



# Development of Swaziland's National Antimicrobial Resistance Containment Strategic Plan

January 2018



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Kholiwe Shongwe  
Shiou-Chu (Judy) Wang

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## **Key Words**

Swaziland, antimicrobial resistance, strategic plan, action plan, One Health approach, antimicrobial stewardship

Systems for Improved Access to Pharmaceuticals and Services  
Pharmaceutical & Health Technologies Group  
Management Sciences for Health  
4301 North Fairfax Drive, Suite 400  
Arlington, VA 22203 USA  
Telephone: 703.524.6575  
Fax: 703.524.7898  
E-mail: [siaps@msh.org](mailto:siaps@msh.org)  
Website: [www.siapsprogram.org](http://www.siapsprogram.org)

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## ACRONYMS

AIDS	acquired immunodeficiency syndrome
AMR	antimicrobial resistance
ART	antiretroviral therapy
DR-TB	drug-resistant TB
GOS	Government of Swaziland
HIV	human immunodeficiency virus
IPC	infection prevention and control
MOA	Ministry of Agriculture
M&E	monitoring and evaluation
MOH	Ministry of Health
MONRE	Ministry of Natural Resources and Energy
NAP	national action plan
PTC	Pharmacy and Therapeutics Committee
SIAPS	Systems for Improved Access to Pharmaceuticals and Services
SO	strategic objective
STA	senior technical advisor
STG/EML	Standard Treatment Guidelines/Essential Medicines List
SWOT	strengths, weaknesses, opportunities, and threats
TA	technical assistance
TB	tuberculosis
USAID	US Agency for International Development
WHA	World Health Assembly
WHO	World Health Organization

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## EXECUTIVE SUMMARY

Antimicrobial resistance (AMR) threatens the health and lives of humans and animals with infectious diseases that could have been treated with effective, nonresistant antimicrobials. Environmental contamination by antimicrobials and resistant microbes could potentially exacerbate the AMR threat. Faced with this global threat, the World Health Assembly (WHA) in May 2015 called on member states to develop national action plans (NAPs) to contain AMR. The World Health Organization (WHO) developed five strategic objectives (SOs) to help contain AMR through an effective One Health approach. Recognizing the importance of antimicrobial resistance containment to both national and global public health, Swaziland actively responded to the call.

Despite economic constraints, the Government of Swaziland (GOS) has invested significantly in the health sector, and improved its population's health status—in particular, through strides in the control of HIV and AIDS, tuberculosis (TB), and malaria. However, cases of drug-resistant TB (DR-TB) are increasing, and diagnosis and prescribing for infectious diseases are still done empirically due to a shortage of diagnostic resources. In addition, the irrational use of antimicrobials in humans and animals has been commonly observed.

Although there are limited data available to quantify the magnitude of AMR in the country, Swaziland is not exempt from the current ongoing emergence of AMR. In response, Swaziland has developed its own national strategic plan to be implemented from 2017 to 2021. Guided by the One Health approach and the WHO global NAP, participatory, extensive stakeholder consultations were engaged as the plan was developed. Fully supported by the GOS, an AMR committee, with members drawn from the Ministry of Health (MOH), the Ministry of Agriculture (MOA), the Ministry of Natural Resources and Energy (MONRE), and academia, was elected to develop the national AMR containment strategic plan in collaboration with development partners and relevant stakeholders. The National AMR Containment Strategic Plan was developed by using a three-phase process:

- 1) Between April 2016 and January 2017, the AMR committee conducted a strengths, weaknesses, opportunities, and threats (SWOT) analysis, and drafted a draft-zero, which was shared with stakeholders for input.
- 2) Between January 2017 and April 2017, with WHO sponsorship, AMR committee members received a training on AMR and the One Health approach, and then revised the draft, incorporating the One Health approach, as draft-one. SIAPS headquarters provided technical assistance (TA) in reviewing draft-one as well as technical guidance for improvement.
- 3) Between April 2017 and October 2017, SIAPS provided in-country TA to the AMR committee to thoroughly review and revise the draft strategic plan, and co-facilitated a wider stakeholder consensus workshop. A final draft was developed and presented to the principal secretaries and senior managers of MOH, MOA, and MONRE for review. Then a monitoring and evaluation (M&E) plan was added in the final version of the National

AMR Containment Strategic Plan. The strategic plan is expected to be signed by the three ministries for launching.

