THE REPUBLIC OF UGANDA

Antimicrobial Resistance National Action Plan

2018 - 2023

"Prevent, slow down and control the spread of resistant organisms"

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ACKNOWLEDGMENTS

The Government of Uganda (GoU) wishes to acknowledge, with gratitude, the Uganda National Academy of Sciences (UNAS) through its standing committee on antimicrobial resistance with the following members: Prof. Denis K. Byarugaba (Chair), Donna A. Kusemererwa (Co-Chair), Aziz A. Maij, Charles B. Rwabukwali, Connie Cleona Kyarisiima, Eric Wobudeya, Florence Najjuka MD, Frederick Byarugaba, George Mukiibi-Muka, Michael Romeo Mutyaba, Richard Odoi Adome, and Victoria Katawera. The committee coordinated the development of this National Action Plan (NAP) on Antimicrobial Resistance (AMR) with support from the Center for Disease Dynamics, Economics & Policy (CDDEP) under the Global Antibiotic Resistance Partnership (GARP) and the World Health organization Uganda Country office. UNAS undertook this work on behalf of the Ministry of Health (MOH), the Ministry of Agriculture, Animal Industry, and Fisheries (MAAIF), and the Ministry of Water and Environment.

The process received invaluable technical support from the World Health Organization (WHO), the Food and Agriculture Organization (FAO), the World Animal Health Organization (OIE), the US Centers for Disease Control and Prevention (CDC), the Infectious Diseases Institute (IDI), and the Uganda AMR Surveillance Task Force.

The GOU also wishes to thank all those individuals who provided additional expert opinions and invaluable comments as they reviewed this document. All these contributions ensured that Uganda developed a plan that will guide efforts towards slowing down the threat of antimicrobial resistance and its attendant impact on public, animal, and environmental health and on sustainable development in Uganda and the world at large.

FOREWORD

Antimicrobial resistance (AMR) is a global One Health—human, animal, and environmental health concern. AMR has reduced the ability of antimicrobial agents to effectively control infectious diseases caused by bacteria, parasites, viruses, and fungi impacting negatively on global health security, healthcare, global trade, agriculture, and the environment. The consequences of AMR threaten the attainment of the Sustainable Development Goals recently agreed upon by UN member countries.

It has been recognized that AMR is accelerated by misuse of antimicrobial agents and aggravated by a host of other factors. These include self-medication, unrestricted access to medicines and both proper and improper use of medicines that allow drug resistant organisms to flourish. Sites with high concentrations of antimicrobials, such as pharmaceutical industries, healthcare facilities and agriculture, can discharge antimicrobial residues and resistant bacteria into the environment.

The current trend in AMR in Uganda and globally is rising and calls for immediate action. The 71st UN General Assembly (UNGA), the 68th World Health Assembly, and organizations including the World Health Organization (WHO), the Food and Agriculture Organization (FAO), and the World Organization for Animal Health (OIE), have agreed on a set of actions that member countries such as Uganda are committed to implement. The Government of Uganda (GOU) has put in place a framework through this National AMR Action Plan to address the threat AMR poses to the welfare of the peoples of Uganda. The Action Plan sets out a coordinated and collaborative One Health approach involving key stakeholders in government and other sectors to confront the threat and shall be coordinated by the National Antimicrobial Resistance Sub-Committee (NAMRSC). The Government will also work together with other governments, international organizations, and partners to address this global threat from AMR.

Although AMR cannot be eradicated, it can be reasonably slowed down and contained. The Ugandan Government is confident that this plan will help respond to the threats of AMR. The Government urges all stakeholders to develop specific plans of action in their respective institutions and sectors and to coordinate with the national effort to prevent, detect, and respond to the threat posed by AMR pathogens so that the people of Uganda are not subjected further to the burden of drug-resistant infections.

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ABBREVIATIONS AND ACRONYMS

AMR	Antimicrobial Resistance
ASP	Antimicrobial Stewardship Programme
BS/S	Bio-safety/bio-security
CDC	The US Centers for Disease Control and Prevention
CHEWS	Community Health Extension Workers
CDDEP	Center for Disease Dynamics, Economics & Policy
CPHL	Central Public Health Laboratories
CSO	Civil Society Organization
FAO	Food and Agriculture Organization
GAP	Global Action Plan
GARP	Global Antibiotic Resistance Partnership
GHSA	Global Health Security Agenda
GOU	Government of Uganda
IDI	Infectious Diseases Institute
INH	Isoniazid
IPC	Infection Prevention and Control
LMICs	Low- and Middle-Income Countries
M&E	Monitoring and Evaluation
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
MDAs	Ministries, Departments and Agencies
MDR TB	Multi-drug resistant Tuberculosis
MING	Ministry of Information and National Guidance
MoES	Ministry of Education and Sports
MOH	Ministry of Health
MoLG	Ministry of Local Government
MoSTI	Ministry of Science, Technology, and Innovation
NAP	National Action Plan
NOHP	National One Health Platform
NEMA	National Environment Management Authority
NWSC	National Water and Sewage Corporation
NAMRSC	National Antimicrobial Resistance Sub-Committee
OIE	World Organization for Animal Health
PSU	Pharmaceutical Society of Uganda
TWC	Technical Working Committee
UNAS	Uganda National Academy of Sciences
UNBS	Uganda National Bureau of Standards
UNCST	Uganda National Council for Science and Technology
UNGA	UN General Assembly
UPDF	Uganda People's Defense Force
UPF	Uganda Police Force
URSB	Uganda Registration Services Bureau
WHA	World Health Assembly
WHO	World Health Organization
XDR-TB	Extensively Drug-Resistant Tuberculosis
TBD	To Be Determined
BUBU	Buy Uganda Build Uganda

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Executive Summary

The impact of antimicrobial resistance will likely be greater in poorer countries that already have a high burden of infectious diseases associated with poor healthcare systems, inadequate sanitation, limited access to safe water and resource constraints. This, in turn, imposes even more urgency for those countries to put in place plans to confront the problem of antimicrobial resistance. AMR cuts across different sectors—particularly health, agriculture and the environment—and is a global problem requiring a global response. It will therefore be important to implement a One Health approach to ensure that each of these sectors clearly understands and plays an appropriate role. The AMR National Action Plan (NAP) is intended to be a guide for Ugandan stakeholders contributing to efforts to confront and contain the problem. The NAP is aligned with the WHO Global Action Plan's strategic objectives and proposes actions aimed at focusing government and partner efforts in the following strategic areas:

- Raising awareness and understanding of the AMR problem and containment options,
- Improving prevention, detection and control of infectious agents,
- Optimizing the use of antimicrobial medicines,
- Generating knowledge and evidence through surveillance
- Research and innovation.

The implementation of this plan will be coordinated and overseen by a Uganda National Antimicrobial Resistance Committee that will also monitor the progress of the interventions. While successful implementation relies heavily on the government's commitment, it is expected that the private sector, civil society organizations and the general public will play a significant role, not only in supporting government efforts but also in implementing some of the proposed interventions.

1.0 Introduction

1.1 Background

The problem of antimicrobial resistance in infectious agents has been rising, and there is global concern that in the absence of interventions to reverse these trends, the means to treat infectious diseases will be limited and out-of-reach for many, especially those living in low- and middle-income countries (LMICs). Resistance to antimicrobial drugs is a natural phenomenon that has been observed since the first antibiotics were discovered. Resistance has increased in recent years with the growing global population and concordant increasing use of antimicrobials. This has exerted selection pressure on microbes and resulted in increased populations of antimicrobial-resistant strains of pathogenic organisms. Unfortunately, the upward trend of AMR has not been matched by the development of new antimicrobial agents to treat the emerging resistant pathogens. The consequences of infection with antimicrobial-resistant organisms can be severe. A recent report commissioned by the UK government estimated that AMR could lead to 10 million deaths a year by 2050 and could result in a USD $100 trillion economic loss if no action is taken.

In accordance with the 68th World Health Assembly resolution on the Global Action Plan of 2015, the OIE Strategy on Antimicrobial Resistance and the Prudent Use of Antimicrobials 2016 and the FAO Global Action Plan of 2016, together with similar commitments by the Heads of State at the 2016 UN General Assembly and the Global Health Security Agenda, Uganda has developed this NAP as a guiding framework for implementation of these global commitments at the country level. This National Action Plan for Antimicrobial Resistance operates in conjunction with preexisting programmes currently being undertaken by the Government of Uganda and various elements of policy and regulation. Both the WHO GAP and the FAO GAP include five strategic objectives that are aimed at slowing down the emergence and spread of AMR and prolonging the efficacy of existing antimicrobial agents.

1.2 Antimicrobial Use and Resistance in Uganda

The Uganda National Academy of Sciences (UNAS) recently undertook a situational analysis on antimicrobial resistance in Uganda under the auspices of the Global Antibiotic Resistance Partnership (GARP)-Uganda (UNAS, 2015). The report found increasing trends in antimicrobial resistance. According to the MOH Annual Health Sector Performance Report for the financial year 2014/2015, microbial infections, including pneumonia, tuberculosis, and sepsis, accounted for 18.4 percent of hospital-based mortality. Of those, pneumonia was the biggest contributor at 9.7 percent. Additionally, microbial infections were responsible for 37 percent of all hospital admissions.

Resistance to the most commonly-used antimicrobials (e.g. penicillins, tetracyclines, cotrimoxazole) was in some cases above 80 percent. Of particular concern was the report of the high prevalence of multi-drug resistant bacteria such as methicillin-resistant *Staphylococcus aureus* (MRSA) and extended-spectrum beta-lactamase (ESBL)-producers. Multi-drug resistant infections restrict treatment options to fewer and often more expensive drugs. In healthcare settings, the prevalence of MRSA varied from as low as 2 percent to as high as 50 percent, while ESBL prevalence ranged from 10 to 75 percent among isolates analyzed. In addition, increasing resistance ranging from 4 to30 percent was reported among gram negative enterobacteria against carbapenems, a last-line treatment. Although the high prevalence of MRSA, ESBL-producers, and carbapenem resistant bacteria may reflect the emergence and growth of resistance, it may also reflect challenges related to the quality of data being generated. To provide more reliable data, quality assurance is needed for sampling, laboratory assays, and related processes. Since these isolates are often recovered from treatment-failed cases, the spread of such bacteria within healthcare settings and into the community poses serious challenges to public health.

The UNAS report also highlighted the impact of the human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS), malaria and tuberculosis (TB) on human health in Uganda. By 2015, about 1.5 million Ugandans were living with HIV, a prevalence of 7 percent, with 83,000 new infections, 28,000 AIDS-related deaths and about 800,000 people on antiretroviral therapy (ART). With an increasing proportion of all ART-eligible people living with HIV that require antiretroviral treatment, resistant HIV infections are likely to increase.

Resistance in TB is equally worrying. In 2010, Uganda was ranked 16th out of the 22 countries with the highest TB burden worldwide. In that year, the prevalence of TB was 193 cases/100,000 persons/year. Treatment for TB is based on the WHO recommendations although there are limited

data on the incidence of drug resistance in Uganda. Some studies show varying resistance levels of resistance to first-line treatments (5-20 percent resistance to isoniazid; 0.5-5 percent to rifampicin; to streptomycin 5-20 percent, to 0.5-10 percent; and MDR-TB, 0.5-10 percent) with most cases co-infected with HIV (50-80 percent). Among the subset of MDR isolates, 83 percent were resistant to ethambutol, 50 percent to pyrazinamide, 48 percent to streptomycin, 16 percent to ethionamide, 6 percent to ofloxacin, and 2 percent to kanamycn, with increasing extensively drug-resistant TB reported as well (Source: National Tuberculosis Reference Laboratory).
Anti-parasitic resistance is also threatening the control of malaria, a major cause of morbidity and mortality in Uganda. Uganda has abandoned the use of chloroquine, while sulfadoxine-pyrimethamine (SP) and the current artemisinin-based treatments are also threatened with resistant strains in other parts of the world.

The report noted a similar situation in animal health, with a high burden of bacterial diseases whose treatment is compromised by resistant organisms. A broad range of bacteria show high resistance (over 50 percent in many cases) to commonly used antimicrobials, and there is high resistance in parasitic infections. Nationally aggregated data on the amount of antimicrobials used in either animals or humans are limited; the National Drug Authority (NDA) keeps records of all antimicrobials imported into the country and periodically collates them, but they are not currently widely shared. Misuse of antimicrobials in both humans and animals was well noted with dispensing over the counter, in unlicensed drug stores and in open vans in markets.

The transmission of common bacteria such as *Enterobacteriaceae* and staphylococci between humans, animals and the environment in the same settings has been reported, and when these bacteria are resistant they cause a problem that requires collaborative action between all sectors to address.

Despite all the above threats, there is limited awareness among the public, policy makers, prescribers and other professionals about the problem of AMR and its consequences. For the successful mitigation of AMR in Uganda and the world, a series of comprehensive health, political and social strategies will need to be implemented.

While there is limited awareness, Uganda has made strides to address many issues related to AMR through guidelines and policies. In relation to infection prevention and control, Uganda maintains National Infection Prevention and Control Guidelines (2013). These guidelines continue to be implemented across the country, with Infection Prevention and Control Committees established in most tertiary healthcare facilities. There is further need to strengthen the committees through facilitation, establishing the required infrastructure, and providing supplies in order to implement committee recommendations in addition to the regular review and monitoring of their performance.

Optimal access and use of antimicrobials in the public and private sectors remains a primary responsibility of the National Drug Authority (NDA). Their mandate is enshrined in the National Drug Policy and Act and is complemented by several guidelines including the National Treatment Guidelines and the National Clinical Guidelines, both of which provide guidance on the usage of antimicrobials in treatment of infectious diseases. In an effort to monitor the state of AMR and the effectiveness of these documents in changing antimicrobial access and usage, a Supervision

Performance Assessment and Recognition Strategy (SPARS) is being implemented at a district level to examine the application of these guidelines in human health facilities.

Surveillance of antimicrobial resistance is increasing overall within Uganda. As noted within the Joint External Evaluation (JEE) of 2017 for Uganda, 25 human health facilities are regularly performing Antimicrobial Susceptibility Testing (AST). In addition, regular reports are provided to the National Animal Disease Diagnostic and Epidemiology Center (NADDEC) on a monthly basis regarding AMR (JEE 2017). At the same time, a Technical Working Group on AMR Surveillance has also produced a National Antimicrobial Resistance Surveillance Plan which is in the process of being approved and implemented.

Furthermore, research and innovation on AMR within Uganda is a growing priority area with opportunities for further improvement. The establishment of the Ministry of Science, Technology, and Innovation (MoSTI) has signaled government interest in further supporting research on areas inclusive of AMR. In addition, there are several strong research institutions such as the National Chemotherapeutics laboratories, higher institutions of learning, as well as research organizations that undertake research on AMR although coordination remains an area for improvement.

While there are substantial challenges for Uganda, the opportunity is ripe for a multi-sectoral and multi-disciplinary approach to strengthen Uganda's animal and human health sectors. This recognition shall require substantial political and technical will to ensure that this plan mobilizes the financial resources necessary to continue the task of building national frameworks and structures that Ugandan stakeholders collectively own. By using this NAP-AMR to guide Uganda's efforts, the global goal of managing AMR can be sustainably achieved.

1.3 Principles of Approach of the NAP

The guiding principles for this NAP conform to the guidance from the WHO/OIE/FAO Action Plans that require integrated and well-coordinated actions globally, regionally, nationally as well as at local government and institutional levels. The principles are as follows:

a) Whole-of-society engagement including a One Health approach.

Antimicrobial resistance arises from collective actions including animal production, terrestrial livestock and aquaculture, crop agriculture, human and environmental activities. Therefore, it requires a One Health approach (defined as '...the collaborative effort of multiple disciplines—working locally, nationally, and globally – to attain optimal health for people, animals and our environment. The implementation of this plan will require concerted efforts from all in accordance with the above principle.

b) Prevention first

Prevention is the most effective, affordable way to reduce risk for and severity of resistant infections. This entails disease prevention and health promotion in general to reduce the use of

antimicrobial agents—the single most important driver of resistance. Infection prevention and control is, therefore, a critical element of slowing down resistance and preserving antimicrobial agents.

c) Access

Access to effective antimicrobial agents is essential in slowing down development of resistant infections. This requires not only equitable access but also optimal use of antimicrobial agents, which also requires adequate access to health care facilities and services, health care professionals, veterinarians and preventive technologies as well as to diagnostic tools and information.

d) Sustainability

Containment of AMR will require long-term sustained efforts that will progressively provide visible impacts. Sustainability of the proposed interventions and activities is therefore critical and will require political commitment and international collaboration to sustain the required resources to support these interventions.

e) Incremental targets for implementation

The operational plan will clearly define the strategies for implementation and define immediate, medium-term and long-term interventions contained in the NAP. Clear definition of these incremental actions is critical for countries with resource constraints to ensure sustained progress towards the ultimate goal of containing AMR.

1.4 Goals and Strategic objectives

1.4.1 Goal

The goal of this NAP is to prevent, slow down, and control the spread of resistant organisms while ensuring the continuous availability of safe, effective, efficacious and quality-assured antimicrobials and their optimal use. This can be achieved only through collaborative actions between partners in human health, agriculture, the food industry, environment, teaching and research institutes, civil societies and associations, the pharmaceutical industry, and global stakeholders to synergize efforts and resources. This action plan was developed in line with the guiding principles and the strategic objectives of relevant global action plans to ensure alignment with global efforts. In all relevant sectors, One Health approaches will be used to implement actions and harness synergies that are needed to successfully combat AMR.

The plan proposes focus areas based on the principle that AMR requires a multi-sectoral approach comprising effective communication, coordination, and collaboration between the different sectors, Ministries, Departments and Agencies, both locally and globally. The plan will exploit the respective strengths of the public sector, the private sector, civil society, academia and research partners. The plan also focuses on strengthening national systems by utilizing existing structures within the national system, while avoiding the creation of new parallel institutions for

implementation. The following strategic objectives are the general categories for the strategies and objectives contained in the Strategic Plan:

1. To promote public awareness and understanding on antimicrobial use, resistance prevention, and containment through effective communication and training.
2. To improve infection prevention and containment of resistant microorganisms in human health care, community and animal health through individual and environmental sanitation, hygiene and infection prevention and biosecurity measures.
3. To optimize the use of antimicrobial drugs in human and animal health-care settings through effective stewardship practices.
4. To strengthen the knowledge and evidence base of antimicrobial use and antimicrobial resistance through One Health surveillance to inform policy.
5. To invest in research and innovations to inform policy and implementation science.

2.0 Governance Mechanisms

For this plan to be successfully implemented, political, technical and financial commitment shall be sustained both nationally and internationally. Global political commitments, evidenced by the recent UN declaration on AMR and high-level meeting on AMR at the 2016 UNGA, are necessary and this commitment must be reflected at the country level where the actions are implemented. The increasing movements of people, animals, food and other products, as well as medical tourism, have facilitated the transmission of resistant microorganisms. Local action alone will not be sufficient to bring about the desired change. Concerted and coordinated national and international efforts are needed to influence opinion, obtain support, mobilize action, harness expertise and resources available in different sectors, and improve governance.

A multi-sectoral committee to oversee and provide overall coordination of the implementation of this AMR National Action Plan (AMR-NAP) will be put in place by the Government of Uganda and shall be known as the National Antimicrobial Resistance Sub-Committee (NAMRSC). In line with the recognition of the importance of a One Health Approach, the National Action Plan shall be coordinated by the National One Health Platform (NOHP). The NOHP is a collaboration between the Ministry of Health, Ministry of Agriculture Animal Health and Fisheries, the Ministry of Water and Environment and the Uganda Wildlife Authority through a Memorandum of Understanding with the objective of coordinating joint efforts to address health issues that affect all the sectors. This committee will be chaired by an independent expert conversant with AMR both nationally and globally. In addition, the committee will have representatives from key line Ministries, Departments and Agencies (MDAs), national and international organizations, academia and civil society organizations. The committee will act as an oversight mechanism with support from international technical agencies in health, agriculture and animal health sector such as the WHO, OIE, and FAO. The NAMRSC will establish Technical Working Committees (TWCs) to support and oversee the implementation of each of the strategic objectives. These TWCs will be composed of technical experts from MDAs, public and private institutions and the civil society with expertise in those areas.

