



Republic of Rwanda

2025-2029

NATIONAL ACTION PLAN ON ANTIMICROBIAL RESISTANCE

Foreword

According to the World Health Organization, antimicrobial resistance (AMR) occurs when bacteria, viruses, fungi, and parasites evolve to the point where they no longer respond to medications. This makes infections harder to treat, increases the risk of disease spread, results in more severe illnesses, and raises the chances of death. This is due to the reduction of treatment effectiveness allowing infections to persist and heightening the risk of transmission to others. Antimicrobial resistance is a global threat that requires urgent and coordinated collaboration across all One Health sectors.

RWANDA DEVELOPED ITS FIRST NAP ON AMR (NAP 1.0)

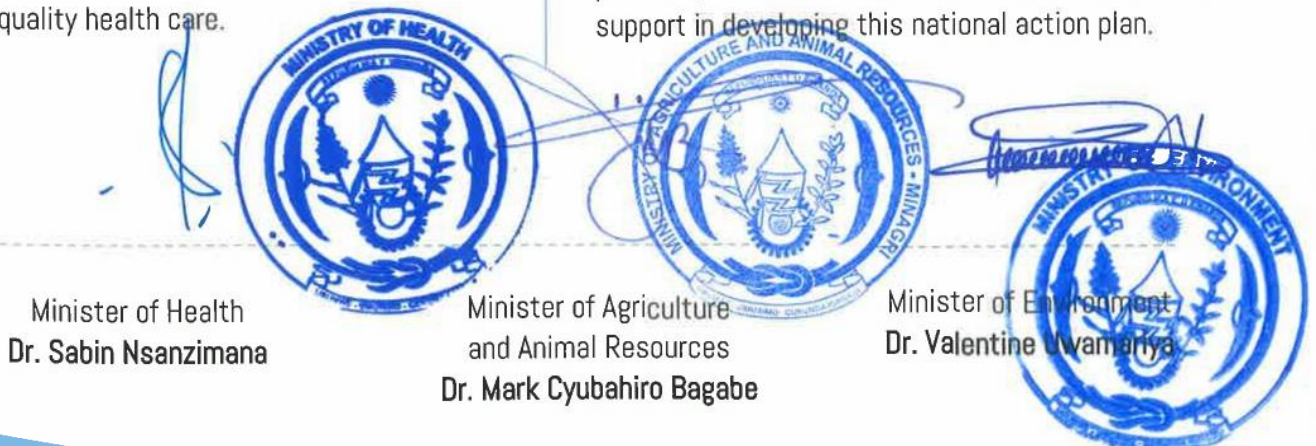
Rwanda has recognized AMR as a priority, following the recommendations of the 68th World Health Assembly in May 2015, which called for countries to develop National Action Plans (NAP) on AMR. In response, Rwanda developed its first NAP on AMR (NAP 1.0) for the period of 2020–2024. The decision to extend this strategic plan for another five years demonstrates the country's strong political commitment to achieving sustainable health, in alignment with global objectives such as SDG 3 (Good Health and Well-being) and Rwanda's Vision 2050 (Rwandan Government, 2020), which prioritizes universal access to high-quality health care.

The development of this NAP has been a coordinated effort by multisectoral Technical Working Groups (TWGs), including national and international organizations, non-governmental organizations, academic institutions, civil society, and development partners from One Health sectors such as human health, animal health, environmental protection, agriculture, and water sanitation.

This NAP 2.0 has six strategic objectives, focusing on six key pillars: awareness, surveillance, infection prevention and control, optimal use of antimicrobials, sustainable investment, and governance. The inclusion of governance as a strategic objective is expected to drive transformative change by institutionalizing AMR management, fostering ownership, and ensuring accountability.

The development and endorsement of this initiative under the One Health framework—reflecting the complexity of causes, consequences, and prevention strategies of antimicrobial—is a significant step towards the effective implementation of the plan and the overarching goal of preventing and controlling antimicrobial resistance.

Sincere appreciation is extended to all stakeholders, including the multisectoral working groups of experts, the Food and Agriculture Organization of the United Nations, World Health Organization, AMR Policy Accelerator, and other partners, for their invaluable contributions and support in developing this national action plan.



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Acknowledgement

The development of the Rwanda NAP 2.0 on AMR for 2025–2029 was initiated by the Rwanda Biomedical Center (RBC) with the support of the Food and Agriculture Organization of the United Nations (FAO). The process involved significant contributions from key stakeholders, who deserve special recognition:



"The **One Health Multi-sectoral Coordination Mechanism (OH-MCM)** made of RBC, RAB, REMA, RDB, Universities and other implementing agencies, the inter-ministerial leadership and coordination level provided technical coordination responsibilities under the leadership of the director general of the RBC who is the acting Coordinator of OH-MCM, where it supported and coordinated technical activities to ensure that a multi-sectoral One Health approach is considered and that there is alignment across existing governmental structures and across the technical activities throughout the development of NAP 2.0."



The **AMR Policy Accelerator** for their assistance in prioritizing interventions through the Smart Choice Process, which was applied for the first time in Africa.



The **World Health Organization (WHO)** for their support in developing the Monitoring and Evaluation framework, training the TWGs on the WHO Costing and Budgeting Tool for Antimicrobial Resistance National Action Plans, and assisting with activity costing.



The national **multi-sectoral TWGs** from various government institutions, universities, Non-Governmental Organizations, and development partners for their dedicated and active participation throughout the development of NAP 2.0, including the prioritization of interventions, the development of Objective 6, the activity definition, the establishment of the Monitoring and Evaluation framework, and the activity costing.



The **East Central and Southern Africa Health Community (ECSA-HC)** for their guidance in aligning NAP 2.0 with global and national guidelines.



ReAct Africa for their support in developing Objective 6 on Governance and for facilitating the TWGs workshop on activity costing.



Partners in Health (PIH) and the **Clinton Health Access Initiative (CHAI)** for their facilitation of the TWGs workshops on the Smart Choice process and Monitoring and Evaluation, respectively.

Abbreviations and Acronyms

AMR	Antimicrobial resistance
AMS	Antimicrobial stewardship
AMU	Antimicrobial Use
AST	Antimicrobial susceptibility testing
AWaRE	Access. Watch. Reserve.
CHAI	Clinton Health Access Initiative
CHUK	University Teaching Hospital of Kigali
CHUB	University Teaching Hospital of Butare
ECSA-HC	East, Central and Southern Africa Health Community
eLMIS	Electronic Health Supply Chain Management Module
FAO	Food and Agriculture Organization of the United Nations
GLASS	Global Antimicrobial Resistance and Use Surveillance System
HAIs	Healthcare-Associated Infections
HCW	Healthcare Workers
IPC	Infection Prevention and Control
KAP	Knowledge, Attitudes, and Practices
KPIs	Key Performance Indicators
KFH	King Faisal Hospital
M&E	Monitoring and Evaluation
MINAGRI	Ministry of Agriculture and Animal Resources
MoE	Ministry of Environment
MoH	Ministry of Health
MoU	Memorandum of Understanding
NAP	National Action Plan
NGO	Non-Government Organization
NPC	Rwanda National Pharmacy Council
PIH	Partners in Health
PPE	Personal Protective Equipment
PPS	Point Prevalence Survey
PMP	Progressive Management Pathway
RAB	Rwanda Agriculture and Animal Resources Development
RBC	Rwanda Biomedical Center
RCVD	Rwanda Council of Veterinary Doctors
Rwanda FDA	Rwanda Food and Drugs Authority
RMRTH	Rwanda Military Referral and Teaching Hospital
RMS	Rwanda Medical Supply
SDG	Sustainable Development Goals
TBD	To Be Determined
ToRs	Terms of Reference
TrACSS	Tracking AMR Country Self-assessment Survey
TWG	Technical Working Group
UR	University of Rwanda
UR-CAVM	University of Rwanda - College of Agriculture, Animal Sciences and Veterinary Medicine (UR – CAVM)
UR-CMHS	University of Rwanda - College of Medicine and Health Sciences (UR- CMHS)
WAAW	World Antimicrobial Awareness Week
WASAC	Water and Sanitation Corporation
WHO	World Health Organization

Executive Summary

Antimicrobial resistance (AMR) poses an urgent global health threat endangering the effectiveness of antibiotics, antivirals, antifungals, and antiparasitics. Recognizing the critical importance of AMR, the Government of Rwanda developed this NAP on for 2025-2029 (NAP 2.0) building on the achievements and lessons learned from the previous action plan for 2020-2024. This NAP plan adopts a One Health approach, integrating efforts across human health, animal health, agriculture, and environmental sectors to address AMR comprehensively. This document aligns with Rwanda's national and international commitments, including Sustainable Development Goal 3 – Good Health and Wellbeing – and Vision 2050. The initiative of developing this NAP 2.0 was led by the Rwanda Biomedical Center (RBC) with support from international partners, such as the Food and Agriculture Organization of the United Nations (FAO), the World Health Organization (WHO), ReAct Africa, Partners In Health (PIH), Clinton Health Access Initiative (CHAI), and Jhpiego. The content in this document is synthesis from the discussions of the multisectoral TWGs coming from national and international organizations, non-governmental organizations (NGOs), academic institutions, civil society, and development partners from One Health sectors such as human health, animal health, environmental protection, agriculture, and water sanitation.

SCOPE

AMR threatens not only public health but also food security, economic stability, and sustainable development. This NAP responds to these concerns with a multisectoral strategy to reduce AMR's impact on health systems, enhance infection control, and promote prudent antimicrobial use. The extension of this plan is a sign of Rwanda's commitment to safeguard the effectiveness of life-saving treatments for future generations.

OBJECTIVES

This NAP is structured around six strategic objectives to strengthen Rwanda's response to AMR. These objectives are structured around the six strategic areas which are awareness; surveillance; Infection Prevention and Control (IPC); optimal use; sustainable investment; and governance.

1. Enhance awareness and understanding of AMR among health professionals, community members, and policymakers.
2. Establish and strengthen AMR and antimicrobial use (AMU) surveillance systems using a One Health approach.
3. Reduce infection rates through effective sanitation, hygiene, and infection prevention measures across all sectors.
4. Improve antimicrobial prescribing, dispensing, and usage practices in human, animal, and agricultural health.
5. Develop a sustainable investment case for AMR interventions and encourage local and international investments in new medicines, diagnostics, vaccines, and other AMR-related technologies.
6. Strengthen governance frameworks to facilitate effective coordination, accountability, and enforcement of AMR control measures across all sectors.

Under these strategic objectives, strategic interventions were defined and prioritized using Smart Choice Process – making Rwanda the first African country to use this tool. In this process, interventions were evaluated focusing on rapidly achievable outcomes, cost-effective solutions, long-term impacts, and health equity. Budget -This NAP was costed using the WHO Costing and Budgeting Tool for AMR National Action Plans. All activities were costed across the six strategic objectives and lead agencies/implementers.

40,147,817,280 RWF
(29,585,716 USD)

Budget -This NAP was costed using the WHO Costing and Budgeting Tool for AMR National Action Plans. All activities were costed across the six strategic objectives and lead agencies/implementers. The overall estimated cost to implement this 5-year action plan is 40,147,817,280.00 RWF (equivalent to USD 29,585,716.49) based on an exchange rate of 1 USD to 1,357 RWF as of October 23, 2024. This total budget is split between implementing institutions which are Rwanda Biomedical Center (RBC), Rwanda Agriculture and Animal Resources Board (RAB), One Health Secretariat, University of Rwanda (UR), Rwanda Environment Management Authority (REMA), Rwanda Food and Drugs Authority (Rwanda FDA) at the proportions of 36.1%; 35.7%; 10.7%; 10.9%; 6.2% and 0.2% respectively.

This NAP is expected to facilitate effective implementation, given the involvement of multisectoral TWGs in its development—many of whom will also contribute to its execution. Additionally, the plan is supported by a comprehensive budget and a clearly defined Monitoring and Evaluation (M&E) framework.

Through this NAP Rwanda aims to create a sustainable, multisectoral response to AMR, preserving the efficacy of antimicrobials and ensuring a safer, healthier future. With strong political commitment, coordinated action, and international collaboration, Rwanda is positioned to make substantial progress in mitigating AMR's impact on human, animal, and environmental health.

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1. Introduction

1.1 BACKGROUND

AMR is a critical global health threat that undermines the effectiveness of antibiotics, antivirals, antifungals and antiparasitics. The Government of Rwanda has prioritized this challenge by developing the first NAP on AMR for 2019- 2024 (NAP 1.0). NAP 1.0 was developed with a One Health perspective to capture the intersectoral nature of AMR. While this initiative represented a significant commitment to preventing and controlling AMR, a recent evaluation by the FAO Progressive Management Pathway (PMP)(FAO Rwanda, 2024) conducted in January 2024 revealed that only 34% of the planned activities were implemented.

Awareness activities under NAP 1.0 had a low implementation rate, with only 38% of planned actions completed. Key achievements included Knowledge, Attitudes, and Practices (KAP) surveys among certain stakeholders, such as the general public and select livestock producers, as well as targeted AMR awareness campaigns conducted during World Antimicrobial Awareness Week (WAAW). Despite these efforts, notable gaps remain, including the absence of systematic data analysis to identify knowledge gaps and limited outreach to critical groups like dairy, horticulture, and aquaculture farmers. To address these issues, recommendations for NAP 2.0 include comprehensive stakeholder mapping, targeted awareness assessments, and the development of a strategic AMR communication and advocacy framework.

Evidence-related activities achieved a 34% implementation rate, with successes in human health pilot studies and data reporting to the Global Antimicrobial Resistance Surveillance System (GLASS).

However, several gaps were noted, including the need for better mapping of antimicrobial distribution pathways, limited laboratory capacity, and inadequate data management in the animal health sector.

Recommendations for NAP 2.0 include establishing a comprehensive AMR surveillance strategy, mapping antimicrobial distribution across sectors, and conducting targeted pilot studies to strengthen data collection and analysis.

Governance activities showed a 67% implementation rate, highlighted by the formation of a multisectoral AMR Technical Working Group and the creation of an operational plan. Successes include the assessment of existing legal frameworks relevant to AMR, though enforcement remains a challenge.

Notable gaps involve the lack of financial resource mapping and an incomplete budgeting process for priority activities. Recommendations for NAP 2.0 emphasize refining operational plans, conducting comprehensive funding assessments, and better integrating activities across sectors to improve coordination and resource allocation.

Implementation in the practices area was notably low at 12%, despite the presence of small-scale initiatives aimed at promoting responsible antimicrobial use.

Significant gaps were identified, including the necessity for a regulatory framework that addresses antimicrobial distribution and the absence of environmental regulations. To improve this situation, recommendations include conducting KAP surveys to assess disease risks and developing targeted training initiatives for stakeholders to enhance understanding and compliance regarding antimicrobial use and management.

Generally, the achievements of Rwanda's NAP 1.0 were modest, but provided a foundational baseline that informed the design of NAP 2.0. Beyond the specific gaps highlighted, the development of NAP 1.0 also revealed general gaps such as a limited situational analysis, lack of a comprehensive Monitoring and Evaluation (M&E) framework, incomprehensive activity costing, and insufficient stakeholder involvement in the planning phase.

To address these challenges, NAP 2.0 incorporates a thorough situational analysis, an M&E plan with globally guided indicators, and detailed contextualized activity costing using the WHO costing tool. Most significantly, NAP 2.0 was developed using a bottom-up approach, actively involving national multi-sectoral TWGs from government institutions, universities, NGOs, and development partners at each step. The TWGs contributed to prioritizing interventions, defining activities, establishing the M&E framework, and conducting activity costing. Engaging stakeholders who will play a central role in implementation is anticipated to enhance the plan's relevance, ownership, accountability, and ultimately, its implementation rate.

34%

Achievement of Evidence-related activities

67%

Achievement of Government Activities

12%

Implementation in the practices area was notably low at 12%

38%

Overall Implementation rate of NAP 1.0

1.2 SITUATIONAL ANALYSIS

1.2.1 OVERVIEW

AMR is a growing concern in Rwanda, as it is in many parts of the world. Studies have shown increasing rates of antibiotic-resistant bacteria among clinical isolates in Rwanda, particularly with regards to common pathogens Gram-negative bacteria such as *Escherichia coli* and *Klebsiella pneumoniae*. This threatens to undermine the effectiveness of essential antimicrobial medications used to treat common infections. Factors contributing to AMR in Rwanda include limited knowledge, inappropriate prescribing practices, limited access to diagnostic testing, poor infection control measures in healthcare settings, and challenges with access to quality-assured antimicrobials.