The National AMR Containment Strategic Plan embraces the vision and mission of the country's commitment to curb AMR. The strategic plan outlines its five strategic objectives (SOs) with priority actions and activities. The SOs are as follows:

- SO1. Improve awareness and understanding of AMR through effective communication, education, and training
- SO2. Strengthen the knowledge and evidence base for AMR containment through surveillance and research
- SO3. Reduce the incidence of infection across human and animal communities, the environment, and health care through individual and environmental sanitation, hygiene, and infection prevention measures
- SO4. Optimize the use of antimicrobial medicines in human and animal health through AMR stewardship
- SO5. Enhance leadership, governance, coordination, and investment in containing AMR

SIAPS has been proactive in supporting Swaziland in various areas of the pharmaceutical sector, which has contributed to the containment of antimicrobial resistance. SIAPS support includes training health workers in establishing Pharmacy and Therapeutics Committees (PTCs); assisting the development and launch of the first Standard Treatment Guidelines and Essential Medicines List (STG/EML) and reviewing HIV treatment guidelines; providing support to MOH in drafting the Pharmacy Bill and the Medicines and Related Substance Act, which was enacted in 2016; strengthening supply chain management; and assistance with developing the National AMR Containment Strategic Plan. Those activities have built part of the foundations for implementing the AMR containment strategic plan, in particular, for SO4 and SO5.

During the process of developing the National AMR Containment Strategic Plan, the stakeholders and the AMR committee have learned valuable lessons—in particular, the importance of the One Health approach, as well as the leadership and collaboration, financial and technical capacity required not only for the development of the strategic plan, but also for its implementation. Understanding the One Health approach at the early stages of the process is helpful in leadership and in collaboration with national and international stakeholders, and securing stakeholders' technical and financial commitment, in addition to the government's investment in the implementation of the strategic plan. A strong M&E system will be required to ensure efficient and effective use of resources and achievement of the desired results. SIAPS's timely technical support played a key part in finalizing the National AMR Containment Strategic Plan. However, further coordination efforts are required from the AMR committee to have the strategic plan approved for implementation in a timely manner.



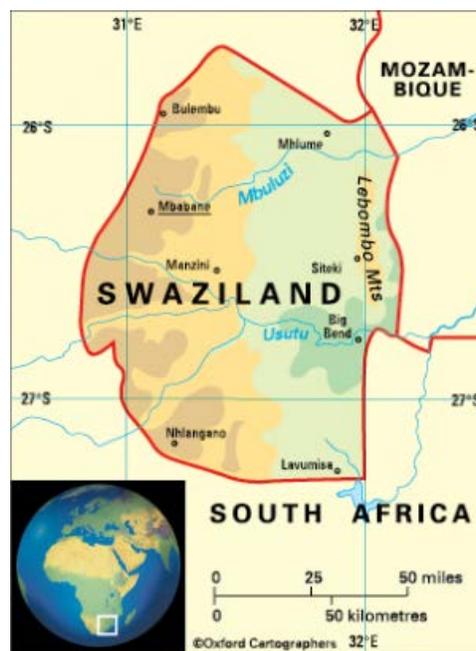
## INTRODUCTION

AMR develops when a microorganism no longer responds to an antimicrobial to which it was originally sensitive by forming selective, resistant microorganism strains. This means that standard treatment is no longer effective, and infections will be harder or impossible to treat. Without measures to curb and control AMR, humans and animals may die from infections that could have been effectively treated. The environment may be negatively impacted by contamination from antibiotics and antibiotic-resistant bacteria coming from antibiotic production facilities as well as human usage and animal usage. Antibiotic-resistant bacteria in the environment could cause or have severe consequences, such as the spread of resistant bacteria, the emergence of new multidrug-resistant pathogenic bacteria, and hard-to-treat infectious diseases of human and animals [1].

Faced with the global threat of AMR and its potential to undermine many advances in health and medicine and even to exterminate human and animal life because of lost effectiveness of antimicrobial medicines, the WHA in May 2015 called on member states to develop national action plans to contain AMR. WHO developed five strategic objectives to help contain AMR through an effective One Health approach, which involves coordination among numerous national and international sectors and actors, including human and veterinary medicine, agriculture, finance, environment, and well-informed consumers [2] [3]. Recognizing the importance of antimicrobial resistance containment to both national and global public health, Swaziland actively responded to WHA's call.