2.1 National AMR Sub-Committee Composition

The NAMRC will include representatives of the following MDAs, organizations and institutions:

1. Ministry of Health (MoH)
2. Ministry of Agriculture Animal Industry, and Fisheries (MAAIF)
3. Ministry of Water and the Environment (MoWE)
4. Uganda Wildlife Authority (UWA)
5. National Drug Authority (NDA)
6. Uganda National Academy of Sciences (UNAS)
7. Public and Private Universities and Post-Secondary Teaching Institutions
8. National Medical Stores (NMS)
9. Research Institutions (Uganda National Health Research Organization, National Agricultural Research Organization, Uganda Virus Research Organization)
10. Professional Societies (Uganda Medical Association, Uganda Veterinary Association Pharmaceutical Society of Uganda, Uganda Allied Health Sciences)
11. Uganda Consumer Society
12. National Water and Sewerage Corporation (NWSC)
13. National Environment Management Authority (NEMA)
14. International agencies (WHO, OIE, FAO etc.)
15. Uganda National Council of Science and Technology (UNCST)
16. Uganda Police Force/Uganda People's Defense Force

2.2 Terms of Reference for the NAMRSC

1. Oversee the implementation of the NAP
2. Provide overall strategic guidance on the NAP-AMR implementation and monitoring
3. Coordinate mobilization of resources for the implementation of the strategy within the sectors and international collaborations
4. Monitor and provide strategic advice necessary changes to achieve the goals outlined in the NAP- AMR
5. Provide a platform to harmonize and establish consensus on implementation advice between private and public stakeholders
6. Support the mainstreaming of the national antimicrobial resistance action plan activities into related sector activities and international programmes
7. Review the knowledge and experiences generated on a regular basis to assess the performance and effects of interventions and provide updates to all stakeholders
8. Revise and/or update the NAP every five years to provide a strategic policy framework for AMR
9. Strengthen international collaborations to improve knowledge and understanding of AMR
10. Coordinate actions with other regional and international plans, including the African Union, WHO, FAO and OIE
11. Maintain national and international political support for action.
12. Collaborate in the development and consistent use of international standards to support evidence- based interventions and evaluation mechanisms for their effectiveness
13. Ensure sustainable coalitions, management and governance arrangements at all levels to bring together different sectors

Strategic Interventions

3.0 Strategic Objective 1: Promote Public Awareness, Training and Education

Previous reports have indicated that most Ugandans are not aware of the growing problem of AMR. This is not limited to the public but also pertains to human and animal health professionals. For this plan to be successfully implemented, it is critical that all stakeholders understand what is at stake. Understanding of antimicrobial use, resistance prevention and containment can be achieved only through raising awareness, effective communication, coordination, collaboration, education and training. Social engagement is needed to ensure a critical change in behavior in the way antimicrobials are used and to take action and promote best practices necessary for slowing the problem of AMR. Tuberculosis, HIV and malaria already have their own national control programs, and these efforts will focus specifically on antibiotic resistance awareness.

The goal of this intervention is to create public awareness and understanding and improve education on antimicrobial use, resistance prevention, and containment in humans, animals and the environment.

The following priority strategies are proposed:

3.0.1 Improve Public Awareness

Promote public awareness, education and empowerment for antimicrobial use and resistance prevention and containment

1. Develop and disseminate a comprehensive communication strategy for AMR for various stakeholders.
2. Develop core communication materials and tools for use by different stakeholders for different communication channels and/or platforms.
3. Conduct regular public awareness campaigns on antimicrobial use and resistance to change general practices and influence behavioral change.
4. Undertake awareness raising activities in primary, secondary and tertiary schools and other training institutions using specialized materials
5. Collaborate with non-governmental organizations (NGOs), Civil Society Organizations (CSOs), the private sector, international organizations, law enforcement and the media to deliver messages on antimicrobial use.
6. Engage and train the media to report on AMR.
7. Engage groups and engage/develop networks for the dissemination of information on antimicrobial use and resistance.
8. Enhance public awareness through the quick and efficient dissemination of relevant research findings as they are published.

3.0.2 Support Education and Training of Human, Animal, Plant and Environmental Health Professionals

Promote knowledge and skills in human, animal and environmental professionals on prudent antimicrobial use and resistance prevention.

1. Create AMR courses for undergraduate and postgraduate health professionals (human, animal and environment) on AMR prevention and containment.
2. Incorporate courses on antimicrobial stewardship, infection prevention and control, biosecurity and AMR into the continuous professional development curricula for all health, agriculture, animal and environmental professionals with a system of ensuring accountability.
3. Develop and/or review prescribing guidelines and promote responsible-use practices, including effective dissemination of guidelines.
4. Facilitate continued education and training to promote responsible prescribing practices, dispensing and administering principles for antimicrobials.

3.2 Strategic Objective 2: Improve Infection Prevention and Control

In order to prevent the spread of resistant infections, it is important to implement infection prevention programs across human and animal communities and health care settings through individual and environmental sanitation and hygiene, as well as through biosecurity measures throughout the entire value chain from farm to plate. Infection prevention and control (IPC) measures in healthcare facilities as well as immunization and sanitation and hygiene in the community reduce the risk of transmission of infections and minimize the need for and use of antimicrobials.

The goal of this intervention is to reduce the burden of infectious diseases.

The following interventions are proposed:

3.2.1 Strengthen Infection Prevention and Control Programs in Healthcare Facilities

1. Maintain up-to-date infection prevention guidelines and standards of professional practice and ensure their availability in all healthcare facilities.
2. Institute/strengthen and support minimum standards for infrastructure in healthcare facilities that promote IPC.
3. Institute/strengthen and support proper functioning of IPC committees in all healthcare facilities.
4. Create and promote specific guidelines for limiting the spread of multidrug-resistant organisms.
5. Support availability and proper use of infection prevention materials and supplies.
6. Encourage timely diagnosis and treatment of drug-resistant microorganisms.
7. Promote hand hygiene and other hygienic practices and behaviors that prevent transmission of infectious diseases.
8. Promote campaigns for infection control at healthcare facilities.

9. Institute systems of incentives or rewards that uphold and monitor good IPC practices.
10. Promote safe waste disposal and waste treatment practices in healthcare facilities.

11. Create and strengthen coordinating entities at all levels from local level facilities to the Ministry of Health for IPC.
12. Improve human resource systems, education, and commitment to professionalism.

3.2.2 Promote Infection Prevention and Control Practices in Communities

1. Develop and disseminate tools for information, education and communication/behavior change communication on IPC in communities, including schools and public places.
2. Promote food hygiene practices in all public places and communities.
3. Improve access to safe and clean water and sanitation throughout the country.
4. Promote safe waste disposal and waste treatment practices at all levels.
5. To promote public awareness and understanding on antimicrobial use, resistance prevention, and containment through effective communication and training.

3.2.3 Promote Farm Biosecurity Measures in Agriculture

1. Develop and disseminate farm biosecurity guidelines to different categories of animal farms, abattoirs and aquaculture facilities.
2. Promote hygiene, sanitation and infection prevention practices on farms.
3. Promote food safety campaigns and programs.
4. Promote good IPC practices in the agricultural, livestock and animal production industries.
5. Ensure minimum standards for infrastructure in animal and agricultural facilities that promote IPC.
6. Ensure availability and proper use of infection prevention materials and supplies in agricultural and animal facilities.
7. Promote safe waste disposal and waste treatment practices from agricultural and animal facilities.

3.2.4 Increase and Optimize Use of Vaccines to Prevent Infectious Diseases

1. Strengthen vaccination programs in human and animal health.
2. Improve coverage of vaccination programs across the country for vaccine preventable diseases in humans and livestock.
3. Increase the range of vaccines and their availability across the country.

3.3 Strategic Objective 3: Promote Optimal Access and Use of Antimicrobials

The major modifiable driver of AMR is the use of antimicrobial agents. Promotion of prudent use of these agents is therefore critical in prolonging their efficacy and curtailing acceleration of AMR. This will involve ensuring access and appropriate use of safe and effective antimicrobials, both in the human, animal and agricultural sectors. Achieving optimal antimicrobial use will require strengthening technical and regulatory frameworks, ensuring availability of appropriate medicines and changing behavior among prescribers, dispensers and consumers. Antimicrobial Stewardship Programs (ASPs) involve coordinated interventions designed to measure and improve the appropriate use of antimicrobials by promoting the selection of the optimal antimicrobial drug

regimen, including dose, duration of therapy and route of administration. They seek to achieve optimal clinical outcomes related to antimicrobial use, minimize toxicity and other adverse events, reduce the costs of health care for infections and limit the selection for antimicrobial resistant strains.

This strategic objective is cognizant of the existing regulatory and policy framework in Uganda to promote access and use of effective antimicrobial agents and diagnostics. In addition to this Uganda National AMR strategy, their implementation will be anchored in the following regulatory and policy instruments:

i) The National Drug Policy and Authority act and its subsequent revisions. The act establishes the NDA with a mandate to ensure the availability, at all times, of essential, efficacious and cost-effective drugs and diagnostics for human and animal health in Uganda. This aspiration is further emphasized in the Uganda National Medicine Policy. ii) Regulations that establish each health profession in Uganda and their subsequent revisions or amendments, such as the pharmacy and drugs act, the veterinary surgeon's act, the medical and dental practitioners act, allied health professionals statute. These laws provide the basis for control of their professional practice, specifically and of relevant to this AMR strategy, the use of antimicrobial agents and diagnostics in their routine practice.

iii) The National Medicine Policy 2015 and the national pharmaceutical sector strategic plan 2015-2020, where measures to control antimicrobial resistance are incorporated in the wider appropriate medicine use intervention area.

The cross-cutting nature of these objectives is a deliberate attempt to add value to these existing systems, sector specific strategic plans and programs and not to supplant them. As a guiding principle, efforts to facilitate and provide synergy will create efficiency and embed sustainability to the Uganda National AMR strategy 2018-2028.

The goal of this intervention is to preserve the effectiveness and efficacy of antimicrobial agents for human and animal health through controlled access, effective antimicrobial stewardship, and appropriate use.

The following interventions are proposed:

3.3.1 Optimize Access to Effective Antimicrobial Medicines and Diagnostics in Human Health

1. Ensuring availability of affordable and accurate diagnostic tools to all health facilities
2. Enhance systems for financing access to diagnostics and antimicrobial medicines.
3. Enhance and strengthen the distribution mechanisms for provision of antimicrobials to human health providers in a timely and efficacious way.
4. Improve the supply chain for antimicrobials by creating a coordinating mechanism to manage the storage, pricing, selection and procurement of appropriate antimicrobials at the national, regional and local levels in order to reduce the costs, wastage and inappropriate selection of antimicrobials.
5. Where funding is available, enhance capacity and support for local producers of antimicrobials.

6. Regulate over-the-counter availability and self –medication with antimicrobial medicines.

3.3.2 Promote Optimal Prescribing, Dispensing and Use in Humans

1. Regularly update and ensure availability of prophylactic and treatment guidelines and protocols for infectious diseases in human health.
2. Institute/strengthen and support proper functioning of drug and therapeutics committees in all health care facilities.
3. Support the development and dissemination of antimicrobial stewardship working manuals and procedures.
4. Support implementation of antimicrobial stewardship through training, supervision, and monitoring.
5. Provide up-to-date and unbiased medicine information services to health providers.
6. Strengthen supervision of prescribing and dispensing outlets.
7. Initiate incentives and reward systems for excellence in adherence to best practices and standards.

3.3.3 Promote access to and prudent use of antimicrobials and diagnostics in Agriculture and Veterinary Medicine

1. Develop and disseminate prescription guidelines for improving appropriate use of antimicrobials in agriculture and veterinary medicine.
2. Promote antimicrobial stewardship programs in veterinary practice and educational programs.
3. Restrict broad or generalized use of antimicrobials as growth promoters or as feed additives.
4. Strengthen regulation and oversight for the supply chain and use of antimicrobials in agriculture and veterinary medicine.
5. Establish regular programs for monitoring antimicrobial residues in foods.

3.3.4 Promote Use of Quality, Safe and Efficacious Antimicrobial Agents

1. Strengthen licensing, approval, regulation and oversight over the antimicrobial supply chain (pharmaceutical manufacturers, distributors, importation, wholesalers and retailers).

2. Support capacity for regular quality assessment of antimicrobial agents in the NDA quality laboratories.
3. Support supervision of pharmacies and ensure adherence to Good Pharmacy Practices in all pharmacy outlets.
4. Strengthen regulation of the pharmaceutical companies and adherence to Good Manufacturing Practices
5. Regulate pharmaceutical and antimicrobial waste.

3.4 Strategic Objective 4: Surveillance

Evidence-based public policy and practices informed by good data, analytical skills and political support are essential for the successful implementation of public health programs. Surveillance (of antimicrobial resistance and use) data help identify program elements and practices capable of improving outcomes. AMR surveillance is essential to detect and monitor changes in antimicrobial use

and resistance, provide early warnings and indications of emerging and reemerging problems and monitor the impacts of interventions. It thus helps guide management of infectious diseases and

> The goal of this intervention is to generate the knowledge and evidence needed through surveillance for identifying emerging and re-emerging AMR issues and informing best practices for slowing down AMR and guiding policy using the One Health approach.

informs policy and updates to treatment guidelines, infection control practices, antimicrobial use and essential medicines lists.

The following interventions are proposed:

3.4.1 Support Surveillance of AMR

1. Support the implementation of a national AMR surveillance programme to generate actionable data.
2. Develop Standard Operating Procedures (SOPs) and methodologies for surveillance of AMR in humans, food, agriculture, veterinary medicine, environment and wildlife consistent and harmonized with international standards.
3. Strengthen and support improvement of laboratory infrastructure, human resources, access to laboratory supplies and equipment for microbiological testing and quality data reporting platforms.
4. Support the routine generation and use of microbiological culture and sensitivity tests on prioritized microorganisms and antimicrobials in health facilities and on farms?
5. Support mechanisms for quality assurance systems and supervision to improve availability and reliability of routine microbiology laboratory testing.
6. Analyze, disseminate and share surveillance data and information to facilitate decision making on diagnoses and treatments in clinical public health, veterinary practice, environment and wildlife laboratories and food technologies.
7. Support One Health networks for data sharing at national and regional levels as well as systems for linking microbiology data to clinical and pharmaceutical data to support decisions for AMR prevention and control.
8. Establish an early warning system and monitor trends to determine the risk factors and drivers of resistance, resistance burden and impacts on public and animal health and the economy.
9. Utilize data generated, including all regions of the country and hard-to-reach areas, to evaluate and improve intervention outcomes.
10. Ensure the inclusion of AMR as a priority in the risk register, MDA plans, and any other mechanisms as needed.

3.4.2 Support Surveillance of Antimicrobial Use

1. Design and implement a national antimicrobial use surveillance plan that defines surveillance activities and the roles consistent with international surveillance standards.
2. Develop and implement procedures and methodologies for monitoring antimicrobials imported, used and disposed of in Uganda.
3. Monitor prescribing practices, dispensing practices, client/community use and consumption patterns in health care settings, veterinary health practice, agriculture, aquaculture, traditional

herbalists (indigenous technical knowledge groups) and communities.
4. Support collection and sharing of data to evaluate and monitor interventions aimed to improve appropriate use and access to antimicrobials.

3.4.3 Support Surveillance for Antimicrobial Drug Residues in Foods

1. Design and implement a national surveillance plan for monitoring antimicrobial residues in foods and animal feeds.
2. Support the use of standard procedures in accordance with international standards including the WHO/FAO Codex Alimentarius for monitoring antimicrobial residues in foods.
3. Collaborate with the WHO/FAO Codex Alimentarius and other international efforts to generate and share actionable data.

3.4.4 Foster Collaboration and Partnerships

1. Collaborate with the WHO, OIE, FAO and other national, regional and international efforts focused on the development and implementation of harmonized surveillance and capacity to detect and monitor antimicrobial use and resistance in prioritized pathogens.
2. Participate in mechanisms for national, regional and international communication of critical events that may signify new resistance trends with global One Health implications.
3. Use national, regional and international quality assurance standards for generation of quality data.

3.5 Strategic Objective 5: Research and Innovation

The goal of this intervention is to stimulate innovations aimed at finding technologies to slow down the emergence and spread of AMR.

The increasing prevalence and geographic distribution of AMR threatens to undermine decades of progress in effective prevention and control of infectious diseases. Major challenges include MDRTB, artemisinin resistance in malaria, HIV resistance to HAART and antimicrobial resistance in the most common bacterial agents causing pneumonia, diarrheal disease, neonatal sepsis, enteric fever, sexually transmitted diseases, maternal infections and other syndromic infections. Uganda must invest in research and innovations for tackling AMR including in areas such as the development of new diagnostics, preventives, therapeutic products and innovative ways of minimizing transmission of infectious agents and preventing infection.

The following interventions are proposed:

3.5.1 Promote Innovations in the Search for Alternative Treatments and Drug Discovery

1. Facilitate and support the Natural Chemotherapeutics Laboratories to expand their antimicrobial product development.
2. Support establishment of and international collaboration in high-throughput screening of antimicrobial compounds.
3. Support academia and other researchers in product development.

4. Support the development of alternative treatments for infections that do not rely on antimicrobials.
5. Link the indigenous technical knowledge (ITK) groups to the product development system.

3.5.2 Promote Innovations in Diagnostic Technology

1. Support investments and collaborations and strengthen capacity for research, development and testing of innovative diagnostic technologies for detection of resistance in real time.
2. Support evaluation of point-of-care diagnostics for detection of infectious diseases and detection of resistance, including linkage to testing sites and the NDA.
3. Create linkages and support for Ugandan scientists to take leadership roles in international research partnerships targeting AMR.

3.5.3 Collaborate with International Partners in Basic Intervention Research

1. Promote research to identify high-risk and high-burden resistant strains, their resistance mechanisms and their transmission.
2. Promote innovations for new antimicrobial drug development, vaccines, and other innovative therapies.
3. Invest and support collaboration in high-throughput genomics and sequencing technologies that have the potential to enhance product development.
4. Support research on the burden of AMR and its interventions to inform policy for investment in interventions.
5. Establish a research innovation fund to support innovations that slow down AMR.

3.5.4 Enhance Operational and Health Systems Research at the Local Level

1. Support local research on resistance and transmission pathways between the environment, humans, animals and food supply chain.
2. Promote local research on antimicrobial use patterns with the goal of producing more context specific stewardship approaches.

4.0 Implementation Plan

4.1 Introduction

This implementation plan presents a detailed, realistic, and costed implementation plan with specific activities and proposed resources required to carry out priority activities to operationalize the strategic plan. Given the complexity of the AMR threat and the response, it is essential that every stakeholder is clear about their contribution to combating AMR in Uganda, both within their own mandate as well as in the context of others. Ownership of the strategy by all stakeholders under the leadership of the Government of Uganda is critical to move forward and yield the desired results. This plan is important in presenting what needs to be done to prevent the emergence and re-emergence of AMR, to contain its spread, and to outline how Uganda fits into regional and global efforts to combat resistance. The Government of Uganda, through the National One Health Platform, will establish the NAMRSC according to the recommended composition and representation outlined within the Strategic Plan. The NAMRSC will be responsible for overseeing the implementation of the strategic plan with the support of technical working groups in each area. The Committee will provide overarching strategic direction and recommendations for action as necessary to all stakeholders engaged in combating AMR.

4.2 Objective

The objective of the implementation plan is to provide clarity on particular actions that need to be undertaken in line with each of the strategies outlined above. By providing guidance on the particular actions, suggested costs, and outputs, stakeholders can understand and act to provide support where needed and where their resources allow them to do so. As a result, the Implementation Plan can be both sufficiently flexible to adjust to contextual needs while maintaining a solid foundation that promotes accountability and transparency.

4.3 Structural Framework

The structural framework of the Implementation Plan is built on the foundation of evidence and data coming from the grassroots upwards with the NAMRSC providing guidance back to implementing stakeholders. The NAMRSC, with its multi-sectoral and multi-disciplinary composition, can provide comprehensive and thorough advice back to the Government of Uganda and other stakeholders on how to better improve the actions being undertaken to address AMR. The NAMRSC will be able to make comprehensive and thorough feedback through independent Technical Working Committees (TWCs), which will comprise multi-disciplinary local experts, who will gather evidence from local level implementers to be able to provide an impartial, objective, and balanced view of the realities on the ground. This structure allows for collective ownership of both the evidence, advice, and at the same time driving accountability and action in response to failures and success of the NAP-AMR.

The TWCs primary role will be to provide the technical knowledge and guidance necessary for action. Their actions are not limited to but may include baseline studies, consolidation and analysis of data, and/or identification of areas requiring improvement. Throughout the lifetime of this plan, the TWCs will continue to refine interventions and implementation strategies as well as M&E

mechanism aimed at improving the outcomes of each strategic objective. By accumulating and documenting the evidence gathered over the lifetime of the NAP-AMR, the following NAP-AMR can be strengthened based off of the lessons learned and evidence gathered.

In order to promote greater accountability and ownership of the NAP-AMR, experts from the Government of Uganda and/or implementers may be called upon to serve on the TWCs in order to provide the evidence for deliberation and evaluation. Since these Government of Uganda stakeholders will be supporting the District Health Teams in the planning and implementation of the plan at the sub-national and peripheral levels, their active participation will allow financial resources and technical expertise to be provided directly. Combining their expertise and participation in the development of technical advice, successful implementation of these proposed interventions will be more directly incorporated into the broader strategy of improving both animal and human health. At the community level, social mobilization through the Community Health Extension Workers (CHEWS) and other relevant animal health entities will be used as a means of promoting local participation and action. Gender specific strategies will be developed to ensure that both men and women are involved in the prevention and control of communicable diseases. At the national level, the Department of National Disease Control (MOH) and the Department of Livestock health and Entomology (MAAIF) in collaboration with other departments will be key focal points in providing data and information to the TWCs as well as key recipients of the NAMRSC's strategic guidance.

The NAMRSC and relevant departments will provide technical supervision and support to District Directors of Health Services and District Veterinary and Environment Offices. Together with the NAMRSC, the technical working groups and the government departments will co-ordinate with the private sector on the establishments of standards and regulations affecting the program, and for monitoring the performance of the plan. The district level, information will be fed into the national data capture system through the national reporting structures. The implementation organizational structure is presented in Fig 1 while the details of the plan are presented in the implementation matrix table.

