers, programs, journalists, etc.

8. What particular media do you think have the most impact with government decision-makers? Could you please specify names of papers, columnists, radio stations, announcers, programs, journalists, etc.

9. What about with decision-makers in the business community? Could you please specify names of papers, columnists, radio stations, announcers, programs, journalists, etc.

10. I’m going to mention some topics. For each one, could you please tell me if you remember having seen or heard any media reports about it in the last year?

Mark Y for each seen/heard in first blank column, then ask—

Can you remember where you saw or heard reports on this topic? [Mark answers in second column. Check rightmost column if they say they/their organization did it. Then ask about the next topic.)
11. How important do you think it is that the public get information on these drug-related topics, as compared to other health/medical issues?

   ___ Most/more important than other issues
   ___ About the same
   ___ Least/less important than other issues.

   Ask: Which other health/medical issues are more important? Why do you believe that?

12. If you had access to reliable information on these drug-related topics, how likely would you/your organization be to disseminate it using your regular channels?

   ___ Very
   ___ Somewhat
   ___ Not very likely
   ___ Not at all

13. What would make it more likely for you/your organization to disseminate information related to these drug-related topics?

14. What kind of specific information would you most need on these topics to be able to use it in your regular channels?

15. In what context, if any, have you heard the term, “antimicrobial resistance?”

   If never heard, skip to question 17, otherwise ask—

16. How would you explain what the term means to someone who hadn’t heard it?

17. In what context if any, have you heard the term, “drug resistance?”

18. How would you explain what the term means to someone who hadn’t heard it?

Thanks for your help.
Form 16. AMR Intervention Prioritization Worksheet

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Cost/Available Resources</th>
<th>Expected Impact</th>
<th>Feasibility</th>
<th>Sustainability</th>
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Form 17. SWOT Analysis Template

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
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<th>Opportunities</th>
<th>Threats</th>
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Form 18. Gantt Chart Template

<table>
<thead>
<tr>
<th>Activity</th>
<th>Responsible Person</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
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<th>Jun</th>
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### Form 19. Implementation Plan Template

<table>
<thead>
<tr>
<th>Activities and Objectives</th>
<th>Indicators</th>
<th>Group with Primary Responsibility</th>
<th>Resources Needed</th>
<th>Gantt Chart for Year</th>
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## Annex 1. WHO Recommendations for AMR Interventions


### Recommendations for intervention

#### 1. Patients and the General Community

**Education**

1.1 Educate patients and the general community on the appropriate use of antimicrobials.

1.2 Educate patients on the importance of measures to prevent infection, such as immunization, vector control, use of bednets, etc.

1.3 Educate patients on simple measures that may reduce transmission of infection in the household and community, such as handwashing, food hygiene, etc.

1.4 Encourage appropriate and informed healthcare seeking behaviour.

1.5 Educate patients on suitable alternatives to antimicrobials for relief of symptoms and discourage patient self-medication of treatment, except in specific circumstances.

#### 2. Prescribers and Dispensers

**Education**

2.1 Educate all groups of prescribers and dispensers (including drug sellers) on the importance of appropriate antimicrobial use and containment of antimicrobial resistance.

2.2 Educate all groups of prescribers on disease prevention (including immunization) and infection control issues.

2.3 Promote targeted undergraduate and postgraduate educational programmes on the accurate diagnosis and management of common infections for all health care workers, veterinarians, prescribers and dispensers.

2.4 Encourage prescribers and dispensers to educate patients on antimicrobial use and the importance of adherence to prescribed treatments.

2.5 Educate all groups of prescribers and dispensers on factors that may strongly influence their prescribing habits, such as economic incentives, promotional activities and inducements by the pharmaceutical industry.

### Regulation

2.10 Link professional registration requirements for prescribers and dispensers to requirements for training and continuing education.

### 3. Hospitals

**Management**

3.1 Establish infection control programmes based on current best practice, with the responsibility for effective management of antimicrobial resistance in hospitals and ensuring that hospitals have access to such a programme.

3.2 Establish effective hospital therapeutics committees with the responsibility for overseeing antimicrobial use in hospitals.

3.3 Develop and regularly update guidelines for antimicrobial treatment and prophylaxis, and hospital antimicrobial formularies.

3.4 Monitor antimicrobial usage, including the quantity and patterns of use, and feedback results to prescribers.

**Diagnostic laboratories**

3.5 Ensure access to microbiology laboratory services that match the level of the hospital; e.g. secondary, tertiary.

3.6 Ensure performance and quality assurance of appropriate diagnostic tests, microbial identification, antimicrobial susceptibility tests of key pathogens, and timely and relevant reporting of results.

3.7 Ensure that laboratory data are recorded, preferably on a database, and are used to produce clinically- and epidemiologically-useful surveillance reports of resistance patterns among common pathogens and infections in a timely manner with feedback to prescribers and to the infection control programme.

### Interactions with the pharmaceutical industry

3.8 Control and monitor pharmaceutical company promotional activities within the hospital environment and ensure that such activities have educational benefit.

### 4. Use of Antimicrobials in Food-Producing Animals

This topic has been the subject of specific consultations which resulted in "WHO global principles for the containment of antimicrobial resistance in animals intended for food". A complete description of all rec-
Annex 1. WHO Recommendations for AMR Interventions

Recommendations is contained in that document and only a summary is reproduced here.

Summary

4.1 Require obligatory prescriptions for all antimicrobials used for disease control in food animals.

4.2 In the absence of a public health safety evaluation, terminate or rapidly phase out the use of antimicrobials for growth promotion if they are also used for treatment of humans.

4.3 Create national systems to monitor antimicrobial usage in food animals.

4.4 Introduce pre-licensing safety evaluation of antimicrobials with consideration of potential resistance to human drugs.

4.5 Monitor resistance to identify emerging health problems and take timely corrective actions to protect human health.

4.6 Develop guidelines for veterinarians to reduce overuse and misuse of antimicrobials in food animals.

5. NATIONAL GOVERNMENTS AND HEALTH SYSTEMS

Advocacy and intersectoral action

5.1 Make the containment of antimicrobial resistance a national priority.
   
   — Create a national intersectoral task force (membership to include healthcare professionals, veterinarians, agriculturalists, pharmaceutical manufacturers, government, media representatives, consumers and other interested parties) to raise awareness about antimicrobial resistance, organize data collection and oversee local task forces. For practical purposes such a task force may need to be a government task force which receives input from multiple sectors.
   