1.2.2 HEALTHCARE STRUCTURE

The healthcare system in Rwanda, in both human and animal health, is organized across various administrative and facility levels to ensure broad access to care (Table 1). For AMR surveillance, there are 17 sentinel laboratories including 12 dedicated to human health and 5 to animal health. These laboratories play an important role in supporting Rwanda's AMR surveillance by monitoring and reporting resistance patterns across both sectors.

	Administrative Levels	Human Health	Animal Health	
Healthcare structure per administration level	Country	National Referral Hospitals (8)	Peripheral RAB Stations (13)	
	Province (5)	Province Referral Hospitals (4)		
	Districts (30)	District Hospitals (40)	Districts Animal Resource Officers (30)	
	Sectors (416)	Health Centers (515)	Sectors Animal Resource Officers (416)	
	Cells (2148)	Health Posts (1,243)	-	
	Villages (14,837)	Community Health Workers (58,567)	-	
Sentinel Sites /Laboratories	<ul style="list-style-type: none"> National Reference Laboratory Rwanda Military Hospital Kigali University Teaching Hospital (CHUK) Butare University Teaching Hospital (CHUB) King Faisal Hospital Butaro Hospital Byumba Hospital Gisenyi Hospital Nyagatare Hospital Kibungo Hospital Ruhengeri Hospital Gihundwe Hospital 	12	<ul style="list-style-type: none"> Rubirizi National Veterinary Reference Laboratory Huye Satellite Laboratory Ngoma Satellite Laboratory Rubavu Satellite Laboratory Nyagatare Satellite Laboratory 	5

Table 1. Rwanda Healthcare structure in human health and animal health

1.2.3 EXTENT OF ANTIMICROBIAL RESISTANCE IN RWANDA IN HUMAN HEALTH

a. Prevalence of AMR

A study conducted in a referral hospitals showed that 75.9% of Gram-negative bacterial isolates were resistant to ceftriaxone, and 71.7% were positive for extended-spectrum beta-lactamase (ESBL) phenotype. Risk factors for resistance included transfer from another facility, recent surgery or antibiotic exposure, and hospital-acquired infection. Mortality was 19.6% among enrolled participants (Sutherland et al. 2019). Among inpatients at referral hospitals, 82% of isolates were Gram-negative and exhibited high rates of resistance, with only 27% susceptible to ceftriaxone, 2.4% to co-amoxiclav, and 44% to ciprofloxacin (Bizimungu et al. 2024).

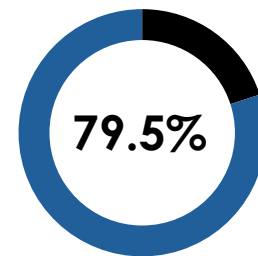
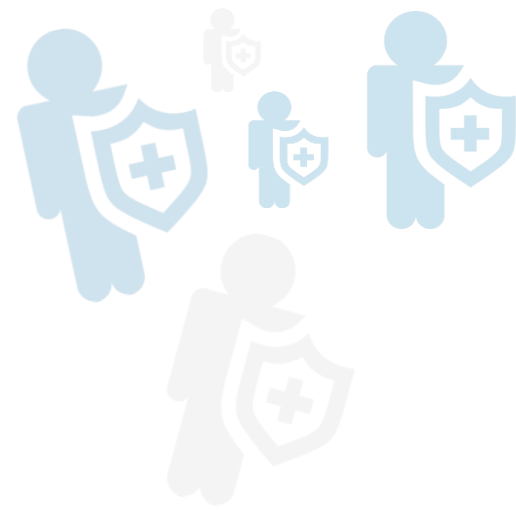
In pediatric patients, the highest resistance rates were observed for ampicillin (86.2%), amoxicillin-clavulanic acid (82.4%), amoxicillin (79%), cefadroxil (69.2%), tetracycline (59.7%), ceftazidime (55.3%), and cefuroxime (53.8%) (Munyemana et al. 2022).

At a tertiary healthcare facility, colistin and imipenem had the greatest activity against Gram-negative bacteria, but resistance to imipenem and colistin was increasing among *Klebsiella*, *E. coli*, *Pseudomonas*, and *Acinetobacter* isolates. Vancomycin retained excellent activity against *Staphylococcus aureus* and *Enterococcus* (Carroll et al. 2016).

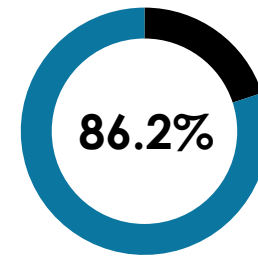
Methicillin-resistant *Staphylococcus aureus* (MRSA) accounted for 31.2% of *S. aureus* isolates (Masaisa et al. 2018).

These findings are aligned with general trends in Africa, with high resistance observed among Gram-negative bacteria, particularly *Klebsiella* spp., and Gram-positive bacteria, including *Streptococcus pneumoniae* and *Staphylococcus aureus* (Gahimbare et al. 2024).

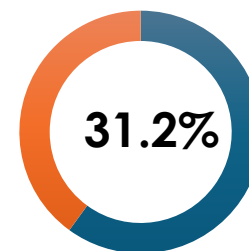
Resistance has also been reported for antimalarial medications, with the emergence of artemisinin-resistant *Plasmodium falciparum* strains carrying K13 mutations, as well as for tuberculosis and HIV drugs (Van Loon et al. 2022) (Bergmann et al. 2021).



In referral hospitals 75.9% of Gram-negative bacterial isolates were resistant to ceftriaxone.



In pediatric patients, the highest resistance rates were observed for ampicillin (86.2%)



Methicillin-resistant *Staphylococcus aureus* (MRSA) accounted for 31.2% of *S. aureus* isolates

b. Existing Capacity and Structures

The 12 sentinel sites are equipped with basic infrastructures for antimicrobial susceptibility test (AST). However, there is still a significant lack of cutting-edge technologies. In addition, there is a lack of quality control SOP and standardization. A recent study that assessed laboratory capacity in rural areas of Rwanda found delays between data collection and analysis due to limited regional supplies and equipment. Quality control testing showed 85.5% concordance for sample testing at district hospitals and 90% concordance for sample testing at the national reference laboratory (Sutherland et al. 2019).

These findings suggest that although basic AST infrastructure is in place, significant gaps remain in access to advanced diagnostic technologies, standardized quality assurance protocols, and timely data reporting.

c. Perceptions and Behaviors

A study on KAP regarding AMR among medical students revealed that 95% (n = 218) acknowledged the potential of inappropriate antibiotic use to lead to resistance, while 96% had encountered information about AMR outside their coursework. However, a concerning 49% reported being able to purchase antibiotics without a prescription, and 83% were unfamiliar with the concept of antimicrobial stewardship. Additionally, 38% did not believe that antibiotics were overused in Rwanda (Nisabwe et al. 2020). In a separate study, it was found that 12.1% (n = 69) of undergraduate university students practiced self-medication with antibiotics, primarily due to illnesses perceived as minor, such as colds and fevers (47.83%). Amoxicillin was the most frequently used antibiotic (59.42%), with community pharmacies being the primary source (72.42%) (Tuyishimire et al. 2019).

Studies investigating antimicrobial stewardship at tertiary hospitals identified effective practices and challenges, such as the frequent prescription of broad-spectrum antibiotics and limited local AMR data. It was found that 39.3% of inpatients receive at least one antimicrobial predominantly antibacterials. 65.1% of the prescribed antibacterials belong to the watch group of the WHO AWaRE classification – mainly cefotaxime, metronidazole, and meropenem – indicating a higher potential for resistance (Igizeneza et al. 2024). The need for regular training for healthcare workers and adherence to AMR guidelines was highlighted (Gashegu et al. 2024).

Furthermore, a rapid review of COVID-19 treatment guidelines across ten African nations found a concerning recommendation of various antibiotics for viral infections, highlighting the necessity for careful antibiotic use in managing COVID-19 to mitigate the risk of further exacerbating AMR (Adebisi et al. 2021).

Although there is a relatively high general awareness of AMR among medical students, significant gaps exist in knowledge about antimicrobial stewardship. Practices at tertiary hospitals also show gaps in antimicrobial stewardship. Addressing these challenges requires strengthening regulatory frameworks, enhancing education on AMR at all levels, and implementing targeted training for healthcare workers to promote adherence to AMR guidelines and responsible antibiotic use.

1.2.4 EXTENT OF ANTIMICROBIAL RESISTANCE IN RWANDA IN ANIMAL HEALTH

a. Prevalence of AMR

A study on antimicrobial susceptibility of *Staphylococcus* species isolated from cattle with mastitis in Rwanda found high levels of resistance, particularly to penicillin and tetracycline. The researchers also detected various antimicrobial and biocide resistance genes in the *Staphylococcus* isolates. These findings indicate that AMR is a significant concern among mastitis-causing bacteria in livestock in Rwanda, underscoring the need for more prudent antibiotic use and improved infection control measures in the animal health sector to mitigate the spread of resistant pathogens (Antók et al. 2019).

b. Existing Capacity and Structures

The laboratory capacity in the animal health sector is significantly lower compared to the human health sector, largely due to a lack of dedicated funding.

Similar gaps observed in human healthcare facilities are also evident in the animal health sector, including issues like lack of standardization and quality control procedures. This disparity in laboratory capabilities between the human and animal health domains indicates the need for greater investment and harmonization of diagnostic infrastructure and quality assurance measures across the One Health spectrum in Rwanda to strengthen AMR surveillance and foster a coordinated, cross-sectoral approach to combating the spread of resistant pathogens in both human and animal populations.

c. Perceptions and Behaviors

An assessment conducted among cattle farmers in the study districts indicated a low level of KAP concerning AMR. Analysis revealed that only 52.6% of farmers met the correct knowledge threshold of 69%, while 56% demonstrated positive attitudes according to a 47% cutoff. Furthermore, 52.8% adhered to correct practices regarding AMR, based on a calculated cutoff of 50%. The findings suggest that higher educational levels are associated with improved knowledge, attitudes, and practices related to antimicrobial use and AMR (Hirwa et al. 2024). A KAP study conducted in animal health professionals showed that younger individuals (aged 24 or younger) tend to misuse antibiotics at a lower rate, while those exhibiting low trust in the veterinary antibiotics available in the local market are significantly more likely to misuse these medications. Furthermore, insufficient knowledge about antibiotics and antibiotic resistance is linked to higher rates of misuse, along with a lack of participation in continuing education initiatives. These results suggest that improving education and trust in veterinary practices may be critical in addressing antibiotic misuse within this professional group (Mugwaneza et al. 2024).

The importation of antibiotics for veterinary use predominantly involved substances intended for food-producing animals, accounting for 99.9% of the total imported weight, which was approximately 35,253.8 kg between 2019 and 2021. The most commonly imported antibiotics were tetracyclines, making up 50.3% of the total at 17,768.6 kg, followed by sulfonamides (22.3%) and aminoglycosides (11.5%). Alarming, 78.9% of these imported antibiotics are classified as highly important antimicrobials for human medicine, raising concerns about their potential impact on public health and antibiotic resistance (Manishimwe et al. 2024).



1.2.5 LEGISLATIVE ENVIRONMENT FOR AMR

a. Rwanda Vision 2050

Rwanda Vision 2050 aims to transform the country into a high-income nation, with a strong focus on health, well-being, and sustainable development. While it does not explicitly mention AMR, its objectives align with efforts to address this global challenge. The vision emphasizes strengthening healthcare systems, improving universal health coverage, and advancing health infrastructure, all of which are essential for effectively combating AMR. Additionally, Vision 2050 prioritizes research and innovation, which are critical for developing new diagnostics, treatments, and monitoring systems to tackle AMR. The focus on sustainability, particularly in agriculture and the environment, supports responsible use of antimicrobials and reduces the risk of resistance.

Furthermore, Rwanda's commitment to global collaboration in health initiatives positions the country to actively participate in international efforts to control AMR. In essence, Rwanda Vision 2050 provides a foundation for addressing AMR through its broader goals of health system strengthening, innovation, and sustainable practices.

b. National Strategy for Transformation (NST 2)

The National Strategy for Transformation 2024-2029 (NST 2) creates a conducive environment for the implementation of this NAP by emphasizing inclusive development, health system strengthening, and sustainable growth. Through its pillars on economic transformation, social transformation, and transformational governance, NST 2 prioritizes investments in healthcare infrastructure, capacity building, and innovation—key drivers for addressing AMR. The strategy's focus on enhancing research, fostering multisectoral collaboration, and improving public service delivery aligns seamlessly with the AMR Action Plan's objectives. Additionally, NST 2's commitment to sustainable development supports the integration of AMR interventions across sectors, ensuring a coordinated and well-resourced response to this critical health threat.

c. Health Sector Policy

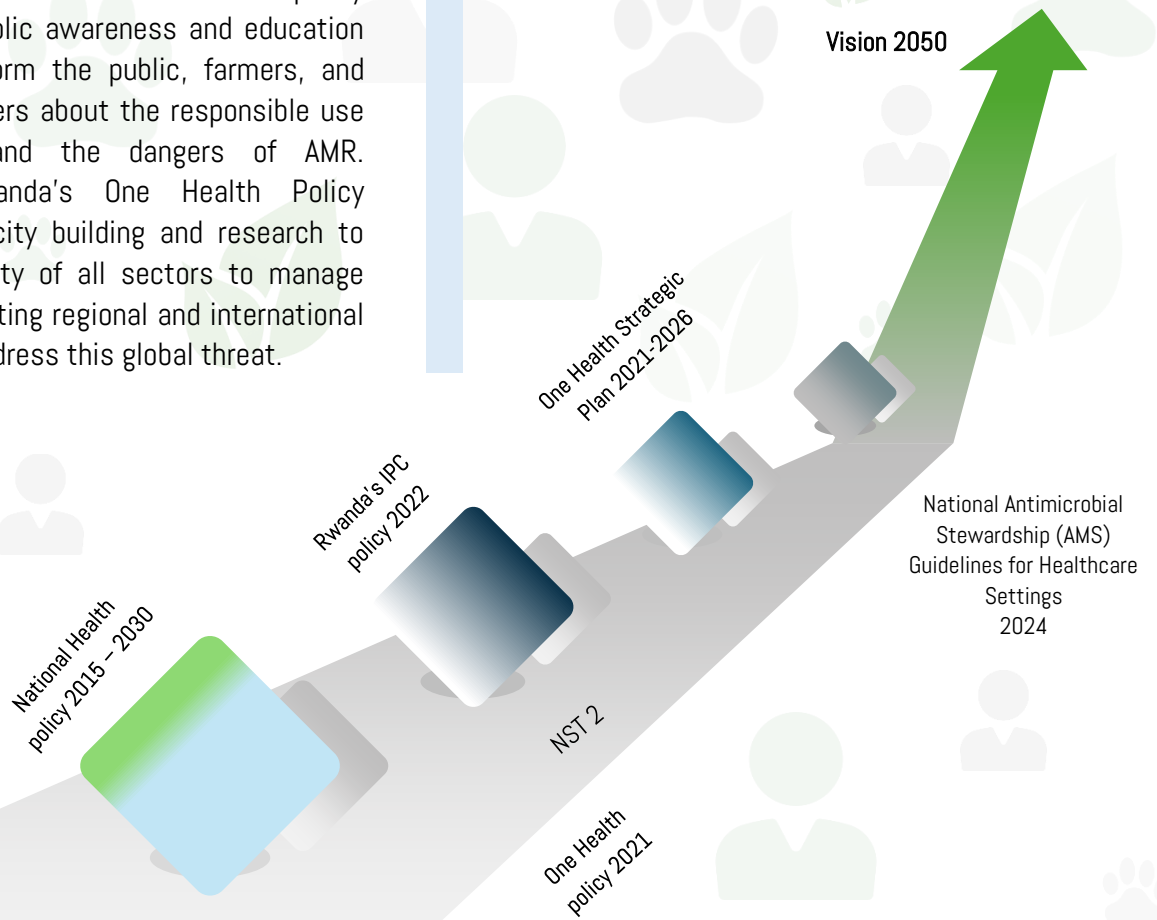
The National Health policy 2015 – 2030 provides strategic guidance for improving health outcomes, achieving universal health coverage, and strengthening the health system. It is aligned with national development frameworks such as Rwanda Vision 2050 and global commitments like the Sustainable Development Goals (SDGs). This policy recognizes AMR as a critical public health issue and outlines key strategies to address it. It emphasizes the need for strengthened surveillance systems to monitor AMR across human, animal, and environmental health sectors, following a One Health approach. The policy promotes the rational use of antimicrobials by encouraging adherence to treatment guidelines and reducing misuse, while also ensuring access to quality-assured medicines. Additionally, it highlights the importance of IPC measures in healthcare settings to minimize infections and the need for antimicrobials. Public awareness campaigns and education are prioritized to inform healthcare providers and the public about the dangers of AMR and responsible antimicrobial use. Capacity building for healthcare professionals is also a key focus, ensuring that they are equipped to manage AMR effectively. The policy further supports international collaboration, allowing Rwanda to engage with global efforts to combat AMR.

c. One Health Policy

The Rwanda One Health Policy, officially signed in March 2021, was developed to promote collaboration across the human, animal, and environmental health sectors in addressing various health threats, including AMR. This policy adopts an integrated approach to tackling AMR by addressing the interconnectedness of human, animal, and environmental health. In regard to AMR, the policy emphasizes collaboration across multiple sectors, including public health, veterinary services, agriculture, and environmental management, to strengthen surveillance systems for monitoring antimicrobial use and resistance in both humans and animals. It promotes the rational use of antimicrobials in healthcare and agriculture, aiming to reduce misuse and overuse, which are key drivers of resistance. IPC measures are a critical focus, particularly in healthcare settings, to reduce the incidence of infections and minimize the need for antimicrobials. The policy also supports public awareness and education initiatives to inform the public, farmers, and healthcare providers about the responsible use of antibiotics and the dangers of AMR. Additionally, Rwanda's One Health Policy encourages capacity building and research to enhance the ability of all sectors to manage AMR, while promoting regional and international cooperation to address this global threat.

e. One Health Strategic Plan 2021-2026

The One Health Strategic Plan 2021–2026 provides a strong foundation for the implementation of this national action plan by fostering an enabling environment for coordinated, multisectoral efforts. The strategic plan promotes collaboration across the human, animal, and environmental health sectors, creating a framework for joint actions and shared responsibilities in addressing complex health challenges like AMR. It emphasizes capacity building, surveillance, and policy harmonization—key elements that align with and support the objectives of the AMR Action Plan. By prioritizing a unified approach to health threats, the One Health Strategic Plan enhances stakeholder engagement, resource mobilization, and effective communication, all of which are critical for the successful implementation of this AMR Action Plan.