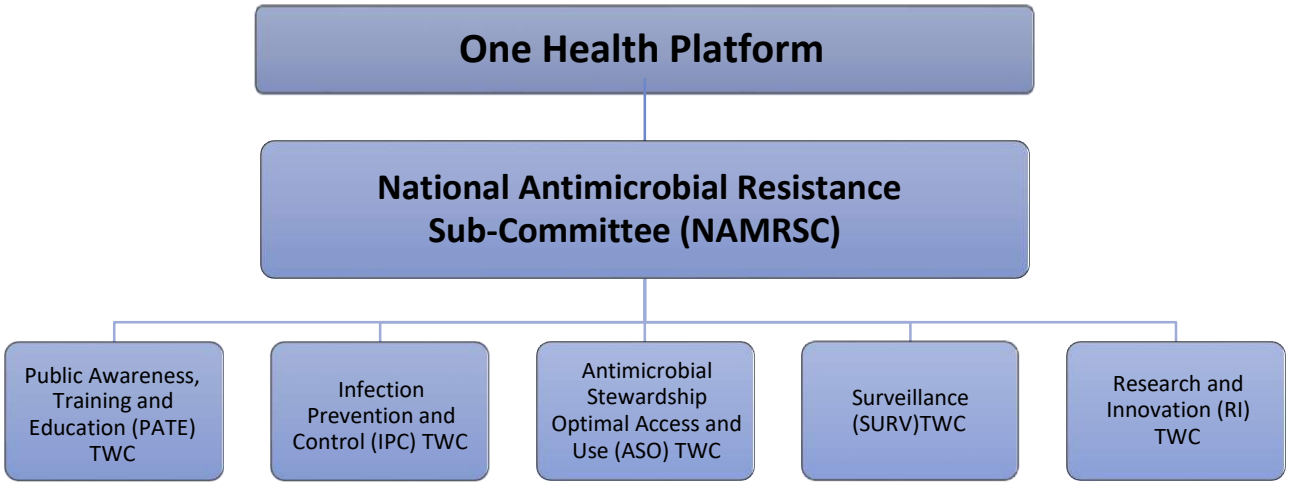

Fig 1. Organization Structure

4.4 Implementation Plan Matrix

The implementation matrix was made basing on the WHO guidance and template for ease of harmonization with the M&E matrix. By using this approach, this table format allows for easier comparison of plans between members of the World Health Assembly. The table outlines activities and sub-activities to be taken under each proposed intervention in the strategic plan and defines the unit of measure, the targeted quantities, the timeline within which the activities are expected to be implemented, the location or place where the stated activities will be undertaken, the lead or responsible entity (in most cases these will be technical MDAs). The table also includes an estimate of the costs for the activity based on the unit and quantities proposed for the activity and propose possible sources of funds. It is anticipated that the TWCs will continuously review the targets and provide a more accurate estimation of the costs based on the baseline surveys and what can be realistically achieved within the timeframe.

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
Strategic Objective 1: Improve Public Awareness, Training and Education							
Intervention 1: Improve Public Awareness							
1.1 Support mechanisms for coordinated communication and public awareness on AMR							
1.1.1 Establish a Technical Working Group (TWC) on public awareness, training, and education (PATE TWC)	PATE TWC	20	Year1	National	NAMRSC	458	Government /Partners
1.2 Develop and disseminate a comprehensive communication strategy for AMR for various stakeholders							
1.2.1 Conduct a needs assessment of communications needs	AMR communications needs	1	Year1	Countrywide	Communications department of MOH, MAAIF, and MWE	30,000	MOH/MAAIF/ Partners
1.2.2 Disseminate needs assessment to stakeholders	Number of Stakeholders reached	80	Year 1	National	Communications Department of MoH, MAAIF, and MWE	3000	MoH/MAAIF / Partners
1.2.3 Develop a communications strategy for the AMR NAP	Communication Strategy	1	Year1	National/ District level	Communications department of MOH and MAAIF	10,486	MOH/MAAIF/ Partners

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
1.2.4 Print and distribute strategy	Copies of the strategy	5,000	Year1	National/ District level	Communications department of MOH and MAAIF	27,778	MOH/MAAIF/ Partners
1.2.5 Disseminate strategy among stakeholders	MOH/MAA IF, CSO, FBO, Dev-partners	100	Sep 2018	National/ District level	Communications department of MOH and MAAIF	3,643	MOH/MAAIF/ Partners
1.3 Develop core communication materials and tools for use by different stakeholders for different communication channels and/or platforms.							
1.3.1 Develop core communication messages for different stakeholders	Communication messages	10	Year 1	National	Communications department of MOH and MAAIF, faith based organizations, CSO	10,486	MOH/MAAIF/ Partners
1.3.2 Print and/or distribute materials and tools	Copies	5,000	Year 1	National/ District level	Communications department of MOH and MAAIF, faith based organizations, CSO	27,778	MOH/MAAIF/ Partners
1.3.3 Disseminate materials and tools among stakeholder s	MOH/MAA IF, CSO, FBO, Dev-partners	100	Year 1	National/ District level	Communications department of MOH and MAAIF, faith based organizations, CSO	556	MOH/MAAIF/ Partners
1.4 Conduct regular public awareness campaigns on antimicrobial use and resistance to change general practices and influence behavioral Change through annual events.							
1.4.1 Conduct ToT for district health educators and veterinary officers	District health educators and veterinary officers	242	Year 1	National	Communications department of MOH and MAAIF, faith based organizations, CSO	40,525	MOH/MAAIF/ Partners
1.4.2 Conduct district-level communications training sessions for health and veterinary workers on AMR	Health and veterinary workers	726	Year 1	Regional Level	Communications department of MOH and MAAIF, faith based organizations, CSO	54,210	MOH/MAAIF/ Partners
1.4.3 Organize activities to raise awareness during the World Antibiotic Awareness Week	Awar eness activit ies	5	Year 1	National/ District level	Communications department of MOH and MAAIF, faith based organizations, CSO	15,000	MOH/MAAIF/ Partners

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
1.4.4 Set up billboards along major travel routes	Billboards	50	Year 1	Countrywide	Communications department of MOH and MAAIF, faith based organizations, CSO	41,667	Gov't/Partners/ Private sector
1.4.5 Print and distribute awareness- raising Leaflets/fliers	Leaflets and Flyer	25,000	Year 1-5	National/ District level	Communications department of MOH and MAAIF, faith based organizations, CSO	13,889	MOH/MAAIF/ Partners
1.4.6 Air radio/TV segments with key messages	TV/Radio segments/quarter	14	Year 2-5	National/ Regional/Districts	Communications department of MOH and MAAIF, faith based organizations, CSO	19,444	MOH/MAAIF/ Partners
1.4.7 Conduct public dramas (at major national events—Independence Day, Labor Day Etc.)	Public Drama per year	5	Year 2-5	National/ Regional/Districts	Communications department of MOH and MAAIF, faith based organizations, CSO	6,944	MOH/MAAIF/ Partners
1.5 Undertake awareness raising activities in primary, secondary and tertiary schools and other training institutions using specialized materials							
1.5.1 Identify existing school health programs and determine integration of AMR messages into these.	School health programs	5	Year 1	National	Communications department of MOH, MOES and MAAIF, faith based organizations, CSO	10,486	MOH/MAAIF/ Partners
1.5.2 Train focal persons at different levels and sectors of the education system	AMR focal persons	5,000	Year 2	National	Communications department of MOH, MOES and MAAIF, faith based organizations, CSO	305,625	MOH/MAAIF/ MOES/Partners
1.5.3 Disseminate materials and tools to focal persons	School AMR focal persons	5,000	Year 2	National/ District level	Communications department of MOH, MOES and MAAIF, faith based organizations, CSO	27,778	MOH/MAAIF/ Partners
1.5.4 Train relevant education partners	Education partners	1,000	Year 2	National	Communications department of MOH, MOES and MAAIF,	20,071	MOH/MAAIF/ Partners

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
					faith based organizations, CSO		
1.6 Collaborate with non-governmental organizations (NGOs), Civil Society Organizations (CSOs), Faith Based Organizations (FBOs) the Private sector, international organizations, law enforcement and the media to deliver messages on antimicrobial use.							
1.6.1 Disseminate training materials and tools to partners	Partners	1,000	Year 2	National/ Regional/Districts	Communications department of MOH and MAAIF	5,556	MOH/MAAIF/ Local Government/ Partners
1.7 Engage and train the media to report on AMR.							
1.7.1 Train media on AMR reporting	Journalist/ communication experts	200	Year 2	National	Communications department of MOH and MAAIF	3,958	MOH/MAAIF/ Local Government /Partners
1.7.2 Distribute communication materials and tools to the media -	Package of materials	200	Year 2	National/ Regional/Districts	Communications department of MOH and MAAIF	1,111	MOH/MAAIF/ Local Government/ Partners
1.8 Engage groups and develop networks for the dissemination of information on antimicrobial use and resistance.							
1.8.1 Conduct a survey to identify pre-existing networks to assist with dissemination of materials and tools to key	Survey Report with lists of gaps	1	Year 1	National	Communications department of MOH and MAAIF	5,000	MOH/MAAIF/ Partners
1.8.2 Design messages for social media networks for AMR awareness	Messages	10	Year 2	National	Communications department of MOH and MAAIF	5,000	MOH/MAAIF/ Partners
1.8.3 Include AMR data in weekly epidemiological reports for MoH/MAAIF	Epidemiologic al reports	104	Year 2-5	National	Communications department of MOH and MAAIF	5,000	MOH/MAAIF/ Partners
1.9 Enhance public awareness through quick and efficient dissemination of relevant research findings as they are published.							
1.9.1 Identify stakeholders (national and global) conducting research on AMR	Researchers	unlimited	Year 1	National and internationa l	PATE TWC/ Universities	-	

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
1.9.2 Periodically review research findings and translate them into popular versions	Popular versions of research reports	unlimited	Year 2-5	National	PATE TWC/Universities	5,000	
1.9.3 Share latest research with relevant policymakers	Policy makers	100	Year 2-5	National	PATE TWC/Universities	2,292	MOH/MAAIF/ Partners
Objective 2: Support Education and Training of Human, Animal and Environmental Health Professionals							
2.1 Create AMR courses for under graduate and postgraduate health professionals (human, animal and environment) on AMR prevention and Containment.							
2.1.1 Conduct a needs assessment of AMR related gaps in the professional education system at different levels	Needs assessment Report	1	Year 1	Countrywide	Universities, health and veterinary professionals councils	5,000	Professional councils/boards
2.1.2 Disseminate the needs assessment findings to relevant educational and curriculum-approval bodies	Educational and curriculum review bodies	100	Year 1	National	Universities, health and veterinary professionals councils	556	Professional councils/boards
2.1.3 Review and update curriculums based on gaps identified in needs assessment	New or updated curriculum	100	Year 2	National	Universities, health and veterinary institutions and professionals councils	16,871	Universities, health and veterinary professionals councils
2.1.4 Train professional educators at different levels on AMR issues	Health professional teacher/educators/lecturers	200	Year 2	National	Universities, health and veterinary institutions and professionals councils	33,529	Universities, health and veterinary professionals councils
2.1.5 Train health/veterinary professionals on AMR	Health/veterinary professional	2,000	Year 3	National	Universities, health and veterinary institutions and professionals councils	333,357	Universities, health and veterinary professionals councils
2.1.6 Conduct a consultative workshop identifying factors	Health, veterinary, and traditional	250	Year 4	National	Universities and traditional health	10,000	Universities, health and veterinary

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
Contributing to usage of alternative medicines					consortiums or organizations		
	Health professionals						professional councils
Strategic Objective 2: Infection Prevention and Control							
Objective 3: Strengthen Infection Prevention and Control Programs in Healthcare Facilities							
Strengthen coordinated mechanisms for infection prevention and control							
1.1.1 Establish a Technical Working Group (TWC) on Infection Prevention and Control (IPC TWC) with TORs	IPC TWC	20	Year 1	National	NAMRSC	458	Government/ Partners
3.1 Maintain and disseminate up-to -date National infection prevention and control manuals including guidelines and standards of professional practice							
3.1.1 Update the IPC policy	IPC Policy	1	Year 1	National	NAMRSC	10,486	Government/ Partners
3.1.2 Revise IPC manual for infection prevention control	IPC guidelines	1	Year 1	National	Departments of Clinical services (MOH), Quality assurance (MOH), Nursing Associations and Licensing Councils	10,486	Government/ Partners
3.1.3 Print and distribute IPC Guidelines	Copies	4,000	Year 2	National	Departments of Clinical services (MOH), Quality assurance (MOH)	22,222	Government/ Partners
3.1.4 Disseminate IPC and standards of professional practice guidelines at all healthcare facilities	Health care workers	5,000	Year 2	Facility Level	Departments of Clinical services (MOH), Quality assurance (MOH), MoLG	27,778	Government/ Partners
3.2 Institute/strengthen and support minimum standards for infrastructure in healthcare facilities that promote IPC.							
3.2.1 Under take an assessment of the current status and needs of IPC in health facilities	Health care facilities	3,584	Year 1	Health facility level	Departments of Clinical services (MOH), planning (MOH), QA (MoH), MoLG	20,000	Government/ Partners

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
3.2.2 Update guidelines for health care facility infrastructure that support minimum IPC standards	IPC compliant Infrastructure Guidelines	1	Year 1	National	Departments of Clinical services (MOH), planning (MOH)	10,486	Government/ Partners
3.2.3 Disseminate the guidelines	Stakeholders	500	Year 1	National	Departments of Clinical services (MOH), planning (MOH), MoLG	2,778	Government/ Partners
3.2.4 Under take support supervision to support implementation of IPC at health facility level	Health facilities	3,584	Year 2-5	health facility level	Departments of Clinical services (MOH), planning (MOH)	961,929	Government/ Partners
3.3 Institute/strengthen and support proper functioning of IPC committees in all healthcare facilities.							
3.3.1 Setup functional IPC committees with TORs	committees	3,584	Year 2-5	Facility	Departments of Clinical services (MOH), Quality assurance (MOH) and Livestock Health and Entomology (MAAIF)	10,000	Government/ Partners
3.3.2 Train IPC committee members on their functions	IPC members	3,584	Year 2-5	National	Directorate of Clinical services (MOH), QA (MoH)	69,758	MOH/Partners
3.3.3 Regularly undertake performance monitoring and mentoring of the IPC committee members	Mentoring sessions for IPCs	3,584	Year 2-5	Facility	Directorate of Clinical services (MOH), QA (MoH)	641,193	MOH/Partners
3.4 Create and promote specific guidelines for limiting the spread of multidrug-resistant (MDR) organisms.							
3.4.1 Update guidelines for prevention and control of MDR organisms	MOP	1	Year 1	National	Departments of Clinical services (MOH), Quality assurance (MOH)	10,486	Government/ Partners

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
3.4.2 Print and distribute the MDR control Guidelines	Copies	4,000	Year 2	National	Departments of Clinical services	22,222	Government/ Partners
					(MOH), Quality assurance (MOH)		
3.4.3 Train health care workers at facility level on the control of MDR	Health care workers	2,000	Year 2	Facility Level	Departments of Clinical services (MOH), Quality assurance (MOH)	38,958	Government/ Partners
3.5 Support availability and proper use of infection prevention materials and supplies.							
3.5.1 Update lists of IPC products, including equipment and supplies	List of IPC materials and supplies	20	Year 1	National	IPC TWC	458	Government/ Partners
3.5.2 Procure and distribute in a timely manner IPC supplies and equipment at health care facilities	Materials	Assorted	Year 2-5	National	Departments of Clinical services (MOH), Quality Assurance (MOH)	4,000,000	Government/ Partners
3.6 Encourage timely diagnosis and treatment of drug-resistant microorganisms.							
3.6.1 Procure and timely distribute tools for rapid diagnosis of drug resistant organisms	Materials	assorted	Year 1-5	Facility Level	Planning (MOH), NMS, CPHL	2,000,000	Government/ Partners
3.6.2 Train health care workers at facility level on the treatment and management of patients with MDR infections	Health care workers	2,000	Year 1-5	Facility Level	Departments of Clinical services (MOH), Quality assurance (MOH), MoES, MAAIF	38,958	Government/ Partners
3.6.3 Procure and timely distribute drugs for treatment of MDR	Drugs	assorted	Year 1-5	Facility Level	Departments of Clinical services (MOH) and Livestock Health and Entomology (MAAIF), NMS	3,000,000	Government/ Partners

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
3.7 Promote hand hygiene and other hygienic practices and behaviors that prevent transmission of infectious diseases.							
3.7.1 Train health care workers at facility level on hand hygiene and other hygienic practices and behaviors that prevent transmission of infectious diseases	Health care workers	7,168	Year 1-5	Facility Level	Departments of Clinical services (MOH), Quality assurance (MOH)	139,447	Government/ Partners
3.7.2 Under take health talks to patients about IPC behaviors to protect themselves from acquisition and transmission of infectious diseases	Health talks	10,000	Year 1-5	Facility Level	Department of health promotion (MOH), health facility in-charges, QA (MoH)	13,889	Government/ Partners
3.7.3 Train personnel on correct use of Personal Protective Equipment and materials for standard and transmission based precautions	Health care workers	14,336	Year 2-5	Facility Level	Departments of Clinical services (MOH), CPHL	79,644	Government/ Partners
3.8 Promote campaigns for IPC at healthcare facilities							
3.8.1 Train health care workers on IPC	health care workers	14,336	Year 2-5	Facility Level	Departments of Clinical services (MOH), QA (MoH)	79,644	Government/ Partners
3.8.2 Under take support supervision visits to reinforce infection control practices	health care facilities	3,854	Year 2-5	Facility Level	Departments of Clinical services (MOH), QA (MoH)	-	Government/ Partners
3.9 Institute systems of incentives or rewards that uphold and monitor good IPC practices.							
3.9.1 Develop guidelines for awards	Guidelines	1	Year 1	national	Departments of Quality Assurance (MOH)	10,486	Government/ Partners
3.9.2 Provide incentives for operationalizing the awards	Set of incentives	assorted	Year 2-5	national	Department of Quality assurance (MOH) and HR (MOH)	50,000	Government/ Partners
3.10 Promote safe waste disposal and waste treatment practices in healthcare facilities.							
3.10.1 Train health care workers on safe waste disposal and waste treatment practices for healthcare Workers.	health care workers	14,336	Year 2-5	Facility Level	Departments of Clinical services (MOH), QA (MoH)	79,644	MOH/Partners

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
3.11 Create and strengthen communication platform for IPC related committees at all levels from local level facilities to the Ministry of Health							
3.11.1 Establish a communication platform among IPC related committees e.g. medicines & therapeutics committee, AMR stewardship	Coordination committee	3,854	Year 2-5	Facility level	Facility management, MoH	107,056	Government/ Partners
committee, infection prevention Control committee, Laboratory Committee and Clinical Committee							
3.11.2 Develop guidelines for the functioning of the communication platform	Guidelines	20	Year 2-5	Facility level	IPC TWC, Local IPC Committees	458	Government/ Partners
3.12 Improve health worker knowledge and skills on IPC							
3.12.1 Con duct survey on training needs for health professionals regarding IPC	Training needs report	1	Year 1	national	department of Quality assurance (MOH) and HR (MOH)	20,000	Government/ Partners
3.12.2 Con duct regular continued profession development (CPD) training regarding IPC	health care workers	2,000	Year 2-5	Facility level	Healthcare facilities	55,556	Government/ Partners
3.12.3 Integrate IPC content in the curriculum/ education for all health training institutions	updated curriculum	100	Year 2-5	national	clinical services (MOH) and Health training institutions	16,871	Government/ Partners
Objective 4: Promote Infection Prevention and Control Practices in Communities							
4.1 Develop and disseminate tools for information, education and communication/behavior change communication on IPC in communities, Including schools and public places.							
4.1.1 Under take a survey on the knowledge/ attitudes/ perceptions and practices in the com munity	survey	1	Year 1	national	Department community health (MOH)	20,000	Government/ Partners

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
4.1.2 Develop tools for information, education and communication /behavior change communication on IPC in communities, including schools and public places. behavioral change Communication strategy	Tools	40	Year 2	national	Department of health promotion (MOH)	20,257	Government/ Partners
4.1.3 Dissemination of information on infection control in the community	public awareness campaigns	500	Year 2-5	communit y level	Department of health promotion (MOH)	277,778	Government/ Partners
4.2 Promote food hygiene practice s in all public places and communities.							
4.2.3 Develop minimum standards for food hygiene, handling and preparation	Guidelines	1	Year 1	National	department of community health (MOH)	10,486	Government/ Partners
4.2.1 Train food vendors and supervisors for proper food handling practices	Food vendors and supervisors	5,000	Year 2-5	Countrywide	Local Government and MoLG	27,778	Government/ Partners
4.2.2 Enforce regular checkups of food handlers for infectious diseases of public health importance related to food	Food handlers examined	5,000	Year 2-5	communit y level	Local Government, MoLG, community health (MOH)	72,806	Government/ Partners
4.2.4 Undertake food inspection of foods and food products for public consumption	Facilities inspected	5,000	Year 2-5	districts	Local Government and MoLG	138,889	Government/ Partners
4.3 Improve access to safe and clean water throughout the country.							
4.3.1 Carry out a baseline to obtain information on safe water usage in relation infection control and prevention is concerned	survey	1	Year 1-5	national	community health (MOH)/ UNBS /QAD (MOH), MoWE, NEMA	20,000	Government/ Partners

