



Building Coalitions for Containing Antimicrobial Resistance: A Guide

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About SIAPS

The goal of the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program is to ensure the availability of quality pharmaceutical products and effective pharmaceutical services to achieve desired health outcomes. Toward this end, the SIAPS result areas include improving governance, building capacity for pharmaceutical management and services, addressing information needed for decision-making in the pharmaceutical sector, strengthening financing strategies and mechanisms to improve access to medicines, and increasing quality pharmaceutical services.

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WHO’s Global Action Plan on Antimicrobial Resistance calls for the promotion and establishment of “multisectoral (one-health) coalitions to address antimicrobial resistance.” This guide offers a practical approach to operationalize these efforts at the local, regional, and national levels and provides tools and approaches to support advocacy and coalition building.

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 Behavior Change Innovation: State of the Art Activity (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 by RPM Plus.

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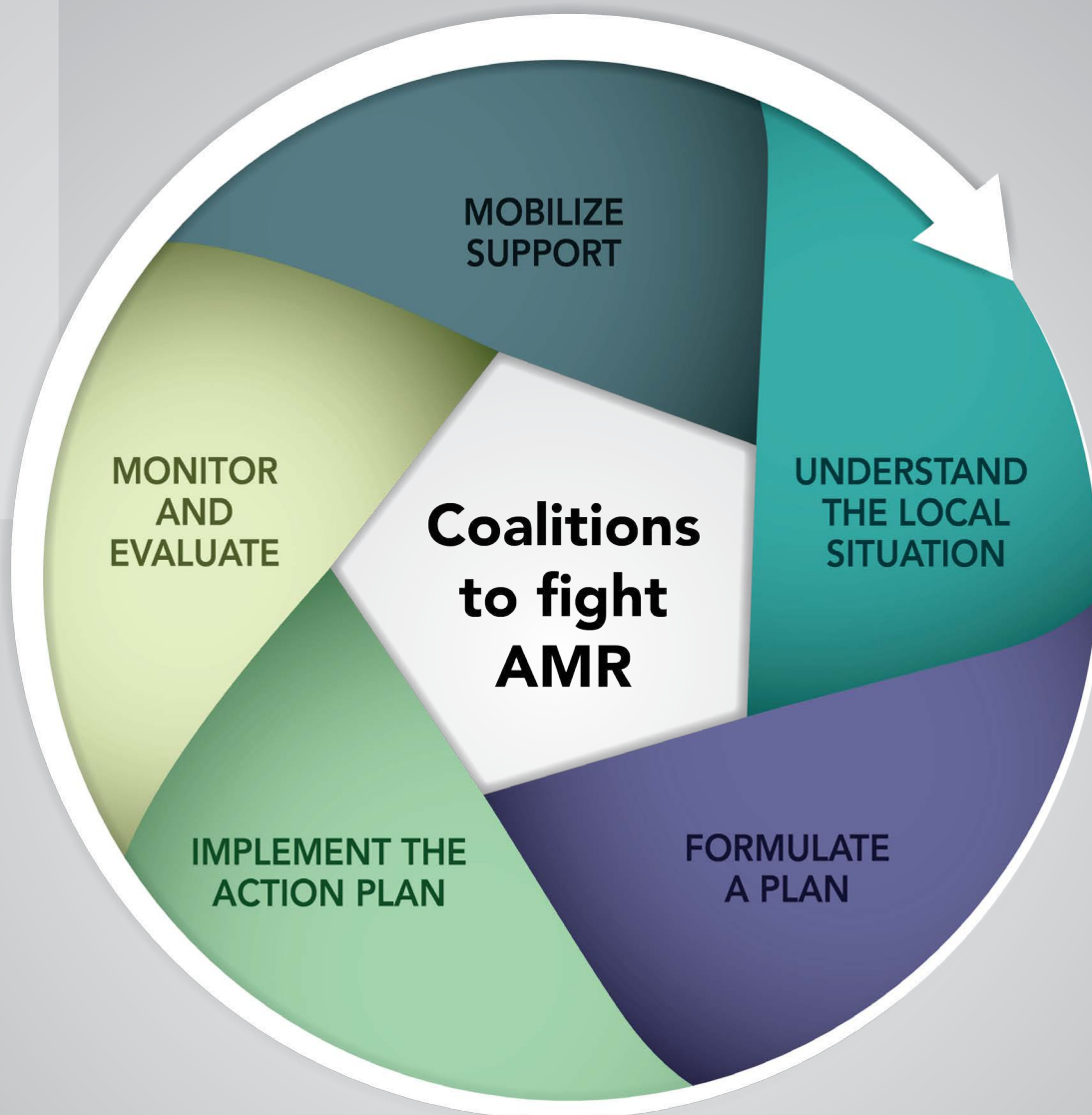




ACRONYMS AND ABBREVIATIONS

ABP	antibiotic prophylaxis
AED	Academy for Educational Development
AMR	antimicrobial resistance
APROMESTO	Association Protestante des Oeuvres Médicosociales et Humanitaires du Togo
ART	antiretroviral therapy
ARV	antiretroviral
BBH	Bon Berger Hospital
BUFMAR	Bureau des Formations Médicales Agrées du Rwanda
CBC	Cameroon Baptist Convention
CBoH	Central Board of Health (Zambia)
CDC	US Centers for Disease Control and Prevention
CHAM	Christian Health Association of Malawi
CHAN	Christian Health Association of Nigeria
CHANGE	Behavior Change Innovation: State of the Art Activity
CHASL	Christian Health Association of Sierra Leone
CHAZ	Churches Health Association of Zambia
CMC	Christian Medical College
CoRSUM	Coalition of Rational and Safe Use of Medicines
CPE	continuing professional education
CS	cesarean section
DACA	Drug Administration and Control Authority
DFID	Department for International Development (UK)
DTC	Drug and Therapeutics Committee
ECWA	Evangelical Church Winning All
EML	essential medicines list
EPN	Ecumenical Pharmaceutical Network
FAO	Food and Agricultural Organization
FMHACA	Food, Medicine and Health Care Administration and Control Authority of Ethiopia
FMOARD	Federal Ministry of Agriculture and Rural Development
FMOH	Federal Ministry of Health
GLASS	Global Antimicrobial Resistance Surveillance System
HIV-DR	HIV drug resistance
HK	Hôpital Kibilizi

ICAT	infection control assessment tool
ICC	infection control committee
ICQI	infection control quality improvement
IPC	infection prevention and control
ITGs	Integrated Treatment Guidelines for Frontline Health Workers (Zambia)
JMS	Joint Medical Store
LMICs	low- and middle-income countries
MEMS	Mission for Essential Medical Supplies
M&E	monitoring and evaluation
MDR-TB	multidrug-resistant tuberculosis
MoH	Ministry of health
MSH	Management Sciences for Health
NGO	nongovernmental organization
NMCG	National Multisectoral Coordinating Group
RPM Plus	Rational Pharmaceutical Management Plus
SIAPS	Systems for Improved Access to Pharmaceuticals and Services
SPS	Strengthening Pharmaceutical Systems
STG	standard treatment guideline
STI	sexually transmitted infection
SWOT	strengths, weaknesses, opportunities, threats
TB	tuberculosis
TOR	terms of reference
UHC	universal health coverage
UNAM	University of Namibia
UNICEF	United Nations Children's Fund
USAID	US Agency for International Development
WHO	World Health Organization
ZACH	Zimbabwe Association of Church-related Hospitals



Introduction

1. INTRODUCTION

Antimicrobial Resistance: An Unprecedented Challenge

AMR occurs when disease-causing microbes develop the ability to survive exposure to medicines intended to disable or kill them. The surviving strains are able to quickly replicate and grow because the antimicrobial agent disables or kills other nonresistant strains (selective pressure).

The continued development and spread of AMR jeopardizes the treatment of major infectious diseases, such as pneumonia, gonorrhoea, cholera and dysentery, malaria, tuberculosis (TB), and HIV/AIDS. It also threatens the effectiveness and feasibility of complex surgeries and procedures, including organ transplantation and chemotherapy, and can make routine hospital stays and relatively low-risk procedures more perilous. An estimated 700,000 people die from drug-resistant infections each year, and this is expected to grow to 10 million by 2050 if AMR is not contained.¹

AMR increases the risk of morbidity, mortality, and the transmission of treatment-resistant disease in a community and also increases health care costs for patients. For example, the cost of treating a case of multidrug-resistant tuberculosis (MDR-TB) can be as much as 200 times higher than non-resistant TB.²

These factors have enormous programmatic and economic consequences for public health programs. In the United States, for example, infections resistant to at least first-line treatment regimens affect two million patients and cost the health system an extra USD 55 billion per year in direct and indirect costs.³ Costs include providing treatment for longer periods of time, switching to more expensive second-line medicine regimens, and lost productivity. Projections indicate that AMR could cost the world's economy USD 100 trillion and decrease the global gross domestic product by 3.8% by 2050.^{4,5}

AMR occurs naturally; however, the overuse and misuse of antimicrobials, including antibiotics, accelerates its development and spread. Many interrelated and crosscutting factors contribute to the misuse of antimicrobials, including excessive or inappropriate use of antibiotics in agriculture, inappropriate use in health care, poor infection prevention and control practices, and excess environmental accumulation. As a result, coordination and action on AMR is needed from many stakeholders across sectors and disciplines, including human health, agriculture, and environment.

Furthermore, although AMR is a global problem, no one intervention or set of interventions will suit all contexts because the extent to which the contributing factors act as local drivers of AMR will vary. However, by engaging stakeholders across sectors and at multiple levels and by prioritizing effective and locally relevant interventions, significant strides can be made to contain resistance.

Multisectoral and multidisciplinary coordination is vitally important to efforts aimed at containing AMR. It is important to note that this guide focuses primarily on how multisectoral coalitions can act in regard to excessive and inappropriate use of antimicrobials in human health. It is strongly suggested that coalition members refer to resources that provide additional information on relevant actions in the agricultural and environmental sectors. [Annex A](#) lists some of these potentially useful resources.

[Annex D](#) contains a PowerPoint presentation describing the causes, challenge, and consequences of AMR. The slides were created as a “starter presentation” to support coalition building and advocacy efforts and may be used or adapted as needed. [Annex A](#) provides additional resources on AMR. [Annex B](#) contains a WHO fact sheet that provides an overview of AMR.

AMR, Universal Health Coverage, and Global Goals

AMR has been detected in every country and across all populations—cutting through geographic divides, political boundaries, and socioeconomic groups. Although AMR threatens low-, middle-, and high-income countries alike, low- and middle-income countries (LMICs) arguably will be more adversely affected by AMR because the resources, capacity, and political will in many of these countries are often insufficient to address AMR comprehensively.⁶ Former WHO Director General Dr. Margaret Chan noted that, “Antimicrobial resistance is a crisis that must be managed with the utmost urgency. As the world enters the ambitious new era of sustainable development, we cannot allow hard-won gains for health to be eroded by the failure of our mainstay medicines.”⁷

Major global health donors, program managers, and governments working to create an AIDS-free generation, protect communities from infectious diseases, and end preventable child and maternal deaths are taking note of the potential for AMR to reverse the major strides made against infectious diseases. However, the cross-cutting nature of AMR means that working within siloed disease programs will likely be insufficient to curb its development. Instead, to address AMR, disease-specific programs must be connected to broader health systems strengthening efforts aimed at improving surveillance, supply chains, and infection control practices, among other areas, to ensure that progress is coordinated and the major drivers of AMR are addressed. WHO, the World Bank, the Global Health Security Agenda, and other stakeholders have also encouraged or supported this “One Health” approach.

In addition, efforts aimed at achieving UHC will need to take steps to prevent inappropriate and excessive use as part of improving access to antimicrobials.⁸ Some studies indicate that up to 50% of all antibiotics are prescribed, dispensed, or sold inappropriately and that half of all patients fail to take their medicines correctly, which is particularly concerning given that overuse and misuse of antimicrobials is a major driver of AMR.⁹ Drug-resistant infections require more expensive second- and third-line medications, which can have a major impact on program costs and negatively impact key UHC hallmarks, including access, affordability, and quality.

However, carefully implemented efforts to expand access to medicines and achieve UHC may also help to curb AMR by reducing the financial burden on patients requiring care or treatment, making it easier to complete treatment regimens, reduce medication sharing, and even potentially depress the circulation of falsified medicines.¹⁰ Alsan et al. demonstrated a strong correlation between out-of-pocket expenses and AMR in LMICs, indicating that co-payments likely lead to patients buying medicines at private-sector pharmacies where medicines may be loosely regulated.¹¹ Therefore, improving access to antimicrobials and putting measures in place to ensure their optimal use may be one of the best strategies for containing and reducing the spread of AMR.

The Role of Coalition Building in Combating AMR

Building on the priorities laid out in its [Global Strategy for Containment of Antimicrobial Resistance](#), WHO published the Global Action Plan on Antimicrobial Resistance in 2015. This document aims to help member states “ensure, for as long as possible, continuity of successful treatment and prevention of infectious diseases with effective and safe medicines that are quality-assured, used in a responsible way, and accessible to all who need them.”¹² The five objectives outlined in the plan provide the framework for AMR efforts at the country level ([Annex C](#)).

WHO's strategy and action plan on AMR both recognize the inherent complexity of addressing AMR and acknowledge that siloed approaches will likely be ineffective. Instead, WHO and other leaders in the field are calling for a "One Health" approach that emphasizes involvement, coordination, and synergistic action across multiple sectors and stakeholders, including human and veterinary medicine, agriculture, finance, environment, and consumer groups.¹³

Coalitions—particularly those that bring relevant stakeholders together across sectors, professions, and disciplines—are important mechanisms for achieving this kind of participatory and multisectoral action. WHO specifically references and recommends the formation of these types of groups in the *Global Action Plan on Antimicrobial Resistance*, as noted in Objective 1: Improve awareness and understanding of antimicrobial resistance through effective communication, education, and training:

"Promote and support establishment of multisectoral (one-health) coalitions to address antimicrobial resistance at local or national level, and participation in such coalitions at regional and global levels."

When coalition members come together and collaborate, priorities can be established, activities can be conducted in a coordinated manner to address strategic gaps, and the overall impact can be maximized. Successful engagement and participation in a coalition is not only key to the coalition's success but also benefits members by exposing participants to a broad network of stakeholders working in related areas, contributing to the spread of best practices, and leveraging the work of others to better inform their own work.

Coalitions: Catalysts for Change

While coalitions can take a wide range of forms at various levels, in the most generic sense, a coalition is a group of people or organizations working together to effect change on a particular issue.¹⁴ The composition of its members depends largely on the intended goals and activities of the coalition, but due to the wide-ranging effects of AMR, most are multidisciplinary and multisectoral in nature.

Coalitions enable shared decision making and action through knowledge generation and sharing, consensus building, advocacy, and accountability. These aspects of coalitions enable them to be effective vehicles for change for many social, health, and development issues, particularly those concerning the global public good. Coalitions can be formed at the community, state, regional, or even global level, but they are most effective when they have strong leadership; are context specific and locally led; and have a clear, results-oriented focus.¹⁵



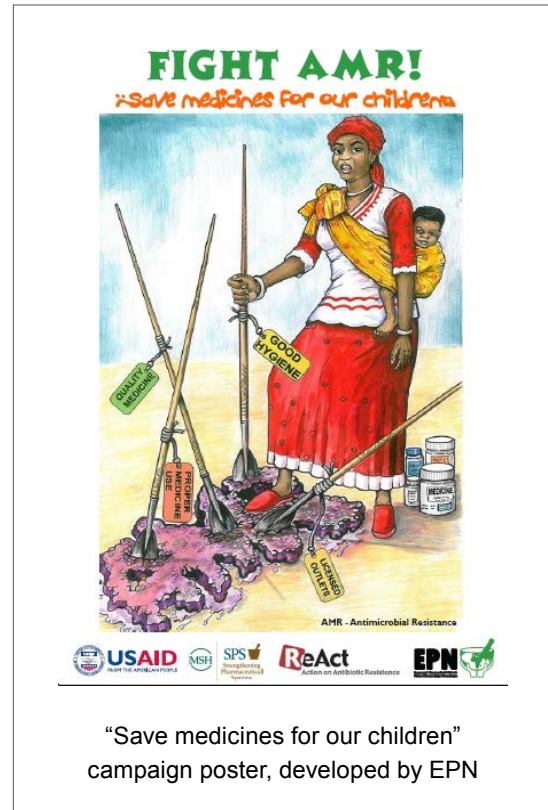
Poster from WHO's 2011 World Health Day, which aimed to draw global attention to the problem of AMR.
Credit: WHO

Coalition building begins with a core group of stakeholders and often grows as momentum for an issue builds and more stakeholders are drawn into the process. The process can be catalyzed through grassroots efforts at the local level, through multinational initiatives, and at any level in between. The coalition's role may not strictly be to act as the sole implementer of containment interventions. It may also be to advocate for other stakeholders to support this implementation.

Examples of successful coalitions can be found in throughout the fields of global health and development, including:

- A multicountry coalition to reduce emissions from deforestation and forest degradation helped to reduce deforestation in Brazil by 80%.¹⁶
- The Global Health Technologies Coalition, a group of nonprofit researchers, advocates, and product developers, helped to secure and expand funding for the development of new, more cost-effective HIV prevention and treatment tools.¹⁷
- The US-based National Cancer Institute's ASSIST network of state-based coalitions helped to enact local anti-tobacco legislation, reduce the sale of tobacco to minors, and ultimately reshape anti-tobacco policies and strategies in the US.¹⁸

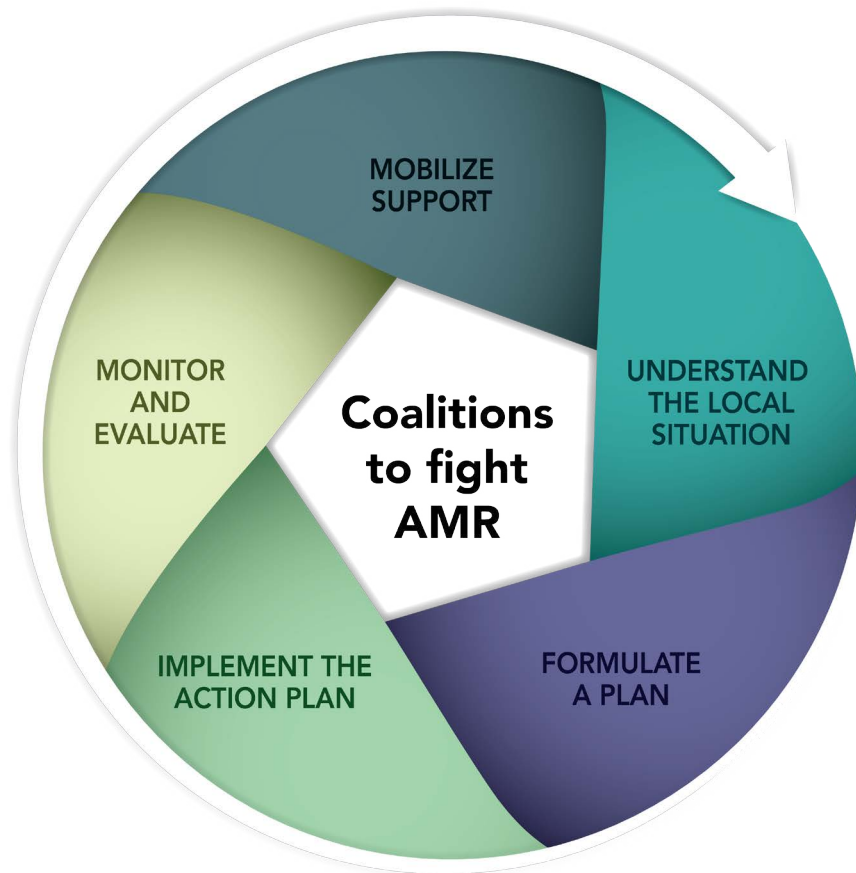
Several coalitions are already working to contain AMR in LMICs. For example, the Ecumenical Pharmaceutical Network (EPN), a regional organization, has successfully issued calls to action and conducted awareness-raising campaigns in Africa. The regional configuration of these coalitions, with partners in multiple countries, has effectively enhanced their reach.



At the country level, the WHO resolution at the 68th World Health Assembly, which set forth the objective for all countries to develop a national action plan on AMR by 2017, has spurred the development of national-level multisectoral coordinating coalitions or committees. As efforts to combat AMR continue to expand, grow, and take shape, these types of coalitions will be critical in ensuring that those efforts are coordinated, systematic, evidence based, and effective.

Approach and Key Elements of This Guide

This document provides guidance on building and strengthening coalitions to combat AMR through five key elements (see below). It primarily focuses on the creation and establishment of new coalitions; however, these elements are relevant throughout the lifespan of a coalition, and revisiting each periodically may be important as coalitions grow and evolve, expand in scope, or wane and need to be revitalized. In addition, the elements of coalition building may not necessarily occur in strict sequential order. Depending on the context and existing systems in place, coalitions may be able to use situational analyses that have already been conducted or utilize an existing active network. In each setting, it is important to understand the needs of the coalition and focus on the elements of this guide that align best with those needs.



Mobilize support: Mobilizing support among key stakeholders is crucial for any coalition. Initial quick investigations include determining the people, institutions, and agencies that are involved with or addressing AMR. A small group of committed stakeholders should kick-start the coalition-building process.

Understand the local situation: In this element of coalition building, stakeholders focus on compiling additional information to guide the development of strategies for advocacy, intervention, and research. They use existing information and key informant interviews to understand the local context and determine what information or data need to be collected regarding antimicrobial use and AMR surveillance capacity, infection control, and medicine policy management.

Formulate a plan: Stakeholders should meet to increase awareness of drug resistance, review local information compiled on AMR, and develop a collaborative plan for addressing drug resistance by focusing on locally prioritized and feasible interventions.

Implement the action plan: Implementing interventions, mobilizing interest and resources, and conducting necessary research will help to fill critical information gaps.

Monitor and evaluate: The findings from monitoring and evaluating the effect of advocacy and containment efforts can be used to reassess the containment strategy and make changes to increase effect and reach.

Box 1. Advantages of Coalitions¹⁹

- **Promote sustainability:** Coalition-building activities increase the momentum around the common issue of AMR and provide opportunities and resources for expanding the scope and breadth of activities.
- **Enhance synergies:** Broad-based coalitions provide a forum for the multidisciplinary collaboration necessary to build activities that increase impact, reduce cost, and add value to programs.
- **Support holistic approaches:** A diverse group of stakeholders helps build strategies to address AMR through comprehensive activities that may be beyond the scope of any one organization.
- **Improve knowledge sharing:** This provides a platform for members to share relevant updates, discuss challenges, and establish best practices.
- **Sharpen focus:** Build trust, cooperation, and consensus through the planning process to help keep the focus on feasibility, effectiveness, and available resources.
- **Enable flexibility:** Implementation strategies can be tailored to the local context to increase impact.

Purpose of This Guide

This guide aims to help individuals, organizations, and governments develop, establish, and maintain effective multidisciplinary and multisectoral coalitions to combat AMR. The principles and guidance provided should be useful to many types of coalitions at different levels of operation and with varying scopes.

This guide is based on the following observations and guiding principles:

- AMR is a multisectoral, multidisciplinary issue that requires the involvement of a wide range of stakeholders to slow its development and spread.
- The potential threat of AMR has been well documented and is now widely recognized. Swift, coordinated, and effective action is required immediately at all levels to prevent the further spread of AMR. Because much is already known about the causes of AMR and what can be done to contain and prevent it, we do not need to wait for more information to act.
- While urgent action is required, efforts must focus on realistic, incremental local strategies that capitalize on existing initiatives, structures, and resources while acting as a catalyst for the identification of new initiatives and best practices.
- Efforts to combat AMR add value to existing health programs, such as those aimed at controlling malaria, HIV/AIDS, and TB, and should not be viewed as a competing vertical program.

Who Should Use This Guide?

AMR affects—and is affected by—a multitude of stakeholders across not only the human health system but also the fields of agriculture, veterinary medicine, academia, and finance. Therefore, comprehensive efforts to combat AMR will require both involvement and a sense of ownership across many sectors and disciplines.

This guide is primarily intended for individuals or groups working to establish, revitalize, or maintain coalitions to combat AMR and current, future, and potential members of these coalitions. This may include organizations or individuals from a diverse group of disciplines and sectors, including medicine, nursing, pharmacy, public health, laboratory, civil society, agriculture, veterinary medicine, environment, donors and development partners, academia, professional associations, consumer advocacy groups, government, non-governmental organizations, and the private sector.

The information provided is particularly relevant for coalition secretariats, conveners, facilitators, advisory committees, strategists, and activity implementers. The guide also contains relevant information for anyone interested in AMR or in learning more about how coalitions can be an effective vehicle for change. For more information on the types of stakeholders typically involved in AMR coalitions, see [Section 2. Mobilize Support](#).

Application of This Guide in Different Contexts

This guide provides a high-level approach to coalition building, but it does not represent a rigid stepwise approach and can be used by coalitions regardless of where they are in the process. For example, already established coalitions may find information on mobilizing stakeholders relevant if they are looking to expand their size or scope. This information can and should be tailored to the local context in which it is being applied. The feasibility, degree of relevance, and priority of the activities in this guide will depend on the in-country needs and resources. The best approach is to work toward a systematic and comprehensive AMR containment initiative; however, if conditions do not allow for such a comprehensive approach, implementing selected individual interventions through small-scale local coalitions can be helpful.

This document was informed and shaped by the experiences of the USAID-funded SIAPS Program and its predecessors—SPS and RPM Plus—all of which were implemented by MSH. These experiences include building coalitions to combat AMR in Ethiopia, Namibia, Rwanda, Zambia, and other countries, all of which are described in detail in this document.

The approach, although initially designed for country-level implementation, has shown itself to be readily adaptable to the regional context, as was our experience collaborating with the EPN. This regional approach can build a multicountry platform to:

- Recognize and address the common problem of AMR
- Create and expand advocacy and coalition building
- Share expertise, experiences, lessons learned, best practices, and resources
- Disseminate available AMR data and improve networking of existing surveillance
- Motivate and strengthen South-South collaboration

Elements of this approach have been applied successfully at the local level. For example, a multidisciplinary coalition of obstetricians, anesthetists, pharmacists, nurses, and other stakeholders, including those from infection control committees, drug and therapeutics committees (DTCs), and quality control units in each of the three public hospitals in Jordan, was able to demonstrate how locally developed protocols and procedures could improve antibiotic prophylaxis practices for cesarean section and reduce cost while still maintaining a below-average rate of surgical site infections. As a result, the Government of Jordan mandated the use of the new protocol at all public-sector hospitals providing obstetric services.²⁰

How to Use This Guide

This guide is organized according to the key elements of coalition building:

- [Section 2. Mobilize Support](#)
- [Section 3. Understand the Local Situation](#)
- [Section 4. Formulate a Plan](#)
- [Section 5. Implement the Action Plan](#)
- [Section 6. Monitor and Evaluate](#)

Each section is structured in a similar way, beginning with an overview of the purpose and contents, and includes tools and resources to help support coalition-building efforts. Tools, forms, and templates that can aid in the development or management of a coalition are noted at relevant points throughout the document and provided at the end of this guide. These resources are meant to serve as examples that can be tailored to meet the needs of different country and local situations.



Sections 2–6 contain Tools, Knowledge and Skills, and Products Summaries

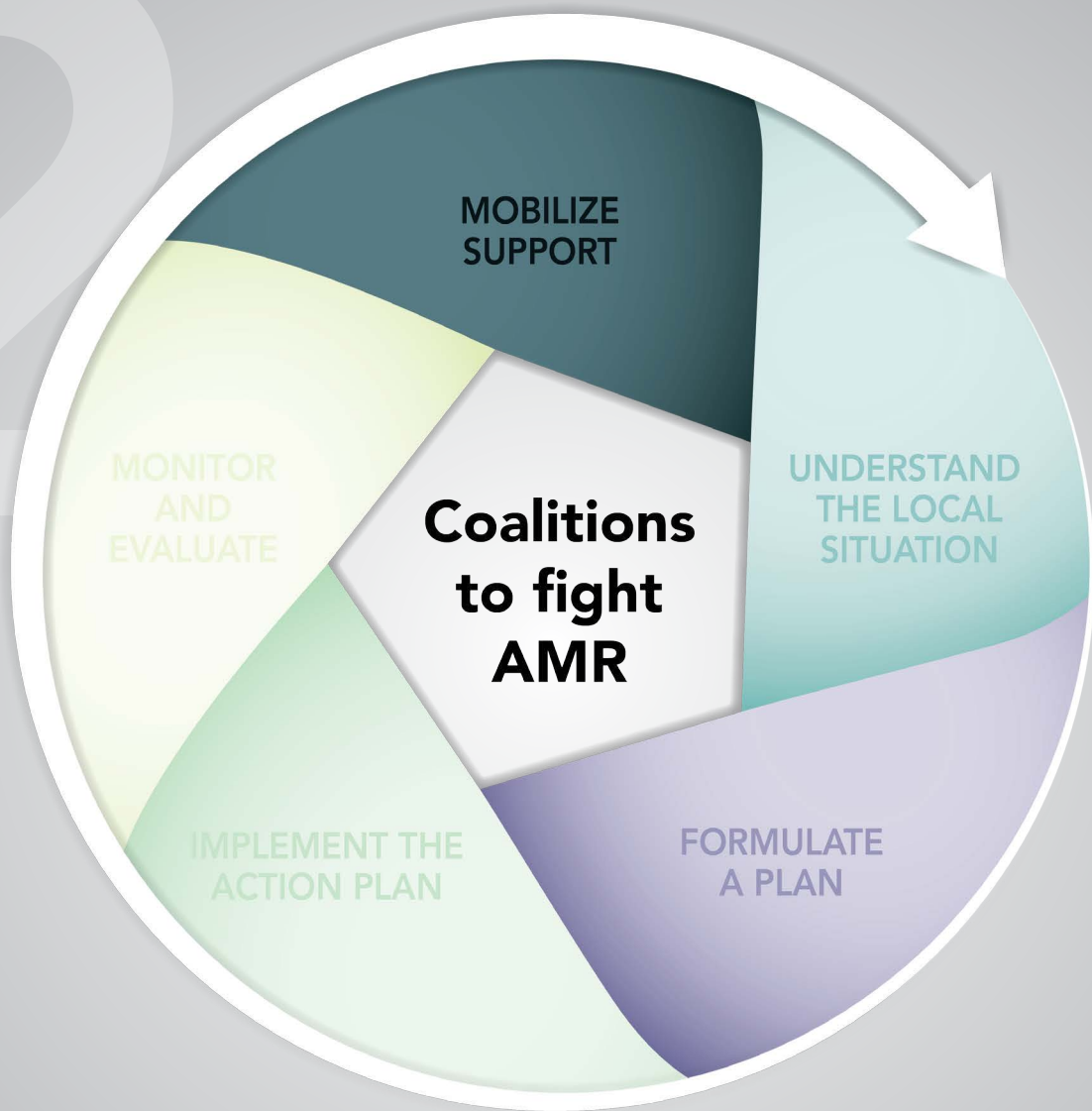
They list:

- Available tools and templates that can be used to perform the activities described in the section (the forms are found at the end of the manual)
- Skills that are helpful in carrying out the activity
- Products that can be developed either during or after the training

The tools should be adapted for local use and can be used by both individuals and groups.

Coalition building and AMR containment are ongoing activities with short- and long-term goals. The products mentioned in this guide can be produced as time and resources allow.

2



Mobilize Support

2. MOBILIZE SUPPORT

Overview

Coalitions can start in a variety of ways and at all levels. A local champion may rally others to join a cause, or a government body or task force may decide to form a coalition to advance issues that are important to public health. Regardless of the catalyst that brings the coalition into existence, the strongest coalitions are those that successfully garner widespread interest, support, and enthusiasm from their members. Mobilizing support is a key first element in building and sustaining an effective coalition.

During this initial element of coalition building, stakeholders are identified, informed, and recruited to participate in the coalition. From these stakeholders, a core subset of members will organize into a working group or champion group to plan and begin building the coalition. If the interest and concern are not sufficient to catalyze the group or engage stakeholders, it may be necessary to conduct further advocacy activities to form the core group or reduce barriers to progress.

New coalitions benefit from structure early on. Developing terms of reference (TOR), which describe the purpose and structure of a project and a scope of work, will provide a shared and clear purpose. As the coalition begins to form, be explicit about how decisions are made and how roles and responsibilities assigned. As the coalition grows and new members are added, you will need to nurture continued consensus on the mission and vision.

This section presents guidance on how to identify and mobilize stakeholders to address the factors that affect AMR. Key components include:

- Identifying key stakeholders
- Gauging stakeholder interest and participation
- Kicking off the coalition
- Organizing a core working group
- Establishing group procedures
- Moving the advocacy process forward



Tools, Knowledge and Skills, and Products

Tools	<ul style="list-style-type: none">• Form 1. Stakeholder Identification Worksheet on page 67• Form 2. Stakeholder Contact List on page 68• Form 3. Stakeholder Interview Guide on page 69• Form 4. Sample Invitation for Kickoff Meeting on page 71• Form 5. Sample Agenda for Kickoff Meeting on page 72
Knowledge and skills	<ul style="list-style-type: none">• Understand AMR and be able to articulate related issues• Understand AMR containment in both local and global contexts• Be able to articulate the goals of the initiative and benefits of coalitions as opposed to individual actions
Products	<ul style="list-style-type: none">• List of relevant stakeholders• Stakeholder contact sheet• TOR for the core working group

Identify Key Stakeholders

Identifying those individuals with a vested interest in the coalition who will act as champions provides catalysts that will drive the work of the coalition. These champions, along with others with a keen interest in AMR, will be critical in creating the core working group, which provides an overall strategic vision for the coalition. Brainstorming with colleagues from different backgrounds and diverse networks is an efficient way to develop the initial list of potential members for both the core working group and the coalition. It is important to remember that AMR stakeholders come from multiple sectors and disciplines and that diverse participation will strengthen the coalition.

Box 2. Who Are AMR Stakeholders?

AMR stakeholders are key players affecting or impacted by medicine resistance. They include WHO, Ministries of Health (MoHs), donors, the public and private sectors, nongovernmental organizations (NGOs), consumers, professional societies, the pharmaceutical industry, academia, and the media. AMR stakeholders can be interested in one condition, such as malaria, TB, pneumonia, or AIDS; in one aspect of AMR, such as antimicrobial stewardship or infection control; or in AMR in general.

Contact key potential stakeholders (box 2) to explain the initiative. [Form 1. Stakeholder Identification Worksheet](#) can be used as a guide to ensure that stakeholders represent a broad spectrum of AMR interests and concerns. The form helps identify which of the five AMR-related areas a stakeholder may best represent—pharmaceutical management, medicine use, laboratory services and surveillance, infection control and disease prevention, and advocacy.

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 that focus on infectious diseases or medicine resistance might be interested in initiating the process.

Below is an example of the stakeholder identification process that was part of the AMR coalition-building activity in Rwanda.

Country Example 1. Stakeholder Identification Worksheet: Rwanda

Stakeholder category	Potential stakeholders within these categories	Stakeholder groups identified	Dimension				
			Pharmaceutical management	Medicine use	Lab services and surveillance	Infection control and disease prevention	Advocacy
Decision makers and politicians	MoH	<ul style="list-style-type: none"> Pharmacy task force Quality care desk Hygiene desk Decentralization desk 	X	X		X	X

Continued...

Stakeholder category	Potential stakeholders within these categories	Stakeholder groups identified	Dimension				
			Pharmaceutical management	Medicine use	Lab services and surveillance	Infection control and disease prevention	Advocacy
	Ministry of Commerce and Industry	Rwanda Bureau of Standards					X
	Center for Treatment and Research on AIDS, Malaria, Tuberculosis, and other Epidemics	<ul style="list-style-type: none"> • Malaria • TB • HIV • Epidemiology 		X	X		X
	Maternal and child health	<ul style="list-style-type: none"> • Immunization program • Community desk • Reproductive health program 		X		X	X
Donor	Multilateral	<ul style="list-style-type: none"> • WHO • United Nations Children's Fund (UNICEF) • United Nations Population Fund 	X	X	X	X	X
	Bilateral	<ul style="list-style-type: none"> • USAID/US Centers for Disease Control and Prevention (CDC) • UK Department for International Development (DFID) 	X		X		X
Global partnerships	Global Fund country coordinating mechanism			X	X		
NGOs/private voluntary organizations (local and international)	Health and development organizations	<ul style="list-style-type: none"> • PSI/Rwanda • Catholic Relief Services • International Center for AIDS Care and Treatment Programs • University of Maryland • Family Health International • Supply Chain Management System • USAID DELIVER 	X	X	X	X	
	Community activists	<ul style="list-style-type: none"> • Diabetes Association • People Living with HIV/AIDS 					X
Health practitioners and providers (public and private sectors)	Organized health/ insurance systems	<ul style="list-style-type: none"> • Rwandaise d'Assurance Maladie • MoH/Mutuelle desk 	X	X			X
	Professional organizations (medical, microbiology, pharmacy, nursing—local and international affiliates)	<ul style="list-style-type: none"> • Rwanda Medical Association • Association of Pharmacists in Rwanda • Rwanda National Association of Nurses 					X
	Employers providing health care for employees	<ul style="list-style-type: none"> • BRALIRWA • Banque Commerciale du Rwanda • National Bank of Rwanda • Bank of Kigali 		X			
	DTCs	<ul style="list-style-type: none"> • Kabutare Hospital • Ruhengeri Hospital • Gisenyi Hospital • Rwinkwavu Hospital (Partners in Health) 	X	X	X	X	

Continued...

Stakeholder category	Potential stakeholders within these categories	Stakeholder groups identified	Dimension				
			Pharmaceutical management	Medicine use	Lab services and surveillance	Infection control and disease prevention	Advocacy
Laboratory services and AMR surveillance	National-level resources	National Reference Laboratory		X	X	X	X
	Academic institutions	• National University of Rwanda (pharmacy and medical schools)					X
		• School of Public Health • Kigali Health Institute nursing school					X X
Public- and private-sector laboratories		• Bugando Medical Centre	X	X	X	X	
		• University Teaching Hospital of Kigali					
		• Centre Hospitalier Universitaire de Butare	X	X	X	X	
		• King Faysal	X	X	X	X	
		• Polyclinique la Croix du Sud • Polyclinique la Medicale	X X	X X	X X	X X	
Educators*							
Pharmaceutical industry	Multinational and local pharmaceutical industry	• Pharmaceutical Laboratory of Rwanda	X	X		X	X
		• Centrale d'Achats des Médicaments Essentiels du Rwanda	X	X			X
	Pharmaceutical importers	• Bureau des Formations Médicales Agrées du Rwanda • Kibogora Hospital	X X	X X			X X
General public	Consumer groups	• Consumers Association					X
News media and journalists	Health reporters, radio stations, newspapers and columnists, television stations, and foreign correspondents	• Radio/TV Rwanda • Salus Radio • Contact FM Radio • Rwanda Health Communication Center/MoH • WHO/Information Desk					X X X X X

* Includes research institutions, professional training institutions and councils, and health education and training organizations.

Once stakeholders have been identified, complete and accurate contact information should be compiled. [Form 2. Stakeholder Contact List](#) can be used as a template for compiling the information. Such a list can be useful for follow-up and reference. Maintaining an up-to-date list is critical to ensure active coalition engagement and can also be helpful in encouraging information sharing among stakeholders.

Gauge Stakeholder Interest and Recruit Members

If stakeholders express interest in the coalition, follow up with additional information about the initiative and, if possible, set up an interview to discuss their participation in the AMR coalition. The interview can help determine stakeholders' knowledge, thoughts, and concerns about AMR and will help gauge their interest and potential participation level. [Form 3. Stakeholder Interview Guide](#) can be used as a template to facilitate the flow of discussion during the interview.

During the interview, bring up current or pressing AMR issues or changing circumstances, such as the introduction of a new policy or new medicines, the availability of funding, or the occurrence of deaths attributed to resistant organisms. Interviewees may also have ideas on additional participants and can contribute to ideas about perceived AMR priorities, concerns, and trends.

The example below lists the results of interviews with health facility stakeholders in Rwanda.²¹ Select responses are listed by how often they were mentioned.

Country Example 2. Top Responses from Interviews with Health Facility Stakeholders in Rwanda

What are the most significant concerns that you have with respect to treating infectious diseases in your country?

- Poor patient compliance
- Unknown or poor quality of medicines, no quality control lab
- Irrational prescribing
- Lack of availability of antibiotics

Do you know if anything is being done about these concerns?

- Standard treatment guidelines (STGs) developed
- Students provide patient training

What do you see as the main causes of AMR?

- Inadequate infection control
- Poor prescribing practices
- Poor patient compliance

What are the best solutions to the problem of AMR?

- Education for physicians
- Strengthen policies and enforcement on prescribing (including STGs)
- Training for pharmacists

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

- Online medicine information sources
- Textbooks

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

- Medicine resistance data for Rwanda
- Comparative information regarding new medicines
- Clinical trials
- Advantages and disadvantages of new medicines

Is your organization planning trainings, surveys, or public education campaigns on AMR in the next year?

- Pharmaceutical management training
- Students will provide training to patients

Coalition Kickoff

Based on the results of the stakeholder identification exercise and interviews, stakeholders can be invited to participate in a kickoff meeting ([Form 4. Sample Invitation for Kickoff Meeting](#)). The meeting should review the AMR situation globally and at the local level and include ample time to review and discuss the proposed coalition and discuss potential coalition approaches and objectives. The meeting can also be used to develop, review, or agree upon proposed TOR for the coalition and identify additional champions and/or members of the core working group.

The country example below from Ethiopia and [Form 5. Sample Agenda for Kickoff Meeting](#) provide a generic idea of the structure and content of a kickoff meeting for AMR stakeholders. The objectives of the meeting should be clear. Illustrative examples include:

- Review the AMR situation globally and locally as appropriate
- Introduce stakeholders and their concerns
- Confirm the need for action
- Introduce the goals of the AMR initiative
- Identify other potential stakeholders and partners
- Achieve consensus on the approach to be taken
- Plan for next steps, such as forming a core working group and developing key TOR documents

Country Example 3. Agenda for Kickoff Meeting for AMR Coalition in Ethiopia

Initiative to Contain Antimicrobial Resistance in Ethiopia Addis Ababa, Ethiopia First Stakeholders' Meeting March 2, 2006 (10:30 am–1:30 pm)		
Agenda		
10:30 am to 10:40 am	Welcome	Abraham G/Giorgis, Drug Administration and Control Authority (DACA)
10:40 am to 11:00 am	Introductions	
11:00 am to 11:10 am	Review of objectives of the meeting <ul style="list-style-type: none"> • 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 	Dr. Maria Miralles, MSH/RPM Plus
11:10 am to 11:30 am	Background: AMR in the world and in Ethiopia and why we are here today	Dr. Mohan Joshi, MSH/RPM Plus
11:30 am to 12:00 pm	Open discussion <ul style="list-style-type: none"> • Validity of the issue • Relevance for stakeholders • Identification of other stakeholders 	All Facilitator: Dr. Negussu Mekonnen, MSH/RPM Plus
12:00 pm to 12:30 pm	Planning for next steps <ul style="list-style-type: none"> • Need for a working group • Call to action • Communications strategy <ul style="list-style-type: none"> – Within groups – Between groups networking – Media 	All Facilitator: Dr. Mohan Joshi, MSH/RPM Plus

Organize a Core Working Group

While a diverse group of stakeholders is required for true multidisciplinary and multisectoral collaboration, it is also important to identify a core group that will directly help manage the coalition. Such a working group or champion 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 volunteer to participate in the core working group or may be nominated during the kickoff meeting. It is important to note that the core working group should not be viewed as the part of the coalition responsible for putting all coalition ideas into action. Instead, as priorities and actions are developed, technical advisory committees, task forces, and other groups can be formed to help implement coalition activities and containment interventions.

A TOR should be developed for the core working group to clarify membership, roles and responsibilities, and purpose. The TOR may be drafted in advance of the kickoff meeting and finalized as part of that meeting, or they may be drafted in subsequent meetings once the core group has been identified. Box 3 shows a sample TOR. In countries that are in the process of establishing or have already established a National Multisectoral Coordinating Group (NMCG) to combat AMR based on WHO guidance ([Annex E](#)), advocacy-oriented or non-government coalitions can complement the work of the NMCG, or in some instances effectively reorganize and evolve functionally into an NMCG-like group.

Box 3. Sample TOR for the Core Working Group

- Move the AMR advocacy process forward over the next six months.
- Participate in meetings and workshops (about one per month) at crucial decision-making points in the process.
- Review and provide comments on tools, collected information, and data analysis, as needed, to formulate a call to action to guide stakeholder actions.
- Identify potential new stakeholders and implementation partners.
- Demonstrate leadership in promoting the initiative.

The core working group typically leads key coalition activities, including conducting a situation analysis; leading efforts to gain consensus on coalition approaches, priorities, and activities; and issuing coalition statements, such as call-to-action documents. These activities are discussed in [Section 3. Understand the Local Situation](#) and [Section 4. Formulate a Plan](#).

Establish Group Procedures

Convene one or more meetings in which the core working group members decide how they plan to work and begin to define the key issues as suggested below:

- 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, such as information gathering, dates and details of 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

Garnering support and raising awareness on the importance of AMR is an ongoing process that typically occurs throughout the life of the coalition and changes as the context or the coalition itself evolves.

[Annex B](#) and [Annex D](#) contain a WHO fact sheet and starter set of slides on AMR, respectively, that may be adapted and used to help support these early advocacy activities. The list below provides illustrative examples of activities that can be used to mobilize support and advance advocacy and awareness:

- 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 call-to-action or a similar advocacy document to disseminate during the coalition-building process ([Section 4. Formulate a Plan](#)). Look for opportunities to distribute the document by piggy-backing with in-country meetings organized for other purposes. [Annex G](#) includes examples of documents developed by country- and regional-level groups. [Annex H](#) provides an advocacy tool for infection control in hospitals. Note that some of these examples include messages for specific audiences. Including such targeted messages can improve the chances of engaging specific groups.
- Develop a contact list of stakeholders ([Form 2. Stakeholder Contact List](#)) and disseminate information on AMR 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 educate donors. Mobilizing funding for coalition support and AMR interventions is important ([Section 5. Implement the Action Plan](#)). Making sure donors are aware of the problem of AMR and how it will impact their existing programs will help build 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.)
- Interact with stakeholders during the evidence-gathering phase ([Section 3. Understand the Local Situation](#)) to engage them in the process.
- Organize an AMR summit or a similar high-level meeting where key stakeholders make written commitments to the cause of containing AMR (see [Country Example 4](#)).

Country Example 4. Written Commitments by High-level Participants during an AMR Summit in South Africa

The National Department of Health of South Africa organized an AMR Summit in Johannesburg on October 16, 2014, in collaboration with SIAPS. The Director General of Health chaired the meeting and the MoH showed high-level support by attending the meeting. The objective of the summit was to obtain commitment from stakeholders and work within the spirit of intersectoral collaboration to combat AMR. This spirit was evidenced by participation of the representatives of the Department of Agriculture, Forestry and Fisheries and the Department of Sciences and Technology as well as those from universities, the private sector, regulatory bodies, civil societies, and other partners. A commitment poster was developed based on the strategic objectives of South Africa's Antimicrobial Resistance National Strategy Framework 2014–2024 and was signed by key stakeholders during the summit to pledge their support for implementing the strategy.²²

Antimicrobial Resistance National Strategy Framework Commitments

The purpose of the Antimicrobial Resistance National Strategy framework is to provide a framework for managing Antimicrobial Resistance (AMR), to limit further increases in resistant microbial infections, and improve patient outcomes.