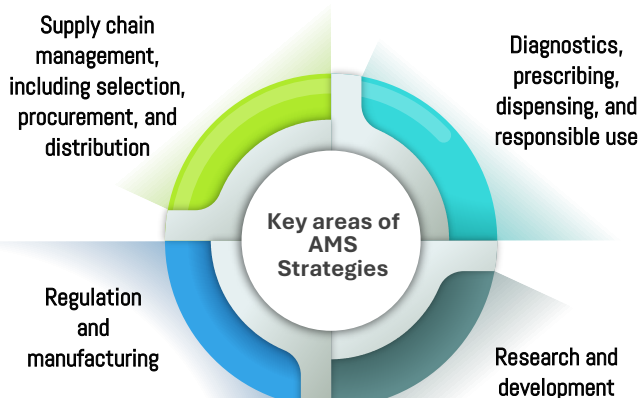


d. National antimicrobial stewardship guidelines for health care settings

The Rwanda National Antimicrobial Stewardship (AMS) Guidelines for Healthcare Settings, developed in 2024, establishes a comprehensive framework to address AMR by promoting optimal antimicrobial use across Rwanda's healthcare system. The guidelines outline core AMS elements such as leadership commitment, accountability, and monitoring, providing a structured approach for implementation at national, provincial, district, and facility levels. AMS strategies are organized into four key areas: (i) supply chain management, including selection, procurement, and distribution; (ii) diagnostics, prescribing, dispensing, and responsible use; (iii) regulation and manufacturing; and (iv) research and development. The guidelines emphasize the formation of multidisciplinary AMS teams, improved diagnostic practices, and regulatory controls over antimicrobial distribution. Led by the Rwanda Biomedical Center (RBC) and other stakeholders, the document also details policy development, training initiatives, and public awareness efforts. This approach aims to standardize AMS practices, improve data monitoring, and ensure responsible antimicrobial use across healthcare settings in Rwanda.

g. Infection Prevention and Control (IPC) Policy

Rwanda's IPC policy, adopted in February 2022, is a comprehensive framework aimed at reducing the risk of infections within healthcare settings and addresses the critical issue of AMR. The policy emphasizes the implementation of rigorous IPC practices to minimize the incidence of healthcare-associated infections, thereby reducing the need for antimicrobials and mitigating the risk of resistance development. It outlines strategies for improving hygiene practices, proper use of personal protective equipment (PPE), and ensuring the rational use of antimicrobials in healthcare. The policy also highlights the importance of training healthcare workers and fostering a culture of safety and accountability to enhance adherence to IPC protocols. By integrating AMR considerations into IPC measures, the policy supports Rwanda's broader health objectives of safeguarding public health and promoting effective infection management across the healthcare system.



1.2.6 CONTEXT OF RWANDA IN THE GLOBAL TRENDS AND INTERNATIONAL STANDARDS

The findings of the 2024 Tracking AMR Country Self-assessment Survey (TrACSS) shows that Rwanda performs well in human health sector management, achieving comprehensive implementation (Level D) in AMR surveillance and infection prevention control, and successfully maintains an integrated surveillance system with effective data usage for policy-making but significant gaps exist in other areas. The professional training varies across sectors, with human health showing advanced implementation (Level C), veterinary sector at moderate implementation (Level B), and aquatic animal health at basic implementation (Level A). Notable weaknesses include the absence (N) of regulatory frameworks for antimicrobial prescription and sales across human, terrestrial, and aquatic animal sectors, lack of environmental monitoring systems, and no structured youth education programs on AMR. The animal health sector shows particularly basic implementation (Level A) in aquatic animal health services and antimicrobial use optimization, while laboratory networks demonstrate comprehensive implementation (Level D) in diagnostic techniques and data management. Food safety and agriculture sectors maintain moderate implementation (Level B) in manufacturing practices and surveillance integration. This mixed performance suggests that while Rwanda has established strong foundations in certain areas, particularly in human health, substantial work remains to achieve comprehensive AMR management across all sectors.



1.2.7 AMR SITUATION IN RWANDA: STRENGTHS, WEAKNESSES, OPPORTUNITIES AND THREATS - (SWOT) ANALYSIS

The following SWOT analysis provides an overview of the strengths, weaknesses, opportunities, and threats associated with this national action plan highlighting key factors that influence its development and implementation (Table 2).

 STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> - Alignment with the Global Action Plan on AMR, ensuring international coherence. - Utilization of the Smart Choice Process to effectively prioritize interventions. - Inclusion of Objective 6 focusing on Governance to enhance accountability. - Comprehensive costing of activities using the WHO Costing and Budgeting Tool for NAPs-AMR. - Multisectoral collaboration throughout the development process. - Strong political commitment to addressing AMR. - Availability of stewardship guidelines in human health to guide responsible antimicrobial use. - Clear delimitation of stakeholder roles and responsibilities to improve accountability and facilitate implementation. 	<ul style="list-style-type: none"> - Insufficient laboratory and diagnostic capacity in both human and animal health sectors. - Lack of farmer involvement, leading to practices like self-treatment. - Minimal engagement of environmental health professionals. - Funding constraints impacting implementation. - Weak collaboration between key stakeholders. - Limited baseline research to quantify the extent of the AMR problem. - Absence of platforms for knowledge sharing and coordination. - Inadequate regulations and infrastructure for proper antimicrobial disposal. - Lack of guidelines and regulatory mechanisms for antimicrobial use in animal health.
 OPPORTUNITIES	 THREATS
<ul style="list-style-type: none"> - Potential for global partnerships and funding from international organizations to support resource mobilization, capacity building, and technical assistance. - Advancements in research and innovation for treatment and diagnostic tools. - Opportunities to enhance public awareness and education, fostering responsible antimicrobial use. - Progress in One Health approaches to address AMR comprehensively. - Rwanda's potential to serve as a model for other African nations in using the Smart Choice Process to prioritize NAP interventions. - A high proportion of youth, representing a dynamic demographic for raising awareness and driving behavior change. 	<ul style="list-style-type: none"> - An increasing AMR burden that could overwhelm Rwanda's healthcare system. - Behavioral barriers that may hinder adherence to AMR guidelines. - Supply chain challenges affecting the timely availability of resources for effective AMR management. - Environmental dissemination of AMR due to inadequate waste management infrastructure, increasing the spread of resistant pathogens. - High dependency on antimicrobials in both human and animal populations. - Economic priorities of antimicrobial supply chain actors (e.g., manufacturers, sellers, users) outweighing health considerations.

Table 2. SWOT analysis of Rwanda National Action Plan on AMR 2025 – 2029

2. Strategic Frameworks for Rwanda National Action Plan

2.1 Vision

A Rwanda free from the burden of antimicrobial resistance, where human, animal, and environmental health are safeguarded through sustainable and coordinated action.

2.2 Mission

To combat antimicrobial resistance through a One Health approach that promotes awareness, responsible antimicrobial use, robust surveillance, and effective infection prevention across all sectors, ensuring the health, economic stability, and well-being of present and future generations.

2.3 Goal and Strategic Objectives

2.3.1 Goal

To ensure the ability to treat and prevent infectious diseases with quality, effective and safe antimicrobials.

2.3.2 Strategic Objectives

There are 6 objectives for 6 priority axes: awareness, surveillance, IPC, optimal use of antimicrobials, economic investment, and Governance in line with the Global Action Plan on AMR.

Strategic Objective 1: Improve awareness and understanding of AMR through effective communication, education, and training among One Health professionals, community members, and policymakers for better decision-making

Strategic Objective 2: Improve national antimicrobial surveillance program using a One Health approach.

Strategic Objective 3: Reduce the incidence of infection through effective sanitation, hygiene and infection prevention measures through a One Health approach

Strategic Objective 4: Optimize the Use of Antimicrobials in Human and Animal Health

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

Strategic Objective 6: Enhance governance and coordination for a multisectoral approach to prevent and control AMR

2.4 Guiding Principles

The development of this NAP 2.0 was guided by the following guiding principles:

- | | |
|--|--|
| i) One Health approach. | v) Promotion of stewardship |
| ii) Alignment with the Global Action Plan on AMR | vi) equity and inclusiveness |
| iii) Evidence-based decision-making | vii) partnership with international institutions |
| iv) Sustainable capacity building | viii) public awareness and engagement |

3. GOVERNANCE AND COORDINATION

Since the One Health approach is central to the development and implementation of NAP 2.0, its coordination will be managed by the One Health governing framework (Figure 1). However, the actual implementation will be carried out by TWGs comprising members from public institutions, academia, healthcare facilities, professional regulatory bodies, private organizations, NGOs, and development partners.

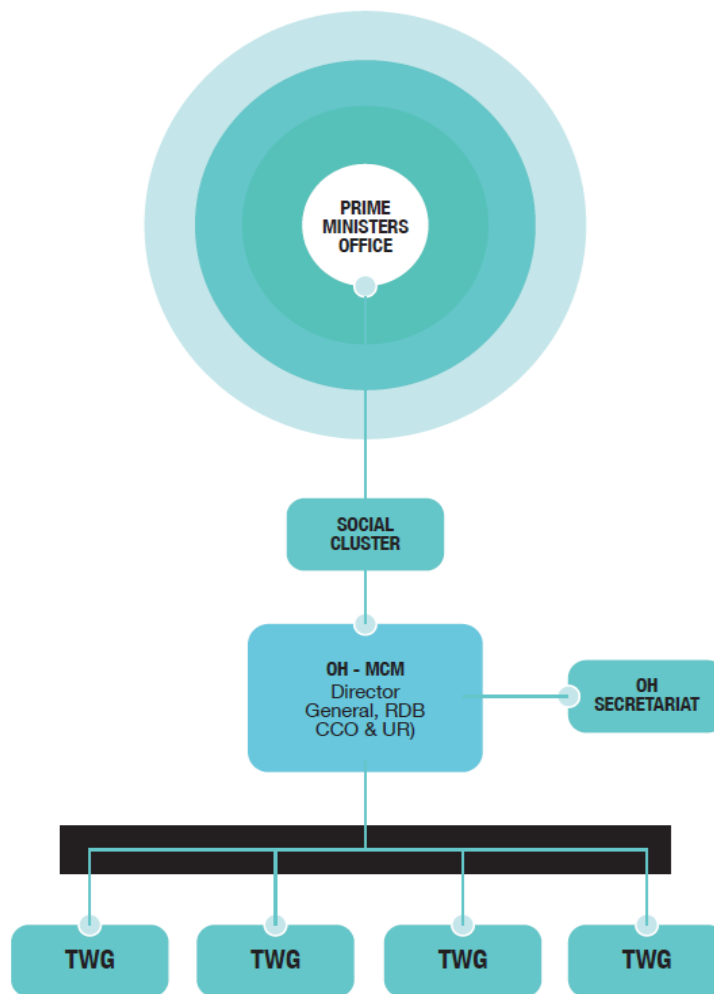


Figure 1. Rwanda One Health Governing structure (source: One Health Policy)

As indicated in budget section, the 5 lead implementing institutions are the One Health Secretariat, Rwanda Biomedical Center (RBC), Rwanda Agriculture and Animal Resources Board (RAB), University of Rwanda (UR), Rwanda Environment Management Authority (REMA), and Rwanda Food and Drugs Authority (Rwanda FDA).

4. STRATEGIC PLAN

Strategic interventions for AMR management are organized under six main objectives, with each objective further divided into specific, targeted interventions. The interventions included in this document were identified through a comprehensive prioritization approach combining the Smart Choice Process (SCP) and national-level consultations. Using the SCP, a structured methodology developed by the AMR Policy Accelerator at the Global Strategy Lab, technical experts from human, animal and environmental health sectors prioritized interventions through the Smart Choice methodology that combines quantitative survey scoring and discussions of TWGs. Additional priority interventions emerged from broader multi-sectoral TWG discussions to ensure a well-rounded response to AMR, aligned with Rwanda's specific needs and strategic objectives.

Strategic objective 1: Improve awareness and understanding of AMR through effective communication, education, and training among One Health professionals, community members, and policymakers for better decision-making	
Strategic intervention 1.1. Enhance interventions aimed at improving public awareness	Intervention 1.1.1. Conduct ongoing assessment of the level of knowledge and practices on AMR among social and professional groups belonging to the human, animal, plant, and environment sectors. This baseline assessment is a crucial step for tailoring effective interventions and tracking progress over time. This assessment supports a coordinated and evidence-informed approach, enabling Rwanda to address AMR holistically and align global standards under the One Health framework. To achieve this, strategies such as increased sensitization and community engagement will be employed to build participant buy-in and foster trust among diverse stakeholders. However, potential barriers include insufficient collaboration between stakeholders and reluctance to disclose practices due to fear of regulatory consequences. Addressing these barriers through capacity building, stakeholder collaboration, and clear communication of the assessment will be essential for the success of this intervention.

Intervention 1.1.2. Undertake AMR awareness-raising activities in primary, secondary, and higher learning institutions, health facilities, youth organizations, animal health workers, community members, and policymakers using specialized educational materials

Educating youth, human and animal health professionals, community members, and policymakers is vital for promoting responsible antimicrobial practices, and mitigating the spread of AMR. This intervention aims to create a knowledgeable population capable of implementing and advocating for AMR prevention measures. Key strategies include developing and disseminating targeted AMR educational materials tailored to each audience, integrating AMR topics into school curricula, and conducting interactive workshops for youth organizations, human and animal health professionals, and policymakers. However, implementation may face challenges such as limited funding, a shortage of trained personnel to effectively deliver AMR content, and difficulties engaging certain target groups. Overcoming these barriers will require innovative funding approaches, capacity building initiatives, and context and culturally sensitive engagement strategies to ensure large impact.

Intervention 1.1.3. Enhance public awareness through dissemination and publication of research findings

Increasing public awareness by sharing and publishing research findings is essential for empowering individuals and communities to make informed decisions and adopt behaviors that help mitigate AMR. This intervention aims to bridge the gap between research and practical action by making scientific findings accessible and actionable for the general public. Strategies include leveraging mass media, community outreach programs, and digital platforms to share research findings, collaborating with human and animal healthcare professionals to incorporate AMR education into patient interactions, and developing user-friendly materials tailored to diverse audiences. However, challenges may arise from limited access to media and digital tools in rural areas, public skepticism or misunderstanding of scientific information, and a lack of resources to sustain comprehensive awareness campaigns. Addressing these challenges will require targeted efforts to improve media accessibility, build trust in research, and establish sustainable funding mechanisms for widespread and effective dissemination.