## BACKGROUND

The Kingdom of Swaziland is a small, landlocked country in the east of Southern Africa bordering South Africa and Mozambique, with an estimated population of 1,250,000 (figure 1). [4]. Swaziland's rate of extreme poverty (defined as those living on or below 1.9 US dollar [USD] per day) is projected to remain near 39% through 2018 [5]. However, owing to a gross domestic product per capita of about USD 3,000, Swaziland is generally categorized as a lower-to-middle-income country, despite economic growth remaining slow since 2013. The slow growth has been associated with continued drought and a weak economic environment, with the increasing risk of fiscal unsustainability [6].



**Figure 1. Kingdom of Swaziland**

The GOS has invested significantly in the health sector, and the MOH remains committed to improving the health status of all the people of Swaziland by upholding its vision and mission. Some of the key milestones achieved are the following:

- Malaria prevalence has been reduced by 74% between 2000 and 2012 and reduced 42% between 2011 and 2012 [7].
- Retention in antiretroviral therapy (ART) and care at 36 months is at 83% [8].
- The overall treatment success rate for TB has increased from 70% in 2011 to 82% in 2015; TB cure rates have increased from 46% in 2011 to 68% in 2015 [9].

Despite these achievements, AIDS treatment remains below the much-acclaimed target of 90% set by the Joint US Programme on HIV/AIDS (UNAIDS), and cases of DR-TB are increasing [9], a cause for concern insofar as AMR is concerned. Diagnosis and prescribing for infectious disease is still done empirically due to a shortage of resources for conducting culture and sensitivity testing for informed diagnosis and prescribing of antibiotics.

Swaziland, as a member state of WHO, is not exempt from the current ongoing emergence of AMR. Although there are limited data available to quantify the magnitude of AMR in the country, the irrational use of antimicrobials in animals and humans has been commonly observed. In response, Swaziland has developed its own national strategic plan, to be implemented from 2017 to 2021. Guided by the One Health approach and the WHO global NAP, participatory, extensive stakeholder consultations were engaged as the document was developed. Fully supported by the GOS, an AMR committee, with members drawn from the MOH, MOA, MONRE, and academia, was elected to develop the national AMR strategic plan in collaboration with development partners and relevant stakeholders.

## **DEVELOPMENT OF THE NATIONAL AMR CONTAINMENT STRATEGIC PLAN**

The National AMR Containment Strategic Plan was developed in three key phases, as described below.

### **Phase 1: AMR Containment Strategic Plan Committee and a Draft-Zero**

In April 2016, the National Antimicrobial Resistance Containment Committee was appointed by the Office of the Chief Pharmacist to work on developing the first National AMR Containment Strategic Plan for Swaziland. The members of the committee included representatives from MOH, MOA, academia, and SIAPS, which also served as the secretariat. In the first meeting, the chairperson and the co-chair were appointed. WHO representative provided guidance to the committee on the development of the strategy.

The committee did a desk review using WHO, national, and International literature on AMR. It then conducted a SWOT analysis on human health and veterinary services relevant to AMR, with recommendations. With the gathered information and analysis, the committee developed a draft-zero of the strategic plan. In August 2016, a stakeholders' workshop was held to review the draft-zero and make inputs to improve it. After the workshop, the committee incorporated the inputs made by the stakeholders into the strategy document. In January 2017, a stakeholders' validation workshop was held to review the input-incorporated version and validate the inputs provided by the stakeholders.

### **Phase 2: One Health Approach, SIAPS Review, and a Draft-One**

The members of the committee were invited by WHO to attend a workshop in Harare, Zimbabwe, held January 25–29, 2017, on the development of AMR NAPs using the One Health approach. Through this workshop, the committee members learned more about how to develop the strategy and identified gaps that needed to be fixed by incorporating more relevant members in the committee to meet the One Health approach goal. As a result, the AMR containment committee incorporated a member from MONRE and a country representative from the Food and Agriculture Organization (FAO), and revised the draft-zero, which included the situation analysis for environment sector relevant to AMR.

The final version of the draft-zero of the National AMR Containment Strategic Plan was sent to SIAPS headquarters in Washington, DC, for review and input in February 2017. After receiving the inputs from SIAPS, the WHO country office provided support for a three-day workshop (April 10–12, 2017) to the committee members to revise it, enabling the committee with a complete draft-one document for the National AMR Containment Strategic Plan 2017–2021 in line with the One Health approach by incorporating the inputs from SIAPS.