Strategic objectives	Governance Structures			Commitments	Time Frames & Actions
	Strengthen, coordinate and institutionalise interdisciplinary efforts through national and health establishment level governance structures	Surveillance Optimise surveillance and early detection of antimicrobial resistances to enable reporting of local, regional, and national resistance patterns to optimise empiric and targeted antibiotic choice	Infection Prevention & Control Enhance infection prevention and control of the spread of resistant microbes to patients in healthcare settings, focusing on improvement in hand hygiene and the identification and isolation of patients with resistant organisms. Community measures include preventing infection through wide-reaching vaccination programmes and improvements in water and sanitation.		
Strategic enablers	Legislative and policy reform for health systems strengthening to support the quality of antimicrobials in the country and to enable control over prescribing of antimicrobials in the animal health sector.			1. To collaborate as intersectoral, interdisciplinary organisations and departments to strengthen, co-ordinate and institutionalise efforts to address Antimicrobial Resistance	Short term – March 2015: Establishment and initial meeting of National Ministerial Advisory Committee Short to medium term 2015 - 2019: Strengthen governance at Health Establishment levels
	Education of all levels of health providers in human health and agriculture in the critical concepts of antimicrobial stewardship, infection control, infectious diseases, microbiology and pharmacology			2. To establish a national surveillance system to track and report resistant organisms and Antimicrobial use in agriculture and human health	Short term 2015 - Develop an Antimicrobial Resistance map for South Africa through data sharing between the private and public sector laboratory services
	Communication to educate the public, create awareness of the dangers of inappropriate antimicrobial use and enhance patient advocacy to combat antimicrobial resistance.			3. To enhance the processes, structures, resources and supplies needed for effective Infection Prevention & Control	Short term 2015 - Ensure the equipment and Infection Prevention & Control resources required to practice effective hand hygiene are available at all times in all Health Establishments
	Research into novel diagnostics, such as point of care testing, new antimicrobials and implementation of treatment guidelines (treatment duration, antimicrobial consumption).			4. To promote the appropriate use of Antimicrobials in human and animal health through antimicrobial stewardship in facilities and suitable enabling legislation and regulations	Short term 2015 - Ensure availability of Antimicrobials according to Essential Medicines List in all Health Establishments Medium term 2016 - 2019 - Review of antimicrobials use in feed additives
				5. To build the expertise and strengthen the competency of health and veterinary professionals and improve the staffing levels of the workforce in Antimicrobial Resistance and Infection Prevention & Control	Medium term 2016 - 2019 - Development of strategy and operational plan for the integration and implementation of Antimicrobial Resistance and Infection Prevention & Control training into the undergraduate and post graduate medical curriculums of health care professionals in South Africa
				6. To increase the community awareness of Antimicrobial Resistance	Short term 2014 - 2015 - Design of an awareness campaign relating to Antimicrobial Resistance based on past successful campaigns
				7. To promote research into novel diagnostics and clinical trials in Infection Prevention & Control and Antimicrobial Resistance	Long term 2019 - 2024 - Defined research opportunities

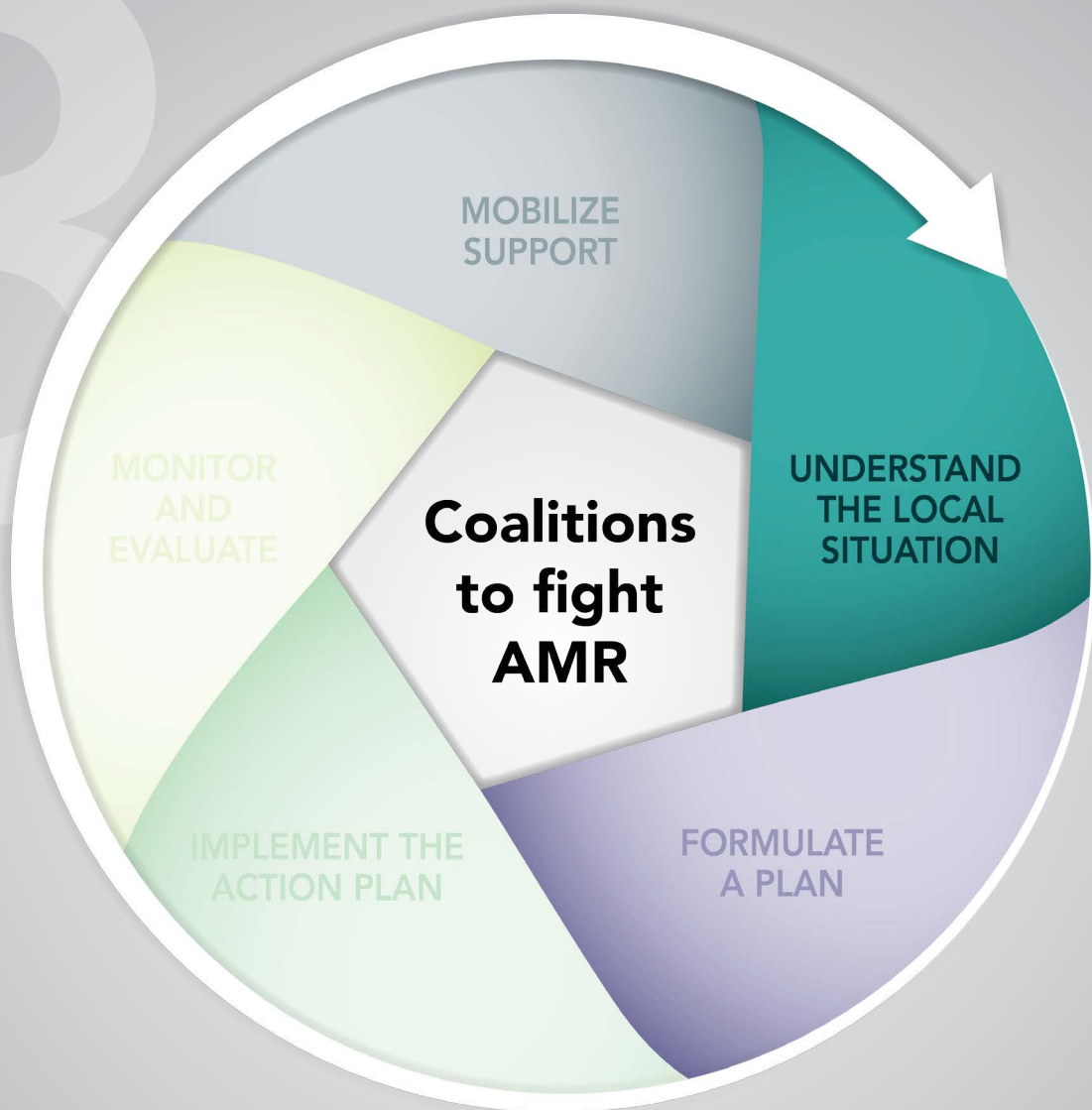
National Department of Health of the Republic of South Africa
and
Participating Stakeholders from Various Sectors, each Company represented herein as follows:

GOVERNMENT	LABORATORY SERVICES	CLINICIAN SOCIETIES	CIVIL SOCIETY	REGULATORY SOCIETIES

Signed on this 16th day of October 2014 in Johannesburg as The Antimicrobial Resistance National Strategy Framework Commitments

South Africa AMR National Strategy Framework Commitments
Courtesy: South Africa National Department of Health





Understand the Local Situation

3. UNDERSTAND THE LOCAL SITUATION

Overview

Understanding the local AMR and antimicrobial use situation and other important contextual factors in which the coalition will operate is critical to its success. This element of coalition building solidifies coalition goals and will inform advocacy, communication, and prevention and containment strategies.

This section describes methods and tools that can be used to compile, analyze, and present information about the local AMR situation and potential information gaps. This information gathering and analysis activity is usually one of the first actions of a coalition.

This section provides guidance on:

- Compiling and assessing AMR-related information, including:
 - Pharmaceutical management information
 - Medicine use behaviors
 - Surveillance capacity
 - Infection prevention and control
- Conducting a stakeholder analysis
- Assessing media presence and communication channels

While this section provides information to help coalitions assess these AMR-related areas in the human health sector, additional understanding of agricultural, veterinary, and environmental factors may be necessary and should also be included in a situational analysis as appropriate. Such an inclusive information-gathering process will support the “One Health” approach.

Collecting and Compiling Information

AMR-related topics are often interrelated, and information on a range of topics may be found in the same source. Although information on a wide range of topics is necessary for a complete picture, the coalition may need to prioritize what it can do initially based on available resources. This section will review key areas of importance; however, there may be other areas to consider assessing as well. The results from an initial attempt to collect information can help bolster the core working group’s efforts to champion the cause and leverage more resources to collect any remaining information.

Gathering information may be delegated to different individuals or agencies or to a single individual. In general, an assessment of the local context should include a thorough review of relevant documentation (including published literature), key informant interviews, and review of other relevant available data (e.g., culture and sensitivity records). The methodology used for these information-gathering exercises comprises document reviews and key informant interviews. Basic guidance on these methods is presented in [Annex I](#).

Stakeholders of the country-level AMR advocacy and containment initiative in Ethiopia conducted a baseline assessment to map the magnitude of AMR and contributing factors to inform further action. [Country Example 5](#) summarizes the methods and results of this assessment.²³ This exercise paved the way for the development of a context- and evidence-based action plan to build advocacy and action around the issue of AMR in Ethiopia.

Country Example 5. Methods and Results of a Baseline Assessment of AMR in Ethiopia

Methods

- Reviewed literature on infectious diseases, antimicrobial prescribing, and usage practices in humans and animals
- Reviewed content of health professionals' courses on AMR containment
- Interviewed in-charges and made observations of cross-sectional survey of AMR containment practices in 73 public health facilities
- Interviewed 675 health practitioners from those 73 health facilities to study their antimicrobial prescribing and dispensing practices
- Performed exit interviews with 1,761 clients on their knowledge on medicines dispensed and perceptions of antibacterial use
- Reviewed 52,682 culture and antibacterial sensitivity records (five years' worth of data)
- Assessed antibacterial prescribing from surgical and medical wards and outpatient prescriptions from systematic samples of 100 records from each health facility

Results

- Of the 52,682 culture and antibacterial sensitivity records, 35.1% showed growth of microorganisms with varying levels of resistance. *Escherichia coli* were resistant to amoxicillin (70%), tetracycline (75%), and penicillin G (88%) while *Staphylococcus aureus* were resistant to vancomycin (18.3%).
- A preservice course content review of health professionals' AMR training showed gaps that can be addressed.
- Key antibacterials, infection prevention materials, and STGs were available in 73%, 82.9%, and 61% of health facilities, respectively.
- Antibacterial prophylaxis was prescribed for 75.9% of surgical procedures in more doses and for a longer duration than is normally recommended.
- Antibacterials were prescribed to 70.6% of medical inpatients.
- Providers' adherence to STGs for treating pneumonia was only 19.6%.
- Providers have reported the existence of nosocomial infection, but actions to contain it are very limited.
- Patients' knowledge of route, dose, frequency, and duration of administration for the dispensed antibacterials was 82%, while 40.2% and 36.3% knew that antibacterials are not used for watery diarrhea and the common cold, respectively.

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.

Most of the information is obtained by reviewing existing documents and conducting key informant interviews. Interviewees should include representatives from the MoH, including the 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.



Tools, Knowledge and Skills, and Products

Tools	<ul style="list-style-type: none"> • Form 6. List of Documents for Review on page 73 • Form 7. Document Review Template on page 74 • Form 8. Questions for Document Review and Interviews on page 75 to guide collecting information on pharmaceutical management issues that relate to AMR
Knowledge and skills	<ul style="list-style-type: none"> • Experience and skill in conducting key informant interviews • Adequate depth of knowledge of the pharmaceutical sector • Creating an environment that will allow senior MoH staff to feel comfortable sharing information
Product	<ul style="list-style-type: none"> • A report summarizing findings, including gaps and priority areas for action

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. Missing or unavailable information should be noted as a 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 questions in [Form 8. Questions for Document Review and Interviews](#) 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. Questions for Document Review and Interviews](#) as a guide to structure a report and ensure that the main areas of pharmaceutical management—selection, procurement, use, and policy and legal framework—are addressed.

[Annex J](#) provides an example of a report detailing the findings of a pharmaceutical management assessment conducted as a part of the country-level AMR advocacy and containment initiative in Zambia.²⁴

Highlight potential opportunities for action, which may be further differentiated according to the following categories:

- Easy to address with few or no additional resources or discussion
- Requires some discussion with stakeholders but few 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 to coalition members for review and discussion. The findings should guide thinking on priorities and next steps.

[Country Example 6](#) gives a summary of the priority actions and corresponding stakeholders that a coalition in Zambia identified after reviewing and discussing their pharmaceutical management rapid assessment.

Country Example 6. Priority Activities Based on Rapid Assessment in Zambia

- Incorrect prescribing and dispensing of antimicrobials is often due to diagnostic limitations and unavailability of recommended medicines.
- STGs, formulary management, and DTCs are useful tools for promoting rational prescribing. These interventions have been introduced in Zambia. However, further action is needed to improve on their usefulness by:
 - Evaluating the performance of existing DTCs and reducing barriers to their effective performance (action: MoH/Central Board of Health [CBoH])
 - Developing and implementing a dissemination plan for STGs and essential medicines lists (EMLs) in the public and the private sectors (action: MoH/CBoH)
 - Ensuring that health workers at all levels are trained (preservice and in-service) on the use of STGs, EMLs, and 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)
 - Strengthening the medicine supply systems to ensure a regular supply of good quality, essential medicines, including developing a long-term financial sustainability plan (action: MoH/CBoH)
- Self-medication for some common problems is taken inappropriately for various reasons, including convenience, cost, and lack of knowledge. It is very likely that, as a result, people are taking the wrong medicines, including antimicrobials, in incorrect doses for the wrong duration. To preserve the effectiveness of these medicines, it is necessary to:
 - Educate the public about the risk of developing resistance due to inappropriate medicine use through media campaigns, school activities, and other behavior change communication activities (action: MoH/CBoH, health professionals, and all health workers)
 - Encourage patients to adhere to prescribed and dispensed medicines (action: all health workers)
 - Encourage medicine vendors to adhere to regulations (action: MoH/CBoH, Pharmacy and Poisons Board)

Table 1 presents the key concepts, rationale, and broad outline of the topics covered by the pharmaceutical management and supply assessment.

Table 1. Key Pharmaceutical Management Concepts, Rationales, and Common Factors

Key concept	Rationale	Common factors relevant to the key concept
Medicine policy	Medicine 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.	Existence of: <ul style="list-style-type: none"> • National medicine policy • National STGs, including mechanisms for updating STGs, guidelines for treatment failures and medicine resistance, and guidelines for different levels of care • National EML • Information sources used in developing medicine policies • Stakeholders involved in developing medicine policies
Regulatory environment	Legislation and regulatory authorities support and enforce implementation of the medicine policy.	<ul style="list-style-type: none"> • Existence of legislation or regulations covering selection, procurement, use, and promotion of medicines • Agencies enforcing regulations and evidence of enforcement

Continued...

Key concept	Rationale	Common factors relevant to the key concept
Selection and procurement	The selection of medicines influences medicine supply; medicine quality influences treatment effectiveness.	<ul style="list-style-type: none"> • Whether the national EML is based on national STGs • Whether a policy limits pharmaceutical procurement in the public and private sectors to medicines included in the EML • Whether recommended first-line medicines for treatment of key infections are included in the EML • Whether recommended second-line medicines for treatment of key infections are included in the EML • Pharmaceutical quality assurance strategies
Management support	Management support enhances pharmaceutical management capacity.	<ul style="list-style-type: none"> • Existence and function of a separate body or committee (national or ad hoc) for the containment of AMR • Existence of infection control strategies in primary care settings • Existence and functions of DTCs • Existence and functions of medicine information center(s) • Existence and functions of adverse drug reaction monitoring systems • Existence and functions of infection control committees in hospitals
Education and training on use	Education can promote appropriate medicine use. Education and the availability of unbiased information on medicines may counteract inappropriate medicine promotion activities.	<ul style="list-style-type: none"> • Whether continuing education is provided for health professionals and whether antimicrobial use and resistance issues are addressed • Whether rational antimicrobial use and AMR topics are adequately addressed in the curricula for medical, pharmacy, pharmacy assistants, nurses, and health workers • Whether and what types of provisions exist for public education on antimicrobial use, AMR, and the link between the two

Medicine Use Behaviors (Prescribers, Dispensers, Consumers)

Medicine use is the key driver of AMR. 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 acute respiratory infections, diarrhea, malaria, sexually transmitted diseases, HIV/AIDS, and TB, that are managed at health facilities and specialized clinics, and more serious infections that may require hospitalization, such as sepsis, severe malaria, and pneumonia. 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

Tools	<ul style="list-style-type: none"> • Form 3. Stakeholder Interview Guide on page 69 • Form 7. Document Review Template on page 74 • Form 8. Questions for Document Review and Interviews on page 75 • Form 9. Document Review Guide for Medicine Use Behaviors and Underlying Causes on page 82
Knowledge and skills	<ul style="list-style-type: none"> • Experience in collecting data (e.g., conducting interviews, reviewing documents, analyzing data, writing reports) • An understanding of medicine use behavior, assessing behavior, and identifying inappropriate behaviors
Product	<ul style="list-style-type: none"> • A report on medicine use behaviors of prescribers, dispensers, and consumers

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

- Prescriber assesses treatment and counsels patient/caretaker appropriately.
- Dispenser has 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 if treatment fails.

These behaviors are influenced by:

- 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 characterized many of these factors, they may not have been examined from the perspective of their influence on medicine use behavior. Table 2 presents key concepts in understanding medicine use behavior, its relevance, and the corresponding factors that commonly contribute to the behaviors.

Table 2. Key Medicine Use Behavior Concepts, Rationales, and Common Factors

Key concepts	Rationale	Common factors relevant to the key concept
Medicine use behaviors	<p>Assessing the way that actual patterns of treatment for the target infections differ from recommended or reported treatments can highlight key problem areas.</p> <p>All health providers who treat the target infections should know the recommended treatments.</p> <p>Antimicrobials are often available without prescription. Staff in private retail outlets should know and recommend appropriate treatments.</p>	<ul style="list-style-type: none"> • Antimicrobial treatment reported as usually used for patients with a common symptom or for the target infections • Reported frequency of use of STGs, formulary, generic medicines, and recommended antimicrobials for target infections • Lab tests and antimicrobial treatment used for a sample of cases seen with each common diagnosis or symptom scenario for the target infections • Self-medication practices
Resources and services	<p>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.</p>	<ul style="list-style-type: none"> • Presence of infectious disease specialist, and availability and frequency of meetings of infection control committees and DTCs • Availability of EML, formulary, STGs, and appropriate lab services for the target conditions • Supervision of prescribing practices
Availability of key antimicrobials	<p>Unreliable availability of the antimicrobials for target infections in health facilities and pharmacies can lead to inappropriate treatment.</p>	<ul style="list-style-type: none"> • Current availability of recommended first-line and other antimicrobials commonly used to treat the target infections • Recent availability of key recommended antimicrobials • Common sources for antimicrobials

Continued...

Key concepts	Rationale	Common factors relevant to the key concept
Consumption of key antimicrobials	Data on relative volumes of use of different antimicrobials can point to problems in underuse or overuse of specific medicines.	<ul style="list-style-type: none"> • Volume used in previous year • Relative purchase levels in previous week • Most commonly sold antimicrobial for treating target infections
Knowledge and attitudes about AMR	All health providers and staff in private retail outlets should have a basic knowledge about the existence, causes, and consequences of AMR.	<ul style="list-style-type: none"> • Awareness of AMR, attitude about its importance, opinion about causes, and perceptions about treatment failure • Prior training on appropriate antimicrobial use and AMR • Communication channels

Guidance for Data Collection

Use [Form 9. Document Review Guide for Medicine 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. Document Review Guide for Medicine Use Behaviors and Underlying Causes](#) to answer the following questions:

- For each of the five behaviors, what factors are positively influencing medicine use behavior? 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?
- From the data you have, do any trends suggest that some behaviors play a more important role than others regarding AMR? Which behaviors? What roles? What does this information imply in terms of an AMR strategy?
- Discuss limitations of the data by conditions represented, sectors, level of care (including self-medication), geographical location, age group, and population. Which information was available but not sufficient? Summarize the recommendations found in studies that were reviewed.
- Does the synthesis of reviewed studies' information give a different impression than the individual or the disease-specific studies?

Examples of Potential Action Points

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

- Developing and implementing a continuing medical education program on appropriate use of antimicrobials and AMR
- Developing printed educational materials for medicine sellers on appropriate antimicrobial dispensing
- Prepacking medicines to improve case management of infectious diseases

Surveillance Information and Capacity Assessment

Functioning AMR surveillance systems provide data that guide the development of treatment guidelines and signal the need to change 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.

Major concepts relevant to AMR containment and prevention from the perspective of surveillance are presented below (table 3).



Tools, Knowledge and Skills, and Products

Tools	<ul style="list-style-type: none"> • Annex K. Data Collection Tables on page 170 • Form 10. Antimicrobial Resistance Levels and Trends on page 84 • Form 11. Interview Guide on AMR Surveillance on page 85 • Form 12. Interview Guide for Reference Laboratories on page 86 • Form 13. Interview Guide for Microbiology Laboratories on page 88
Knowledge and skills	<ul style="list-style-type: none"> • Understand and interpret information on AMR levels and trends • Familiarity with the pathogens being tested for resistance and the laboratories that are conducting the susceptibility testing • Knowledge of sources of local surveillance data and surveillance methodologies
Product	<ul style="list-style-type: none"> • A report that briefly describes AMR surveillance activities in your country

Table 3. Key Surveillance Information and Capacity Concepts, Rationale, and Common Factors

Key concept	Rationale	Common factors relevant to the key concept
AMR levels and trends	Correct treatment and appropriate medicine selection guidelines should reflect local resistance levels.	<ul style="list-style-type: none"> • AMR levels and trends (published and unpublished sources) for key infections
Laboratory capacity	The ability to generate quality data is necessary to support AMR surveillance.	<ul style="list-style-type: none"> • Availability of public and private laboratories conducting antimicrobial susceptibility testing on key pathogens • Use of laboratory quality standards • Communication between laboratories • Training
Reference laboratory	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.	<ul style="list-style-type: none"> • Existence of reference laboratories for key pathogens
Use of data	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.	<ul style="list-style-type: none"> • Quality and use of AMR data • Aggregation of data from other laboratories

Guidance for Data Collection

Transfer the results of your literature search on AMR levels and pathogen trends 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 the best people to meet with.

Complete interviews using [Form 11. Interview Guide on AMR Surveillance](#); [Form 12. Interview Guide for Reference Laboratories](#); and [Form 13. Interview Guide for Microbiology Laboratories](#).

[Annex L](#) has a report of the findings on AMR surveillance information and capacity assessment conducted as a part of the country-level AMR coalition in Zambia.

Product Preparation

Prepare a report that briefly describes AMR surveillance activities in your country. Include important contributions as well as limitations and 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 be included. 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 sectors. 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 sectors have maintaining equipment and supplies.

Outcome/impact: Document and summarize information on the type, volume, and quality of data generated from reference and other laboratories. Document and summarize data on quality assurance activities. Discuss the 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, 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](#) and [Table 7](#).

Infection Prevention and Control

Infection prevention and control (IPC) limits the development and spread of antimicrobial resistance, preserves the therapeutic effectiveness of currently available antimicrobial agents, and improves patient safety.²⁵ By preventing cross-infection with resistant organisms, particularly among patients in health care facilities, and reducing the use of antimicrobials, infection control reduces the opportunity for medicine resistance to develop or spread.

Hospitals are a critical component of the AMR 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 IPC practices, such as hand washing before and after contact with patients, is a common cause of infection spread in hospitals and health facilities. Hospitals are also the eventual site of treatment for many patients with severe infections due to resistant pathogens acquired in the community.²⁶

IPC is a fundamental intervention to prevent the emergence and spread of AMR in hospitals and other health facilities. Conducting a self-assessment of current IPC practices can help identify potential opportunities for action.^{27, 28}



Tools, Knowledge and Skills, and Products

Tools	<ul style="list-style-type: none"> Annex F. Infection Control Assessment Tool (Hand hygiene module provided)
Knowledge and skills	<ul style="list-style-type: none"> Understanding IPC standards and best practices Experience collecting data (conducting interviews, reviewing documents, carrying out self-assessment); analyzing data; and writing reports
Product	<ul style="list-style-type: none"> A report that briefly describes IPC practices, behaviors, and knowledge in your country

Table 4. Key IPC Concepts, Rationale, and Common Factors*

Key concept	Rationale	Common factors relevant to the key concept
Hand hygiene	Neglecting to follow appropriate hand washing practices before and after contact with patients is a common cause of infection spread in hospitals and health facilities	<ul style="list-style-type: none"> Availability of hand washing stations Awareness of the importance of hand hygiene
Waste management	Proper waste management reduces the risk of transmission of infectious diseases	<ul style="list-style-type: none"> Existence of explicit protocol and specific policies on handling contaminated waste Evidence or lack of implementation protocols and policies on contaminated waste management Training of clinical, laboratory, support, and administrative staff on effective waste management
Surgical antibiotic use	Evidence-based use of antibiotics for surgical prophylaxis can dramatically reduce the incidence of surgical site infections; however, their inappropriate and excessive use for surgical purposes can also contribute to the development of antimicrobial resistance	<ul style="list-style-type: none"> Out-of-date treatment guidelines or policies Lack of availability or awareness of or adherence to standard treatment guidelines
Sterilization and disinfection of equipment	Inappropriate sterilization or disinfection procedures or practices can spread infectious disease between patients in hospital settings	<ul style="list-style-type: none"> Existence of written policies or procedures on sterilization and disinfection of equipment Level of effective implementation of the approved policies and procedures Formal training of related staff to ensure that practices conform to recognized standards
Injections	Unsafe injection practices can cause sepsis and even transmit serious infections, such as HIV and hepatitis B and C	<ul style="list-style-type: none"> Training and behavior change communication strategies for patients and health care workers to decrease injection overuse and achieve injection safety Availability of necessary equipment and supplies Management of waste sharps

* In addition to those illustrated in this table, other key concepts pertain to isolation and standard precautions, labor and delivery, surgical equipment procedures, surgical area practices, intensive care units, pharmacy, microbiology laboratory, intravenous fluids and medications, airway suctioning, and intravenous and urinary catheters. Simple self-assessment tools can be used to map where a facility stands with regard to each of these aspects of IPC and what remedial actions are needed.^{29, 30}

Country Example 7 presents the results of a self-assessment of the status of hand hygiene at Prince Faisal Hospital in Jordan. The assessment was done in 2012 by a team comprising staff from the Quality Control, Infection Control, and Nursing Development and Education Units of the hospital along with SIAPS technical staff.³¹

Country Example 7. Findings of a 2012 Self-assessment on Hand Hygiene at Prince Faisal Hospital in Jordan That Used the Infection Control Assessment Tool (ICAT); see Annex F for details on the hand hygiene module of the tool

IPC area assessed	Score	Possible Total	%	Rating	Major IPC issues to be addressed
Hand hygiene					
Equipment and supplies	13	19	68%	B	No sinks on ward visited. Sinks available at nursing station outside of wards. No towels available. No hand lotion available.
Practices	7	11	64%	B	No charts or posters to guide hand hygiene practices.
Total for hand hygiene	20	30	67%	B	

Rating Guide

A — Recommended practices are followed consistently and thoroughly

B — Recommended practices usually followed

C — Training and follow-up needed on recommended practices

Guidance for Data Collection

In consultation with senior facility management, a member of the core working group in charge of leading the IPC assessment should identify a multidisciplinary team to take part in the assessment process. This team should including physicians, nurses, and at least one other appropriate infection control partner, such as a quality improvement representative, pharmacist, or microbiologist. An initial meeting with the identified team should be convened to present an overview of the assessment and to discuss viable approaches for improving infection control quality. At the meeting, the team can:

- Agree on assessment objectives
- Plan the assessment process
- Prepare observation checklists
- Establish a schedule for meetings and targets during the process
- Assign individual assessment topics to team members
- Determine which facility staff (as identified in the assessment plan) will be the most appropriate to approach to complete interviews or observations for individual modules

Product Preparation

Document the results of any infection control assessments in a report that describes the facilities assessed (including the rationale for selecting those facilities); the areas of IPC assessed (e.g., waste management, hand washing); the results from the assessment; and specific recommendations for improvement. The assessment results should be discussed first within the assessment team and then in a face-to-face meeting with facility management. The assessment can then be used by the coalition to determine possible areas for action.

Examples of Potential Action Points

Areas of potential action for the coalition may include:

- Revising or introducing new IPC policies
- Reviewing and updating standard prophylaxis and treatment guidelines for infectious diseases
- Conducting trainings on new or existing IPC standards to improve awareness and compliance
- Introducing, revising, or strengthening IPC record keeping, reporting, and surveillance tools and mechanisms

Conduct Stakeholder Analysis

Understanding the stakeholders related to AMR is required for strategic planning for advocacy and building a strong coalition. [Country Example 1](#) presents an example of a stakeholder identification worksheet filled out to map the existing AMR-related players in Rwanda.

Start by reviewing an existing list of stakeholders and any interviews that have been conducted. If additional stakeholders have been identified during the interview process or the kickoff meeting, they should be added to the list of potential interviewees.



Tools, Knowledge and Skills, and Products

Tools	<ul style="list-style-type: none"> • Form 1. Stakeholder Identification Worksheet on page 67 • Form 3. Stakeholder Interview Guide on page 69 • Form 14. Stakeholder Prioritization Worksheet on page 90
Knowledge and skills	<ul style="list-style-type: none"> • Experience extracting information from documents and reports • In-depth interviewing skills (ability to probe for information) • A broad perspective of medicine resistance
Product	<ul style="list-style-type: none"> • A report that describes the main characteristics of key stakeholders

Guidance for Data Collection

Insights on stakeholders can be obtained by mapping them according to important characteristics or qualities. With the information that has already been collected as part of the stakeholder identification exercise ([Form 1. Stakeholder Identification Worksheet](#)) and the interviews ([Form 3. Stakeholder Interview Guide](#)), 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.

Country Example 8 contains key characteristics of some major stakeholders in Zambia that the rapid assessment and stakeholder analysis identified in 2004.

Country Example 8. Key Stakeholder Characteristics Related to AMR in Zambia

Stakeholder	Role in AMR	Interest in AMR	Knowledge of the issues and solutions	Position	Perceived impact of issue on stakeholder	Area of influence
National Malaria Control Center	Leadership, provide data	High	High	Supportive	High	Advocacy, technical
WHO	Provide evidence and other technical support and leadership	High	High	Supportive	High	Advocacy, technical, finance

Continued...

Stakeholder	Role in AMR	Interest in AMR	Knowledge of the issues and solutions	Position	Perceived impact of issue on stakeholder	Area of influence
Faculty of General Practitioners	Peripheral	Medium	Medium	Non-mobilized	Medium	Technical, advocacy
Pharmacy and Poisons Board	Regulatory, provide data	High	High	Supportive	High	Advocacy, implementation of interventions, regulatory
CBoH	Leadership, provide data, lend authority to decisions and actions	High	High	Supportive	High	Advocacy, implementation of interventions
Madison Insurance	Pressure insurers to take interest and act on AMR	Medium	Low	Non-mobilized	Medium	Advocacy, implementation of interventions
National HIV/AIDS/STI/TB Council	Leadership, develop guidelines	Low	High	Non-mobilized	Low	Advocacy, development and implementation of interventions
Alliance for the Prudent Use of Antibiotics	Provide data and other technical support, advocacy	High	High	Supportive	High	Advocacy, peer guidance, research
UNICEF	Provide data, leadership	High	High	Supportive	High	Advocacy, technical, finance
Interchem	Pharmaceutical supply and management, technical support	Medium	Low	Non-mobilized	Medium	Pharmaceutical supply and quality
Churches Health Association of Zambia	Pharmaceutical supply management, technical support, provide data	High	High	Supportive	High	Advocacy, pharmaceutical supply, implementation of interventions

Note that some stakeholders with high influence may not consider AMR an urgent problem while others may be very concerned about AMR but have less influence. Although [Form 14. Stakeholder Prioritization Worksheet](#) assesses influence and urgency, you can use other variables as well. For example, look at the stakeholders who were considered essential to see how many of them thought AMR was urgent. Another topic to map might be the degree of motivation by stakeholders and the availability of resources (e.g., people, funds, materials).

Product Preparation

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

- Which groups think AMR is a problem?
- Which consider it an urgent problem?
- Which stakeholders are making the link between medicine resistance and their activities?
- Which are 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 coalition members for review and discussion. The findings should guide thinking on priorities and next steps.

[Annex M](#) contains a summary report of the interviews conducted to identify stakeholder perceptions regarding the issue of AMR in Zambia.

Examples of Potential Action Points

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

Map Media and Communication Channels

Part of coalition building and mobilizing for action is 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 with a variety of roles, advocacy activities should follow a strategy that incorporates different modes of communication, matches the message with the intended audience, and uses appropriate technologies. Messages can include general information and educational messages about AMR for professionals and laypersons; communications can include what has been done and what is planned for funders, partners, and the general public.

[Annex N](#) shows examples of messages and related actions developed by workshop participants for different audiences, including the public, health institutions, and health systems.

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 achieve 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.

Assessing media resources and information and communication channels will help the AMR initiative develop optimal advocacy and communication strategies. By doing this, appropriate communication channels for information dissemination can be identified, the role of the media in delivering health information in your country can be analyzed, and the information needs of the media can be understood. The rationales for examining information and communications channels and including the media are presented in [Table 5](#).



Tools, Knowledge and Skills, and Products

Tools	<ul style="list-style-type: none"> • Form 3. Stakeholder Interview Guide on page 69 • Form 7. Document Review Template on page 74 • Form 15. Interview Guide for Media on page 91
Knowledge and skills	<ul style="list-style-type: none"> • Experience with information, education, and communication or social marketing campaigns related to public health • In-depth interviewing capability (ability to probe for information, broad perspective of medicine resistance) • Ability to think strategically about the potential role of media for containing and preventing AMR
Products	<ul style="list-style-type: none"> • An advocacy tool that lists stakeholder groups and messages developed specifically for them • A report that describes the communication channels in your country and the audiences they serve

Table 5. Key Concepts in Communications, Rationale, and Common Factors

Key concept	Rationale	Common factors relevant to the key concept
Information needs and information channels	Strategies will try to improve the use of existing information on medicine resistance and existing information channels to increase the transfer of information and expand its utility.	<ul style="list-style-type: none"> • 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.	<ul style="list-style-type: none"> • Information needs for the media and interest in health issues in general and medicine 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 to interview. Take into account their target populations. For example, radio tends to have the broadest reach and is a good way to get information to rural areas; print media will reach only the literate segment of the population. 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.
- Ensure that the report also discusses the media's interest in addressing medicine-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 AMR and the coalition.
- 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 coalition members to consider when developing a communications strategy, including information and educational campaigns, to support the AMR initiative’s goals and objectives.

[Annex O](#) contains excerpts from interviews with 10 members of the media representing newspapers, magazines, radio, and television in Zambia. The objective was to gather information on media presence and communication channels to help develop advocacy and communication strategies that optimally engage the media.

Examples of Potential Action Points

- Create a communications plan/strategy
- Create a media plan
- Create an advocacy strategy

Table 6 provides examples of advocacy activities and products that you might want to prepare to support AMR advocacy activities.

Table 6. Identifying Products Needed for Different Activities³²

Activities	Advocacy products
Meetings with policy makers (e.g., meetings with law makers to advocate for increased AMR funding)	<ul style="list-style-type: none"> • Fact sheets • Presentations and other visual aids, such as slides, photos, and posters • Letters • Briefs that summarize data
Outreach to media (e.g., to promote the AMR awareness campaign)	<ul style="list-style-type: none"> • Letters to the editor • Op-eds • Press releases • Public service announcements, live-read scripts/announcements • Summaries of key findings, articles (and authors)
Public awareness activities (e.g., increase awareness about AMR and appropriate medicine use)	<ul style="list-style-type: none"> • Informational booklets, leaflets/flyers, posters • Radio and television spots (live-read scripts or produced public service advertisements)
Peer education and training (e.g., for health care workers and communities to identify AMR drivers and change behavior to help contain AMR and improve medicine use)	<ul style="list-style-type: none"> • Training modules • Fact sheets • Flip charts/flannel boards • Instructional posters/wall paintings/job aids • Videotapes/CDs
Presentations at seminars or other gatherings (e.g., with decision makers or health care professionals)	<ul style="list-style-type: none"> • Presentation slides or other visual aids, such as photos or CDs • Displays, including posters, photographs, and models

These potential action points are discussed further in [Section 4. Formulate a Plan](#).

Disseminate the Findings

Gathering information on and analyzing the local AMR situation are only useful if the results reach the appropriate stakeholders. The reports produced from each area of research must be disseminated to each member of the core working group. [Section 4. Formulate a Plan](#) describes the process of holding a consensus-building workshop for the coalition 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.

Country Example 9. Engaging the Media in AMR Awareness in Zimbabwe

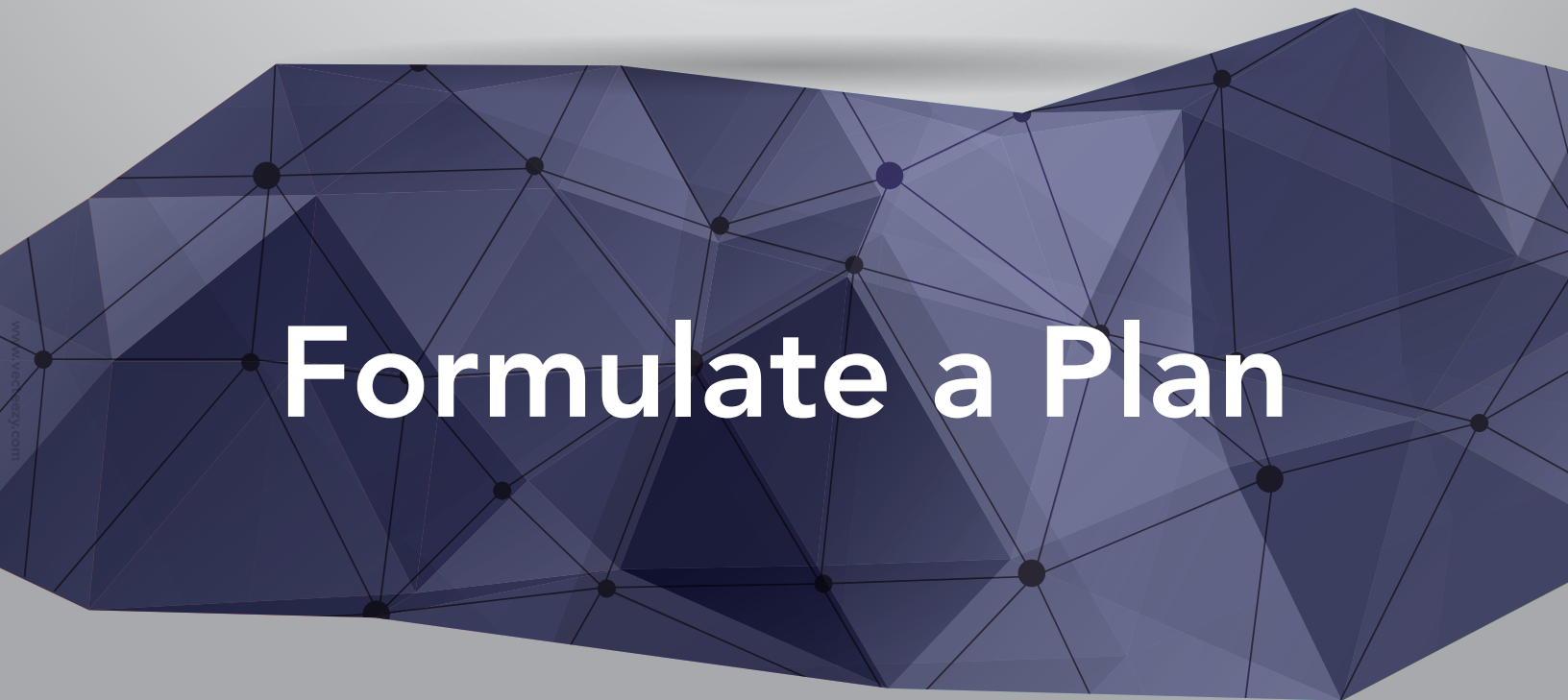
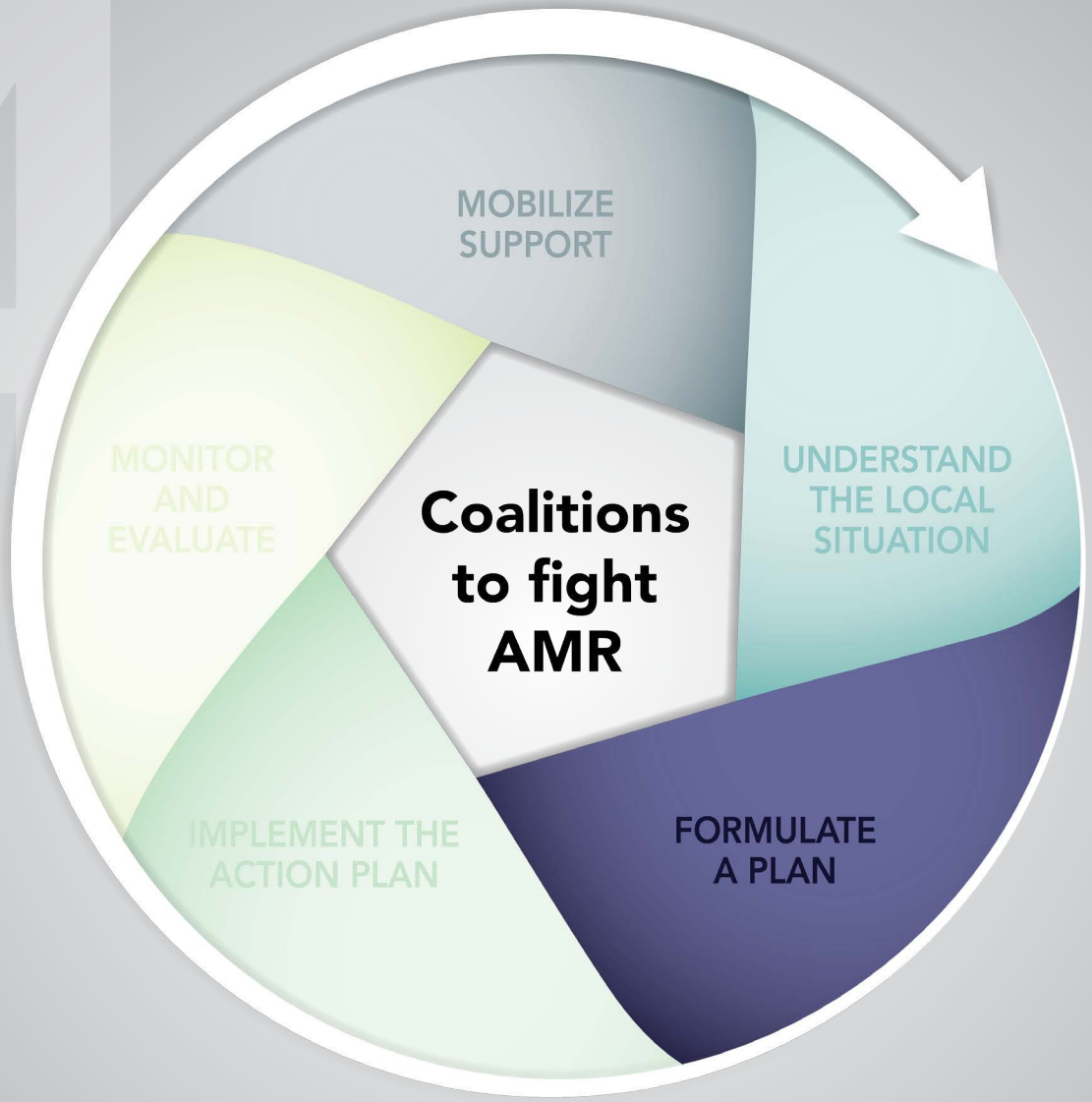
In 2016, with support from EPN and SIAPS, the Zimbabwe Association of Church-related Hospitals (ZACH) implemented a project aimed at improving public awareness of AMR through improved media coverage and at changing social norms and behaviors contributing to inappropriate use of antimicrobials. After reviewing the coverage of AMR over the 12 months leading up to the intervention and holding discussions with the AMR National Technical Working Group, ZACH developed a curriculum and held a training workshop for 23 journalists from more than 10 media houses, networks, and newspapers. In the five months following the workshop, 23 publications and/or broadcasts were produced (10 print/electronic articles, 8 radio broadcasts, and 5 television segments) compared to approximately 20 articles published the year before. Sample articles generated as a part of these efforts can be found in [Annex Q](#).



Dr. Nzou, ZACH Program Manager, discusses AMR on a Zimbabwean national television program in 2016 to raise public awareness on the issue. Photo Credit: ZACH



4



Formulate a Plan

4. FORMULATE A PLAN

Overview

After the coalition has collected and coalesced the information required to understand the local AMR situation (using guidance from [Section 3. Understand the Local Situation](#)), the core working group will meet to review and discuss the findings. The group then will need to determine its priorities and begin to plan for future activities. Gaining consensus and agreement on these plans may occur in two phases:

- Holding a consensus-building meeting for the core working group that allows for detailed discussion of the situational analyses and the potential areas of action
- Bringing the results of the core working group's decisions to the larger coalition at a call-to-action meeting where members can further discuss and agree on the proposed action plan

Throughout this process, the core working group and coalition members must identify the highest-priority issues; identify which partners, stakeholders, and champions within the coalition are best suited to address those issues; and discuss feasibility concerns. While this manual suggests the above discrete steps to foster consensus building and inclusion in the creation of a plan, depending on the composition, size, funding, and local context, coalitions may be required to adjust or modify these steps. For example, the core working group may ensure that all the information regarding the local AMR situation is compiled but consensus building may actually occur during the call-to-action meeting (provided that the meeting is well structured to allow enough time for this step). Some coalitions may decide to draft a call-to-action document ahead of the coalition meeting, while others may do so during that meeting. In either case, the draft call-to-action document should be presented, approved, and declared through a plenary session of the coalition meeting. The coalition should also develop a plan to disseminate the document widely.