   — Allocate resources to promote the implementation of interventions to contain resistance. These interventions should include the appropriate utilization of antimicrobial drugs, the control and prevention of infection, and research activities.
   
   — Develop indicators to monitor and evaluate the impact of the antimicrobial resistance containment strategy.

Regulations

5.2 Establish an effective registration scheme for dispensing outlets.

5.3 Limit the availability of antimicrobials to prescription-only status, except in special circumstances when they may be dispensed on the advice of a trained healthcare professional.

5.4 Link prescription-only status to regulations regarding the sale, supply, dispensing and allowable promotional activities of antimicrobial agents; institute mechanisms to facilitate compliance by practitioners and systems to monitor compliance.

5.5 Ensure that only antimicrobials meeting international standards of quality, safety and efficacy are granted marketing authorization.

5.6 Introduce legal requirements for manufacturers to collect and report data on antimicrobial distribution (including import/export).

5.7 Create economic incentives for appropriate use of antimicrobials.

Policies and guidelines

5.8 Establish and maintain updated national Standard Treatment Guidelines (STGs) and encourage their implementation.

5.9 Establish an Essential Drugs List (EDL) consistent with national STGs and ensure the accessibility and quality of these drugs.

5.10 Enhance immunization coverage and other disease preventive measures, thereby reducing the need for antimicrobials.

Education

5.11 Maximize and maintain the effectiveness of the EDL and STGs by conducting appropriate undergraduate and postgraduate education programmes of healthcare professionals on the importance of appropriate antimicrobial use and containment of antimicrobial resistance.

5.12 Ensure that prescribers have access to approved prescribing literature on individual drugs.

Surveillance of resistance, antimicrobial usage and disease burden

5.13 Designate or develop reference microbiology laboratory facilities to coordinate effective epidemiologically sound surveillance of antimicrobial resistance among common pathogens in the community, hospitals and other health care facilities. The standard of those laboratory facilities should be at least at the level of recommendation 5.6.

5.14 Adapt and apply WHO model systems for antimicrobial resistance surveillance and ensure data flow to the national intersectoral task force, to authorities responsible for the national STGs and drug policy and to prescribers.

5.15 Establish systems for monitoring antimicrobial use in hospitals and the community, and link these findings to resistance and disease surveillance data.

5.16 Establish surveillance for key infectious diseases and syndromes according to country priorities, and link this information to other surveillance data.
Building Local Coalitions for Containing Drug Resistance

6. DRUG AND VACCINE DEVELOPMENT

6.1 Encourage cooperation between industry, government bodies and academic institutions in the search for new drugs and vaccines.

6.2 Encourage drug development programmes which seek to optimize treatment regimens with regard to safety, efficacy and the risk of selecting for resistant organisms.

6.3 Provide incentives for industry to invest in the research and development of new antimicrobials.

6.4 Consider establishing or utilizing fast-track marketing authorization for safe new agents.

6.5 Consider using an orphan drug scheme where available and applicable.

6.6 Make available time-limited exclusivity for new formulations and/or indications for use of antimicrobials.

6.7 Align intellectual property rights to provide suitable patent protection for new antimicrobial agents and vaccines.

6.8 Seek innovative partnerships with the pharmaceutical industry to improve access to newer essential drugs.

7. PHARMACEUTICAL PROMOTION

7.1 Introduce requirements for pharmaceutical companies to comply with national or international codes of practice on promotional activities.

7.2 Ensure that national or internationally codes of practice cover direct-to-consumer advertising, including advertising the Internet.

7.3 Institute systems for monitoring compliance with legislation on promotional activities.

7.4 Identify and eliminate economic incentives that encourage inappropriate antimicrobial use.

7.5 Make prescribers aware that promotion in accordance with the datasheet may not necessarily constitute appropriate antimicrobial use.

8. INTERNATIONAL ASPECTS OF CONTAINING ANTIMICROBIAL RESISTANCE

8.1 Encourage collaboration between governments, non-governmental organizations, professional societies and international agencies to recognize the importance of antimicrobial resistance, to present consistent, simple and accurate messages regarding the importance of antimicrobial use, antimicrobial resistance and its containment, and to implement strategies to contain resistance.

8.2 Consider the information derived from the surveillance of antimicrobial use and antimicrobial resistance, including the containment thereof, as global public goods for health to which all governments should contribute.

8.3 Encourage governments, non-governmental organizations, professional societies and international agencies to support the establishment of networks, with trained staff and adequate infrastructures, which can undertake epidemiologically valid surveillance of antimicrobial resistance and antimicrobial use to provide information for the optimal containment of resistance.

8.4 Support drug donations in line with the UN interagency guidelines*.

8.5 Encourage the establishment of international inspection teams qualified to conduct valid assessments of pharmaceutical manufacturing plants.

8.6 Support an international approach to the control of counterfeit antimicrobials in line with the WHO guidelines**.

8.7 Encourage innovative approaches to incentives for the development of new pharmaceutical products and vaccines for neglected diseases.

8.8 Establish an international database of potential research funding agencies with an interest in antimicrobial resistance.

8.9 Establish new and reinforce existing programmes for researchers to improve the design, preparation and conduct of research to contain antimicrobial resistance.

---


Antimicrobial resistance

Since their discovery during the 20th century, antimicrobial agents (antibiotics and related medicinal drugs) have substantially reduced the threat posed by infectious diseases. The use of these "wonder drugs", combined with improvements in sanitation, housing, and nutrition, and the advent of widespread immunization programmes, has led to a dramatic drop in deaths from diseases that were previously widespread, untreatable, and frequently fatal. Over the years, antimicrobials have saved the lives and eased the suffering of millions of people. By helping to bring many serious infectious diseases under control, these drugs have also contributed to the major gains in life expectancy experienced during the latter part of the last century.

These gains are now seriously jeopardized by another recent development: the emergence and spread of microbes that are resistant to cheap and effective first-choice, or "first-line" drugs. The bacterial infections which contribute most to human disease are also those in which emerging and microbial resistance is most evident: diarrhoeal diseases, respiratory tract infections, meningitis, sexually transmitted infections, and hospital-acquired infections. Some important examples include penicillin-resistant Streptococcus pneumoniae, vancomycin-resistant enterococci, methicillin-resistant Staphylococcus aureus, multi-resistant salmonellae, and multi-resistant Mycobacterium tuberculosis. The development of resistance to drugs commonly used to treat malaria is of particular concern, as is the emerging resistance to anti-HIV drugs.