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
4.3.2 Increase safe water coverage in communities	safe water sources	each community	Year 1-5	Countrywide	MoWE	30,000,000	Government/ Partners
4.3.3 Review standards and guidelines for assessing water safety in the context of AMR	Guidelines	1	Year 1-5	community level	department of quality assurance and inspection (MOH), community health (MOH)/ UNBS, MoWE, NEMA	10,486	Government/ Partners
4.3.4 Conduct periodic water safety analyses at consumption points	Water Consumption points	2,000	Year 1-5	community level	community health (MOH)/ local government/ UNBS	114,472	Government/ Partners
4.4 Promote safe waste disposal an d waste treatment practices.							
4.4.1 Revie w and update IEC materials on safe waste disposal	Set of IEC materials	1	Year 1-5	National	community health (MOH), health promotion (MOH)	10,486	Government/ Partners
4.4.2 Procure and make available waste disposal materials for infectious wastes wherever generated	Materials	assorted	Year 1-5	Facility level	Department of community health (MOH), QAD (MOH)/ NEMA, Planning (MoH)	2,000,000	Government/ Partners
4.4.3 Conduct training of trainers (TOT) for waste hand ers	ToT trained	121	Year 1-5	National	Department of community health (MOH), QAD (MOH)/ NEMA	59,831	Government/ Partners
4.4.3 Conduct mentorships sessions for waste handlers	Health facilities	1,740	Year 1-5	Facility level	Department of community health (MOH), QAD (MOH)/ NEMA	48,333	Government/ Partners
4.4.4 Set up health care waste treatment facilities at each health facility	Health care facility	3,854	Year 1-5	regional	Department of community health (MOH), QAD (MOH)/ NEMA	19,270,000	Government/ Partners
4.5 Reduce transmission of AMR at the household level.							
4.5.1 Sensitization of the public on AMR	Public awareness campaigns	50	Year 1-5	national	community health (MOH), health promotion (MOH), local educational institutions	69,444	Government/ Partners

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
4.5.3 Contact tracing and management of patients with drug resistant microorganisms	Patients with MDR	1,000	Year 1-5	household level	NDC (MOH) and local government	138,889	Government/ Partners
4.5.4 Support adherence to antibiotic treatment at household level	Individuals	1,000	Year 1-5	household level	NDC (MOH) and local government	138,889	Government/ Partners
	Objective 5: Promote Farm Biosecurity Measures in Agriculture						
	5.1 Develop and disseminate farm biosecurity guidelines to different categories of animal farms, slaughter facilities, abattoirs and aquaculture Facilities.						
5.1.1 Revie w and update biosecurity guidelines f or different categories of animal farms, slaughter facilities, abattoirs and aquaculture facilities.	Guidelines	1	Year 1	National	Department of Livestock Health and Entomology, MAAIF Fishery Department	10,486	MAAIF/partners
5.1.2 Print and distribute biosecurity guidelines to veterinarians and other stakeholder s	Copies of the guidelines	5,000	Year 1	National	Department of Livestock Health and Entomology	27,778	MAAIF/partners
5.1.3 Sensitize stakeholders on biosecurity guidelines	Stakeholders	5,000	Year 1	National	Department of Livestock Health and Entomology	97,292	MAAIF/partners
5.1.4 Train district veterinary officers on biosecurity guidelines	DVOs	121	Year 1	National	Department of Livestock Health and Entomology	23,827	MAAIF/partners
5.1.5 Promote biosecurity practices on farms and animal facilities (e.g. abattoirs)	Radio/TV segments	50	Year 2-5	National	Department of Livestock Health and Entomology	69,444	MAAIF/partners
	5.2 Promote hygiene, sanitation and infection prevention practices on farms.						
5.2.1 Train farmers in on-farm sanitation and good hygiene practices	Farmers	5,000	Year 2	National	Department of Livestock Health and Entomology	97,292	MAAIF/partners
5.2.2 Under take regular checks on sanitation and hygiene on animal facilities and farms	Animal facilities and farms	500	Year 2-5	Farm level	District veterinary office, District Veterinary Officers	134,222	MAAIF/partners
5.2.3 Regular checks on animal feeds for contamination	feed checks	2,000	Year 2-5	Farm level	District veterinary office	114,472	MAAIF/partners
	5.3 Promote food safety campaign s and programmes.						

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
5.3.1 Sensitize farmers and the general public on production of safe animals for human consumption	Public awareness campaigns	100	Year 2-5	National	Department of Livestock Health and Entomology	55,556	MAAIF/partners
5.4 Promote good biosecurity practices in the agricultural, livestock and animal production industries.							
5.4.1 Train farmers in standard animal husbandry practices that reduce the need to use antimicrobial agents	Farmers	5,000	Year 2-5	districts	District Veterinary office, QA (MAAIF)	97,292	MAAIF/partners
5.4.2 Provide regular advisory extension services to farmers	Follow up visits	2,000			MoLG, MAAIF	55,611	MAAIF/partners
5.5 Ensure minimum standards for infrastructure in animal and agricultural facilities that promote biosecurity							
5.5.1 Develop/update standards for farm infrastructure that promote infection prevention in animal handling facilities and farms	Standards	1	Year 1	National	Department of Livestock Health and Entomology, Planning (MAAIF)	10,486	MAAIF/partners
5.5.2 Print and distribute animal facility and farm infrastructure standards	Copies of the guidelines	2,000	Year 1	National	Department of Livestock Health and Entomology, MoES	11,111	MAAIF/partners
5.5.3 Train district veterinary officers on facility and farm infrastructure standards	DVOs	121	Year 2	National	Department of Livestock Health and Entomology	20,369	MAAIF/partners
5.5.4 Conduct regular advisory/support supervision /inspection of abattoirs/slaughter houses and aquaculture facilities	Facilities	2,000	Year 2-5	National	Department of Farm infrastructure and Department of Vet Public Health, MoLG, KCCA	55,611	MAAIF/partners

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
5.5.5 Sensitize stakeholders on the need for ante-mortem and post-mortem inspection	meetings	1,000	Year 2-5	National/regional	Department of Farm infrastructure and Department of Vet Public Health, MoLG	19,514	MAAIF/partners
5.6 Ensure availability and proper use of infection prevention materials and supplies in agricultural and animal facilities							
5.6.1 Develop/disseminate guidelines for infection prevention materials for animal facilities an d farms	Guidelines	1	Year 1	National	Department of Livestock Health and Entomology, MoLG	10,486	MAAIF/partners
5.6.2 Sensitize farmers and animal facility operators on the guidelines	Animal facility operators and farmers	1,000	Year 2-5	National	Department of Livestock Health and Entomology	19,514	MAAIF/partners
5.7 Promote safe waste disposal and waste treatment practices from agricultural and animal facilities.							
5.7.1 Conduct a baseline assessment of the current status of animal facility and farm waste disposal	Baseline report	1	Year 2-5	National	Department of Livestock Health and Entomology, MAAIF	20,000	MAAIF/partners
5.7.2 Develop/disseminate guidelines for safe waste disposal for animal facilities and farms	Guidelines	1	Year 2-5	National	Department of Livestock Health and Entomology, MoLG	10,486	MAAIF/partners
5.7.3 Sensitize farmers and animal facility operators on safe waste disposal and treatment practices	Farmers and animal facility operators	1,000	Year 2-5	National	Department of Livestock Health and Entomology	19,514	MAAIF/partners
5.7.4 Sensitize stakeholders and farmers on animal facility and farm waste recycling	Farmers and animal facility operators	1,000	Year 2-5	National	Department of Livestock Health and Entomology, MoLG	19,514	MAAIF/partners
5.7.5 Procure incinerators for abattoirs and sick animals	Incinerators	20	Year 2-5	National	Department of Livestock Health and Entomology, MAAIF	400,000	MAAIF/partners

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
Objective 6: Increase and Optimize Use of Vaccines to Prevent Infectious Diseases							
6.1 Strengthen vaccination programs in human and animal health.							
6.1.1 Procure vaccine and supply vaccines for humans an d animals	Vaccines	5,000,000	Year 2-5	National	Department of national Disease Control (NDC) and livestock health and entomology (MAAIF), MoH	25,000,000	Government/ Partners
6.1.2 Develop/review regulations for vaccination s for animals with vaccination schedules	Regulations	1	Year 1	National	Department of national Disease Control (NDC) and livestock health and entomology (MAAIF)	10,486	Government/ Partners
6.1.3 Conduct campaigns to provide information , awareness and schedules about vaccination s in Uganda	public awareness campaign	50	Year 2-5	National	Department of national Disease Control (NDC) and livestock health and entomology (MAAIF), Community Health (MoH)	69,444	Government/ Partners
6.1.4 Under take vaccination of individuals against a broader range of diseases	vaccinated individuals	15,000,000	Year 2-5	National	Department of national Disease Control (NDC)	75,000,000	Government/ Partners
6.1.5 Under take vaccination of animals against a broader range of diseases	vaccinated animals	5,000,000	Year 2-5	National	Department of national Disease Control (NDC) and livestock health and entomology (MAAIF)	25,000,000	Government/ Partners
6.2 Improve coverage of vaccination programs across the country for vaccine preventable diseases in humans and livestock.							
6.2.1 Conduct a baseline assessment for animal and human vaccines program and services coverage	baseline study	1	Year 1	National	Department of national Disease Control (NDC) and livestock health and entomology (MAAIF), NDA, UNEPI	20,000	Government/ Partners

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
6.2.2 Develop a vaccine stock management tool to monitor vaccine stocks to prevent stock outs	Tool	1	Year 1	National	Department of national Disease Control (NDC) and	10,486	Government/ Partners
					livestock health and entomology (MAAIF)		
6.2.3 Review vaccine schedules to optimize uptake (combination vaccines to increase uptake and reduce cost)	Revised vaccination schedule	1	Year 1	National	Department of national Disease Control (NDC) and livestock health and entomology (MAAI F), UNEPI	10,486	Government/ Partners
6.2.5 Support routine maintenance of a functional cold chain	Cold chain	4 per facility per year	Year 2-5	health facility level	Department of national Disease Control (NDC) and livestock health and entomology (MAAIF)	50,000	Government/ Partners
6.3 Increase the range of vaccines and their availability across the country.							
6.3.1 Revie w and recommend introduction of new vaccines for both human and animals	Updated vaccine list	1	Year 1	National	Department of national Disease Control (NDC) and livestock health and entomology (MAAIF)	10,486	Government/ Partners
6.3.2 Under take research to measure the impact/best methods of vaccinating animals	study	1	Year 2	National	Department of national Disease Control (NDC) and livestock health and entomology (MAAIF)	50,000	Government/ Partners

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
Strategic Objective 3: Optimal Access and Use of Antimicrobials							
Objective 7: Promote Optimal Prescribing and Use							
7.1 Create mechanisms for coordination and support of Antimicrobial Stewardship and ensuring Optimal Use							
7.1.1 Establish a Technical Working Group (TWC) Antimicrobial Stewardship and Optimal Us e (ASO TWC)	ASO TWC	20	Year 1	National	NAMRSC	458	MOH/MAAIF/ Partners
7.2 Regularly update and ensure availability of prophylactic, prescribing/treatment guidelines and protocols for infectious diseases in human health							
7.2.1 Review and update prescribing guidelines for formulaic and	Prescribing guideline	1	Every 2 years	National	Departments of Clinical services (MOH) and NDA	40,000	MOH/MAAIF/ Partners
7.2.2 Disseminate prescribing guidelines in both print and online to all health facilities	Copies of the guidelines	5,000	Year 1-5	National/ District level	Departments of Clinical services (MOH) and NDA	3,778	MOH/MAAIF/ Partners
7.2.3 Training prescribers and dispensers on the guidelines	Prescribers and dispensers	3,000	Year 2-5	National/ Regional	Departments of Clinical services (MOH) and NDA	70,000	MOH/MAAIF/ Partners
7.2.4 Sensitize regulatory agencies and policymakers to improve adherence to prescribing guidelines	Regulatory bodies	2	Year 1	national	Departments of Clinical services (MOH) and Livestock Health and Entomology (MAAIF)	5,486	MOH/MAAIF/ Partners
7.3 Facilitate continued education and training to promote responsible prescribing practices, dispensing and administration principles for antimicrobials.							
7.3.1 Conduct a needs assessment to inform AMR-related CME trainings for relevant professions	Report with lists recommendation for AMR related CMEs	1	Year 1	National	Professional associations and councils and boards	5,000	Universities, health and veterinary professionals councils
7.3.2 Organize ToT sessions for different professionals	ToT sessions	20	Year 1	National	Departments of Clinical services (MOH) and Livestock Health and Entomology (MAAIF)	50,000	MOH/MAAIF/ Partners

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
7.3.3 Conduct AMR-specific CMEs through the professional associations	CMEs/CPDs	25	Year 1-5	National	Departments of Clinical services (MOH) and Livestock Health and Entomology (MAAIF)	12,929	MOH/MAAIF/ Partners
7.4 Incorporate courses on antimicrobial stewardship and AMR into the continuous professional development curricula for all health, agriculture, animal and environmental professionals with a system of ensuring accountability.							
7.4.1 Share findings of needs assessment to stakeholder s	Stakeholders	500	Year 1	National	Professional associations and regulatory councils and boards	5,000	Universities, health and veterinary professionals councils
7.4.2 Develop training manuals for the health professional CME on AMR	Training manuals	1	Year 2	National	Professional Councils, Universities	10,486	Universities, health and veterinary professionals councils
7.4.3 Sensitise relevant professional boards and council s on the training needs of their professions	Professional boards and councils	4	Year 2	National	Professional associations and regulatory councils and boards	15, 000	Universities, health and veterinary professionals councils
7.5 Institute/strengthen and support proper functioning of Medicines and Therapeutics committees in all health care facilities							
7.5.1 Activate Medicines and Therapeutic Committees (MTCs) at national and health facility levels with clear TORs	MTCs	348	Year 1-5	Regional	Departments of Clinical services (MOH) and NDA	70,000	MOH/MAAIF/ Partners
7.5.2 Train MTCs in their functions	MTC members	1,740	Year 2-5	National	Directorate of Clinical services (MOH)	20,000	MOH/Partners
7.5.3 Regularly undertake performance monitoring and mentoring of the therapeutic committees	Mentoring sessions for MTCs	348	Year 1-5	Facility	Directorate of Clinical services (MOH)	50,000	MOH/Partners

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
7.6 Support the development and dissemination of antimicrobial stewardship working manuals and procedures.							
7.6.1 Develop the antimicrobial stewardship working manuals and procedures	MOP	1	Year 1	National	Departments of Clinical services (MOH) and Livestock Health and Entomology (MAAIF)	10,486	MOH/Partners
7.6.2 Print and distribute antimicrobial stewardship working manuals	Copies	5,000	Year 1	National	Departments of Clinical services (MOH) and Livestock Health and Entomology (MAAIF)	2,857	MOH/Partners
7.6.3 Train healthcare workers on antimicrobial stewardships for both public and private workers	Healthcare workers on antimicrobial stewardships	1,000	Year 2-5	National/ Regional and healthcare facilities (including clinics, pharmacies	Departments of Clinical services (MOH) and Livestock Health and Entomology (MAAIF)	200,000	
				and drug shops)			
7.7 Provide up-to-date and unbiased medicine information services to human and animal health providers.							
7.7.1 Share susceptibility and antimicrobial use data regularly to stakeholders	AST and Antimicrobial usage data shared	Monthly (12)	Year 1-5	National and facility based	Departments of Clinical services (MOH), NDA and Livestock Health and Entomology (MAAIF)	20,000	MOH/Partners
7.7.2 Provide and share other update scientific and popular literature to improve prescribing practices	Information shared	Monthly (12)	Year 1-5	National and facility based	Departments of Clinical services (MOH), NDA and Livestock Health and Entomology (MAAIF)	20,000	MOH/Partners

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
7.8 Strengthen supervision of prescribing and dispensing outlets for human and animal antimicrobials							
7.8.1 Develop a tool for more efficient supervision and monitoring of healthcare facilities and pharmacies/drug stores	Supervision tool		Year 1	National	Departments of Clinical services (MOH), NDA and Livestock Health and Entomology (MAAIF)	10,486	MOH/MAAIF/ Partners
7.8.2 Train professional councils and licensing organs on supervision and monitoring dispensing outlets	Professional councils and licensing organs members trained	20	Year 1	National	Departments of Clinical services (MOH), NDA and Livestock Health and Entomology (MAAIF), Professional Councils	20,000	MOH/MAAIF/ Partners
7.8.3 Conduct CMEs to improve prescription and good pharmacy practice for health and veterinary prescribers	Health and veterinary prescribers	1,000	Year 2		Departments of Clinical services (MOH), NDA and Livestock Health and Entomology (MAAIF), Professional Councils	200,000	MOH/MAAIF/ Partners
7.8.4 Review and update regulations on prescription of antimicrobials	Updated regulations	1	Year 1	National	Departments of Clinical services (MOH), NDA and Livestock Health and Entomology (MAAIF), Professional Councils	10,486	MOH/MAAIF/ Partners
7.8.6 Develop digital/manual tools for tracking and tracing prescriptions at dispensing facilities	Prescription tracking tool	2	Year 1	National	Departments of Clinical services (MOH), NDA and Livestock Health and Entomology (MAAIF), Professional Councils	2,000,000	MOH/MAAIF/ Partners
7.8.7 Disseminate the tools for tracking and tracing prescriptions	Shared tools	2	Year 1	Regionals	Departments of Clinical services (MOH), NDA and Livestock Health and Entomology (MAAIF), Professional Councils	140,000	MOH/MAAIF/ Partners

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
7.9 Initiate incentives and reward systems for excellence in adherence to best practices and standards							
7.9.1 Develop tools for the Licensing bodies and Professional Councils to track performance of adherence to best practices and standards	Performance monitoring tool	1	Year 1	National	Professional Councils	10,486	MOH/MAAIF/ Partners
7.9.2 Develop guidelines for award of incentives for excellence in prescription practices	Guideline		Year 1	National	Professional Councils	10,486	MOH/MAAIF/ Partners/MPS
7.10 Institute/strengthen stewardship committees							
7.10.1 Develop procedures and protocols for antimicrobial prescriptions at both public and private facilities	MOP	1	Year 1	National	Departments of Clinical services (MOH), UNHLS	50,000	local protocols developed
7.10.2 Establish stewardship committees at health care facilities	Stewardship committees	348	Year 1	Health facility level	Hospital Administration	-	Hospital
7.10.3 Update National guidelines for handling resistant microorganism to prevent transmission	MOP	1	Year 1	National	Departments of Clinical services (MOH), UNHLS	50,000	Hospital
7.10.4 Integrate data from different committees (IPC, MTC, QA etc.) to inform best practices for containment of resistant organisms a t health facilities	Integrated data	12 (monthly)	Year 1	Health facility level	Departments of Clinical services (MOH), UNHLS	50,000	Hospital
7.10.5 Develop a tool for auditing antimicrobial prescriptions practices at health care facilities	Audit tool	1	Year 1	Health facility level	Departments of Clinical services (MOH), UNHLS	2,500	Hospital
7.10.6 Con duct audits of antimicrobial prescription s practices at health care facilities	Facilities adhering to prescription guidelines	5 (one per annum	Year 1-5	Health facility level	Departments of Clinical services (MOH), UNHLS	2,500	Hospital

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
Objective 8: Optimize Access to Effective Antimicrobial Medicines and Diagnostics in Human and Animal Health							
8.1 Ensuring availability of affordable and accurate diagnostic tools to all health facilities							
8.1.1 Procure adequate diagnostic tools (equipment, supplies, services) for infectious diseases at both public and private facilities and animal health facilities including Point of Care diagnostics	Procured diagnostic supplies and equipment	assorted	Year 1-5	National and facility based	Departments of Clinical services (MOH), NADDEC, Livestock Health and Entomology (MAAIF), UNHLS,	3,200,000	MOH/MAAIF/ Partners
8.1.2 Establish a subcommittee that evaluates/re commends appropriate/affordable and accurate diagnostic tools	Committees at health facilities	348	Year 1	National and facility based	Departments of Clinical services (MOH), NADDEC, Livestock Health and Entomology (MAAIF), UNHLS,	5,000	MOH/MAAIF/ Partners
8.2 Enhance systems for financing access to antimicrobial medicines or preventative AMR programs.							
8.2.1 Identify optimal financing mechanisms for antimicrobial medicines or preventive AMR programs	recommendations on Financing		Year 1	National	Departments of Clinical services (MOH), Livestock Health and Entomology (MAAIF),	50,000	MOH/MAAIF/ Partners
8.2.2 Lobby for financing for adequate antibiotics at all health care facilities	Lobbying activities	TBD	Year 1-5	National	ASO TWC	TBD	MOH/MAAIF/ Partners
8.3 Enhance and strengthen the distribution mechanisms for provision of antimicrobials to human health providers in a timely and efficient way.							
8.3.1 Expand support to human health stakeholder s engaged in medication distribution	Assessment on implementation best practices	1	Year 1	National	Departments of Clinical services (MOH), Livestock Health and Entomology (MAAIF),	75,000	MOH/MAAIF/ Partners
8.4 Improve the supply chain for antimicrobials by creating a coordinating mechanism to manage the storage, pricing, selection and procurement of appropriate antimicrobials at the national, regional and local levels in order to reduce the costs, wastage and inappropriate selection of antimicrobials							
8.4.1 Train suppliers of antimicrobials at national levels in efficient supply chain management	National supplies managers trained	50	Year 1	National	Departments of Clinical services (MOH), Livestock Health and Entomology (MAAIF),	20,000	MOH/MAAIF/ Partners

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
8.4.2 Train health facility procurement officers in procurement management of antimicrobials to ensure availability of appropriate antimicrobials and related supplies	Facility Procurement officers trained	348	Year 1	National	Departments of Clinical services (MOH), Livestock Health and Entomology (MAAIF),	20,000	MOH/MAAIF/ Partners
8.4.3 Train facility pharmacists in antimicrobial chain management and forecasting of need antimicrobials at their facilities	Trained pharmacists	348	Year 1	National	Departments of Clinical services (MOH), Livestock Health and Entomology (MAAIF), NDA, NMS, JMS, Private distributors	20,000	MOH/MAAIF/ Partners
8.5 Enhance capacity and support f or local producers/manufacturers of antimicrobials.							
8.5.1 Expand support to existing incentive structures for local production of antimicrobials and compliance with standards of current good manufacturing practices	Funds provided	5	Year 1	National	NDA	500,000	NDA, MOFPED
8.5.2 Train local producers of antimicrobials in compliance with standards of current good manufacturing practices	Drug manufacturers trained	100	Year 1	National	NDA	50,000	NDA, Partners
8.5.3 Train regulators to enhance turnaround time for registration process for all producers of antimicrobials	Regulators trained	50	Year 1	National	NDA	20,000	NDA, Partners
Objective 9: Promote Access to and Prudent Us e of Antimicrobials in Agriculture and Veterinary Medicine							
9.1 Develop and disseminate prescription guidelines for improving appropriate use of antimicrobials in agriculture and veterinary medicine							
9.1.1 Develop Prescribing/treatment guidelines in animals	Prescribing guidelines	4	Year 1	National	Department Livestock Health and Entomology (MAAIF)	100,000	MAAIF/Partners