Tools, Knowledge and Skills, and Products

Tools	<ul style="list-style-type: none">• Annex C. WHO Recommendations for AMR Interventions on page 108• Annex D. AMR Overview Presentation on page 115• Annex G. Example of Country- and Regional-level Call-to-action Documents on page 147• Form 16. AMR Intervention Prioritization Worksheet on page 94
Knowledge and skills	The participation of the core working group is critical for this element of coalition building. The information that will be discussed as part of the priority-setting exercise will need to be defended and challenged. Broader discussion within the larger coalition will serve to further benefit the plans by incorporating contributions from stakeholders with varying perspectives.
Products	<ul style="list-style-type: none">• A call-to-action document for stakeholders• Prioritized action plan of key intervention areas to contain AMR

Hold a Consensus-building Meeting for the Core Working Group to Develop a Draft Action Plan

The core working group is primarily responsible for reviewing the results of the various assessments and developing the initial action plan through several key steps:

- Convene a consensus-building workshop for core working group members
- Develop organizational and advocacy materials
- In advance, be sure that all members have received copies of the reports obtained from the information-gathering exercises

- Prepare an agenda that specifies the following activities:
 - Reviewing reports
 - Identifying key issues
 - Prioritizing issues
 - Drafting a call to action ([Annex G](#))
 - Planning for next steps

During the consensus-building meeting, present findings from the assessments and identify priority issues. Stakeholders should discuss and prioritize interventions. Table 7 provides examples of some potential action points that address gaps that may have been identified in the analysis in [Section 3. Understand the Local Situation](#). In addition, the 2015 WHO Global Action Plan on Antimicrobial Resistance provides detailed descriptions of recommended interventions and the rationale behind their development ([Annex C](#)). Use [Form 16. AMR Intervention Prioritization Worksheet](#) to help think through which issues or intervention to address first.

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 of the various topics and that all core working group members have an opportunity to make observations, ask questions, and contribute to the development of the product.

Table 7. Examples of Potential Action Points for Containing AMR

Pharmaceutical management	<p>Develop, disseminate, and implement STGs The establishment of standard treatment promotes therapeutically effective and economically efficient prescribing. The goal of STGs is to develop a list of the preferred medicine and nonmedicine treatments for common health problems experienced by people in a specific health system and to implement the use of those treatments.</p> <p>Develop formularies and EMLs 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.</p> <p>Develop or improve the efficiency of DTCs DTCs, which comprise physicians, pharmacists, nurses, and other health officials, are formed to improve antimicrobial selection and use in hospitals and clinics through management of medicine STGs, formularies, and medicine use.</p> <p>Strengthen pharmaceutical management capacity Effective pharmaceutical management is critical for improving the availability and use of good quality antimicrobials. Pharmaceutical management is a specialized professional activity that requires a combination of knowledge, skills, and experience.</p>
Medicine use behavior	<p>Develop and implement a continuing medical education program on appropriate use of antimicrobials and AMR 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.</p> <p>Develop printed educational materials for drug sellers on appropriate dispensing of antimicrobials AMR dispensing practices and the rationale for these practices are assessed and a multidisciplinary working group develops educational materials for drug sellers to improve these practices.</p> <p>Prepackage medicines to improve case management of infectious diseases 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.</p>

Continued...

Surveillance	<p>Strengthen AMR surveillance data Public and private laboratories performing antimicrobial susceptibility testing can form networks to increase data quality, representation, and utility for policy.</p> <p>Improve AMR surveillance capacity 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.</p>
Infection prevention and control	<p>Develop and implement hospital infection control programs Infection control programs provide a link to laboratory data and among 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).</p> <p>Support pre- and in-service trainings Coalition members may be well suited to advocate for and assist in bringing about reforms in preservice curricula at health training institutions. They may also be able to introduce or strengthen in-service trainings. IPC can also a required topic for continuing education credits or professional relicensing.</p> <p>Advocate for and support efforts to develop or strengthen national policies and standards of practice on IPC Using information from assessments, the coalition may be able to make the case for stronger policies and assist in the effective implementation of existing or new policies or guidelines. Adherence to IPC standards can be established as one of the criteria for the accreditation of health facilities.</p>
Stakeholder analysis	<p>Advocate for preventing and containing AMR in professional meetings, policy discussions, and public events Coalition members can act as catalysts for action by virtue of their legitimate concern for and expertise in AMR.</p> <p>Coordinate and collaborate with other stakeholders on activities relevant to AMR Stakeholders may capitalize on initiatives and activities initiated under the banner of specific health programs. For example, malaria, TB, and HIV programs are all concerned about providers prescribing appropriately, having the right medicines available, and adhering to treatment.</p>
Media and communication channels	<p>Create a media and communications strategy This plan should outline regular interaction with the media about AMR-related stories and events and activities of the working group that will be important to advocacy.</p>

Strengths, Weaknesses, Opportunities, Threats Analysis³³

Use [Form 17. SWOT Analysis Template](#) to evaluate the core working group's current position and environment. Strengths and weaknesses are usually factors within the working group, while opportunities and threats to the working group are external and associated with the environment in which the group operates.

- Using the weaknesses and threats cells from the strengths, weaknesses, opportunities, threats (SWOT) analysis, do a more in-depth analysis of possible barriers and threats toward achieving the action plan's goals and objectives.
- Create a contingency plan.
- Strategize ways to neutralize the identified threats and barriers.

[Country Example 10](#) presents the SWOT analysis done by Zambia's AMR coalition during its strategic focus workshop in 2004.³⁴

Country Example 10. Zambia SWOT Analysis

<p style="text-align: center;">Strengths</p> <ul style="list-style-type: none"> • Diversity – understanding • Credibility • Team members representing general practitioners' groups • Professional expertise • Group members are concerned (committed) • Professional training (of group members) • Team members are volunteers (thus committed) • Support team available (MSH, consultants) <p>How do we maximize our strengths?</p> <p>We need to utilize the support group.</p>	<p style="text-align: center;">Weaknesses</p> <ul style="list-style-type: none"> • The group does not have enough time • Members of the group all have other jobs • Inconsistency of group members (e.g., not attending meetings) • Volunteers (no one gets paid) • Lack of commitment from some team members • Limited resources <p>How do we minimize our weaknesses?</p> <p>By sharing the load (e.g., presentations) among all members of the group and by recruiting at least two additional group members who are enthusiastic and committed.</p>
<p style="text-align: center;">Opportunities</p> <ul style="list-style-type: none"> • Possibility of success • Reduction of AMR problem • External support (the environment is conducive) • Access to information • Facilitate the implementation of WHO guidelines 	<p style="text-align: center;">Threats</p> <ul style="list-style-type: none"> • Other special interest groups • Pharmaceutical companies • No control over stakeholders • Limited government money • Lack of government support for AMR • Cultural barriers (resistance to change/family influence) • Lack of knowledge by external bodies (media) to make sure the message is loud and clear

Develop an Action Plan

An action plan will begin to form at the consensus meeting as participants identify issues and the interventions needed to address them. The action plan may cover activities at the regional, national, or community level and should consider how AMR interventions can be integrated into existing public health programs and other ongoing activities (Box 4). [Country Example 12](#) provides insight into the development of the national action plan in Tanzania.

Developing an action plan may also reveal possible stakeholders that had not previously been considered. Additional elements should be added to the plan to guide the next steps of the coalition. The plan should have three main elements:

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

Box 4. Examples of Interventions that Can Fit into Existing Public Health Programs

- Antimicrobial policies and stewardship programs
- AMR surveillance programs and use of data to inform policy decisions
- DTCs
- Rational medicine use (RMU) trainings
- Antimicrobial use studies accompanied by corrective measures
- STGs/EMLs
- Pharmaceutical management improvements
- IPC practices in health care facilities
- Medicine quality assurance
- Pre- and in-service curriculum reform and training
- Information, education, and behavior change communication materials and counseling for consumers
- Public-private partnerships for AMR awareness and advocacy

The following coalition-building activities and communication activities may also be considered:

- A media and communication 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). Country Example 11 is a draft action plan developed at a regional AMR workshop for EPN members.

Country Example 11. Action Plans from Bureau des Formations Médicales Agréées du Rwanda (BUFMAR)/Kibogora Hospital, Rwanda; Churches Health Association of Zambia (CHAZ); and the University of Namibia's (UNAM) Stakeholder's Workshop

*BUFMAR/Kibogora Hospital, Rwanda*³⁵

Issue	Activity	Indicator	Resources	Time Frame
Irrational use of antimicrobials	Add a session on AMR to the planned continuing professional education (CPE) in December	Number of persons trained	Translation of training module Supplies for the workshop	December 3–5, 2008
	Contact the Health Centre Communication to run a program on radio or TV about RMU	Number of programs broadcast	Money to pay for the radio/TV air time	February–March 2009
	Publish the EPN call to action in the medical journal of Rwanda	Status of publication	Funds to translate into French and Kinyarwanda	January–March 2009
	Present on AMR at a meeting that includes health workers at the district level	Number of participants at the meeting	Refreshments LCD projector	December 2008
	Present on AMR to staff at Kibogora Hospital	Number of participants at the meeting	Refreshments LCD projector	December 2008
Infection control practices	Conduct an assessment of hand washing practices at the health facilities under Kibogora Hospitals	Number of facilities included in the assessment	Supplies Transport	January–March 2009

CHAZ³⁶

Issue	Activity	Indicator	Resources	Time Frame
AMR advocacy and awareness	Present to CHAZ management on the workshop	Status of report	Use reference materials from workshop	November 2008
	Distribute workshop report to relevant parties	Availability of report	Copies of report	January 2009
	Incorporate AMR prevention and containment issues into the CHAZ advocacy strategy	Status of advocacy strategy		March 2009
	Print and distribute information, education, and communication materials on AMR	Number of materials distributed	Financial	April 2009
	Publish EPN call to action in print media (Post, Times, and CHAZ Newsletter)	Availability of published articles	Financial	June 2009
RMU	Train DTCs on RMU	Number of DTCs trained	Resource materials, time, financial	September 2009
	Support RMU activities in the CHIs	Level of compliance with STGs on antimicrobial use	Resource materials, time, financial	Starting March 2009
Infection control	Set up Infection Control Committees at CHIs and other facilities	Availability of IC committees	Time, financial	Starting March 2009

Namibia Stakeholder's Workshop on AMR (2013)³⁷

Intervention area	Activity	Institution responsible	Timeline (month and date, if possible)	Key contact for follow up
Education (training)	Incorporate/review the current curriculum content (topics, teaching materials) to incorporate AMR/RMU of antiretrovirals (ARVs), anti-TB, and other medicines; facilitate training of RMU courses in the School of Pharmacy (SOP) and other schools at UNAM, including Schools of Medicine and Nursing and CPE course for practitioners	UNAM, HPCNA	December 2013	Dr. Tim Rennie, Associate Dean, SOP
	In-service training on AMR/RMU for health care workers at the regional level Target: public and private practitioners	MoHSS (Div. PhS) with partner support, HPCNA	November 2013	Mr. Indongo Lazarus, Deputy Director, Div. PhS (MoHSS)
	Reactivate and retrain DTCs to conduct medicine use evaluations	MoHSS (Div. PhS) with partner support, HPCNA	February 2014	Deputy Director, Div. PhS (MoHSS), with chief medical officer
	In-service training on infection control retraining (innovative interventions to promote good infection control practices)	NAAR, UNAM	March 2014	

Country Example 12. Development of a National Action Plan on AMR in Tanzania³⁸

In 2015, the World Health Assembly endorsed the WHO Global Action Plan on AMR and adopted a resolution that each member state develop a national plan on AMR by 2017. Some countries, such as South Africa, have already developed national-level AMR plans; however, most LMICs had yet to do so at the time of the resolution.

The resolution spurred many countries to begin taking steps toward developing a national action plan—many of which have also adopted WHO’s recommendation that the process be led by a national, multisectoral coalition or coordinating group.³⁹

Tanzania, through the national committee tasked with overseeing AMR containment efforts, conducted an initial assessment of the AMR situation with support from the Global Antibiotic Resistance Partnership. The results of this analysis were used during a 2016 workshop that brought together a diverse group of stakeholders to develop the national action plan.

Participants included representatives from:

- WHO country office
- Food and Agricultural Organization (FAO) country office
- Pharmaceutical Services Section of the Ministry of Health Community Development, Gender, Elderly and Children
- National Malaria Control Program
- Pharmacy Council
- Tanzania Food and Drugs Authority
- Laboratory Diagnostic Council
- Muhimbili National Hospital
- Regional medical officers
- District medical officers
- Pharmacists
- Ministry of Agriculture, Livestock and Fisheries
- Veterinary Council
- St. John University
- Management Sciences for Health

During the workshop, participants reviewed the AMR situation in Tanzania and split into technical groups to discuss the four proposed objectives of the national plan:

1. Improve AMR awareness and education
2. Strengthen AMR surveillance, investment, and research and development
3. Reduce the incidence of infection
4. Optimize the use of antimicrobial medicines

Based on the weaknesses and challenges identified in the situational analysis, each group developed strategic interventions to guide AMR containment activities under each objective. For example, under Objective 4 (Optimize the use of antimicrobial medicines), the group came up with the following key interventions:

- Establish a regulatory framework/structure to oversee the preservation of antimicrobial agents in the country

- Strengthen enforcement of laws and professional ethics that govern the use of antimicrobial agents
- Develop/formulate national policies on the use of antimicrobial agents in animals, agriculture, and fisheries
- Ensure monitoring of the appropriate use of antimicrobial agents (e.g., establish a central database system for data aggregation)
- Strengthen multisectoral coordination on the use of antimicrobial agents at all levels

Disseminate the Meeting Report and Action Plan

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

Plan and Convene a Call-to-action Meeting

A call-to-action meeting is in itself an advocacy activity and a critical step in strengthening the coalition. The meeting will raise awareness of AMR, mobilize people and resources for containment activities, gain wider consensus for the AMR action plan, and secure commitments from participating organizations to act on specific items (Country Example 13).

Country Example 13. Examples of Personal Action Commitments

Florence C. Najjuka, Faculty of Medicine, Makerere University, Uganda

I will urge the MoH [quality assurance department, infection control unit, and injection safety project] to work on standard treatment guidelines and an infection control strategy. I will also lobby with the Private Practitioners Association, the Uganda Medical Association, the Nursing Council, and any others involved in curriculum development to include issues of infection control and AMR in preservice training.

Eugene Conteh, CHASL, Sierra Leone

I will circulate the EPN call-to-action document to the Pharmacy Board in the country, medical institutions, professional associations, and medical and dental colleges as a starting point to building a local coalition for AMR work.

Maurice Audi, Mission for Essential Drugs and Supplies, Kenya

I will share with the training manager at MEDS [Mission for Essential Drugs & Supplies], the idea to include an AMR module in the continuing medical education workshops that MEDS run.

There are no hard and fast rules for call-to-action meetings; however, some useful tips include the following.

Before the meeting

- Develop an extensive list of stakeholders to invite to the meeting, including representatives from across a wide array of sectors.
- Develop a draft call-to-action document that can be revised and amended according to the specific proceedings of the meeting ([Annex G](#)).
- 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 situation (see [Annex D](#) 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 ([Country Example 12](#)).
- Lead an open discussion among stakeholders to elicit opinions on the country's AMR-related issues ([Country Example 14](#)).
- 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 the responsible parties to all meeting attendees and other stakeholders.
- Provide regular updates to participants as activities are implemented to encourage increased participation.

Country Example 15 summarizes the call-to-action meetings from four countries.

Country Example 14. Stakeholders' Opinions on AMR-Related Issues in Rwanda

- Widespread lack of training for physicians leads to irrational prescribing of antimicrobials
- Little regulatory enforcement contributes to the availability of antimicrobials and other medicines without a prescription
- Poor communication about AMR in health centers and hospitals and a need to understand the current AMR situation and what drugs to use when resistance is considered significant
- Inadequate information from laboratories on test results; testing is not the same from lab to lab
- Lack of training for laboratory personnel
- Need for DTCs to monitor medicine use and antimicrobial management
- Improved infection control in hospitals needed to control the emergence of nosocomial infections
- Poor quality medicines in the community
- Non-licensed persons providing medical services
- Poor patient adherence to medical treatment
- Insurance not paying for some important medicines
- Inadequate storage conditions in the home that can cause some medicines to degrade
- Health facilities giving partial treatments because of poor availability of antimicrobials
- Shared medicines in the community
- High patient demand for antimicrobials

Country Example 15. AMR Call-to-action Meetings in Namibia, Zambia, Ethiopia, and Rwanda

Namibia

Ongoing efforts to expand treatment programs for diseases such as HIV and TB are receiving strong national support. However, as access to treatment increases, the development of drug-resistant infections also remains a concern, although relatively little local information is available on the status of AMR in Namibia, and the platforms for addressing AMR are fragmented.

Recognizing these challenges and with the aim of beginning to advance progress against AMR in a coordinated and comprehensive manner, UNAM partnered with SIAPS to organize a multisectoral stakeholder's forum in July 2013 to discuss AMR and explore potential areas of action.⁴⁰

The workshop brought together more than 60 stakeholders from academia, government, and public and private health care facilities. Together, stakeholders developed a call-to-action document promoting the rational use of ARVs, anti-TB medicines, and other antimicrobials. Key actions included:

- Creating a national movement to enhance capacity, increase evidence on antimicrobial use, raise awareness about AMR, and support the implementation of effective interventions
- Enhancing the engagement of patients and caregivers in making informed choices on adherence to treatment plans through treatment literacy and other interventions
- Supporting ongoing efforts to reduce the risk of HIV drug resistance (HIV-DR) in Namibia, including implementing HIV-DR early warning indicators, treatment guidelines, and treatment adherence
- Broadening the focus to include antimicrobials for TB, opportunistic infections, and the general use of antibiotics
- Increasing private-sector engagement and collaboration with the public sector on RMU and AMR
- Strengthening collaboration between medicine use interventions and laboratory services groups
- increasing support for community-based interventions on appropriate medicine use



Participants join hands against AMR during a call-to-action session at the AMR Workshop and Stakeholders Forum in Namibia in July 2013. Photo Credit: SIAPS

Zambia

In March 2004, a group of key AMR stakeholders met in Zambia to form an AMR advocacy working group.⁴¹ The core working group first conducted a rapid appraisal survey to understand the existing situation. Following this survey, the rapid appraisal report was circulated among stakeholders to raise awareness of AMR. The results of the rapid appraisal sparked discussion of the major areas for action.⁴² Following the meeting, members of the core working group prepared a call-to-action document to mobilize stakeholders and resources for action on AMR and prepared work plans with time lines for coalition activities, including a large call-to-action stakeholders meeting.

A widely attended call-to-action meeting took place in November 2004 and attracted 70 participants from the public and private sectors, including government, service providers, academia, professional societies, pharmaceutical companies, consumers, journalists, and NGOs. In breakout sessions, participants discussed how AMR was affecting their professions and what their role could be in addressing it. At the end of the meeting, the call-to-action document 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. Several members of the news media covered the call-to-action event and used the information to create and publish AMR-related news items.⁴³ [Annex Q](#) includes an example of this coverage.

Ethiopia

The AMR Advocacy Coalition was created in March 2006.⁴⁴ A task force was formed to plan an AMR call-to-action meeting. The task force met regularly over several months to work out details for the meeting, including objectives, participant list, agenda items, and outputs. The call to action was held in Adama in November 2006.⁴⁵ It was a three-day meeting with presentations from representatives of major sectors, including national infectious disease programs, academia, regulatory bodies, practitioners, media, and NGOs. The presentations covered:

- Global and local problems of AMR
- Impact of AMR on specific infectious disease programs
- Response of different sectors to AMR
- Gaps in knowledge of AMR

Following the presentations, the participants had a day to work in breakout groups. The groups discussed and prioritized the issues and strategies for intervention 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 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.

Rwanda⁴⁶

An AMR awareness and advocacy meeting was conducted in Rwanda in October 2009 for 40 stakeholders from the MoH, academic institutions, professional associations, procurement and wholesale medicine agencies, public and private health facilities, donor organizations, NGOs, and others. The meeting agenda was guided by the results of in-depth interviews with major stakeholders that had been conducted in advance.

The meeting objectives included:

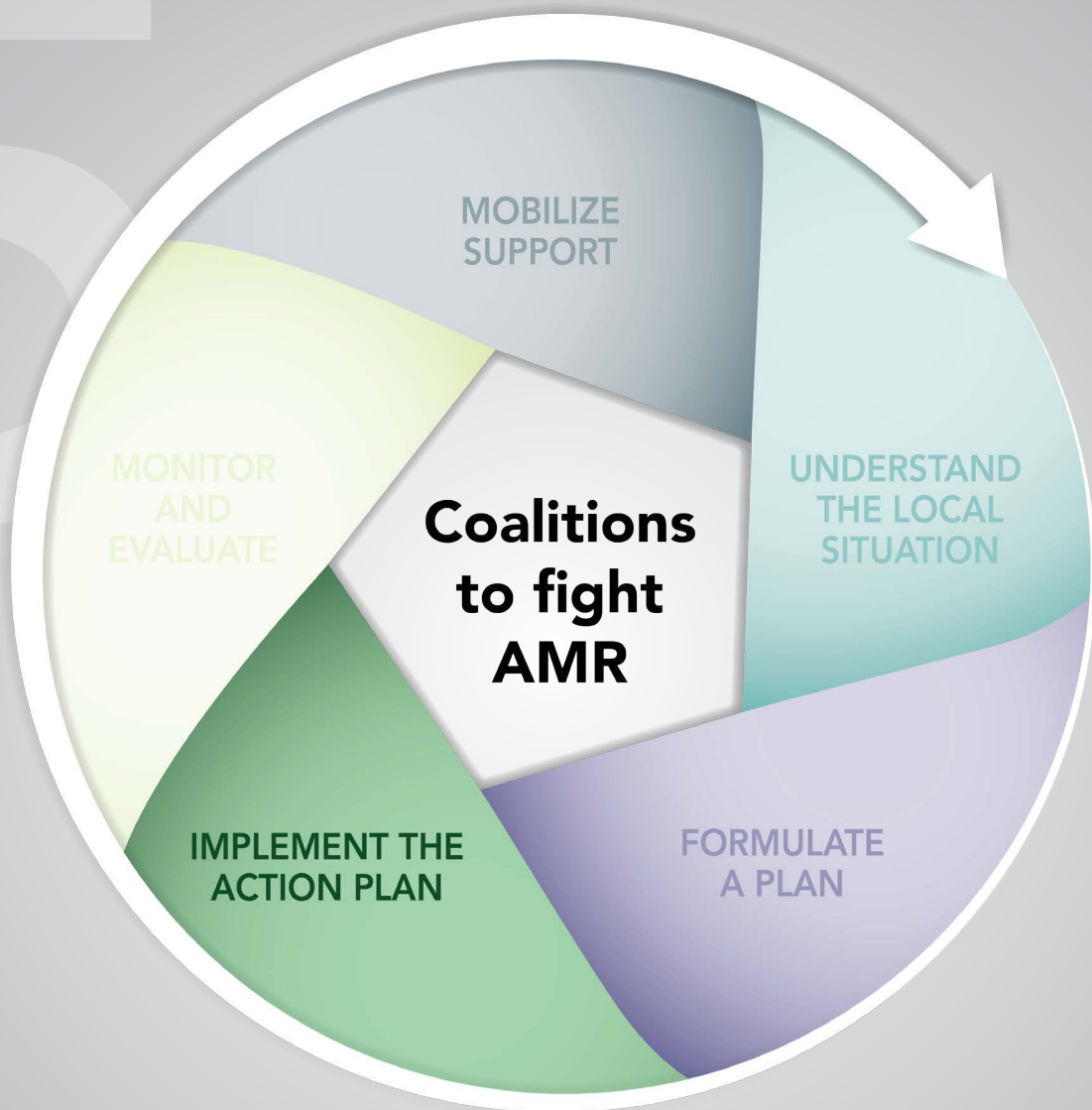
- Informing stakeholders of the serious nature of AMR in Rwanda and worldwide
- Advocating for a nationwide response to AMR
- Identifying and confirming the need for a nationwide response to AMR
- Identifying potential stakeholders for a campaign to address AMR
- Obtaining consensus on the approach and action plan

During the workshop, the participants drafted a call-to-action document for the proposed AMR working group.

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 attend regular core working group meetings.

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 implementing those activities.



**Implement the
Action Plan**

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. The core working group must consider and plan for technical and logistical management issues and consider how the expertise of coalition members can be used most effectively. 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 some of the tools necessary to effectively implement your plan for AMR advocacy and containment activities formed in [Section 4. Formulate a Plan](#).

Key steps include:

- Assessing and describing the AMR working group's resources and environment
- Creating work plans
- Developing an implementation plan



Tools, Knowledge and Skills, and Products

Tools	<ul style="list-style-type: none">• Form 1. Stakeholder Identification Worksheet on page 67• Form 14. Stakeholder Prioritization Worksheet on page 90• Form 17. SWOT Analysis Template on page 95• Form 18. Gantt Chart Template on page 96• Form 19. Implementation Plan Template on page 97
Knowledge and skills	<ul style="list-style-type: none">• Budget planning and tracking, environmental analysis, resource mapping, organization
Products	<ul style="list-style-type: none">• Work plans, implementation plan

Assess and Describe the Coalition'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

Successful implementation will require careful planning and effective resource management. Map out the planned products and financial and human resources before initiating implementation of the action plan.

Planned Products

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

Financial Resources

The main questions are what funding is already available, what is needed, and how additional funding can be mobilized (box 5). 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

Box 5. Planning for Financial Sustainability

Financial sustainability can be defined as the ability to mobilize and efficiently use domestic and supplementary external resources on a regular basis to achieve current and future targets.⁴⁷

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 their 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 is not available 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.⁴⁸

Human Resources

- Create a detailed breakdown of activities and the tasks and subtasks within these activities from the plan developed in [Section 4. Formulate a Plan](#).
- 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 be needed. [Form 1. Stakeholder Identification Worksheet](#), [Form 14. Stakeholder Prioritization Worksheet](#), and the stakeholder mapping exercise in [Country Example 1](#) can be used in this review.

Risk Assessment

All members of the working group should have a sense of “where the coalition is” and “where it wants to go.” Most members will have a clear idea of where the working group is headed based on the action plan. Key lessons learned from implementing country-level AMR containment programs are provided in [Section 7. Summary and Lessons Learned](#) and may be helpful to consider during these exercises. To get a clear picture of where the working group is starting, try to work through the exercises described below, including the SWOT analyses and the identification of barriers and threats.

Revisit the SWOT Analyses

The SWOT analyses conducted while formulating the coalition's action plan will be useful to reference during implementation as well. As implementation progresses, it may be useful to conduct additional SWOT analyses for each of the coalition's specific objectives or activities to help to determine the best course for carrying out the planned activities.

Documentation

Documentation goes beyond record keeping. Logistical decisions will need to be made on who will collect what data or record what information, where and how the information 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 to develop, collect, and store includes:

- **Indicators for the success of coalition activities.** These carefully crafted statements are used in the monitoring process ([Section 6. Monitor and Evaluate](#)) 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 advanced.
- **Meeting minutes.** These will form a historical record of the working group's activities and can be used to chart progress and serve as evidence of action. In addition, they can serve as useful reference materials for the coalition. See [Annex P](#) for an example of meeting minutes from the AMR Advocacy Working Group Meeting in Zambia in 2007.⁴⁹
- **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 and Track Implementation

Work plans differ from the action plan developed in [Section 4. Formulate a Plan](#). Work plans are more specific in terms of outputs, responsibilities, time frames and deadlines, and budgets.

Work plans should describe performance objectives for specific activities in the upcoming year. Performance objectives are what the coalition hopes to achieve through its planned activities. Writing good objectives for the working group's activities should be one of the first priorities during the implementation phase. A significant amount of time should be spent on crafting objectives, and this should be done with the working group's input and should follow the "SMART" parameters below.

SMART objectives are:⁵⁰

- **Specific.** Objectives should specify exactly what will be achieved to avoid ambiguity, misinterpretation, or confusion about the work.
- **Measurable.** Each objective should include details on how it will be measured.
- **Achievable.** The objectives should be achievable and attainable.
- **Realistic.** The objectives should be realistic and feasible given the resources.
- **Time-related.** Each objective should include the timeline by which it is expected to be achieved to guide implementation plans and maintain accountability.

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

Participants at the EPN regional workshop on AMR in Moshi in 2008 collaborated on the following indicators to use for AMR advocacy and containment (box 6).⁵¹ For examples of action plans that include process indicators, refer to [Country Example 10](#).

Box 6. Sample Indicators for AMR Advocacy and Containment Objectives

Institutional indicators

- Number of institutions with active DTCs
- Number of days antibiotics were out of stock
- Number of hospitals with infection control policies and procedures
- Number of activities on AMR that are taking place in the institution
- Number of policies on infection control that are displayed in the institution
- Availability of focal persons on infection control
- Availability of top 10 diseases list in institutions and their treatment guidelines
- Number of audits conducted on AMR

National/network indicators

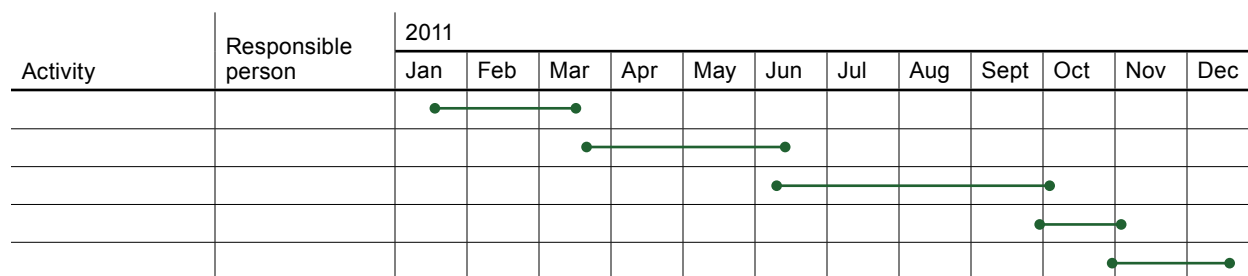
- Number of registered medicine outlets
- Number of institutions involved in AMR
- Number of hours of media coverage on AMR
- Number of AMR meetings and activities conducted at the regional/national level
- Number of focal persons in the network who are reference persons for AMR activities
- Percentage of functional laboratories that can do culture and sensitivity within the network
- Number of information, education, and communication materials that have been distributed
- Number of research publications on AMR

Targets are the measurable intermediate progress points.⁵² Indicators help measure change directly or indirectly and assess the extent to which targets and objectives are met.⁵³

List the major activities for each objective. Prepare an activity-time chart (Form 18. [Gantt Chart Template](#)). This diagram provides a clear, concise summary that communicates the responsibility and timing to all working group members and is useful for monitoring progress.

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

* A Gantt chart is a planning tool that shows project activities by length of project and target completion dates. Gantt charts can be created at different levels of activity (e.g., at the working group level or for intermediate steps at the activity level) and at different levels of time detail (e.g., monthly by year, quarterly by week). Below is an example of a Gantt chart. See Form 18 for a template.



*For more information, visit www.ganttchart.com.

The objectives, activities, indicators, and Gantt chart can be compiled into an implementation plan (Form 19. [Implementation Plan Template](#)) to help guide, track, and monitor the process. The plan provides an overall picture of ongoing activities. A detailed operational plan will typically include:

- Introduction
 - A description of the AMR context and rationale for the planned activities and a brief summary of the research findings and/or situational assessment
- Strategic approach
 - Strategies being used to contain AMR (interventions)
 - Overall objectives
 - General description of activities planned under each objective

- Implementation plan
 - List of specific objectives and activities
 - Person(s) responsible
 - Indicator
 - Budget
 - Time frame (Gantt chart)

Country Example 16. Implementation Examples from AMR Coalitions in Namibia, Zambia, and Ethiopia

Namibia

Following a surge in momentum from the call-to-action workshop, the AMR coalition in Namibia catalyzed action against AMR in several important areas:

- **Continuing professional development and preservice training.** Working with the Ministry of Health and Social Services and SIAPS, the Pharmaceutical Society of Namibia organized its 2013 Annual Pharmacy Week to focus on AMR. During the event, the Pharmaceutical Society facilitated an accredited professional development seminar on AMR. At the preservice level, the UNAM School of Pharmacy integrated AMR and RMU topics into its bachelor of pharmacy curriculum. The school used a task-oriented approach and self-directed learning as the primary delivery method. Student feedback showed that the method increased self-responsibility, active participation, and self-learning.⁵⁴
- **Medication adherence strategy.** The Ministry of Health and Social Services has led efforts to institutionalize the use of the WHO HIV drug resistance early warning indicators strategy. WHO promotes this strategy as a non-laboratory-based way for resource-constrained countries to monitor and prevent potential drug resistance. SIAPS has been working with health care facilities to use an electronic dispensing tool to monitor the indicators, including those that provide proxy data on adherence to antiretroviral therapy such as on-time pill pick-up, retention in care, and pharmacy stock-outs. As a result, Namibia's antiretroviral therapy clinics have been able to improve the accuracy of their data abstraction, standardize dispensing practices, and track treatment adherence.⁵⁵ SIAPS has also supported national stakeholders to pilot an SMS-based adherence reminder system in health facilities. The system integrates directly with information from the electronic dispensing tool and sends text messages to patients to remind them to stay on their ARVs.
- **Infection prevention and control.** To improve hospital infection control, the Ministry of Health and Social Services adopted the ICAT as the official tool for infection control activities.¹⁵ This approach combines self-assessment using the 21-module ICAT with continuous quality improvement cycles to design, implement, and monitor appropriate, affordable infection control solutions. With training on the ICAT and revised infection prevention control guidelines, district hospitals in Namibia have put structures in place to implement infection control and medical waste management measures.

Zambia

Following a rapid appraisal of the local situation and a subsequent call-to-action meeting, the AMR advocacy working group in Zambia catalyzed and facilitated several interventions in collaboration with national stakeholders.

- **STGs.** The Zambian working group worked to train physicians on using STGs appropriately and drafted recommendations for revising and implementing the STGs. Zambia's National Formulary

Committee reviewed the infectious disease components of the national STGs and incorporated rational use concepts. The working group maintained its collaboration with the formulary committee and the MoH until the revised STGs were published in 2008.

- **Training curricula.** The working group worked with local consultants to assess gaps in the in-service and preservice training curricula for health professionals. These findings prompted the University of Zambia School of Medicine to review and update the undergraduate curriculum in 2010 to include new and locally relevant information on AMR and RMU.
- **Media engagement.** The working group conducted a mapping of Zambia's media presence and communication channels and developed relevant messages and materials for both radio and print. In addition, segments on AMR and RMU aired on the television program, *Your Health Matters*.
- **Medicine quality assurance.** The working group collaborated with the Pharmaceutical Regulatory Authority and with CHAZ to strengthen medicine quality assurance by supporting an inspection scheme that included document verification, visual inspection, and Minilab® testing of medicine samples at key ports of entry. Standard operating procedures were integrated in the system to make it transparent and efficient.

Ethiopia

Following the declaration of a call to action in 2006, the AMR task force in Ethiopia launched several key activities to combat AMR:

- **Media engagement.** A 2007 workshop was held for journalists, spokespersons, and advocacy representatives to support accurate and relevant media coverage on AMR. Trainings for journalists focused on evidence-based reporting, while the spokesperson training included a mock press conference and the opportunity for spokespersons to interact with journalists during a joint exercise to practice their new skills. The advocates discussed awareness-raising techniques that can be applied in the Ethiopian context. Following the workshop, the Food, Medicine and Health Care Administration and Control Authority of Ethiopia (FMHACA) developed a strategy to continue to improve journalists' understanding of AMR and maintained the journalist training program from 2012 to 2014. During that time, AMR-related topics were covered in 218 stories in 10 languages via radio (83.5%), newspapers (8.7%), and television (7.8%). Topics included antimicrobial use and AMR prevention and containment (26.1%); RMU (17.9%); medicine use in treating TB (10.1%); ARV use and adherence (9.6%); medicine use in treating malaria (4.6%); and self-medication, sharing medicines, hygiene and infection prevention, and counterfeit medicines (31.7%).
- **National strategy against AMR.** In collaboration with other national stakeholders, the FMHACA finalized and published an initial and revised strategy for the prevention and containment of AMR (2015–2020). The strategy's objectives include strengthening awareness and understanding of AMR; surveillance to gather evidence on antimicrobial use and AMR; infection control practices; antimicrobial stewardship; and partnerships, governance, and resource mobilization efforts. The strategy emphasizes the "One Health" concept.⁵⁶

Regional Case Study—Ecumenical Pharmaceutical Network's AMR Campaign

Founded in 1981, the EPN is a faith-based organization comprising pharmacists and health care professionals working across countries, mainly in Africa, to provide and improve the quality of pharmaceutical services. Given the potential threat posed by AMR, the EPN was keen to begin catalyzing change that would help contain the spread of AMR.

With support from SIAPS and SPS, the EPN began several advocacy and containment activities across its network. EPN and SPS kicked off this AMR-related work during regional workshops in 2008 and 2009.^{57, 58}

These workshops helped to inform EPN members of the threat of AMR and prompted members in several countries to make personal action commitments and begin implementing AMR-related advocacy and actions.

Following the initial spark, the EPN led the development of a landmark call-to-action and advocacy campaign entitled “Fight AMR! Save Medicines for our Children” that focused on raising awareness, promoting infection control and effective diagnosis, improving prescribing practices, and encouraging optimal use of antimicrobial medicines.

Between 2008 and 2011, EPN members implemented more than 120 AMR-related activities, including advocacy, research, training, publication, and containment-related actions.⁵⁹ The EPN also developed comic strips on AMR that were widely distributed.

Building on this initial campaign, the EPN, with support from SIAPS, conducted a training of trainers workshop for three of its member organizations from Tanzania, Zambia, and Zimbabwe in 2013. The workshop helped to equip participants with the information, tools, and resources needed to train others on AMR, rational use, and AMR containment activities.

The EPN further institutionalized its AMR work by making it a priority in its 2016–2020 strategic plan. In 2016, the EPN gathered its members at the biannual EPN Forum to discuss the continued challenges surrounding AMR and the impact on global health goals, including expanding universal health coverage.⁶⁰ Delegates then renewed their commitment to addressing AMR through advocacy and containment initiatives and issued a new call to action to catalyze and guide member actions ([Annex G](#)).⁶¹

The EPN has continued to motivate and build the capacity of its member organizations to carry out AMR-related advocacy and containment activities, and it has been successful in leveraging funding from international partner organizations to support AMR activities. With funding from USAID and support from SIAPS and SPS, the EPN has also supported antimicrobial stewardship and AMR-related projects from its member organizations that have led to strengthening of hand hygiene practices, publication of articles on AMR following training for journalists, and assessment and improvement of prescribing adherence to STGs.

[Country Example 17](#) includes additional activities and accomplishments of the EPN and its member groups; [Annex R](#) includes a more comprehensive list of activities.



Country Example 17. Selected AMR Advocacy and Containment Actions Carried Out by the EPN and its Member Organizations, 2008–2011

Democratic Republic of Congo

- Conducted a retrospective study of culture and sensitivity results over a one-year period
- Reviewed, analyzed, and used the ICAT in various departments of a hospital to evaluate practices and define corrective actions
- Conducted sensitization in Kananga by using the local Catholic women's group to mobilize community members to change practices that promote the spread of resistant organisms

India

- Educated 1,371 children in 11 schools on the dangers of AMR, the need to use medicines correctly, and health promotion. The students were between 14 and 18 years of age. Pre- and post-intervention assessments indicated that their knowledge level increased from 29% to 66%.

Nigeria

- Conducted an AMR advocacy workshop for high-level stakeholders, including the commissioner of health for Plateau State and other government officials; the general secretary of the Evangelical Church of West Africa; and representatives of the private sector, the medicines regulatory agency, and the pharmaceutical professional associations. In addition to the good turnout, the workshop was covered on both radio and television.

Tanzania

- Assessed AMR knowledge among high school students in Arusha and found that few students knew about AMR; developed modules on infection control and AMR for onsite training; and lobbied for the inclusion of AMR in the secondary school curriculum

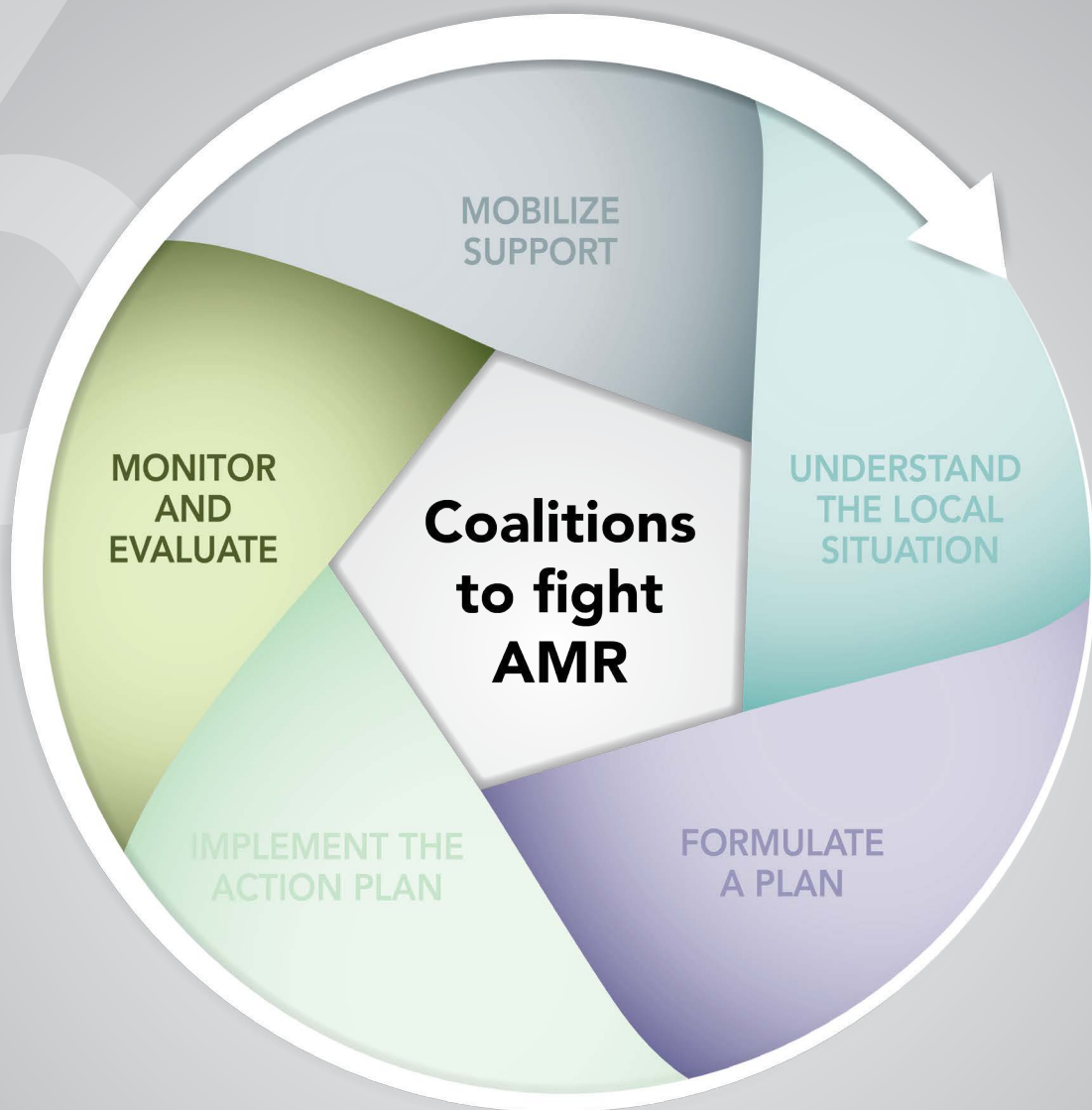
Togo

- Held a workshop for prescribers and journalists to raise awareness of AMR
- Set up a waste management system for a health facility (Kpele Eleme)

Zimbabwe

Nhowe Mission Hospital:

- Used the ICAT modules on labor and delivery and infection control
- Introduced a policy to use alcohol-based antiseptics
- Constructed a pit for medical waste disposal
- Purchased protective clothing for staff
- Made plans to set up a microbiology lab and institute a DTC



Monitor and Evaluate

6. MONITOR AND EVALUATE

Overview

M&E is the final consideration in the coalition-building cycle. Although 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.

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

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

An in-depth discussion of the “how to” of M&E is beyond the scope of this guide. This section will focus on the monitoring activities that will be part of the day-to-day management of the working group and play a role in the implementation process. This section provides basic information and tools to:

- Determine whether 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 medicine 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

Monitor

Designing the System

The principles for designing a monitoring system are to:⁶²

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

The biggest failures in routine monitoring/reporting are overdesign and underimplementation. An overwhelming amount of data often results in too little analysis. Likewise, overly complex reporting systems can result in poor compliance.⁶³

Crafting and Using Indicators

Reliable monitoring depends on having standards to judge performance and progress. To determine whether 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 the implementation of program and work plans
- Evaluating the achievement of long-term goals
- Assessing individual units' performance
- Identifying relative strengths and weaknesses
- Measuring the 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

In addition to following the SMART criteria (page 51), good indicators should also show:⁶⁴

- **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 terms
- **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

Implementation monitoring looks at inputs, processes, and outputs associated with specific implementation activities. Incorporating appropriate indicators from the outset and periodically measuring them will help track progress and offer valuable evidence in the longer term for evaluation of the program.

Monitoring Activities

Periodically review the overall AMR containment plan to determine whether it is necessary to:⁶⁵

- 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, annual reports), which 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 antimicrobial stewardship, infection control, or other AMR containment plans as needed. Findings from M&E activities can be disseminated for advocacy and resource mobilization activities.

Country Example 18 shows a monitoring plan for a Togolese hospital's interventions to increase infection control.⁶⁶

Country Example 19 lists indicators developed and longitudinally tracked by multidisciplinary teams of stakeholders in three Jordanian hospitals to generate evidence-based data on the impact of new protocols and procedures for prophylactic antibiotic use in cesarean section.⁶⁷ The results show substantial improvements in the use of the correct antibiotic, the timing of administration, and the number of doses. The results also show that the cost of antibiotic prophylaxis decreased significantly and the rate of surgical site infections remained level.

Country Example 20 describes an interim monitoring review of the activities of Zambia's Advocacy Working Group. The rapid assessment generated several recommendations to help guide future activities.

Country Example 18. Hospital Monitoring Plan for Infection Control Activities in Togo*

Specific objective	Planned activities	Person in charge	Time period	Indicators			Results of the exercise	
				What will be measured?	How will it be measured?	When will it be measured?	Before the intervention	After the intervention
Establish an annual training program for staff on waste management at the center from now until June 30, 2010	Sensitize the staff to become aware of the scope of the problem	President of the center's ICQI* office	Once a week	Inventory of the center's departments	With the waste management tool and its grading sheet	Daily, from 7:30 to 9:00, beginning January 2, 2010	Center generally dirty and mixture of waste in the departments	Condition of departments is very clean, with correct management of waste by category
	Provide training and refresher training to the staff	Senior nursing officer of the center	Once every six months	Number of staff trained and retrained	Training register	March 15, 2010 September 13, 2010	Number of staff not trained	Number of staff trained at the end of the year
Give the center maintenance and infectious waste management equipment in January 2010	Supply the center with maintenance and waste management equipment	Senior nursing officer of the center	Once a month	Maintenance and waste management equipment available	Review the order and delivery sheets	The first of every month	Lack of maintenance and waste management equipment	Permanent availability of maintenance and waste management equipment
Establish a formalized operating procedures manual for infectious waste management at the center, now through March 2010	Form a committee to create this procedures document	President of the center's ICQI office	One month	Operating procedures manual available at the center	Work sessions and register of meeting minutes	March 22, 2010	No formalized operating procedures manual for waste management at the center	Effective availability of the formalized operating procedures manual for waste management at the center

*These activities will be measured by the infection quality control improvement (ICQI) team.