Consequences

The consequences are severe. Infections caused by resistant microbes fail to respond to treatment, resulting in prolonged illness and greater risk of death. Treatment failures also lead to longer periods of infectivity, which increase the numbers of infected people moving in the community and thus expose the general population to the risk of contracting a resistant strain of infection.

When infections become resistant to first-line antimicrobials, treatment has to be switched to second- or third-line drugs, which are nearly always much more expensive and sometimes more toxic as well, e.g. the drugs needed to treat multidrug-resistant forms of tuberculosis are over 100 times more expensive than the first-line drugs used to treat non-resistant forms. In many countries, the high cost of such replacement drugs is prohibitive, with the result that some diseases can no longer be treated in areas where resistance to first-line drugs is widespread. Most alarming of all are diseases where resistance is developing for virtually all currently available drugs, thus raising the spectre of a post-antibiotic era. Even if the pharmaceutical industry were to step up efforts to develop new replacement antibiotic drugs immediately, current trends suggest that some diseases will have no effective therapies within the next ten years.
Causes

Microbes (the collective term for bacteria, fungi, parasites, and viruses) cause infectious diseases, and antimicrobial agents, such as penicillin, streptomycin, and more than 150 others, have been developed to combat the spread and severity of many of these diseases. Resistance to antimicrobials is a natural biological phenomenon that can be amplified or accelerated by a variety of factors, including human practices. The use of an antimicrobial for any infection, real or feared, in any dose and over any time period, forces microbes to either adapt or die in a phenomenon known as "selective pressure". The microbes which adapt and survive carry genes for resistance, which can be passed on.

Bacteria are particularly efficient at enhancing the effects of resistance, not only because of their ability to multiply very rapidly but also because they can transfer their resistance genes, which are passed on when the bacteria replicate. In the medical setting, such resistant microbes will not be killed by an antimicrobial agent during a standard course of treatment. Resistant bacteria can also pass on their resistance genes to other related bacteria through "conjugation", whereby plasmids carrying the genes jump from one organism to another. Resistance to a single drug can thus spread rapidly through a bacterial population. When anti-microbials are used incorrectly - for too short a time, at too low a dose, at inadequate potency; or for the wrong disease - the likelihood that bacteria and other microbes will adapt and replicate rather than be killed is greatly enhanced.

Much evidence supports the view that the total consumption of antimicrobials is the critical factor in selecting resistance. Paradoxically, underuse through lack of access, inadequate dosing, poor adherence, and substandard anti-microbials may play as important a role as overuse. For these reasons, improving use is a priority if the emergence and spread of resistance are to be controlled.

Unprecedented trends

In the past, medicine and science were able to stay ahead of this natural phenomenon through the discovery of potent new classes of antimicrobials, a process that flourished from 1930-1970 and has since slowed to a virtual standstill, partly because of misplaced confidence that infectious diseases had been conquered, at least in the industrialized world. In just the past few decades, the development of resistant microbes has been greatly accelerated by several concurrent trends. These have worked to increase the number of infections and thus expand both the need for antimicrobials and the opportunities for their misuse. Such trends include:

- urbanization with its associated overcrowding and poor sanitation, which greatly facilitate the spread of such diseases as typhoid, tuberculosis, respiratory infections, and pneumonia;
- pollution, environmental degradation, and changing weather patterns, which can affect the incidence and distribution of infectious diseases, especially those, such as malaria, that are spread by insects and other vectors;
• demographic changes, which have resulted in a growing proportion of elderly people needing hospital-based interventions and thus at risk of exposure to highly resistant pathogens found in hospital settings;
• the AIDS epidemic, which has greatly enlarged the population of immunocompromised patients at risk of numerous infections, many of which were previously rare;
• the resurgence of old foes, such as malaria and tuberculosis, which are now responsible for many millions of infections each year;
• the enormous growth of global trade and travel which have increased the speed and facility with which both infectious diseases and resistant microorganisms can spread between continents.

As the number of infections and the corresponding use of antimicrobials have increased, so has the prevalence of resistance. In addition, the enhanced food requirements of an expanding world population have led to the widespread routine use of antimicrobials as growth promoters or preventive agents in food-producing animals and poultry flocks. Such practices have likewise contributed to the rise in resistant microbes, which can be transmitted from animals to man.

Factors that encourage the spread of resistance

The emergence and spread of antimicrobial resistance are complex problems driven by numerous interconnected factors, many of which are linked to the misuse of antimicrobials and thus amenable to change. In turn, antimicrobial use is influenced by an interplay of the knowledge, expectations, and interactions of prescribers and patients, economic incentives, characteristics of a country's health system, and the regulatory environment.

Patient-related factors are major drivers of inappropriate antimicrobial use. For example, many patients believe that new and expensive medications are more efficacious than older agents. In addition to causing unnecessary health care expenditure, this perception encourages the selection of resistance to these newer agents as well as to older agents in their class.

Self-medication with antimicrobials is another major factor contributing to resistance. Self-mediated antimicrobials may be unnecessary, are often inadequately dosed, or may not contain adequate amounts of active drug, especially if they are counterfeit drugs. In many developing countries, antimicrobials are purchased in single doses and taken only until the patient feels better, which may occur before the pathogen has been eliminated. Inappropriate demand can also be stimulated by marketing practices. Direct-to-consumer advertising allows pharmaceutical manufacturers to market medicines directly to the public via television, radio, print media, and the Internet. In particular, advertising on the Internet is gaining market penetration, yet it is difficult to control with legislation due to poor enforceability.

Prescribers' perceptions regarding patient expectations and demands substantially influence prescribing practice. Physicians can be pressured by patient expectations to prescribe antimicrobials even in the absence of appropriate indications. In some cultural settings, antimicrobials given by injection are considered more efficacious than oral formulations. Such perceptions tend to be associated with the over-prescribing of broad-spectrum injectable agents when a narrow-spectrum oral agent would be more appropriate. Prescribing “just to be on the
safe side" increases when there is diagnostic uncertainty, lack of prescriber knowledge regarding optimal diagnostic approaches, lack of opportunity for patient follow-up, or fear of possible litigation. In many countries, antimicrobials can be easily obtained in pharmacies and markets without a prescription.

Patient compliance with recommended treatment is another major problem. Patients forget to take medication, interrupt their treatment when they begin to feel better, or may be unable to afford a full course, thereby creating an ideal environment for microbes to adapt rather than be killed. In some countries, low quality antibiotics (poorly formulated or manufactured, counterfeited or expired) are still sold and used for self-medication or prophylaxis.