Strategic objective 2: Improve national antimicrobial surveillance program using a One Health approach.	
Strategic intervention 2.1 Support laboratory surveillance of AMR	<p>Intervention 2.1.1. Build laboratory capacity for AMR surveillance by establishing national and subnational microbiological services using up-to-date molecular techniques, and by standardizing testing methods across agencies for humans, livestock, aquaculture, plants, the environment, and pets</p> <p>Building laboratory capacity for AMR surveillance is critical for accurately detecting and monitoring resistant pathogens across human, animal, plant and environmental sectors. This enables timely interventions and informed decision-making, laying the foundation for effective AMR control and prevention. Key strategies include mobilizing resources, optimizing planning and budgeting processes, improving supply chain management for laboratory supplies, and establishing a robust framework for the maintenance of laboratory equipment. However, implementation may face significant challenges such as the high cost of reagents, unavailability of laboratory supplies locally, lengthy procurement processes, inconsistent supply chains, lack of sectoral ownership and accountability, inadequate equipment maintenance, and shortages of skilled personnel. Addressing these barriers will require strategic investments, cross-sectoral collaboration, and capacity-building efforts to ensure sustainable and standardized AMR surveillance nationwide.</p>
	<p>Intervention 2.1.2. Collect, analyze, disseminate and share surveillance data and information through routine clinical sampling of patients to facilitate decision-making on diagnoses and treatments in clinical human (public and private) health, veterinary practice, environment and wildlife laboratories and food technologies using a One Health approach.</p> <p>Routine collection, analysis, and dissemination of AMR surveillance data using a One Health approach is crucial for timely and evidence-based decisions in diagnosis and treatment across human, veterinary, environmental and food production sectors. This ensures that interventions are guided by reliable data, enhancing the effectiveness of AMR management. Strategies for achieving this include implementing targeted training programs to enhance technical skills, creating a centralized data system for efficient data sharing, integrating real-time testing practice, engaging leadership to promote effective use of data, and establishing a stable supply chain to meet laboratory requirements. However, challenges such as shortage of trained personnel, limited laboratory and IT infrastructure, and the absence of centralized, standardized data system may impede implementation. Addressing these challenges requires coordinated capacity-building efforts, investments in IT and laboratory resources, and strong leadership to promote data generation and collaboration across sectors.</p>

<p>Strategic intervention 2.2 Support Surveillance of Antimicrobial use</p>	<p>Intervention 2.2.1. Develop, review, and implement procedures and methodologies for monitoring the import, use, and disposal of antimicrobials.</p> <p>Developing and implementing procedures for monitoring the import, use, and disposal of antimicrobials is vital for ensuring their responsible management and reducing the risk of AMR. This intervention promotes accountability and safeguards public health by minimizing improper usage of antimicrobials and environmental contamination. Key strategies include establishing robust regulatory frameworks to track antimicrobial imports, creating standardized protocols for appropriate usage in human and animal health settings, and implementing effective disposal systems for expired or unused antimicrobials. However, challenges such as inconsistent enforcement of regulations, limited infrastructure or training for proper disposal, and insufficient funding to support comprehensive monitoring systems may hinder progress. Overcoming these barriers requires strengthened governance, investment in infrastructure, capacity building, and sustained resource mobilization.</p>
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Strategic objective 3: Reduce the incidence of infection through effective sanitation, hygiene and infection prevention measures through a One Health approach

<p>Strategic intervention 3.1. Promote Biosecurity Measures in Agriculture</p>	<p>Intervention 3.1.1. Promote hygiene, sanitation and infection prevention practices on farms.</p> <p>Promoting the adoption of hygiene, sanitation, and infection prevention practices on farms is essential to minimize the spread of AMR by reducing the need for antimicrobial use and preventing infections at their source. Key strategies to achieve this include mobilizing funds to support farm-level initiatives, enhancing awareness campaigns to emphasize the importance of hygiene, conducting behavior diagnostics to identify resistance to adopting these practices and delivering consistent information on the benefits of improved sanitation. However, barriers such as limited financial resources and difficulties in achieving behavioral change among farmers may impede the implementation. Addressing these barriers will require targeted investments, tailored communication strategies, and collaborative efforts between stakeholders to drive sustainable good practices.</p>
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<p>Strategic intervention 3.2. Strengthen Infection Prevention and Control Programs in Human, animal and environment</p>	<p>Intervention 3.2.1. Strengthening infection prevention practices in communities and healthcare and farming facilities</p> <p>Strengthening infection prevention practices in communities, healthcare and farming facilities is essential for reducing reliance on antimicrobials and promoting sustainable AMR management. By preventing infections at their source, this intervention lays a strong foundation for reducing the need for antimicrobials and mitigating the spread of resistant pathogens. Strategies to achieve this include constructing adequate waste disposal facilities, raising awareness campaigns, securing necessary resources for infection prevention, and enhancing IPC infrastructure. However, challenges such as insufficient water, sanitation, and hygiene (WASH) infrastructure, limited IPC resources, and inadequate financial support may impede the effectiveness of these efforts. Overcoming these challenges requires targeted investments in IPC infrastructure, capacity building, and long-term financial commitment.</p>
	<p>Intervention 3.2.2. Conduct a baseline assessment of barriers to adherence to infection prevention and control (IPC) guidelines (e.g., insufficient space to isolate patients and lack of training on guidelines)</p> <p>This baseline assessment is crucial for identifying gaps in practices and infrastructure, ensuring safe and hygienic environments that effectively reduce healthcare-associated infections. This is essential for safeguarding health across all sectors and mitigating the spread of infections. Key strategies include mobilizing robust funding, conducting targeted awareness campaigns to promote IPC practices, and continuously emphasizing the public health importance of IPC in all settings. However, barriers such as limited financial resources, lengthy procurement processes, and resistance to behavior change may impede the successful implementation of this intervention. Addressing these challenges requires efficient resource mobilization, strong leadership commitment, and a focus on improving the capacity and infrastructure necessary for effective IPC adherence.</p>

Intervention 3.2.3. Develop and disseminate tools for information, education, and behavior change on IPC using a One Health approach

Developing and disseminating tools for information, education, and behavior change on IPC using One Health approach is critical to promote a cohesive and effective strategy across human, animal, and environmental health sectors. This integrated approach ensures that IPC practices are collectively applied, reducing the risk of infections and AMR across all sectors. Strategies to achieve this include creating and distributing targeted educational materials, organizing multi-sectoral workshops to promote IPC best practices, and incorporating IPC tools into existing One Health training programs for human and animal health professionals and communities. However, barriers such as limited coordination sectors, insufficient resources for widespread training and tool distribution, and resistance to adopting new IPC practices due to cultural or logistical challenges may reduce the success of this intervention. Overcoming these barriers requires strengthening cross-sector collaboration, securing sustainable funding, and promoting local ownership and commitment to IPC practices.

Intervention 3.2.4. Assess and institute or strengthen minimum infrastructure standards to promote IPC across all One Health settings

Assessing and strengthening minimum infrastructure standards for IPC across all One Health settings is essential to ensuring effective protection against AMR in human, animal, and environmental health sectors. This intervention aims to create a unified and comprehensive approach to IPC, reducing the risk of AMR transmission across various sectors. Key strategies include conducting thorough assessments to identify infrastructure gaps, establishing standardized minimum IPC infrastructure requirements for human healthcare, veterinary, and environmental settings, and allocating necessary resources to upgrade facilities and ensure adherence to IPC standards. However, challenges such as limited financial resources for infrastructure improvements, lack of coordination between sectors in implementing standardized IPC practices, and resistance to new infrastructure standards due to existing systems constraints may impede progress. Addressing these barriers requires coordinated efforts, cross-sectoral collaboration, and targeted investments to ensure successful implementation.

<p>Strategic intervention 3.3. Review and strengthen health waste management systems in human and animal health sectors</p>	<p>Intervention 3.3.1. Promote personal hygiene and environmental sanitation in congregate settings</p> <p>Promoting personal hygiene and environmental sanitation in congregate settings, particularly in AMR hotspots such as hospitals and intensive food-animal production systems is essential to preventing the spread of resistant pathogens and protecting public health. This intervention aims to reduce the risk of AMR transmission by ensuring that hygiene and sanitation practices are prioritized in high-risk environments. Strategies include mobilizing funds to support sanitation initiatives, enhancing awareness through targeted campaigns, conducting behavioral diagnoses to understand resistance to hygiene practices, and delivering consistent information on benefits of good hygiene and sanitation. However, barriers such as limited financial resources, low awareness of the importance of sanitation, and resistance to change may hinder the effectiveness of this intervention. Overcoming these obstacles requires coordinated efforts, sustained funding, and tailored strategies to promote long-term improvement in hygiene practices.</p>
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Strategic objectives 4: Optimize the use of antimicrobial agents in human and animal health	
Strategic intervention 4.1 Promote Optimal Prescribing, Dispensing and Use of antimicrobials	Intervention 4.1.1. Promote the use of standard treatment guidelines for infectious diseases in both human and animal health Promoting the use of standard treatment guidelines for infectious diseases in both human and animal health is crucial for ensuring appropriate antimicrobial use and mitigating the risk of AMR across both sectors. These guidelines help ensure consistent and evidence-based treatment, minimizing the misuse of antimicrobials. Strategies include developing and distributing comprehensive standard treatment guidelines, providing training for healthcare and veterinary professionals on their proper use, and establishing monitoring and enforcement systems to ensure adherence to the guidelines. However, barriers such as resistance from healthcare and veterinary professionals to adopting standardized guidelines, limited access to resources or training in rural areas, and challenges in regularly updating the guidelines based on emerging resistance patterns may impede successful implementation. Addressing these challenges will require targeted training, resource allocation, and a dynamic system for guideline updates.
	Intervention 4.1.2. Strengthen supervision of prescribing healthcare facilities and dispensing pharmacies and other outlets for human and animal-related antimicrobials This intervention is essential for ensuring the responsible use of antimicrobials and preventing the emergence of AMR. Effective supervision helps ensure that antimicrobials are prescribed and dispensed according to established guidelines, minimizing misuse and overuse. Key strategies include enhancing regulatory frameworks to better monitor antimicrobial prescriptions, conducting regular inspections of pharmacies and other dispensing outlets, and providing targeted training to healthcare providers and pharmacists on proper antimicrobial dispensing practices. However, challenges such as limited resources for conducting frequent inspections, inadequate enforcement of regulations, and resistance from some pharmacists and healthcare providers may hinder the successful implementation of this intervention. Addressing these barriers requires increased resource allocation, strengthened regulatory mechanisms, and efforts to engage and educate stakeholders on the importance of strict supervision for public health.

<p>Strategic intervention 4.2. Strengthen the pharmaceutical manufacturing and supply chain</p>	<p>Intervention 4.2.1. Enhance stock management and accessibility of antimicrobial products in the human and animal health sectors</p> <p>Enhancing stock management and accessibility of antimicrobial products in both the human and animal health sectors is vital for ensuring that antimicrobials are available when needed, while preventing misuse and the development of AMR. Effective stock management ensures that the right antimicrobials are accessible for appropriate treatment without overstocking or shortages. Strategies to achieve this include implementing robust inventory management systems, conducting regular stock audits and replenishments, and improving supply chain coordination to ensure timely access to quality antimicrobials across both sectors. However, barriers such as limited infrastructure and logistics for effective stock management, inconsistent funding for supply chain improvements, and challenges in coordinating efforts between the human and animal health sectors may impede the success of this intervention. Addressing these issues will require investment in infrastructure, stable funding, and improved coordination between stakeholders.</p>
	<p>Intervention 4.2.2. Enhance opportunities for new drug development</p> <p>Enhancing opportunities for new drug development is critical to combat the growing threat of AMR by ensuring the availability of effective treatments for resistant infections. Developing new antimicrobials is essential for staying ahead of evolving resistant pathogens. Strategies to promote new drug development include encouraging public-private partnerships for research and development, providing incentives such as funding or tax breaks to stimulate antimicrobial innovation, and establishing regulatory frameworks that allow for the fast-tracking of new drug approvals. However, barriers such as limited financial investment in antimicrobial research, regulatory difficulties in bringing new medications to market, and the high cost and complexity of developing novel antimicrobials may impede progress. Overcoming these challenges requires increased investment, streamlined regulatory processes, and collaboration between public and private sectors.</p>

Strategic objective 5: Develop the economic case for sustainable investment that takes account of the needs of Rwanda, and increase investment in new medicines, diagnostic tools, vaccines and other interventions.	
Strategic intervention 5.1. Collaborate with International Partners in Basic Strategic objective Research	Intervention 5.3.1. Promote research to identify high-risk and high-burden resistant strains, their resistance mechanisms and their transmission Promoting research to identify high-risk and high-burden resistant strains, their mechanisms of resistance, and pathways of transmission is crucial for informing targeted interventions and effectively addressing AMR. This research will provide valuable insights into the spread of resistant pathogens and guide the development of strategies to prevent further resistance. Key strategies include supporting collaborative research initiatives between academic institutions, public health agencies, and the private sector, establishing surveillance systems to track resistant strains and their transmission, and providing funding for the development of advanced diagnostic tools and studies on resistance mechanisms. However, barriers such as limited funding for AMR research, lack of infrastructure for comprehensive surveillance and data collection, and challenges in coordinating multi-sectoral research efforts may impede progress. Overcoming these obstacles will require increased investment, improved infrastructure, and strengthened collaboration across sectors.

Strategic objective 6: Enhance governance and coordination for a multisectoral approach to prevent and control AMR	
Strategic intervention 6.1. Establish and Strengthen Governance and Coordination Mechanism at National and other Subnational Levels	Intervention 6.1.1. Strengthen governance and coordination mechanisms to support a multisectoral approach for the prevention and control of AMR Strengthening governance and coordination mechanisms is critical to fostering a unified, multisectoral approach to prevent and control AMR effectively across human, animal, and environmental health sectors. Robust governance ensures harmonized actions, efficient resource utilization, and sustained commitment to addressing AMR. Strategies include establishing a central coordinating body to lead AMR efforts, enhancing collaboration among government agencies and stakeholders from healthcare, veterinary, and environmental sectors, and formulating clear policies and action plans to support a multisectoral response. However, barriers such as insufficient collaboration across sectors, limited financial resources to prioritize coordination efforts, and challenges in aligning policies and regulations across diverse domains may hinder successful implementation. Addressing these barriers will require sustained advocacy, increased funding, and efforts to build trust and alignment among all stakeholders.
	Intervention 6.1.2. Strengthen and sustain collaborative efforts among stakeholders to enhance a multisectoral response to AMR prevention and control Strengthening and sustaining collaborative efforts among stakeholders is vital to achieving a cohesive and effective multisectoral response to AMR prevention and control. Collaboration ensures that efforts across human, animal, and environmental health sectors are aligned and mutually reinforcing. Strategies include creating regular platforms for dialogue and collaboration among stakeholders, establishing joint task forces with clearly defined roles and responsibilities, and developing multi-stakeholder action plans that align AMR objectives across sectors. However, barriers such as inadequate funding for sustained collaborative initiatives, challenges in aligning diverse sectoral priorities and goals, and limited capacity or willingness of stakeholders to commit to long-term partnerships may impede progress. Addressing these challenges will require stable funding, strategic alignment, and fostering trust and engagement among all stakeholders.

Intervention 6.1.3. Establish and sustain effective monitoring and evaluation systems to track progress, assess impact, and ensure the effective implementation of AMR control and prevention interventions across all sectors

This intervention aims to create robust systems to provide data-driven insights to guide decision-making and enhance accountability in AMR control and prevention efforts. Strategies include developing a comprehensive AMR monitoring and evaluation framework, integrating data collection and reporting mechanisms into existing health and environmental systems, and equipping stakeholders with the training and resources needed for efficient monitoring and reporting. However, barriers such as limited financial resources for system development and maintenance, inadequate mechanisms for data sharing between sectors, and challenges in maintaining consistent and accurate data collection may impede implementation. Addressing these barriers requires sustained investment, improved inter-sectoral collaboration, and capacity building initiatives.

5. OPERATIONAL PLAN

Table 3 below shows the years of implementation of activities, interventions, strategic interventions, and strategic objectives and the implementing institutions. Details about the budget can be found in Annex I.