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
9.1.2 Print and distribute the prescribing guidelines to all health facilities	Copies of the guidelines	5,000	Year 1-5	National/ District level	Communications department of MOH and MAAIF, faith based organisations, CSO	12,778	MOH/MAAIF/ Partners
9.1.3 Train veterinarians on prescription guidelines	veterinarians trained	500	Year 1	National	Department Livestock Health and Entomology (MAAIF)	50,000	MAAIF/Partners
9.1.4 Share digital animal prescribing guidelines to improve the usability	Digital copies available	5	Year 1	National	Department Livestock Health and Entomology (MAAIF), NDA	5,000	MAAIF/Partners
	9.2 Support the development and dissemination of antimicrobial stewardship working manuals and procedures for the agriculture and veterinary sector						
9.2.1 Develop antimicrobial stewardship programs f or agriculture and veterinary practice	MOPs	1	Year 1	National	Department of Livestock Health and Entomology (MAAIF) and NDA	10,000	MAAIF/Partners
9.2.2 Print and distribute antimicrobial stewardship working manuals	Copies	5,000	Year 1	National	Department of Livestock Health and Entomology (MAAIF) and NDA	12,857	MAAIF/Partners
9.2.3 Train veterinary and agriculture practitioners on antimicrobial stewardships for both public and private practitioners	Veterinary and agriculture practitioners	500	Year 2-5	National/ Regional and veterinary facilities	Department of Livestock Health and Entomology (MAAIF) and NDA	100,000	MAAIF/Partners
	9.3 Restrict broad or generalized u se of antimicrobials as growth promoters or as fee d additives						

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
9.3.1 Conduct a risk assessment on the use of growth promoters and use of antimicrobial agents as feed additives	Risk assessment report	1	Year 1	National	Department of Livestock Health and Entomology (MAAIF) and NDA	20,000	MAAIF/Partners
9.3.2 Develop regulations/guidelines on the use of growth promoters and use of microbial agents as feed additives	Regulations	1	Year 1	National	Department of Livestock Health and Entomology (MAAIF) and NDA	20,000	MAAIF/Partners
9.3.3 Print and distribute the regulation/guidelines on growth promoters and feed additives	Copies of the guidelines	5,000	Year 1	National/ District level	Department of Livestock Health and Entomology (MAAIF) and NDA	12,778	MOH/MAAIF/ Partners
9.3.4 Sensitize farmers/animal health professionals and feed producers on growth promoters	Farmers/anima l health professionals and feed producers	1,000	Year 2-5	Regional	Department of Livestock Health and Entomology (MAAIF) and NDA	55,000	MAAIF/Partners
9.4 Strengthen regulation and over sight for the supply chain and use of antimicrobials in agriculture and veterinary medicine.							
9.4.1 Conduct a situational analysis of the existing regulations and their implementation / enforcement	Baseline status	1	Year 1	National	Department of Livestock Health and Entomology (MAAIF) and NDA	50,000	MOH/MAAIF/ Partners
9.4.2 Train drug supplier, pharmacists, veterinarian s and agricultural suppliers to in supply chai n management of the agricultural and veterinary antimicrobials	Report with recommendations	1	Year 1	National	Department of Livestock Health and Entomology (MAAIF) and NDA	50,000	MOH/MAAIF /Partners
9.4.3 Train drug distributors and animal health work ers on distribution mechanisms of antimicrobials	Trained animal health workers and drug distributors	500	Year 2-5	National/ regional	Department of Livestock Health and Entomology (MAAIF) and NDA	50,000	MOH/MAAIF/ Partners

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
Objective 10: Promote Use of Quality, Safe and Efficacious antimicrobial agents							
10.1 Strengthen licensing, approval, regulation and oversight over the antimicrobial supply chain (pharmaceutical manufacturers, distributors, importation, wholesalers and retail ers)							
10.1.1 Expand support to and recruitment of professionals in NDA to improve efficiency in their oversight and regulatory function	Recruitment	100	Year 1-5	National and regional	NDA	186,111	NDA
10.1.2 Expand support to automated system for improving processes	Automated system effectiveness	6	Year 2-5	National and regional	NDA	1 ,500, 00 0	NDA/Partners
10.1.3 Sensitize private providers of antibiotics of NDA regulations to increase compliance	Private Sector awareness on regulations	5,000	Year 2-5	National and regional	NDA	2 ,000, 00 0	NDA/Partners
10.2 Support capacity for regular quality assessment of antimicrobial agents in the NDA quality laboratories.							
10.2.1 Procure supplies and equipment for testing quality of antimicrobials	Supplies and equipment	assorted	Year 2-5	National	NDA	5,000	NDA
10.2.2 Collaboration with external laboratories for testing quality of antimicrobials	MOUs	5	Year 2-	National	NDA	5,000	NDA
10.2.3 Undertake routine QA/QC checks for sustained compliance to WHO prequalification	QA/QC	4	Year 2-5	National	NDA	20,000	NDA
in chemical analysis and relevant international standards							
10.2.4 Undertake infrastructure improvements for NDA quality control lab	Renovated facilities	1	Year 2-3	National	NDA	200,000	NDA
10.2.5 Procure and install a laboratory information management system (LIMS)	Information management system	1	Year 2	National	NDA	10,000	MOH/MAAIF/ Partners

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
10.3 Support supervision of Pharmacies and ensure adherence to Good Pharmacy Practices in all Pharmacy outlets							
10.3.1 Con duct inspections on pharmacies against GP P and establish compliance to OTC and self medication prescribing	Pharmacies inspected	quarterly	Year 1-5	National and regional	NDA	40,000	NDA
10.4 Regulate over-the-counter availability and self-medication with antimicrobial medicines.							
10.4.1 Enforce compliance to OTC dispensing guidelines	Facilities inspected	quarterly	Year 1-5	National and regional	NDA	40,000	NDA
10.5 Strengthen regulation of the pharmaceutical companies and adherence to Good Manufacturing Practices							
10.5.1 Establish Harmonisation mechanisms with WHO and other NDA on the compliance assessment s for pharmaceutical companies	MOUs	3	Year 1	National	NDA	20,000	NDA
10.6 Regulate pharmaceutical and antimicrobial waste							
10.6.1 Develop guidelines for disposal of pharmaceutical and antimicrobial waste by the health facilities and general public	Guidelines	1	Year 1	National	NDA	9,999	NDA
10.6.2 Print and disseminate disposal guidelines	Copies of the guidelines	500	Year 1	National	NDA	10,000	NDA
10.6.3 Sensitize pharmacies and drug dealers on pharmaceutical waste disposal	Pharmacies and Drug handlers	500	Year 2-5	national	NDA		NDA

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
Strategic Objective 4: Surveillance							
Objective 11: Support Surveillance of AMR							
11.1 Support the implementation o f a national AMR surveillance programme to generate actionable data							
11.1.1 Establish a national Technical Working Group (TWC) for AMR surveillance (SURV TWC)	SURV TWC	1	Year 1	National	NAMRSC	500	Government /Partners
11.1.2 Conduct a baseline survey and needs assessment on AMR surveillance system	Baseline report		Year 1	Countrywide	National Health Laboratory Services (MOH) NADDEC (MAAIF)	15,000	MOH/MAAIF/ Partners
11.1.3 Develop an integrated AMR surveillance plan	Integrated AMR Surveillance plan	1	Year 1	National	National Health Laboratory Services (MOH) NADDEC (MAAIF)	10,057	MOH/MAAIF/ Partners
11.1.4 Print and distribute the AMR surveillance plan	copies	1,000	Year 1	National	National Health Laboratory Services (MOH) NADDEC (MAAIF)	5,556	MOH/MAAIF/ Partners
11.1.5 Select priority surveillance sites and agree on harmonized surveillance methodologies	List of surveillance sites	14	Year 1	National	National Health Laboratory Services (MOH) NADDEC (MAAIF)	833	MOH/MAAIF/ Partners
11.2 Develop/review Standard Operating Procedures (SOPs) for surveillance of AMR in humans, food, agriculture, veterinary medicine, environment and wildlife, consistent and harmonized with international standards							
11.2.1 Develop a manual of SOPs for AMR surveillance	Manual of Procedures (MOP)	1	Year 1	National	National Health Laboratory Services (MOH) NADDEC (MAAIF)	10,057	MOH/MAAIF/ Partners
11.2.2 Identify priority organisms, samples and testing panels in coordination with international partners	List	1	Year 1	National	National Health Laboratory Services (MOH) NADDEC (MAAIF)	833	MOH/MAAIF/ Partners

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
11.3 Strengthen and support improvement of laboratory infrastructure, human resources, access to laboratory supplies and equipment for microbiological testing and quality data reporting platforms.							
11.3.1 Undertake improvements in infrastructure and equipment for microbiological isolation and susceptibility testing	Renovations	20	Year 2-3	National	National Health Laboratory Services (MOH) NADDEC (MAAIF)	4,000,000	MOH/MAAIF/ Partners
11.3.2 Equip laboratories micro biological isolation and susceptibility testing	Equipment	20	Year 2	National	National Health Laboratory Services (MOH) NADDEC (MAAIF)	4,000,000	MOH/MAAIF/ Partners
11.3.3 Train laboratory staff in logistics and supply management	Laboratory staff	40	Year 2	National	National Health Laboratory Services (MOH) NADDEC (MAAIF)	10,629	MOH/MAAIF/ Partners
11.3.4 Procure and install a laboratory information management system (LIMS)	LIMS software	20	Year 2-3	National	National Health Laboratory Services (MOH) NADDEC (MAAIF)	10,000	MOH/MAAIF/ Partners
11.4 Support the routine use of microbiological culture and sensitivity tests on prioritized microorganisms and antimicrobials in health facilities and on farms							
11.4.1 Re-train clinicians and veterinarians on appropriate sample collection and submission	Clinicians	70	Year 2-3	National	National Health Laboratory Services (MOH) NADDEC (MAAIF)	35,000	MOH/MAAIF/ Partners
11.4.2 Procure consumables for sample collection, microbiological materials and susceptibility testing panels and reagents	materials	assorted	Year 2-5	National	National Health Laboratory Services (MOH) NADDEC (MAAIF)	4,000,000	MOH/MAAIF/ Partners
11.5 Support mechanisms for quality assurance systems and supervision to improve availability and reliability of routine micro biology laboratory testing							
11.5.1 Procure and make available control strains and reference materials	Reference materials	assorted	Year 2-5	National	National Health Laboratory Services (MOH) NADDEC (MAAIF)	10,000	MOH/MAAIF/ Partners
11.5.2 Train laboratory staff, veterinarians and clinicians on quality control and quality assurance	Clinicians, veterinarians and lab staff	100	Year 2-6	National	National Health Laboratory Services (MOH) NADDEC (MAAIF)	10,000	MOH/MAAIF/ Partners

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
11.6 Enroll the various participating laboratories in national and international Extern al Quality Assurance programs							
11.6.1 Accredit the participating laboratories	Laboratories	20	Year 3	National	National Health Laboratory Services (MOH) NADDEC (MAAIF)	20,000	MOH/MAAIF/ Partners
11.6.2 Con duct annual review of the manual of SOPs	Manual of Procedures	1	Year 3-5	National	National Health Laboratory Services (MOH) NADDEC (MAAIF)	10,000	MOH/MAAIF/ Partners
11.6.3 Undertake regular supervision and mentorship of the hospital surveillance sites	Surveillance sites	14	Year 3	Facility	National Health Laboratory Services (MOH) NADDEC (MAAIF)	20,000	MOH/MAAIF/ Partners
11.6.4 Designate national microbiology reference labs	Reference labs	4	Year 3	National	National Health Laboratory Services (MOH) NADDEC (MAAIF)	1,000	MOH/MAAIF/ Partners
11.7 Analyze, disseminate and share surveillance data and information to facilitate decision making on diagnoses an d treatments in clinical public health, veterinary practice, environment and wildlife laboratories and food technologies							
11.7.1 Procure and install computers for data management disseminating information to partners	Computers	40	Year 2	National	National Health Laboratory Services (MOH) NADDEC (MAAIF)	40,000	MOH/MAAIF/ Partners
11.7.2 Train personnel on data management and reporting	Laboratory staff	40	Year 2	National	National Health Laboratory Services (MOH) NADDEC (MAAIF)	8,000	MOH/MAAIF/ Partners
11.7.4 Share data locally, nationally and internally	Reports		Year 2- 5	National	National Health Laboratory Services (MOH) NADDEC (MAAIF)	50,000	MOH/MAAIF/ Partners
11.8 Support One Health networks for data sharing at national and regional levels as well as systems for linking microbiology data to clinical and pharmaceutical data to support decisions for A MR prevention and control							
11.8.1 Undertake an assessment to identify data needs for the various stakeholders to inform actions for minimizing AMR	Assessment Report	1	Year 2	National	National Health Laboratory Services (MOH) NADDEC (MAAIF)	10,000	MOH/MAAIF/ Partners
11.8.2 Develop a tool for sharing data at different levels and to different stakeholders	Tool for sharing data at different levels and to different stakeholders	1	Year 2	National	National Health Laboratory Services (MOH) NADDEC (MAAIF)	10,000	MOH/MAAIF/ Partners

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
11.9 Establish an early warning system and monitor trends to determine the risk factors and drivers of resistance, resistance burden and impacts on public and animal health and the economy							
11.9.1 Adopt international standards for AMR early warning	Adopted standards	1	Year 2	National	National Health Laboratory Services (MOH) NADDEC (MAAIF)	5,000	MOH/MAAIF/ Partners
11.9.2 Sensitize laboratory staff, clinicians, and veterinarians on identification and evaluation of risks	Staff sensitized	100	Year 2	National	National Health Laboratory Services (MOH) NADDEC (MAAIF)	5,000	MOH/MAAIF/ Partners
11.9.3 Com pile and provide information on identified risks	Risk events	4	Year 2 -5	National	National Health Laboratory Services (MOH) NADDEC (MAAIF)	5,000	MOH/MAAIF/ Partners
11.10 Utilize data generated, including all regions of the country and hard-to-reach areas, to evaluate and improve A MR intervention outcomes							
11.10.1 Disseminate AMR data throughout the country including remote and hard-to reach areas	Reports	121	Year 2-5	Districts	Departments of National Disease Control (MOH) and Livestock Health and Entomology (MAAIF)	5,000	MOH/MAAIF/ Partners
11.11 Ensure the inclusion of AM R as a priority in the risk register, MDA plans, and any other mechanisms as needed							
11.11.1 Train risk registrars to incorporate risk reporting in to their registers	Risk educators	100	Year 2	National	Departments of National Disease Control (MOH) and Livestock Health and Entomology (MAAIF)	2,014	MOH/MAAIF/ Partners
Objective 12: Support Surveillance of Antimicrobial Use							
12.1 Design and implement a national antimicrobial use surveillance plan that defines activities and roles consistent with international surveillance standards							
12.1.1 Undertake a baseline survey and needs assessment and identify gaps for implementing an antimicrobial use surveillance plan	Baseline assessment report	1	Year 1	National	Departments of Clinical services (MOH)/National Drug Authority/and Livestock Health and Entomology (MAAIF)	10,000	MOH/MAAIF/ Partners
12.1.2 Develop an integrated antimicrobial use surveillance plan	AMR use Plan	1	Year 1	national	Departments of Clinical services (MOH)/National Drug Authority/and Livestock Health and Entomology (MAAIF)	20,000	

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
12.1.3 Print and distribute antimicrobial use plan	copies	1,000	Year 1	national	Departments of Clinical services (MOH)/National Drug Authority/and Livestock Health and Entomology (MAAIF)	5,479	MOH/MAAIF/ Partners
12.1.4 Disseminate the national surveillance of antimicrobial use plan	stakeholders	200	Year 2	National	Departments of Clinical services (MOH)/NDA/and Livestock Health and Entomology (MAAIF)	10,486	MOH/MAAIF/ Partners
12.2 Develop and implement procedures and methodologies for monitoring antimicrobials imported, used and disposed of in Uganda							
12.2.1 Develop and manual of procedures and methodologies for routine monitoring antimicrobial use	Manual of Procedures	1	Year 1	National	Departments of Clinical services (MOH)/NDA/and Livestock Health and Entomology (MAAIF)	10,486	MOH/MAAIF/ Partners
12.2.3 Train hospital, pharmacy and veterinary staff to collect and share antimicrobial use data routinely	Health, Pharmacy and veterinary staff	1,000	Year 2	National	Departments of Clinical services (MOH)/NDA/and Livestock Health and Entomology (MAAIF)	30,000	MOH/MAAIF/ Partners
12.2.2 Collect, collate and share antimicrobial use data regularly	Reports	1,000	Year 2	National	Departments of Clinical services (MOH)/NDA/and Livestock Health and Entomology (MAAIF)	30,000	MOH/MAAIF/ Partners
12.3 Monitor prescribing practices, dispensing practices, client/community use and consumption patterns in health care settings, veterinary health practice, agriculture, aquaculture, traditional herbalists (indigenous technical knowledge groups) and communities							
12.3.1 Identify antimicrobial use and practice indicators	List of indicators		Year 1	National	Departments of Clinical services (MOH)/NDA/and Livestock Health and Entomology (MAAIF)	5,000	MOH/MAAIF/ Partners
12.3.2 Develop a manual of procedures for monitoring prescription and dispensing practices	Manual of Procedures	1	Year 1		Departments of Clinical services (MOH)/NDA/and Livestock Health and Entomology (MAAIF)		

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
12.3.3 Regularly collect data on prescribing and dispensing practices	Monthly Reports	12	Year 2-5	National	Departments of Clinical services (MOH)/NDA/and Livestock Health and Entomology (MAAIF)	20,000	MOH/MAAIF/ Partners
12.4 Support collection and sharing of data to evaluate and monitor interventions aimed to improve appropriate use and access to antimicrobials in humans and animals							
12.4.1 Undertake regular data collection on antimicrobial access and use	Reports	1,000	Year 2-5	Countrywide	Departments of Clinical services (MOH) NDA, and Livestock Health and Entomology (MAAIF)	20,000	MOH/MAAIF/ Partners
12.4.2 Analyze and share data with relevant stakeholder s	Quarterly reports	4	Year 2-5	National	Departments of Clinical services (MOH) NDA, and Livestock Health and Entomology (MAAIF)	5,000	MOH/MAAIF/ Partners
12.5 Monitor and evaluate the imp act of pharmaceutical promotion on antimicrobial use							
12.5.1 Develop tools for monitoring the impact of pharmaceutical promotion	Tools	1	Year 2-5	National	Departments of Clinical services (MOH)/NDA/and Livestock Health and Entomology (MAAIF)	5,000	MOH/MAAIF/ Partners
12.5.2 Collect, evaluate, and disseminate data on the impact of pharmaceutical promotion on antimicrobial use	Quarterly reports	4	Year 2-5	National	Departments of Clinical services (MOH)/NDA/and Livestock Health and Entomology (MAAIF)	5,000	MOH/MAAIF/ Partners
Objective 13: Support Surveillance for Antimicrobial Drug Residues in Foods							
13.1 Design and implement a national surveillance plan for monitoring antimicrobial residues in foods and animal feeds							
13.1.1 Undertake a baseline survey and needs assessment and identify gaps for surveillance of antimicrobial residues in foods andanimal feeds	Assessment Report	1	Year 1	National	NADDEC/UNBS	20,000	MAAIF/Partners

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
13.1.2 Develop a national plan for monitoring of antimicrobial residues in foods and animal feeds	Monitoring plan of antimicrobial residues in foods	1	Year 1	National	NADDEC/UNBS	20,000	MAAIF/Partners
13.1.3 Print and distribute national surveillance plan for monitoring residues in foods and animal feeds	copies	5,000	Year 1	National	NADDEC/UNBS	27,397	MAAIF/Partners
13.1.4 Disseminate the national surveillance plan	stakeholders	500	Year 2	National	NADDEC/UNBS	10,000	MAAIF/Partners
13.2 Support the use of standard procedures in accordance with international standards including the WHO/FAO Co dex Alimentarius for monitoring antimicrobial residues in foods							
13.2.1 Develop or adopt international standards f or antimicrobial residues in foods	Manual of Procedures	1	Year 1	National	NADDEC and UNBS		MAAIF/Partners
13.2.2 Train veterinarians and laboratory personnel on monitoring antimicrobial residues in food and animal feeds	Veterinary and laboratory staff	50	Year 2	National	NADDEC and UNBS	10,000	MAAIF/Partners
13.2.3 Identify and prioritize samples and antimicrobial residues for testing	List of priority samples	1	Year 1	National	NADDEC and UNBS	5,000	MAAIF/Partners
13.2.4 Provide the appropriate infrastructure and renovations for the laboratories	Renovations	2	Year 1	National	NADDEC and UNBS	800,000	MAAIF/Partners
13.2.5 Equip national laboratories for monitoring antimicrobial residues	Equipment	assorted	Year 2		NADDEC and UNBS		
13.2.6 Train personnel in laboratory logistics and supply management	Veterinary and laboratory staff	50	Year 1	National	NADDEC and UNBS	20,000	MAAIF/Partners
13.2.7 Procure laboratory information management system	LIMS software	2	Year 2	National	NADDEC and UNBS	10,000	MAAIF/Partners