Country Example 19. Indicators in Three Jordanian Hospitals to Track Progress in a Pilot Program on Improving Antibiotic Prophylaxis in Cesarean Section⁶⁸

Description	P. Hussein Hospital	P. Faisal Hospital	Totanji Hospital	Combined for all three hospitals
Total number of cesarean section (CS) prophylaxis cases presenting through the obstetrics and gynecology ward regardless of protocol implementation or CS log completion (denominator for indicator 6 below)	659	1,065	1,105	2,829
Number of CS prophylaxis cases for which a CS log was completed appropriately (denominator for indicators 1 to 5 below)	641	682	980	2,303
CS log capture rate: CS cases captured with a completed CS log	97% (641/659)	64% (682/1,065)	89% (980/1,105)	81% (2,303/2,829)
Percentage of cases in which the correct prophylactic antibiotic (cefazolin) was administered (indicator 1)	87% (559/641)	93% (634/682)	81% (791/980)	86% (1,984/2,303)
First dose of prophylactic antibiotic administered at the appropriate time (indicator 2)	89% (573/641)	95% (648/682)	92% (897/980)	92% (2,118/2,303)
Correct number of prophylactic antibiotic doses administered (indicator 3)	90% (580/641)	87% (593/682)	88% (860/980)	88% (2,033/2,303)
Antibiotics other than recommended antibiotic (not per protocol) prescribed (indicator 4)	17% (109/641)	19% (132/682)	42% (407/980)	28% (648/2,303)

Continued...

Description	P. Hussein Hospital	P. Faisal Hospital	Totajni Hospital	Combined for all three hospitals
Followed-up by clinic visit and/or telephone (indicator 5)	86% (550/641)	83% (567/682)	89% (872/980)	86% (1,989/2,303)
CS surgical site infection cases relative to total number of CS cases (indicator 6)	2.12% (14/659)	1.03% (11/1,065)	1.81% (20/1,105)	1.59% (45/2,829)
Current average antibiotic prophylaxis (ABP) cost per case (JOD = Jordanian Dinar)	JOD 1.515	JOD 0.731	JOD 1.425	JOD 1.245
Baseline average ABP cost per case	JOD 8.553	JOD 5.448	JOD 5.980	JOD 5.980
Percent decrease in average ABP cost per case (when the current average ABP cost per case is compared with the baseline average ABP cost per case)	82%	87%	76%	79%

Country Example 20. Rapid Assessment of Zambia's Advocacy Working Group Activities⁶⁹

With support from the USAID-funded RPM-Plus project and consultants from Links Media, the Zambia Advocacy Working Group conducted a rapid assessment monitoring exercise of their activities to date to assess effectiveness and inform future activities. The assessment team utilized a mixed-methods approach using in-depth interviewing and review of both published and grey literature to collect data. More than 50 publications were reviewed, and interviews were conducted with 29 AMR stakeholders. Key selected results and recommendations are presented below.

Key results and recommendations:

- Result: Working group members are extremely committed but often have competing demands or insufficient resources, which results in some issues with member attrition or inactivity
 - Recommendation: Conduct inventory of membership commitments, resources, and roles to reduce overlap, leverage partnerships, and ensure that participation is strategic
- Result: Journalists were highly engaged on AMR following workshops and trainings and expressed a desire to be kept informed of ongoing developments and activities
 - Recommendation: Sustaining and nurturing effective relationships with the media through ongoing outreach and communications should be integrated into operational and strategic plans
- Result: Working group members were energized following the call to action workshop but were unsure of how to implement proposed strategic actions and activities and unclear of which resources were available to support implementation
 - Recommendation: The strategic plan should be reviewed and revised and a specific action plan should be developed. A strategic inventory of available resources should be developed and utilized by members to guide activities.

Evaluate

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 7). There are two types of evaluation:

- **Formative** evaluation takes place during implementation and assesses progress toward 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.

Box 7. Questions for Formative and Summative Evaluations

- Is the program relevant and appropriate to the in-country context?
- Is the program effective? (Is it achieving its objectives? Why or why not?)
- Do the results from the monitoring system represent the actual situation?
- Is the program efficient?
- Is the program sustainable?
- Is the program having the intended impact?
- What future changes should be made?

Outcome Indicators for Advocacy

There are six categories of outcomes that represent changes in lives, health sector conditions, institutions, and health systems and result from advocacy work.⁷⁰

- Shifts in social norms
- Strengthened organizational capacity
- Strengthened alliances
- Strengthened base of support
- Improved policies
- Changes in impact⁷¹

Table 8 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 coalition activities that can be evaluated.

Table 8. Examples of Outcomes for AMR Advocacy and Containment Work*

Shift in social norms	Strengthened base of support
<ul style="list-style-type: none"> • Changes in awareness of AMR and related issues • Changes in beliefs about medicine use • Changes in attitudes about medicine use • Increased alignment of coalition objectives and core societal values • Changes in public behavior 	<ul style="list-style-type: none"> • Increased public involvement in AMR issues • Increased level of action by champions of AMR issues • Increased breadth of partners supporting AMR-related activities • Increased media coverage • Increased awareness of AMR and coalition messages among key groups of people • Increased visibility of coalition activities
Strengthened organizational capacity	Improved policies
<ul style="list-style-type: none"> • Improved management of coalition organizational capacity • Improved strategic abilities • Improved capacity to communicate and promote AMR advocacy messages • Improved stability of the coalition 	<ul style="list-style-type: none"> • Policy development • Policy implementation • Policy enforcement
Strengthened alliances	Changes in impact
<ul style="list-style-type: none"> • Increased number of coalition stakeholders • Increased level of collaboration and coordination on AMR issues • Improved alignment of partnership efforts (e.g., shared priorities, objectives) • Strategic alliances with important partners • Increased ability of the coalition to work toward policy change and other AMR containment issues 	<ul style="list-style-type: none"> • Improved containment practices and reduced AMR levels

*Adapted from Reisman, J. 2007. A Guide to Measuring Advocacy and Policy. The Evaluation Exchange XIII: I. and Organizational Research Services. 2007. A Guide to Measuring Advocacy and Policy. Prepared for the Annie E. Casey Foundation: Baltimore, MD.

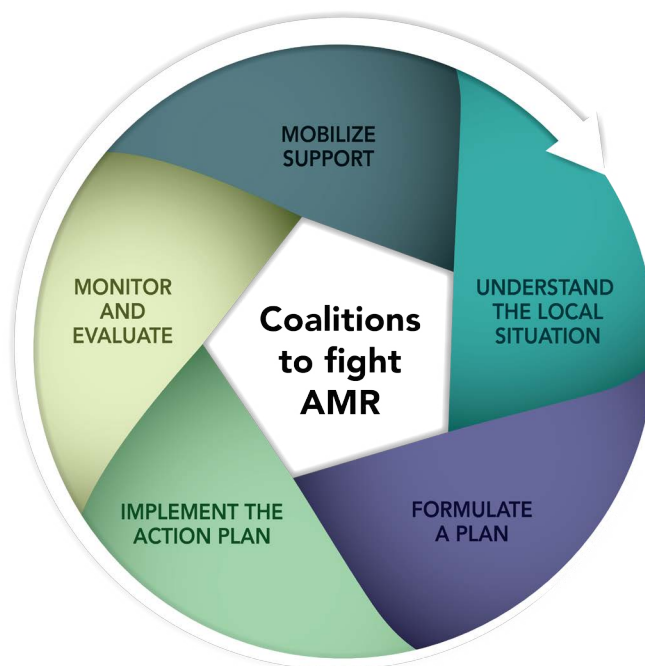
Evaluation Resources

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

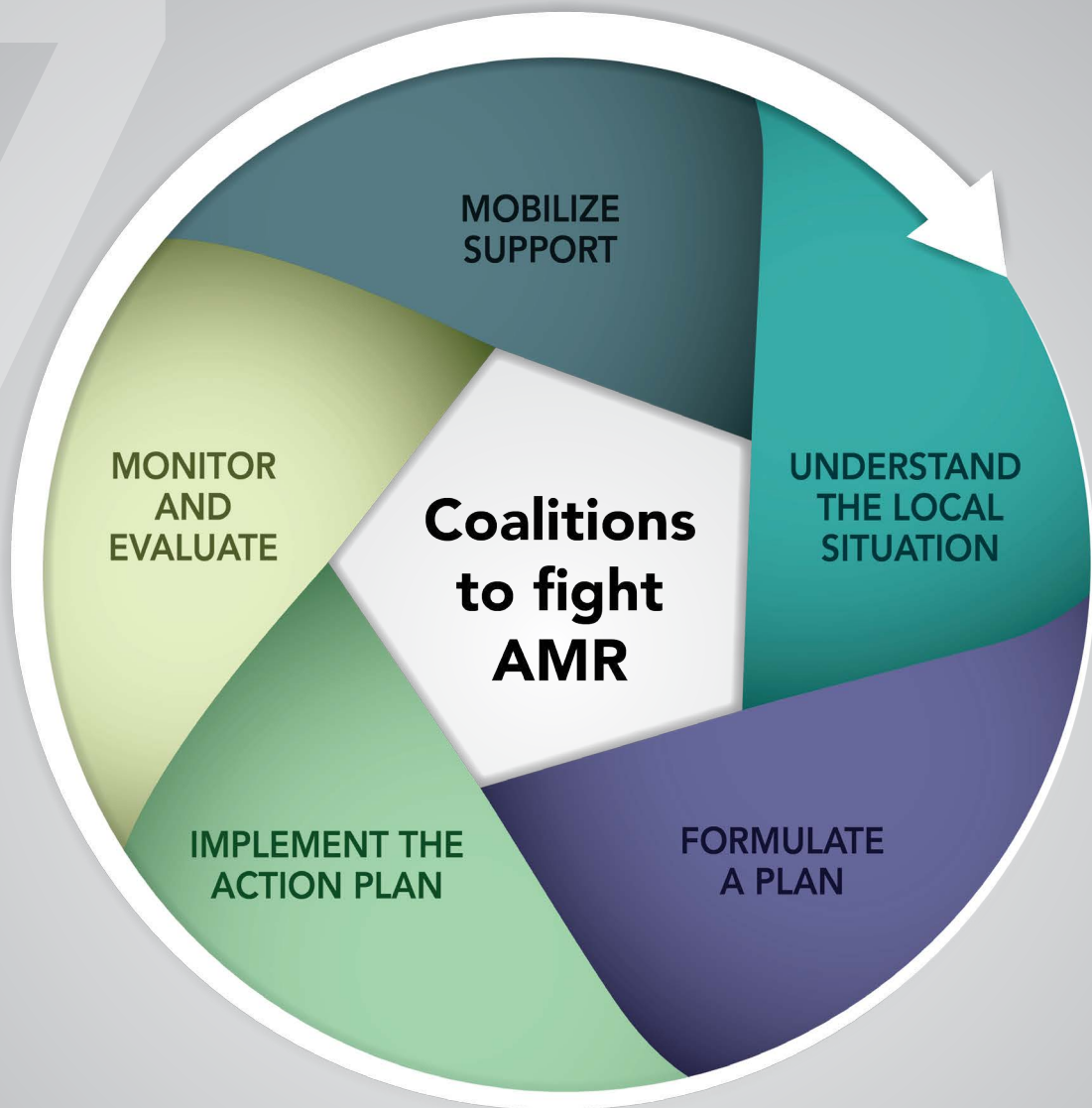
Continue the Cycle

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 additional research to further understand existing problems or new challenges.

Initial coalition activities usually necessitate a major focus on generating advocacy, momentum, and mobilizing resources. As the coalition grows and expands, the focus can shift toward specific implementation or support of AMR containment initiatives. Ensuring the coalition's ongoing sustainability⁷² will require continued attention to funding sources; drawing in new stakeholders; and emphasizing continued stakeholder engagement, advocacy, and communications to maintain transparency, relevancy, and public visibility.



Because AMR is a multifaceted and complex problem spanning several sectors, it requires consistent vigilance, a multidisciplinary and holistic approach, and long-term commitment and action. 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 the efforts of stakeholders to ensure that progress continues. Therefore, it is the coalition's charge to keep AMR in the public eye and on the agenda of all stakeholders.



Summary and Lessons Learned

7. SUMMARY AND LESSONS LEARNED

Summary

Recent WHO, CDC, and World Bank publications^{73, 74, 75} and other major documents describe the grave threat that AMR poses to public health. If not contained, this rapidly escalating problem is likely to reach a pandemic level in the near future. In 2012, then WHO Director General Margaret Chan said, “A post-antibiotic era means, in effect, an end to modern medicine as we know it. Things as common as strep throat or a child’s scratched knee could once again kill.”⁷⁶ If we do not act while there is still time, AMR may bring a catastrophic blow to the health systems and lead to unimaginable consequences. Furthermore, effective action to contain AMR is critical for making continued progress in major global programs, including Creating an AIDS Free Generation (AFG), Ending Preventable Child and Maternal Deaths (EPCMD), and Protecting Communities from Infectious Diseases (PCID).

However, AMR-related awareness and advocacy are still low in most resource-constrained countries. Such actions are critical for various global objectives, such as the WHO Global Action Plan on AMR (2015); the Global Health Security Agenda; Goal 5 (improving international collaboration and capacities) of the US National Action Plan for Combating Antibiotic-resistant Bacteria (2015); and Goal 3 of the Sustainable Development Goal.⁷⁷

Recognizing this gap in advocacy and awareness, SIAPS and its predecessor programs developed and implemented an approach to jump-start and expand local coalitions to fight AMR. The approach focuses on “catalyzing” coalitions and advocacy by local stakeholders to build realistic strategies to contain AMR. The key elements of the approach include mobilizing support, understanding the local situation, formulating a plan, implementing the plan, and monitoring and evaluation (box 8). These elements should not be perceived or presented as prescriptive. Depending on the capacities, realities, available information, and opportunities in a given local setting, some flexibility in the approach may be appropriate or even required.

The approach was first implemented at the country level in Zambia and subsequently applied in Ethiopia and Namibia. It was also expanded to the regional level through the EPN. Table 9 shows some achievements of these country- and regional-level initiatives.

Box 8: Key Elements of the Coalition-building Approach Supported by SIAPS and Its Predecessor Programs

- Mobilize support
 - Identify key stakeholders
 - Gauge stakeholder interest and recruit members
 - Kick off the coalition
 - Organize a core working group
 - Establish group procedures
 - Move the advocacy process forward
- Understand the local situation
 - Collect and compile information
 - Conduct stakeholder analysis
 - Map media and communications channels
 - Disseminate the findings
- Formulate a plan
 - Hold a consensus-building meeting for the core working group to develop a draft action plan
 - Plan and convene a call-to-action meeting
- Implement the action plan
 - Assess and describe the coalition’s resources and environment
 - Create work plans and track implementation
- Monitor and evaluate and continue the cycle

Table 9: Key Accomplishments of Local Stakeholders through Country- and Regional-level Coalitions supported by SIAPS and its Predecessor Programs

Country or Body	Level	Activities
Zambia	Country	<ul style="list-style-type: none"> • Mobilized key stakeholders against AMR through call-to-action meeting • Revised national STGs • Improved medicine quality assurance system • Used TV programs on AMR to educate the public • Incorporated AMR and RMU topics into UNZA medical curriculum
Ethiopia	Country	<ul style="list-style-type: none"> • Mobilized key stakeholders against AMR through call-to-action meeting • Conducted national baseline study on AMR and developed action plan • Revised Medicines Formulary (2013) and STGs (2014) • Trained journalists, resulting in 218 media spots on AMR and rational medicine use over three years • Revised National Strategy for Prevention and Containment of AMR (2015–2020)
Namibia	Country	<ul style="list-style-type: none"> • Mobilized key stakeholders against AMR through call-to-action meeting • Collaborated with Namibians Against Antimicrobial Resistance and Pharmaceutical Society of Namibia • Helped the University of Namibia School of Pharmacy integrate AMR and RMU topics into preservice pharmacy curriculum • Helped implement HIV drug resistance early warning indicators
EPN	Regional	<ul style="list-style-type: none"> • Developed and distributed AMR call-to-action document in five languages • EPN constituents in more than 12 countries carried out hundreds of AMR-related advocacy, awareness, sensitizations, surveys, trainings, and containment actions, including antimicrobial stewardship and infection control activities • Institutionalized AMR work by prioritizing it in its 2016–2020 strategic plan

This how-to guide describes the key elements of the approach and provides advocacy and coalition-building guidelines and practical implementation examples from country- and regional-level initiatives. It also provides practical implementation tools and templates and other useful resources. Experiences implementing the approach in various countries and at the regional level have also generated several important lessons, which are presented below.

Lessons Learned

Learning from the implementation and improving how activities are conducted are useful at the end of a program or activity, and information can be collected throughout the implementation process and used to adapt and improve programs as necessary. Through the coalition-building support provided by SIAPS, its predecessor programs, and other partners, several key lessons learned have been identified.

1. **Initial support can kick-start stakeholder action.** Support to kick-start initial actions can effectively mobilize local stakeholders into a coalition to combat the common threat of AMR. Emphasizing the cross-cutting nature of drug resistance and the need for urgent action, a multisectoral group of stakeholders can generate a shared vision, expand the coalition, and mount organized advocacy and interventions to preserve the effectiveness of existing antimicrobials and contain AMR. This initial momentum also helps to conceptualize, design, and implement subsequent actions and generate a viable multifaceted response, particularly if a *champion group* or core working group plays the role of a catalyst. The champion group can be highly effective when it includes a mix of respected and influential opinion leaders to legitimize activities and change agents to carry them out. This group is most effective as a facilitator rather than as the only action body.

2. **Coalition building can be effective at all levels.** While this manual focuses mainly on national and regional coalitions against AMR, coalitions have successfully implemented key antimicrobial stewardship interventions at the local level as well. For example, the multidisciplinary coalition of stakeholders in Jordan (as described in the introduction, [Country Example 7](#), and [Country Example 19](#)) effectively addressed and improved prophylactic antimicrobial use for CS procedures, a move that reduced inappropriate use of antibiotics, saved money, and resulted in a new treatment protocol that was rolled out at all ministry-run health facilities providing obstetric care.⁷⁸ Local coalitions can often respond quickly and efficiently to real-time challenges and can be effective mechanisms for change without necessarily incurring a significant financial investment.
3. **Build on existing mechanisms, structures, or groups when possible.** AMR is a cross-cutting issue that affects many stakeholders and the issue and/or potential solutions are often too expansive for one group to address. However, in some cases, professional groups, government task forces, the private sector, or other groups may exist that can catalyze a larger coalition-building effort. For example, the EPN was well-suited to take on the issue of AMR in several countries in Africa with support from some of its partners. EPN headquarters then successfully catalyzed action throughout its network rather than attempting to implement all AMR containment activities itself. In many cases, coalition building is about informing others and motivating them to act in ways that are meaningful to their work while also supporting the work of the coalition. In this way, active participation is mutually beneficial for the coalition and the stakeholders.
4. **Root the coalition in the realities of the local context.** The most effective coalitions bring together a diverse mix of stakeholders from different disciplines and sectors. The diversity of a coalition can also mean that members have widely varying perceptions, opinions, and ideas for how the coalition should operate. However, by conducting a rapid situation analysis, the coalition can use data to help direct action that is both relevant and achievable. The situational assessment may help identify context-specific concepts or messages that resonate better with local stakeholders (for example, reframing the issue of AMR to ‘preserving drug effectiveness’ served as a unifying concept in Zambia and formed the basis of the subsequent advocacy campaign). The situation analysis may also provide the coalition with low-hanging fruit or easy-to-achieve opportunities that help to illustrate the value of AMR containment activities and the value of the coalition itself. Even if local data on AMR are few or weak, the coalition need not wait to look for opportunities to initiate immediate advocacy and actions because enough information and recommendations are available globally to warrant urgent local action. Once such opportunities are identified, they need to be packaged and presented as value-added to existing programs rather than as new and competing actions requiring their own resources. Along the way, the coalition can strategize to generate locally prioritized and feasible sets of additional local data to inform further advocacy and containment actions. Focusing on promoting and supporting local leadership and ownership of the activities contributes to high levels of success and sustainability. Another strategy to support sustainability is to continually look for opportunities to diversify funding and mobilize internal resources.
5. **Use advocacy to drive specific interventions.** Coalitions often arise as a result of a need to act on an issue that is not fully or adequately addressed by other groups. As a result, members of the coalition itself and other stakeholders outside the coalition may not be aware, informed, or educated on the importance of AMR containment. Each coalition described in this guide first laid a foundation of advocacy work that helped to catalyze further actions and interventions. Several coalitions found it useful to continue advocacy activities, such as calls to actions or stakeholder/journalist trainings, as part of their larger action

plans and found that the media in particular can be a powerful ally in raising awareness on the issue. This undercurrent of advocacy helped to maintain and expand the coalition and contributed to its long-term sustainability. Stakeholders supporting advocacy should design and catalyze the process in such a way that it serves as a means to further action rather than being an end in itself.

6. **AMR containment should support health systems strengthening efforts.** Weak health systems accelerate the development and spread of AMR. AMR in turn makes providing health care more complex and costly, which can further weaken health systems. Therefore, coalitions should consider activities that contribute to strengthening the building blocks or core functions of health systems. For example, the aforementioned pilot program in Jordanian hospitals addressed all six health systems core functions—governance and leadership, human resources, information, medicines and technologies, financing, and service delivery—to bring about systems-based policy and programmatic changes.⁷⁹ Many AMR containment interventions are centered on creating strong health systems (e.g., infection control and prevention programs, antimicrobial stewardship, surveillance, and preservice curriculum reform). Like many other efforts to strengthen health systems, preserving antimicrobials and containing AMR requires consistent, long-term efforts rather than one-off activities.

The image features a minimalist, monochromatic design. The background is a light gray gradient. At the top center, there is a bright, circular light source that creates a soft glow. The bottom portion of the image is dominated by a dark, faceted, geometric shape that resembles a low-poly landscape or a complex crystalline structure. This shape is composed of numerous interconnected triangles and polygons, with some vertices highlighted by small black dots. The overall aesthetic is clean, modern, and architectural.

Forms

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. Types of potential stakeholder groups are listed, but being designated a key stakeholder in this area will depend on a group's focus and influence.

AMR-related areas to consider include pharmaceutical management, medicine use, laboratory services and AMR surveillance, infection control and disease prevention, and advocacy. Other stakeholders in the agricultural, veterinary, and environmental sectors may also be appropriate. Once stakeholders have been identified, obtain individual names and contact information, and record the information on the stakeholder identification worksheet.

Stakeholder Identification Worksheet

Stakeholder category	Potential stakeholder groups within this categories (examples)	Stakeholder groups identified	Dimension*				
			PHM	USE	LAB	IDP	ADV
Decision makers and politicians	<ul style="list-style-type: none"> 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 medicines, ARIs, expanded program on immunization, reproductive health, health services) 						
Donors	<ul style="list-style-type: none"> Multilateral (e.g., UNAIDS, WHO, World Bank, UNICEF) Bilateral (e.g., USAID, Sida, DFID) 						
Global partnerships	<ul style="list-style-type: none"> Roll Back Malaria, Stop TB, Global Fund country coordinating mechanism 						
NGOs/private voluntary organizations (local and international)	<ul style="list-style-type: none"> Relief organizations Health and development organizations Community activists 						
Health practitioners and providers (public and private sectors)	<ul style="list-style-type: none"> Organized health and insurance systems Professional organizations (medical, microbiology, pharmacy, nursing—local and international affiliates) Employers providing health care for employees 						
Laboratory services and AMR surveillance	<ul style="list-style-type: none"> National reference laboratory Academic institutions Public and private laboratories 						
Educators	<ul style="list-style-type: none"> Research institutions Professional training institutions/councils Health education and training organizations 						
Pharmaceutical industry	<ul style="list-style-type: none"> Multinational and local pharmaceutical industry Pharmaceutical importers/retailers 						
General public	<ul style="list-style-type: none"> Consumer groups 						
News media and journalists	<ul style="list-style-type: none"> Health reporters, radio stations, newspapers/columnists, television, foreign correspondents 						

* PHM, pharmaceutical management; USE, medicine use; LAB, laboratory services and surveillance; IDP, infection control and disease prevention; ADV, advocacy

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? 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 how.

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

1. Where do you get information on new medicines and their use?
2. If you had information on new medicines, their use, or drug resistance that you wanted to share with your colleagues, what are the main ways you would get this information to them?
3. If you had medicine-related information that you wanted to share with the public, what are the main ways you would get this information to them?
4. What kinds of information regarding new medicines and their use or drug resistance do you need that you are not getting?
5. Do you have any reports (e.g., studies, surveys, evaluations) addressing issues surrounding drug resistance in our country?
6. Is your organization planning trainings, surveys, or public education campaigns on AMR in the next year? If yes, please describe what you have planned.
7. 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?
8. (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: [insert stakeholder name; refer to stakeholder contact list ([Form 2](#))]

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 date, 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 role in containing it. I look forward to seeing you. Please respond with your intention to come—either by telephone at [enter phone number here] or by email at [email address here].

Sincerely,

Attachment: Agenda

Form 5. Sample Agenda for Kickoff Meeting

Initiative to Contain Antimicrobial Resistance Kickoff Meeting

[Insert Date/Venue]

Agenda

10 minutes	Welcome	Facilitator: insert name
20 minutes	Introductions	All
10 minutes	<ul style="list-style-type: none"> • Review of objectives of the meeting • 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 	Facilitator:
20 minutes	Background: AMR in the world and in our country and why we are here today	Facilitator:
30 minutes	Open discussion: <ul style="list-style-type: none"> • Validity of issue • Relevance for stakeholders • Identification of other stakeholders 	All Facilitator:
30 minutes	Planning for next steps: <ul style="list-style-type: none"> • Need for a working group • Call to action • Communications strategy • Networking among and within groups • Media 	All Facilitator:

Form 6. List of Documents for Review

No.	Title	Author(s)	Type of publication or journal name	Brief description of contents	Location where archived
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
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17					
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20					

Form 7. Document Review Template

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

Full reference (including name of author or organization that produced the document if no author); year published; title of document, book, journal, or article; volume and page numbers of journal; publisher (and location of publisher) of book, report, proceeding, or any other type of document; and website, if applicable.

Example: Malhotra-Kumar, S., C. Lammens, S. Coenen, K. Van Herck, H. Goossens. 2007. Effect of Azithromycin and Clarithromycin Therapy on Pharyngeal Carriage of Macrolide-Resistant Streptococci in Healthy Volunteers: A Randomised, Double-Blind, Placebo-Controlled Study. *The Lancet*. Vol. 369, Issue 9560; Pages 482–490.

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 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, and still others will address 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 to the STG follow-up questions listed below starting at 1.A. If no, go to questions about EMLs).
 - 1.A What was the process of their development?
 - 1.B How often are they revised? When were they last revised?
 - 1.C Do STGs exist for different levels of health care practice?
 - 1.D Are prescribers (at different levels) trained on the use of and adherence to the STGs? If yes, what kinds of prescribers are trained and how often?
 - 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 to the EML follow-up questions listed below starting at 2.A. If no, go to any additional questions.)
 - 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 Are there any data on the extent of availability of EML in health facilities?
 - 2.H Any there 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 the EML.

1. What quality assurance mechanisms are in place in the public and private sectors 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 following mechanisms 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 Practice certification
 - Monitoring of quality of the marketed product
 - Inspection at the point of importation
 - Inspection at retail/wholesale pharmacies
 - Lab testing of the samples obtained from drug outlets
 - Supplier performance M&E
 - Other
4. To what extent are the above mechanisms/regulations enforced?
5. Are there any data on the proportion of inspected antimicrobials that were substandard in the last two years?
6. Are documented reports of counterfeit antimicrobials available?
7. Is there a policy of using the EML antimicrobial list for procurement of antimicrobials? (Yes/No. If yes, ask the follow-up questions listed below starting at 7.A. If no, go to any additional questions)
 - 7.A Does this policy exist in the public sector?
 - 7.B Does this policy exist in the private sector?
 - 7.C Are 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 preservice training of health professionals and appropriate use by prescribers, dispensers, and patients.

In-service Training

1. Is in-service training/continuing education on the importance of appropriate antimicrobial use and containment of AMR provided to health professionals (ask for both public and private sectors)? (Yes/No. If yes, go to the follow-up questions listed below starting with 1.A. If no, go 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 it counted as a continuing professional development credit
 - Any other relevant information
- 1.B Are there any data on the impact of these trainings on knowledge and practice regarding antimicrobials?

Preservice Training

1. Are separate topics on appropriate antimicrobial use and AMR included in undergraduate and postgraduate curricula (medical, pharmacy, nursing, paramedical)? Examples include the problem of overuse/irrational use of antimicrobials/antibiotics, the problem of drug resistance, strategies to improve antimicrobial use, and strategies to contain AMR. Record any other curricular inclusions on appropriate antimicrobial use and AMR.
2. Which curricula include topics and which do not? (Include information on the identified topics, hours of exposure, and methodology of teaching/learning. Document any other relevant information.)
3. Are any data/impressions available 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 exist on the level of appropriateness of antimicrobial prescribing and dispensing? Record key findings of all relevant documents that are 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 to the next question.)
 - 2.A What kind of campaigns have been conducted and how frequently?
 - 2.B Who conducted these campaigns?
 - 2.C Are there education campaigns relating to infection prevention (e.g., hand hygiene, food hygiene, vector control, immunizations)?
 - 2.D Are there education campaigns relating to appropriate use of antimicrobials/antibiotics and sensitization of AMR issues?
 - 2.E Are there any data on the impact of these measures?

3. Are schoolchildren educated/informed about infection prevention (e.g., hand hygiene, food hygiene, vector control, immunizations) and rational medicine use, including antibiotics? (Yes/No. If yes, go to question 3.A. If no, go to the next question.)
 - 3.A Describe the activities in detail.
 - 3.B Are these activities already a part of the existing curricula or are they carried out as additional educational efforts?
 - 3.C Are there any data on the impact of these measures?
4. Are there any data on the use of antimicrobials by the public (including level of appropriateness of use)?
5. Has the country participated in WHO World Antibiotic Awareness Week or other world/regional AMR awareness campaigns? If yes, briefly describe participation/activities.

Medicine Use and AMR-related 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 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)? Is there a mechanism to monitor adherence to STGs?
3. Are there any data on the level of prescribing adherence to STGs in the public and private sectors?

DTC, ICC, or AMR Containment Committees

1. Is there a national coordinating body or committee for containment of AMR? (Yes/No. If yes, go to question 1.A. If no, go to question 2.)
 - 1.A Is the group multisectoral (e.g., includes representatives from the human health, animal health, agricultural, and/or environmental sectors)?
 - 1.B What are the responsibilities of this body/committee?
 - 1.C What activities has it carried out to date?
 - 1.D Has any funding been allocated by the government for AMR activities?
 - 1.E Are there 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 existing body that considers resistance issues? (Yes/No. If yes, go to question 2.A. If no, go to the next question.)
 - 2.A What body or committee considers resistance issues?
 - 2.B What AMR-related activities has this body carried out to date?
 - 2.C Are there any data on the impact of activities carried out by this body/committee?
3. Do any of the existing disease-specific programs (e.g., HIV/AIDS, TB, malaria) in the country have AMR containment programs? (Yes/No. If yes, try to gather more information about the 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 the Global Fund, are incorporating or initiating any AMR-related issues within their activities.)

4. Do hospitals have infection control committees (ICCs)? If yes, what proportion of tertiary and secondary hospitals have ICCs?
5. Do the ICCs have infection control programs? (Yes/No. If yes, go to question 5.A. If no, go to the next question.)
 - 5.A What is the level of their implementation?
 - 5.B How many times do the ICCs meet each year?
 - 5.C Are there any data on impact of ICC activities?
6. Are there infection control/prevention activities at the 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 (DTCs)? (Yes/No. If yes, go to question 7.A. If no, go 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 relating to antimicrobial use and AMR?
 - 7.D How many times did the DTC meet during the past 12 months?
 - 7.E Are there any data on the impact of DTC activities?
 - 7.F Do you feel that the DTC has performed activities normally expected of such a committee. (If the answer is “no,” ask what the underlying factors could be.)

Policies, Strategies, Action Plans, Guidelines, and Legal Framework

1. Is there a national medicines policy? If yes, when was it adopted?
2. Does a national strategy and/or action plan on AMR exist?
 - 2.A When was the strategy/action plan adopted?
 - 2.B What are the essential elements of the strategy/action plan?
3. Does the country have a Global Health Security Agenda roadmap? If yes, describe main elements of the AMR-related sections.

4. Do national infection prevention and control (IPC) policies, standards, and/or guidelines exist? If yes, list the documents, the year each was produced, and which sectors (e.g., humans, animals) are covered. Also list the areas covered (e.g., hand hygiene, surgical prophylaxis, sterilization and disinfection, safe injections, waste management). Provide any information on whether they are being implemented.
5. Do national or local policies/guidelines/standards exist on pharmaceutical waste management? If yes, briefly describe the elements of the document. Also state whether the term antimicrobial or antibiotic is mentioned in the document (because it is an important class of pharmaceutical waste that can contribute to AMR if improperly handled).
6. Do antimicrobial stewardship strategies/guidelines exist for human health at the national and/or local levels? If yes, briefly describe the elements of the strategies/guidelines.
7. Is there a regulation on the use of antimicrobials in food animals? (If yes, ask the follow-up questions listed below starting with question 7.A. If no, go to the next question.)
 - 7.A What regulations are in place?
 - 7.B Are mechanisms in place to monitor implementation of these regulations?
 - 7.C Are any data available on the level of implementation of these regulations?
 - 7.D Are any data available on the impact of these regulations?
8. Are there regulations in place for use of antimicrobial agents in the plant sector? If yes, briefly describe what regulations are in place.
9. Is there a regulation limiting antimicrobials to prescription-only medicines status? (If yes, go to question 9.A. If no, go to the next question.)
 - 9.A Are there exceptions to the regulation?
 - 9.B What processes have been adopted to oversee enforcement of this regulation?
 - 9.C Are there any data on the level of enforcement of this policy?
10. Are there any guidelines to regulate the promotional activities of pharmaceutical companies? (If yes, ask the follow-up questions listed below starting with question 10.A. If no, go to the next question.)
 - 10.A What regulations are in place?
 - 10.B Are any data available on the level of enforcement of the regulations?
 - 10.C Are any data available on the impact of the regulations?
11. Is there a policy regarding antibiotic prescribing? (If yes, ask the follow-up questions listed below starting with question 11.A. If no, go to the next question.)
 - 11.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)?
 - 11.B Have levels of antimicrobial prescribing authority been defined?
 - 11.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.)
 - 11.D Are any new policies being developed to allow prescribing rights to a wider group of health professionals?

- 11.E Are there any other regulations on prescribing of antimicrobials?
 - 11.F What is the level of implementation of these policies?
 - 11.G Are any data available on the impact of these policies?
12. Is there a regulation requiring registration of medicines used in the country? If yes, what is the level of enforcement?
 13. Is there a regulation requiring registration of pharmacies by the Drug Regulatory Authority? If yes, what is the level of enforcement?
 14. Is there a regulation requiring registration of pharmaceutical personnel by the Practitioners Registration Authority? If yes, what is the level of enforcement?
 15. 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?
 16. 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?
 17. How many antimicrobial products are registered (including all branded antimicrobials)?
 18. How many antimicrobial agents (unique chemical entities, not counting the different brands) are registered?
 19. What percentage of medicines (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 in each sector?
 20. What percentage of medicines used in the country is manufactured locally? (If possible, also find out what percentage of antimicrobials used in the country is manufactured locally.)
 21. Are any price controls or medicine financing mechanisms (e.g., cost sharing, insurance schemes) in place? (Ask for both public and private sectors.)

Form 9. Document Review Guide for Medicine Use Behaviors and Underlying Causes

Complete the following worksheet for each desired behavior:

1. Prescriber assesses treatment appropriately
2. Dispenser keeps appropriate medicines available and accessible (right medicine, good quality)
3. Consumer acquires correct medicine
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 Medicine Use Behaviors and Underlying Causes (Continued)

Record information extracted from the review in these columns

Behaviors noted (desired and inappropriate)	Contributing factors or causes (positive)	Contributing factors or causes (negative)	Condition/ disease studied	Population sample, level of care, etc.*	Where was the population studied?	What are the study recommendations?	Reference from document review list

*For example, a sample of 50 patients seeking care at 3 public health facilities.

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).

Key pathogen tested	Resistance levels (range)	Record any information on the quality of the data	Date	Population	Location	Reference
<i>Mycobacterium tuberculosis</i>						
<i>Plasmodium falciparum</i>						
<i>Neisseria gonorrhoeae</i>						
<i>Streptococcus pneumoniae</i>						
<i>Haemophilus influenzae</i>						
<i>Shigella spp.</i>						
<i>Vibrio cholerae</i>						
HIV						
Other						

Form 11. Interview Guide on AMR Surveillance

Name: _____
Position: _____
Contact information: _____

Does a national surveillance system exist for AMR?

Do disease- or pathogen-specific surveillance systems exist? If yes, list the disease/priority pathogens programs (e.g., HIV, malaria, TB, other priority pathogens of public health importance)

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.
- Are the data being used to inform policy and other actions? Please provide examples.

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

- What are the main pathogens tested?
- Are data being used to inform policy and other actions? Please provide 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 in the last two years?

Are there any successful surveillance networks in the country or region? 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 have you observed?

Which donors are supporting AMR surveillance activities?

- Describe the type of support (e.g., technical assistance, training, supplies and equipment).
- Do you anticipate any new support for AMR surveillance? From what sources? Why is there new interest?

Does the country participate in and share AMR surveillance data through WHO's Global Antimicrobial Resistance Surveillance System (GLASS)?

Form 12. Interview Guide for Reference Laboratories

Respondent's Name: _____

Position: _____

Contact information: _____

Level of laboratory

- Health facility
- District
- Provincial/state/regional
- National

Affiliation

- Public
- Private
- Academic institution
- NGO/religious institution

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 the 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 participated in any trainings in the last two years? (Describe topics covered, audience, etc.)

Have you sponsored any trainings in the last two 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?
- Are the surveillance data routinely published (list source)?

How are they used? Give examples.

- If data are not being provided 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)

Organism tested for resistance	Is the reference laboratory doing primary isolation of the organism?	# Labs submitting isolates for specific organism (list labs on a separate form)	# Isolates processed per year by the reference lab	# Isolates tested for resistance per year	Laboratory method used for testing resistance (for each organism)	Are all isolates received tested or is a sample of isolates tested?
<i>Mycobacterium tuberculosis</i> (TB)						
<i>Plasmodium falciparum</i> (malaria)						
<i>Neisseria gonorrhoeae</i> (sexually transmitted infection (STI))						
<i>Streptococcus pneumoniae</i>						
<i>Haemophilus influenzae</i>						
HIV						
Other (e.g., <i>Shigella</i> spp., <i>Vibrio cholerae</i>)						

Form 13. Interview Guide for Microbiology Laboratories

Respondent's Name: _____

Position: _____

Contact information: _____

Level of laboratory

- Health facility
- District
- Provincial/state/regional
- National

Affiliation

- Public
- Private
- Academic institution
- NGO/religious institution

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 resistance data?

Has anyone from this laboratory received training in the last two 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 are the data coming out of this laboratory used? Can you give some examples?

Complete the table below.

Interview Guide for Microbiology Laboratories (continued)

Organism tested for resistance	Is this laboratory doing primary isolation of the organism?	Number of isolates processed per year by the lab	Number of isolates tested for resistance per year	Laboratory method used for testing resistance (for each organism)	Are all isolates received tested or is a sample of isolates tested?
<i>Mycobacterium tuberculosis</i> (TB)					
<i>Plasmodium falciparum</i> (malaria)					
<i>Neisseria gonorrhoeae</i> (STI)					
<i>Streptococcus pneumoniae</i>					
<i>Haemophilus influenzae</i>					
HIV					
Other (e.g., <i>E. coli</i> , <i>K. pneumoniae</i> , <i>S. aureus</i> , <i>Shigella</i> spp., <i>Vibrio cholerae</i>)					

Form 14. Stakeholder Prioritization Worksheet

Review the stakeholders identified in [Form 1](#) and map them on the grid below according to high influence and low urgency, high influence and high urgency, low influence and low urgency, and low influence and high urgency.

	Perceive AMR as low urgency	Perceive AMR as high urgency
High-influence stakeholder		
Low-influence stakeholder		

Form 15. Interview Guide for Media

We are interested in speaking with members of the media 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.

Useful information may include:

- Description of your media source (radio/TV station/program)
- How many health- and medicine-related topics the media source covers (what percentage of time and articles/programs are related to health/medicine)
- The main target audience of the health/medical-related work (e.g., public, decision makers)
- The reach of the column/program (e.g., local, regional, national)

If this information cannot 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 the health/medical topics that you report on?
3. Which of these sources for health/medical information do you find to be the most reliable or credible?
4. *If no local sources are included above, ask:* Which are your most reliable local sources for health/medical information?
5. Why do you consider these sources to be the most credible or 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 the following table*)_____?
Record response, and ask:

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

	Source 1	Source 2	Source 3
New medicines for malaria?			
Medical treatment for pneumonia?			
HIV/AIDS treatment?			

7. What particular media outlets do you find to have the most credibility on health/medical issues with the public? Could you please specify names of newspapers, 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 newspapers, columnists, radio stations, announcers, programs, journalists, etc.?
9. What about with decision makers in the business community? Could you please specify names of newspapers, columnists, radio stations, announcers, programs, journalists, etc.?
10. I'm going to list 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, and 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.]

Topic	Yes/No	Where did you see or hear the report?	I/we did article or program on it
Quality of medicines or fake medicines			
Safety or side effects of medicines			
Availability and affordability of medicines			
New medicines available for treatment of illnesses			
Need to finish the full course of medical treatment			
Drug resistance			

11. How important do you think it is that the public get information on these medicine-related topics compared to other health/medical issues?
 - More important than other issues
 - About the same
 - Less important than other issues

Which other health/medical issues are more important? Why?

12. If you had access to reliable information on these medicine-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 topics?

14. What 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 the term, 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

Intervention	Cost/available resources	Expected impact	Feasibility	Sustainability

Form 17. SWOT Analysis Template

Strengths

Weaknesses

Opportunities

Threats

Form 18. Gantt Chart Template

Activity	Responsible person	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

Form 19. Implementation Plan Template

Objectives and activities	Indicators	Group with primary responsibility	Resources needed	Gantt chart for year _____												
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	



The image features a minimalist design on a light gray background. A bright, circular light source is positioned in the upper center, creating a soft glow. At the bottom, a dark, faceted geometric shape, resembling a low-poly mountain range or a network of interconnected nodes, spans the width of the page. The word "Annexes" is centered in white, bold, sans-serif font over the dark shape.