Table 3: Operational Plan

Strategic Objectives/ Strategic Interventions/ Interventions/Activities	Years of Implementation					Implementer(s)
	The cross sign (X) indicates the year of implementation					
	2025	2026	2027	2028	2029	
Strategic objective 1: Improve awareness and understanding of AMR through effective communication, education, and training among One Health professionals, community members, and policymakers for better decision-making.	X	X	X	X	X	One Health Secretariat, RBC, RAB, REMA, UR
Strategic intervention 1.1: Enhance Interventions aimed at improving public awareness	X	X	X	X	X	One Health Secretariat, RBC, RAB, REMA, UR
Intervention 1.1.1: Conduct ongoing assessment of the level of knowledge and practices on AMR among social and professional groups belonging to the human, animal, plant, and environment sectors.	X					One Health Secretariat, RBC, RAB, REMA
Activity 1.1.1.1: Develop awareness assessment tools on AMR for human, animal, plant, and environmental sectors	X					RBC
Activity 1.1.1.2: Conduct an assessment of the levels of knowledge and practices regarding AMR among social and professional groups within the human, animal, plant, and environmental sectors	X		X		X	One Health Secretariat, RBC, RAB, REMA
Activity 1.1.1.3: Disseminate the findings of the assessment among relevant stakeholder sectors	X		X		X	One Health Secretariat

	2025	2026	2027	2028	2029	
Intervention 1.1.2: Undertake AMR awareness-raising activities in primary, secondary, and higher learning institutions, health facilities, youth organizations, animal health workers, community members, and policymakers using specialized educational materials	X	X	X	X	X	One Health Secretariat, UR
Activity 1.1.2.1: Develop an awareness-raising plan for academic institutions, health facilities, youth organizations, animal health workers, community members, and policymakers using specialized materials	X		X		X	One Health Secretariat
Activity 1.1.2.2: Develop and disseminate awareness-raising posters, flyers, banners, and charts for academic institutions, health facilities, youth organizations, and communities	X		X		X	One Health Secretariat
Activity 1.1.2.3: Raise public awareness on AMR status, risk factors, and prevention during World Antimicrobial Awareness Week (WAAW)	X	X	X	X	X	One Health Secretariat
Activities 1.1.2.4: Organize high-level policy dialogue on AMR	X					One Health Secretariat
Activity 1.1.2.5: Conduct behavior change campaigns among relevant institutions, including animal and human health workers, community members, youth organizations, and those involved in the use of antimicrobials in humans, animals, plants, and the food value chain, especially where alternatives exist to reduce antimicrobial use	X	X	X	X	X	UR
Activity 1.1.2.6: Develop training materials on AMR adapted to different One Health sectors (human, animal, environment, and plant) and targeting relevant professionals		X		X		One Health Secretariat
Activity 1.1.2.7: Conduct regular trainings on AMR for professionals in all One Health sectors		X	X	X	X	One Health Secretariat

	2025	2026	2027	2028	2029	
Intervention 1.1.3: Enhance public awareness through dissemination and publication of research findings	X	X	X	X	X	UR
Activity 1.1.3.1: Organize seminars, conferences, and symposiums for sharing AMR research findings	X	X	X	X	X	UR

	2025	2026	2027	2028	2029	
Strategic objective 2: Improve national antimicrobial surveillance program using a One Health approach.	X	X	X	X	X	RBC, RAB, REMA, Rwanda FDA
Strategic intervention 2.1: Support laboratory surveillance of AMR	X	X	X	X	X	RBC, RAB, REMA
Intervention 2.1.1: Build laboratory capacity for AMR surveillance by establishing national and subnational microbiological services using up-to-date molecular techniques, and by standardizing testing methods across agencies for humans, livestock, aquaculture, plants, the environment, and pets	X	X	X	X	X	RBC, RAB, REMA
Activity 2.1.1.1: Build human capacity in sample collection, testing procedures, and data analysis (through training, mentorship, and supervision) for both human and animal health	X	X	X	X	X	RBC, RAB
Activity 2.1.1.2: Equip all sentinel sites with equipment, reagents, and consumables for culture, identification, and antimicrobial susceptibility testing (AST)	X	X	X	X	X	RBC, RAB
Activity 2.1.1.3: Standardize laboratory infrastructure in all microbiology laboratories across the human, animal, plant, and environmental sectors to achieve optimal and consistent results in culture, identification, and AST			X			RBC, RAB, REMA
Activity 2.1.1.4: Certify testing laboratories in accordance with recognized international standards for human and animal health	X	X	X	X	X	RBC, RAB, REMA
Activity 2.1.1.5: Hire personnel responsible for analyzing AMR surveillance data		X	X	X	X	RBC, RAB, REMA

	2025	2026	2027	2028	2029	
Intervention 2.1.2: Collect, analyze, disseminate, and share surveillance data and information through routine clinical sampling of patients to facilitate decision-making on diagnoses and treatments in clinical human (public and private) health, veterinary practice, environment and wildlife laboratories and food technologies using a One Health approach	X	X	X	X	X	RBC, RAB, REMA
Activity 2.1.2.1: Develop and review guidelines and protocols related to AMR surveillance	X			X		RBC, RAB, REMA
Activity 2.1.2.2: Develop an integrated reporting system tool for AMR surveillance	X	X	X	X	X	RBC
Activity 2.1.2.3: Collect passive AMR surveillance data from facility-based sources, analyze them, and report findings using the surveillance tool		X				RBC, RAB
Activity 2.1.2.4: Collect active AMR surveillance data from human, animal, and environmental community-based sources, analyze them, and report the findings using the surveillance tool.	X	X	X	X	X	RBC, RAB, REMA
Activity 2.1.2.5: Develop and publish manuscripts and policy briefs based on AMR surveillance data	X	X	X	X	X	RBC
Activity 2.1.2.6: Conduct a Technical Working Group (TWG) workshop for the validation and dissemination of AMR surveillance data	X	X	X	X	X	RBC

	2025	2026	2027	2028	2029	
Strategic intervention 2.2: Support Surveillance of Antimicrobial use	X	X	X	X	X	RBC, RAB, REMA, Rwanda FDA
Intervention 2.2.1: Develop and implement procedures and methodologies for monitoring the import, use, and disposal of antimicrobials	X	X	X	X	X	RBC, RAB, REMA, Rwanda FDA
Activity 2.2.1.1: Hire a consultant/ build the capacity of the One Health unit to develop policies, guidelines, and procedures for monitoring the import, use, and disposal of antimicrobials	X					Rwanda FDA
Activity 2.2.1.2: Validate and approve the developed policies, guidelines, and procedures for monitoring antimicrobials		X				RBC, RAB, REMA
Activity 2.2.1.3: Train One Health practitioners on the policies, guidelines, and procedures for monitoring the use of antimicrobials	X					RBC, RAB, REMA
Activity 2.2.1.4: Analyze and monitor AMR surveillance data in relation to antimicrobial consumption (AMC) and antimicrobial use (AMU) data across One Health sectors		X	X	X	X	RBC, RAB, REMA

	2025	2026	2027	2028	209	
Strategic objective 3: Reduce the incidence of infection through effective sanitation, hygiene and infection prevention measures through a One Health approach	X	X	X	X	X	RBC, RAB, REMA
Strategic intervention 3.1: Promote Biosecurity Measures in Agriculture	X	X	X	X	X	RBC, RAB
Intervention 3.1.1: Promote hygiene, sanitation, and infection prevention practices on farms.	X	X	X	X	X	RBC, RAB
Activity 3.1.1.1: Conduct awareness campaigns for farmers on hygiene, sanitation, and infection prevention practices on farms		X	X	X	X	RAB
Activity 3.1.1.2: Conduct training for farmers on biosecurity measures, including proper equipment disinfection, footbath usage, and controlled access to the farms		X	X	X	X	RAB
Activity 3.1.1.3: Establish handwashing and footbath stations in health facilities and farms to prevent the spread of pathogens		X	X	X	X	RBC, RAB

	2025	2026	2027	2028	2029	
Strategic intervention 3.2: Strengthen Infection Prevention and Control Programs in Human, animal, and environment	X	X	X	X	X	RBC, RAB, REMA
Intervention 3.2.1: Strengthening infection prevention practices in communities and healthcare and farming facilities	X	X	X	X	X	RBC, RAB
Activity 3.2.1.1: Organize workshops on infection prevention, personal hygiene, handwashing techniques, and proper sanitation practices tailored for community members, healthcare workers, and farmers	X	X	X	X	X	RBC, RAB
Activity 3.2.1.2: Establish handwashing stations equipped with soap and clean water in public areas to promote regular hand hygiene		X	X			RBC
Activity 3.2.1.3: Develop proper waste management systems for the safe disposal of medical and farm waste, including needles, syringes, animal waste, and expired medications	X	X				REMA

	2025	2026	2027	2028	2029	
Activity 3.3.1.4: Conduct handwashing campaigns in public places to encourage regular handwashing	X	X	X	X	X	RBC
Activity 3.3.1.5: Develop and implement hygiene and sanitation response plans for managing infectious disease outbreaks to prevent the rapid spread of infections	X	X	X	X	X	RBC

	2025	2026	2027	2028	2029	
Strategic objective 4: Optimize the use of antimicrobials in human and animal health	X	X	X	X	X	One Health Secretariat, RBC, RAB
Strategic intervention 4.1: Promote Optimal Prescribing, Dispensing and Use of antimicrobials	X	X	X	X	X	One Health Secretariat, RBC, RAB
Intervention 4.1.1: Promote the use of standard treatment guidelines for infectious diseases in both human and animal health	X	X	X	X	X	One Health Secretariat, RBC, RAB
Activity 4.1.1.1: Establish prescription-only legislation for antimicrobials in humans, animals, and plants, and incorporate inspection variables for the prescription and dispensing of antimicrobials into the key performance indicators (KPIs) of both public and private human and veterinary pharmacies and other outlets	X	X	X	X	X	One Health Secretariat
Activity 4.1.1.2: Establish legislation that prohibits the use of antibiotics for growth promotion in animals and restricts the use of applicable pesticides with antimicrobial effects, such as bactericides and fungicides, in plant production	X	X				RAB
Activity 4.1.1.3: Develop/revise and disseminate standard treatment guidelines for the use of antimicrobials in human and animal health sectors, including both domestic and wild animals, across public and private facilities	X	X	X	X	X	One Health Secretariat, RBC, RAB
Activity 4.1.1.4: Develop a tool for assessing antimicrobial stewardship programs in human and animal health		X	X			RBC
Activity 4.1.1.5: Conduct a nationwide assessment of antimicrobial stewardship (AMS) programs in human and animal health		X	X	X	X	RBC

	2025	2026	2027	2028	2029	
Intervention 4.1.2: Strengthen supervision of prescribing healthcare facilities and dispensing pharmacies and other outlets for human and animal-related antimicrobials	X	X	X	X	X	One Health Secretariat, RBC, RAB
Activity 4.1.2.1: Develop tools for inspecting antimicrobial prescription and dispensing at all levels of human and animal health systems	X	X				RBC
Activity 4.1.2.2: Develop electronic prescriptions that integrate (interoperate) with systems at pharmacies and other antimicrobial dispensing outlets	X	X	X			One Health Secretariat
Activity 4.1.2.3: Conduct regular inspections on prescription and dispensing of antimicrobials in public and private hospitals, pharmacies, and dispensaries within human and animal health systems		X	X	X	X	RBC, RAB

	2025	2026	2027	2028	2029	
Strategic intervention 4.2: Strengthen the pharmaceutical manufacturing and supply chain	X	X	X	X	X	One Health Secretariat, RAB
Intervention 4.2.1: Enhance stock management and accessibility of antimicrobial products in the human and animal health sectors	X	X	X	X	X	One Health Secretariat
Activity 4.2.1.1: Link stock management systems at health facility levels with one another, and with the Electronic Health Supply Chain Management Module for Rwanda Medical Supply (RMS) at both local and central levels	X	X				One Health Secretariat
Activity 4.2.1.2: Establish stock management rules for antimicrobial products at all levels relative to the respective AWaRe and VEN classifications as well as a mechanism to report the antimicrobial inventory	X	X	X	X	X	One Health Secretariat
Intervention 4.2.2: Enhance opportunities for new drug development	X	X				One Health Secretariat, RAB
Activity 4.2.2.1: Conduct an assessment of the effectiveness of traditional disease management practices for selected common animal infectious disease as an alternative to antibiotic use	X					RAB
Activity 4.2.2.2: Assess the prerequisites for facilitating the establishment of a pharmaceutical industry in Rwanda	X	X				One Health Secretariat

	2025	2026	2027	2028	2029	
Strategic objective 5: Develop the economic case for sustainable investment that takes account of the needs of Rwanda, and increase investment in new medicines, diagnostic tools, vaccines, and other interventions.	X	X				RBC
Strategic intervention 5.1: Collaborate with International Partners in Basic Strategic objective Research	X	X				RBC
Intervention 5.1.1: Promote research to identify high-risk and high-burden resistant strains, their resistance mechanisms, and their transmission			X	X	X	RBC
Activity 5.1.1.1: Incorporate AMR into the national research agenda	X					RBC
Activity 5.1.1.2: Conduct specialized training programs, including in-house training, for scientists engaged in AMR research, with a focus on molecular biology, bioinformatics, and epidemiology	X					RBC
Activity 5.1.1.3: Establish a research grant program focused on AMR through multidisciplinary collaborations among microbiologists, epidemiologists, pharmacologists, and public health experts	X					RBC
Activity 5.1.1.4: Develop a centralized, open-access platform for researchers and health agencies to share data on resistant strains, resistance genes, and epidemiological patterns	X					RBC
Activity 5.1.1.4: Advocate for the establishment of local pharmaceutical companies for the manufacturing of diagnostic tools, medicines, and vaccines.	X					RBC

	2025	2026	2027	2028	2029	
Strategic objective 6: Enhance governance and coordination for a multisectoral approach to prevent and control AMR	X	X	X	X	X	One Health Secretariat, RBC, RAB, Rwanda FDA
Strategic intervention 6.1: Establish and Strengthen Governance and Coordination Mechanism at National and Subnational Levels	X	X	X	X	X	One Health Secretariat, RBC, RAB, Rwanda FDA
Intervention 6.1.1: Strengthen governance and coordination mechanisms to support a multisectoral approach for the prevention and control of AMR	X	X	X	X	X	One Health Secretariat, RBC, RAB, Rwanda FDA
Activity 6.1.1.1: Map and review all regulations relevant to AMR and AMU	X					RBC, Rwanda FDA
Activity 6.1.1.2: Operationalize Antimicrobial Stewardship Committees in human and animal health facilities	X	X	X	X	X	RBC, RAB
Activity 6.1.1.3: Develop the technical, operational, and financial capacity of the National Antimicrobial Resistance Advisory Committee for effective coordination and implementation of the NAP	X	X	X	X	X	One Health Secretariat
Activity 6.1.1.4: Support the quarterly meetings of the AMR Multisectoral TWGs	X	X	X	X	X	One Health Secretariat

	2025	2026	2027	2028	2029	
Intervention 6.1.2: Strengthen and sustain collaborative efforts among stakeholders to enhance a multisectoral response to AMR prevention and control	X	X	X			One Health Secretariat
Activity 6.1.2.1: Conduct a mapping of stakeholders involved in the implementation of the NAP on AMR	X					One Health Secretariat
Activity 6.1.2.2: Formalize partnerships and collaborations with relevant stakeholders in AMR	X		X			One Health Secretariat
Activity 6.1.2.3: Develop a framework for cross-sectoral collaboration related to AMR		X				One Health Secretariat
Activity 6.1.2.4: Advocate for AMR at the ministry level to strengthen the control system for overseeing compliance with the existing regulatory and legal framework on antimicrobials in the human, animal, plant, and environmental sectors		X				One Health Secretariat
Intervention 6.1.3: Establish and sustain effective monitoring and evaluation systems to track progress, assess impact, and ensure the effective implementation of AMR control and prevention interventions across all sectors	X	X	X	X	X	One Health Secretariat
Activity 6.1.3.1: Establish a continuous monitoring and evaluation (M&E) system for the implementation of the NAP		X	X	X	X	One Health Secretariat
Activity 6.1.3.2: Conduct a biannual Self-Assessment of the activities of the National Antimicrobial Resistance Advisory Committee	X	X	X	X	X	One Health Secretariat

6. COSTED OPERATIONAL PLAN

The effective execution of Rwanda's AMR NAP 2.0 will depend significantly on securing sustainable and adequate human, infrastructure, and financial resources. The NAP 2.0 was costed using the WHO Costing and Budgeting Tool for AMR NAPs (<https://www.who.int/teams/surveillance-prevention-control-AMR/who-amr-costing-and-budgeting-tool>). All activities were costed across the six strategic objectives and lead agencies/implementers.