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
13.2.8 Procure and consumables and supplies	procurement	assorted	Year 2	National	NADDEC and UNBS	400,000	MAAIF/Partners
13.2.9 Enroll the various labs in national and international external quality assurance programs	Labs	2	Year 2	National	NADDEC and UNBS	5,000	MAAIF/Partners
	13.3 Collaborate with the WHO/FAO Codex Alimentarius and other international efforts to generate and share actionable data						
13.3.1 Summarise and share data in standardized formats regularly	Reports	12	Year 2	National/ regional	NADDEC	20,000	MAAIF/Partners
13.3.3 Hold regular dissemination meetings for sharing data summaries with stakeholders	Stakeholders	100	Year 2 -5	National	NADDEC	10,000	MAAIF/Partners
	Objective 14: Foster Collaboration and Partnerships						
	14.1 Collaborate with the WHO, O IE, FAO and other national, region al and international efforts focused on the development and implementation of harmonized surveillance and capacity to detect and monitor antimicrobial use and resistance in prioritized pathogens						
14.1.1 Organize a harmonization workshop with international partners and other stakeholder s on the surveillance tools and methodologies	International partners	5	Year 2	National	Departments of National Disease Control (MOH) and Livestock Health and Entomology (MAAIF)	10,000	MOH/MAAIF/ Partners
14.1.2 Participate in regional and global data sharing plat forms, including GLASS	Partners	5	Year 2 -5	National/ International	Departments of National Disease Control (MOH) and Livestock Health and Entomology (MAAIF)	5,000	MOH/MAAIF/ Partners
	14.2 Participate in mechanisms for national, regional and international communication of critical events that may signify new resistance trends with global One Health implications						
14.2.1 Identify AMR critical events that are consistent with international standards	Report	5	Year 2	National	Departments of National Disease Control (MOH) and Livestock Health and Entomology (MAAIF)	5,000	MOH/MAAIF/ Partners
14.2.2 Institute global reporting mechanisms for critical events	Reports	5	Year 2 -5	National	Departments of National Disease Control (MOH) and Livestock Health and Entomology (MAAIF)	5,000	MOH/MAAIF/ Partners

	14.3 Use national, regional and international quality assurance standards for generation of quality data						
SUB-ACTIVITY	**UNIT**	**QUANTITY**	**TIMELINE**	**LOCATION**	**RESPONSIBLE ENTITY**	**COST (USD)**	**SOURCE OF FUNDING**
14.3.1 Develop manual of procedures for Quality assurance mechanisms for surveillance	Manual of Procedures	1	Year 2 -5	National	Departments of National Disease Control (MOH) and Livestock Health and Entomology (MAAIF)	10,000	MOH/MAAIF/ Partners
14.3.1 Train personnel in Quality assurance mechanisms for surveillance	Laboratory staff	100	Year 2 -5	National	Departments of National Disease Control (MOH) and Livestock Health and Entomology (MAAIF)	10,000	MOH/MAAIF/ Partners
14.3.2 Enroll all laboratory surveillance partners in relevant quality assurance mechanisms	Enrollment	22	Year 2 -5	National	Departments of National Disease Control (MOH) and	5,000	MOH/MAAIF/ Partners
					Livestock Health and Entomology (MAAIF)		
	Focus Area 5: Research and Inn ovation						
	Objective 15: Promote Innovation in the Search for Alternative Treatments and Drug Discovery						
	15.1 Support mechanisms for coordinated research and innovation						
15.1.1 Establish a Technical Working Group (TWC) on Research and innovation (RI TWC)	RI TWC	1	Year 1	National	NAMRSC	500	MOH/MAAIF/ Partners
15.1.2 Provide hands-on training to researchers on grant writing	Researchers	100	Year 1-5	National	UNCST, MoSTI	10,000	UNCST, MoSTI
15.1.3 Advocate, lobby and AMR research	Report	continuous	Year 1	National	UNCST, RI TWC, MoSTI	10,000	UNCST, MoSTI
15.1.4 Sensitize researchers on intellectual property rights and patenting	Report	200	Year 1	National	UNCST, RI TWC, URSB	10,000	Workshop report
	15.2 Facilitate and support the Natural Chemotherapeutics Laboratories (NCL) and other partners to expand their antimicrobial product Development						

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
15.2.1 Con duct a baseline survey and needs assessment on antimicrobial resources in the country, an d identify opportunities and gaps to be filled	Assessment Report	1	Year 1	National	RI TWC in collaboration with NCL	40,000	MOH/MAAIF/ Partners
15.2.2 Con duct a study to identify challenges and opportunities for enhancing antimicrobial product development	Report	1	Year 1	National	NCL/Universities/NDA	30,000	MOH/MAAIF/P artners
15.3 Support the establishment of international col laborations in high through put screening of antimicrobial compounds							
15.3.1 Develop governance structures and policies that encourage development and research of antimicrobial compounds	Research network	1	Year 1-5	National	MoH, MoSTI	5,000	List of researchers engaged
15.4 Support academia and other researchers in product development							
15.4.1 Provide seed funding for proposal development	Research groups	100	Year 1-5	National	UNCST/Academic and partners	100,000	Minister of Science Technology and Innovation/UN C ST
15.4.2 Post calls for funding opportunities onto institutional websites and mailing lists of stakeholders	Posts	continuous	Year 1-5	National	UNCST/Academic and partners	-	UNCST
15.4.3 Establish a database of biological materials, including plants, fungi, and other compounds with suspected antimicrobial properties	Database compounds	TBD	Year 1-5	Countrywide	Research institution s, UNCST, NCL, NDA, NaCOTHA	200,000	UNCST/NCL/ N DA
15.5 Support research in alternative treatments for infections							
15.5.1 Explore and share innovative ideas about alternative treatments to infectious diseases	Researchers	100	Year 1-5	National	RI TWC, NaCOTHA, MoH, MAAIF, NFA	10,000	UNCST
15.6 Link the indigenous technical knowledge (ITK) groups to the product development system							

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
15.6.1 Facilitate the establishment of MoUs between IT Ks, the National Chemotherapeutic Laboratories and other stakeholders	MOUs	5	Year 1-5	National and regional	MoH,NCL,NDA, THETA	1,000	UNCST/NCL/ N DA
15.6.2 Carry out country-wide survey of indigenous knowledge on antimicrobial solutions	survey	1	Year 1	National	THETA, Universities	20,000	UNCST/NCL/ N DA
	Objective 16: Promote Innovations in Diagnostic Technology						
	16.1 Support investments and collaborations and strength incapacity for research, development and testing of innovative diagnostic technologies for detection of resistance in real time.						
16.1.1 Con duct a baseline survey and needs assessment to identify the opportunities and challenges in innovative diagnostics	Report	1	Year 1	National	MoSTI, Universities	300,000	UNSCT
6.1.2 Enhance the capacity of national regulatory bodies to assess and approve potentially innovative antimicrobial diagnostic technologies	Regulatory bodies	1	Year 1	National	NDA	10,000	MoSTI
	16.2 Support validation of point-of -care diagnostic s for detection of infectious diseases and detection of resistance.						
16.2.1 Undertake an assessment of the point of care diagnostics in different stages of development	Assessmen t Report	1	Year 1	National	MoSTI	20,000	MoSTI
16.2.2 Sensitize stakeholders on regulatory systems an d processes for approval of diagnostic technologies	Stakeholders	100	Year 1-5	National	NDA, URSB	10,000	MoSTI
16.2.3 Train regulatory agency staff in approval processes for diagnostics	Report	20	Year 1-5	National	NDA, UNCST	5,000	NDA, WHO, OIEC, IBA
	16.3 Create linkages and support for Ugandan scientists to take leadership roles in international research partnerships targeting AMR.						

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
16.3.1 Identify and disseminate opportunities for Ugandan scientists in international research partnerships and offer mentorship	Opportunities	TBD	Year 1-5	National	MoH/MAAIF	5,000	List of potential partnerships
16.3.2 Provide seed funding to support Ugandan scientists in research leadership	Researchers in leadership	TBD	Year 2	National	MoH, MAAIF, MoSTI	TBD	Researchers in leadership roles
Objective 17: Collaborate with International Partners in Basic Intervention Research							
17.1 Promote research to identify high-risk and high-burden resistant strains, their resistance mechanisms and their transmission.							
17.1.1 Organize workshops to share knowledge on high-risk and high-burden resistant strains	workshops	4 (1 per year)	Year 1-5	National	MoH, MAAIF, Academia	5,000	UNCST
17.1.2 Expand seed funding provided for pilot studies of new antimicrobials	Pilot studies	TBD	TBD	National	UNCST, MoSTI	TBD	MoSTI, UNCST
17.2 Promote innovations for new antimicrobial drug development, vaccines, and other innovative therapies.							
17.2.1 Identify and disseminate opportunities for participation in the development of antimicrobials, vaccines, and other innovative therapies	Stakeholders	100	Year 1-5	National	UNCST	5,000	UNCST
17.2.2 Identify and twin local laboratories with foreign lab oratories to support the local production of vaccines	MOUs	5	Year 1-5	National	MoH, MAAIF, RI TWC	5,000	UNCST
17.2.3 Establish and maintain microbial collections and other biological resources for research an d development of AMR solutions	Biological Resource Centres	1	Year 1-5	National	CPHL, Academia	5,000	UNCST

SUB-ACTIVITY	UNIT	QUANTITY	TIMELINE	LOCATION	RESPONSIBLE ENTITY	COST (USD)	SOURCE OF FUNDING
17.3 Invest and support collaboration in high-throughput genomics and sequencing technologies that have the potential to enhance product development							
17.3.1 Undertake a baseline survey and needs assessment to identify current capabilities and gaps in high-throughput genomics and sequencing in the country	Assessment Report	1	Year 1	National	RI TWC	5,000	UNCST
17.3.2 Establish a National Genomics and Bioinformatics Centre (NGBC) to support AMR research	Genomics center	1	Year 1-5	National	UNCST	3 ,000, 000 0	MoSTI
17.3.3 Identify and facilitate collaboration of the NGBC with other international centres of excellence	MOUs	1	Year 1-5	National	UNCST	500	UNCST
17.4 Support research on the burden of AMR to inform policy for investment in interventions.							
17.4.1 Undertake research to examine the burden of A MR in the country	Report	1	Year 1	National	MAAIF, MoH, Research Institutions	150,000	Government and partners
17.5 Establish a research innovation fund to support innovations that slow down AMR.							
17.5.1 Advocate and lobby for funding support for research innovations from government and pharmaceutical companies	Research and innovation fund	1	Year 1	National	MoSTI	5,000,000	Funding support promises from government and other funders
Objective 18: Enhance Operational and Health Systems Research at the Local Level							
18.1 Support local research on resistance and transmission pathways between the environment, humans, animals and food supply chain							
18.1.1 Organize One Health workshops to identify priorities for research on resistance and transmission pathways	Report	1	Year 1	National	MoH, UNHRO, MAAIF	5,000	One Health Platform
18.1.2 Identify and disseminate opportunities for One Health research funding	Report	continuous	Year 1-5	National	UNHRO, MoH, MAAIF	5,000	One Health Platform
18.2 Promote local research on antimicrobial use patterns with the goa l of producing more context specific stewardship approaches.							
18.2.1 Identify priorities for research to establish and improve antimicrobial prescription and use patterns	workshops	1	Year 1	national	UNCST	5,000	UNCST

18.2.2 Conduct research to assess behavioral, cultural and anthropological practices on antimicrobial use in society, prescription practices and motivators	research	5	Year 1	national	MOH/NDA/RITWC	200,000	UNCST

5.0 Monitoring and Evaluation

5.1 Introduction

The Monitoring & Evaluation Plan provides a guidance framework for evaluating progress made regarding the NAP-AMR. In accordance with the Strategic Plan and the Implementation Plan, the strategic actions are coupled with the relevant indicators that can provide insight and evidence to the NAMRSC. The usage of this Monitoring & Evaluation plan can thus provide an initial foundation to all stakeholders regarding pertinent and relevant indicators that can alert relevant stakeholders to failures and successes in the implementation of the NAP-AMR.

5.2 Goal and Objectives of the M&E Plan

The AMR NAP M&E plan goal is aligned with GAP which is the global framework for the containment of AMR. These goals align with the goal of increasing stewardship of the health agenda by the MoH. The stewardship function of the MoH focuses around provision of appropriate guidance to implement health programs as well as priorities for implementation. In order to provide appropriate guidance, there is need for an M&E system that provides timely and accurate information to government and partners in order to inform performance reviews, policy discussions and periodic revisions to the national strategic and operational plans.

Goal of the M&E

The goal of the AMR NAP M&E plan is to establish a system that is robust, comprehensive, fully integrated, harmonized and well-coordinated to guide monitoring of the implementation of the AMR NAP and evaluate impact.

Specific Objectives of the M&E

The specific objectives of the AMR NAP M&E plan are:

1. To provide a framework for tracking progress and demonstrating results of the AMR NAP over the medium term.
2. To build capacity of the U N A M R C to regularly and systematically track progress of implementation of the NAP.
3. To facilitate NAMRSC and other stakeholders assess the performance in accordance with the agreed objectives and performance indicators to support management for results (evidence-based decision making),
4. To improve compliance with broader government policies
5. To facilitate continuous learning (document and share the challenges and lessons learnt) by stakeholders during implementation of the NAP

Key Outputs of the M&E

The expected key outputs of the M&E framework are:

1. A functional sector-wide unified integrated, harmonized and well- coordinated M&E system with effective and timely feedback to stakeholders.
2. Performance reports (baseline survey reports, periodic progress reports, annual performance reports, financial audit reports etc.)
3. Basic statistical data on health service delivery, resources, outputs and beneficiaries.
4. Regular updates on core performance indicators.
5. National infrastructure for M&E.

M&E Outcomes

The M&E Plan should result in:

1. Timely reporting on progress of implementation of the AMR NAP
2. Timely meeting of reporting obligations to government and partners
3. Objective decision making for performance improvement
4. Accountability to government, partners and citizens
5. Policy dialogue with stakeholders
6. Evidence-based policy development and advocacy
7. Institutional memory on AMR NAP implementation

5.3 Structural Framework

The structure of the Monitoring & Evaluation matrix can be generally characterized as an out comer requirement model. This model establishes what the desired outcome for any focus area or objective is and pairs it with the respective strategic actions being taken. With each of these strategic actions being taken, the monitoring & evaluation indicators establishes how those actions contribute to the achievement of the desired outcome. In doing so, stakeholders can evaluate where there are bottlenecks to the desired outcome and/or highlight where the relationship between the desired outcome and the strategic activity did not create as much impact as desired. As a result, the NAP-AMR monitoring & evaluation framework provides critical information that can aide both in mid-course changes as the NAP-AMR is implemented and also guide planning in the future.

5.4 Methodology

The development of the AMR NAP M&E plan was drafted by the UNAS Standing Committee on AMR. UNAS spearheaded the development of the NAP by undertaking the situational analysis in 2015 and the AMR strategy in 2017. With support from WHO, UNAS drafted the AMR M&E plan which was subjected to stakeholder review and approval by various stakeholders.

The plan relied on the AMR strategy and implementation plan and aimed to provide a framework for monitoring performance of the implementation of the proposed interventions in the strategy. The process also took into consideration the Global Action Plan (GAP) on AMR approved by the

global community and the various international agencies; in particular, WHO/OIE/FAO tripartite plans. In order to ensure uniformity with other national plans for ease of global monitoring, the plan followed the WHO guidance in development of the M&E plan.

The plan provides a summary of the key outcome and output indicators while the process indicators are provided in the detailed M&E framework in Appendix 1.

5.5 Monitoring and Evaluation Framework Matrix

The monitoring evaluation matrix summary below follows the standard programmatic M&E format that includes required inputs or basic resources needed, the process or activities, the outputs (results at the level of the programme), the outcomes (results at the level of the population) and their desired impact over the long term. This is in consonance with WHO format for ease of comparison with WHO member countries. The detailed matrix that follows in Appendix 1 gives more details of the indicators for the targets and their sources of verification according to the proposed activities.

Planning	**Input**	**Process**	**Output**	**Outcome**	**Impact and Goals**
	Basic resources	**Activities**	**Results at level of the programme**	**Results at level of populations**	**Ultimate effect in long term**
Strategic Objective 1: Public Awareness and professional competencies in AMR improved	Communication strategy for all stakeholders Funding for communication to the public and the professionals secured	Coordinated communication and public awareness on AMR	A national coordination (PATE) committee in place	Increased public awareness and knowledgeable public on AMR Increase in the public that complete antibiotic treatment courses Proportion of public who know use of antibiotics causes resistance Increase in the public that are not self-medicating Demonstrated competencies of health care workers, animal and environmental professionals in AMR related issues	Increased knowledge on AMR Responsible use of antibiotics
		A comprehensive communication strategy for AMR in place	A comprehensive communication strategy in place		
		Communication materials and tools for use by different stakeholders for different communication channels and/or platforms.	Tailored communication materials on AMR for the public and farmers available		
		Regular public awareness campaigns on antimicrobial use and resistance undertaken	Proportion of planned public awareness campaigns implemented at district and national levels		
		Awareness raising in primary, secondary and tertiary schools and other training institutions using specialized materials undertaken	Percentage of veterinary and health training institutions that have incorporated AMR in their core curricular, Proportion of primary and secondary schools incorporating AMR in health education sessions		
		Collaboration established with NGOs, Civil Society Organizations (CSOs), Faith Based Organizations (FBOs) the private sector,	Functional coordination forum linking stakeholders established, Proportion of		

Planning	Input	Process	Output	Outcome	Impact and Goals
	Basic resources	**Activities**	**Results at level of the programme**	**Results at level of populations**	**Ultimate effect in long term**
		International organizations, law enforcement and the media to deliver messages on antimicrobial use.	stakeholders participating in the forum		
		Media trained to report on AMR.	Percentage of media houses trained in AMR Number of media practitioners trained in AMR,		
		Networks for the dissemination of information on antimicrobial use and resistance developed.	Number of functional dissemination networks established by region		
		AMR included as a priority in the risk register, MDA plans.	Number of MDA plans with AMR as a priority in the risk registers		
		Research findings translated to popular versions and disseminated	Number of Research findings translated into popular versions Number of popular version research findings disseminated		
		AMR courses for under and graduates on AMR prevention and containment developed	Proportion of health care workers, animal and environmental professionals demonstrating AMR competencies		
		AMR courses for under and graduates on AMR prevention and containment developed	Proportion of undergraduate and postgraduate courses with updated AMR content		
		AMR courses for under and graduates on AMR prevention and containment developed	Proportion of undergraduate and postgraduate courses with updated AMR content		

Planning	Input	Process	Output	Outcome	Impact and Goals
	Basic resources	**Activities**	**Results at level of the programme**	**Results at level of populations**	**Ultimate effect in long term**
Strategic Objective 2: Improved Infection	Infections and Control Guidelines	Strengthened coordination mechanisms for infection prevention and control	A functional national coordination IPC TWC committee in place	Reduction in Incidence of healthcare acquired	Reduction in incidence of infections in health facilities, farms &
Prevention and Control	Biosecuty Guidelines	Updated national infection prevention and control manuals and guidelines disseminated	Proportion of health facilities with updated IPC manuals	infections	communities, and overall
Planning	Input	**Process**	**Output**	**Outcome**	Impact and Goals
	Basic resources	**Activities**	**Results at level of the programme**	**Results at level of populations**	Ultimate effect in long term
	Funding for IPC secured	IPC compliant infrastructure in healthcare facilities	Proportion of health facilities with IPC compliant infrastructure	Reduced in incidence of infections in the community Reduced incidence of infectious diseases in animals and Agriculture Reduced incidence of vaccine preventable diseases in human s and animals	environmental contamination

Planning	Input	Process	Output	Outcome	Impact and Goals
	Basic resources	**Activities**	**Results at level of the programme**	**Results at level of populations**	**Ultimate effect in long term**
	Prescription and Treatment Guidelines Antimicrobial	Strengthened coordination mechanisms for coordination and support of Antimicrobial Stewardship and ensuring Optimal Use	A functional Technical working group (ASO TWC) in place	Effectiveness and efficacy of antimicrobials preserved	Successful treatment of infectious disease
	stewardship Guidelines	Up-to-date prophylactic, prescribing/treatment guidelines and protocols for infectious diseases in human health	Proportion of health care facilities with up-to-date Prophylactic, prescribing/treatment guidelines and protocols for infectious	Effective and timely treatment of	\
Focus Area 3: Antimicrobial					
	Funding for IPC materials			infectious diseases Effective and timely treatment of	
Stewardship and Optimal Use		Responsible prescribing practices, dispensing and administration	Proportion of health care workers adhering to prescribing practices,	infectious diseases in animals and agriculture	
		With a system of ensuring accountability.			
		Institute/strengthen and support proper functioning of Medicines and Therapeutics committees in all health care facilities	Proportion of health care facilities with functional		
			MTCs		