Annexes

Annex A. Key Resources

WHO, FAO, and OIE Resources

- *AMR: Aide-Memoire*
<http://www.who.int/antimicrobial-resistance/amr-aidememoire-may2016.pdf?ua=1>
- *AMR flyer (FAO/OIE/WHO)*
http://www.who.int/foodsafety/areas_work/antimicrobial-resistance/amr_tripartite_flyer.pdf?ua=1
- *AMR: For Policy-makers*
<http://www.who.int/antimicrobial-resistance/policy-package-july2016.pdf?ua=1>
- *Antimicrobial resistance: A manual for developing national action plans*
<http://www.who.int/antimicrobial-resistance/national-action-plans/manual/en/>
- *Antimicrobial resistance: global report on surveillance 2014*
<http://www.who.int/antimicrobial-resistance/publications/surveillancereport/en/>
- *Antibiotic resistance: Multi-country public awareness survey*
<http://www.who.int/antimicrobial-resistance/publications/baselinesurveynov2015/en/>
- *Drivers, Dynamics and Epidemiology of Antimicrobial Resistance in Animal Production*-Food and Agriculture Organization of the United Nations (FAO)
<http://www.fao.org/3/a-i6209e.pdf>
- *Fact sheet on AMR (Sep 2016)*
<http://www.who.int/mediacentre/factsheets/fs194/en/>
- *Fact sheet on antibiotic resistance (Oct 2016)*
<http://www.who.int/mediacentre/factsheets/antibiotic-resistance/en/>
- *Global action plan on antimicrobial resistance*- WHO
<http://www.who.int/antimicrobial-resistance/publications/global-action-plan/en/>
- *Global Antimicrobial Resistance Surveillance System: Manual for Early Implementation*
<http://www.who.int/antimicrobial-resistance/publications/surveillance-system-manual/en/>
- *Global guidelines on the prevention of surgical site infection*
<http://www.who.int/gpsc/ssi-prevention-guidelines/en/>
- *Global monitoring of country progress on addressing antimicrobial resistance*
<http://www.who.int/antimicrobial-resistance/national-action-plans/AMR-self-assessment-2016/en/>
 - *Global Monitoring of Country Progress on Antimicrobial Resistance (AMR): Country self-assessment questionnaire*
<http://www.who.int/antimicrobial-resistance/national-action-plans/AMR-country-questionnaire-1.1-English.pdf?ua=1>
 - *Guidance notes to accompany the global monitoring questionnaire on AMR*
<http://www.who.int/antimicrobial-resistance/national-action-plans/AMR-country-questionnaire-guidance-note-1.1-English.pdf?ua=1>
- *Global report on early warning indicators of HIV drug resistance: Technical report*
<http://www.who.int/hiv/pub/drugresistance/ewi-hivdr-2016/en/>
- *Global tuberculosis report 2016*
http://www.who.int/tb/publications/global_report/en/
- *Global strategy for the containment of antimicrobial resistance*- WHO
http://www.who.int/drugresistance/WHO_Global_Strategy.htm/en/

- *Guidelines on core components of infection prevention and control programmes at the national and acute health care facility level*
<http://www.who.int/gpsc/ipc-components-guidelines/en/>
- *Health care without avoidable infections: The critical role of infection prevention and control*
<http://apps.who.int/iris/bitstream/10665/246235/1/WHO-HIS-SDS-2016.10-eng.pdf?ua=1>
- *MDR-TB 2016 Update*
http://www.who.int/tb/challenges/mdr/mdr_tb_factsheet.pdf?ua=1
- *National action plans (NAP): Supporting documents and tools*
<http://www.who.int/antimicrobial-resistance/national-action-plans/supporting-documents-tools/en/>
- *Sample conceptual monitoring and evaluation framework for national action plans on AMR- WHO*
<http://www.who.int/antimicrobial-resistance/national-action-plans/sample-framework.pdf?ua=1>
- *Sample terms of reference for a national multisectoral coordinating group, national focal point, and technical working group- WHO*
<http://www.who.int/entity/antimicrobial-resistance/national-action-plans/TOR.pdf?ua=1>
- *The evolving threat of antimicrobial resistance: Options for action*
http://apps.who.int/iris/bitstream/10665/44812/1/9789241503181_eng.pdf
- *The FAO Action Plan on Antimicrobial Resistance, 2016-2020- FAO*
<http://www.fao.org/3/a-i5996e.pdf>
- *The OIE Strategy on Antimicrobial Resistance and the Prudent Use of Antimicrobials- World Organization for Animal Health (OIE)*
http://www.oie.int/fileadmin/Home/eng/Media_Center/docs/pdf/PortailAMR/EN_OIE-AMRstrategy.pdf
- *Update on artemisinin and ACT resistance (October 2016)*
<http://www.who.int/malaria/publications/atoz/update-artemisinin-resistance-october2016/en/>
- *WHO HIV drug resistance report 2012*
<http://www.who.int/hiv/pub/drugresistance/report2012/en/>
- *Worldwide country situation analysis: response to antimicrobial resistance*
<http://www.who.int/antimicrobial-resistance/publications/situationanalysis/en/>

Additional Resources and Publications

- *Advocacy, Communication and Social Mobilization for Tuberculosis Control: A Handbook for Country Programmes- WHO/StopTB Partnership*
http://www.stoptb.org/assets/documents/resources/publications/acsm/ACSM_Handbook.pdf
- *Advocacy Toolkit: Practical Action in Advocacy- TearFund*
<http://www.ircwash.org/sites/default/files/Gordon-2002-Advocacy2.pdf>
- *Advocacy Tools and Guidelines: Promoting Policy Change- CARE*
http://www.careclimatechange.org/files/toolkit/CARE_Advocacy_Guidelines.pdf
- *An Introduction to Advocacy- USAID/SARA Project (AED)*
<http://womenthrive.org/sites/default/files/images/advocacytrainingguide.pdf>
- *AMR: a major european and global challenge- European Commission*
http://ec.europa.eu/dgs/health_food-safety/docs/amr_factsheet_en.pdf
- *Antibiotic Resistance Threats in the United States – CDC*
<https://www.cdc.gov/drugresistance/pdf/ar-threats-2013-508.pdf>
- *Antimicrobial Resistance Module for Population-based Surveys- USAID/RPM Plus*
http://www.dhsprogram.com/What-We-Do/Survey-Types/upload/AMR_Mod_8_5_8_FINAL.pdf

- *Core Elements of Hospital Antibiotic Stewardship Programs* – CDC
<https://www.cdc.gov/getsmart/healthcare/pdfs/core-elements.pdf>
- *Developing Effective Coalitions: An Eight Step Guide*- Prevention Institute
https://www.preventioninstitute.org/sites/default/files/uploads/8steps_040511_WEB.pdf
- *Developing, Implementing, and Monitoring the Use of Standard Treatment Guidelines: A SIAPS How-To Manual*- USAID/SIAPS Program
<http://siapsprogram.org/publication/stg-how-to-manual/>
- *Drug-Resistant Infections: A Threat to Our Economic Future*- World Bank
<http://pubdocs.worldbank.org/en/527731474225046104/AMR-Discussion-Draft-Sept18updated.pdf>
- *Drug Use Reviews—A Practical Strategy to Ensure the Rational use of Anti-Tuberculosis Medicines*- USAID/SIAPS Program
<http://siapsprogram.org/publication/dur-anti-tb-medicines/>
- *Harvesting the Wisdom of Coalitions*-University of Alberta
http://www.cup.ualberta.ca/wp-content/uploads/2013/11/Final-Harvesting-the-wisdom-November-2013_final
- *How to Investigate Antimicrobial Use in Hospitals: Selected Indicators*- USAID/SIAPS Program
<http://siapsprogram.org/publication/how-to-investigate-antimicrobial-use-in-hospitals-selected-indicators/>
- *Improving Infection Prevention and Control Practices at Health Facilities in Resource-Limited Settings*- USAID/SIAPS Program
<http://siapsprogram.org/publication/improving-infection-prevention-and-control-practices-at-health-facilities-in-resource-limited-settings-siaps-technical-report/>
- *Infection Control Assessment Tool*- USAID/SPS Program
 - Tool: http://siapsprogram.org/wp-content/uploads/2012/05/ICAT-composite_FINAL_May-2009.pdf
 - User Manual: <https://docs.google.com/a/msh.org/viewer?a=v&pid=sites&srcid=bXNoLm9yZ3xzczHMtYXJjaGl2ZXxneDozYjUyZjBjYzc1YTVMY2I>
 - Primary Health Care Facilities:
 - <http://siapsprogram.org/publication/infection-control-assessment-tool-for-primary-health-care-facilities/>
- *Insight Report: Global Risks 2013* - World Economic Forum
 - http://www3.weforum.org/docs/WEF_GlobalRisks_Report_2013.pdf
- *Review on AMR. 2016. Tackling Drug-Resistant Infections Globally: Final Report and Recommendations*. The Review on Antimicrobial Resistance. https://amr-review.org/sites/default/files/160518_Final%20paper_with%20cover.pdf
- *Review on AMR 2015. Antimicrobials in Agriculture and the Environment: Reducing Unnecessary Use and Waste*. The Review on Antimicrobial Resistance. <https://amr-review.org/sites/default/files/Antimicrobials%20in%20agriculture%20and%20the%20environment%20-%20Reducing%20unnecessary%20use%20and%20waste.pdf>
- *Revising Preservice Curriculum to Incorporate Rational Medicine Use Topics: A Guide*- USAID/SIAPS Program
<http://siapsprogram.org/wp-content/uploads/2013/01/Preservice-Curriculum-Final.pdf>
- Singer AC, Shaw H, Rhodes V and Hart A (2016) Review of Antimicrobial Resistance in the Environment and Its Relevance to Environmental Regulators. *Front. Microbiol.* 7:1728. doi: 10.3389/fmicb.2016.01728

- *State of the World's Antibiotics*-CDDEP
https://cddep.org/sites/default/files/swa_2015_final.pdf
- *Strengthening Partnerships: Linking National Organizations and Local Coalitions*- CADCA
<http://www.cadca.org/resources/detail/strengthening-partnerships-toolkit>
- *Sustaining the Effort—Sustainability Resources*- CADCA
<http://www.cadca.org/resources/detail/sustaining-effort-sustainability-resources>
- *System-based Approaches to Improving Medication Adherence*- USAID/SIAPS Program
<http://siapsprogram.org/publication/systems-based-approaches-to-improving-medication-adherence/>
- *Tackling Drug-Resistant Infections Globally: final report and recommendations*
https://amr-review.org/sites/default/files/160525_Final%20paper_with%20cover.pdf
- *Telling the Coalition Story: Comprehensive Communication Strategies*- CADCA
<http://www.cadca.org/resources/detail/telling-coalition-story-comprehensive-communication-strategies>
- Bank Group. 2017. *Drug-Resistant Infections: A Threat to Our Economic Future (Final Report)*. Washington, DC: International Bank for Reconstruction and Development/The World Bank. <http://documents.worldbank.org/curated/en/323311493396993758/pdf/114679-REVISED-v2-Drug-Resistant-Infections-Final-Report.pdf>

Useful Websites

- *Antimicrobial Resistance - Part 1 and Part 2* (free online course through USAID's Global Health eLearning Center)
<https://www.globalhealthlearning.org/>
- *Antimicrobial Resistance in the Food Chain* (free online course)
<https://www.futurelearn.com/courses/antimicrobial-resistance-food-chain>
- *Antimicrobial resistance - theory and methods* (online course through Coursera)
<https://www.coursera.org/learn/antimicrobial-resistance>
- *CDC*
<https://www.cdc.gov/drugresistance/>
- *FAO action plan on antimicrobial resistance 2016–2020*
www.fao.org/3/a-i5996e.pdf
- *FAO: AMR webpages*
<http://www.fao.org/antimicrobial-resistance/en/>
- *FAO/OIE/WHO Tripartite Collaboration on AMR*
http://www.who.int/foodsafety/areas_work/antimicrobial-resistance/tripartite/en/
- *Global Health Security Agenda website*
<https://www.ghsagenda.org/>
- *GHSAs – Action Package on AMR*
<https://www.ghsagenda.org/packages/p1-antimicrobial-resistance>
- *Lancet series on antimicrobial access and resistance* (November 2015)
<http://www.thelancet.com/series/antimicrobials-access-and-sustainable-effectiveness>
- *ReAct Toolbox for taking action on antibiotic resistance*
<http://www.reactgroup.org/toolbox/>
- *Review on AMR*
<https://amr-review.org/>
- *SIAPS*
<http://siapsprogram.org/approach/pharmaceutical-services/antimicrobial-resistance/>

- WHO: AMR
<http://www.who.int/antimicrobial-resistance/en/>
- WHO: antimicrobial use
<http://www.who.int/antimicrobial-resistance/global-action-plan/optimize-use/antimicrobials/en/>
- WHO: drug-resistant tuberculosis
<http://www.who.int/tb/areas-of-work/drug-resistant-tb/en/>
- WHO: HIV drug resistance
<http://www.who.int/hiv/topics/drugresistance/en/>
- WHO: Library of national action plans
<http://www.who.int/antimicrobial-resistance/national-action-plans/library/en/>
- WHO: malaria drug resistance
http://www.who.int/malaria/areas/drug_resistance/en/
- WHO: surveillance of antimicrobial use
<http://www.who.int/antimicrobial-resistance/global-action-plan/optimize-use/surveillance/en/>
- WHO: World Antibiotic Awareness Week – Infographics and posters
<http://www.who.int/campaigns/world-antibiotic-awareness-week/infographics/en/>
- World Organization for Animal Health (OIE) work on AMR
<http://www.oie.int/en/our-scientific-expertise/veterinary-products/antimicrobials/>

Annex B. WHO AMR Fact Sheet

(Reproduced from <http://www.who.int/mediacentre/factsheets/fs194/en/>)

Antimicrobial resistance

Fact sheet

Updated September 2016

Key facts

- Antimicrobial resistance (AMR) threatens the effective prevention and treatment of an ever-increasing range of infections caused by bacteria, parasites, viruses, and fungi.
- AMR is an increasingly serious threat to global public health that requires action across all government sectors and society.
- Without effective antibiotics, the success of major surgery and cancer chemotherapy would be compromised.
- The cost of health care for patients with resistant infections is higher than care for patients with non-resistant infections due to longer duration of illness, additional tests, and use of more expensive drugs.
- Globally, 480 000 people develop multi-drug resistant TB each year, and drug resistance is starting to complicate the fight against HIV and malaria as well.

What is antimicrobial resistance?

Antimicrobial resistance happens when microorganisms (such as bacteria, fungi, viruses, and parasites) change when they are exposed to antimicrobial drugs (such as antibiotics, antifungals, antivirals, antimalarials, and anthelmintics). Microorganisms that develop antimicrobial resistance are sometimes referred to as “superbugs”.

As a result, the medicines become ineffective and infections persist in the body, increasing the risk of spread to others.

Why is antimicrobial resistance a global concern?

New resistance mechanisms are emerging and spreading globally, threatening our ability to treat common infectious diseases, resulting in prolonged illness, disability, and death.

Without effective antimicrobials for prevention and treatment of infections, medical procedures such as organ transplantation, cancer chemotherapy, diabetes management, and major surgery (for example, caesarean sections or hip replacements) become very high risk.

Antimicrobial resistance increases the cost of health care with lengthier stays in hospitals and more intensive care required.

Antimicrobial resistance is putting the gains of the Millennium Development Goals at risk and endangers achievement of the Sustainable Development Goals.

What accelerates the emergence and spread of antimicrobial resistance?

Antimicrobial resistance occurs naturally over time, usually through genetic changes. However, the misuse and overuse of antimicrobials is accelerating this process. In many places, antibiotics are overused and misused in people and animals, and often given without professional oversight. Examples of misuse include when they are taken by people with viral infections like colds and flu, and when they are given as growth promoters in animals and fish.

Antimicrobial resistant-microbes are found in people, animals, food, and the environment (in water, soil, and air). They can spread between people and animals, and from person to person. Poor infection control, inadequate sanitary conditions, and inappropriate food handling encourage the spread of antimicrobial resistance.

Present situation

Resistance in bacteria

Antibiotic resistance is present in every country.

Patients with infections caused by drug-resistant bacteria are at increased risk of worse clinical outcomes and death and consume more health-care resources than patients infected with non-resistant strains of the same bacteria.

- Resistance in *Klebsiella pneumoniae* – common intestinal bacteria that can cause life-threatening infections – to a last resort treatment (carbapenem antibiotics) has spread to all regions of the world. *K. pneumoniae* is a major cause of hospital-acquired infections such as pneumonia, bloodstream infections, and infections in newborns and intensive-care unit patients. In some countries, because of resistance, carbapenem antibiotics do not work in more than half of people treated for *K. pneumoniae* infections.
- Resistance in *E. coli* to one of the most widely used medicines for the treatment of urinary tract infections (fluoroquinolone antibiotics) is very widespread. There are countries in many parts of the world where this treatment is now ineffective in more than half of patients.
- Treatment failure to the last resort of medicine for gonorrhoea (third generation cephalosporin antibiotics) has been confirmed in at least 10 countries (Australia, Austria, Canada, France, Japan, Norway, Slovenia, South Africa, Sweden and the United Kingdom of Great Britain and Northern Ireland). WHO recently updated the treatment guidelines for gonorrhoea to address emerging resistance. The new WHO guidelines do not recommend quinolones (a class of antibiotic) for the treatment of gonorrhoea due to widespread high levels of resistance. In addition, treatment guidelines for chlamydial infections and syphilis were also updated.
- Resistance to first-line drugs to treat infections caused by *Staphylococcus aureus*—a common cause of severe infections in health facilities and the community—is widespread. People with MRSA (methicillin-resistant *Staphylococcus aureus*) are estimated to be 64% more likely to die than people with a non-resistant form of the infection.
- Colistin is the last resort treatment for life-threatening infections caused by Enterobacteriaceae, which are resistant to carbapenems. Resistance to colistin has recently been detected in several countries and regions, making infections caused by such bacteria untreatable.

Resistance in tuberculosis (TB)

WHO estimates that, in 2014, there were about 480,000 new cases of multidrug-resistant tuberculosis (MDR-TB), a form of tuberculosis that is resistant to the two most powerful anti-TB drugs. Only about a quarter of these (123,000 cases) were detected and reported. MDR-TB requires treatment courses that are much longer and less effective than those for non-resistant TB. Globally, only half of MDR-TB patients were successfully treated in 2014.

Among new TB cases in 2014, an estimated 3.3% were multidrug-resistant. The proportion is higher among people previously treated for TB, at 20%.

Extensively drug-resistant tuberculosis (XDR-TB), a form of tuberculosis that is resistant to at least four of the core anti-TB drugs, has been identified in 105 countries. An estimated 9.7% of people with MDR-TB have XDR-TB.

Resistance in malaria

As of July 2016, resistance to the first-line treatment for *P. falciparum* malaria (artemisinin-based combination therapies, also known as ACTs) has been confirmed in five countries of the Greater Mekong subregion (Cambodia, the Lao People's Democratic Republic, Myanmar, Thailand and Viet Nam). In most places, patients with artemisinin-resistant infections recover fully after treatment, provided that they are treated with an ACT containing an effective partner drug. However, along the Cambodia-Thailand border, *P. falciparum* has become resistant to almost all available antimalarial medicines, making treatment more challenging and requiring close monitoring. There is a real risk that multidrug resistance will soon emerge in other parts of the subregion as well. The spread of resistant strains to other parts of the world could pose a major public health challenge and jeopardize important recent gains in malaria control.

A “WHO Strategy for Malaria Elimination in the Greater Mekong subregion (2015–2030)” was endorsed by all five countries, as well as China.

Resistance in HIV

In 2010, an estimated 7% of people starting antiretroviral therapy (ART) in developing countries had drug-resistant HIV. In developed countries, the same figure was 10–20%. Some countries have recently reported levels at or above 15% among those starting HIV treatment, and up to 40% among people re-starting treatment. This requires urgent attention.

Increasing levels of resistance have important economic implications as second and third-line regimens are 3 times and 18 times more expensive, respectively, than first-line drugs.

Since September 2015, WHO has recommended that everyone living with HIV start on antiretroviral treatment. Greater use of ART is expected to further increase ART resistance in all regions of the world. To maximize the long-term effectiveness of first-line ART regimens, and to ensure that people are taking the most effective regimen, it is essential to continue monitoring resistance and to minimize its further emergence and spread. In consultation with countries, partners and stakeholders, WHO is currently developing a new “Global Action Plan for HIV Drug Resistance (2017–2021)”.

Resistance in influenza

Antiviral drugs are important for treatment of epidemic and pandemic influenza. So far, virtually all influenza A viruses circulating in humans were resistant to one category of antiviral drugs – M2 Inhibitors (amantadine and rimantadine). However, the frequency of resistance to the neuraminidase inhibitor oseltamivir remains low (1–2%). Antiviral susceptibility is constantly monitored through the WHO Global Influenza Surveillance and Response System.

Need for coordinated action

Antimicrobial resistance is a complex problem that affects all of society and is driven by many interconnected factors. Single, isolated interventions have limited impact. Coordinated action is required to minimize the emergence and spread of antimicrobial resistance.

All countries need national action plans on AMR.

Greater innovation and investment are required in research and development of new antimicrobial medicines, vaccines, and diagnostic tools.

WHO's response

WHO is providing technical assistance to help countries develop their national action plans and strengthen their health and surveillance systems so that they can prevent and manage antimicrobial resistance. It is collaborating with partners to strengthen the evidence base and develop new responses to this global threat.

WHO is working closely with the Food and Agriculture Organization of the United Nations (FAO) and the World Organization for Animal Health (OIE) in a 'One Health' approach to promote best practices to avoid the emergence and spread of antibacterial resistance, including optimal use of antibiotics in both humans and animals.

A global action plan on antimicrobial resistance was adopted by Member States at the Sixty-eighth World Health Assembly and supported by the governing bodies of FAO and OIE in May and June 2015. The goal of the global action plan is to ensure, for as long as possible, continuity of successful treatment and prevention of infectious diseases with effective and safe medicines that are quality-assured, used in a responsible way, and accessible to all who need them.

A high-level meeting on antimicrobial resistance at the United Nations General Assembly [was] held on 21 September 2016 to accelerate global commitments and enhance national multi-sectoral efforts to combat antimicrobial resistance.

Annex C. WHO Recommendations for AMR Interventions

(Excerpt reprinted from WHO's *Global Action Plan on Antimicrobial Resistance*. 2015. Geneva: WHO.)

Objective 1: Improve awareness and understanding of antimicrobial resistance through effective communication, education and training

Potential measures of effectiveness: extent of reduction in global human consumption of antibiotics (with allowance for the need for improved access in some settings), and reduction in the volume of antibiotic use in food production

I. Member State action

- i. Increase national awareness of antimicrobial resistance through public communication programmes that target the different audiences in human health, animal health and agricultural practice, including participation in an annual world antibiotic awareness campaign.
- ii. Establish antimicrobial resistance as a core component of professional education, training, certification and development for the health and veterinary sectors and agricultural practice.
- iii. Include antimicrobial use and resistance in school curricula in order to promote better understanding and awareness, and provide the public media with accurate and relevant information so that public information and reporting reinforce key messages.
- iv. Recognize antimicrobial resistance as a priority need for action across all government ministries through inclusion in national risk registers or other effective mechanisms for cross-government commitment.
- v. Promote and support establishment of multisectoral (one-health) coalitions to address antimicrobial resistance at local or national level, and participation in such coalitions at regional and global levels.

II. Secretariat action

- i. Develop and implement global communication programmes and campaigns, including an annual world antibiotic awareness campaign, building on existing regional and national campaigns and in partnership with other organizations (e.g. UNESCO and UNICEF). Provide core communication materials and tools (including those for social media and for assessing public awareness and understanding) that can be adapted and implemented by Member States and others.
- ii. Develop, with FAO and OIE through the tripartite collaboration, core communication, education and training materials that can be adapted and implemented regionally and nationally, on subjects that include the need for responsible use of antibiotics, the importance of infection prevention in human and animal health and agricultural practice, and measures to control spread of resistant organisms through food and the environment. Provide support to Member States with the integration of education on antimicrobial resistance into professional training, education and registration.
- iii. Publish regular reports on progress in implementing the global action plan and progress towards meeting impact targets, in order to maintain commitment to reducing antimicrobial resistance.
- iv. Maintain antimicrobial resistance as a priority for discussion with Member States through the regional committees, the Executive Board and Health Assembly, and with other intergovernmental organizations, including the United Nations.

III. International and national partners' action

- i. Professional organizations and societies should establish antimicrobial resistance as a core component of education, training, examination, professional registration or certification, and professional development.
- ii. OIE should continue to support its members in implementing OIE standards including veterinary professional standards and training, applying its Performance of Veterinary Services Pathway¹⁶ and updating of legislation.
- iii. FAO should support awareness-raising on antimicrobial resistance and promote good animal production and hygiene practices among animal production and health workers, animal producers, and other stakeholders in the food and agriculture sectors.
- iv. Intergovernmental organizations, including FAO, OIE and the World Bank, should raise awareness and understanding of antimicrobial resistance and, in collaboration with WHO, should mirror the actions of the Secretariat within their constituencies.
- v. Other stakeholders – including civil society organizations, trade and industry bodies, employee organizations, foundations with an interest in science education, and the media – should help to promote public awareness and understanding of infection prevention and use of antimicrobial medicines across all sectors.
- vi. WHO, FAO, OIE and other international stakeholders should encourage and support Member States in forging in-country as well as regional/global coalitions and alliances.

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¹⁶ See: <http://www.oie.int/support-to-oie-members/pvs-evaluations/> (accessed 20 November 2014).

**Objective 2: Strengthen the knowledge and evidence base through surveillance and research**

Potential measure of effectiveness: extent of reduction in the prevalence of antimicrobial resistance, based on data collected through integrated programmes for surveillance of antimicrobial resistance in all countries

I. Member State action

- i. Develop a national surveillance system for antimicrobial resistance that:
 - ▶ includes a national reference centre with the ability systematically to collect and analyse data – including those on a core set of organisms and antimicrobial medicines from both health care facilities and the community – in order to inform national policies and decision-making;
 - ▶ includes at least one reference laboratory capable of susceptibility testing to fulfil the core data requirements, using standardized tests for identification of resistant microorganisms and operating to agreed quality standards;
 - ▶ strengthens surveillance in animal health and agriculture sectors by implementation of the recommendations of the WHO Advisory Group on Integrated Surveillance of Antimicrobial Resistance for antimicrobial susceptibility testing of foodborne pathogens,¹⁷ the standards published in the OIE terrestrial and aquatic animal codes including the monitoring of resistance and antimicrobial use,^{18,19} the FAO/WHO Codex Alimentarius Code of Practice to Minimize and Contain Antimicrobial Resistance²⁰ and the Codex Alimentarius Guidelines for Risk Analysis of Foodborne Antimicrobial Resistance;

II. Secretariat action

- i. Develop and implement a global programme for surveillance of antimicrobial resistance in human health, including surveillance and reporting standards and tools, case definitions, external quality assessment schemes, and a network of WHO Collaborating Centres to support surveillance of antimicrobial resistance and external quality assessment in each WHO region.
- ii. Develop, in consultation with Member States and other multisectoral stakeholders, standards for the reporting, sharing and publication of data on antimicrobial resistance that take into account established practices for global disease surveillance and reporting, as well as legal and ethical requirements.
- iii. Report regularly on global and regional trends in the prevalence of antimicrobial resistance in human health.
- iv. Work with FAO and OIE, within the tripartite collaboration, to support integrated surveillance and reporting of antimicrobial resistance in human and animal health and agriculture, and develop measures of antimicrobial resistance in the food chain for use as indicators of risk to human health.
- v. Develop a framework for monitoring and reporting on antimicrobial consumption in human health, including standards for collection and reporting of data on use in different settings, building on the work of OECD.²¹
- vi. With FAO and OIE, within the tripartite collaboration, collect, consolidate and publish information on the global consumption of antimicrobial medicines.

III. International and national partners' action

- i. FAO, with WHO, should review and update regularly the FAO/WHO Codex Alimentarius Code of Practice to minimize and contain antimicrobial resistance and the Codex Alimentarius guidelines for risk analysis of foodborne antimicrobial resistance.
- ii. The international research community and FAO should support studies to improve understanding of the impact of antimicrobial resistance on agriculture, animal production and food security, as well as the impacts of agricultural practices on development and spread of antimicrobial resistance, and to reduce non-therapeutic use of antimicrobial agents in agriculture through the development of sustainable husbandry practices.
- iii. OIE should regularly update the terrestrial and aquatic animal codes (particularly with reference to antimicrobial resistance), revise the guideline on laboratory methods for bacterial antimicrobial susceptibility testing, and support the establishment of veterinary laboratory services through its Performance of Veterinary Services Pathway.
- iv. Global health donors, international development bodies, and aid and technical agencies should support developing countries to build capacity to collect and analyse data on the prevalence of antimicrobial resistance and share or report such data.

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¹⁷ Integrated surveillance on antimicrobial resistance: guidance from a WHO advisory group. Geneva: World Health Organization; 2013.

¹⁸ See document CAC/GL 77-2011 at: <http://www.codexalimentarius.org/standards/list-of-standards/en/> (accessed 20 November 2014).

¹⁹ See: <http://www.oie.int/en/our-scientific-expertise/veterinary-products/antimicrobials> (accessed 20 November 2014).

²⁰ See: <http://www.codexalimentarius.org/committees-task-forces/?provide=committeeDetail&idList=6> (accessed 20 November 2014).

²¹ Prescribing in primary care. In: Health at a glance 2013: OECD Indicators. Paris: Organisation for Economic Cooperation and Development; 2013.

Objective 2 (cont.): Strengthen the knowledge and evidence base through surveillance and research

Potential measure of effectiveness: extent of reduction in the prevalence of antimicrobial resistance, based on data collected through integrated programmes for surveillance of antimicrobial resistance in all countries

I. Member State action

- ▶ promotes participation in regional and global networks and sharing of information so that national, regional and global trends can be detected and monitored;
- ▶ has the capacity to detect and report newly emerged resistance that may constitute a public health emergency of international concern, as required under the International Health Regulations (2005).
- ii. Collect and report data on use of antimicrobial agents in human and animal health and agriculture so that trends can be monitored and the impact of action plans assessed.
- iii. Consider implementing an agreed global public health research agenda on antimicrobial resistance, including: research to promote responsible use of antimicrobial medicines; defining improved practices for preventing infection in human and animal health and agricultural practice; and encouraging development of novel diagnostic tools and antimicrobial medicines.

II. Secretariat action

- vii. Consult Member States and other multisectoral stakeholders for the development of a global public health research agenda for filling major gaps in knowledge on antimicrobial resistance, including methods to assess the health and economic burdens of antimicrobial resistance, cost-effectiveness of actions, mechanisms of development and spread of resistance, and research to underpin development of new interventions, diagnostic tools and vaccines. Monitor and report on implementation of the research agenda, for instance through the use of WHO's Global Health Research and Development Observatory.
- viii. Work with partners to establish a sustainable repository for information on antimicrobial resistance and on the use and efficacy of antimicrobial medicines that is integrated with the global health research and development observatory and with a programme for independent evidence assessment and evaluation.

III. International and national partners' action

- v. Research funding organizations and foundations should support implementation of the agreed global public health research agenda on antimicrobial resistance.

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**Objective 3: Reduce the incidence of infection through effective sanitation, hygiene and infection prevention measures**

Potential measures of effectiveness: extent of reduction in the prevalence of preventable infections, and in particular the incidence of drug-resistant infections in health care settings

I. Member State action

- i. Member States may consider the following actions:
 - ▶ take urgent action to implement and strengthen hygiene and infection prevention and control;
 - ▶ include training and education in hygiene and infection prevention and control as core (mandatory) content in training and education for health care and veterinary professionals and in their continuing professional development and accreditation or registration.
 - ▶ develop or strengthen national policies and standards of practice regarding infection prevention and control activities in health facilities and monitor implementation of and adherence to these national policies and standards.
- ii. Include within national surveillance of antimicrobial resistance the collection and reporting of data on antimicrobial susceptibility of microorganisms causing health care-associated infections.
- iii. Strengthen animal health and agricultural practices through implementation of the standards published in the OIE Terrestrial and Aquatic Animal Health Codes²² and FAO/WHO Codex Alimentarius Code of Practice to Minimize and Contain Antimicrobial Resistance.²³
- iv. Promote vaccination as a method of reducing infections in food animals.

II. Secretariat action

- i. Facilitate the design and implementation of policies and tools to strengthen hygiene and infection prevention and control practices, particularly to counter antimicrobial resistance, and promote the engagement of civil society and patient groups in improving practices in hygiene and infection prevention and control.
- ii. Ensure that policy recommendations for new and existing vaccines take into account the prospects for restricted treatment options because of antimicrobial resistance, and the additional benefits of reduced use of antimicrobial agents, including antibiotics.
- iii. Work with partners and other organizations to facilitate the development and clinical evaluation of specific priority vaccines for the prevention of difficult-to-treat or untreatable infections.
- iv. Work with FAO and OIE, within the tripartite collaboration, to develop recommendations for the use of vaccines in food-producing animals, including recommendations for new vaccines, as a means to prevent foodborne diseases in humans and animals and reduce antimicrobial use.

III. International and national partners' action

- i. Professional societies and accreditation bodies should support training and education on infection-prevention measures as a mandatory requirement in professional development, accreditation and registration.
- ii. OIE should update its codes and manuals to take account of new developments in vaccines.
- iii. FAO should continue to engage and support producers and stakeholders in the food and agriculture sectors in adopting good practices in animal husbandry and health aimed at reducing the use of antibiotics and the risk of development and spread of antimicrobial resistance.

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²² See: <http://www.oie.int/en/our-scientific-expertise/veterinary-products/antimicrobials> (accessed 20 November 2014).

²³ See: <http://www.codexalimentarius.org/committees-task-forces/?provide=committeeDetail&idList=6> (accessed 29 October 2014).

Objective 4: Optimize the use of antimicrobial medicines in human and animal health

Potential measure of effectiveness: extent of reduction in global human consumption of antibiotics (with allowance for the need for improved access in some settings), the consumption of antibiotics used in food production (terrestrial and aquatic livestock, and other agricultural practices), and the use of medical and veterinary antimicrobial agents for applications other than human and animal health

I. Member State action

- i. Develop and implement comprehensive action plans on antimicrobial resistance that incorporate the following elements:
 - ▶ distribution, prescription, and dispensing of antimicrobials is carried out by accredited health or veterinary professionals under statutory body supervision or other suitably trained person authorized in accordance with national legislation;
 - ▶ marketing authorization is given only to antimicrobial agents that are quality assured, safe and efficacious;
 - ▶ development and implementation of national and institutional essential medicine lists guided by the WHO Model Lists of Essential Medicines, reimbursement lists and standard treatment guidelines to guide purchasing and prescribing of antimicrobial medicines, and regulation and control of promotional practices by industry;
 - ▶ laboratory capacity to identify pathogens and their antimicrobial susceptibility in order to guide optimal use of antimicrobial medicines in clinical practice;
 - ▶ provision of stewardship programmes that monitor and promote optimization of antimicrobial use at national and local levels in accordance with international standards in order to ensure the correct choice of medicine at the right dose on the basis of evidence;
 - ▶ identification and elimination of economic incentives in all sectors that encourage inappropriate use of antimicrobial agents, and introduction of incentives to optimize use;

II. Secretariat action

- i. Strengthen and align, within the tripartite collaboration with FAO and OIE, the concepts of critically important antibiotics for human and animal health, and ensure that these concepts include use of new antibiotics so that a common position on restriction of antimicrobial medicines for human use can be established.
- ii. Provide support to Member States in the development and enforcement of relevant regulations so that only, quality assured, safe and effective antimicrobial products reach users.
- iii. Develop technical guidelines and standards to support access to, and evidence-based selection and responsible use of, antimicrobial medicines, including follow-up to treatment failure.
- iv. Provide leadership to strengthen medicines regulatory systems at national and regional levels, so that appropriate practices for optimizing use of antimicrobial medicines are supported by appropriate and enforceable regulation, and that promotional practices can be adequately regulated.
- v. Consult with Member States and pharmaceutical industry associations on innovative regulatory mechanisms for new antimicrobial medicines, for example considering them as a class of medicine that will require a different set of regulatory controls, and on new approaches to product labelling that focus on public health needs rather than marketing claims, in order to address the need for preservation of effectiveness and for global access.

III. International and national partners' action

- i. OIE should regularly update its Terrestrial and Aquatic Animal Health Codes, particularly with reference to antimicrobial resistance.
- ii. FAO, in collaboration with WHO, should regularly review and update the FAO/WHO Codex Alimentarius Code of Practice to Minimize and Contain Antimicrobial Resistance to take into account not only residues in food but also the need for standards to minimize and control use of antimicrobial agents in agricultural practice.
- iii. OIE, supported by FAO and WHO within the tripartite collaboration, should build and maintain a global database on the use of antimicrobial medicines in animals.
- iv. The research community in both the public and private sectors, including the pharmaceutical industry, should invest in the development of effective and low-cost tools for diagnosis of infectious diseases and antimicrobial susceptibility testing for use in human and animal health at points of care and dispensing (pharmacies).
- v. Donors, philanthropic and other nongovernmental organizations and civil society should ensure that their efforts to increase access to antimicrobial medicines are accompanied by measures to protect the continued efficacy of such medicines.



Objective 4 (cont.): Optimize the use of antimicrobial medicines in human and animal health

Potential measure of effectiveness: extent of reduction in global human consumption of antibiotics (with allowance for the need for improved access in some settings), the consumption of antibiotics used in food production (terrestrial and aquatic livestock, and other agricultural practices), and the use of medical and veterinary antimicrobial agents for applications other than human and animal health

I. Member State action

- ▶ effective and enforceable regulation and governance for licensing, distribution, use and quality assurance of antimicrobial medicines in human and animal health, including a regulatory framework for preservation of new antibiotics;
- ▶ policies on use of antimicrobial agents in terrestrial and aquatic animals and agriculture, including: implementation of Codex Alimentarius and OIE international standards and guidelines as well as WHO/OIE guidance on the use of critically important antibiotics; phasing out of use of antibiotics for animal growth promotion and crop protection in the absence of risk analysis; and reduction in nontherapeutic use of antimicrobial medicines in animal health.

II. Secretariat action

- vi. Develop standards and guidance (within the tripartite collaboration with FAO and OIE), based on best available evidence of harms, for the presence of antimicrobial agents and their residues in the environment, especially in water, wastewater and food (including aquatic and terrestrial animal feed).

III. International and national partners' action

- vi. Professional bodies and associations, including industry associations, health insurance providers and other payers, should develop a code of conduct for appropriate training in, education about, and marketing, purchasing, reimbursement and use of antimicrobial agents. This code should include commitment to comply with national and international regulations and standards, and to eliminate dependence on the pharmaceutical industry for information and education on medicines and, in some cases, income.



Objective 5: Develop the economic case for sustainable investment that takes account of the needs of all countries, and increase investment in new medicines, diagnostic tools, vaccines and other interventions

Potential measures of effectiveness: extent of increase in sustainable investment in capacity to counter antimicrobial resistance for all countries, including investment in development of new medicines, diagnostics and other interventions

I. Member State action

- i. Member States should consider assessing investment needs for implementation of their national action plans on antimicrobial resistance, and should develop plans to secure and apply the required financing.
- ii. Member States are encouraged to participate in international collaborative research to support the development of new medicines, diagnostic tools and vaccines through:
 - ▶ prioritization and support of basic scientific research on infectious diseases, and promoting partnerships between research institutions in developed and developing countries;
 - ▶ collaboration, based on fair and equitable benefit sharing as mutually agreed, in the investigation of natural sources of biodiversity and biorepositories as sources for the development of new antibiotics;
 - ▶ strengthening existing and creating new public-private partnerships for encouraging research and development of new antimicrobial agents and diagnostics;
 - ▶ piloting of innovative ideas for financing research and development and for the adoption of new market models to encourage investment and ensure access to new antimicrobial products.

II. Secretariat action

- i. Work with the United Nations Secretary-General and bodies in the United Nations system to identify the best mechanism(s) to realize the investment needed to implement the global action plan on antimicrobial resistance, particularly with regard to the needs of developing countries.
- ii. Work with the World Bank and with other development banks to develop and implement a template or models to estimate the investment needed to implement national action plans on antimicrobial resistance, and to collate and summarize these needs.
- iii. Work with the World Bank and with FAO and OIE, within the tripartite collaboration, to assess the economic impact of antimicrobial resistance and of implementation of the action plan in animal health and agriculture.
- iv. Explore with Member States, intergovernmental organizations, industry associations and other stakeholders, options for the establishment of a new partnership or partnerships:
 - ▶ to coordinate the work of many unlinked initiatives aiming to renew investment in research and development of antibiotics (including follow-up initiatives from the Consultative Expert Working Group on Research and Development²⁴);
 - ▶ to identify priorities for new treatments, diagnostics and vaccines on the basis of emergence and prevalence of serious or life-threatening infections caused by resistant pathogens;
 - ▶ to act as the vehicle(s) for securing and managing investment in new medicines, diagnostics, vaccines and other interventions;
 - ▶ to facilitate affordable and equitable access to existing and new medicines²⁵ and other products while ensuring their proper and optimal use;
 - ▶ to establish open collaborative models of research and development in a manner that will support access to the knowledge and products from such research, and provide incentives for investment.

III. International and national partners' action

- i. Partners in the finance and economic sectors should define the economic case for national and global investment in combating antimicrobial resistance, including an assessment of the cost of implementing this action plan and the consequential cost of no action; this work could be led by the World Bank.
- ii. FAO, OIE and other partners should support appropriate analyses to establish the case for investment and to inform the selection of interventions to improve animal husbandry, management, health, hygiene and biosecurity practices aimed at reducing antimicrobial use (and antimicrobial resistance) in different production settings.

²⁴ Research and development to meet health needs in developing countries: strengthening global financing and coordination. Report of the consultative expert working group on research and development: financing and coordination. Geneva: World Health Organization; 2012.


²⁵ Many of the actions that can support affordable and equitable access to medicines are set out in the Global strategy and plan of action on public health, innovation and intellectual property. Geneva: World Health Organization; 2011.

Annex D. AMR Overview Presentation



The following slides provide a basic overview of AMR. These slides may be helpful at meetings where people may not be familiar with the scope, magnitude, or basic concepts of AMR and can be used in any way that may be helpful to users of this manual. Depending on the type of audience, you can adapt or remove slides as necessary.

Some of the slides or texts in this PowerPoint set were reproduced or drawn from the following sources:

- AMR Review, Final Report and Recommendations, 2016: https://amr-review.org/sites/default/files/160525_Final%20paper_with%20cover.pdf
- Centers for Disease Control. 2013. Antibiotic resistance threats in the United States. Atlanta. www.cdc.gov/drugresistance/pdf/ar-threats-2013-508.pdf
- Joshi MP. 2016. *Containing Antimicrobial Resistance to Realize the Goals of Universal Health Coverage*. Plenary presented at the Ecumenical Pharmaceutical (EPN) Forum 2016. 18–20 May 2016, Tübingen, Germany. <http://siapsprogram.org/publication/containing-antimicrobial-resistance-to-realize-the-goals-of-universal-health-coverage/>
- Joshi MP, Andualem T, Phulu B, Mpundu M, Ludman M. 2015. *Country and regional level advocacy and coalition-building against antimicrobial resistance*. Presentation at the 143rd American Public Health Association (APHA) Annual Meeting and Expo. October 31–November 4, 2015. Chicago, IL. <http://siapsprogram.org/publication/country-and-regional-level-advocacy-and-coalition-building-against-antimicrobial-resistance/>
- Joshi MP, Ludman M. 2015. Fight Antimicrobial Resistance or Go Back to the Pre-Antimicrobial Era. PowerPoint presented at the USAID Global Health Mini University, March 2, 2015, Washington, DC, USA. http://siapsprogram.org/wp-content/uploads/2015/05/Mohan_USAID-Mini-U_fight_antimicrobial_resistance_or_go_back_to_the_pre-antimicrobial_era.pdf
- WHO, OIE, FAO. Antimicrobial resistance (AMR). <http://www.who.int/antimicrobial-resistance/policy-package-july2016.pdf?ua=1>
- USAID Global Health eLearning Center, Antimicrobial Resistance: <https://www.globalhealthlearning.org>



Antimicrobial Resistance: An Overview

“Antimicrobial resistance is a crisis that must be managed with the utmost urgency. As the world enters the ambitious new era of sustainable development, we cannot allow hard-won gains for health to be eroded by the failure of our mainstay medicines.”



Dr. Margaret Chan
Former Director General
World Health Organization

Source: WHO
http://apps.who.int/iris/bitstream/10665/193736/1/9789241509763_eng.pdf?ua=1



The Rising Tide of AMR

- Antimicrobial medicines are the cornerstones of modern medicine
 - Help to prevent and treat many infections, such as wound infections and pneumonia
 - Allow for complex surgeries and procedures, such as organ transplants and chemotherapy
- But these medical advances are threatened by the continued development and spread of AMR



What Is AMR?

Antimicrobial resistance (AMR)
is the ability of microorganisms (like bacteria, viruses, and some parasites) to stop antimicrobial agents (such as antibiotics, antivirals, and antimalarials) from working against them.

Source:
WHO: <http://www.who.int/antimicrobial-resistance/en/>
Photo Credit: CDC



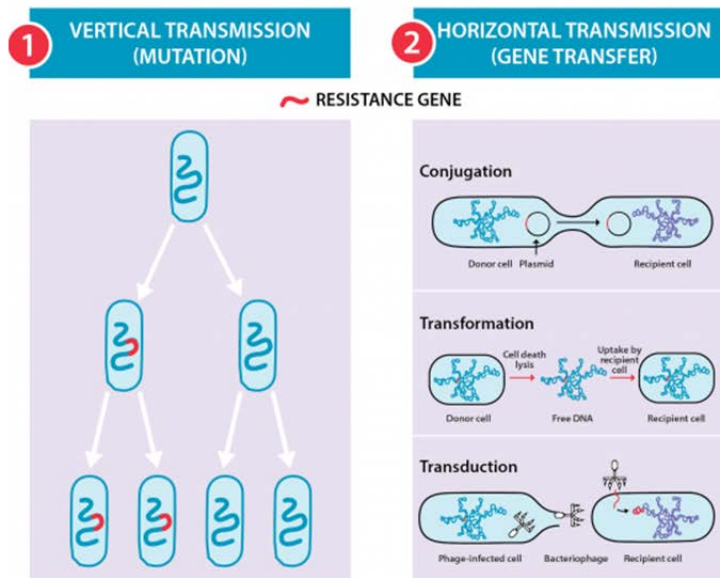
How AMR Occurs (1)

- Some microbes are preprogrammed to be resistant to certain types of antimicrobials. This is known as **inherent or intrinsic resistance**.
- Microbes can also acquire genes that code for resistance, known as **acquired resistance**, in two ways (also see the graphic on the next slide):
 - spontaneously develop resistance during replication (**vertical transmission**)
 - acquire genes that code for resistance (**horizontal transmission**)

Reproduced from: USAID Global Health eLearning Center, Antimicrobial Resistance (Part 1);
<https://www.globalhealthlearning.org/course/antimicrobial-resistance-part-1-0>

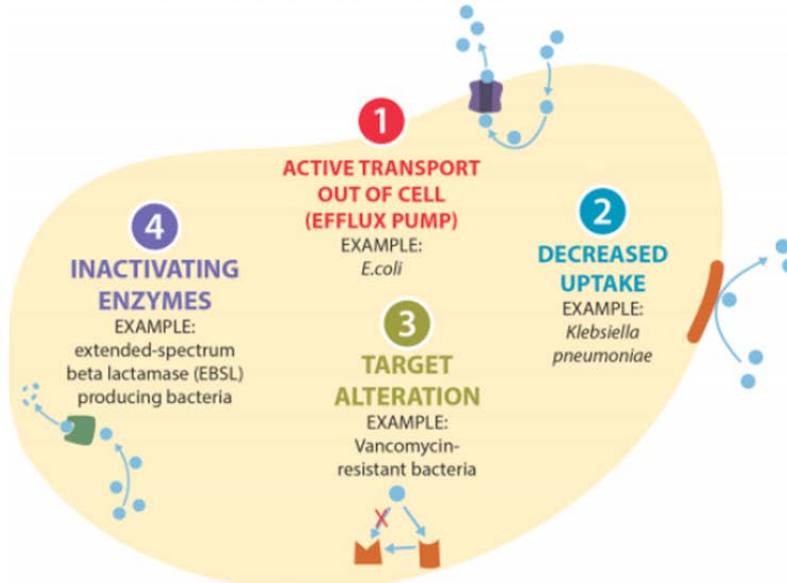


How AMR Occurs (2)



Graphic reproduced from: USAID Global Health eLearning Center, Antimicrobial Resistance (Part 1);
<https://www.globalhealthlearning.org/course/antimicrobial-resistance-part-1-0>
Sources: Dantes G, Sommer M. 2014. How to Fight Back Against Antibiotic Resistance. *Am Sci*. 2014 Feb;102(1):42-51.
Furuja E, Lowy F. 2006. Antimicrobial-resistant bacteria in the community setting. *Nature Reviews Microbiology*. 4,36-45.

Molecular Mechanism of AMR

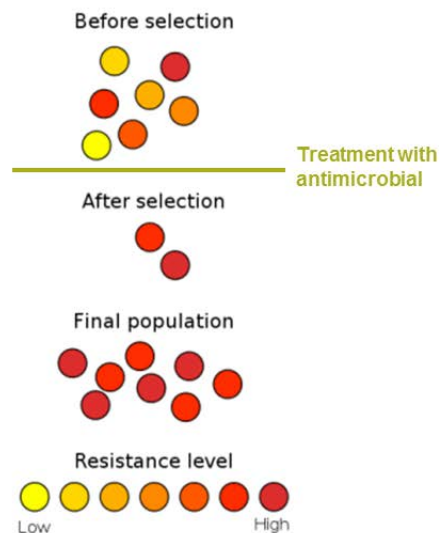


Source: USAID Global Health eLearning Center, Antimicrobial Resistance (Part 1)
<https://www.globalhealthlearning.org/course/antimicrobial-resistance-part-1-0>
 Graphic adapted from: Todar 2011; Abreu et al. 2012, and Dantas et al. 2014



Selective Pressure

- Microbes with resistance to an antimicrobial will survive in the presence of that antimicrobial while microbes without the resistance genes die
- This **selective pressure** leaves resistant microbes behind to multiply and spread

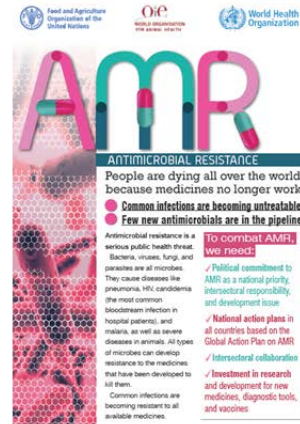


Source: USAID Global Health eLearning Center, Antimicrobial Resistance (Part 1): <https://www.globalhealthlearning.org>



Why Is AMR a Concern?

- One of the biggest global public health threats
- A major global health security risk
- Widespread in both hospitals and communities
- Rapidly making many first-line treatments ineffective
- Affects all infectious diseases, including TB, malaria, and HIV/AIDS



How Does AMR Affect Individuals and the Community?



<http://www.cdc.gov/drugresistance/pdf/ar-threats-2013-508.pdf>

- Increases morbidity and mortality
- Increases direct costs (e.g., longer hospital stays, use of more expensive second- or third-line drugs)
- Increases indirect costs (e.g., prolonged absence from work)
- Causes psychological stress
- Creates financial hardships
- Prolongs periods of infectiousness, increasing the risk of transmitting infection to others in the community



How Does AMR Affect Health Systems and Countries?