Hospitals are a critical component of the antimicrobial resistance problem worldwide. The combination of highly susceptible patients, intensive and prolonged antimicrobial use, and cross-infection has resulted in nosocomial infections with highly resistant bacterial pathogens. Resistant hospital-acquired infections are expensive to control and extremely difficult to eradicate. Failure to implement simple infection control practices, such as handwashing and changing gloves before and after contact with patients, is a common cause of infection spread in hospitals throughout the world. Hospitals are also the eventual site of treatment for many patients with severe infections due to resistant pathogens acquired in the community. In the wake of the AIDS epidemic, the prevalence of such infections can be expected to increase.

Veterinary prescription of antimicrobials also contributes to the problem of resistance. In North America and Europe, an estimated 50% in tonnage of all antimicrobial production is used in food-producing animals and poultry. The largest quantities are used as regular supplements for prophylaxis or growth promotion, thus exposing a large number of animals, irrespective of their health status, to frequently subtherapeutic concentrations of antimicrobials. Such widespread use of antimicrobials for disease control and growth promotion in animals has been paralleled by an increase in resistance in those bacteria (such as Salmonella and Campylobacter) that can spread from animals, often through food, to cause infections in humans.

The need for a global response

In September 2001, WHO launched the first global strategy for combating the serious problems caused by the emergence and spread of antimicrobial resistance. Known as the WHO Global Strategy for Containment of Antimicrobial Resistance, the strategy recognizes that antimicrobial resistance is a global problem that must be addressed in all countries. No single nation, however effective it is at containing resistance within its borders, can protect itself from the importation of resistant pathogens through travel and trade. Poor prescribing practices in any country now threaten to undermine the potency of vital antimicrobials everywhere.

The strategy recommends interventions that can be used to slow the emergence and reduce the spread of resistance in a diverse range of settings. The interventions are organized according to groups of people whose practices and behaviours contribute to resistance and where changes are judged likely to have a significant impact at both national and international levels. These include consumers, prescribers and dispensers, veterinarians, and managers of hospitals and diagnostic laboratories as well as national governments, the pharmaceutical industry, professional societies,
and international agencies. Global principles for the containment of antimicrobial resistance in food-producing animals were issued by WHO in June 2000.

As much of the responsibility for containing resistance rests with national governments, the strategy gives particular attention to interventions involving the introduction of legislation and policies governing the development, licensing, distribution, and sale of antimicrobial agents. The strategy is sufficiently flexible to be applied in poor and wealthy nations alike. The process for selecting the necessary interventions to limit emerging antimicrobial resistance can be based on the diseases most prevalent in a given country. In advocating widespread adoption of this strategy, WHO aims to encourage the urgent actions needed to reverse or at least curtail trends which have major economic as well as health implications. Moreover, in view of the global nature of the antimicrobial resistance problem, the efforts of any nation to implement the WHO Global Strategy are likely to be felt worldwide.

The strategy builds on a number of WHO activities aimed at both monitoring the global emergence and spread of antimicrobial resistance and extending direct support to countries. WHO helps countries establish laboratory-based networks for the surveillance of resistance. Specific activities include staff training, support in methods for the quality assurance of laboratory tests, and provision of laboratory reagents. In addition, WHO distributes a computer software program, WHONET. Microbiologists, clinicians, and infection control workers may use this software to improve the systematic monitoring of drug resistance in their hospitals and communities and to share their data in a common format among national networks.

Since 1977, WHO has produced Model Lists of Essential Drugs in order to help governments select the most effective and appropriate drugs in line with priority needs. The lists, which are regularly revised, also contribute to the rational purchasing and use of drugs. Studies have demonstrated that in those areas in which an essential drugs programme is in operation, significantly more essential drugs are available, significantly fewer injections and antimicrobials are utilized, and drug stocks last about three times longer than in regions without such a programme. At present over 120 countries have implemented an essential drugs list. With the first global strategy for containment of antimicrobial resistance now available, WHO is also in a position to advise health policy-makers and managers on the specific interventions needed to safeguard the effectiveness of vital drugs and thus ensure that their life-saving capacity remains available to future generations.

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E-mail: mediainquiries@who.int
Annex 3. Global AMR Situation PowerPoint Slides

The following PowerPoint slides contain examples of global and country-level data on AMR. They follow a logical sequence and cover the major points necessary in an overview of AMR. A presentation (or presentations) covering these topics will be helpful at any meeting at which people may not be familiar with AMR or be aware of the extent of the problem. However, you can use the slides in any way that may be helpful to you.

What is AMR?

- WHO: “the ability of a parasite strain to survive and/or multiply despite the administration and absorption of a drug given in doses equal to or higher than those usually recommended but within tolerance of the subject.”
- In simple terms, AMR means that the recommended antimicrobial medicine is no longer effective in disabling or killing a microbe.
- Other terms: “drug resistance” and “antibiotic resistance.”
Global Situation of Antimicrobial Resistance (AMR)

- Pathogens causing diseases like tuberculosis (TB), malaria, sexually transmitted infections, typhoid, bacterial dysentery, and pneumonia are now resistant to several first-line antimicrobials
- About 1 in 5 cases of TB is multidrug-resistant (MDR)
- In 81 of 92 malaria-prevalent countries, chloroquine is no longer effective


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Global Situation of AMR:
Prevalence of Streptococcus pneumoniae not susceptible to any three drug classes (including penicillin), Alexander Project 1998—2000

- South Africa (33.5%)
- France (49.1%)
- Italy (22.4%)
- Spain (32.9%)
- Hong Kong (79.3%)
- Japan (63.1%)
- Singapore (39.9%)
- Saudi Arabia (23.5%)
- Mexico (31.1%)
- US (25.8%)

Country Examples of AMR (1)

- Malaria in Ethiopia—very high CQ resistance (65% treatment failure)\(^1\) and high SP resistance (32% parasitological failure)\(^1,2\)
- 30-50% of isolates from previously untreated TB cases in Uzbekistan and Turkmenistan were resistant to one TB drug, and 10-30% were MDR\(^3\)

Sources:

Country Examples of AMR (2)

- Current range of penicillin resistant gonorrhea—9-90% in Asia and >35% in Sub-Saharan Africa and the Caribbean\(^1\)
- Zheng and colleagues showed a remarkable increase of resistance amongst *N. gonorrhoeae* isolates in Guangzhou in China during a 6-year period from 1996 to 2001—from 57.2% to 81.8% for penicillin G and from 17.6% to 72.7% for ciprofloxacin\(^2\)

Sources:
Country Examples of AMR (3)

- The *Shigella* strains isolated from children under 5 with acute diarrhea in Chile over a 4-year period showed high levels of resistance to ampicillin (82%), chloramphenicol (49%), cotrimoxazole (65%), and tetracycline (53%).