Planning	Input	Process	Output	Outcome	Impact and Goals
		Support the development and dissemination of antimicrobial stewardship working manuals and	(l) Up-to-da the antimicrobial manuals and procedures (2) Proportion of health care workers with the manuals		
		Procedures. Provide up-to-date and unbiased medicine information services to human and animal health providers.			
			Proportion of human and animal health providers accessing up-to-date medical information		
		Strengthened super vision of prescribing and dispensing outlets for human and animal antimicrobials	Proportion of prescribing and dispensing outlets for human and animal antimicrobials adhering to guidelines and standards		
		Incentives and reward sys terms for excellence in adherence to best practices and standards	Proportion of healthcare rewards and sanctions committees that have included prescribing practices as a criteria		
		Functional stewardship committees at all health care facilities	Proportion of health care facilities with functional stewardship committees		
		Affordable and accurate diagnostic tools available at all health facilities	proportion n of healthcare facilities with diagnostic tools		
		Financing mechanisms for antimicrobial medicines or preventative **AMR** programs Enhanced.	proportion of the medicine budget allocated to financing antimicrobials medicine		
		Timely and efficient distribution mechanisms for pro vision of	Proportion of deliveries of aantimicrobials to health care facilities done on time		

Planning	Input	Process	Output	Outcome	Impact and Goals
		antimicrobials to health care providers			
		Output 8.5: Capacity of local producers/manufacturers of Antimicrobials enhanced.	Proportion of local antimicrobial manufacturers with increased capabilities		
		Promote Access to and Prudent Use of Antimicrobials in Agriculture and Veterinary Medicine	Effective and timely treatment of infectious diseases in animals and agriculture		
		Up-to-date prescription guidelines	Proportion of health care facilities with up-to-date prescription guidelines		
		Up-to-date antimicrobial stewardship working manuals and procedures for the agriculture and veterinary sector	Proportion of agriculture and veterinary practitioners with up-to-date antimicrobial stewardship working manuals and procedures		
		Restricted broad or generalized use of antimicrobials as growth promoters or as feed additives	Proportion of feed manufacturers not using antimicrobials in feeds		
		Supply chain and use of Antimicrobials in agriculture and veterinary medicine strengthened.	Proportion of agriculture and veterinary practitioners adhering to the regulations		
		Promote Use of Quality, Safe and Efficacious antimicrobial agents	Effective treatment of infectious diseases		
		Capacity for regular quality assessment of antimicrobial agents in the NDA quality laboratories Strengthened.	Number of analyses undertaken in a year and Rate of turnaround time for analyses		
		Improved supervision of Pharmacies	Proportion of pharmacy outlets adhering to GPP		

Planning	Input	Process	Output	Outcome	Impact and Goals
Strategic Objective 4: Surveillance	Manual of procedures for Surveillance of AMR Manual of procedures for Surveillance of antimicrobial use Manual of and for Surveillance of antimicrobial residues in foods Funds for AMR surveillance	Over-the-counter availability and self-medication with antimicrobial medicines adherence to regulations improved	Proportion of drug outlets adhering to regulations regarding OTC	Increased evidence based decisions on antimicrobial use Reduced levels of antimicrobial drug residues in foods Harmonized and coordinated AMR surveillance system	Early detection and response to emerging MDR problems
		Strengthened regulation of the pharmaceutical companies and adherence to Good Manufacturing Practices	Proportion of pharmaceutical companies adhering to GMPs		
		Strengthened regulation of the pharmaceutical and antimicrobial waste	Proportion of facilities adhering to guidelines for pharmaceutical and antimicrobial waste disposal		
		A national AMR surveillance programme in place	A fully functional surveillance programme		
		SOPs and methodologies for surveillance of AMR in place	Proportion of laboratories adhering to standard procedures to generate AST data		
		Laboratory infrastructure, human resources, supplies and equipment improved	(1) Suitable infrastructure (2) Well trained human resource (3) Suitable equipment in place		
		Microbiological culture and sensitivity tests performed routinely	Proportion of laboratories undertaking microbiological culture and AST		
		Quality assurance systems for microbiology laboratory testing in place	Proportion of laboratories with QA/QC system in place		
		Laboratories enrolled in national and international external quality	Proportion of laboratories enrolled in external quality		
		assurance programs	assurance programs		
			Proportion of health care and		
		Surveillance data and information	veterinary facilities utilizing		
		disseminated to healthcare facilities	AST data to inform their decision of choice of antimicrobials		

Planning	Input	Process	Output	Outcome	Impact and Goals
		One Health networks created to widely share data	Number of One Health functional networks created		
		An early warning system to monitor trends off AMR established	Proportion of facilities with an early warning system in place		
		Countrywide utilization of data	Proportion of health care facilities utilizing AMR data		
		Support Surveillance of Antimicrobial Use	Evidence based decisions on antimicrobial use		
		A national antimicrobial use surveillance plan in place	A functional national antimicrobial use surveillance plan		
		Procedures and methodologies for monitoring antimicrobials developed	Proportion of facilities with and using standard procedures to monitor antimicrobial use		
		Robust data on prescribing practices, dispensing practices, client/community use generated	Proportion of facilities generating prescribing practices, dispensing practices data		
		Antimicrobial use data generated and shared	Proportion of facilities generating antimicrobial use data		
		Data on impact of pharmaceutical promotion on antimicrobial use generated	Amount of data about impact of pharmaceutical promotion		
		Support Surveillance for Antimicrobial Drug Residues in Foods	Reduced levels of antimicrobial drug residues in foods		

Planning	Input	Process	Output	Outcome	Impact and Goals
		A national surveillance plan for monitoring antimicrobial residues in foods and animal feeds in place	A functional plan for monitoring antimicrobial residues in foods in place		
		Standard procedures for monitoring antimicrobial residues in foods in place	Number of laboratories with and using standard procedures for monitoring antimicrobial residues in foods		
		Collaborating with WHO/FAO Codex Alimentarius and other international partner established	An international platform for sharing data		
		Foster Collaboration and Partnerships among AMR stakeholders	Harmonized and coordinated AMR surveillance system		
		Harmonized surveillance and capacity to detect and monitor antimicrobial use and resistance in prioritized pathogens established	Increased capacity for surveillance AMR and use		
		Mechanisms for participation international, regional and international communication of critical events established	A platform for communicating AMR critical events		
		National, regional and international quality assurance standards in place	Proportion of facilities with QA/QC procedures in place		
		Mechanisms for coordinated research and innovation in place	A platform (RI TWC)for coordinated research in AMR	Effective control of resistant infections Accurate and cost effective diagnosis of infections	
	Funds for Research and	Enhanced antimicrobial product development by the Natural Chemotherapeutics Laboratories (NCL) and other partners	Number of new antimicrobial products developed by NCL and other partners and approved		

Planning	Input	Process	Output	Outcome	Impact and Goals
Strategic Objective 5: Research and Innovation	Innovation secured	International collaborations in high-throughput screening of antimicrobial compounds established	Number of international collaborations in high through putting screening of antimicrobial compounds established	High quality basic intervention research Evidence-based health systems operations	Reduced emergence and spread of AMR
		Academia and other researchers supported in product development	Number of new antimicrobial products developed by academia and other researchers and approved		
		Research in alternative treatments for infections supported	Number f alternatives for treatment of infectious diseases developed		
		Linkages between indigenous	Number of ITKs developed into antimicrobial products		
		Technical knowledge (ITK) groups to the product development system established			
		Promote Innovations in Diagnostic Technology	Accurate and cost effective diagnosis of infections		
		Capacity for research, development and testing of innovative diagnostic technologies strengthened	Number of new innovative diagnostics developed		
		Point-of-care diagnostics for detection of infectious diseases and detection of resistance validated	Number of point-of-care diagnostics validated and approved		
		Ugandan science leaders in international research on AMR	Number of Uganda scientists with leadership position in international research partnerships		

Planning	Input	Process	Output	Outcome	Impact and Goals
		Collaborate with International Partners in Basic Intervention Research	High quality basic intervention research		
		High-risk and high-burden resistant strains identified	Number of high-risk and high burden resistant strains reported routinely		
		Innovations for new antimicrobial drug development, vaccines, and other innovative therapies	Number of innovative new antimicrobial drug development, vaccines, and other innovative therapies developed		
		Collaborations in high-throughput genomics and sequencing technologies established	Number of high-throughput genomics and sequencing technologies available		
		The burden of AMR established	The proportion of burden infectious diseases that is attributed to AMR		
		A research innovation fund to support innovations that slow down AMR established.			
		Transmission pathways between the environment, humans, animals and food supply chain established	Elucidation of resistance transmission pathways		
		Local Antimicrobial use patterns established	Patterns and trends of antimicrobial use locally		

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Appendix 1: Detailed Monitoring and Evaluation Matrix

The following M&E matrix provides the framework for a more specific and detailed targets for monitoring the implementation of the plan. It was developed basing on the WHO recommended templates which enables a more uniform and standard way to monitor the AMR NAP implementation across countries. The table therefore provides the indicators for each target as defined in the implementation plan against the baseline values and proposes performance values either as proportions of the targets or yes or no statements, as well as the frequency of data collection, suggested data sources, and means of verification. It should be noted that most the baseline values were not accurately defined at the time of the design of this plan and it is expected that first activity in the M&E process will be to establish those baselines values (where there was no data available, or verify the estimates provided) against which progress will be measured.

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
Strategic Objective 1: Public Aware ness and professional competencies in AMR improved		Desired Outcome: increase in (1) Proportion of the public aware and knowledgeable on AMR, (2) Pro portion of professional healthcare workers who know about AM R					
Objective 1: Public Awareness improved		Desired Outcome: increase in (1) proportion of public who know use of antibiotics causes resistance (2) Proportion of the public of the not self-medicating (animal and humans)					
Output 1.1 Coordinated communication and public awareness on AMR		Indicator: A national coordination (PATE) committee in place					
1.1.1 Establish a Technical Working Committee (TWC) on public awareness, training, and education, with clear terms of reference (PATE	TWC formed with list of members and ToR	Yes/No	1	Once	Report of inauguration with list of members	Observation/Document review/Key informant interview	No PATE TWC
Output 1.2 A comprehensive communication strategy for AMR in place		Indicator: (1) A comprehensive communication strategy in place					
1.2.1 Conduct a needs assessment of communications needs	List of communication needs for AMR identified	Yes/No	1	Once	Assessment report	Observation/Document review/Key informant interview	No KAP study

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
1.2.2 Develop a communications strategy for the AMR NAP	Strategy draft complete and approved	Yes/No	1	3 meetings	Draft Report	Observation/Document review/Key informant interview	No Communication strategy
1.2.3 Print and distribute strategy	# of copies printed and distributed	Proportion	5000	once	Copies of the strategy and distribution list	Observation/Document review/Key informant interview	TBD
1.2.4 Disseminate strategy among stakeholders	# of stakeholders aware of the AMR communication strategy	Proportion	100	once	Dissemination Report	Observation/Document review/Key informant interview	Draft strategy
Output 1.3 Communication materials and tools for use by different stakeholders for different communication channels and/or platforms.		Indicators: Tailored communication materials on AMR for the public and farmers available					
1.3.1 Develop core communication messages for different stakeholders	# of and type communications messages available for different stakeholders	Proportion	10	Annual	Copies of the messages	Observation/Document review/Key informant interview	TBD
1.3.2 Print and/or distribute materials and tools	# of copies printed and distributed	Proportion	5000	1	Copies and list of distribution list	Observation/Document review/Key informant interview	Drafts available
1.3.3 Disseminate materials and tools among stakeholders through mechanisms such as National and District AMR Conferences	# of stakeholders with appropriate communications materials and tools	Proportion	100	2	Dissemination Report	Observation/Document review/Key informant interview	Drafts available

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
Output 1.4 Regular public awareness campaigns on antimicrobial use and resistance undertaken		Indicators: Proportion of planned public awareness campaigns implemented at district and national levels					
1.4.1 Conduct ToT for District health educators (including but not exclusive to DHOs, CAOs)	# of district health educator trainees trained	Proportion	280	7	Training reports	Observation/Document review/Key informant interview	Materials available
1.4.2 Conduct district-level communications training sessions for health and veterinary workers on AMR (including but not exclusive to DHOs, DVOs)	# of health workers trained	Proportion	140	Annual	Training reports	Observation/Document review/Key informant interview	No data available
1.4. Organize activities to raise awareness during the World Antibiotic Awareness Week	# and type of activities organized	Proportion	5	Annual	Reports	Observation/Document review/Key informant interview	No data available
1.4.4 Set up billboards along major travel routes	# of Billboards set up	Proportion	50	Annual	Reports	Observation/Document review/Key informant interview	TBD
1.4.5 Print and distribute awareness raising Leaflets /flyers	# of Flyers/leaflets created and delivered to regional hubs	Proportion	50000	Annual	Copies and distribution reports	Observation/Document review/Key informant interview	TBD
1.4.6 Air radio/TV segments with key messages	# of Radio segments on the radio and TV	Proportion	14	Annual	Media monitoring reports	Observation/Document review/Key informant interview	TBD
1.4.7 Conduct public dramas (at major national events—Independence Day, Labor Day etc.)	# of dramas conducted at national events	Proportion	5	Annual	Reports	Observation/Document review/Key informant interview	TBD

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
Output 1.5 Awareness raising in primary, secondary and tertiary schools and other training institutions using specialized materials undertaken		Indicators: 1) percentage of veterinary and health training institutions that have incorporated AMR in their core curricular, 2) proportion of primary and secondary schools incorporating AMR in health education sessions					
1.5.1 Identify existing school health programs and determine integration of AMR messages into these.	# of school health programs in which AMR has been integrated	Proportion	5	Annual	Copies of the new or updated reports	Observation/Document review/Key informant interview	TBD
1.5.2 Train focal persons at different levels and sectors of the education system	# of Focal persons trained	Proportion	5000	Once	Training reports	Observation/Document review/Key informant interview	TBD
1.5.3 Disseminate materials and tools to focal persons	# school focal persons to whom communications materials have been delivered	Proportion	5000	Once	Distribution lists to focal persons	Observation/Document review/Key informant interview	TBD
1.5.4 Train relevant education partners	# of education partners trained on AMR issues	Proportion	1000	Annual	Training Report	Observation/Document review/Key informant interview	TBD
Output 1.6 Collaboration established with NGOs, Civil Society Organizations (CSOs), Faith Based Organizations (FBOs) the private sector, international organizations, law enforcement and the media to deliver messages on antimicrobial use.		Indicators: 1) Functional coordination forum linking stakeholders established, 2) proportion of stakeholders participating in the forum					
1.6.1 Disseminate training materials and tools to partners	# of partners to whom training materials have been delivered	Proportion	100	Once	Training reports	Observation/Document review/Key informant interview	TBD
Output 1.7 Media trained to report on AMR.		Indicators: 1) Percentage of media houses trained in AMR 2) Number of media practitioners trained in A MR,					
1.7.1 Train media on AMR reporting	# of journalists/people trained in AMR reporting	Proportion	200	Annual	Training reports	Observation/Document review/Key informant interview	TBD

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
1.7.2 Distribute communication materials and tools to the media	# and type of communications materials and tools distributed to the media	Proportion	200	Annual	Delivery reports	Observation/Document review/Key informant interview	TBD
Output 1.8 Networks for the dissemination of information on antimicrobial use and resistance developed.		Indicators: 1) Number of functional dissemination networks established by region					
1.8.1 Conduct a survey to identify existing networks to assist with dissemination of materials and tools tokey	List of existing and potential networks that can be used to disseminate information on AMR	Yes/No	1	Annual	Needs assessment report	Observation/Document review/Key informant interview	TBD
1.8.2 Design messages for social media networks for AMR awareness	# of messages designed for social media networks	Proportion	10	Annual	Copies of the messages	Observation/Document review/Key informant interview	TBD
1.8.3 Include AMR data in weekly epidemiological reports for MoH/MAAIF	#of reports that have AMR data or information included	Proportion	104		Copies of the epidemiological reports	Observation/Document review/Key informant interview	TBD
Output 1.9 Research findings translate d to popular versions and disseminated		Indicators: 1) Number of Research findings translated into popular versions 2) Number of popular version research findings disseminated					
1.9.1 Periodically review research findings and translate them into popular versions	# of Popular versions of research synthesis published	Proportion	unlimited	Annual	Copies of synthesized versions	Observation/Document review/Key informant interview	TBD
1.9.2 Share latest research with relevant policymakers	Amount of policy relevant information shared with policy makers	Proportion	1	monthly	Copies of materials shared with policy makers	Observation/Document review/Key informant interview	TBD

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
Objective 2: Support Education and Training of Human, Animal and Environmental Health Professionals		Desired Outcome: (1) increased proportion of health care workers, animal and environmental professionals demonstrating AMR competencies (under development).					
Output 2.1 AMR courses for under and graduates on AMR prevention and containment developed		Indicators: (1) Proportion of undergraduate and postgraduate courses with updated AMR content					
2.1.1 Conduct a needs assessment of AMR-related	Assessment conducted	Yes/No		Once	Assessment report	Observation/Document review/Key informant interview	No data available
gaps in the education system at different levels							
2.1.2 Conduct a dissemination workshop on the e needs assessment findings to relevant educational and curriculum-approval bodies	Workshop held	Yes/No		1	Dissemination meeting report	Observation/Document review/Key informant interview	TBD
2.1.3 Conduct workshops to review or update curriculums based on gaps identified in needs assessment	Meetings held	Yes/No		8	Meeting reports with Updated curricula	Observation/Document review/Key informant interview	50% content existing
2.1.4 Conduct training workshops for educators	Number of trainings	Yes/No		4	Training reports with list participants	Observation/Document review/Key informant interview	No data available
2.1.5 Convene training workshops of health professionals on AMR	Workshop held	Yes/No		1	Dissemination meeting report	Observation/Document review/Key informant interview	TBD

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
2.2.1 Conduct a needs assessment for AMR-related gaps in CPD trainings for relevant professions	Assessment conducted	Yes/No		once	Assessment report	Observation/Document review/Key informant interview	No data available
2.2.2 Convene a meeting to share findings of needs assessment in stakeholder dissemination meetings	Meeting held	Yes/No		5	Meeting reports	Observation/Document review/Key informant interview	TBD
2.2.3 Conduct meetings to develop training manuals of health professional CPD on AMR	Meetings held	Yes/No		1	Sensitizatio n meeting reports	Observation/Document review/Key informant interview	TBD
2.2.4 Conduct sensitization sessions for relevant professional boards and councils and facilitate revision of guidelines for prescriptions	Sensitizatio n sessions held	Yes/No		7 (I per region)	Training workshops reports	Observation/Document review/Key informant interview	TBD
Strategic Objective 2: Improved Infection Prevention and Control		Desired Outcome: Reduction in incidence of infections in health facilities, farms & communities, and overall environmental contamination					
Objective 3: Strengthen Infection Prevention and Control Programs in Healthcare Facilities		Desired Outcome: Reduction in incidence of healthcare acquired infections					
Output 2.1 Strengthened coordination mechanisms for infection prevention and control		Indicators: A functional national coordination IPC TWC committee in place					
3.0.1 Establish a Technical Working Group (TWC) on Infection Prevention and Control (IPC TWC) with TORs	ToR signed, TWC formed with list of members	Yes/No	1	1	NAMRS C minutes	Observation/Document review/Key informant interview	None
Output 3.1 Updated national infection prevention and control manuals and guidelines disseminated		Indicators: Pr oportion of health facilities with updated IPC manuals					

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
3.1.1 Update the IPC policy	Updated IPC policy	Yes/No	1	Once	Function al TWC with TOR, TWC Meeting minutes	Observation/Document review/Key informant interview	TBD
3.1.2 Revise IPC manual for infection prevention control	Updated IPC manual for approved health facility structural designs	Yes/No	1	Once	Updated IPC policy	Observation/Document review/Key informant interview	
3.1.3 Print and distribute IPC Guidelines	# of copies of the Guidelines printed and distributed	Yes/No	4000	once	Printed copies and distribution reports	Observation/Document review/Key informant interview	
3.1.4 Disseminate IPC and standards of professional practice guidelines at all health-care facilities	# of health workers to whom the guidelines have been disseminated by facility	Yes/No	5000	once	Dissemination reports	Observation/Document review/Key informant interview	TBD
Output 3.2 IPC compliant infrastructure in healthcare facilities		Indicators: Proportion of health facilities with IPC compliant infrastructure					
3.2.1 Undertake an assessment of the current status and needs of IPC in health facilities	Baseline and needs for IPC at health facilities	Yes/No	3584	annually	Baseline report	Observation/Document review/Key informant interview	TBD
3.2.2 Update guidelines for health care facility infrastructure that support minimum IPC standards	IPC compliant Infrastructure Guidelines	Yes/No	1	once	IPC compliant Infrastructure Guidelines	Observation/Document review/Key informant interview	TBD

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
3.2.3 Disseminate the guidelines	# of stakeholders knowledgeable about the IPC guidelines	Yes/No	500	once	Dissemination reports	Observation/Document review/Key informant interview	TBD
3.2.4 Undertake support supervision to support implementation of IPC at health facility level	# health facilities supported	Yes/No	3584	annually	Supervision reports	Observation/Document review/Key informant interview	TBD
Output 3.3: Functional IPC committees in healthcare Facilities.		Indicators: Proportion of healthcare facilities with functional IPC committees (N= 3584)					
3.3.1 Setup functional IPC committees with TORs	# of health Facilities with Functional IPC committees	Yes/No	3584	annually	List of IPC committees and meeting minutes	Observation/Document review/Key informant interview	TBD
3.3.2 Train IPC committee members on their functions	# of MTC members by facility trained	Yes/No	3584	annually	Training report with list of participants	Observation/Document review/Key informant interview	TBD
3.3.3 Regularly undertake performance monitoring and mentoring of the IPC committee members	# of MTC members by facility mentored	Yes/No	3584	annually	Monitoring reports	Observation/Document review/Key informant interview	TBD
Output 3.4 Guidelines for limiting the spread of multi drug resistant (MDR) organisms disseminated		Indicators: Proportion of healthcare facilities with MDRO control guidelines (N=3584)					
3.4.1 Update guidelines for prevention and control of MDR organisms	Updated guidelines for prevention of MDR	Yes/No	1	once	Copies of the updated guidelines	Observation/Document review/Key informant interview	TBD