Beyond the human health sector, AMR affects several other sectors:

- Animal health and welfare
- Food supply and production
- Crops, livestock, and fish
- Environment
- Social and economic development
- Water and sanitation
- Trade and commerce
- Travel and tourism

Consequences:

- Overburdened or bankrupt health systems
- Lost productivity
- Decreased food production and unsafe foods
- Potential future impacts on travel, migration, and trade

Source: WHO, OIE, FAO. Antimicrobial resistance (AMR).
<http://www.who.int/antimicrobial-resistance/policy-package-july2016.pdf?ua=1>
World Economic Forum 2013
http://www3.weforum.org/docs/WEF_GlobalRisks_Report_2013.pdf

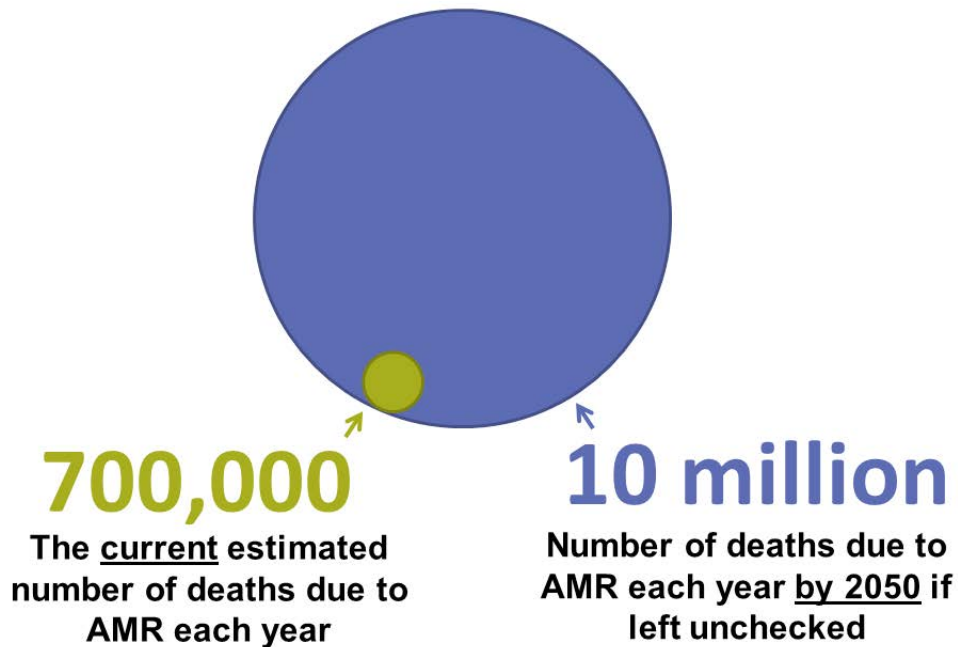


Gains of MDGs Will Be Lost; SDGs in Danger

- The Millennium Development Goals (MDGs) helped slow the spread of HIV/AIDS, malaria, and TB and accelerated declines in maternal and child deaths. AMR can turn back the clock on these achievements.
- AMR also threatens progress on the health-related Sustainable Development Goals (SDGs). AMR will affect poor people in developing countries the most.

Reproduced from: WHO, OIE, FAO. Antimicrobial resistance (AMR).
<http://www.who.int/antimicrobial-resistance/policy-package-july2016.pdf?ua=1>





Hoffman SJ et al. 2015. An international legal framework to address antimicrobial resistance. Bull World Health Organ 93:66 | doi: <http://dx.doi.org/10.2471/BLT.15.152710>



Burden of Deaths from AMR: Country Examples

UNITED STATES	More than 2 million people are affected by drug-resistant infections every year, and more than 23,000 die as a direct result*
THAILAND	Antibiotic-resistant infections affect more than 140,000 people and claim more than 30,000 lives every year**
CHINA	Approximately 80,000 people die every year from drug-resistant hospital-acquired infections**

*Centers for Disease Control. 2013. *Antibiotic resistance threats in the United States*. Atlanta.
 ** World Economic Forum. 2013. *Global risks 2013: Eighth edition*. Geneva.



USD100 trillion

**Cumulative costs due to
AMR by 2050 if it is not
contained**

Source: Review on Antimicrobial Resistance. 2015. *Tackling a Global Health Crisis: Initial Steps*.
http://amr-review.org/sites/default/files/Report-52_15.pdf



**Projected decrease in
global GDP by 2050 if AMR
is left unchecked**

3.8%

Source: World Bank Group. 2017. *Drug-Resistant Infections: A Threat to Our Economic Future (Final Report)*. Washington, DC: International Bank for Reconstruction and Development/The World Bank.
<http://documents.worldbank.org/curated/en/323311493396993759/pdf/114679REVISED-v2-Drug-Resistant-Infections-Final-Report.pdf>.






Examples of Multidrug-resistant (MDR) Pathogens

- Methicillin-resistant *Staphylococcus aureus* (MRSA)
- Carbapenem-resistant Enterobacteriaceae (CRE)
- MDR *Neisseria gonorrhoeae*
- Extended spectrum β -lactamase-producing Enterobacteriaceae (ESBLs)
- MDR *Pseudomonas aeruginosa*
- Vancomycin-resistant *Staphylococcus aureus* (VISA)
- Vancomycin-resistant *Enterococcus* (VRE)
- MDR *Acinetobacter*
- MDR and extensively drug-resistant (XDR) TB
- MDR *Plasmodium falciparum*

Centers for Disease Control. 2013. *Antibiotic resistance threats in the United States*. Atlanta, WHO. 2014. *Antimicrobial Resistance: Global Report on Surveillance*. WHO, Geneva.



Examples of Drug Resistance in Selected Pathogens	 BACTERIA	 EXAMPLES OF ILLNESS CAUSED	 SHOWING RESISTANCE TO:
	Enterococci	<ul style="list-style-type: none"> • Urinary tract infections • Bloodstream infections • Wound infections 	<ul style="list-style-type: none"> • Vancomycin (called vancomycin-resistant enterococci or VRE)
<i>Escherichia coli</i> (<i>E.coli</i>)	<ul style="list-style-type: none"> • Urinary tract infections • Bloodstream infections 	<ul style="list-style-type: none"> • Third-generation cephalosporins, with production of extended spectrum beta-lactamases (ESBLs) 	
<i>Klebsiella pneumoniae</i> (<i>K. pneumoniae</i>)	<ul style="list-style-type: none"> • Pneumonia • Bloodstream infections • Urinary tract infections 	<ul style="list-style-type: none"> • Third-generation cephalosporins (with production of ESBLs) • Carbapenems 	
Nontyphoidal <i>Salmonella</i>	<ul style="list-style-type: none"> • Foodborne diarrhea and/or • Blood stream infections 	<ul style="list-style-type: none"> • Ceftriaxone • Ciprofloxacin 	
<i>Pseudomonas aeruginosa</i>	<ul style="list-style-type: none"> • Pneumonia • Bloodstream infections • Urinary tract infections • Surgical site infections 	<ul style="list-style-type: none"> • Aminoglycosides • Cephalosporins • Fluoroquinolones • Carbapenems 	
<i>Salmonella typhi</i>	<ul style="list-style-type: none"> • Typhoid fever 	<ul style="list-style-type: none"> • Azithromycin • Ceftriaxone • Ciprofloxacin 	
<i>Shigella</i> species	<ul style="list-style-type: none"> • Diarrhea ("bacillary dysentery") 	<ul style="list-style-type: none"> • Azithromycin • Ciprofloxacin 	

Reproduced from: USAID Global Health eLearning Center, Antimicrobial Resistance (Part 1): <https://www.globalhealthlearning.org/course/antimicrobial-resistance-part-1-0>
 Adapted from: CDC. 2013. *Antibiotic Resistance Threats in the United States*. <https://www.cdc.gov/drugresistance/threat-report-2013/pdf/ar-threats-2013-508.pdf#page=77>



Tuberculosis

- The world had an estimated 480,000 new cases of multidrug-resistant TB in 2013, the majority of which were untreated*

Malaria

- Artemisinin-resistant malarial parasites have been identified in Cambodia, Myanmar, Thailand, and Vietnam**

HIV

- Recent studies in low- and middle-income countries have shown increases in transmitted HIV drug resistance*** among patients starting antiretroviral therapy**

***Transmitted HIV drug resistance occurs when previously uninfected individuals are infected with a drug-resistant virus

*WHO, 2014. *Global Tuberculosis Report*. WHO, Geneva.

**WHO, 2014. *Antimicrobial Resistance: Global Report on Surveillance*. WHO, Geneva.

***WHO, 2012. *HIV Drug Resistance Report*. WHO, Geneva.



Comparative Data on Death Rates: Examples from Selected Studies

Bacteria	Death rate from sensitive strain	Death rate from resistant strain
<i>E. coli</i>	17.0%	32.0%
<i>A. baumannii</i>	5.4%	16.4%
<i>K. pneumoniae</i>	18.9%	42.9% (CRKP)
<i>K. pneumoniae</i>	12.5%	43.8% (CRKP)
<i>K. pneumoniae</i>	12.0%	38.0%
<i>S. aureus</i>	27.0%	36.4% (MRSA)
<i>S. aureus</i>	11.5%	23.6% (MRSA)

CRKP = Carbapenem-resistant *Klebsiella pneumoniae*

MRSA = Methicillin-resistant *Staphylococcus aureus*

Adapted from: ReAct, 2012. *Burden of Antibiotic Resistance*.



Factors Contributing to the Development and Spread of AMR

- Antimicrobial misuse in humans and agriculture
- Limited access to antimicrobials
- Poor quality antimicrobial products
- Poor infection prevention and control
- Poor regulation and enforcement of laws
- Inadequate surveillance of antimicrobial use and resistance
- Inappropriate drug promotion

Many factors related to weaknesses in health systems

Source: Global Health eLearning Center. Antimicrobial Resistance Course, Part 2
<https://www.globalhealthlearning.org/>.



Inappropriate Use of and Poor Access to Antimicrobials

- Up to 50% of all antibiotic prescriptions are unnecessary
- Two-thirds of antibiotics are sold without prescription, mostly via the unregulated private sector
- 50% of patients have poor compliance
- Only half of malaria cases receive recommended first-line agents
- 50% of the population lack access to essential antibiotics

Overuse/ misuse of antimicrobials is a major driver of AMR

Source: Littmann and Viens. Public Health Ethics 2015: 1-16

Sources: CDC - Antibiotic resistance threats in the United States, 2013; Holloway and van Dijk. World medicines situation 2011 – rational use of medicines, WHO; WHO-SEARO. PowerPoint slides on Prevention and Containment of Antimicrobial Resistance: Use Antibiotics Rationally. World Health Day 2011: Antimicrobial Resistance
http://www.searo.who.int/entity/antimicrobial_resistance/WHO-11_ARM.pdf?ua=1



Health Care Associated Infections (HAIs)

- 10% of patients affected by HAIs globally. Figure higher in low- and middle-income countries (LMICs) – 15.5%
- Incidence of HAIs much higher for patients in intensive care units
- HAIs are mostly caused by drug-resistant pathogens and a major cause of spread of AMR.
- Infection prevention and control (IPC) practices are generally poor in LMICs.
- On average, 61% of health workers do not adhere to recommended hand hygiene practices
- Less than 40% of countries have put in place IPC programs for AMR containment

Sources: WHO. Health care without avoidable infections: The critical role of infection prevention and control
<http://apps.who.int/iris/bitstream/10665/246235/1/WHO-HIS-SDS-2016.10-eng.pdf?ua=1>;
Allegranzi et al, Lancet, Jan 15, 2011;
EU. AMR – A major European and global challenge.
http://ec.europa.eu/dgs/health_food-safety/docs/amr_factsheet_en.pdf



Poor Quality Antimicrobials

- Availability of poor quality antimicrobials is a big challenge:
 - A recent systematic review of 15 studies from 25 countries showed that the median prevalence of poor quality medicines was 28.5% (range 11 to 48%), most of which applied to antimicrobials.
 - A 2013 study of 39 African countries estimated that in children under five, 122,350 deaths were associated with the use of poor quality antimalarial medicines.
- Poor quality antimicrobials produce sub-therapeutic levels of the drug in the patient, resulting in treatment failure and growth of resistant strains of microbes.

Sources: Almuzaini T, Choonara I, Sammons H. 2013. *BMJ Open* 3:e002923. doi:10.1136/bmjopen-2013-002923.
Renschler J et al. 2015. *The American journal of tropical medicine and hygiene*: 14-0725.
Quoted in: Global Health eLearning Center. Antimicrobial Resistance Course, Part 2 <https://www.globalhealthlearning.org/>



AMR – A Big Challenge on the Path to Universal Health Coverage

- Makes first- and second-line antimicrobials ineffective, thus **impacting efficacy and access**
- Heavily diverts scarce resources, **impacting affordability** for health systems
- Very expensive to treat, bringing **affordability** issues and **financial risks** to patients
- Makes treatment difficult and complex, **impacting quality and effectiveness of services**

EXAMPLE: MDR-TB Treatment

- Up to 200 times more expensive
- More side effects
- Lower cure rates (<50%)
- Treatment duration 20 months or more
- Only 20% of those with MDR-TB access treatment

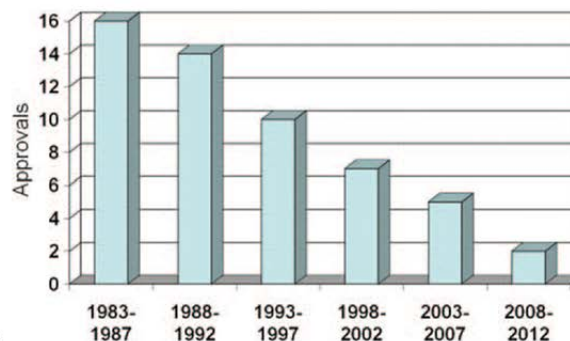
Source: Nugent et al. The Race Against Drug Resistance. CGD, 2010; <https://www.whitehouse.gov/blog/2015/12/22/national-action-plan-combat-multi-drug-resistant-tuberculosis>
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4076529/pdf/eri-44-01-023.pdf>



Adding to the Urgency: A Dwindling Antimicrobial Pipeline

- The pipeline for new antimicrobials is drying up
- We have fewer options to treat resistant pathogens
- **Preserving the effectiveness of existing antimicrobials is more urgent than ever**

New systemic antibacterial agents approved by FDA per five-year period



Boucher et al. 2013. 10 x '20 Progress—Development of New Drugs Active Against Gram-Negative Bacilli: An Update From the Infectious Diseases Society of America. Clin Infect Dis. doi: 10.1093/cid/cit152



Inadequate AMR Awareness and Advocacy

- WHO has provided Global Strategy (2001) and Global Action Plan (2015) on AMR, but country-level actions are limited, especially in LMICs
- Only 34 of 133 countries participating in a WHO survey said they have national plans to fight AMR
- Public awareness of AMR is low in all regions



Sources: ICIUM 2004 recommendations on AMR; WHA58.27; Leung et al. Bulletin of the World Health Organization 2011;89:390-392; WHO AMR country situation analysis 2015



Timeline of Key WHO Actions on AMR

Year	World Health Organization (WHO) Response to AMR
2001	WHO Global Strategy for Containment of AMR
2005	WHA resolution 58.27: Improving the containment of antimicrobial resistance
2007	WHA resolution 60.16: Progress in the rational use of medicines
2011	World Health Day on AMR, with 6-point policy package
2012	The Evolving Threat of AMR: Options for Action (book)
2014	AMR: Global Report on Surveillance; WHA resolution 67.25: Antimicrobial resistance
2015	Global Action Plan to Combat AMR; Worldwide country situation analysis; First World Antibiotic Awareness Week
2016	Antimicrobial resistance: A manual for developing national action plans; Second World Antibiotic Awareness Week

Reproduced with a small addition from: USAID Global Health eLearning Center, Antimicrobial Resistance (Part 1): <https://www.globalhealthlearning.org/course/antimicrobial-resistance-part-1-0>



WHO Global Action Plan on AMR

1. Improve awareness and understanding of AMR
2. Strengthen the knowledge and evidence base
3. Reduce the incidence of infection
4. Optimize use of antimicrobial medicines in humans/animals
5. Develop economic case for sustainable investment



Source:
WHO. 2015. Global Action Plan on AMR
<http://www.who.int/antimicrobial-resistance/publications/global-action-plan/en/>



Global Health Security Agenda

- Launched in 2014
- Partnership of nearly 50 nations, international organizations, and nongovernmental stakeholders
- Aims to build countries' capacity to create a world safe from infectious disease threats, including AMR

Source: <https://www.ghsagenda.org/>





**ANTIBIOTICS ARE
A PRECIOUS
RESOURCE**

*We need to preserve this
resource by working
together*

**Combating antimicrobial
resistance: No action
today, no cure tomorrow**

Reproduced from: WHO-SEARO. PowerPoint slides on Prevention and Containment of Antimicrobial Resistance: Use Antibiotics Rationally. World Health Day 2011: Antimicrobial Resistance
http://www.searo.who.int/entity/antimicrobial_resistance/WHD-11_ARM.pdf?ua=1



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Annex E. WHO Sample Terms of Reference for a National Multisectoral Coordinating group, National Focal Point, and a Technical Working Group*

Sample terms of reference for a national multisectoral coordinating group, for a national focal point and for a technical working group

Introduction

A governance mechanism is essential for coordinating national efforts to combat antimicrobial resistance (AMR). All Member States will have a process for developing and managing such a system; however, they may differ from one country to another. Countries are therefore advised to use this guide to develop their own national terms of reference.

The governance mechanism should comprise a national multisectoral coordinating group (MCG), which will establish supporting technical working groups as needed.

A national governance mechanism is far more likely to be effective if it has political support and authority to act, if it is accountable and if it has dedicated funds and an adequate secretariat to operate. If any of these prerequisites is not in place at the time of constitution of the group, it should be ensured in the plan of activities so that work can begin.

Political support: As human health is the ultimate concern of activities to control AMR, the ministry of health may lead the group, but joint leadership with other relevant ministries or departments is preferable. In some countries, inter-ministerial cooperation might require oversight from a specified authority.

Authority to act: The coordinating group should be given sufficient authority to ensure that its recommendations and plans are implemented.

Accountability: The group should be accountable to the lead minister or ministers or a senior executive function in the government.

Dedicated funds: The availability of dedicated funds will increase the operational effectiveness of the group. Seed funds from external sources are often required initially, but government funds should be secured as early as possible to ensure political “ownership” and increase the likelihood of programme sustainability.

Secretariat: Operational sustainability is more likely when sufficient dedicated personnel and funding are available to support administrative activities.

National multisectoral coordinating group

Purpose

The **purpose** of the national MCG is to oversee and, when necessary, to coordinate AMR-related activities in all sectors to ensure a systematic, comprehensive approach. It is recommended that the

*Source: <http://www.who.int/drugresistance/action-plans/TOR.pdf?ua=1>

approach accord with defined AMR-related public health goals and with the global action plan for AMR.¹

Scope

The MCG should address all AMR-related activities in country. The scope should be broad enough to address all five strategic objectives of the global action plan, prioritizing activities in a step-wise approach.

Role and responsibilities

Leadership

The MCG is expected to lead facilitation and, when appropriate, coordination of a national response to the threat of AMR. Its leadership could take the form of officially delegated authority, with more formal procedures and official monitoring, evaluation and reporting. Its role could be extended to making recommendations and progress reports and providing a platform for programme planning and implementation.

Information sharing

The MCG provides a structure for information-sharing to mutually reinforce activities among sectors.

Facilitation and coordination

The MCG should facilitate and, when appropriate and agreed, coordinate efforts to contain and reduce the threat of AMR at subnational, national and supranational levels.

It is recommended that the MCG build a collaborative, cooperative, supportive environment for sharing knowledge, information and experience. Each participating party should understand the scope and limits of its own contributions and also its inter-dependence with other parties and with the whole system in order to meet the defined goals. The difficulty of achieving such an environment and building such a system should not be underestimated. Political support and selection of a chairperson with appropriate status and leadership skills are critical factors.

External interactions

Collaboration with internal and external agencies and organizations is essential for many countries. WHO offices can support Member States in identifying and facilitating relations with external partners. Countries will be invited, encouraged and supported to participate in any existing initiatives of the country office, regional office or WHO headquarters.

Internal interactions

A national AMR initiative must interact with the health system and public health and disease-specific programmes. The nature of these internal interactions and the results will depend on the country. As many agencies and programmes have responsibilities in areas affected by AMR, a guiding principle of the MCG is to find the most appropriate ways to facilitate and provide synergy with new or

¹ Draft global action plan for antimicrobial resistance (World Health Assembly document A68/20, 27 March 2015) (http://www.who.int/drugresistance/global_action_plan/en/).

existing work so that the overall objectives of the programme are achieved. Furthermore, the MCG must be appropriately integrated and have clearly defined roles and responsibilities in existing health system, public health and disease-specific programmes, animal health and production, the food sector and environmental initiatives. The cross-cutting nature of the MCG should add value to these systems and programmes, not supplant them.

Membership

The national MCG should be composed of members representing the relevant sectors, notably human health, animal health and production and the food and environment sectors. Representatives should be given sufficient authority by their institutions to make decisions. While it is important to have sufficient representation of these key stakeholders, the MCG should remain small enough to be functional, striking a balance between full representation and the functionality of the coordinating group.

Meeting format and rules

The meeting format and rules should conform to national norms. Standard operating procedures may be elaborated, transparently and according to the principles of best practice, to guide the activities of the coordinating group.

The responsible minister(s) should select a **chairperson** on the basis of his or her expertise in leadership. Rotation of the chair among members of the MCG could be considered.

Members should be selected to ensure that all relevant stakeholders are equitably represented. The stakeholders may be invited to propose members, but the chairperson (with the support of the secretariat) should ensure that the proposed members have sufficient skills, knowledge, authority and influence and can collaborate. It is advisable to achieve a gender balance. Consideration should be given to the duration of membership, with the objectives of balancing knowledge and experience with new ideas and maintaining representativeness while maximizing overall effectiveness.

If the MCG becomes too large or is given tasks that require specific expertise or input, it is often efficient to form either ad hoc or standing subgroups. Any subgroup should have a clearly defined mandate and an appointed chairperson. In addition, technical working groups can be established and mandated for tasks that include providing technical input for MCG decision-making.

It is strongly recommended that the MCG be supported by an appropriately resourced *secretariat* responsible for the logistics of meetings; minute-taking; preparation and circulation of documents (e.g. background papers, reports and advisory notes to ministers); and storage and archiving. Ideally, the head of the secretariat will be the national AMR focal point (see below).

It is recommended that the group have a mechanism (with appropriate records) to ensure that its members have no conflicts of interests and that the work of the MCG in the interests of public health is *transparent*. Failure to ensure these elements could undermine the credibility and limit the effectiveness of the group.

National focal point

Purpose

A national AMR focal point should be designated to coordinate AMR activities and tasks in the health sector.

Scope, roles and responsibilities

The focal point should:

- build sustained partnerships and work nationally and internationally on containment of AMR;
- identify stakeholders and facilitate formation of an inclusive MCG;
- lead and coordinate drafting of a national action plan for containment of AMR;
- facilitate and oversee implementation, M&E of the plan through the MCG;
- ensure regular data collection and information sharing by instituting effective communication and coordination among all stakeholders, the members of MCG and their constituencies, sectors and disciplines;
- coordinate national activities for establishment of AMR surveillance systems; and
- report on the prevalence of and trends in AMR to the global AMR surveillance system (GLASS).²

In view of the complexity of AMR, which requires a collaborative response, and in view of the importance of a comprehensive approach to addressing AMR at country level, the focal point should have good communication skills, convening power, resources and strong managerial skills. The focal point will be the primary contact for all issues related to AMR in the country.

Technical working group

Purpose

National MCG may decide to form a technical working group (TWG) mandated with specific tasks such as providing technical input, conducting situational analyses or drafting NAPs.

Scope, roles and responsibilities

The terms of reference (ToR) of the TWG shall be established by the NMCG, providing specific scope, role and responsibilities. These will usually be task-specific, and focused on areas which the coordinating group have determined to be of particular focus for the country. The TWG will remain a national group and shall interact with country representatives of the required sectors, as determined by the scope of work. The TWG remains a group mandated by the NMCG. As such, reporting and communications with the NMCG should be regular and will be defined in the TWG ToR.

² Global AMR surveillance system (GLASS), <http://www.who.int/drugresistance/surveillance/en/>.

Activities may include drafting technical advice and reports, contributing to country situation analyses or participating in national action plan development.

Membership

Depending on the purpose, scope and tasks of the TWG, membership of a TWG may come from any of the relevant technical specialities. These may include experts from areas such as infectious diseases, microbiology, infection prevention and control, social health, food and drug regulation, surveillance system expertise, environment and others.

Annex F. Infection Control Assessment Tool

The ICAT, developed by RPM Plus and revised under SPS, helps to assess infection control practices in hospitals and health facilities. The ICAT consists of individual modules containing questions for self-assessment, a scoring system, reference notes with current international standards, and checklists to objectively measure infection control practices. The modules cover various aspects of infection control, including hand hygiene, patient isolation, standard precautions, and waste management. The ICAT tool and user manual are available in three languages:

- English: [ICAT](#) | [User Manual](#)
- French: [ICAT](#) | [User Manual](#)
- Spanish: [ICAT](#) | [User Manual](#)

ICAT/CQI is a simple and practical approach that helps assess the adequacy of existing infection prevention and control (IPC) practices and provides specific recommendations for improving practices and monitoring the effectiveness of interventions over time. National stakeholders have found the tool to be useful, were able to adapt sections or the entire tool to local context and needs, and assumed ownership, thereby promoting an IPC culture in their hospitals.

SIAPS has furthered this work by adapting the original ICAT for use in primary health care settings and has piloted the tool in Guatemala.

The ICAT module on hand hygiene is reproduced below as part of this guide. However, many ICAT modules may be useful in assessing IPC practices. Other ICAT modules include:

- Modules administered once for a facility as a whole:
 - Health facility information
 - Infection control program
 - Isolation and standard precautions
 - Tuberculosis precautions
 - Employee health
 - Pharmacy
 - Waste management
- Modules administered once for specific services (if present)
 - Labor and delivery
 - Surgical antibiotic use and surgical equipment procedures
 - Surgical area practices
 - Intensive care units
 - Microbiology laboratory
- Modules administered once where disinfection or sterilization takes place
 - Sterilization and disinfection: equipment and IV fluids
 - Sterilization and disinfection: needles and syringes
 - Sterilization and disinfection: gloves
- Modules administered once for each clinical area (if relevant)
 - General ward
 - Hand hygiene
 - Injections
 - Airway suctioning
 - Intravenous catheters
 - Intravenous fluids and medications
 - Urinary catheters

All modules can be accessed at <http://siapsprogram.org/approach/pharmaceutical-services/antimicrobial-resistance/>.

MODULE 17: HAND HYGIENE

These questions should be completed by the chief physician or head nurse of each clinical or service area assessed, including Medical/Surgical wards, Labor and Delivery, and Surgical Areas.

For each item, mark the answer that best describes your current situation by putting a check mark ✓ inside the brackets [✓]. Note that some questions ask for only one answer, and others ask you to mark all answers that apply.

What is the name of this unit or service area?

Hand Hygiene Equipment and Supplies

The first set of questions focuses on the availability of equipment and supplies recommended for good hand hygiene practices.

1. How many hand washing stations and how many beds are on this unit? Enter numbers _____ / _____
for each in the space to the right, then mark one answer below.
 None
 1 Fewer than one hand washing station per six beds if General Ward
(per two beds if Intensive Care Unit)
 2 One or more hand washing station per six beds if General Ward
(per two beds if Intensive Care Unit)

2. What is the usual source of water for hand washing? (Mark one answer)
 No water is usually available
 Water is scooped from a basin and poured over hands
 1 Water is usually poured over hands from a basin
 1 Water is usually available from a cistern or container with gravity flow
 2 Running water from sink

3. How frequently is running water available?
 Never
 Sometimes
 1 Usually
 2 Always

4. What type of soap is most frequently available for hand washing? (Mark one answer)
 No soap is available
 Plain bar soap stored in a receptacle that does not allow water to drain
 1 Plain bar soap stored in a receptacle that allows water to drain
 1 Plain liquid soap
 1 Soap powder, leaves, or flakes
 1 Soap with antimicrobial agent

5. How frequently is soap available? (Mark one answer)
 Never
 Sometimes
 1 Usually
 2 Always

-
6. What types of dispensers are used on this unit for liquid soaps? (Mark one answer)
- Liquid soaps are not used
 - Handheld pour bottle or squeeze dispenser
 - 1 Hand-operated pump dispenser
 - 1 Foot pump dispenser
-
7. How are liquid soap dispensers usually cleaned? (Mark one answer)
- Liquid soaps are not used
 - Dispensers are topped off or refilled without cleaning
 - 1 Dispensers are emptied, washed, and dried before refilling
 - 1 Dispenser or dispenser insert is disposed of when empty and new one is used
-
8. What method is usually available for drying hands after hand washing? (Mark one answer)
- None (air dry)
 - Multiple-use cloth towel
 - 1 Single-use cloth towel
 - 1 Paper towels
 - 1 Hot air dryer
-
9. Is a waterless alcohol-based hand antiseptic used for hand hygiene? (Mark one answer)
- No
 - 1 Yes, alcohol-based antiseptic without emollient
 - 3 Yes, alcohol-based antiseptic with emollient
-
10. How frequently is there a sufficient supply of waterless alcohol-based hand antiseptic? (Mark one answer)
- Alcohol-based hand antiseptic is not available
 - Supply of alcohol-based antiseptic is never sufficient
 - Sometimes
 - 1 Usually
 - 2 Always
-
11. How many dispensers of waterless alcohol-based antiseptic are available on the ward? (Mark one answer)
- Alcohol-based hand antiseptic is not available
 - 1 Fewer than one for every four beds
 - 2 One or more for every four beds

Assessment section total: _____ Possible section total: 19

Hand Hygiene Practices

The following questions address hand hygiene practices in the clinical areas of your facility.

12. In which of the following situations do health care personnel such as doctors and nurses routinely wash their hands with soap and water or a waterless alcohol-based hand antiseptic? (Mark all answers that apply)

- 1 Before contact with patients
 - 1 After contact with individual patients or their immediate environment
 - 1 Before manipulating medical devices such as intravenous catheters, urinary catheters, or endotracheal tubes, or before handling wound dressing
 - 1 After touching potentially contaminated objects or surfaces
 - 1 After removing gloves
 - 1 After using bathroom, toilet, latrine
-

13. Is there a policy on covering skin lesions and cuts with waterproof dressings?

- No
 - 1 Yes
-

14. Is there a policy on keeping finger nails short and/or not using artificial nails or nail extenders?

- No
 - 1 Yes
-

15. Is it usual practice to wear gloves instead of washing hands for contact with patients or potentially contaminated environmental surfaces? (Mark one answer)

- 1 No
 - Yes
-

16. Is hand lotion (emollient) usually available for staff to use after hand washing? (Mark one answer)

- No
 - 1 Yes, hand lotion in disposable containers
 - 1 Yes, hand lotion in reusable containers
-

17. When a hand lotion container is empty, what usually happens? (Mark one answer)

- Hand lotion is not usually available
- Container is refilled or topped off without cleaning
- 1 Container is emptied, washed, and dried before refilling
- 1 Container is disposed of when empty and new container is used

Assessment section total: _____ Possible section total: 11

Hand Hygiene Annotations

Background

Infectious agents frequently contaminate the hands of clinicians and other health care personnel. Effective and frequent hand hygiene procedures can prevent the acquiring and spreading of infectious microorganisms from clinicians and health care personnel to patients and other hospital workers. Good hand hygiene practices are an important—and one of the simplest—methods of preventing the spread of nosocomial infections.

Hand Hygiene Procedures

Introduction: Definition and Purpose of Hand Hygiene

Hand hygiene is a simple, proven, low-cost, and important practice to prevent infections. Hand washing involves cleaning one's hands by appropriately rubbing them with water and soap. Hand sanitization consists of briefly rubbing hands with an alcohol-based hand rub.

The purpose of hand hygiene is to reduce or eliminate resident and transient microbial flora from the skin covering hands and forearms to prevent infections from being transmitted.

Types of Hand Hygiene

There are four types of hand hygiene:

1. Social hand washing
2. Clinical or medical hand washing
3. Hand sanitization
4. Surgical hand washing

The appropriate type of hand washing is determined by the following four criteria:

1. Type of contact with patient, or if there is contact with patient's blood or body fluids
2. Likelihood of microbial transmission
3. Vulnerability to infections
4. Type of procedure to be conducted

1. Social Hand Washing

Social hand washing can be performed by any person. It consists of briefly rubbing the surface of the hands with regular soap and then rinsing the hands with water. Social hand washing is intended to remove dirt.

2. Clinical Hand Washing

Clinical washing refers to removing dirt and permanent and transient bacterial flora from hands by rubbing the palms and backs of hands, fingers, spaces between fingers, and wrists with antiseptic soap and sufficient running water.

Purpose

To reduce the concentration of transient bacterial flora acquired by contact with patients to prevent contamination and infection.

Technique

- Remove jewelry and accessories
- Turn on the water faucet to moderate pressure
- Wet your hands
- Apply sufficient liquid and antiseptic soap, and spread it all over the surface covering hands, fingers, and wrists
- Rub your hands—palms and backs of hands
- Using your right hand, rub the fingers of your left hand one by one with circular movements
- Using your left hand, rub the fingers of your right hand one by one with circular movements
- Clean your nails using your thumb nails
- Rub the spaces between fingers of both hands
- Rinse your hands with sufficient water
- Dry your hands by using a disposable paper towel, towel not shared with others, or an electric dryer
- Turn off the faucet without contaminating your hands by using the towel used to dry your hands in the previous step
- Spend no less than 30 seconds washing hands

3. Hand Sanitization

Hand sanitization consists of briefly rubbing hands with an alcohol/emollient-based antiseptic solution. Hand sanitization does not replace clinical hand washing; in addition, hands should be clear of organic material before they can be sanitized.

Purpose

To destroy microorganisms in transient bacterial flora and reduce resident flora from hands to prevent their transmission.

Technique

- Apply a solution of glycerine and alcohol (95% isopropyl alcohol + 5% glycerine) on one of your hands
- Spread it all over the surface covering your hands, spaces between fingers, and wrists
- Rub gently
- Let air dry

4. Surgical Hand Washing

Surgical hand washing refers to a thorough cleansing of hands and forearms prior to conducting any invasive procedure. All staff participating in invasive procedures should conduct surgical hand washing.

Purpose

To reduce concentration of bacteria in the resident flora and to completely remove transient flora, which are both acquired by recent contact with patients.

Technique

- Use antiseptic soap
- Use a water faucet activated by a pedal or the elbow or use a photoelectric faucet
- Remove your watch, rings, and other accessories

- Moisten your hands and forearms with antiseptic soap
- Spread soap all over the surface of your hands
- Rub hands together
- Using your left hand, rub the back of your right hand
- Using your right hand, rub the back of your left hand
- Rub the sides of your fingers by interlacing fingers of both hands
- Using your right hand, rub the fingers of your left hand one by one with circular movements, starting with your little finger
- Using your left hand, rub the fingers of your right hand one by one with circular movements, starting with your little finger
- Using your thumb nails or a special toothpick, clean your nails on both hands
- Rub your left wrist and then your right wrist
- Rub your left forearm and then your right forearm
- Rinse with sufficient water, letting the water flow toward your elbows
- Dry your hands with a sterile towel, using one end for each hand
- Avoid splashing
- Turn off the water faucet with your elbow or knee
- Be careful not to touch your hands and forearms while entering the operating room or while putting on gloves
- The first hand washing of the day should last at least five minutes; subsequent hand washings should take at least three minutes if no septic operations have been conducted

(Roosevelt Hospital 2008, San Juan de Dios General Hospital 2008)

Item Notes

1. Easy access to sinks will allow clinicians and health care workers to clean their hands immediately before and after patient contact. Health care personnel are more likely to use sinks if they are within immediate or easy reach. It is most desirable for a sink to be shared by no more than four patient beds, and ideally there would be one sink per patient bed, especially in critical care areas.
2. Microorganisms can live and multiply in stagnant water. Scooping water, probably with a ladle, can mean that the ladle is likely set down on a surface that may be contaminated between uses, and the ladle inserted in the water for the next use. Pouring is cleaner because nothing has been inserted into the water. Freely flowing water inhibits the growth of microorganisms and will prevent hands from being re-exposed to pathogens. Flowing water may be delivered by a cistern or container with gravity flow or through pipes from a distant source.
3. The use of soap has been shown to reduce debris and microorganisms from hands. Soap is especially effective when hands are vigorously scrubbed beneath flowing water. Bars of soap that sit in a pool of water in a soap dish can become heavily contaminated, so if bar soap is used, there should be good drainage from the soap dish. Antimicrobial soap has inherent microbicidal activity and is especially preferred in intensive care units.
4. Because soap should be used before and after all patient encounters, an adequate supply should always be available.

5. Because liquid soap is dispensed before hands are clean, soap dispensers may become contaminated by microbes on the user's hands. The use of pump-dispensers can minimize or prevent contact with contaminated hands.
6. Microorganisms can live and grow in liquid soap. Even antimicrobial soaps can harbor bacteria. If containers are refilled without being completely emptied and cleaned first, bacteria in the residual soap may contaminate the entire container. To prevent contamination, soap dispensers should be emptied and thoroughly washed and dried before reuse.
7. Hands should be dried after washing to remove residual bacteria and minimize recolonization of infectious microorganisms. Acceptable methods include single-use paper and cloth towels and hot air driers. Towels should not be reused as they may become contaminated after each use.
8. Alcohol-based hand antiseptics are quick and convenient, and their proper use reduces hand flora more effectively than hand washing with soap. The alcohol content should be 60–90%. Unlike hand washing, alcohol-based antiseptics will not remove dirt or debris, so if any visible dirt or debris is present, hands should be washed with soap and dried before using an alcohol-based antiseptic. Emollients such as glycerine, propylene glycol, and sorbitol protect and soften skin and prevent irritation. The use of emollients improves compliance with alcohol-based hand antiseptics.
9. An adequate supply of alcohol-based antiseptics will ensure that proper hand hygiene can always be practiced. Easy availability will facilitate compliance with alcohol-based hand antiseptics. An adequate number of dispensers conveniently placed in a patient care area will facilitate compliance.
10. Hands must be cleaned immediately before and after every patient encounter. Hands must also be cleaned after contact with any potentially contaminated area or object. These include:
 - Objects in contact with patients (i.e., dressings, catheters, and linens)
 - Surfaces in clinical or laboratory areas
 - Bathrooms, toilets, and latrinesFurthermore, gloves do not provide complete protection against the transmission of bacteria and viruses because the hands are easily contaminated in the process of glove removal and hands must be washed immediately after their removal.
11. Bacteria from patients can be recovered from a significant number of health care workers who wear gloves. Some hospital workers have contracted blood-borne pathogens, such as hepatitis B, from patients despite wearing gloves. Gloves may have microscopic defects, particularly if they are cleaned and reused. Thus, glove use should not alter hand hygiene practices (washing and drying) in any way.
12. Skin irritation can occur when hands are frequently washed. The periodic use of hand lotions can prevent dermatitis and inhibit bacterial growth.
13. Bacteria can grow in hand lotion dispensers. The use of small, disposable containers will minimize colonization. Reusable containers should be emptied, thoroughly washed, and dried to eliminate residual bacteria before refilling.

References

Management Sciences for Health/Strengthening Pharmaceutical Systems. 2008. Hand Hygiene Posters.

Nosocomial Infection Control Committee. 2008. Prevention and Control Standards for Infectious Diseases Associated with Nosocomial Healthcare. Roosevelt Hospital, Guatemala City, Guatemala.

Nursing Department. 2008. *Hand Washing Procedure*. San Juan de Dios General Hospital, Guatemala City, Guatemala.

MODULE SCORING SHEET

Name of facility: _____

Name of module: _____

Date completed: _____

	1	2	3	4
Module Section	Assessment Total	Possible Total	Percent Score	Rating Based on Percent Score
Total for Module				

Column Notes:

- Assessment Total**—Sum of points for all marked responses
- Possible Total**—Sum of all possible points for the question
- Percent Score**—(Column 1/Column 2) / 100
- Rating**—

More than 75% of possible points:	A—recommended practices are followed consistently and thoroughly
50–75% of possible points:	B—recommended practices usually followed
Less than 50% of possible points:	C—training and follow-up needed on recommended

Annex G. Example of Country- and Regional-level Call-to-action Documents

Call-to-Action for Antimicrobial Resistance Advocacy and Containment in Namibia

July 2013

THE CALL TO ACTION

The Namibia AMR/RMU Call to Action – July 2013



Republic of Namibia



Ministry of Health and Social

Call-to-Action for Antimicrobial Resistance Advocacy and Containment in Namibia July 2013

Infectious diseases kill 11 million people around the world every year, 95 percent of whom live in resource-constrained settings. The major life-saving intervention for infectious diseases is antimicrobial treatment; however the problem of antimicrobial resistance (AMR) is rapidly reducing the effectiveness of these life-saving medicines. AMR is a steadily increasing global public health threat that impacts all public health diseases of major significance, including HIV, TB, and malaria. When compared to drug-susceptible infections, drug-resistant infections result in a 1.3 to 2-fold increase in morbidity, mortality, and cost³. Other related consequences include prolonged infectiousness, increased risk of transmission of resistant pathogens, extended hospital stay, use of more expensive second- or third-line medicines, reduced productivity, and financial hardships.

Resistance to antimicrobials often develops as a result of poor prescribing and dispensing practices, inappropriate use by patients, and poor medicine quality. Furthermore, weak systems for pharmaceutical management, poor infection prevention and control practices, and inadequate regulation contribute to AMR.

Enhanced availability and use of evidence generated through research, effective advocacy through coalition-building at various levels, and implementation of prioritized containment interventions are vital for an organized, coordinated, and sustained response to the challenge of AMR. AMR is a complex, multi-faceted problem that necessitates a multi-faceted approach. Much is already known about AMR and a number of interventions and tools are available to address and correct factors contributing to AMR, as outlined in the *World Health Organization Global Strategy for the Containment of Antimicrobial Resistance*⁴. Several activities that support AMR containment have been implemented in Namibia; however several gaps remain but at the same time various opportunities also exist to strengthen and enhance a more integrated approach to AMR containment. We must communicate to share expertise, experience, lessons learned, best practices, and resources.

We, the participants of this *workshop on antimicrobial resistance and promoting the rational use of ARVs, anti-TB and other medicines in Namibia* (held at the University of Namibia School of Pharmacy in Windhoek from July 22 to 24, 2013), represent various institutions and stakeholder groups involved in health care in Namibia. We recognize and commend the actions by various local, national and international players in the fight against AMR and view AMR containment as our collective

³ Cosgrove SE and Y Cameli. 2003. The impact of AMR on health and economic outcomes. *Clinical Infectious Diseases*. 36:1433-1437

⁴ WHO Global Strategy for Containment of Antimicrobial Resistance. Geneva: WHO, 2001

The Call to Action

responsibility. We hereby call for action from all stakeholders, including government, academia, regulatory authorities, professional associations, donor agencies, civil society, media personnel, and industry to forge strong alliances to minimize the risk of AMR in Namibia.

We commit ourselves to –

- ✓ *Creating a national movement to enhance capacity, increase evidence on antimicrobial use, raise awareness about AMR, and support implementation of effective interventions*
- ✓ *Enhancing the engagement of patients and caregivers in making informed choices on adherence to treatment plans through treatment literacy and other interventions*
- ✓ *Supporting ongoing efforts to reduce the risk of HIV drug resistance in Namibia, including implementation of HIV drug resistance early warning indicators, treatment guidelines, and treatment adherence*
- ✓ *Broadening the focus to include antimicrobials for TB, opportunistic infections, and antibiotics in general-use*
- ✓ *Increasing private sector engagement and collaboration with the public sector on Rational Use of Medicines/ Antimicrobial resistance*
- ✓ *Strengthening collaboration between medicines use interventions and laboratory services*
- ✓ *Increasing support for community based interventions on appropriate use of medicines*

If we do not act now to preserve the effectiveness of antimicrobial medicines, the health and prosperity of current and future generations will suffer. We make this call-to-action to all the players to join hands against this common threat and collectively work to engage new partners, strengthen collaboration with existing partners, and advocate for AMR as a local and national priority in Namibia.



Preserving the Effectiveness of Drugs: A Call for Action in Zambia

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 existed 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 artemisinin-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 STGs, 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 STGs and Essential Medicines Lists in the public and private sectors. (Action: MoH/CBoH)
- Ensure that health workers at all levels are trained (pre-service and in-service) on the use of STGs, the 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 a regular supply of good quality, essential drugs, including development of a long-term financial sustainability plan. (Action: MoH/CBoH, CHAZ, and other health care 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 drugs. Use media campaigns, school activities, and other community-based organization (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)
- Encourage drug vendors to adhere to regulations. (Action: MoH/CBoH, Pharmacy and Poisons Board, and health professional bodies)

Poor quality drugs impact 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 need to be done:

- Establish a National Drug Quality Control Laboratory without delay. (Action: MoH, 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 need 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, 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)

CALL TO ACTION, EPN

Combat Antimicrobial Resistance and Preserve Antimicrobials for Future Generations May 2016

<http://siapsprogram.org/publication/altview/siaps-joins-epn-in-issuing-call-to-action-against-antimicrobial-resistance/english/>



THE NEED TO ACT NOW

Antimicrobial resistance (AMR) has the potential to jeopardize progress against many current global health threats and to cause a resurgence of diseases that are currently easily treated with antibacterials, antivirals, or other antimicrobials. AMR could also severely hinder many of today's medical advances, such as cancer chemotherapy and organ transplantation, which often require the use of effective antimicrobials. AMR reduces the effectiveness of treatment, which means that patients remain ill and infectious for longer periods of time, thereby increasing the chances of further spreading antimicrobial-resistant strains. Because resistant strains take longer to treat and often require more expensive secondary therapies, AMR increases overall health care costs and strains health systems.¹ Already, approximately 700,000 deaths globally can be attributed to AMR each year. But that number could jump to 10 million by 2050, if widespread and coordinated action is not taken.²

Globally, more than 50% of medicines are prescribed, dispensed, or sold inappropriately.³ Overuse and misuse of antimicrobials is a worldwide problem and results from complex and interacting deficiencies across health systems, including lack of legislation and regulation, inefficient supply chain management, few or no quality assurance mechanisms, inappropriate prescribing and dispensing practices, and lack of adherence and other patient behaviors. The overuse and misuse of antimicrobials is a major driver of AMR.⁴

AMR is a known threat in every region, in every country in the world, regardless of income level. It is critical that every country proactively take steps against AMR, as containment will likely only occur with concerted, coordinated global action.

OUR CALL TO ACTION

The Ecumenical Pharmaceutical Network (EPN), a faith-based organization, includes over 100 members from over 30 countries across 5 continents. EPN supports churches and church health systems in providing and promoting just, compassionate, and quality pharmaceutical services; and believes that access to safe and effective medicines of assured quality is a human right. As the work of expanding equitable access to medicines and pharmaceutical services continues, we believe it is also imperative to protect the continued efficacy of such medicines.

Our 2016 biannual forum, held May 19–21 in Tübingen, Germany, further intensified our focus on AMR and infectious diseases and brought together stakeholders to exchange ideas, share knowledge and best practices, and chart an effective course of action to address the global challenge of AMR.