- 51% of the strains were resistant to multiple antibiotics.


Country Examples of AMR (4)

1981-1999 Surveillance data on nosocomial infections at National Taiwan University Hospital showed a great increase in the incidence of some drug resistant pathogens

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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Methicillin-resistant <em>Staphylococcus aureus</em></td>
<td>4.3%</td>
<td>58.9%</td>
</tr>
<tr>
<td>Cefotaxime-resistant <em>Escherichia coli</em></td>
<td>0%</td>
<td>6.1%</td>
</tr>
<tr>
<td>Cefotaxime-resistant <em>Klebsiella pneumoniae</em></td>
<td>4%</td>
<td>25.8%</td>
</tr>
</tbody>
</table>

Impact of AMR

- Huge individual as well as Public Health Consequences in terms of
  - Prolonged illness
  - Increased mortality
  - Prolonged periods of infectiousness with ↑ risk of transmission of resistant pathogen to others
  - Increased direct cost (longer hospital stay, use of more expensive 2nd or 3rd line drugs)
  - Indirect costs (prolonged absence from work, etc)

Impact of AMR—Example of MDR-TB

MDR-TB (resistant to at least isoniazid and rifampicin)
- Treatment 100 times more expensive, treatment duration much longer, cure rate much lower even in the best centers
- A report showed that the cost for drug treatment for TB in Northwest Province of South Africa was Rand 26,354 (roughly US$4300) for MDR cases vs. Rand 215 (roughly US$35) for susceptible cases

Source:
Impact of AMR—Example of XDR-TB

- Extensively drug resistant TB (XDR-TB) cases—cases that are resistant to 3 of the 6 classes of second-line drugs—carry a very high mortality rate and are growing.
- An XDR-TB strain in South Africa killed 52 of 53 identified cases in 2006 causing widespread concern in the public health community.\(^1\)

Source:

---

Impact of AMR—Cost Implications of Nosocomial MRSA

Primary blood stream infections due to nosocomial methicillin-resistant *Staph aureus* caused about 3-fold increase in cost and hospital stay when compared with infections due to methicillin-sensitive *Staph aureus*.

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Median hospital stay (days)</th>
<th>Median total cost (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methicillin-sensitive <em>Staphylococcus aureus</em></td>
<td>4</td>
<td>9,661</td>
</tr>
<tr>
<td>Methicillin-resistant <em>Staphylococcus aureus</em></td>
<td>12</td>
<td>27,083</td>
</tr>
</tbody>
</table>

Impact of AMR—Cost Implications of Changing Over to ACT Regimen for Malaria Treatment

Because of failing treatment with chloroquine or SP, most malaria-affected African countries have changed to ACT-based regimen, which has significant cost implications.

<table>
<thead>
<tr>
<th>Drug</th>
<th>Cost for an adult treatment course (US$)¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artemether-lumefantrine (Coartem)</td>
<td>2.4</td>
</tr>
<tr>
<td>Chloroquine</td>
<td>0.13</td>
</tr>
<tr>
<td>Sulfadoxine-pyrimethamine (SP)</td>
<td>0.14</td>
</tr>
</tbody>
</table>


AMR in Hospitals

- Up to 10% of admitted patients get hospital-acquired infections
- Hospitals are a major source of drug-resistant infections
- Important hospital pathogens
  - Methicillin-resistant Staphylococcus aureus (MRSA), Pseudomonas aeruginosa, Escherichia coli, Klebsiella pneumoniae, Enterococcus faecium, Enterobacter spp., Citrobacter spp., and Acinetobacter calcoaceticus
AMR in Community

- Increasingly being reported in community-acquired infections
- *Strep. pneumoniae, Strep. pyogenes, H. influenzae, Neisseria gonorrhoeae, Neisseria meningitidis, Salmonella spp., Shigella spp., Campylobacter spp., E. coli, M. tuberculosis, community acquired MRSA*

Key Factors Contributing to AMR

- Inappropriate use by providers and patients
- Limited access to antimicrobials
- Easily obtainable over-the-counter where available (in most resource-constrained countries)
- Poor quality antimicrobial products
- Poor infection prevention and control
- Drug promotion, including direct-to-the-consumer and Internet ads
Building Local Coalitions for Containing Drug Resistance

Inappropriate Use—A Major Contributor to AMR

- Antimicrobials are one of the most widely used and misused agents
- 20–50% of human use UNNECESSARY
- 40–80% of animal use HIGHLY QUESTIONABLE


2005 World Health Assembly Resolution to Improve AMR Containment

Recognizing the increasing threat posed by antimicrobial resistance, the 58th World Health Assembly (WHA58/27) of WHO adopted a resolution to improve AMR containment, particularly through the rational use of medicines.
Annex 4. Information Collection Activities

How to Conduct a Document Review and an Interview

Document Reviews

Information sources: sources outlined in the guidelines for each assessment to get a sense of the kinds of documents to gather and the kind of information to extract from the documents.

Tools

Figure 2: Possible Sources of Information
Form 1. Stakeholder Identification Worksheet
Form 3. Stakeholder Interview Guide
Form 5. Sample Agenda for Kickoff Meeting
Form 6. List of Documents for Review
Form 8. Questions for Document Review and Interviews
Form 14. Stakeholder Prioritization Worksheet

Collect all relevant documents (policy, published and unpublished articles, curricula, media articles, etc.). Broad categories include—

- Identification of new stakeholders
- Communication channels
- Key organizations, programs, initiatives involved in relevant activities
- Pharmaceutical management
- Drug selection and procurement
- Training and education on appropriate use (including curricula)
- Management support
- Policy and legal framework
- Drug use behaviors among prescribers, dispensers and consumers
- Antimicrobial resistance levels and trends

Document sources. Use Form 6. List of Documents for Review to record the name, source, and other identifying factors. Record relevant information to describe the key conceptual areas contained in each document. Data collection instructions for each of the studies will describe what type of information to extract from the documents you have assembled.