### **Phase 3: SIAPS Technical Support and a Final Strategic Plan**

With the support of SIAPS, the committee held three workshops April 18–21, 2017, at Happy Valley Hotel in Mbabane for the finalization of the strategic plan. The workshops included a review and preparation workshop (April 18–19), a wider-stakeholders’ consensus workshop (April 20), and a finalization workshop (April 21). During this period, a SIAPS senior technical advisor (STA) traveled to the country to work with the committee. On April 18–19, the STA worked with the committee to review the document, and provided guidance on the facilitation of the wider-stakeholders’ workshop. In this wider-stakeholders’ workshop, on April 20, the STA co-facilitated review of the strategic plan with the committee members. Eighty-four participants from various sectors, including human health, agriculture, veterinary and livestock, environment, education, media, and civil society, as well as representatives from WHO and the World Food Programme (WFP), attended the workshop (annex A). Senior officials from WHO, MOH, MOA, and MONRE gave speeches highlighting the threat of AMR, and encouraged participants to contribute to the AMR containment strategic plan. The workshop was highly participatory and productive. The participants in each group actively reviewed, discussed, and provided inputs to the draft strategic plan. On April 21, 2017, the committee met with the SIAPS STA to finalize the draft-one of the strategic plan.



**Group photo of wider-stakeholders’ workshop participants, including senior officials from MOH, MOA, and MONRE and the SIAPS STA.**

After finalization of draft-one of the National AMR Containment Strategic Plan, it was presented to the principal secretaries and senior managers of MOH, MOA, and MONRE on July 25, 2017, at the Emafini Country Lodge in Mbabane. The principal secretaries and senior managers went through the document and made their inputs. The main input was that the document includes an M&E plan. The committee was then tasked with making the final additions. SIAPS provided support for technical review and editorial review. The AMR containment strategic plan has been finalized and is awaiting signing by the signatories from the three ministries, after which it will be ready for printing and launch.



**Group photo of the principal secretaries and senior managers' breakfast meeting from MOH, MOA, and MONRE**

## HIGHLIGHTS OF THE NATIONAL AMR CONTAINMENT STRATEGIC PLAN

### Vision

Having a society where communicable diseases are minimized, and the antimicrobial drugs benefit people, animals, and the environment, thus contributing to the global AMR containment agenda

### Mission

To prevent communicable diseases, improve the use of antimicrobial drugs, and monitor AMR through the One Health approach among health, agriculture, and environmental sectors and other stakeholders at all levels

Table 1 presents the SOs and priority actions of the strategic plan. The detail strategic plan with activities is presented in annex B.

**Table 1. Strategic objectives and priority actions of the National AMR Containment Strategic Plan**

Strategic objectives	Priority actions
<b>SO1. Improve awareness and understanding</b> of AMR through effective communication, education, and training	1.1 Raise awareness on AMR to promote behavioral change
	1.2 Develop or strengthen antimicrobials training curricula for training human health, veterinary, and environmental professionals
	1.3 Advocate for sensitization of all school-going pupils on infection prevention and AMR
<b>SO2. Strengthen the knowledge and evidence base</b> for AMR containment through surveillance and research	2.1 Identify current gaps in AMR surveillance and research
	2.2 Build capacity in AMR surveillance for human and animal health, environment, and agriculture sectors
	2.3 Establish a comprehensive AMR surveillance system
<b>SO3. Reduce the incidence of infection</b> across human and animal communities, the environment, and health care through individual and environmental sanitation, hygiene, and infection prevention measures	3.1 Strengthen infection prevention and control (IPC) at veterinary and human health service points
	3.2 Strengthen IPC in food establishments and communities
	3.3 Strengthen environmental sanitation
<b>SO4. Optimize the use of antimicrobial medicines</b> in human and animal health through AMR stewardship	4.1 Enforce the interventions aimed at improving the use of antimicrobials
	4.2 Promote rational prescribing and good dispensing practices of antimicrobials in humans and animals
	4.3 Support evidence-based selection of antimicrobials for EML to conserve their effectiveness and longevity
<b>SO5. Enhance leadership, governance, coordination, and investment</b> in containing AMR	5.1 Build AMR oversight capacity within the MOH
	5.2 Strengthen national partnership, coordination, and collaboration at all levels
	5.3 Strengthen regional and international AMR partnerships and collaboration
	5.5 Strengthen cross-border regulations for importing and exporting plants, animals, and human medicines
	5.6 Advocate for Chemical and Pesticides Management Bill



**Front cover of the National AMR Containment Strategic Plan**

## SIAPS SUPPORTS THAT LINK TO THE NATIONAL AMR CONTAINMENT STRATEGIC PLAN

SIAPS has proactively supported Swaziland in various areas of the pharmaceutical sector, which has contributed to the containment of antimicrobial resistance. SIAPS had worked with MOH to implement specific activities to contain AMR even prior to the development of the National AMR Containment Strategic Plan. Those activities have built part of the foundations for implementing the AMR containment strategic plan—in particular, for SO4 and SO5. The activities discussed below are examples that link to the strategic objectives of the AMR containment strategic plan.