The overall estimated cost to implement Rwanda's 5-year NAP 2.0 operational plan is 40,147,817,280.00 RWF (equivalent to USD 29,585,716.49) based on an exchange rate of 1 USD to 1,357 RWF as of October 23, 2024. The comprehensive budget outlines specific unit costs, implementation timelines, lead agency, and key underlying assumptions.

This section outlines the distribution of costs by implementation year and by strategic objective as well as the distribution of costs across lead agencies/implementers.

To achieve the estimated budget for NAP 2.0, Rwanda must strategically mobilize both domestic and international resources by leveraging contributions from public and private sectors. This approach includes not only increasing domestic funding for AMR but also actively seeking support through international partnerships and funding mechanisms. Additionally, exploring innovative financing options, such as public-private partnerships (PPPs), is essential as they can leverage government and private sector resources to support sustainable AMR interventions.

6.1 DISTRIBUTION OF COSTS BY IMPLEMENTATION YEARS (2025-2029)

Figure 2 presents the distribution of costs by implementation year from 2025 to 2029. The lowest implementation cost is expected during year 1 (2025) while the highest costs are anticipated in years 2 and 3. Understanding the annual cost distribution is essential for prioritizing resources and ensuring effective financial planning throughout the implementation period.

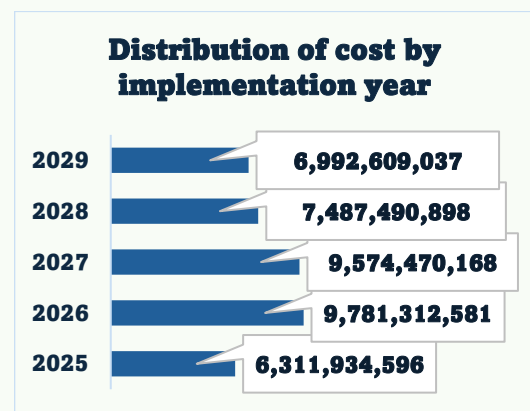


Figure 2: Distribution of costs by implementation year (2025-2029)

6.2 COSTS BY STRATEGIC OBJECTIVES OVER IMPLEMENTATION YEARS (2025-2029)

As Rwanda continues to advance its efforts in combating AMR, a structured financial framework is essential for effective resource mobilization. This section outlines the costs associated with each strategic objective over the implementation period from 2025 to 2029, providing a clear understanding of the investments required for the successful implementation of AMR NAP 2.0. Table 4 below presents the distribution of costs across strategic objectives over implementation years. Apart from Strategic Objective 5 - Develop the economic case for sustainable investment - all other objectives are planned to be implemented every year across the period of 2025-2029.

	Implementation year					Total Cost
	2025	2026	2027	2028	2029	
Strategic Objective 1 (SO1): Improve awareness and understanding of AMR	1,215,423,325 RWF (895,669.36 USD)	1,545,205,515 RWF (1,138,692.35 USD)	1,630,970,284 RWF (1,201,894.09 USD)	1,552,292,817 RWF (1,143,915.12 USD)	1,729,643,984 RWF (1,274,608.68 USD)	7,673,535,925 RWF (5,654,780 USD)
Strategic Objective 2 (SO2): Improve national antimicrobial surveillance program	4,108,587,920 RWF (3,027,699.28 USD)	2,861,851,060 RWF (2,108,954.36 USD)	3,821,822,136 RWF (2,816,375.93 USD)	1,778,726,799 RWF (1,310,778.78 USD)	1,797,543,301 RWF (1,324,645.03 USD)	14,368,531,216 RWF (10,588,453 USD)
Strategic Objective 3 (SO3): Reduce the incidence of infection	443,550,001 RWF (326,860.72 USD)	4,662,772,230 RWF (3,436,088.60 USD)	3,836,767,231 RWF (2,827,389.26 USD)	3,849,384,544 RWF (2,836,687.21 USD)	3,228,965,547 RWF (2,379,488.24 USD)	16,021,439,553 RWF (11,806,514 USD)
Strategic Objective 4 (SO4): Optimize the use of antimicrobials.	279,506,850 RWF (205,974.10 USD)	551,246,720 RWF (406,224.55 USD)	188,332,366 RWF (138,785.83 USD)	235,666,828 RWF (173,667.52 USD)	155,072,568 RWF (114,276.03 USD)	1,409,825,332 RWF (1,038,928 USD)
Strategic Objective 5 (SO5): Develop the economic case for sustainable investment	106,380,000 RWF (78,393.52 USD)	55,013,700 RWF (40,540.68 USD)	0	0	0	161,393,700.00 RWF (118,934 USD)
Strategic Objective 6 (SO6): Enhance governance and coordination.	158,486,500 RWF (116,791.82 USD)	105,223,356 RWF (77,541.16 USD)	96,578,151 RWF (71,170.34 USD)	71,419,910 RWF (52,630.74 USD)	81,383,637 RWF (59,973.20 USD)	513,091,554 RWF (378,107 USD)
Total Cost	6,311,934,596 RWF (4,651,388.80 USD)	9,781,312,581 RWF (7,208,041.70 USD)	9,574,470,168 RWF (7,055,615.45 USD)	7,487,490,898 RWF (5,517,679.36 USD)	6,992,609,037 RWF (5,152,991.18 USD)	40,147,817,280 RWF (29,585,716 USD)

Table 4: Distribution of costs across strategic objectives over implementation years

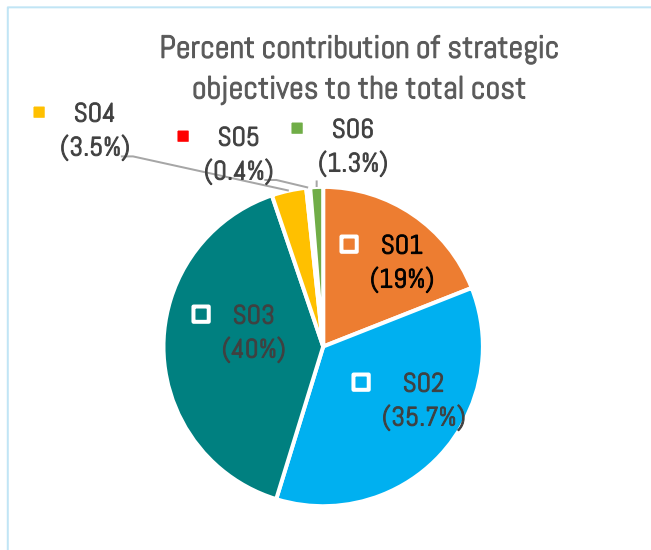


Figure 3 presents the percentage contribution of each strategic objective to the total cost. The strategic objective 3 - Reduce the incidence of infections- contributes the highest percentage of the total cost (40%) followed by strategic objective 2-Improve national antimicrobial surveillance program (35.7%).

Figure 3: Percent contribution of strategic objectives to the total cost

6.3 DISTRIBUTION OF COSTS ACROSS LEAD AGENCIES/IMPLEMENTERS (2025-2029)

In the spirit of 'One Health' approach, six national agencies were identified to lead the implementation of Rwanda NAP2.0: One Health Secretariate; Rwanda Biomedical Centre (RBC); Rwanda Animal Board (RAB); Rwanda Environment Management Authority (REMA); Rwanda Food and Drugs Authority (RFDA) and University of Rwanda (UR). Figure 4 highlights the distribution of costs across lead agencies/implementers for the period from 2025 to 2029, presented in both RWF and USD. It also includes a breakdown of the percentage distribution of costs among these agencies. It is expected that RAB and RBC will be responsible for implementing, in equal shares (36% each), the largest portion of the estimated budget, followed by One Health Secretariate and UR (11% each), while REMA and RFDA will be responsible for activities representing 6% and 0.2% of the total cost, respectively.

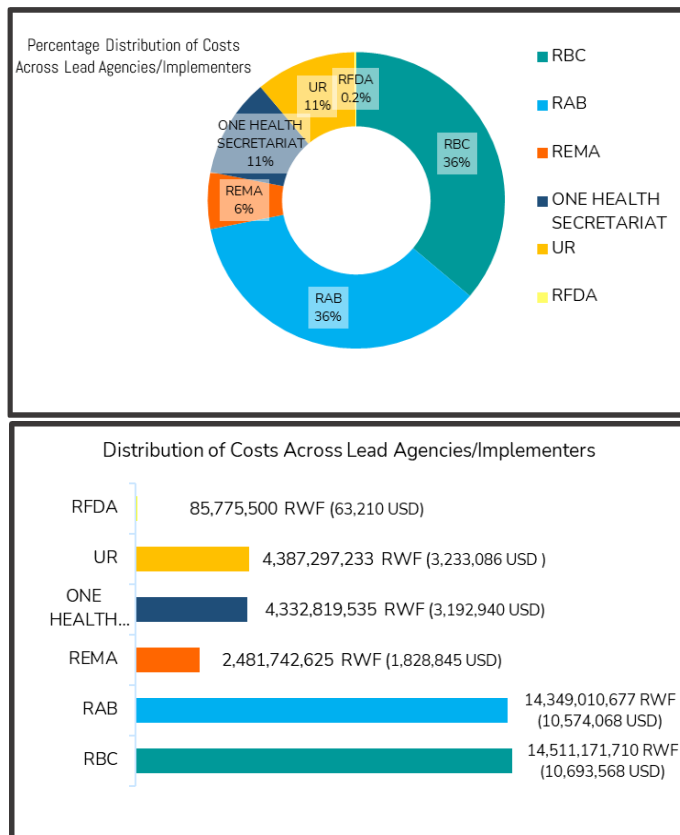


Figure 4: Distribution of Costs in Amount and Percentage Across Lead Agencies/Implementers

	Implementation year					Total Cost
	2025	2026	2025	2026	2025	
One Health Secretariat	593,918,075 RWF 437,670 (USD)	1,100,246,090 RWF 810,793 (USD)	889,626,700 RWF 655,583 (USD)	860,453,359 RWF 634,085 (USD)	888,575,311 RWF 654,809 (USD)	4,332,819,535 RWF 3,192,940 (USD)
Rwanda Biomedical Center (RBC)	3,610,722,694 RWF 2,658,853 (USD)	4,058,935,353 RWF 2,991,109 (USD)	2,614,165,758 RWF 1,926,430 (USD)	2,461,417,953 RWF 1,813,867 (USD)	1,768,588,805 RWF 1,303,308 (USD)	14,511,171,710 RWF 10,693,568 (USD)
Rwanda Agriculture and Animal Resources Development (RAB)	1,101,433,650 RWF 811,070 (USD)	3,642,506,601 RWF 2,684,235 (USD)	3,104,205,947 RWF 2,287,550 (USD)	3,178,035,996 RWF 2,341,957 (USD)	3,323,639,553 RWF 2,449,255 (USD)	14,349,010,677 RWF 10,574,068 (USD)
Rwanda Environment Management Authority (REMA)	128,331,200 RWF 94,570 (USD)	86,501,467 RWF 63,745 (USD)	2,098,781,436 RWF 1,546,633 (USD)	76,508,746 RWF 56,381 (USD)	91,619,776 RWF 67,516 (USD)	2,481,742,625 RWF 1,828,845 (USD)
University of Rwanda	795,223,400 RWF 586,016 (USD)	893,123,070 RWF 658,160 (USD)	867,690,327 RWF 639,418 (USD)	911,074,844 RWF 671,389 (USD)	920,185,592 RWF 678,103 (USD)	4,387,297,233 RWF 3,233,086 (USD)
Rwanda Food and Drugs Authority (Rwanda FDA)	85,775,500 RWF 63,210 (USD)	0 RWF 0 (USD)	0 RWF 0 (USD)	0 RWF 0 (USD)	0 RWF 0 (USD)	85,775,500 RWF 63,210 (USD)
Total Cost	6,311,934,596 RWF 4,651,389 (USD)	9,781,312,581 RWF 7,208,042 (USD)	9,574,470,168 RWF 7,055,615 (USD)	7,487,490,898 RWF 5,517,679 (USD)	6,992,609,037 RWF 5,152,991 (USD)	40,147,817,280 RWF 29,585,716 (USD)

Table 5: Distribution of costs lead agencies/implementers over implementation years

The summary of the 5 years costed results by activity, for each strategic objective and for lead agency, are included in the Annex I to this document. The detailed breakdown of the costs associated with each activity, refer to the AMR NAP costing tool available through the following link:

<https://app.box.com/s/j9uzj488dd3q6vt5mrol4ugeseitzf0g>

7. MONITORING AND EVALUATION

7.1 LOGICAL FRAMEWORK

This Monitoring and Evaluation logical framework defines indicators, targets, and data sources at the level of the interventions which feed into the higher-level indicators at the level of strategic interventions and objectives for a broader picture of the impact.

Table 6: Monitoring and evaluation legal framework

Strategic Objectives & Strategic interventions & Interventions	Indicators	Baseline 2024	INTERIM TARGETS					Target 2029	Data Source
			2025	2026	2027	2028	2029		
STRATEGIC OBJECTIVE 1: Improve awareness and understanding of AMR through effective communication, education, and training among One Health professionals, community members, and policymakers for better decision-making.	Awareness and knowledge score of stakeholders on AMR	TBD	-	-		Increase of 25%	-	Increase of 50%	KAP survey reports
Strategic Intervention 1.1. Enhance Interventions aimed at improving public awareness	Number of training/education sessions on AMR conducted in all One Health sectors	0	2	4		6	8	10	One Health Secretariat Awareness activities report
Intervention 1.1.1. Conduct ongoing assessment of the level of knowledge and practices on AMR among social and professional groups belonging to the human, animal, plant, and environment sectors.	Number of KAP assessments conducted	0	1			1		3	KAPs report at One Health secretariat
Intervention 1.1.2. Undertake AMR awareness-raising activities in primary, secondary, and higher learning institutions, health facilities, youth organizations, animal health workers, community members, and policymakers using specialized educational materials	Number of AMR awareness campaigns undertaken in One Health sectors	0	1	1		1	1	5	One Health Secretariat Awareness activities report

Strategic Objectives & Strategic interventions & Interventions	Indicators	Baseline 2024	INTERIM TARGETS					Target 2029	Data Source
			2025	2026	2027	2028	2029		
Intervention 2.1.2. Collect, analyze, disseminate and share surveillance data and information through routine clinical sampling of patients to facilitate decision-making on diagnoses and treatments in clinical human (public and private) health, veterinary practice, environment and wildlife laboratories and food technologies using a One Health approach	Proportion of surveillance data from functional sentinel laboratories collected, analyzed, and shared promptly	TBD	100%	100%		100%	100%	100%	Annual Report
	Proportion of sentinel sites generating AMR surveillance data	24% (4 sites out of 17 sites generate AMR surveillance data)	35% (6 out of 17 sites)	40% (7 out of 17 sites)		60% (10 out of 17 sites)	90% (16 out of 17 sites)	100%	Annual Report
Strategic Intervention 2.2 Support Surveillance of Antimicrobial use	Availability of a Surveillance system of Antimicrobial Use in One Health sectors	No				Yes		Yes	Assessment report of the Surveillance system of Antimicrobial Use in One Health sectors
Intervention 2.2.1. Develop and implement procedures and methodologies for monitoring the import, use, and disposal of antimicrobials	Cumulative number of point prevalence surveys on antimicrobial use in human health (inpatient and outpatients) conducted nationally	0	1			2		3	Point prevalence survey reports
	Cumulative number of surveys on antimicrobial use in animal health conducted nationally	0	1			2		3	Survey reports
	Cumulative number of surveys on antimicrobial use in agriculture conducted nationally	0	1			2		3	Survey reports

Strategic Objectives & Strategic interventions & Interventions	Indicators	Baseline 2024	INTERIM TARGETS					Target 2029	Data Source
			2025	2026	2027	2028	2029		
OBJECTIVE 3: Reduce the incidence of infection through effective sanitation, hygiene and infection prevention measures through a One Health approach	Incidence of Healthcare Associated Infections (HAIs) in human and animal health	TBD				15% reduction		30% reduction	Assessment reports
Strategic Intervention 3.1. Promote Biosecurity Measures in Agriculture	Proportion of farms that adhere to biosecurity measures	TBD				25% increase		50% increase	Assessment reports
Intervention 3.1.1. Promote hygiene, sanitation and infection prevention practices on farms.	Cumulative number of trainings on hygiene, sanitation and infection prevention practices conducted among farmers	Unknown	3	6		9	12	15	Training reports and attendance records
Strategic Intervention 3.2. Strengthen Infection Prevention and Control (IPC) programs in Human, animal and environment	Proportion of health facilities that adhere to IPC guidelines	TBD				30% increase		60% increase	Assessments reports
	Proportion of farms that adhere to IPC guidelines	TBD				30% increase		60% increase	Assessments reports
Intervention 3.2.1. Strengthening infection prevention practices in communities and healthcare and farming facilities.	Cumulative number of trainings conducted for IPC among community members, Healthcare workers (HCW) and farmers	TBD	4	8		12	16	20	Annual Report
	Cumulative number of the assessments conducted regarding the adherence to IPC standards in healthcare and farming facilities	Unknown	2	4		6	8	10	Assessment reports