Map key programs and new stakeholders identified during your review to the Form 1. Stakeholder Identification Worksheet. Remember that this worksheet should be considered a living document to be continuously updated.
Conducting an Interview

- Identify and interview stakeholders (the AWG should be involved in this activity).

- Prioritize stakeholders for interviewing using **Form 14. Stakeholder Prioritization Worksheet**. This involves transferring the names of stakeholders from **Form 1. Stakeholder Identification Worksheet**.

- Prioritize by identifying those stakeholders that bring leadership and technical and financial resources. Not all the stakeholders that fall into this category will necessarily be supporters of the activity or interested in AMR at the time of the interview.

- Be sure to include key stakeholder programs, initiatives, organizations, and donors identified in the inventory of programs.

- Schedule an interview after AWG members have reviewed the list.

- Review and adapt tools.

- Use **Form 3. Stakeholder Interview Guide** for interviewing all drug resistance Stakeholders selected for interviewing (excluding the media).

- Review interview guidelines to assess whether questions need to be adapted to fit the specific aspects of the drug resistance issues being assessed.

- When you have finished adapting the interview guidelines, pretest them with non-priority stakeholders (those identified on the initial list but not considered priority stakeholders) to determine whether—
  - Interviewers are comfortable with the questionnaire.
  - The stakeholder interviewed understands the questions.
  - The interview does not take more than one hour.
  - Interviewers adhere to the established protocol.

Conduct Interviews

Interviews might be best conducted with two people as it is easier to document the information—one to take notes and one to interview. Using two people also helps prevent bias. When the two people have different backgrounds they may interpret the information differently.

Review Figure 1 for general tips on in-depth interviewing. In addition to these general tips, note that in this document, we use the term antimicrobial resistance and drug resistance interchangeably. However, many people use the term ‘antimicrobial resistance’ differently. In some areas and in some fields, it is not used at all. A person’s response to interview questions will reflect their interpretation of resistance (e.g., only antibiotic resistance). Or, if the person is not sure what the term means, they may feel uncomfortable answering questions. This can affect
their answers or even their participation in the interview. Because we are most interested in what stakeholders know about drug resistance, we recommend you use this term during the interviews. When the interview has been completed, check it off the Stakeholder Contact List. You can see at a glance how many interviews remain.

Identify new stakeholders: Rely on stakeholders interviewed to add names to the list of key stakeholders. Go through the same process described above to determine whether these stakeholders will be interviewed. Remember to add all the newly identified stakeholders to the Contact List, even those you do not think you will need to interview.

Review notes: As soon as possible after the interview, the interviewers should review their notes to ensure they are understandable. Record the responses on the interview form, either by hand or on a computer. The aim is to record as closely as possible what respondent said, not what the interviewer thought he was ‘trying’ to say. Otherwise, you will not get a clear picture of the situation.

<table>
<thead>
<tr>
<th>“Do’s”</th>
<th>“Don’ts”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do begin the interview with a friendly and familiar greeting.</td>
<td>Don’t influence or bias responses by introducing one’s own perceptions or asking leading questions which encourage a particular response.</td>
</tr>
<tr>
<td>Impress upon the respondent that his/her opinion is important. This can be repeated during the interview. People enjoy expressing their opinion about an issue once they are assured that it is important and legitimate.</td>
<td>Don’t move too quickly from one topic to the next.</td>
</tr>
<tr>
<td>Do listen attentively to capture every piece of information from respondents.</td>
<td>Don’t interrupt the informant.</td>
</tr>
<tr>
<td>Do explore key words, phrases, idioms, and terms as they occur in the discussion.</td>
<td>Don’t mislead about the subject matter in order to obtain information.</td>
</tr>
<tr>
<td>Do listen to impressions, topics avoided by informant, deliberate distortions and misconceptions or misunderstandings. Take prompt action to explore each of these. Where appropriate, use probing questions to get more details.</td>
<td></td>
</tr>
<tr>
<td>Do ensure a natural flow of discussion by guiding informant from one topic to the next.</td>
<td></td>
</tr>
<tr>
<td>Do be silent to give the respondent plenty of room to talk.</td>
<td></td>
</tr>
<tr>
<td>Do be open to unexpected information.</td>
<td></td>
</tr>
</tbody>
</table>


Figure 1. Tips on how to conduct in-depth interviews.
Guidelines to interviewers

Wherever possible, first carry out as comprehensive a document review as possible on the related topics before interviewing the key informants. This provides information on what is already available; possessing such background information/facts by the interviewer facilitates the interviewing process, increases credibility, and saves time. You may use the data tables in Annex 4 to record information.

Depending on how much information you’re able to gather, there may be a need to identify more key informants, as a second step, and interview them to be able to gather adequate information. Always note down name and contact information for any people recommended during the interview process.

Before going for the interview of an identified key informant, make sure that the set of questions relevant for that informant is made ready.

Ask relevant questions of all the stakeholders identified in the questions below, even if you think you already have adequate information from one or two informants. This increases the level of dependability of the information gathered, helps get detailed responses, and may help get names of new informants/documents.

Adopt a flexible approach during the interview. Don’t interrupt the flow of the informant. Just ensure that you have covered all relevant questions by the end of the interview – order of asking questions is not critical. If, during the process of interview, a new but relevant issue emerges, ask more about that question to capture adequate information.

If you think you are not receiving adequate information for a particular issue, try probing or exploring further by asking supplementary questions that are outside the list of questions provided below. Also you may decide to omit certain questions if the situation so requires. (Examples of such a situation would be: the informant has already provided response to an issue while answering a previous question; the informant prefers to guide you to a subordinate for more in-depth information gathering.)