In this context, we, the participants of EPN's Forum 2016 renew our call for immediate and swift action from our network and other stakeholders to

mitigate the threat that AMR poses to every country and every person. The four recommended actions, listed in the pages that follow, build upon our 2011 call for action and also draw on the World Health Organization's 2015 Global Action Plan on Antimicrobial Resistance.

We know that without coordinated action from a multitude of stakeholders, progress against AMR will fall short. For that reason, we recommend targeted areas of action for key groups:

- Governments and policymakers
- Health care institutions (both public and private)
- Health schools, training institutions, and professional associations
- Health care providers, including community health workers
- Patient advocacy groups, civil society organizations, consumers, and the general public

STRENGTHENING OUR RESOLVE

Moving forward with a renewed emphasis on collaboration and coordination, the participants of this Forum resolve to promote, advocate, and implement these actions against AMR in alignment with WHO's Global Action Plan on AMR and EPN's 2016-2020 Strategic Plan,⁵ specifically Strategic Priority

Area 6 (Antimicrobial Resistance and Infectious Diseases). EPN and its members remain deeply committed to building awareness and catalyzing momentum in the fight against AMR so that the use of antimicrobials can be preserved for future generations.

1 <http://www.who.int/mediacentre/factsheets/fs194/en/>

2 amr-review.org/file/111

3 World Health Organization. 2010. Medicines: Rational Use of Medicines, Fact Sheet N° 338.

4 Littmann J. 2015. The Ethical Significance of Antimicrobial Resistance. *Public Health Ethics*, 8 (3): 209-224.

5 Ecumenical Pharmaceutical Network Strategic Plan, 2016-2020.



ACTION 1
BUILD ADVOCACY, AWARENESS, AND POLITICAL WILL TO COMBAT AMR

GOVERNMENT AND POLICY MAKERS	HEALTH CARE INSTITUTIONS	HEALTH SCHOOLS, TRAINING INSTITUTIONS, AND PROFESSIONAL ASSOCIATIONS	HEALTH CARE PROVIDERS AND COMMUNITY HEALTH WORKERS	PATIENT ADVOCACY GROUPS, CONSUMERS, AND THE GENERAL PUBLIC
<p>Help promote public awareness and understanding of infection prevention and responsible use of antimicrobial medicines across all sectors</p> <p>Devote appropriate resources to strengthen systems that help mitigate AMR, including surveillance, regulatory, registration, and quality assurance functions</p>	<p>Promote and increase awareness of the importance of rational prescribing and dispensing practices among both public and private sector health-facility staff</p>	<p>Include antimicrobial use and resistance topics in school curricula to promote better understanding and awareness</p> <p>Provide the media with accurate and relevant information so that public information and reporting reinforce key messages</p>	<p>Counsel patients on correct use of medicines prescribed and dispensed</p> <p>Educate patients on importance of adhering to prescribed regimens, dangers of self-medication, and potential for development of AMR</p> <p>Stay abreast of new AMR-related developments in relevant professional or health areas or specialties</p>	<p>Consumers/public: Ask for information from your health care provider about the risks of non-adherence and self-medication, and always follow instructions given by health care providers</p> <p>Advocacy groups: Integrate AMR into action plans and strategies</p> <p>Advocacy groups: Engage the media on AMR topics</p>

ACTION 2
STRENGTHEN CAPACITY OF HEALTH SYSTEMS TO EFFECTIVELY ADDRESS AMR

<p>Create or strengthen effective and enforceable licensing, distribution, use, and quality assurance mechanisms in human and animal health, including a regulatory framework for preservation of new antimicrobials</p> <p>Develop national infection prevention and control policies and create enabling environments for their implementation</p> <p>Develop, update, or revise national standard treatment guidelines (STGs) and essential medicines lists, with focused attention to the sections that include antimicrobials, to support rational use</p>	<p>Ensure that mechanisms to implement and promote antimicrobial stewardship, such as Drug and Therapeutic Committees, exist to ensure the correct selection and use of medicines at the right dose, route, and duration based on best evidence available</p> <p>Establish/strengthen systems to improve facility-level infection prevention and control practices</p> <p>Develop and implement facility-specific STGs, in alignment with national and global guidelines</p> <p>Develop, distribute, and train staff on infection control and waste management guidelines</p>	<p>Ensure mandatory training and education on AMR and infection prevention measures for all health professionals</p> <p>Include training on AMR as a requirement in professional development, accreditation, and registration</p> <p>Ensure training programs utilize most recent standard guidelines</p>	<p>Treat patients and prescribe, dispense, and administer medicines in line with national guidelines and based on essential medicines lists</p> <p>Adhere to recommended infection prevention and control policies and practices</p> <p>Practice proper hygiene and implement appropriate infection control measures</p> <p>Use behavior change communication strategies with patients and their caregivers to encourage correct behaviors regarding antimicrobial use and infection prevention</p>	<p>Consumers/general public: Follow basic infection control practices, such as regular handwashing, to prevent disease</p> <p>Consumers/general public: Stay up-to-date on vaccines and practice other prevention measures to avoid contracting a drug-resistant infection</p> <p>Advocacy groups: Ensure that efforts to expand access to medicines are accompanied by efforts to mitigate AMR</p> <p>Advocacy groups: Advocate for patient-centered approaches to help facilitate rational medicine use</p>
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ACTION 3
ENSURE EFFECTIVE COORDINATION
BETWEEN STAKEHOLDERS

GOVERNMENT AND POLICY MAKERS	HEALTH CARE INSTITUTIONS	HEALTH SCHOOLS, TRAINING INSTITUTIONS, AND PROFESSIONAL ASSOCIATIONS	HEALTH CARE PROVIDERS AND COMMUNITY HEALTH WORKERS	PATIENT ADVOCACY GROUPS, CONSUMERS, AND THE GENERAL PUBLIC
Promote, establish, and support multi-sectoral coalitions, including the veterinary and agriculture sectors, to address AMR at local and national levels and foster engagement at regional and global levels	Develop networks and collaborations with practitioners, other facilities, and partners to encourage information sharing and support technical assistance for containing AMR	Establish AMR as a core component of education, training, examination, professional registration or certification, and professional development	Connect to relevant coordination mechanisms at facilities and stay abreast of current developments	Consumers/general public: Talk to your health care provider about the potential for drug resistance and ask how you can reduce your risk Advocacy groups: Engage and convene stakeholder groups regularly to stay abreast of new AMR developments and join coalitions against AMR

ACTION 4
STRENGTHEN MONITORING AND
SURVEILLANCE SYSTEMS FOR AMR

Develop national capacity to collect and analyze data on the prevalence of AMR and antimicrobial use, and disseminate data to appropriate national and international bodies	Ensure that monitoring and surveillance data are collected and analyzed through a coordinating body, such as a Drug and Therapeutics Committee, and submitted to appropriate national bodies	Ensure that training curricula and materials include appropriate information on a professional's responsibility to monitor and support surveillance of AMR and antimicrobial use	Follow local and national AMR monitoring and reporting guidelines as applicable	Consumers/general public: When taking antimicrobials, report adverse drug events to your health care provider Advocacy groups: Advocate for the collection and dissemination of information on AMR and public availability of relevant antimicrobial use and AMR data
Strengthen national regulatory authorities to ensure that quality control laboratories are operational, functional, and efficient in responding to AMR	Ensure that facilities have laboratory capacity to monitor AMR and encourage the use of resistance data for decision making			



Adama Declaration: Declaration of the Call-to-Action National Workshop on Antimicrobial Resistance Containment, Nov. 16–18, 2006, Adama, Ethiopia

Background:

Sixty-five participants from the Federal Ministry of Health (FMOH), Drug Administration and Control Authority (DACA), Federal Ministry of Agriculture and Rural Development (FMOARD), regional health bureaus, academic and research institutions, developmental partners, importers/wholesalers, local pharmaceutical manufacturers, hospitals, professional associations, and mass media agencies assembled for three days at the Adama Mekonen Hotel, Adama, November 16–18, 2006, to deliberate on antimicrobial drug use and resistance situation and call-to-actions to be taken by all concerned bodies in Ethiopia.

Coordinated by the DACA and the Antimicrobial Resistance Taskforce, the participants were briefed on the current situation of treatment protocols of major diseases; regulatory activities, including efforts to promote rational use; quality of health professionals training curricula in light of containing AMR; research activities in the area; and international interventions as well as experiences of other countries. In between the presentations, the participants had discussed issues of concern and had opportunities to recommend possible interventions to contain AMR in the public and animal health sectors.

To enable in-depth discussion and to come up with pertinent recommendations and an implementable plan of action on the major agenda items, including drug regulation, research, training, drug supply, and rational use, the participants were assigned to four groups. At the end of the three-day intensive workshop, the following declaration was released.

We the participants:

- Commend the current initiative being undertaken by the Federal Ministry of Health, the Drug Administration and Control Authority AMR Taskforce, and partners to bring the issue to the attention of concerned bodies.
- Realized that effective regulation and quality use of antimicrobial drugs are key instruments to alleviate the major health problems of the country and in the creation of healthy population.
- Are aware that efforts to monitor antimicrobial drugs' effectiveness have been under way and served as the corner stone for changing treatment protocols.
- Also recognized the availability of data and information on the prevalence of AMR in the health service, which can serve as input to take policy measures to contain AMR
- Also are aware that the issue of rational use of antimicrobial drugs is adequately addressed in the curricula of some health professionals' training institutions but learned that more has to be done in the emerging as well as some existing universities.
- Recognize that even though concerned bodies, including the Federal Ministry of Health, Federal Ministry of Agriculture and Rural Development, the Drug Administration and Control Authority of Ethiopia, the Ethiopian Health and Nutrition Research Institute, academic institutions, and partners, have been striving to regulate, monitor efficacy, and promote the quality use of antimicrobial drugs, we have identified that there is an urgent need to ensure that realistic commitment is in place and that coordinated efforts and result-oriented interventions are considered by all concerned bodies.

We therefore recommend that:

- The AMR Advocacy and Containment activities be officially inaugurated.
- The AMR advisory committee, in collaboration with governmental agencies and other partners, devise mechanisms to conduct a national base line survey on the current situation of antimicrobial drug supply management, research, regulation, and use as well as other parameters to facilitate for further action.
- Based on available data and information and with due consideration of the results of the envisaged baseline survey, the Federal Ministry of Health, Federal Ministry of Agriculture and Rural Development, and the Drug Administration and Control Authority, in collaboration with the AMR advisory committee, develop a national program for AMR containment.
- The health professionals training higher education institutions assess their curricula in terms of its contribution to ensure containment of AMR and take measures to address any identified gaps, including the promotion of attitudinal change among graduates.
- Professional associations to collaborate with concerned bodies on AMR and ensure that their members participate in relevant continuing education programs.
- Recognizing the complexity of the issue and its multidimensionality in involving stakeholders, FMOH, FMOARD, and DACA, should create an enabling environment and foster cooperation among local and international partners who have interest in and potential to contribute towards the shared vision.
- The FMOH, FMOARD, and DACA should intensify surveillance on the safety, efficacy, and quality of antimicrobial drugs in the market; take prompt corrective action accordingly; and communicate so to stakeholders. This activity should not be limited to urban areas of the country.
- Public and private drug manufacturing and procuring agencies should work closely with public and animal health institutions to ensure the antimicrobials supplied reflect realistic needs of the country.
- Health institution infection control systems should be set up.
- Disease prevention campaigns and activities should be strengthened.

And call upon:

- DACA to strengthen its regulatory mechanisms and quality use promotion strategies to ensure that the antimicrobial drugs used in the Ethiopian public and animal health sectors are safe, effective, and of good quality.
- The FMOH, FMOARD, DACA, and other governmental and nongovernmental agencies to provide and/or facilitate capacity building (i.e., technical support, management and organizational development training, logistics) for all stakeholders and in different parts of the country.
- Development partners to work closely with government agencies, training institutions, research institutions, and the mass media to provide technical and financial support.
- Research institutions to intensify research on antimicrobial traditional medicines used for the preservation of human and animal health.
- All concerned organizations to exchange information regarding research outputs, reports on antimicrobial use, and other related fields.
- Public and private higher education institutions to train adequate and qualified professionals to alleviate the current serious shortage at public and animal health facilities.
- The mass media to give more attention to the area; initiate new health education programs; and collaborate with the FMOH, FMOARD, DACA, and other partner organizations to discourage current inappropriate self-medication practices among the general public.

We commit ourselves to:

- Mobilize our colleagues collaboratively to:
 - Create awareness on the need to contain AMR in our settings
 - Share the plan of action developed at the workshop and play our part in its implementation
 - Educate patients and animal owners on the harm of inappropriate self-medication
 - Organize ourselves to better work with our partners
 - Work in collaboration with mass media agencies in building awareness on the rational use of drugs
 - Link AMR containment activities and support other health interventions and sectors/areas

The way forward:

We, the workshop participants, mandate the FMOH and DACA in collaboration with the AMR Task Force to:

- Develop a proposal and coordinate to conduct a national baseline survey on antimicrobial supply, regulation, research, use, etc., and develop a national AMR containment program document
- Formally launch a national program for the containment of AMR
- Ensure the participation of all concerned bodies and funding for the program

Annex H. Advocacy Tool for Infection Control in Hospitals

Infectious diseases kill 11 million people globally each year, 95% of whom live in countries with limited resources. The principal life-saving intervention for infectious diseases remains antimicrobial treatment. However, antimicrobial resistance (AMR) is rapidly reducing the effectiveness of these vital medicines. This problem has rendered many first-line treatments ineffective. This has an impact on all infectious diseases, in particular HIV, tuberculosis, and malaria.

Antimicrobial resistance often develops due to poor prescribing and dispensing practices, improper use by patient self-medication, and the poor quality of medicines.

Antimicrobial resistance has severe consequences for public health, including increased morbidity and mortality linked to infections, higher treatment costs, long infectious periods with an increased risk of transmitting resistant pathogens to other people, extended hospital stays, prolonged absence from work, and a reduced list of effective antimicrobials.

For example, MDR tuberculosis treatment is 100 times more expensive than the treatment for drug-sensitive tuberculosis. Even for malaria, the cost of chloroquine-resistant malaria treatment is 6 to 35 times more expensive than treatment for infections with drug-sensitive parasites. With regard to HIV treatment, it has proven necessary to preserve the medicines that are available, because in four to five years, the cost of providing second-line treatments could require up to 90% of the budgets available to fund antiretroviral medicines. This could seriously compromise access to care if several patients must be treated with second-line regimens.

There are two basic pillars for containing AMR, specifically, sensitization activities and containment activities, which are carried out on two levels: rational medicine use and infection control.

According to the *World Health Organization (WHO) Global Strategy for Containment of Antimicrobial Disease*, infection control is a key intervention for hospitals and health care facilities because it reduces the disease burden and spread of infection.

Nosocomial infections are a frequent problem with an approximate prevalence of 9% (WHO/CDS/CSR/EPH/2002.12). In some regions of sub-Saharan Africa, this rate is as high as 40%. However, most of these infections could be avoided through the low-cost strategies available. This involves compliance with infection control strategies, in particular, washing hands and wearing gloves, as well as effective decontamination and proper waste management.

It is our opinion that in order to achieve this, different stakeholders in health care from different countries must emphasize infection control and prevention in health care facilities.

Efforts are already under way in this area to raise the awareness of health care professionals of the importance of the fight. This is the case of the *Francophone Workshop on Antimicrobial Resistance and Infection Control in Health Care Facilities* held in November 2009 in Kigali by EPN in collaboration with the MSH/SPS program. This workshop brought together 30 professionals from seven Central and West African Francophone countries: Cameroon, Togo, Benin, CAR, DRC, Chad, and Rwanda.

This fight is not the prerogative of health care employees solely, but requires multidisciplinary collaboration involving all stakeholders, notably Ministries of Health, health care facilities, churches and faith-based organizations, health care training organizations, associations of health care professionals, health care providers, and mass media agencies, as well as the entire population.

Political leaders and decision makers

- Support and be actively involved in infection control and AMR activities.
- Establish, disseminate, put into general use, and enact standards and guidelines on infection control in hospital environments.
- Ensure the strict application of policies and laws governing the health sector.
- Sensitize international partners so that they comply with national policies and standards.
- Improve the working conditions of health care professionals with regard to infrastructure, equipment, materials, and continuing training.

International partners

- Respect the laws, health policies, and guidelines in different countries.

Organizations and associations of health care professionals

- Take the appropriate steps to ensure compliance with ethics rules relative to infection control and the rational use of medicine.
- Promote an atmosphere of collaboration among health care professionals and create networks related to infection control and antimicrobial resistance (AMR).

Managers of health care facilities

- Establish and disseminate to all parties concerned the policies, procedures, and guidelines for infection control and ensure their enforcement.
- Establish and support hygiene and/or infection control committees and Drug and Therapeutics Committees (DTC).
- Provide the infrastructure and equipment necessary to prevent nosocomial infections (e.g., equipment for hand hygiene, waste management).
- Set up laboratories and/or make them operational for appropriate research on infections.
- Establish mechanisms for monitoring and evaluation relative to infection control and the appropriate use of antimicrobials.
- Collect information regularly on infections and submit it to the competent officials for action.
- Plan and organize continuing training sessions for health care staff on infection control activities.
- Ensure the availability and accessibility of good quality pharmaceutical products and their rational use.

Managers of health training organizations

- Include and strengthen the aspect of infection control in hospital environments in training programs.
- Support the Ministry and health facilities in the organization and validation of continuing training on infection control for health care professionals.
- Promote and publish research projects on infections.

Health care providers (advocate a multidisciplinary team approach)

- Practice proper hand hygiene in your daily performance.
- Periodically train on/inquire about developments in infection control and prevention science.
- Use the standard treatment guide for antimicrobials when treating infections.

- Train patients and the public on general hygiene and infection prevention at the individual and community levels.
- Train patients on the correct use of medicines and the dangers of self-medication, especially with antimicrobials.

Patients

- Relentlessly perform hygiene measures to prevent infection.
- Consult a medical professional immediately when sick and avoid as much as possible spreading germs to others.
- Follow the instructions given by the health care staff when taking medicines.
- Do not self-medicate, especially with antibiotics.

General public

- Practice daily hand hygiene with clean (running) water and soap.
- Keep household waste in appropriate locations.
- Do not self-medicate with antibiotics or buy medicine on the street.
- Consult health care professionals for the correct information on infection control.

Media

- Become actively involved in disseminating sensitization messages on infection control, antimicrobial resistance, self-medication, and hygiene in general.

This document was prepared by the participants at the *Francophone Workshop on Antimicrobial Resistance and Infection Control in Health Care Facilities*, which took place in Kigali, Rwanda, November 23–27, 2009.¹

1 Meiburg A, Goredema W, Ntengu M. 2010. Francophone Workshop on Antimicrobial Resistance and Infection Control in Health Care Facilities. Presented by the Ecumenical Pharmaceutical Network and Management Sciences for Health. http://pdf.usaid.gov/pdf_docs/Pnadu432.pdf

Annex I. Information Collection Activities

How to Conduct a Document Review and an Interview

Document Reviews

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

Tools

- [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 (e.g., policies, articles published or accepted in journals, curricula, media articles). Broad categories include:

- Identification of new stakeholders
- Communication channels
- Key organizations, programs, and 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 information to describe the key conceptual areas contained in each document. Data collection instructions for each study will describe what type of information to extract from the documents that have been assembled.

Map key programs and new stakeholders identified during your review to [Form 1. Stakeholder Identification Worksheet](#). This worksheet should be considered a living document to be continually updated.

Preparing for an Interview

- Identify and interview stakeholders (the coalition 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 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 key coalition members have reviewed the list.
- Review and adapt tools.
- Use [Form 3. Stakeholder Interview Guide](#) for interviewing all drug-resistance stakeholders selected (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 nonpriority stakeholders (those identified on the initial list but not considered priority stakeholders) to determine whether:
 - Interviewers are comfortable with the questionnaire
 - The stakeholders interviewed understand 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 if one person takes notes and the other does the interview. Using two people also helps prevent bias. When the two people have different backgrounds, they may interpret the information differently.

Review box I-1 for general tips on in-depth interviewing. In addition to these general tips, note that in this document, we use the terms 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 his or her interpretation of resistance (e.g., only antibiotic resistance). If the person is not sure what the term means, he or she may feel uncomfortable answering questions. This can affect answers or even participation in the interview. Because we are most interested in what stakeholders know about drug resistance, we recommend this term be used 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 interviewees to add names to the list of key stakeholders. Go through the same process described above to determine whether these stakeholders should be interviewed. Remember to add all the newly identified stakeholders to the contact list, including 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 or she was trying to say. Otherwise, you will not get a clear picture of the situation.

Box I-1. Conducting In-depth Interviews

Do:

- Begin the interview with a friendly and familiar greeting.
- Impress upon the respondent that his or 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.
- Listen attentively to capture every piece of information from respondents.
- Explore key words, phrases, idioms, and terms as they occur in the discussion.
- Listen to impressions, topics avoided by the informant, deliberate distortions, and misconceptions or misunderstandings. Take prompt action to explore each of these. Where appropriate, use probing questions to get more details.
- Ensure a natural flow of discussion by guiding the informant from one topic to the next.
- Be silent to give the respondent plenty of time to talk.
- Be open to unexpected information.

Do not:

- Influence or bias responses by introducing one's own perceptions or asking leading questions that encourage a particular response.
- Move too quickly from one topic to the next.
- Interrupt the informant.
- Mislead about the subject matter to obtain information.

Adapted from *How to Use Applied Qualitative Methods to Design Drug Use Interventions*, Produced by the International Network for the Rational Use of Drugs Scientists Working Group, Working Draft, December 1996.

Guidelines for Interviewers

Wherever possible, perform as comprehensive a document review as possible on the related topics before interviewing key informants. This provides information on what is already available, and possessing such background information/facts facilitates the interviewing process, increases credibility, and saves time. The data tables in [Annex K](#) may be used to record information.

Depending on how much information is gathered, there may be a need to identify additional key informants and interview them to gather adequate information. Always note the name and contact information for anyone 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 ready.

Ask all stakeholders 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, helps get detailed responses, and may help get names of new informants or documents.

Adopt a flexible approach during the interview. Don't interrupt the flow of the informant. Ensure that all relevant questions are covered by the end of the interview, but the order of the questions is not critical. If during the interview a new but relevant issue emerges, ask more questions about that issue 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. Certain questions may be omitted if the situation so requires (e.g., the informant has already provided a response to an issue while answering a previous question or the informant refers you to a subordinate for more in-depth information).

Box I-2. Potential Sources of Information on AMR

Internet document searches

Internet search by topic:

- USAID document clearinghouse—<http://dec.usaid.gov/>
- WHO—<http://who.int>
- U.S. National Library of Medicine PubMed— <http://www.ncbi.nlm.nih.gov/sites/entrez>

Structural indicators

Basic structural indicators of health, education, access to services, etc., can usually be obtained from:

- Health information services
- 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 medicines 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

Media

- Newspapers, magazines, newsletters, radio
- International development/donor priorities/ programs
- Search websites for project reports, studies, and development assistance strategies.
 - <http://www.usaid.gov/>
 - <http://www.dfid.gov.uk/>
 - <http://WHO.int>
 - <http://UNICEF.org>
 - <http://UNAIDS.org>
 - <http://www.worldbank.org>
 - www.cdc.gov

By the end of the interview, ensure that you have asked the informant about relevant documents pertaining to the issue(s) discussed and the sources for obtaining them. If you are made aware of a document that you have not reviewed, try to obtain a copy. (Keep copies of all the reviewed documents properly archived for future reference.)

Annex J. Pharmaceutical Management Assessment Findings, Zambia 2004⁸⁰

Area of practice	Findings	Source of data
Selection and procurement of antimicrobial agents		
Treatment guidelines	<p><i>Existence</i> Different guidelines exist. There are STGs and integrated treatment guidelines for frontline health workers (ITGs) for all common diseases in Zambia and also disease-specific guidelines for malaria, ART, and TB.</p> <p><i>Development and revision</i> All guidelines are developed through the consensus of experts and key opinion leaders in the various conditions covered in the guidelines and approved by the Zambian National Formulary Committee. There is no set period for revision but the committee aims at revision every three to four years.</p> <p>Some programs (e.g., Family Health Trust) have developed guidelines (syndromic management of STIs) for specific programs.</p> <p><i>Guidelines for different levels of care</i> Guidelines stipulate care to be provided at different levels.</p> <p><i>Availability of and adherence to STGs</i> There are no data on the national availability of STGs. One study found that approximately 50% of selected health facilities in Lusaka had ITGs in the screening room.</p> <p>CBoH is in the process of establishing a drug management system that will incorporate the collection of such data.</p> <p>DTCs at the facility level are responsible for promoting health worker adherence to recommended treatment protocols.</p>	<ul style="list-style-type: none"> • CBoH (Pharmacy Unit-Zambian National Formulary Committee secretariat) • STGs • ITGs • Guidelines for the Diagnosis and Management of Malaria • Integrated Management of Childhood Illness Guidelines • Infection Prevention Guidelines • TB Manual • ART: A Reference Manual • Management of Opportunistic Infections: A Reference Manual <ul style="list-style-type: none"> • CBoH-Essential Drug Program • Literature search • Report of survey during training for DTCs, April 2001
Essential medicines list	<p><i>Existence</i> An EML exists with 200 to 300 medicines, including antimicrobials. The new STGs include an EML and essential laboratory supplies.</p> <p><i>Selection process</i> EMLs are selected on the basis of the treatments recommended. They consist largely of first-line medicines with some second-line medicines. The Zambian National Formulary Committee is responsible for selection.</p> <p><i>Revision</i> There is no set period of revision, but the Zambian National Formulary Committee aims to revise the list every three to four years. The last revision (2003) was done after four years.</p> <p><i>Listing according to levels of care</i> Antimicrobials and other drugs are listed according to levels of care at which there is expected to be competence to administer the drugs.</p> <p><i>Availability</i> There are no data on the availability of EMLs in health facilities. CBoH is in the process of establishing a system that will incorporate collection of such data.</p>	<ul style="list-style-type: none"> • EML • STGs <ul style="list-style-type: none"> • EML • STGs • CBoH-Essential Drug Program <ul style="list-style-type: none"> • EML • CBoH-Essential Drug Program <ul style="list-style-type: none"> • EML <ul style="list-style-type: none"> • Literature search

Continued...

Area of practice	Findings	Source of data
	<p><i>Availability of medicines on EML in facilities</i></p> <p>No data exist for the country-wide situation. A survey on medicine availability at 12 sites in Lusaka by the district health management team found that 70% of facilities had certain selected tracer medicines. The same survey indicated an average stock-out rate of 16% of the tracer medicines.</p>	<ul style="list-style-type: none"> • Literature search • Medicine supply and use review in Lusaka urban district, 2002
Policy and legal framework		
<p>National Drug Policy</p>	<p>The National Drug Policy was adopted by the government in 1999.</p> <p><i>Antibiotic policy</i></p> <p>There is no national antibiotic policy. The use of antibiotics is restricted by statute (Therapeutic Substances Act and Pharmacy and Poisons Act) to prescription-only medicines. The Pharmacy and Poisons Board is responsible for enforcing the laws. There is no “reserve list” of antibiotics in Zambia.</p> <p><i>Prescribing restrictions</i></p> <p>Antibiotics can only legally be prescribed by medical practitioners and dental surgeons registered with the Medical Council of Zambia, veterinary surgeons, and other categories of practitioners authorized by the act. A new law aims at authorizing a limited range of medicines to be prescribed by nurses. Clinical officers in the public sector may prescribe drugs authorized for the level of care at which they practice.</p> <p>Veterinary antibiotics are regulated under the same laws.</p> <p><i>Drug promotion</i></p> <p>The promotion of medicines, including antibiotics, is guided by the Standards of Pharmaceutical Practice in Zambia.</p> <p><i>Enforcement capacity</i></p> <p>Data are not available on the implementation or impact of these laws and regulations. However, it is generally accepted that the capacity for effective regulation of medicines and pharmacy practice is lacking in Zambia for various reasons. Pharmacy and medicines regulations are currently being reviewed and new legislation is expected to be enacted soon to correct this situation.</p> <p><i>Product registration</i></p> <p>All medicines intended for the Zambian market must be registered with the Pharmacy and Poisons Board. Medicines, except general sale list medicines in their original packs, may only legally be sold in pharmacies registered with the Pharmacy and Poisons Board. The number of antimicrobials registered is not available.</p> <p><i>Regulation of pharmaceutical personnel</i></p> <p>Pharmaceutical personnel are registered with the Medical Council of Zambia, including pharmacists and pharmacy technicians</p>	<ul style="list-style-type: none"> • CBoH-Essential Drugs Program • National Drug Policy • Pharmacy and Poisons Board • Medical Council of Zambia • Standards of Pharmaceutical Practice • Medical and Allied Professions Act

Continued...

Area of practice	Findings	Source of data
Education, training, and capacity building		
In-service training/ CPE	<p>Statutory professional registration bodies (Medical Council of Zambia, General Nursing Council) require professionals to earn CPE points to retain their registered status. The Medical Council of Zambia does not conduct CPE activities, but the General Nursing Council does organize some CPE/in-service training activities. Professional bodies, such as the Faculty of General Practitioners and the Pharmaceutical Society of Zambia, are more active in organizing CPE activities.</p> <p>Topics for CPE programs vary and include some AMR-related issues. There are no data available on topics (from the Pharmaceutical Society of Zambia and the Medical Council of Zambia) covered by Medical Council of Zambia registered professionals in CPE. There are no data available on the impact of such activities.</p> <p>Opportunities exist for including AMR topics in CPE programs for nurses and pharmacists. There are no data available on the appropriateness of dispensing and prescribing. CBoH, through the District Integrated Logistics Self-Assessment Tool, has incorporated collection of such data.</p> <p>There is no training provided to health workers on the use of STGs, but training has been provided by TB, HIV/AIDS, and malaria programs on the use of disease-specific guidelines. The training is for all categories of health workers.</p> <p>The quality assurance program within the CBoH provides training and technical support for quality assurance in district health management teams and health centers. The Directorate of Monitoring and Evaluation provides training and oversight. CBoH monitors quality through quarterly performance audits, supervision visits by district health management teams, and health management information systems. The new health management information system was piloted in 15 districts and is being established nationwide. CBoH developed a manual of standards for priority health areas, including reproductive health and family planning, HIV/AIDS and STIs, child health and nutrition, TB, and water and sanitation. A total of 85 quality assurance teams operate in 95% of the districts.</p>	<ul style="list-style-type: none"> • Medical Council of Zambia • Pharmaceutical Society of Zambia • General Nursing Council <p>University of Zambia School of Medicine (Department of Pharmacy), General Nursing Council</p> <p>Marquez, L. and Madubuike, C., 1999</p>
Preservice training	<p>Curricula for nurses, pharmacy, and biomedical sciences were reviewed. Only the nursing curriculum (three categories of nurses) had specific AMR topics outlined. The other curricula did not specifically list AMR-related topics. The review did not include any of the syllabi, which could have AMR-related topics in the detail.</p> <p>There are no data to demonstrate what is taught within the curriculum. AMR topics may be included in the biomedical sciences, nursing, and pharmacy curricula without going through the normal long, bureaucratic process, according to the respective heads of the training institutions.</p> <p>The preservice curricula for nurses and pharmacy students do not include treatment guidelines. Curricula for medical students and clinical officers were not obtained.</p> <p>Of the curricula reviewed for institutions that are training health workers, only the nurses' curriculum includes the EML.</p>	<p>Curricula for nursing, pharmacy, and biomedical sciences</p> <p>General Nursing Council, University of Zambia (School of Medicine)</p> <p>University of Zambia School of Medicine (Department of Pharmacy), General Nursing Council</p> <p>Curricula for pharmacy, nurses, and biomedical sciences</p>

Continued...

Area of practice	Findings	Source of data
Public education campaigns	<p>There have been many campaigns organized to promote the correct use of medicines, including antibiotics. Many messages in such campaigns focus on antimicrobial use. The Pharmacy and Poisons Board and Pharmaceutical Society of Zambia jointly organized one such campaign in 2000–2001.</p> <p>The National Malaria Control Center, as part of the Roll Back Malaria activities, participates in the annual Southern African Development Community (November) and Africa Malaria Days (April). Appropriate use of antimalarial drugs is one of the aspects promoted during these events. Such campaigns include promotion of infection prevention strategies, such as use of insecticide-treated nets. The National Malaria Control Center is planning an intensive awareness campaign (starting in September) as part of the plan for rolling out the treatment policy.</p>	<p>Pharmacy and Poisons Board report on the public awareness campaign, 2001</p> <p>National Malaria Control Center</p>
Capacity building	<p><i>Infection prevention committee</i> Some hospitals in the public sector have infection prevention committees. No data are available on how many of these committees exist in the country or in the private sector.</p> <p>CBoH, with funding from JPHIEGO, is in the process of providing orientation to health workers on infection prevention.</p> <p><i>Infection prevention guidelines</i> Guidelines have been developed and health facilities are being trained on how to implement the guidelines.</p> <p><i>DTCs</i> All public-sector facilities are expected to have a functional DTC. However, not all do. No data are available on how many do and do not.</p> <p>No data are available on what existing DTCs have done about AMR containment; DTCs are supposed to report to the Zambian National Formulary Committee.</p>	<p>JPHIEGO, University Teaching Hospital Microbiology Laboratory</p> <p>CBoH-Essential Drugs Program</p>
Quality		
Quality assurance mechanisms	<p>In the private sector, there is no standard mechanism. Some companies have developed in-house mechanisms. No data were collected from the private sector on this aspect.</p> <p>A number of private-sector importers and manufacturers have quality control facilities in which medicine quality may be tested.</p> <p>The EML is not strictly applied for procurement in the private sector, although it has some effect because it influences public-sector demand.</p> <p>In the private sector, procurement is also influenced by product licensing requirements. Only licensed products may be marketed in Zambia. In the public sector, procurement of antimicrobials is largely based on the EML. The National Drug Policy stipulates that procurements must be based on the EML.</p> <p>In the public sector, prequalification of suppliers is applied for some products. There is no public drug quality control laboratory for routine testing of medicines for the public sector.</p> <p>Product licensing requirements are enforced quite effectively although no data exist to determine compliance.</p> <p>No data exist on the proportion of antimicrobials found to be substandard or counterfeit.</p>	<ul style="list-style-type: none"> • CBoH • Literature search • Pharmacy and Poisons Board

Annex K. Data Collection 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, drug use review, and surveillance information and capacity assessment.

Burden of Disease

Because the volume of medicine use may be difficult to measure, the number of illness episodes (outpatient cases and hospital admissions) can give an idea of what infections may be at risk for developing resistance to medicines due to high volume of medicine use. This information can be found in several places, including 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, they must be indicated. For example, if data represent only partial coverage, record the information you have and note that it is incomplete.

Table K-1. High-burden Infectious Diseases

	Mortality rates			
	Total population	Data source/data quality	Children under the age of five	Data source/data quality
TB				
Malaria				
STIs				
Diarrheal disease				
ARI				
HIV/AIDS				

For each condition in table K-2, record the percentage of total admissions that the condition represents in each sector. Information from the private sector may not be available in some countries.

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

	Public	Private	Both	Data source/data quality
TB				
Malaria				
STIs				
Diarrheal disease				
ARI				
HIV/AIDS				

For each condition in table K-3, record the percentage of total outpatient visits that the condition represents in each sector. Information from the private sector may not be available in some countries.

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

	Public	Private	Both	Data source/data quality
TB				
Malaria				
STIs				
Diarrheal disease				
ARI				
HIV/AIDS				

AMR Surveillance Information and Capacity

Transfer the results of the literature search on AMR levels and trends of key pathogens to table K-4 (pathogens may vary by country). 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 N/A under resistance levels). Data quality of reported results may vary.

Table K-4. Antimicrobial Resistance Levels and Trends

Key pathogen tested	Resistance levels (range)	Record any information on data quality	Date	Location	Population	Information source
<i>Mycobacterium tuberculosis</i>						
<i>Plasmodium falciparum</i>						
<i>Neisseria gonorrhoeae</i>						
<i>Streptococcus pneumoniae</i>						
<i>Haemophilus influenzae</i>						
<i>Shigella spp.</i>						
<i>Vibrio cholerae</i>						
HIV						
Other						

Summarize the range of resistance levels and the periods covered in table K-4 in table K-5. Note key pathogens for which no data were available (insert N/A under resistance levels). Data quality of reported results may vary.

Table K-5. Antimicrobial Resistance Levels and Trends Summary Tables

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

Annex L. Summary of AMR Surveillance and Capacity Assessment in Zambia, 2004⁸¹

Condition	AMR levels/treatment failure	Location	Population	Reference
Enterobacteria from AIDS patients	<ul style="list-style-type: none"> Nontyphoidal salmonellae (resistance to treatment 6–92%) Shigella flexneri (6–100%) S. dysenteriae (0–100%) 	Lusaka	124 adults, 105 children	Mwansa J, Mutela K, Zulu I, et al. Emerging Infectious Diseases 8.1 (2002): 92–93
Malaria	Clinical failure: chloroquine: 31–48% Clinical failure: sulfadoxine-pyrimethamine: 3–17%	6 sites	300 febrile children <5 years	Barat LM, Himonga B, et al. (CDC). Tropical Medicine & International Health 3.7 (July 1998): 535–42
Malaria	Clinical failure: sulfadoxine-pyrimethamine: 0 Clinical failure: chloroquine: 25%	Lundazi District Hospital	169 children <5 years with slide-confirmed uncomplicated malaria	Williams HA, Kachur S, et al. (CDC, Tropical Disease Research Centre, Zambia). Tropical Medicine & International Health Vol. 4(10) October 1999
Malaria	Chloroquine resistance: 58% Sulfadoxine-pyrimethamine resistance: 26%	Kaoma District	70 patients with uncomplicated falciparum malaria; sulfadoxine-pyrimethamine given to those patients who had received chloroquine prior to enrollment	Bijl HM, et al. (Kaoma (District Hospital, Zambia, Dept. of Internal Medicine, Groningen University Hospital, The Netherlands). Tropical Medicine & International Health 5.10 (October 2000): 692–95
Streptococcus pneumonia	Overall resistance: 34.1% <ul style="list-style-type: none"> Tetracycline: 23.0% Penicillin: 14.3% Sulfamethoxazole + trimethoprim: 12.7% Chloramphenicol: 3.9% 	Zambia	260 children <6 years	Woolfson A, Huebner R, et al. (University of Oxford). Bull World Health Org 75.5 (1997): 453–62

Surveillance Capacity

Background

Data obtained through AMR surveillance are used for decision making at various levels within institutions (e.g., University Teaching Hospital) and at the national level for policy decisions and the development of evidence-based treatment guidelines. The malaria treatment policy, TB guidelines, and STI and antiretroviral therapy protocols were influenced by available surveillance data. The cholera treatment policy has been influenced by such data since the early 1990s. Several drug resistance stakeholders who were interviewed reported on the need for more geographically representative data.

University Teaching Hospital–Microbiology, University Teaching Hospital–Virology, and the Tropical Diseases Research Center are WHO regional reference centers. Data on the number of health facilities with functioning laboratories in the country are not available. However, it is estimated that only approximately 33% of health facilities in Zambia have the capacity to carry out microscopy. There are five reference laboratories in Zambia—University Teaching Hospital Microbiology Laboratory, University Teaching Hospital Virology Laboratory, National Malaria Control Center, Tropical Diseases Research Center, and Chest Diseases Laboratory. The National Malaria Control Center and Chest Disease

Laboratory specialize in malaria and TB, respectively. All facilities are involved in surveillance activities. The National Malaria Control Center and Tropical Diseases Research Center have set up 10 sentinel sites for malaria, where most of the surveillance activities are undertaken. Mining companies on the Copperbelt have good laboratory infrastructure with the capacity to do surveillance work. Other facilities, such as mission hospitals, defense forces hospitals, and private hospitals, have laboratories that may have surveillance capacity.

Findings from Surveillance Capacity Interviews

Information was obtained by interviewing key informants and reviewing documents. The sample of laboratories (located in Lusaka, Kitwe, and Ndola) interviewed included five national-level reference laboratories and three private laboratories. The sample is not necessarily representative. Private laboratories were interviewed to assess their interest in and capacity to participate in surveillance activities.

Guidelines

Four of the five reference labs and one private lab were aware of guidelines regarding the recommended level of microbiology laboratory services for different levels of hospitals.

Laboratory Quality Assurance

There was no awareness of a national medical laboratory quality assessment scheme among the private laboratories interviewed. The reference laboratories reported varying use of a national laboratory quality assurance scheme at a variety of laboratory levels (national, institutional, provincial). One laboratory reported, however, that there was no networking among the laboratories in terms of quality assurance. One of the three private laboratories interviewed reported participating in equivalent quality control through the CDC. University Teaching Hospital participated in regional quality control and the Tropical Diseases Research Center, Chest Disease Laboratory, and University Teaching Hospital–Virology reference laboratories participate in international quality control programs.

Funding Sources

The private-sector laboratories interviewed rely on patient subscriptions for support and are not aware of donor support for surveillance activities. Government, WHO, Japanese International Cooperation Agency, USAID, CDC, DFID, and the Global Fund were identified as donors supporting AMR surveillance activities. Two laboratories noted the disease- and program-specific nature of surveillance funding. Two laboratories reported that all types of funding were difficult to obtain. Technical training (three labs) and information management (two labs) were mentioned as difficult areas for which to obtain donor support.

Four out of the five reference laboratories interviewed reported increased interest in supporting surveillance activities as well as new donor involvement (Gates Foundation for TB surveillance and global initiatives for malaria surveillance). Availability of new medicines and changing treatment protocols were mentioned as reasons for increased interest.

Role of the Private Sector in Antimicrobial Resistance Activities

The role of private laboratories in drug resistance surveillance activities was seen as primarily diagnostic by reference laboratories, although one respondent felt the private labs could be contributing much more than they were. Two respondents mentioned that AMR surveillance in the private sector consisted primarily of susceptibility testing and that private labs differ from public labs in levels of supervision and standards. Some of the private laboratories interviewed were interested in participating in surveillance activities and felt they

had human and infrastructure resources to contribute. However, they currently had neither a relationship with public-sector laboratories nor access to standard operating procedures and other materials provided by the public sector. More private-sector laboratories would need to be assessed to fully understand the potential role they could play in AMR surveillance.

Use of Data

Respondents were asked how data collected are being disseminated and used. Diagnostic information is used by clinicians and disseminated through results forms. Data for surveillance and policy is used primarily by the government (MoH and CBoH) and disseminated through reports and workshops. The questions used did not pick up any information on the role of DTCs in information management, use, and dissemination.

All respondents (except one private laboratory that was not collecting surveillance data) reported that they were collecting data that are not being used. The main reasons cited were lack of coordination between laboratory staff and clinicians (three labs). Other reasons mentioned included a lack of funding for dissemination and data being used for research or specific projects but not disseminated further.

Training

All respondents, except one from the private sector, had received some training in the past two years. When asked what type of training would be most welcomed, four of the six respondents mentioned information management/computer training.

Information Needs and Information Dissemination

When asked about information they needed but were not getting, five of the eight laboratories said they needed general information on drug resistance. Specialized information needs included information on the molecular basis of resistance and atypical mycobacteria.

Primary mechanisms mentioned for dissemination of information among colleagues were meetings and workshops (5), leaflets and circulars (4), and email/internet (3). Print media, policy makers, and leaflets were most frequently mentioned for dissemination of information to the public.

Data Management

Limited data management capacity was a recurring theme and was cited as affecting data quality and as a barrier to data utilization. Respondents listed data management as an area for which it was difficult to find funding and where training would be welcome.

All of the reference laboratories had computer access. All were using Epi Info for data management, and one lab also used WHONET software. None of the private laboratories had computer access.

Annex M. Summary of Interviews to Identify Stakeholder Perceptions of AMR, Zambia 2004

Analysis of Stakeholder Data

Representativeness

Stakeholders	Number
Sector:	
Public	11
Private	1
NGO	1
Industry	2
Academia	0
Cooperating partners/multilateral	3
Specialty:	
Disease control	12
Pharmaceutical management	5
Laboratory/surveillance	1
Total	18

Stakeholder Groups Interviewed

- National Malaria Control Center
- WHO
- Medical and pharmaceutical professional association (Faculty of General Practitioners)
- Pharmacy and Poisons Board
- Directorate of Public Health Laboratories
- CBoH, Essential Drugs Program
- CBoH, Directorate of Clinical Care
- CBoH, Directorate of Public Health
- CBoH, Maternal Child Health
- CBoH, TB Program
- UNICEF, HIV/AIDS program
- Alliance for the Prudent Use of Antibiotics
- Pharmaceutical manufacturer and distributor
- Health insurance
- National HIV/AIDS/STI/TB Council
- Churches Health Association of Zambia
- General Nursing Council

General Comments

- Magnitude/urgency of the AMR problem
 - Serious (big)/urgent attention (6/18)
 - Not too bad (3/18)
 - Not significant (1/18)
 - Others—did not know about problem or did not comment
- Hot topics
 - Change of treatment policy
 - New drugs (antiretrovirals, coartem) in circulation—new challenge
 - Revision of medicines regulations
 - Pharmacovigilance
 - NDP implementation
 - Revision of curricula
 - Quality control of (new) medicines
- Consequences of AMR
 - Increased morbidity and mortality
 - Economic loss
 - Treatment failure
 - Need for alternative drugs

- Who needs to be concerned/involved
 - Community
 - Government
 - Health professionals
 - Policy makers and implementers
 - Media
 - Multisectoral
- Need for information/type of information
 - Not enough information
 - Local sensitivity/resistance data
 - Global resistance data
- Limitations
 - Need for expertise (surveillance, etc.)
 - Financial resources
 - Facilities for monitoring

General Observations

- Magnitude of problem
 - Private sector did not view AMR as big problem.
 - Public sector respondents viewed it as serious problem (6/12)
 - Cooperating partners viewed AMR as serious problem (3/3)
 - Lab experts (director labs/microbiology) considered problem not bad/not out of hand
- Hot topics
 - Identified new medicines as issue requiring special attention (e.g., training) (5/18)
 - Identified medicine quality as topical (2/18)
- Consequences of AMR
 - Mentioned increased treatment costs as a consequence of AMR (8/11)
 - Mentioned increased morbidity and/or mortality as a consequence (4/11)
- Who needs to be involved
 - Health workers (7/11)
 - Public (4/11)
 - Policy makers (4/11)

- Need for information (type)
 - Not enough information available on AMR in Zambia (11/11)
 - Needed information on sensitivity/resistance patterns (2/11)
 - Needed local data on AMR (2/11)
- Areas of stakeholder contribution
 - Leadership
 - Providing evidence (data)
 - Support to groups doing AMR work
 - Regulatory support
 - Standardizing guidelines and other technical support
 - Information dissemination
 - Training of health workers
 - Training of students (nurses, pharmacy, biomed sciences)
- AMR activities already initiated
 - Training in drug supply management
 - New malaria policy implementation
 - Awareness campaigns
- Community support network for patients to assist with compliance
 - APUA chapter-promoting prudent use of antibiotics
 - ART management guidelines and training
 - Revision of STG, ZNF, etc.
 - CPE for various health professionals

Conclusions

- Awareness of AMR is high among health professionals
- No existing group addressing AMR as cross-cutting issue
- Enough interest exists
- Formation of core working group an important step
- Some AMR activities already initiated
- Significant amount of data exists, some of which needs analysis

Annex N. Examples of Messages for Different Audiences⁸²

Messages for the public		
AMR message	Why	What action is required
<ul style="list-style-type: none"> • Use medicines well in order to save them for our children • Misuse of antimicrobials may cost you or your child's life tomorrow • It is not true that the newest antibiotics are the best for your illness; many times simple antibiotics are just as effective • Antimicrobial agents are a non-renewable resource that must be preserved 	<ul style="list-style-type: none"> • Proper use of medicine prolongs their useful life • Medicines can be very harmful if used in the wrong way • Irrational use of medicines reduces the treatment options for proper patient care 	<ul style="list-style-type: none"> • Always take your antibiotic medicine as prescribed • Always complete your prescribed treatment • Use antibiotics after consultation with a health worker • Don't share your prescribed medicines with others • Report shortage of important antibiotics to the responsible authorities
Practice a high level of hygiene in your home	<ul style="list-style-type: none"> • The spread of resistant bacteria can be reduced by good hygiene and sanitation practices • Hand hygiene is the single most important way to cut down the spread of infections and can limit the spread of resistant bacteria 	<ul style="list-style-type: none"> • Always wash hands with water and soap before eating, before making food, and after using toilet/latrine • Keep kitchen and cooking utensils clean • Keep your house and surrounding environment clean
Each individual has a role to play in preserving the effectiveness of medicines	<ul style="list-style-type: none"> • The major cause of resistance is overuse and misuse of antibiotics • The more the public uses antibiotics the more they become ineffective 	<ul style="list-style-type: none"> • Avoid the routine use of antimicrobial agents in animals (e.g., poultry)
Refuse to be treated with poor quality medicines	Substandard medicines can compromise your return to health	<ul style="list-style-type: none"> • Buy medicines only from licensed outlets with qualified personnel and always check or ask about the expiration date of medicines you buy
You and not your doctor controls your life; get to know about rational medicine use and antimicrobial resistance	Inappropriate use of medicines (indiscriminate, noncompliant) is dangerous and increases the risk of AMR, which means loss of effective medicines	<ul style="list-style-type: none"> • Take your medicines as prescribed and follow instructions as given
Keep it simple: use narrow spectrum antibiotics for specific needs—broad spectrum antibiotics may not be best	<ul style="list-style-type: none"> • Correct use of medicines saves lives and reduces the cost of health care • Correct antimicrobial treatment gives life, but inappropriate treatment gives death 	<ul style="list-style-type: none"> • Use available technology to get a definitive diagnosis and as such treat effectively • Make use of available reference materials to keep up to date with current treatment regimens • Promote use of agreed treatment guidelines
Surgical officers and surgeons have to follow agreed evidence-based protocols on surgical prophylaxis	<ul style="list-style-type: none"> • To reduce the cost of care to the patient and contain the development of AMR • To reduce the facility overhead (e.g., cost of procurement storage) 	<ul style="list-style-type: none"> • Establish the hospital protocol, implement, and monitor practice
Keep up to date with the level of antibiotic use in your facility	Development of AMR has a correlation with the level of antibiotic use	<ul style="list-style-type: none"> • Undertake operational research and surveillance at the facility • Agree on STGs for common conditions the guidelines should be developed by consensus • Conduct baseline studies on antibiotic use in hospitals
Build a AMR network with colleagues at the institutional, local, district, regional, and national levels	Building local coalitions is a success factor for AMR containment	<ul style="list-style-type: none"> • Identify key stakeholders at the institution/district/national level • Regularly share information and support each other in implementing interventions

Continued...