Strategic Objectives & Strategic interventions & Interventions	Indicators	Baseline 2024	INTERIM TARGETS					Target 2029	Data Source
			2025	2026	2027	2028	2029		
Intervention 3.3.2. Organize training sessions for animal health workers on hygiene and safety.	Cumulative number of trainings on personal hygiene and environmental sanitation conducted in congregate settings	TBD	3	6		9	12	15	Training reports and attendance records
	Cumulative number of trainings of animal health workers on hygiene and safety	TBD	3	6		9	12	15	Training reports and attendance records
STRATEGIC OBJECTIVE 4: Optimize the Use of Antimicrobials in Human, Plants and Animal Health	Percentage of human and animal health facilities that implement and adhere to standardized antimicrobial stewardship guidelines	TBD				15% increase		30% increase	Point prevalence survey report and prescription audit in hospitals, surveys in plant and dispensing outlets
Strategic Intervention 4.1 Promote Optimal Prescribing, Dispensing and Use of antimicrobials	Percentage of adult and pediatric hospital patients receiving an antibiotic according to AWaRe categories	TBD				15% increase		30% increase	PPS reports
Intervention 4.1.1. Promote the use of standard treatment guidelines for infectious diseases both in human and animal health	Number of public and private institutions in human, animal, and plant health sectors that integrate prescription regulations and standard treatment guidelines for antimicrobials into their key performance indicators (KPIs)	0		25			45	70	Institution assessment reports
Interventions 4.1.2: Strengthen supervision of prescribing of prescribing healthcare facilities and dispensing pharmacies and other outlets for human and animal-related antimicrobials	Cumulative number of supervisions of prescribing and dispensing outlets for human and animal-related antimicrobials per year	0	1	2		3	4	5	Inspection report at the MoH and Rwanda FDA

Strategic Objectives & Strategic interventions & Interventions	Indicators	Baseline 2024	INTERIM TARGETS					Target 2029	Data Source
			2025	2026	2027	2028	2029		
Strategic Intervention 4.2. Strengthen the pharmaceutical manufacturing and supply chain	Proportion of human and animal health facilities with efficient and real-time stock management system and inventory	TBD				25% increase		50% increase	Assessment report of the real-time stock management system in health facilities
Intervention 4.2.1. Enhance stock management and accessibility of antimicrobial products in the human and animal health sectors	Number of health facilities in the human sector whose stock management has real-time interoperability with the Electronic Health Supply Chain Management Module (eLMIS) for Rwanda Medical Supply (RMS).	0		13			30	43	Assessment report
	Number of health facilities in animal health with electronic stock management system					5	2	7	Assessment report
Intervention 4.2.2 Enhance opportunities for new drug development	Number of investigated traditional management practices of animal and/or plants infectious disease as an alternative to antibiotic use	0				1		1	Research report

Strategic Objectives & Strategic interventions & Interventions	Indicators	Baseline 2024	INTERIM TARGETS					Target 2029	Data Source
			2025	2026	2027	2028	2029		
STRATEGIC OBJECTIVE 5: Develop the economic case for sustainable investment that takes account of the needs of Rwanda, and increase investment in new medicines, diagnostic tools, vaccines and other interventions.	Number of feasibility study to create companies that develop new medicines, diagnostic tools, and vaccines.	0	0	0		0	1	2	
Strategic Intervention 5.3 Collaborate with International Partners in Basic Strategic objective Research	Number of international partners involved in basic strategic objective research projects	TBD				at least 3 additional partners		at least 5 additional partners	Report
Intervention 5.3.1. Promote research to identify high-risk and high-burden resistant strains, their resistance mechanisms and their transmission	Number of research studies published to identify high-risk and high-burden antimicrobial-resistant strains, their resistance mechanisms, and transmission pathways.	TBD		1		1	1	4	Annual Report
	Cumulative number of grants related to AMR research	0				1		2	Annual Report

Strategic Objectives & Strategic interventions & Interventions	Indicators	Baseline 2024	INTERIM TARGETS					Target 2029	Data Source
			2025	2026	2027	2028	2029		
STRATEGIC OBJECTIVE 6: Enhance governance and coordination for a multisectoral approach to prevent and control AMR	Number of formal and effective governance bodies on AMR			1				1	Annual Report
Strategic Intervention 6.1. Establish and Strengthen Governance and Coordination Mechanism at National and Subnational Levels									Annual Report
Intervention 6.1.1. Strengthen governance and coordination mechanisms to support a multisectoral approach for the prevention and control of AMR	Cumulative number of AMR-related policies or action plans that are approved and implemented	5	7	8		9	10	11	List of AMR-related policies or action plans
	Proportion of established AMR Technical Working Group with approved clear terms of references (ToRs)	60%	60%	70%		70%	90%	100%	Approved ToR for AMR TWG, Approved Action plan for AMR activities
	Approved One Health Prime Ministers Instruction establishing the One Health Secretariat	0	0	1				1	Published Ministerial Instructions
	Cumulative number of established and operational AMS committees	12		17				20	Government reports, meeting minutes, and official records from ministries or health agencies
	Cumulative number of interagency coordination meetings on AMR-related issues	4	8	12		16	20	24	Minutes of meeting/ meeting reports

Strategic Objectives & Strategic interventions & Interventions	Indicators	Baseline 2024	INTERIM TARGETS					Target 2029	Data Source
			2025	2026	2027	2028	2029		
Intervention 6.1.2. Strengthen and sustain collaborative efforts among stakeholders to enhance a multisectoral response to AMR prevention and control	Cumulative number of formal partnerships or agreements signed between key stakeholders (government, private sector, academia, and international organizations) for AMR collaboration	0	1			2	3	3	Memoranda of understanding (MoUs), partnership agreements, and government records
	Percentage of interventions with available funding in the NAP	TBD				50%		75%	Program reports, funding disbursement records, and monitoring logs from relevant organizations
	Number of ministerial orders for compliance to regulatory and legal requirements	0	1					1	Ministerial order
Intervention 6.1.3. Establish and sustain effective monitoring and evaluation systems to track progress, assess impact, and ensure the effective implementation of AMR interventions control and prevention across all sectors	Cumulative number of annual M&E reports produced on a timely basis	0	1	2		3	4	5	M&E framework documents, government reports, and health institution records.
	Cumulative number of evaluations of the AMR NAP	0				1		2	Evaluation reports

8. Glossary

- Antimicrobial resistance:** is the ability of microorganisms—such as bacteria, viruses, fungi, and parasites—to resist the effects of medications that once successfully treated infections caused by them.
- Antimicrobial use:** is the consumption of antimicrobials—including antibiotics, antivirals, antifungals, and antiparasitics—across human, animal, and agricultural sector.
- Antimicrobial stewardship:** refers to a coordinated approach to optimizing the use of antimicrobials—such as antibiotics, antivirals, antifungals, and antiparasitics—in order to improve patient outcomes, reduce microbial resistance, and decrease the spread of infections caused by resistant organisms.
- Antimicrobial Susceptibility Testing:** is a laboratory procedure used to determine the effectiveness of specific antimicrobials (such as antibiotics, antivirals, antifungals, or antiparasitics) against microorganisms.

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10. Annexes

Annex I: Elaborated Summary of Cost (in RWF) of Activities and Lead Agency/ Implementers (2025 –2029)

Activities	Lead agency implementer						Total Cost (RWF)
	RBC	RAB	REMA	ONE HEALTH SECRETARIAT	UR	FDA	
Strategic objectives 1: Improve awareness and understanding of AMR through effective communication, education, and training among One Health professionals, community members, and policymakers for better decision-making.	81,056,423	89,875,846	44,937,923	3,070,368,500	4,387,297,233		7,673,535,925
Strategic interventions 1.1: Enhance Interventions aimed at improving public awareness	81,056,423	89,875,846	44,937,923	3,070,368,500	4,387,297,233		7,673,535,925
Interventions 1.1.1: Conduct ongoing assessment of the level of knowledge and practices on AMR among social and professional groups belonging to the human, animal, plant, and environment sectors.	81,056,423	89,875,846	44,937,923	326,161,820			542,032,012
Activities 1.1.1.1: Develop awareness assessment tools on AMR for human, animal, plant, and environmental sectors	36,118,500						36,118,500

Activities	Lead agency implementer						Total Cost (RWF)
	RBC	RAB	REMA	ONE HEALTH SECRETARIAT	UR	FDA	
Activities 1.1.1.2: Conduct an assessment of the levels of knowledge and practices regarding AMR among social and professional groups within the human, animal, plant, and environmental sectors	44,937,923	89,875,846	44,937,923	24,050,706			203,802,398
Activities 1.1.1.3: Disseminate the findings of the assessment among relevant stakeholder sectors				302,111,114			302,111,114
Interventions 1.1.2: Undertake AMR awareness-raising activities in primary, secondary, and higher learning institutions, health facilities, youth organizations, animal health workers, community members, and policymakers using specialized educational materials				2,744,206,680	4,025,034,470		6,769,241,150
Activities 1.1.2.1: Develop an awareness-raising plan for academic institutions, health facilities, youth organizations, animal health workers, community members, and policymakers using specialized materials				82,092,208			82,092,208

Activities	Lead agency implementer						Total Cost (RWF)
	RBC	RAB	REMA	ONE HEALTH SECRETARIAT	UR	FDA	
Activities 1.1.2.2: Develop and disseminate awareness-raising posters, flyers, banners, and charts for academic institutions, health facilities, youth organizations, and communities				123,536,366			123,536,366
Activities 1.1.2.3: Raise public awareness on AMR status, risk factors, and prevention during World Antimicrobial Awareness Week (WAAW)				806,895,643			806,895,643
Activities 1.1.2.4: Organize high-level policy dialogue on AMR				23,704,200			23,704,200
Activities 1.1.2.5: Conduct behavior change campaigns among relevant institutions, including animal and human health workers, community members, youth organizations, and those involved in the use of antimicrobials in humans, animals, plants, and the food value chain, especially where alternatives exist to reduce antimicrobial use					4,025,034,470		4,025,034,470
Activities 1.1.2.6: Develop training materials on AMR adapted to different One Health sectors (human, animal, environment, and plant) and targeting relevant professionals				49,490,683			49,490,683

Activities	Lead agency implementer						Total Cost (RWF)
	RBC	RAB	REMA	ONE HEALTH SECRETARIAT	UR	FDA	
Activities 1.1.2.7: Conduct regular trainings on AMR for professionals in all One Health sectors				1,658,487,580			1,658,487,580
Interventions 1.1.3: Enhance public awareness through dissemination and publication of research findings					362,262,763		362,262,763
Activities 1.1.3.1: Organize seminars, conferences, and symposiums for sharing AMR research findings					362,262,763		362,262,763
Strategic objectives 2: Improve national antimicrobial surveillance program using a One Health approach.	9,004,801,859	3,000,969,031	2,316,239,326			46,521,000	14,368,531,216
Strategic interventions 2.1: Support laboratory surveillance of AMR	8,933,690,465	2,929,857,637	2,282,161,265				14,145,709,367
Interventions 2.1.1: Build laboratory capacity for AMR surveillance by establishing national and subnational microbiological services using up-to-date molecular techniques, and by standardizing testing methods across agencies for humans, livestock, aquaculture, plants, the environment, and pets	8,133,764,634	2,510,423,553	2,079,584,234				12,723,772,421

Activities	Lead agency implementer						Total Cost (RWF)
	RBC	RAB	REMA	ONE HEALTH SECRETARIAT	UR	FDA	
Activities 2.1.1.1: Build human capacity in sample collection, testing procedures, and data analysis (through training, mentorship, and supervision) for both human and animal health	681,106,157	449,252,871					1,130,359,028
Activities 2.1.1.2: Equip all sentinel sites with equipment, reagents, and consumables for culture, identification, and antimicrobial susceptibility testing (AST)	5,567,547,153	1,448,817,688					7,016,364,841
Activities 2.1.1.3: Standardize laboratory infrastructure in all microbiology laboratories across the human, animal, plant, and environmental sectors to achieve optimal and consistent results in culture, identification, and AST	703,500,000	241,500,000	2,040,200,000				2,985,200,000
Activities 2.1.1.4: Certify testing laboratories in accordance with recognized international standards for human and animal health	1,148,868,130	338,109,800	30,996,373				1,517,974,303
Activities 2.1.1.5: Hire personnel responsible for analyzing AMR surveillance data	32,743,194	32,743,194	8,387,861				73,874,249

Activities	Lead agency implementer						Total Cost (RWF)
	RBC	RAB	REMA	ONE HEALTH SECRETARIAT	UR	FDA	
Interventions 2.1.2: Collect, analyze, disseminate, and share surveillance data and information through routine clinical sampling of patients to facilitate decision-making on diagnoses and treatments in clinical human (public and private) health, veterinary practice, environment and wildlife laboratories and food technologies using a One Health approach	799,925,831	419,434,084	202,577,031				1,421,936,946
Activities 2.1.2.1: Develop and review guidelines and protocols related to AMR surveillance	117,356,473	78,259,188	53,967,197				249,582,858
Activities 2.1.2.2: Develop an integrated reporting system tool for AMR surveillance	217,284,813						217,284,813
Activities 2.1.2.3: Collect passive AMR surveillance data from facility-based sources, analyze them, and report findings using the surveillance tool	13,608,914	4,536,304					18,145,218
Activities 2.1.2.4: Collect active AMR surveillance data from human, animal, and environmental community-based sources, analyze them, and report the findings using the surveillance tool.	232,178,171	336,638,592	148,609,834				717,426,597

Activities	Lead agency implementer						Total Cost (RWF)
	RBC	RAB	REMA	ONE HEALTH SECRETARIAT	UR	FDA	
Activities 2.1.2.5: Develop and publish manuscripts and policy briefs based on AMR surveillance data	91,387,200						91,387,200
Activities 2.1.2.6: Conduct a Technical Working Group (TWG) workshop for the validation and dissemination of AMR surveillance data	128,110,260						128,110,260
Strategic interventions 2.2: Support Surveillance of Antimicrobial use	71,111,394	71,111,394	34,078,061			46,521,000	222,821,849
Interventions 2.2.1: Develop and implement procedures and methodologies for monitoring the import, use, and disposal of antimicrobials	71,111,394	71,111,394	34,078,061			46,521,000	222,821,849
Activities 2.2.1.1: Hire a consultant/ build the capacity of the One Health unit to develop policies, guidelines, and procedures for monitoring the import, use, and disposal of antimicrobials						46,521,000	46,521,000
Activities 2.2.1.2: Validate and approve the developed policies, guidelines, and procedures for monitoring antimicrobials	12,877,200	12,877,200	12,877,200				38,631,600

Activities	Lead agency implementer						Total Cost (RWF)
	RBC	RAB	REMA	ONE HEALTH SECRETARIAT	UR	FDA	
Activities 2.1.1.3: Standardize laboratory infrastructure in all microbiology laboratories across the human, animal, plant, and environmental sectors to achieve optimal and consistent results in culture, identification, and AST	703,500,000	241,500,000	2,040,200,000				2,985,200,000
Activities 2.1.1.4: Certify testing laboratories in accordance with recognized international standards for human and animal health	1,148,868,130	338,109,800	30,996,373				1,517,974,303
Activities 2.1.1.5: Hire personnel responsible for analyzing AMR surveillance data	32,743,194	32,743,194	8,387,861				73,874,249
Interventions 2.1.2: Collect, analyze, disseminate, and share surveillance data and information through routine clinical sampling of patients to facilitate decision-making on diagnoses and treatments in clinical human (public and private) health, veterinary practice, environment and wildlife laboratories and food technologies using a One Health approach	799,925,831	419,434,084	202,577,031				1,421,936,946
Activities 2.1.2.1: Develop and review guidelines and protocols related to AMR surveillance	117,356,473	78,259,188	53,967,197				249,582,858
Activities 2.1.2.3: Collect passive AMR surveillance data from facility-based sources, analyze them, and report findings using the surveillance tool	13,608,914	4,536,304					18,145,218