The following SIAPS supports have contributed to SO4 and SO5:

- SIAPS trained 62 health care workers from four hospitals and two health centers on how to establish PTCs in their health facilities to improve rational medicines use. A functional PTC implies good governance in managing pharmaceutical selection, procurement, supply, and use in the health facilities.
- SIAPS supported MOH in development and launch of the STGs/EML, and reviewing HIV treatment guidelines to improve rational prescribing and use of medicines in the country. These guidelines are used by prescribers in both the public and private sectors to improve rational prescribing and use of essential medicines and antiretrovirals (ARVs) to improve patient health outcomes.

The following SIAPS supports have contributed to SO5:

- SIAPS supported the MOH in drafting the Pharmacy Bill and the Medicines and Related Substance Act. The act, which became law in 2016, regulates the importation and use of good-quality medicines by the public.
- SIAPS supported the MOH in strengthening supply chain management to ensure accountability and good-quality medicines for end users as follows:
  - 
  - During the tendering process, SIAPS provided support in verifying WHO prequalified companies and provides *the International Drug Price Indicator Guide* for selection and procurement of quality HIV medicines.
  - SIAPS supported in supply chain processes and warehouse management.
- SIAPS supported the development of the National AMR Containment Strategic Plan.

## LESSONS LEARNED

During the process of developing the National AMR Containment Strategic Plan, the stakeholders and the AMR committee have learned good lessons—in particular, the One Health approach, the leadership and collaboration, financial and technical capacity required to accomplish not only the development of the strategic plan, but also the plan’s implementation.

Development of the National AMR Containment Strategic Plan requires good collaboration among various ministries and relevant stakeholders. A strong leadership and commitment from the government stakeholders and the AMR committee are imperative to drive not only the development of the strategic plan, but also the implementation. The government leadership’s understanding of the One Health approach at the early stage of the process is critical for appreciating stakeholders’ roles in combating AMR and engaging them in developing the strategic plan. WHO’s support for the training about AMR containment through the One Health approach has helped establish the multisectoral AMR committee that was able to collaborate with wider stakeholders in developing the AMR containment strategic plan. Engaging these stakeholders in the strategic planning stages also served to motivate the stakeholders to plan for actions and commit to implementation.

As Swaziland is a lower-middle-income country, financial capacity was a key concern for implementing the strategic plan. The AMR committee, through situation analysis, and internal and stakeholders’ discussions, has tried to prioritize the needed actions. The engagement of international and private implementing partners in the development of the strategic plan will also mobilize partners’ financial and technical support in addition to the government’s investment in the plan’s implementation. A strong M&E system will be required to ensure efficient and effective use of resources and achievement of desired results.

In addition to WHO’s support, SIAPS provided timely technical support in reviewing the draft strategic plan and guidance to improve the plan, a key step in finalizing the plan. However, the extremely busy schedules of the three ministries’ leadership have been a key challenge facing the AMR committee in its efforts to have the strategic plan signed and approved. Further coordination efforts would be required by the committee to have the strategic plan approved for budgeting and implementation in a timely manner.