Messages for the public		
AMR message	Why	What action is required
Infection control must be practiced at all levels	Good infection control is a prerequisite to reducing hospital acquired infections	<ul style="list-style-type: none"> • Define policies on infection control • Inform staff about infection control tools and improve on actual practice • Put in place a comprehensive waste management system • Establish infection control committees • Produce information education materials for staff and organized training sessions
Set up and maintain good bacteriology labs	Proper laboratory diagnosis reduces antimicrobial resistance and reduces the cost of care provision within the institution	<ul style="list-style-type: none"> • Promote education and communication between clinician and lab staff • Health workers must be committed to make the most of bacteriology and other lab services • Standard guidelines/protocols on investigations
Proper hand washing is critical in the health institutions—no water, no soap, no health	Good hand hygiene is an effective way of controlling the spread of infection in health facilities	<ul style="list-style-type: none"> • Wash hands the proper way • Provide a regular supply of material for hand washing • Define the hand washing procedure in the facility for both in- and outpatients
AMR is a global problem but its cost varies from dollars in the North to lives in the South	AMR increases morbidity and mortality of infections, length of hospital stays, duration of the illness, and cost of treatments up to 10 times	<ul style="list-style-type: none"> • Develop national plan of action for AMR containment • Set up AMR country working groups to spearhead the AMR advocacy and containment actions
Adopt and adapt WHO Global Strategy and Resolution 60.16 of 2007 on containment of AMR	The global strategy has a wealth of information on causes and possible intervention for AMR containment	<ul style="list-style-type: none"> • Distribute the WHO Global Strategy and Resolution • Build local capacity to tackle the issue by training health workers and the public • Follow up to ascertain implementation
Health systems should put in place mechanisms to detect AMR	Knowing the situation of antimicrobial use in health facilities is an important point to addressing AMR	<ul style="list-style-type: none"> • Develop surveillance systems, conduct AMR surveillance, and document any AMR encountered
Health systems should put in place a comprehensive continuous multifaceted mechanism to contain AMR	<ul style="list-style-type: none"> • For certain things prevention is better than the cure: AMR is one of them • It costs money to address AMR but lives not! • Resistance patterns in rural areas may be different from urban 	<ul style="list-style-type: none"> • Build and equip facilities and provide tools for proper diagnosis (e.g., microbiology laboratories) • Support the establishment of effective DTCs (which can develop guidelines, protocols and monitor medicine use, etc.) and strengthen those that exist
Put in place mechanisms to guarantee rational medicine use at all levels	Rational medicine use is the core intervention to contain AMR	<ul style="list-style-type: none"> • Provide guidelines on the use of antimicrobials • The public must be educated on the common diseases in their communities and when there is need for antibiotic treatment • Patients need to be educated on adherence to treatment regimens, especially medicines taken long term (e.g., TB treatment and antiretrovirals)

Annex O. Excerpts from Interviews with 10 Members of the Media in Zambia⁸³

Knowledge and perspectives on drug resistance and related issues

- Of the editors interviewed, only one had heard the term “antimicrobial resistance”. He heard the term at an international conference. However, he could not explain what it meant to someone who had not heard it before.
- All editors interviewed had heard the term “drug resistance,” but only in relation to malaria. They could explain what the term drug resistance means to someone who has not heard it before.
- The editors interviewed said drug resistance is a big problem in Zambia. However, because of a lack of media coverage (as a result of not having information from health experts), drug resistance is not perceived to be a big problem.
- Death was said to be the ultimate consequence of drug resistance, while self-prescription and failure to finish the full course of medical treatment are said to be causes of drug resistance.

Decision makers

- Editors determine stories to be published or broadcast. However, reporters have the leeway to cover other stories as long as such stories meet the editorial policy of their respective media outlets.

Information sources for health stories

- Locally, the MoH, CBoH, hospitals, and clinics are the main sources of health topics reported in the media; others include WHO, the internet, BBC, and Reuters.
- The most reliable and credible sources of health information to the media include the MoH, WHO, BBC, and Reuters. The first two have health experts and are involved in health research, while the last two quote reputable and credible sources in their stories.

Health topics currently covered by the media

- HIV/AIDS is by far the most covered health topic, followed by malaria and TB.
- Stories about drug donations and shortages in public health institutions and quality of medicines or counterfeit medicines also feature prominently in the media.

Communication channels for health information

- Radio, newspapers, television, and word of mouth are ways that the public learns of health topics such as the new medicines for malaria, medical treatment for pneumonia, and HIV/AIDS treatment.
- Print media in general is said to be the most credible on both health/medicine issues and other issues due to its durability and referral advantage.
- Television has the greatest impact for both government decision makers and the business community because they “like seeing themselves on television.”
- The editors suggested that community-based organizations be involved in disseminating information on health issues because of their remarkable outreach capabilities to access nontraditional audiences in suburbs and villages.

Barriers to coverage of drug resistance and related topics

- Limited resources: Inadequate numbers of reporters, transport vehicles, computers, and cameras
- Bureaucracy: Only official spokespersons are allowed to speak or comment on health stories
- Difficulties in securing expert comments on health information
- None of the media houses interviewed had health reporters
- The percentage of coverage of health- and medicine-related data in terms of time, stories, and programs could not be estimated because health articles are covered on the basis of universal news criteria.

Editors' suggestions for facilitating coverage of drug resistance

- Increased access to reliable information: Given access to reliable information on drug-related topics, the editors said they would readily disseminate that information through their media channels.
- Build relationships: Stakeholders should be encouraged to identify and establish contacts with reporters who have shown interest in reporting on topics related to health and drug resistance. Therefore, there is a need to exchange contact information with such reporters so that health information for publication or broadcasting can be shared.
- Contribute to health columns: The editors said health experts/organizations are free to have a health column or radio/television program and discuss details with the media outlets. However, a serious commitment to consistently write such stories must be made because the editorial space/airtime for that purpose will be reserved.
- *Provide user-friendly context. The health columns are good, particularly when the messages are packaged in a user-friendly way without jargon. Such columns do increase sales because some readers buy newspapers specifically to read the column.*
- Provide logistical assistance: Provide transportation to journalists so they can cover drug-related issues.
- Sponsor training: Empower media personnel with the necessary background information and key concepts about drug resistance.
- Facilitate access: Assist the media in obtaining access to health facilities that do not have public relations officers.
- Enhance professional support: The editors suggested the formation of a media health watch group to enhance their ability to access information because of increased legitimacy and opportunities for information exchange.

Annex P. Minutes of Zambia AMR Advocacy Working Group Meeting

Thursday, March 15, 2007

17:45–19:05

Present

- Professor Chifumbe Chintu (CC) - Chairperson
- Dr James Mwansa (JM) – Vice Chairman
- Patrick Mwanza (PM) - member
- Bernice Mwale (BM) - member
- Dr Jennifer Chisanga (JC) - member
- Oliver Hazemba (OH) - member

Apologies

- Anne Zulu,
- Pascalina Chanda
- Velepi Mtonga

Agenda

1. Welcome remarks from the AWG Chairman
2. Review and correction of previous meeting minutes
3. School of Medicine Undergraduate Curriculum Review Workshop
4. Report on the National Quality Assurance Workshop
5. Progress report on the Review of the National Standard Treatment Guidelines
6. Next steps
7. Any other business
8. Close of the meeting

Topic	Discussion
1. Chairman's introduction and welcome Remarks	<ul style="list-style-type: none"> • The Chairperson welcomed the all the members present to the meeting at 17:45hrs • The agenda of this meeting was proposed by the Chair and seconded by the members
2. Review and correction of previous meeting minutes	<ul style="list-style-type: none"> • The members reviewed the minutes of the previous meeting and made the following corrections: <ul style="list-style-type: none"> – The name “Ann Zulu” to read “Anne Zulu” – The second bullet, the word “chair” to cite as “Chair” with a capital C. – The word, “passed” to read “agreed upon” – Third bullet, the word “call to action” to read, “Call to Action” with a capital C and A wherever they appear e. On page 2, second bullet, line number three, the word “have” to be replaced with “has”. – Line number 5, the word “Agency” to be replaced with “Authority” – Second Bullet, line number 2, the word “medicine” should cite as “Medicine”, with a capital M.
3. School of Medicine Undergraduate Curriculum Review Workshop	<ul style="list-style-type: none"> • The secretariat gave a brief on the ongoing workshop. He informed the members that the AWG Chairman, AWG Vice Chairman in his capacity as APUA Chairman and RPM Plus AMR Manager made presentations to advocate for inclusion of AMR topics in the Medical Undergraduate curriculum. Dr. Sekeleni Banda also presented the report of the “Medical Undergraduate Curriculum Review that he did in 2006. In general, the presentations were well received. It was observed that the participants got the message and were eager to incorporate the information in the curriculum. The Vice-Chairman informed the members that the change likely to happen is a paradigm shift from traditional to modern innovative approaches incorporating AMR issues.

Continued...

Topic	Discussion
4. Report on the National Quality Assurance Workshop	<ul style="list-style-type: none"> • The Chairman requested a member from PRA to give an update on the Quality Assurance Workshop that was held in February with the support of RPM Plus. In response the member informed the members that 7 inspectors drawn from Lusaka PRA office and Nakonde District Hospital were trained. One trainee came from NISIR and will assist with analysis of samples. The participant from Nakode will assist with tests on the products imported through the Nakonde border. PRA plans to hold a stakeholders meeting to inform them of the initiation of min-labs tests to be done on imports and locally manufactured products. • Customs officers will work with PRA. The Chairman reminded members that Customs officer have power to refuse entry of imports in the country which PRA inspectors may not have. It is important that the collaboration is strengthened. • PRA plans to extend the use of min-labs technology to other border posts such as Chirundu, Kazungula and Kasumbalesa. PRA intend to have the entry points gazetted in the near future. • Tests will be applicable to all imports including donations, gifts and sales. This will be done to complement drug donations guidelines.
5. Progress report on the Review of the National Standard Treatment Guidelines	<ul style="list-style-type: none"> • The secretariat reported the slow progress on the STG review. Not all the eminent persons requested to contribute have submitted their pieces. As a result this has slowed down the original momentum initiated at the September 2006 workshop. However, some of the contributors contacted committed themselves to hand in their materials the following Monday (March 19). • The secretariat will make a follow on all the other issues raised from the previous meeting to ensure that the remaining pieces are availed, including the issue of remunerations
6. Next Steps	<ul style="list-style-type: none"> • It was generally agreed that the AWG should continue to: <ul style="list-style-type: none"> – Support the curriculum review process of the medical undergraduate curriculum review. It was agreed that Dr. Sekeleni Banda be informed that AWG is willing to support the development of the AMR module even before the review process is completed. – Complete the STG review process – Continue to advocate AMR issues through the public and health care workers
7. AOB	<ul style="list-style-type: none"> • The Chairman requested each member for any other business. <ul style="list-style-type: none"> – A question was raised on the continued support to PRA on quality assurance. The Chairman informed the members that PRA should mainstream the activity and budget for its continued operations. In addition, it should look for a long term strategy to ensure that a Quality Control Laboratory is instituted. In addition, Dr. Joshi acknowledged the PRA and the AWG for the good work and initiatives in promoting AMR containment. The PRA use of SOPs is a very good strategy as it provides step by step guidance on quality control analysis. However, the SOPs are dynamic and should be reviewed regularly for their relevance. AWG/RPM Plus may support the monitoring and evaluation in the future to ascertain the impact of the intervention. – The secretariat was requested to circulate the minutes electronically prior to the scheduled meeting. This was agreed. – Continued financing of AWG activities, particularly public information dissemination was also raised. It was observed that the migration of donors to a centralized budget has a big impact NGO's capacity to access donor funding. It was agreed that AWG should approach Reuben Kamoto at MoH to incorporate AMR issues in the MoH weekly health messages. – Patrick Mwanza volunteered to assist with dissemination of AMR issues through the print media. He call upon the members to avail him with articles and any other AMR related activities He is available to assist with publishing the information in the print media

There being no other business, the meeting was closed at 19:05hrs

Chairman _____

Secretariat _____

Annex Q. Sample Press Related to AMR Coalition Activities August 30, 2016: The Herald (Zimbabwe) (following CHAZ journalist training)

Antibiotic resistance: A ticking time bomb

August 30, 2016 Features, Opinion & Analysis

Sharleen Mohammed

Diseases becoming resistant to antibiotics are as serious as terrorism and pose a big threat to global health today as this affects anyone, of any age, in any country. Antibiotic resistance occurs naturally, but misuse of antibiotics in humans and animals is accelerating the process. A growing number of infections, such as pneumonia, tuberculosis, and gonorrhoea, are becoming harder to treat as the antibiotics used to treat them become less effective. Antibiotic resistance leads to longer hospital stays, higher medical costs and increased mortality.

Antibiotics are designed to fight infections and heal by killing or slowing down the growth of bacteria but if not used in the correct way such as taking them for too long or for too short, the medicine may not work.

These medicines are used to prevent and treat bacterial infections. Antibiotic resistance occurs when bacteria change in response to the use of these medicines.



Antimicrobial resistance is a global concern

Bacteria, not humans, become antibiotic resistant and these bacteria may then infect humans and are harder to treat than non-resistant bacteria.

Stanley Midzi of the World Health Organization (WHO) said gonorrhoea was recently added to the list of diseases that had become global threats.

"Sexually transmitted infections (STIs) are back to haunt us once again, when your patients get infected, you have to juggle around medicines to prescribe to a patient suffering from the disease," he said.

"Sexually transmitted infections (STIs) are back to haunt us once again, when your patients get infected, you have to juggle around medicines to prescribe to a patient suffering from the disease," he said.

"Some of the strains can only be tackled by a combination of drugs since there is no longer a single cure that can be used to treat a particular disease as no new molecules for the disease had been made in the past 10 years.

He highlighted that experts ignored the area since the introduction of condoms, with the general perception that the nation was moving towards an STI-free era.

"Nearly 700 000 people around the world die each year because of drug resistance, adding that if unchecked, the figure could rise to one million deaths annually with medical costs rising by over \$100 trillion, as more expensive drugs would be used," Midzi revealed.

Health and Child Care deputy minister Aldrin Musiwa said the issue of anti-microbial resistant drugs needed to be addressed urgently.



Health and Child Care Deputy Minister Aldrin Musiwa

"We have noted emerging cases of multiple drug resistance among TB and malaria patients. There has also been resistance to first or second line medicines for HIV, forcing us to change to more expensive medications.

"Anti-microbial resistance is like a time bomb which will cause more deaths than the HIV pandemic and TB infections combined in sub-Saharan Africa if left unattended.

He added that anti-microbial drug resistance applied to all infectious diseases caused by bacteria, viruses, fungi or parasites.

He added that the Health ministry had commissioned a national anti-microbial resistance core team to guide the country in the one-health.

Musiwa said antimicrobial agents had saved millions of lives and improved the outcomes for countless patients since these medicines were introduced in the 1930s.

The Ministry has joined forces with the Medicines Control Authority of Zimbabwe, African Treatment Access Movement and the Veterinary Public Health in an effort to develop an antimicrobial resistance national action plan.

Project co-coordinator Pamela Woods said the project would cover both humans and livestock in Zimbabwe.

"This is for both human beings and animals as both are being affected by the microbial bugs and the bugs spread from human beings to animals," she said.

"These bugs might affect one if they fail to use medication correctly or fail to finish the course prescribed by medical practitioners," she said.

Ministry of Health and Child Care deputy director of pharmacy services Newman Madzikwa said the aim of the project was to combat the generation of microbial resistance.

"What we trying to do here is fight the generation of microbial resistance, which is why we joined hands with the Veterinary Service," he said.

The Health ministry, in partnership with the Consumer Council of Zimbabwe, requires at least \$200 000 to develop a National Action Plan against the usage of antibiotics in livestock.

The Ministry's director of epidemiology and disease control, Portia Manangazira, said antibiotic resistance was rising to dangerously high levels and without urgent action, the world was heading towards a post-antibiotic era in which important medicines would stop working and common infections and minor injuries would start killing people again.

"The campaign against what has been considered excessive clinical use has been generally evenly directed at human and animal medicine, but there has been a concerted attack on the agricultural use of antibiotics, based on the assumption that all such usage is imprudent since it might act as an important source of resistance in bacteria affecting humans."

She said if measures were not taken urgently to reduce global consumption of antibiotics, simple infections would kill people.

"Consumers have an important role to play in persuading food companies to make the changes that are needed to stop this global public health threat and protect our medicines for the future," Mananganzira said.

According to a global Antimicrobial resistance (AMR) is one of the major issues facing society, by 2050, if not tackled, it will kill more people than cancer, and cost, globally, more than the size of the current global economy.

The aim of the research is to understand how AMR is introduced into natural soil bacteria, for example from manures applied by farmers or exposure to domesticated or wild animal and bird fecal droppings, and how this transfer takes place in different soil types.

The vast majority is used on healthy animals to promote growth, or prevent disease in crowded or unsanitary conditions. The meat and poultry production industry argues, however, that there is no harm in this.

According to the US' Consumer Union, a key question is can antibiotic use in animals promote the development of hard-to-treat antibiotic-resistant superbugs that make people sick?

"And if it can, are the illnesses rare occurrences, and the risks theoretical, or could current usage in animals pose a serious threat to human health," it poses.

Chris Webb, Marketing Executive at Biorex Food Diagnostics, concluded that the threat to public health from the overuse of antibiotics in food animals is real and growing.

It is said humans are at risk both due to potential presence of superbugs in meat and poultry, and to the general migration of superbugs into the environment, where they can transmit their genetic immunity to antibiotics to other bacteria, including bacteria that make people sick.

Republic of Namibia.



Ministry of Health and
Social Services



Pharmaceutical Society of Namibia

Let's join hands to improve medicine use and tackle drug resistance

Medicines help to treat diseases and save lives. But, according to the World Health Organization (WHO), about half of all medicines are used incorrectly. Irrational medicine use is a worldwide problem, and Namibia is no exception. A 2012 report by the IMS Institute for Healthcare Informatics says that, globally, we would save about US\$ 500 billion per year if we invested carefully in more responsible use of medicines.

Compounding the problem of irrational medicine use is the rapidly rising issue of drug resistance, or antimicrobial resistance (AMR). We know that antimicrobial medicines have saved an incalculable number of lives from infectious diseases such as HIV/AIDS, tuberculosis (TB), malaria and other infections. But drug resistance, or AMR, is increasingly rendering such miracle medicines ineffective. The WHO considers AMR as one of the biggest threats to public health. A key factor that contributes to this problem is the irrational or injudicious use of antimicrobials, which is very common and widespread.

Many germs are now becoming resistant to multiple antimicrobial agents. An example is extensively drug resistant TB, which is almost incurable. Multi-drug resistant infections are much harder and a lot more expensive to treat because first-line medicines are usually ineffective in such cases. Treating such infections with second and third line medicines is much harder and more expensive, with higher chances of side effects. Moreover, in some cases, the treatment simply does not succeed.

All of us need to work together and act immediately to preserve the effectiveness of these precious antimicrobial medicines or else we will soon start seeing totally untreatable infections. Necessary action includes more rational prescribing, dispensing and use of antimicrobials by all stakeholders, such as physicians, pharmacists, dispensers, nurses, patients and communities.

Article continues on next page.

To support this cause, the Ministry of Health and Social Services (MoHSS) and the Pharmaceutical Society of Namibia (PSN) are dedicating this year's National Pharmacy Week to the topic "Pharmacy Against Antimicrobial Resistance". Pharmacy Week is an annual collaborative event between the public and private sectors. Hosted by PSN, this year's event will convene the MoHSS and other stakeholders from various sectors to discuss and promote this topic, along with other rational medicine use issues, as an overarching theme across five days of activities from September 16 to 20.

Namibia has made significant strides in ensuring good access to medicines for treating a variety of infectious diseases, including HIV and TB. For example, the coverage of antiretroviral therapy (ART) to treat people living with HIV has reached 80 percent. As the MoHSS continues to increase access to ART, it becomes all the more challenging and important to ensure that these medicines are being prescribed, dispensed and taken appropriately. Several activities aimed at preserving the effectiveness of antimicrobials, including antiretrovirals (ARVs), have been initiated in Namibia. A recent example is a three-day accredited workshop on AMR and promoting the rational use of ARVs, anti-TB and other medicines in Namibia that was organized in July 2013 by the University of Namibia School of Pharmacy (UNAM/SoP), with technical assistance from the United States Agency for International Development (USAID)-supported Systems for Improved Access to Pharmaceuticals and Services (SIAPS) program. The workshop brought together 60 academics, administrators, and public and private sector health care workers to raise awareness of rational use of medicines, discuss ways of investigating medicine use, designing and reviewing strategies for addressing medicine use problems.

Speaking at the opening ceremony of that workshop, the Dean of the UNAM Faculty of Health Sciences Professor Peter Nyarang'o highlighted the need to tackle the issue of AMR and promoting rational medicine use through multiple approaches, such as good technical skills, appropriate professional behavior, advocacy and political action. His statements set the stage for creating a national movement to combat the spread of AMR, spearheaded by a coalition of informed, dedicated stakeholders. Representatives from the MoHSS, UNAM, Health Professions Council of Namibia, and PSN deliberated on various aspects of AMR and concluded the workshop by developing a 'Call-to-Action for Antimicrobial Resistance Advocacy and Containment', the last paragraph of which reads, "If we do not act now to preserve the effectiveness of antimicrobial medicines, the health and prosperity of current and future generations will suffer. We make this call-to-action to all the players to join hands against this common threat and collectively work to engage new partners, strengthen collaboration with existing partners, and advocate for AMR containment as a local and national priority in Namibia."



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Better Health Outcomes.

Drug resistance jolts

By A CORRESPONDENT

"I DO not know what is wrong with me. Malaria is refusing to go away although I have been taking chloroquine," a Chawama resident, Ms Mary Zulu, complained to a health worker at Chawama Health Centre in Lusaka where she went to seek health medical attention recently.

What Ms Zulu did not know was that chloroquine, the drug that has been used as the first treatment for uncomplicated malaria for the past four decades, is no longer effective in treating malaria as a result of parasite resistance.

Studies conducted in different parts of Zambia have shown levels of chloroquine resistance that range from 24 per cent to 52 per cent.

To significantly reduce the malaria disease burden, the Government through the ministry of Health adopted the use of anti-malaria combination therapy strategy as a replacement to the monotherapy options in the management of uncomplicated malaria in Zambia.

Available evidence shows that the problem of drug resistance (antimicrobial resistance or AMR) is increasing in Zambia.

At global level, the USAID has been supporting efforts to raise awareness of the problem of AMR and to develop interventions to improve drug use practices and drug quality.

The initial key step was to support the development of global strategy by the World Health Organisation (WHO) for the containment of AMR, which represents global consensus on interventions, research gaps and appropriate approaches for containing drug resistance.

To try and address the problem of AMR, a team of concerned health professionals formed an AMR advocacy-working group (AWG). It should be mentioned that Zambia is the first country in the world to apply the approach.

Professor Chifumbe Chintu, of the University of Zambia (UNZA), is the chairperson of the AWG whose members work on a

voluntary basis as they are in full-time employment elsewhere. The group receives support from the cooperating partners, mainly USAID and Central Board of Health (CBoH).

On November 12, 2004, AWG organised an AMR "Call for action" meeting, which was held at Holiday Inn in Lusaka. The forum was the first of its kind in the history of AMR in Zambia. Minister of Health Brian Chituwo officially opened the meeting. The aim of the meeting was to help people become aware about the potential problem of drug resistance in Zambia, to advocate for their participation in addressing the problem and to facilitate the follow-up discussions.

Health experts from diverse medical fields including the microbiology and virology laboratories at the University Teaching Hospital (UTH) and School of Veterinary at UNZA presented papers on AMR during the meeting.

Malaria, TB, pneumonia, dysentery, cholera, HIV/AIDS were among the top public health diseases that

were discussed. The impact of antibiotics that are used to treat animals on human beings was also highlighted.

From the presentations, it was clear that if nothing is done to address the problem of AMR, Zambia could be heading for a situation where the hospitals will be full of patients with resistant infections.

What causes this drug resistance? A number of factors contribute to the development of AMR. However, wrong use of drugs is by far the single major contributor.

According to the paper titled 'Preserving the Effectiveness of Drugs: Call for Action' which was distributed to the participants, bad prescription and dispensing, poor quality or substandard drugs and inappropriate treatment-seeking behaviour are some of the factors that cause AMR.

However, each one of these causes happen because of other reasons. For example, poor quality drugs could be caused by lack of a national drug quality control laboratory and pharmacovigilance system

Article continues on next page

experts into action

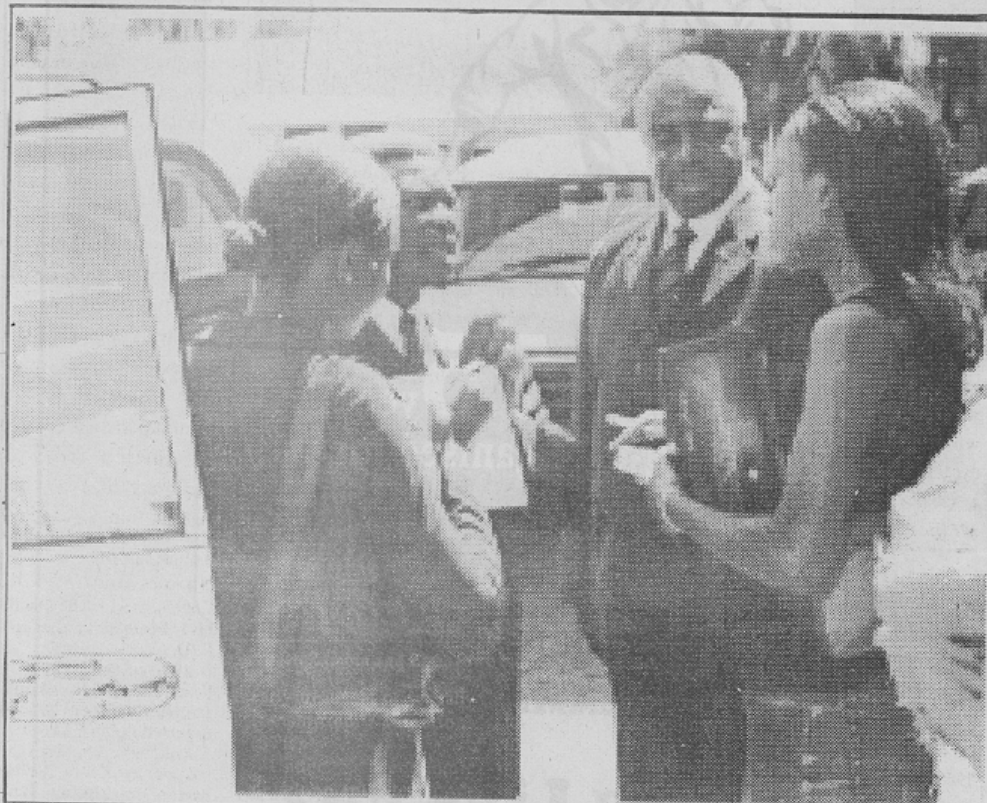
and inadequate surveillance and supervision.

The consequences of AMR are equally many. The obvious one is that people start dying from otherwise curable diseases, prolonged illness, the danger of AMR spreading to the population, high cost of treatment to the family as well as high cost of drug replacement to the country.

What then should be done in order to preserve the effectiveness of drugs? Taking the correct quantities of drugs, finishing the prescribed course of drugs, going to a health worker for antibiotics, avoiding self-medication and desisting from buying drugs from illegal drug stores.

The participants who attended the AMR "Call for Action" meeting included journalists, consumers, pharmacists, academicians, policy-makers, cooperating partners and medical professionals from all over Zambia. The general atmosphere and quality of contributions at the meeting were encouraging.

"Apart from sharing



•MINISTER of Health Brian Chituwo chats with Professor Chifumbe Chintu at the AMR meeting in Lusaka.

knowledge and experiences in AMR, the meeting provided me with an opportunity to meet some of my professional colleagues some of whom I last met 10 years ago at medical school," one participant said.

Dr Chituwo was able to chat with Prof Chintu, who was his lecturer at UNZA some years back.

The AMR meeting was punctuated by the "call for action". The ministry of Health, through CBøH

director general Ben Chirwa, seized the opportunity to officially launch the standard treatment guidelines to promote rational prescribing in health institutions.

Source: malaria policy statement

Annex R. Summary of EPN and Member Group AMR Activities, 2008–2011

Armenia

- Coalition of Rational and Safe Use of Medicines conducted a round table on AMR with the Armenian Orthodox Church (November 2010)

Cameroon

- Cameroon Baptist Convention (CBC) set up its health board AMR committee (May 2009)
- CBC held a technical meeting to plan AMR activity in Cameroon (May 2009)
- CBC distributed materials (e.g., call to action, posters, book marks) (July 2009)
- Organisation Catholique pour la Santé au Cameroun sensitized 25 Diocesan coordinators on AMR (December 2009)
- CBC conducted retrospective studies on culture and sensitive tests done in CBC hospitals (2009)
- Bishops conference adopted an AMR work plan by Organisation Catholique pour la Santé au Cameroun (April 2010)
- CBC implemented various interventions, including the provision of personal protective equipment, waste disposal containers, a placenta pit, and training at Mboppi Hospital (November 2010)
- CBC held AMR training/workshop for hospital staff (December 2010)
- Baptist Hospital Banyo carried out continuing education using EPN materials and produced a skit on AMR (April 2011)

Democratic Republic of Congo

- Bon Berger Hospital (BBH) conducted AMR sensitization among women's groups in Kananga (March 2010)
- BBH conducted retrospective studies on sensitivity of isolates for 2008–2009 (April 2010)
- BBH trained 50 hospital staff on hand hygiene (July 2010)
- BBH installed hand wash basins (September 2010)

Newly Independent States

- Coalition of Rational and Safe Use of Medicines issued the MEDEX newsletter with a focus on infection control, AMR, and the historical role of Dr. Ignaz Semmelweis, 1847 (November 2010)
- Coalition of Rational and Safe Use of Medicines discussed, adopted, and distributed its declaration on AMR (2010)

Germany

- German Institute for Medical Mission/Medical Mission International held a technical meeting to review bacteriology studies from Ghana (June 2009)

India

- Christian Medical College (CMC) translated the call-to-action into Tamil (May 2009)
- Annamalai University (AU)—Dr. Prasad organized an education campaign on AMR for high school students (1,372 students in 11 schools) (June 2009)
- AU—Dr. Prasad used infection control assessment tool and implementation of corrective action based on findings (August 2010)

- AU—Dr. Prasad trained 300 hospital staff on infection control (August 2010)
- AU—Dr. Prasad developed STGs for common infectious diseases (October 2010)
- CMC held regular meetings of hospital infection control committee and review (2010)
- CMC published and disseminated guidelines for infection control (2010)
- CMC revamped the antibiotic guidelines policy and antibiotic panel (2010)
- CMC published a booklet in collaboration with WHO Regional Office for South-East Asia titled, Step by Step Approach for Development and Implementation of Hospital Antibiotic Policy and Standard Treatment Guidelines (2010)
- CMC conducted research projects on costs of resistance and impact of antibiotic guidelines (2010)
- CMC trained personnel in hand hygiene and infection control (2010)

Kenya

- EPN developed AMR campaign image (February 2009)
- EPN raised awareness on AMR among meeting participants (February 2009)
- Mission for Essential Drugs and Supplies published AMR article in its update (March 2009)
- EPN launched the EPN Fight AMR campaign on Facebook (March 2009)
- EPN held a public lecture: AMR sensitization at University of Nairobi (August 2009)
- SPS/Kenya distributed AMR fact sheets for health professionals country wide (September 2009)
- The EPN Secretariat developed a tool to undertake a national study on AMR attitudes (September 2009)
- The EPN Secretariat distributed the AMR advocacy calendar (November 2009)
- EPN and SPS organized a follow-up workshop on AMR (Beyond Awareness: Consolidating Action for AMR Containment) for more than 20 EPN members (May 2010)
- Mission for Essential Drugs and Supplies trained hospital staff on infection control (March 2011)
- EPN participated in World Health Day and published a community action comic strip (April 2011)

Malawi

- Dr. Seke Kayuni sensitized staff in the hospital on AMR (December 2008)
- Christian Health Association of Malawi (CHAM) sensitized its staff on AMR (December 2008)
- CHAM distributed a call to action and other AMR materials (May 2009)
- CHAM developed a preserving antibiotics poster in Chichewa and distributed it to 45 facilities (May 2009)
- CHAM established DTCs in five hospitals (December 2010)

Moldova

- Coalition of Rational and Safe Use of Medicines (CoRSUM) translated a call to action into Russian (May 2009)
- CoRSUM organized a performance by children on not taking antibiotics for cold and flu (May 2009)
- CoRSUM held an AMR capacity building workshop for 22 doctors, pharmacists, and other stakeholders (September 2010)
- CoRSUM held an AMR kickoff meeting for stakeholders in Moldova (October 2010)
- CoRSUM conducted a DTC workshop on AMR (September 2010)
- CoRSUM held a school program for hand washing/hand hygiene (October 2010)
- CoRSUM conducted a workshop in a TB hospital on challenges in anti-TB medicines for children (November 2010)
- CoRSUM distributed materials in hard copy and electronically and designed a website for AMR (2010)

- CoRSUM and Association of Pharmacists of Moldova presented an AMR declaration for the Parliamentarian Public Health Group (March 2011)

Moldova, Ukraine, Armenia, Kazakhstan, and Russia

- CoRSUM organized European Antibiotic Awareness Day (November 2010)
- CoRSUM held Skype teleconferences on advocacy in AMR (December 2010–March 2011)

Moldova for Newly Independent States

- CoRSUM translated the “Infection Control Advocacy Tool” into Russian (July 2010)
- CoRSUM designed, printed, and distributed a pamphlet “Antibiotic Resistance is Threatening our Future” (August 2010)
- CoRSUM organized an campaign on “Global Hand Washing Day” (October 2010)

Moldova, Armenia, and Ukraine

- CoRSUM held an AMR kickoff meeting for stakeholders in Moldova (October 2010)

Network wide

- AMR call to action circulated to all members (May 2009)
- EPN issued Pharmalink on AMR (September 2009)

Nigeria

- Christian Health Association of Nigeria (CHAN) Medi-Pharm sensitized its staff and member hospitals (April 2009)
- CHAN Medi-Pharm organized a media campaign on AMR (May 2009)
- Evangelical Church Winning All (ECWA) distributed 2,000 AMR posters (May 2009)
- ECWA held a national call-to-action workshop for key state actors (May 2009)
- CHAN Medi-Pharm held a Scientific Symposium on AMR (May 2009)
- CHAN Medi-Pharm organized an AMR workshop for 10 mission health facilities (August 2009)
- CHAN Medi-Pharm trained health professionals on AMR (August 2009)
- CHAN Medi-Pharm distributed an AMR survey in 10 hospitals (August 2010)
- CHAN Medi-Pharm held hospital practice workshops (2010)
- CHAN Medi-Pharm distributed information, education, and communication materials to health workers and facilities on a regular basis (2010)
- ECWA used mass media for publicity radio and TV (May 2011)

Peru

- Translated the called to action into Spanish (May 2009)

Rwanda

- Dr. Damien sensitized medical staff of Kibogora hospital on AMR (January 2009)
- Dr. Damien and others sensitized staff in various health centers on AMR (January 2009)
- BUFMAR distributed a call to action to key stakeholders (June 2009)
- EPN, SPS, and BUFMAR held a Francophone regional AMR workshop (November 2009)

- Kibogora Hospital held a meeting for staff from the hospital and satellite clinics on nosocomial infection (December 2009)
- Kibogora Hospital set up a hospital infection control committee for the hospital and satellite clinics (December 2009)
- Musanze District Pharmacy conducted an ABC analysis to determine relative expenditure on antibiotics (December 2009)
- BUFMAR held an AMR workshop for 15 faith-based hospitals and health centers (November 2010)
- Hôpital Kibilizi (HK) implemented a committee to be in charge of hygiene and a “hygiene officer” (2010)
- HK assessed the needs to improve hygiene in the hospital (2010)
- HK installed sinks for hand washing in consultation rooms on the wards (2010)
- HK introduced alcohol (with glycerin) for hand washing (2010)

Sierra Leone

- Christian Health Association of Sierra Leone (CHASL) distributed a workshop report to the pharmacy board (February 2009)
- Eugene Conteh presented at Sierra Leone’s pharmacists association meeting (May 2009)
- CHASL presented on AMR at Sierra Leone’s pharmacists associate meeting (July 2009)
- Eugene Conteh presented at Sierra Leone’s pharmacists association meeting (July 2009)
- CHASL organized an AMR talk for its members attending a general meeting (October 2009)
- CHASL administered an AMR survey in nine hospitals (August 2010)
- CHASL introduced AMR as a topic in its continuous pharmaceutical education sessions (ongoing)

Switzerland

- EPN’s Eva Ombaka participated in an AMR expert working group (rational drug use and drug regulation) meeting of WHO to develop part of the global work plan on AMR (March 2009)
- EPN/ReAct launched EPN’s Fight AMR campaign at the World Health Assembly in Geneva (May 2009)

Tanzania

- EPN and SPS conducted a regional AMR workshop in Moshi (November 2008)
- Mission for Essential Medical Supplies (MEMS) sensitized its staff on AMR (December 2008)
- MEMS distributed posters and a call to action to the public (May 2009)
- MEMS utilized mass media publicity on AMR via Habari Leo (print and web; May 2009)
- MEMS administered a survey on perceptions of high school students on AMR (May 2009)
- MEMS translated a call to action to Swahili (May 2009)
- MEMS established and strengthened DTCs in six hospitals (January 2011)

Togo

- APROMESTO (Association Protestante des Oeuvres Médicosociales et Humanitaires du Togo) sensitized the media and prescribers on AMR (May 2009)
- APROMESTO strengthened DTCs in four hospitals and two health centers (January 2011)

Uganda

- Dr. Najjuka of Makerere University circulate a call to action to Uganda Medical Association (January 2009)

- Joint Medical Store (JMS) sensitized its staff on AMR (January 2009)
- Dr. Najjuka of Makerere University sensitized Alliance for the Prudent Use of Antibiotics Uganda chapter on AMR call to action (January 2009)
- JMS published AMR article in its information bulletin (February 2009)
- JMS sensitized participants at the Joint Medical Store Kampala (February 2009)
- Dr. Najjuka participated in coordinating the kickoff of a situation analysis study of AMR in Uganda and Zambia (March 2009)
- JMS held a workshop on rational management of antibiotics for 61 staff (September 2009)
- JMS published AMR messages in the information bulletin and distributed 6,000 copies (2009)
- JMS sensitized health facility staff nationwide at four regional customer days (2009)
- Dr. Najjuka involved students in the administration of the hand hygiene and surgical chemoprophylaxis tools (annually)

Zambia

- CHAZ conducted a survey on sensitivity patterns of commonly used ARVs (November 2009)
- CHAZ featured AMR in its annual bulletin (December 2009)
- CHAZ conducted a desk review of potential resistance to co-trimoxazole following use for prophylaxis in HIV and AIDS patients (December 2009)
- CHAZ commemorated World Health Day Kenya (April 2011)

Zimbabwe

- Dr. Dhege sensitized Zimbabwe Association of Church Hospitals and hospital staff on the ICAT (December 2008)
- Nhowe Mission Hospital reviewed its infection control policy and introduced alcohol-based antiseptics (February 2009)
- Nhowe Mission Hospital recruited a lab technician to improve diagnosis (April 2009)
- Nhowe Mission Hospital focused on hospital waste management and constructed an Otto waste pit and Blair-type toilets (October 2009)
- Zimbabwe Association of Church Hospitals trained health workers from various hospitals on AMR (November 2009)
- Nhowe Mission Hospital purchased protective clothing for staff as part of a series of infection control measures (December 2009)
- Nhowe Mission Hospital institutionalized a hospital infection control committee (January 2010)
- Dr. Dhege/Nhowe Mission Hospital presented a position paper on AMR at the June 2010 Public Health Advisory Board meeting. The ministry has now taken up training on infection control (June 2010)
- Zimbabwe Association of Church Hospitals conducted an AMR survey in 10 hospitals (August 2010)

Source: EPN



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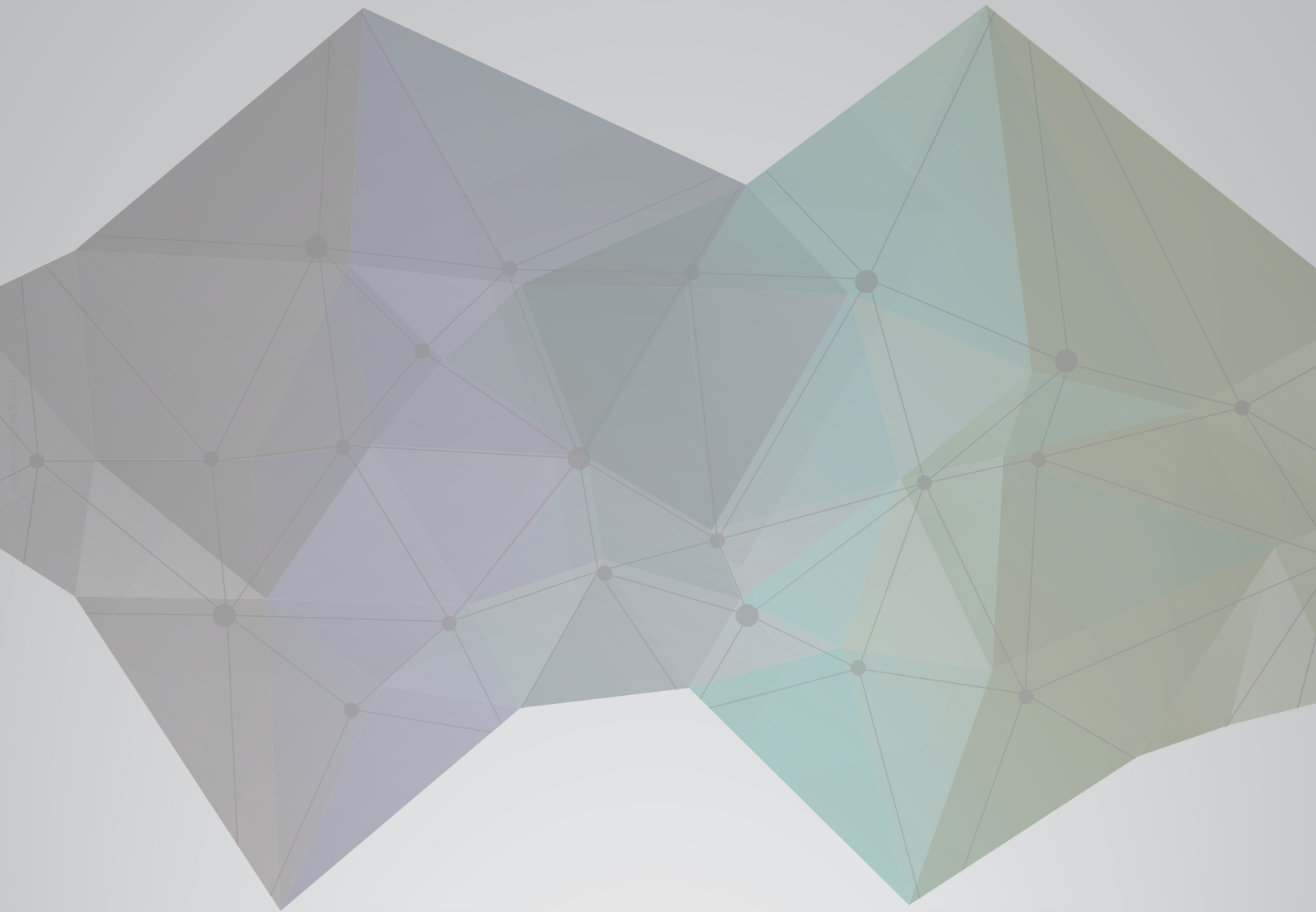
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