By the end of the interview ensure that you have asked the informant about relevant documents pertaining to the issue(s) discussed and the source of obtaining them. In case you’re informed about a document that you have not reviewed or were not aware of, try to obtain a copy of that and then review it. (Keep copies of all the reviewed documents properly archived for future reference.)
### Annex 4. Information Collection Activities

#### Internet Document Searches

Internet search by topic
- WHO website—[http://who.int](http://who.int)

#### Structural Indicators

Basic structural indicators of health, education, access to services, etc., can usually be obtained from—
- Health information services (HIS, HMIS)
- Demographic and health surveys
- National health policy and strategy documents

#### Disease Burden and Drug Resistance Levels

- Health information services
- Ministry of Health
- Burden of disease studies
- Program statistics
- National reference laboratory
- Published/unpublished studies
- Laboratory annual reports

#### Policies, Guidelines, and Curricula

- Drug policy documents, including antibiotic policy
- National Standard Treatment Guidelines, the National Essential Drug List and National Formulary, disease-specific or program-specific treatment guidelines
- Copies of relevant legislation supporting the Drug Policy
- Infection Control Program Guidelines
- Laboratory Guidelines
- Ministry reports, five-year plans, and annual work plans
- Relevant curricula from medical, pharmacy, and nursing schools

#### Medicine Use Practices

- Demographic and Health Surveys
- Program surveys and studies
- Published and unpublished studies
- Provider surveys
- Service delivery statistics
- Program surveys and studies
- Published studies

#### Service Utilization and Drug Supply

- Health Information Services
- Provider surveys
- National policy/strategy documents

#### Health Financing and Resource Allocation

- Government budget
- Expenditures of public financing agencies
- Pharmaceutical procurement reports
- National health accounts
- Public expenditure reviews
- Household surveys

#### Available Media

Newspapers, magazines, newsletters, radio

#### International Development/Donor Priorities/Programs

Search websites for project reports, studies, and development assistance strategies.
- [http://www.dfid.gov.uk/](http://www.dfid.gov.uk/)
- [http://WHO.int](http://WHO.int)
- [http://UNICEF.org](http://UNICEF.org)
- [http://UNAIDS.org](http://UNAIDS.org)
- [http://sida.se](http://sida.se)
- [www.cdc.gov](http://www.cdc.gov)
- [www.msh.org/rplplus](http://www.msh.org/rplplus)
- [www.apua.org](http://www.apua.org)
- [www.reactgroup.org](http://www.reactgroup.org)

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**Figure 2. Potential sources of information on AMR.**
Annex 5. Data Collation Tables

This section contains charts and tables to collate data collected during the document reviews and interviews as part of the stakeholder analysis, pharmaceutical management assessment, the drug use review and the surveillance information and capacity assessment. Use these tables in conjunction with the analysis guidelines in the next section. When completed, these tables should provide enough information to assess critical information gaps and may be sufficient to make decisions about the scope and focus of the AMR plan. Depending on the focus of your assessments, it may also be useful to look at the data in other ways than are portrayed in these tables. Analyze the information using the analysis guidelines contained in section 3. Understand the Local Situation.

Burden of Disease

Because volume of medicine use may be difficult to measure, number of illness episodes (outpatient cases and hospital admissions) can give an idea of what infections that may be at risk for developing resistance to drugs due to high volume of drug use. This information can be found in several places, such as health information systems and disease control programs. Data may not be complete or may not include the private sector. Data do not need to be perfect to get a rough indicator. If errors or limitations in data are known, please indicate. For example, if data represent only partial coverage, record the information you have and note that it is incomplete.

Table 1. Complete the Table for the High Burden Infectious Diseases in Your Country

<table>
<thead>
<tr>
<th>Condition</th>
<th>Total population</th>
<th>Data Source/Data Quality</th>
<th>Children under the age of five</th>
<th>Data Source/Data Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>TB</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malaria</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STIs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diarrheal Disease</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ARI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For each condition, record the percentage of total admissions that the condition represents. Record information in the appropriate column, depending on which sector it represents. Information from the private sector may not be available in some countries.

Table 2. Health Service Burden: Percentage of Total Hospital Admissions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Public</th>
<th>Private</th>
<th>Both</th>
<th>Data Source/Data Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>TB</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malaria</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STIs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diarrheal Disease</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ARI</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
For each condition, record the percentage of total outpatient visits that the condition represents. Record information in the appropriate column, depending on which sector it represents. Information from the private sector may not be available in some countries.

**Table 3. Health Service Burden: Percentage of Total Outpatient Visits**

<table>
<thead>
<tr>
<th></th>
<th>Public</th>
<th>Private</th>
<th>Both</th>
<th>Data Source/Data Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>TB</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malaria</td>
<td></td>
<td></td>
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<tr>
<td>STIs</td>
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<tr>
<td>Diarrheal Disease</td>
<td></td>
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<tr>
<td>ARI</td>
<td></td>
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</tr>
<tr>
<td>HIV/AIDS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
AMR Surveillance Information and Capacity

Transfer the results of your literature search on AMR levels and trends of key pathogens to the table below (pathogens may vary by country). Add more lines as needed. If AMR surveillance is being conducted, there may be reports from which data can be obtained. Note key pathogens for which no data were available (insert NA in column two). Data quality of reported results may vary.

Table 4. Antimicrobial Resistance Levels and Trends

<table>
<thead>
<tr>
<th>Key pathogen tested</th>
<th>Resistance levels (range)</th>
<th>Record any information on data quality</th>
<th>Date</th>
<th>Location</th>
<th>Population</th>
<th>Information Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Mycobacterium tuberculosis</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Plasmodium falciparum</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Neisseria gonorrhoeae</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Streptococcus pneumoniae</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Haemophilus influenzae</em></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><em>Shigella spp.</em></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><em>Vibrio cholerae</em></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>HIV</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Summarize the range of resistance levels and the periods covered in Table 4 in the table below. Note key pathogens for which no data were available (insert NA in column two). Data quality of reported results may vary.

**Table 5. Antimicrobial Resistance Levels and Trends Summary Tables**

<table>
<thead>
<tr>
<th>Key pathogen tested</th>
<th>Resistance levels (range)</th>
<th>Record any information on data quality</th>
<th>Dates covered</th>
<th>Locations covered</th>
<th>Populations covered</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Mycobacterium tuberculosis</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Plasmodium falciparum</em></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Neisseria gonorrhoeae</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Streptococcus pneumoniae</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Haemophilus influenzae</em></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><em>Shigella spp.</em></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><em>Vibrio cholera</em></td>
<td></td>
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</tr>
<tr>
<td>HIV</td>
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<tr>
<td>Other</td>
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</tbody>
</table>

Preserving the Effectiveness of Drugs: A Call for Action

The Advocacy Working Group for antimicrobial drug resistance, working in close collaboration with the Central Board of Health, calls all those concerned with health and the well being of the Zambians to come together and address the problem of failing effectiveness of drugs.

More than 4 million Zambians were reported by the Central Board of Health (CBoH) to have suffered from malaria in 2003. Over 2 million of these cases would not have recovered if they were treated with chloroquine, the drug of choice for treating malaria over the last four decades. TB, which affects more than 50,000 Zambians, can no longer be treated with only one drug. Effective TB treatment now requires a combination of antibiotics. In this era of the HIV/AIDS pandemic there are new concerns. If nothing is done, treatment failure with antiretroviral drugs (ARVs) due to drug resistance is imminent.