## ANNEX A. STAKEHOLDERS INVOLVED IN THE NATIONAL AMR CONTAINMENT STRATEGIC PLANNING PROCESS

Sectors	Organizations
Health	Ministry of Health – MOH
	MOH – Research Unit
	Swaziland Environmental Authority – SEA
	National Laboratory Services – Mbabane Government Hospital
	Central Medical Stores / Ministry of Health – CMS/MOH
	Swazi Pharm Wholesale
	ASD Medical Wholesale
	National TB Hospital – NTBH
	BAYLOR Centre of Excellence
	WHO
	Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Project funded by USAID, operated by Management Sciences for Health (MSH)
Agriculture and food	Ministry of Agriculture – Veterinary Public Health Unit
	Ministry of Agriculture – Livestock Services
	Swaziland Meat Industries
	Farm Chemicals
	World Food Programme – WFP
Environment	Ministry of Natural Resources and Energy – MONRE
	Malkerns Research and Plant Protection Unit
	Swaziland Commercial Amadoda Road Transportation Association – SCARTA
	Ministry of Tourism
Academia, research and development	University of Swaziland – UNISWA
	Swaziland Christian University – SCU
	Southern Africa Nazarene University – SANU
	Royal Science Technology Park
Media and communication	Swaziland Broadcasting and Information Service – SBIS
	Swazi Observer
Other	Swaziland Standards Authority – SWASA
	Swaziland National Trust Commission – SNTC
	His Majesty Correctional Services – HMCS
	Royal Swaziland Police – RSP

## ANNEX B. NATIONAL AMR CONTAINMENT STRATEGIC PLAN MATRIX

<b>SO 1: Improve awareness and understanding of AMR through effective communication, education, and training</b>	
<b>Priority actions</b>	<b>Activities</b>
1.1 Raise awareness on AMR to promote behavioral change	<p><b>Overall</b></p> <ul style="list-style-type: none"> <li>a. Create/raise political awareness (politicians, policy makers, judiciary/legislators, and community leaders)</li> </ul> <p><b>Animals (veterinary and livestock)</b></p> <ul style="list-style-type: none"> <li>a. Conduct public awareness campaigns in both urban and rural areas on areas of IPC and the issue of AMR through use of antibiotics in animals for treating diseases or for growth promotion</li> <li>b. Promote adherence to prescribed antimicrobial treatment and observe withdrawal periods in animals treated with antimicrobials</li> <li>c. Promote rational use of antimicrobials in animal husbandry</li> <li>d. Educate/train animal owners on good animal husbandry practices that will reduce infection and use of antimicrobials for growth promotion and clinical treatment purposes</li> <li>e. Provide regular, up-to-date, and unbiased medicine information to health providers, animal owners, and communities</li> </ul> <p><b>Environment and agriculture</b></p> <ul style="list-style-type: none"> <li>a. Conduct public awareness campaigns in both urban and rural areas on antimicrobial resistant microorganisms in the environment</li> <li>b. Promote responsible discharge periods in plants treated with pesticides</li> <li>c. Promote rational use of pesticides in plants</li> </ul> <p><b>Humans</b></p> <ul style="list-style-type: none"> <li>a. Conduct public awareness campaigns in both urban and rural areas on IPC, rational use of antimicrobials, and risk of AMR in humans</li> <li>b. Create health care workers' awareness on the risk of treatment failures and poor patient outcomes due to AMR</li> </ul>
1.2 Develop or strengthen antimicrobial training curricula for training human health, veterinary, and environmental professionals	<p><b>Overall</b></p> <ul style="list-style-type: none"> <li>a. Advocate for and support periodic curriculum revision to include modules on AMR in pre-service training for human health, animal, agriculture, and environmental professionals</li> <li>b. Update the training materials for AMR curricula for pre-service and in-service training according to surveillance and research results</li> <li>c. Incorporate AMR containment program in in-service training for all professionals involved in AMR containment</li> </ul>
1.3 Advocate for sensitization of all school-going pupils on infection prevention and AMR	<p><b>Overall</b></p> <p>Incorporate AMR awareness and containment topics in schools syllabus</p>