Activities	Lead agency implementer						Total Cost (RWF)
	RBC	RAB	REMA	ONE HEALTH SECRETARIAT	UR	FDA	
Activities 2.1.2.4: Collect active AMR surveillance data from human, animal, and environmental community-based sources, analyze them, and report the findings using the surveillance tool.	232,178,171	336,638,592	148,609,834				717,426,597
Activities 2.1.2.5: Develop and publish manuscripts and policy briefs based on AMR surveillance data	91,387,200						91,387,200
Activities 2.1.2.6: Conduct a Technical Working Group (TWG) workshop for the validation and dissemination of AMR surveillance data	128,110,260						128,110,260
Strategic interventions 2.2: Support Surveillance of Antimicrobial use	71,111,394	71,111,394	34,078,061			46,521,000	222,821,849
Interventions 2.2.1: Develop and implement procedures and methodologies for monitoring the import, use, and disposal of antimicrobials	71,111,394	71,111,394	34,078,061			46,521,000	222,821,849
Activities 2.2.1.1: Hire a consultant/ build the capacity of the One Health unit to develop policies, guidelines, and procedures for monitoring the import, use, and disposal of antimicrobials						46,521,000	46,521,000
Activities 2.2.1.2: Validate and approve the developed policies, guidelines, and procedures for monitoring antimicrobials	12,877,200	12,877,200	12,877,200				38,631,600

Activities	Lead agency implementer						Total Cost (RWF)
	RBC	RAB	REMA	ONE HEALTH SECRETARIAT	UR	FDA	
Activities 2.2.1.3: Train One Health practitioners on the policies, guidelines, and procedures for monitoring the use of antimicrobials	25,491,000	25,491,000	12,813,000				63,795,000
Activities 2.2.1.4: Analyze and monitor AMR surveillance data in relation to antimicrobial consumption (AMC) and antimicrobial use (AMU) data across One Health sectors	32,743,194	32,743,194	8,387,861				73,874,249
Strategic objectives 3: Reduce the incidence of infection through effective sanitation, hygiene and infection prevention measures through a One Health approach	4,809,211,123	11,091,663,054	120,565,376				16,021,439,553
Strategic interventions 3.1: Promote Biosecurity Measures in Agriculture	1,472,014,868	10,978,313,956					12,450,328,824
Interventions 3.1.1: Promote hygiene, sanitation, and infection prevention practices on farms.	1,472,014,868	10,978,313,956					12,450,328,824
Activities 3.1.1.1: Conduct awareness campaigns for farmers on hygiene, sanitation, and infection prevention practices on farms		4,100,942,276					4,100,942,276
Activities 3.1.1.2: Conduct training for farmers on biosecurity measures, including proper equipment disinfection, footbath usage, and controlled access to the farms		585,914,920					585,914,920
Activities 3.1.1.3: Establish handwashing and footbath stations in health facilities and farms to prevent the spread of pathogens	1,472,014,868	6,291,456,760					7,763,471,628

Activities	Lead agency implementer						Total Cost (RWF)
	RBC	RAB	REMA	ONE HEALTH SECRETARIAT	UR	FDA	
Strategic interventions 3.2: Strengthen Infection Prevention and Control Programs in Human, animal, and environment	2,024,378,811	113,349,098	120,565,376				2,258,293,285
Interventions 3.2.1: Strengthening infection prevention practices in communities and healthcare and farming facilities	1,798,025,365	31,372,538	90,269,775				1,919,667,678
Activities 3.2.1.1: Organize workshops on infection prevention, personal hygiene, handwashing techniques, and proper sanitation practices tailored for community members, healthcare workers, and farmers	245,450,365	31,372,538					276,822,903
Activities 3.2.1.2: Establish handwashing stations equipped with soap and clean water in public areas to promote regular hand hygiene	1,552,575,000						1,552,575,000
Activities 3.2.1.3: Develop proper waste management systems for the safe disposal of medical and farm waste, including needles, syringes, animal waste, and expired medications			90,269,775				90,269,775
Interventions 3.2.2: Conduct a baseline assessment of barriers to adherence to infection prevention and control (IPC) guidelines (e.g., insufficient space to isolate patients and lack of training on guidelines)	54,353,376						54,353,376
Activities 3.2.2.1: Design a comprehensive research plan that details the assessment scope, methodology, data collection tools, and timeline	16,357,950						16,357,950

Activities	Lead agency implementer						Total Cost (RWF)
	RBC	RAB	REMA	ONE HEALTH SECRETARIAT	UR	FDA	
Activities 3.2.2.2: Conduct a baseline assessment of barriers to adherence to IPC guidelines	37,995,426						37,995,426
Interventions 3.2.3: Develop and disseminate tools for information, education, and behavior change on IPC using a One Health approach	81,113,269	51,680,959					132,794,228
Activities 3.2.3.1: Conduct continuous surveillance of healthcare-associated infections (HAIs) in human and animal healthcare facilities	81,113,269	51,680,959					132,794,228
Interventions 3.2.4: Assess and institute or strengthen minimum infrastructure standards to promote IPC across all One Health settings	90,886,801	30,295,601	30,295,601				151,478,003
Activities 3.2.4.1: Monitor and evaluate existing infrastructures against established standards for IPC	90,886,801	30,295,601	30,295,601				151,478,003
Strategic interventions 3.3: Review and strengthen health waste management systems in human and animal health sectors	1,312,817,444						1,312,817,444
Interventions 3.3.1: Promote personal hygiene and environmental sanitation in congregate settings	1,312,817,444						1,312,817,444
Activities 3.3.1.1: Provide pamphlets, posters, and flyers in visible locations, such as bathrooms and communal areas, highlighting key personal hygiene practices	155,095,802						155,095,802

Activities	Lead agency implementer						Total Cost (RWF)
	RBC	RAB	REMA	ONE HEALTH SECRETARIAT	UR	FDA	
Activities 3.3.1.2: Set up refillable handwashing and sanitizing stations at public strategic locations, such as restrooms, eating areas, and entry/exit points, ensuring regular restocking	530,276,250						530,276,250
Activities 3.3.1.3: Support the implementation of the waste management guidelines at health facility level	140,976,911						140,976,911
Activities 3.3.1.4: Conduct handwashing campaigns in public places to encourage regular handwashing	226,175,063						226,175,063
Activities 3.3.1.5: Develop and implement hygiene and sanitation response plans for managing infectious disease outbreaks to prevent the rapid spread of infections	260,293,418						260,293,418
Strategic objectives 4: Optimize the use of antimicrobials in human and animal health	415,999,921	95,359,500		898,465,911			1,409,825,332
Strategic interventions 4.1: Promote Optimal Prescribing, Dispensing and Use of antimicrobials	415,999,921	63,328,500		630,606,109			1,109,934,530
Interventions 4.1.1: Promote the use of standard treatment guidelines for infectious diseases in both human and animal health	294,682,211	56,457,000		564,706,918			915,846,129
Activities 4.1.1.1: Establish prescription-only legislation for antimicrobials in humans, animals, and plants, and incorporate inspection variables for the prescription and dispensing of antimicrobials into the key performance indicators (KPIs) of both public and private human and veterinary pharmacies and other outlets				334,333,503			334,333,503

Activities	Lead agency implementer						Total Cost (RWF)
	RBC	RAB	REMA	ONE HEALTH SECRETARIAT	UR	FDA	
Activities 4.1.1.2: Establish legislation that prohibits the use of antibiotics for growth promotion in animals and restricts the use of applicable pesticides with antimicrobial effects, such as bactericides and fungicides, in plant production		40,329,000					40,329,000
Activities 4.1.1.3: Develop/revise and disseminate standard treatment guidelines for the use of antimicrobials in human and animal health sectors, including both domestic and wild animals, across public and private facilities	55,020,394	16,128,000		230,373,415			301,521,809
Activities 4.1.1.4: Develop a tool for assessing antimicrobial stewardship programs in human and animal health	34,318,938						34,318,938
Activities 4.1.1.5: Conduct a nationwide assessment of antimicrobial stewardship (AMS) programs in human and animal health	205,342,879						205,342,879
Interventions 4.1.2: Strengthen supervision of prescribing of prescribing healthcare facilities and dispensing pharmacies and other outlets for human and animal-related antimicrobials	121,317,710	6,871,500		65,899,191			194,088,401
Activities 4.1.2.1: Develop tools for inspecting antimicrobial prescription and dispensing at all levels of human and animal health systems	16,670,255						16,670,255
Activities 4.1.2.2: Develop electronic prescriptions that integrate (interoperate) with systems at pharmacies and other antimicrobial dispensing outlets				65,899,191			65,899,191
Activities 4.1.2.3: Conduct regular inspections on prescription and dispensing of antimicrobials in public and private hospitals, pharmacies, and dispensaries within human and animal health systems	104,647,455	6,871,500					111,518,955

Activities	Lead agency implementer						Total Cost (RWF)
	RBC	RAB	REMA	ONE HEALTH SECRETARIAT	UR	FDA	
Strategic interventions 4.2: Strengthen the pharmaceutical manufacturing and supply chain		32,031,000		267,859,802			299,890,802
Interventions 4.2.1: Enhance stock management and accessibility of antimicrobial products in the human and animal health sectors				171,870,777			171,870,777
Activities 4.2.1.1: Link stock management systems at health facility levels with one another, and with the Electronic Health Supply Chain Management Module for Rwanda Medical Supply (RMS) at both local and central levels				146,877,445			146,877,445
Activities 4.2.1.2: Establish stock management rules for antimicrobial products at all levels relative to the respective AWaRe and VEN classifications as well as a mechanism to report the antimicrobial inventory				24,993,332			24,993,332
Interventions 4.2.2: Enhance opportunities for new drug development		32,031,000		95,989,025			128,020,025
Activities 4.2.2.1: Conduct an assessment of the effectiveness of traditional disease management practices for selected common animal infectious disease as an alternative to antibiotic use		32,031,000					32,031,000
Activities 4.2.2.2: Assess the prerequisites for facilitating the establishment of a pharmaceutical industry in Rwanda				95,989,025			95,989,025

Activities	Lead agency implementer						Total Cost (RWF)
	RBC	RAB	REMA	ONE HEALTH SECRETARIAT	UR	FDA	
Strategic objectives 5: Develop the economic case for sustainable investment that takes account of the needs of Rwanda, and increase investment in new medicines, diagnostic tools, vaccines, and other interventions.	161,393,700						161,393,700
Strategic interventions 5.1: Collaborate with International Partners in Basic Strategic objective Research	161,393,700						161,393,700
Interventions 5.1.1: Promote research to identify high-risk and high-burden resistant strains, their resistance mechanisms, and their transmission	161,393,700						161,393,700
Activities 5.1.1.1: Incorporate AMR into the national research agenda	31,158,000						31,158,000
Activities 5.1.1.2: Conduct specialized training programs, including in-house training, for scientists engaged in AMR research, with a focus on molecular biology, bioinformatics, and epidemiology	73,272,000						73,272,000
Activities 5.1.1.3: Establish a research grant program focused on AMR through multidisciplinary collaborations among microbiologists, epidemiologists, pharmacologists, and public health experts	1,950,000						1,950,000
Activities 5.1.1.4: Develop a centralized, open-access platform for researchers and health agencies to share data on resistant strains, resistance genes, and epidemiological patterns	52,500,000						52,500,000
Activities 5.1.1.5: Advocate for the establishment of local pharmaceutical companies for the manufacturing of diagnostic tools, medicines, and vaccines.	2,513,700						2,513,700

Activities	Lead agency implementer						Total Cost (RWF)
	RBC	RAB	REMA	ONE HEALTH SECRETARIAT	UR	FDA	
Strategic objectives 6: Enhance governance and coordination for a multisectoral approach to prevent and control AMR	38,708,684	71,143,246		363,985,124		39,254,500	513,091,554
Strategic interventions 6.1: Establish and Strengthen Governance and Coordination Mechanism at National and Subnational Levels	38,708,684	71,143,246		363,985,124		39,254,500	513,091,554
Interventions 6.1.1: Strengthen governance and coordination mechanisms to support a multisectoral approach for the prevention and control of antimicrobial resistance (AMR)	38,708,684	71,143,246		261,631,890		39,254,500	410,738,320
Activities 6.1.1.1: Map and review all regulations relevant to AMR and AMU	21,735,000					39,254,500	60,989,500
Activities 6.1.1.2: Operationalize Antimicrobial Stewardship Committees in human and animal health facilities	16,973,684	71,143,246					88,116,930
Activities 6.1.1.3: Develop the technical, operational, and financial capacity of the National Antimicrobial Resistance Advisory Committee for effective coordination and implementation of the NAP				38,817,812			38,817,812
Activities 6.1.1.4: Support the quarterly meetings of the AMR Multisectoral Technical Working Groups (TWG)				222,814,078			222,814,078

Activities	Lead agency implementer						Total Cost (RWF)
	RBC	RAB	REMA	ONE HEALTH SECRETARIAT	UR	FDA	
Interventions 6.1.2: Strengthen and sustain collaborative efforts among stakeholders to enhance a multisectoral response to AMR prevention and control				42,228,106			42,228,106
Activities 6.1.2.1: Conduct a mapping of stakeholders involved in the implementation of the NAP on AMR				3,078,000			3,078,000
Activities 6.1.2.2: Formalize partnerships and collaborations with relevant stakeholders in AMR				18,508,156			18,508,156
Activities 6.1.2.3: Develop a framework for cross-sectoral collaboration related to AMR				16,357,950			16,357,950
Activities 6.1.2.4: Advocate for AMR at the ministry level to strengthen the control system for overseeing compliance with the existing regulatory and legal framework on antimicrobials in the human, animal, plant, and environmental sectors				4,284,000			4,284,000

Activities	Lead agency implementer						Total Cost (RWF)
	RBC	RAB	REMA	ONE HEALTH SECRETARIAT	UR	FDA	
Interventions 6.1.3: Establish and sustain effective monitoring and evaluation systems to track progress, assess impact, and ensure the effective implementation of antimicrobial resistance (AMR) control and prevention interventions across all sectors				60,125,128			60,125,128
Activities 6.1.3.1: Establish a continuous monitoring and evaluation (M&E) system for the implementation of the NAP				40,476,123			40,476,123
Activities 6.1.3.2: Conduct a biannual Self-Assessment of the activities of the National Antimicrobial Resistance Advisory Committee				19,649,005			19,649,005
Total Cost	14,511,171,710	14,349,010,677	2,481,742,625	4,332,819,535	4,387,297,233	85,775,500	40,147,817,280

Annex II: List of Participants

The following list consists of all individuals who participated in the technical workshops that led to the development of this document. The participants were from public institutions, academia, hospitals, professional regulatory bodies, private organizations, NGOs, and development partners.

From public institutions

From Public Institutions

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- Dr. Leandre Ishema, One Health specialist at Rwanda Biomedical Center
- Dr. Denyse Mugwaneza, One Health specialist at Rwanda Biomedical Center
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- Andrew Muhire, Digital Analyst at the Ministry of Health
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- Diane Uwumukiza, Station manager at Rwanda Agriculture and Animal Resources Development Board
- Samson Ntegeyibizaza, Veterinary Services Coordinator at Rwanda Agriculture and Animal Resources Development Board
- Dr. Jean de Dieu Niyitanga, Animal Resources Officer at Rwamagana District
- Nizeyimana Jean Pierre, Green Economy specialist at the Ministry of Environment
- Jean Edouard Munyangaju, Division Manager at Rwanda Food and Drugs Authority
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- Adrien Nkundimana, Conservation & Research Assistant at Akagera National Park
- Richard Muvunyi, Head of Wildlife Veterinary Unit at Rwanda Development Board
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From Academic Institutions

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- Dr. Marie Françoise Mwabonimana, Senior Lecturer at the University of Rwanda – College of Agriculture, Animal Sciences and Veterinary Medicine
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From Hospitals

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From professional regulatory bodies, private organizations and NGOs

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- Cosmas Ntare, Legal Representative of Rwaje Farmers and Breeders Association
- Dr. John Musemakweli, Technical Expert at Rwanda National Dairy Platform
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- Dr. Jean Claude Masengesho, Executive Director, at Rwanda Animal Welfare Organization
- Andrew Butare, Chairperson of Rwanda Poultry Industry Association
- Benjamin Shumbusho, Technical Advisor, Healthy Life Biotechnology Ltd
- Jean Claude Shirimpumu, Chairman of Rwanda's Pig Farmer Association
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