Resistance to antimicrobial drugs, a global threat that has since the 20th century, presents a growing peril for Zambia and requires urgent action by every Zambian.

It is gratifying to note that some significant developments to combat drug resistance have been initiated. In 2003, when chloroquine no longer worked, the Ministry of Health (MOH) introduced Coartem, an Artemesinin-based Combination Therapy (ACT), Treatment for sexually transmitted infections (STIs) and cholera has also changed because drug resistance to the common drugs including penicillin and tetracycline has developed.

Replacing ineffective drugs is an important and necessary strategy for improving drug effectiveness. However, because of limited treatment options it is critical that we act to preserve the effectiveness of existing drugs. While the action being taken is commendable and indeed desirable, evidence available indicates that the problem of drug resistance in Zambia is growing. Parasite resistance to the malaria drug, Sulphadoxine-pyrimethamine (commonly known as Fansidar) has now reached unacceptable levels in some parts of Zambia. A similar trend has been observed in TB where multi-drug resistance (MDR) is reported to be developing. There is also evidence that drugs used for treating pneumonia, typhoid and dysentery are losing their effectiveness.

When drugs are no longer effective people remain sick for longer periods of time, treatment costs increase and more people die from otherwise curable diseases. Preserving the effectiveness of antimicrobial drugs should therefore be an immediate concern for all.

The use of antimicrobials is widespread in Zambia. Resistance to these drugs often develops as a result of bad prescribing and dispensing practices, self-medication, and poor drug quality. Evidence shows irrational prescribing and dispensing of antibiotics in Zambia for treatment of viral infections, diarrhea and malaria. Irrational prescribing means recommending the wrong drug, the wrong amount or the wrong length of treatment. Many Zambians treat themselves and obtain their medicines from unauthorized sources. This promotes development of resistance to drugs. Poor drug quality may also promote the development of drug resistance. Although drug
quality is not tested regularly in Zambia, it is known that some of the drugs used in Zambia do not meet the minimum standards stipulated by the Pharmacy and Poisons Board.

Preserving drug effectiveness requires different actions from different stakeholders. Stakeholders include the Government of the Republic of Zambia, the media, Cooperating Partners, health professionals and consumers.

- This “Call for Action” draws attention to actions that should be taken to preserve the effectiveness of existing drugs.

Incorrect prescribing and dispensing of antimicrobials is often due to diagnostic limitations and unavailability of recommended drugs. Drug availability has increased in many areas and tools for promoting rational prescribing such as Standard Treatment Guidelines, Formulary Management and Drugs and Therapeutics Committees (DTCs) have also been introduced in Zambia. Further action is needed to ensure drug availability and improve the usefulness of tools for promoting rational prescribing. In this regard, there is need to:

- Evaluate the performance of existing DTCs and reduce barriers to their effective performance. (Action: MoH/CBoH)

- Develop and implement a dissemination plan for standard treatment guidelines (STGs) and Essential Drugs Lists in the public and the private sectors. (Action: MoH/CBoH)

- Ensure that health workers at all levels are trained (pre-service and in-service) on the use of STGs, Essential Medicines List and antimicrobial resistance (AMR). (Action: University of Zambia, Chainama College of Health Sciences, General Nursing Council, Medical Council of Zambia, Evelyn Hone College and other training institutions for health workers)

- Strengthen the drug supply systems to ensure regular supply of good quality essential drugs, including development of a long-term financial sustainability plan. (Action: MoH/CBoH, CHAZ and other healthcare providers)

Self-medication is a common problem that contributes to drug resistance. Some of the reasons people treat themselves without professional advice are lack of knowledge, inconvenience and high cost of drugs and health services. When people treat themselves they often take the wrong drug or unnecessary drugs. When they obtain the correct drug, they often take the wrong amount or stop taking the medicine too soon. To preserve the effectiveness of drugs it is necessary to:

- Educate the public about the risk of developing drug resistance due to inappropriate drug. Use media campaigns, school activities and other community based organizations (CBOs) activities. (Action: MoH/CBoH, Ministry of Education, media communications, Consumer Association of Zambia, health professional bodies, and all health workers)

- Encourage patients to adhere to prescribed and dispensed medicines. (Action: Consumer Association of Zambia, media communications, caregivers and all health workers)
Building Local Coalitions for Containing Drug Resistance

- Encourage drug vendors to adhere to regulations. (Action: MoH/CBoH, Pharmacy and Poisons Board and health professional bodies)

Poor quality drugs impact on treatment effectiveness and development of resistance. The drug quality control systems in Zambia currently require improvement, thereby providing opportunities for poor quality drugs to be used. To prevent development of antimicrobial resistance due to poor quality drugs the following needs to be done:

- Establish a National Drug Quality Control Laboratory without delay. (Action: MoH and Pharmacy and Poisons Board and Cooperating Partners)

- Establish a pharmacovigilance system that will monitor drug quality. (Action: MoH, Pharmacy and Poisons Board and all health institutions)

- Educate the public about the risks associated with poor quality drugs. (Action: Pharmacy and Poisons Board, media communications, Pharmaceutical Society of Zambia and other health regulatory and professional bodies)

Preserving drug effectiveness requires effective surveillance strategies and mechanisms to facilitate the collection and management of information for appropriate action. The following needs to be done:

- Collect information on drug resistance and make it available to the body designated to spearhead the implementation of drug resistance containment strategies. (Action: All institutions providing health care services)

- Be vigilant and report cases where patients do not respond to treatment as expected, especially for such diseases as TB, Malaria and HIV/AIDS. (Action: All health workers and patients)

- Develop good network and feedback systems in order to enhance the use of information on drug resistance. (Action: Institutions such as TDRC, CDL, Virology and Microbiology Laboratories and NMCC and all health institutions)

- Strengthen existing laboratory capacities to support diagnosis and conduct surveillance and improve intra and external supervisory capacity of reference laboratories. (Action: MoH/CBoH)

- Include the private sector in the dissemination of information and materials. For example, Standard Operating Procedures and capacity building activities for laboratories (including quality control) should be availed to the private sector. (Action: MoH/CBoH and private sector)

This Call for Action is based on findings of a rapid appraisal conducted for the Advocacy Working Group (AWG). For more information, contact the AWG secretariat at: Rational Pharmaceutical Management Plus; Plot No. 8749 Buluwe Road, Woodlands; Lusaka, Zambia; Tel: 260.1.261614.