<b>SO 2: Strengthen the knowledge and evidence base for AMR containment through surveillance and research</b>	
<b>Priority actions</b>	<b>Activities</b>
2.1 Identify current gaps in AMR surveillance and research	<p><b>Overall</b></p> <ul style="list-style-type: none"> <li>a. Conduct a knowledge, attitude, and practice survey among animal, environment, and human health workers; regulatory and enforcement bodies; and the public on antimicrobial use and AMR</li> <li>b. Conduct regular knowledge assessment on medicines use and adherence in line with STGs as per specified conditions</li> <li>c. Conduct AMR-related operational research to identify and address gaps in the existing national research agenda</li> <li>d. Conduct a passive surveillance on AMR in animals and humans*</li> </ul>
2.2 Build capacity in AMR surveillance for human and animal health, environment, and agriculture sectors	<p><b>Overall</b></p> <ul style="list-style-type: none"> <li>a. Strengthen monitoring and evaluation of AMR surveillance activities in animals, the environment, and humans</li> <li>b. Capacitate the National Quality Control Laboratory for quality control testing of all medicines used both in animals and humans</li> </ul> <p><b>Humans</b></p> <ul style="list-style-type: none"> <li>a. Capacitate laboratories in all hospitals and health centers to perform culture and sensitivity testing for antimicrobials prescribed to humans</li> </ul> <p><b>Animals (veterinary and livestock)</b></p> <ul style="list-style-type: none"> <li>a. Develop a structured surveillance system in AMR in line with the provision of the terrestrial Code of OIE</li> <li>b. Capacitate the veterinary laboratories, i.e., equipment, supplies, and human resources</li> <li>c. Establish regional laboratories to perform culture and sensitivity testing for all veterinary services</li> <li>d. Establish satellite veterinary laboratories in the four regions</li> </ul> <p><b>Environment and agriculture</b></p> <ul style="list-style-type: none"> <li>a. Develop a structured surveillance system in pesticide resistance in line with the provision of the International Plant Protection Convention</li> <li>b. Strengthen residue monitoring/testing in food of plant and animal origin</li> <li>c. Establish environmental residue monitoring/testing for pharmaceutical manufacturers</li> </ul>
2.3 Establish a comprehensive AMR surveillance system	<p><b>Overall</b></p> <ul style="list-style-type: none"> <li>a. Set up a national surveillance system and database for antimicrobial sensitivity monitoring for animals, the environment, and humans</li> <li>b. Implement an AMR surveillance system through a phased-in process according to the capacities built at all levels of human, animal, and environmental sectors</li> <li>c. Strengthen the National Research Council to coordinate the research agenda among all sectors</li> <li>d. Establish a national research newsletter</li> </ul>

\* Active surveillance is considered a long-term strategy and will be included in the next strategic plan.

<b>SO. 3: Reduce the incidence of infection across human and animal communities, the environment, and health care settings through individual and environmental sanitation, hygiene, and infection prevention measures</b>	
<b>Priority actions</b>	<b>Activities</b>
3.1 Strengthen IPC at veterinary and human health service points	<p><b>Overall</b></p> <ul style="list-style-type: none"> <li>a. Review and update the IPC policies/guidelines</li> </ul> <p><b>Animals (veterinary and livestock) and humans</b></p> <ul style="list-style-type: none"> <li>a. Disseminate IPC policies/guidelines for animal and human health at service points</li> <li>b. Provide materials and resources for IPC at all animal and human service points.</li> <li>c. Advocate for the provision of hand-washing facilities at all service points with safe running water or sanitizers</li> <li>d. Provide training to service point staff to implement IPC policies and guidelines</li> <li>e. Implement IPC policies and guidelines</li> <li>f. Monitor implementation of IPC policies and guidelines</li> </ul>
3.2 Strengthen IPC in food establishments and communities	<ul style="list-style-type: none"> <li>a. Disseminate food hygiene and safety policies/guidelines/standards to all food establishments (slaughter sites, food production/processing sites, distributors, restaurants, grocery stores, food vendors)</li> <li>b. Provide training to food establishment staff to implement food hygiene policies and guidelines</li> <li>c. Advocate for the provision of hand-washing facilities at all food establishments with safe running water or sanitizers</li> <li>d. Provide information, education, and communication (IEC) materials for proper hand washing at all food service points and key public areas</li> <li>e. Provide IEC materials for proper food storage and handling for the general public at food selling sites</li> <li>f. Inspect food establishments and slaughter sites to ensure good operational practices and food hygiene</li> </ul>
3.3 Strengthen environmental sanitation	<p><b>Animals (veterinary and livestock)</b></p> <ul style="list-style-type: none"> <li>a. Educate/train livestock owners on good animal husbandry practices that will reduce infection</li> </ul> <p><b>Humans</b></p> <ul style="list-style-type: none"> <li>a. Finalize the health care waste policy and regulation</li> <li>b. Continue to roll out the construction of ventilated improved pit latrines</li> <li>c. Strengthen household waste management and disposal practices</li> </ul> <p><b>Environment</b></p> <ul style="list-style-type: none"> <li>a. Strengthen and improve practices on the protection of water sources</li> </ul>

<b>SO 4: Optimize the use of antimicrobial medicines in humans and animals through AMR stewardship</b>	
<b>Priority actions</b>	<b>Activities</b>
4.1 Enforce the interventions aimed at improving the use of antimicrobials	<p><b>Overall</b></p> <ul style="list-style-type: none"> <li>a. Train veterinary, human health, and environmental professionals on AMR stewardship programs</li> </ul> <p><b>Humans</b></p> <ul style="list-style-type: none"> <li>a. Activate hospital/health facility PTCs and strengthen their capacity to improve the use of antimicrobials and other medicines</li> <li>b. Empower hospital PTCs to educate and monitor prescribing and dispensing practices for antimicrobials</li> <li>c. Conduct regular review of the STGs/EML to ensure inclusion of effective antimicrobials for humans using evidence-based results from surveillance reports</li> </ul> <p><b>Animals (veterinary and livestock)</b></p> <ul style="list-style-type: none"> <li>a. Educate/train veterinary practitioners on rational use of antimicrobials</li> <li>b. Coordinate the prescription pattern monitoring and passive surveillance results to inform veterinarians for improving the use of antimicrobials</li> <li>c. Monitor veterinary prescription patterns</li> </ul> <p><b>Environment</b></p> <ul style="list-style-type: none"> <li>a. Sensitize designers of water and waste water treatment facilities on AMR</li> <li>b. Sensitize health facilities and other health service points on proper disposal of expired or obsolete antimicrobials to reduce AMR</li> <li>c. Sensitize and enforce manufacturing industries on adherence to effluent disposal and waste management guidelines for the environment to safeguard against AMR</li> </ul>
4.2 Promote rational prescribing and good dispensing practices of antimicrobials in humans and animals	<p><b>Animals (veterinary and livestock) and humans</b></p> <ul style="list-style-type: none"> <li>a. Conduct regular medicine use evaluations of prescribing and dispensing practices for antimicrobials for animals and humans</li> <li>b. Develop STGs for animal health use</li> <li>c. Develop good agriculture practices for plant protection</li> <li>d. Conduct regular monitoring of the environment as a result of human and animal activities</li> </ul>
4.3 Support evidence-based selection of antimicrobials for the EML to conserve their effectiveness and longevity	<ul style="list-style-type: none"> <li>a. Use sensitivity testing or surveillance and research results for the selection of antimicrobials for optimum animal and human health outcomes</li> </ul>

<b>SO 5: Enhance leadership, governance, coordination, and investment in containing AMR</b>	
<b>Priority actions</b>	<b>Activities</b>
5.1 Build AMR oversight capacity within the MOH	<ul style="list-style-type: none"> <li>a. Establish a coordination mechanism among ministerial sectors (MOH, MOA, and MONRE) to coordinate AMR activities</li> <li>b. Review relevant policies or regulations to support implementation of AMR strategies</li> <li>c. Monitor implementation status of the AMR strategic plan</li> <li>d. Establish an inspectorate team to monitor antimicrobial use for animals, the environment, and humans</li> <li>e. Capacitate stakeholders on AMR containment strategies</li> </ul>
5.2 Strengthen national partnership, coordination, and collaboration at all levels	<ul style="list-style-type: none"> <li>a. Develop a national AMR containment framework for animal and human health and the environment</li> <li>b. Establish a coordination mechanism to coordinate AMR activities in human and veterinary health facilities</li> <li>c. Promote public-private partnerships and networking for AMR and new medicine/technology-related interventions and research</li> <li>d. Develop an implementation plan for the AMR strategy and build stakeholder consensus</li> <li>e. Coordinate resource mobilization mechanisms</li> </ul>
5.3 Strengthen regional and international AMR partnerships and collaboration	<ul style="list-style-type: none"> <li>a. Collaborate with neighbouring countries and regional/international partners on AMR containment research in medicines, diagnostic tools, vaccines, and interventions</li> <li>b. Harmonize EML within Southern African Development Community (SADC) countries</li> </ul>
5.4 Enforce medicines legislation in the human and veterinary sectors	<ul style="list-style-type: none"> <li>a. Set up a clear coordination and collaboration mechanism for both animal and human health at all levels</li> <li>b. Establish a One Health triad electronic system for adequate regulation and monitoring of medicine importation and distribution</li> </ul>
5.5 Strengthen cross-border regulations for importing and exporting plants, animals, and human medicines	<ul style="list-style-type: none"> <li>a. Compile a list of prohibited plants, animals, and human medicines and review frequently</li> <li>b. Collaborate with SADC countries on controlling the import and export of animal, human, and plant medicines</li> </ul>
5.6 Advocate for the Chemical and Pesticides Management Bill	<ul style="list-style-type: none"> <li>a. Lobby for the enactment of the Chemical and Pesticides Management Bill for antimicrobials and pesticides usage</li> </ul>

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