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
3.4.2 Print and distribute the MDR control Guidelines	# of copies of the Guidelines printed and distributed	Yes/No	4000	once	Printed copies and distribution reports	Observation/Document review/Key informant interview	TBD
3.4.3 Train health care workers at facility level on the control of MDR	# of health workers trained in MDR control by facility	Yes/No	2000	annually	Training reports with list participants	Observation/Document review/Key informant interview	TBD
Output 3.5: Proper use of infection prevention materials and supplies		Indicators: (1) Proportion of health facilities using appropriate Infection prevention materials and supplies					
3.5.1 Update lists of IPC products, including equipment and supplies	Updated list of IPC materials and supplies	Yes/No	1	Once	Updated list of IPC materials	Observation/Document review/Key informant interview	TBD
3.5.2 Procure and distribute in a timely manner IPC supplies and equipment at health care facilities	List of IPC supplies, materials and equipment procured by facility	Yes/No	assorted	annually	Delivery reports	Observation/Document review/Key informant interview	TBD
Outputs 3.6: Timely diagnosis and treatment of drug-resistant microorganisms		Indicators: (1) Proportion of healthcare facilities timely diagnosing MDRO (2) Proportion of healthcare facilities timely treating drug-resist ant infections					
3.6.1 Procure and timely distribute tools for rapid diagnosis of drug resistant organisms	List of diagnosis supplies for MDR procured by facility	Yes/No	assorted	annually	Delivery reports	Observation/Document review/Key informant interview	TBD
3.6.2 Train health care workers at facility level on the treatment and management of patients with MDR infections	# of health workers trained on the treatment and management of MDR infections	Yes/No	2000	annually	Training reports with list participants	Observation/Document review/Key informant interview	TBD
3.6.3 Procure and timely distribute drugs for treatment of MDR	List drugs for treatment of MDR procured by facility	Yes/No	assorted	annually	Delivery reports	Observation/Document review/Key informant interview	TBD

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
Output 3.7: Adherence to standards fo r hand hygiene and other hygienic practices health care facilities		Indicators: (1) Proportion of health facilities adhering to standards of hand hygiene and other hygienic practices					
3.7.1 Train health care workers at facility level on hand hygiene and other hygienic practices and	# of health workers to whom the guidelines have been disseminated by facility	Yes/No	7168	annually	Training reports with list	Observation/Document review/Key informant interview	TBD
behaviors that prevent transmission of infectious diseases					participants		
3.7.2 Undertake health talks to patients about IPC behaviours to protect themselves from acquisition and transmission of infectious diseases	# Health talks to patients conducted	Yes/No	10000	annually	Training reports with list participants	Observation/Document review/Key informant interview	TBD
3.7.3 Train personnel on correct use of Personal Protective Equipment and materials for standard and transmission based precautions	# Health workers trained on PPE use	Yes/No	14336	annually	Supervision reports	Observation/Document review/Key informant interview	TBD
Output 3.8: Increased awareness about IPC at healthcare facilities		Indicators: Proportion of healthcare facilities with workers adhering to IPC guidelines					
3.8.1 Train health care workers on IPC	# Health workers trained on IPC	Yes/No	14336	annually	Training reports with list participants	Observation/Document review/Key informant interview	TBD
3.8.2 Undertake support supervision visits to reinforce infection control practices	# healthcare facilities supported	Yes/No	3854	annually	Supervision reports	Observation/Document review/Key informant interview	TBD

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
Output 3.9: IPC good practices included as criteria for rewards and sanctions in health care facilities		Indicators: Proportion of healthcare rewards and sanctions committees that have included IPC good practices as a criteria					
3.9.1 Develop guidelines for awards	Guidelines available	Yes/No	1	once	Copies of the guideline s	Observation/Document review/Key informant interview	TBD
3.9.2 Provide incentives for operationalizing the awards	List and type of incentives	Yes/No	assorted	annually	Report about the incentive s	Observation/Document review/Key informant interview	TBD
Output 3.10: Safe waste disposal and waste treatment practices in healthcare facilities improved		Indicators: Proportion of health care facilities with safe waste disposal and waste treatment practices					
3.10.1 Train health care workers on safe waste disposal and waste treatment practices for healthcare workers.	# of health care workers trained on waste disposal	Yes/No	14336	annually	Training reports with list participants	Observation/Document review/Key informant interview	TBD
Output 3.11 Functional Communication platforms for IPC related committees at all health care administrative levels in place		Indicators: Percentage of health care administrative levels with functional communication platforms for IPC					
3.11.1 Establish a communication platform among IPC related committees e.g. medicines & therapeutics committee, AMR stewardship committee, infection prevention Control committee, Laboratory Committee and Clinical Committee	# of Communication platforms established by facility	Yes/No	3854	annually	Reports/ minutes of joint meetings	Observation/Document review/Key informant interview	TBD
3.11.2 Develop guidelines for the functioning of the communication platform	Guidelines for the communication platform in place	Yes/No	1	annually	Copies of the guidelines	Observation/Document review/Key informant interview	TBD

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
3.12 Improve health worker knowledge and skills on IPC		Indicators: percentage of health workers in a facility with competencies to implement IPC					
3.12.1 Conduct survey on training needs for health professionals regarding IPC	Baseline and needs for health professionals regarding IPC	Yes/No	1	annually	Baseline report	Observation/Document review/Key informant interview	TBD
3.12.2 Conduct regular continued profession development (CPD) training regarding IPC	# of health workers undertaking CPDs on IPC and how many	Yes/No	2000	annually	Training reports with list participants	Observation/Document review/Key informant interview	TBD
3.12.3 Integrate IPC content in the curriculum/education for all health training institutions	# of revised curricula in health training institutions that reflects IPC strategies	Yes/No	5	Once	Copies of the revised curricula	Observation/Document review/Key informant interview	TBD
Objective 4: Promote Infection Prevent ion and Control Practices in Communities		Desired Outcome: (1) Reduced in incidence of infections in the community					
Output 4.1 IEC/BCC tools on IPC in communities, including schools and public places disseminated.		Indicators: Proportion of sub counties with IEC materials in local language					
4.1.1 Undertake a survey on the knowledge/attitudes/ perceptions and practices in the community	Baseline IPC knowledge/attitudes/ perceptions and practices in the community and their needs	Yes/No	1	annually	Baseline report	Observation/Document review/Key informant interview	TBD
4.1.2 Develop tools for information, education and	# of tools developed	Yes/No	5	one	Copies of the IEC tools	Observation/Document review/Key informant interview	TBD

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
Communication/behavior change communication on IPC in communities, including schools and public places. behavioral change communication strategy							
4.1.3 Dissemination of information on infection control in the community	# and type of public awareness campaigns conducted	Yes/No	500	annually	Dissemination meeting report	Observation/Document review/Key informant interview	TBD
4.2.3 Develop minimum standards for food hygiene, handling and preparation	Guideline for food hygiene, handling and preparation developed	Yes/No	1	annually	Copies of the guidelines	Observation/Document review/Key informant interview	TBD
Output 4.2: Adherence to food hygiene guidelines by food handlers		Indicators: Proportion of public places adhering to recommended food hygiene practices					
4.2.1 Train food vendors and supervisors for proper food handling practices	# of food vendors and supervisors trained	Yes/No	5000	annually	Training reports with list participants	Observation/Document review/Key informant interview	TBD
4.2.2 Enforce regular checkups of food handlers for infectious diseases of public health importance related to food	# of food vendors and supervisors examined for infectious diseases and how often	Yes/No	5000	annually	Medical examination reports	Observation/Document review/Key informant interview	TBD
4.2.4 Undertake food inspection of foods and food products for public consumption	# of facilities inspected and how often	Yes/No		annually	Inspection reports	Observation/Document review/Key informant interview	TBD
Output 4.3: Communities with adequate access clean and safe water throughout the country.		Indicators: Proportion of communities with access to safe water within 1 km					

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
4.3.1 Carry out a baseline to obtain information on safe water usage in relation infection control and prevention is concerned	Baseline on water safety	Yes/No	1	Once	Baseline report	Observation/Document review/Key informant interview	TBD
4.3.2 Increase safe water coverage in communities	# of new safe water sources put in place	Yes/No	each community	annually	Report	Observation/Document review/Key informant interview	TBD
4.3.3 Review standards and guidelines for assessing water safety in the context of AMR	Guidelines	Yes/No	1	Once	Copies of the guidelines	Observation/Document review/Key informant interview	TBD
4.3.4 Conduct periodic water safety analyses at consumption points	#of water consumption points assessed for safety	Yes/No	2000	annually	Analysis reports	Observation/Document review/Key informant interview	TBD
Output 4.4: Safe waste disposal and waste treatment Practices.		Indicators: Proportion of communities practicing safe waste disposal and waste treatment					
4.4.1 Review and update IEC materials on safe waste disposal	Set of updated IEC waste disposal IEC materials	Yes/No	1	Once	Copies of IEC	Observation/Document review/Key informant interview	TBD
4.4.2 Procure and make available waste disposal materials for infectious wastes wherever generated	List of waste disposal materials by facility	Yes/No	assorted	annually	Delivery reports	Observation/Document review/Key informant interview	TBD
4.4.3 Conduct training of trainers (TOT) for waste handlers	# of trainee trainers trained in waste handling	Yes/No	500	annually	Training reports with list participants	Observation/Document review/Key informant interview	TBD
4.4.3 Conduct mentorships sessions for waste handlers	# of health facilities mentored in waste disposal	Yes/No	1740	annually	Mentorship reports	Observation/Document review/Key informant interview	TBD
4.4.4 Set up health care waste treatment facilities at each health facility	# of health care waste treatment facilities by facility	Yes/No	3854	annually	Reports	Observation/Document review/Key informant interview	TBD

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
Output 4.5: Reduced transmission of A MR at the household level.		Indicators: Proportion of household transmissions of resistant infections					
4.5.1 Sensitization of the public on AMR	# and type of public awareness campaign conducted	Yes/No	1000	annually	Reports of the campaign	Observation/Document review/Key informant interview	TBD
4.5.3 Contact tracing and management of patients with drug resistant Micro organisms	# of patients with MDR traced and managed	Yes/No	1000	annually	Reports	Observation/Document review/Key informant interview	TBD
4.5.4 Support adherence to Antibiotic treatment at house hold level	# of individuals adhering to antibiotics	Yes/No		annually	Reports	Observation/Document review/Key informant interview	TBD
Objective 5: Promote Farm Biosecurity Measures in Agriculture		Desired Outcome: Reduced incidence of infectious diseases in animals and Agriculture					
Output 5.1 Biosecurity guidelines for animal farms, slaughter facilities, abattoirs and aquaculture facilities developed and disseminated		Indicators: Proportion of animal farms, slaughter facilities, abattoirs and aquaculture facilities with access to the guidelines					
5.1.1 Review and update biosecurity guidelines for different categories of animal farms, slaughter facilities, abattoirs and Aquaculture facilities.	Updated Biosecurity guidelines	Yes/No	1	Once	Copies of the guideline s	Observation/Document review/Key informant interview	TBD
5.1.2 Print and distribute biosecurity guidelines to veterinarians and other stakeholders	# of copies of the Guidelines printed and distributed	Yes/No	2000	once	Copies of the guideline s	Observation/Document review/Key informant interview	TBD
5.1.3 Sensitize stakeholders on biosecurity guidelines	# of stakeholders sensitized	Yes/No	5000	annually	Sensitization meeting reports	Observation/Document review/Key informant interview	TBD

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
5.1.4 Train district veterinary officers on biosecurity guidelines	# of DVOs trained	Yes/No	121	annually	Training reports with list participants	Observation/Document review/Key informant interview	TBD
5.1.5 Promote biosecurity practices on farms and animal facilities (e.g. Abattoirs)	# of visits undertaken	Yes/No	500	annually	Reports of the visits	Observation/Document review/Key informant interview	TBD
Output 5.2: Adherence to Hygiene, sanitation and infection prevention standards		Indicators: Proportion of farms adhering to hygiene, sanitation and infection prevention standards					
5.2.1 Train farmers in on-farm sanitation and good hygiene practices	# of farmers trained	Yes/No	5000	annually	Training reports with list participants	Observation/Document review/Key informant interview	TBD
5.2.2 Undertake regular checks on sanitation and hygiene on animal facilities and farms	# of facilities and farms checked for proper hygiene and sanitation	Yes/No	100	annually	Inspection reports	Observation/Document review/Key informant interview	TBD
5.2.3 Regular checks on animal feeds for contamination	# feed samples checks	Yes/No	100	annually	Analysis reports	Observation/Document review/Key informant interview	TBD
Output 5.3: Food safety campaigns and programs on farms implemented.		Indicators: Number of food safety campaigns targeting food safety on farms by region					
5.3.1 Sensitize farmers and the general public on production of safe animals for human consumption	3 and type of public awareness campaigns conducted	Yes/No	50	annually	Sensitization meeting reports	Observation/Document review/Key informant interview	TBD
Output 5.4: Adherence to biosecurity standards in in the agricultural, livestock and animal production industries		Indicators: Proportion of agricultural, livestock an d animal production industries adhering to biosecurity standards					

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
5.4.1 Train farmers in standard animal husbandry practices that reduce the need to use antimicrobial agents	# of farmers trained	Yes/No	5000	annually	Training reports with list participants	Observation/Document review/Key informant interview	TBD
5.4.2 Provide regular advisory extension services to farmers	# of extension visits undertaken	Yes/No	1000	annually	extension service reports	Observation/Document review/Key informant interview	TBD
Output 5.5: Biosecurity compliant infrastructure in animal and agricultural facilities		Indicators: Proportion of animal and agricultural facilities with infrastructure compliant with biosecurity standards					
5.5.1 Develop/update tstandards for farm infrastructure that promote infection prevention in animal handling facilities and farms	Guidelines developed/updated	Yes/No	1	once	Copies of the guidelines	Observation/Document review/Key informant interview	TBD
5.5.2 Print and distribute animal facility and farm infrastructure standards	# of copies of the Guidelines printed and distributed	Yes/No	2000	annually	Copies of the guidelines	Observation/Document review/Key informant interview	TBD
5.5.3 Train district veterinary officers on facility and farm infrastructure Standards	Guidelines disseminated	Yes/No	121	annually	Training reports with list participants	Observation/Document review/Key informant interview	TBD
5.5.4 Conduct regular							
advisory/support supervision/inspection of abattoirs/slaughter houses and aquaculture facilities	# facilities and frequency of supervision	Yes/No	2000	annually	Supervision reports	Observation/Document review/Key informant interview	TBD

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
v5.5.5 Sensitize stakeholders on the need for ante-mortem and postmortem inspection	# of stakeholders sensitized	Yes/No	5 per year	annually	Sensitization meeting reports	Observation/Document review/Key informant interview	TBD
Output 5.6: Proper use of infection prevention materials and supplies in agricultural and animal facilities		Indicators: Proportion of agricultural and animal facilities using appropriate Infection prevention materials and supplies					
5.6.1 Develop/disseminate guidelines for infection prevention materials for animal facilities and farms	Guidelines developed	Yes/No	1	annually	Copies of the guidelines	Observation/Document review/Key informant interview	TBD
5.6.2 Sensitize farmers and animal facility operators on the guidelines	# of public awareness campaigns conducted	Yes/No	1000	annually	Sensitization meeting reports	Observation/Document review/Key informant interview	TBD
Output 5.7: Adherence to safe waste disposal and Waste treatment practices in agricultural and animal facilities.		Indicators: Proportion of agricultural and animal facilities adhering to safe waste disposal and waste treatment standards					
5.7.1 Conduct a baseline assessment of the current status of animal facility and farm waste disposal	Baseline on the waste disposal at animal facility and farms	Yes/No	1	annually	Baseline report	Observation/Document review/Key informant interview	TBD
5.7.2 Develop/disseminate guidelines for safe waste disposal for animal facilities and farms	Guideline developed	Yes/No	1	annually	Copies of the guidelines	Observation/Document review/Key informant interview	TBD
5.7.3 Sensitize farmers and animal facility operators on safe waste disposal and treatment practices	# of farmers and animal facility operators sensitized	Yes/No	1000	annually	Sensitization meeting reports	Observation/Document review/Key informant interview	TBD

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
5.7.4 Sensitize stakeholders and farmers on animal facility and farm waste recycling	# of farmers and animal facility operators sensitized	Yes/No	1000	annually	Sensitization meeting reports	Observation/Document review/Key informant interview	TBD
5.7.5 Procure incinerators for abattoirs and sick animals	# of incinerators procured by facility	Yes/No	20	annually	Delivery reports	Observation/Document review/Key informant interview	TBD
Objective 6: Increase and Optimize Us e of Vaccines to Prevent Infectious Diseases		Desired Outcome: Reduced incidence of vaccine preventable diseases in humans and animals					
Output 6.1 Vaccination programs in human and animal health strengthened.		Indicators: Proportion of the human and animal population vaccinated disaggregated by disease					
6.1.1 Procure vaccine and supply vaccines for humans and animals	# and type of vaccines procured for humans and animals	Yes/No	???	annually	Delivery reports	Observation/Document review/Key informant interview	TBD
6.1.2 Develop/review regulations for vaccinations for animals with vaccination schedules	Updated animal vaccination regulations	Yes/No	1	annually	Copies of the regulations	Observation/Document review/Key informant interview	TBD
6.1.3 Conduct campaigns to provide information, awareness and schedules about vaccinations in Uganda	# and type of public awareness campaign conducted	Yes/No	100	annually	Reports of the campaign	Observation/Document review/Key informant interview	TBD
6.1.3 Undertake vaccination of individuals against a broader range of diseases	# of individuals vaccine by disease	Yes/No	???	annually	Vaccination reports	Observation/Document review/Key informant interview	TBD
6.1.3 Undertake vaccination of animals against a broader range of diseases	# of animals vaccinate by species and by disease	Yes/No	???	annually	Vaccination reports	Observation/Document review/Key informant interview	TBD

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
Output 6.2: Countrywide coverage of vaccination Programs for vaccine preventable diseases in human s and livestock.		Indicators: Proportion of the country covered by vaccination programs against vaccine preventable disease					
6.2.1 Conduct a baseline assessment for animal and human vaccines program and services coverage	Baseline on vaccination services	Yes/No	1	annually	Baseline report	Observation/Document review/Key informant interview	TBD
6.2.2 Develop a vaccine stock management tool to monitor vaccine stocks to prevent stock outs	Tool developed	Yes/No	1	annually	Copy of the management tool	Observation/Document review/Key informant interview	TBD
6.2.3 Review vaccine schedules to optimize uptake (combination vaccines to increase uptake and reduce cost)	Optimized vaccine schedule	Yes/No	1	annually	Copies of vaccination schedule s	Observation/Document review/Key informant interview	TBD
6.2.5 Support routine maintenance of a functional cold chain	Functional cold chains deployed	Yes/No	4 per facility per year	annually	reports on cold chain management	Observation/Document review/Key informant interview	TBD
Output 6.3: Broad range of vaccines and their availability across the country.		Indicators: Number of vaccines available at various healthcare facilities and veterinary offices across the country					
6.3.1 Review and recommend introduction of new vaccines for both human and animals	List of updated vaccines for the country	Yes/No	1	annually	Copies of the list of updated vaccines for the country	Observation/Document review/Key informant interview	TBD
6.3.2 Undertake research to measure the impact/best methods of vaccinating animals	Best methods for vaccinating animals recommendations	Yes/No	1	annually	Copies of the report with recommendations	Observation/Document review/Key informant interview	TBD

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
Strategic Objective 3: Antimicrobial Stewardship and Optimal Use		Desired Outcome: Successful treatment of infectious disease					
Objective 7: Promote Optimal Prescribing and Use of antimicrobials		Desired Outcome: Effectiveness and efficacy of antimicrobials preserved					
7.1 Strengthened coordination mechanisms for coordination and support of Antimicrobial Stewardship and ensuring Optimal Use		Indicators: A functional Technical working group (ASO TWC) in place					
7.1.1 Establish a Technical Working Group Antimicrobial Stewardship and Optimal Use (ASO TWC)	TWC formed with list of members and ToR	Yes/No	1	Annual	Reports	Observation/Document review/Key informant interview	None
Output 7.2: Up-to-date prophylactic, prescribing/treatment guidelines and protocols for infectious diseases in human health		Indicators: Proportion of health care facilities with up-to-date Prophylactic, prescribing/treatment guidelines and protocols for infectious					
7.2.1 Review and update prescribing guidelines	Published review of prescription guidelines	Yes/No	1	Annual	Reports	Observation/Document review/Key informant interview	2016 version available
7.2.2 Print and distribute the prescribing guidelines to all health facilities	# guidelines printed and delivered to regional hubs	Proportion	5000	Annual	Reports	Observation/Document review/Key informant interview	200
7.2.3 Upload updated prescribing/treatment guidelines to the MOH and NDA website	Guidelines available on websites	Yes/No	2	Annual	Reports	Observation/Document review/Key informant interview	??
7.2.4 Training prescribers and dispensers on the guidelines	#prescribers and dispensers trainees	Proportion	3000	Annual	Reports	Observation/Document review/Key informant interview	TBD
7.2.5 Activate Medicines and Therapeutic Committees (MTCs) at national and health facility levels with clear TORs	# of Drug and Therapeutic Committees formed	Proportion	348	Annual	Reports	Observation/Document review/Key informant interview	TBD

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
7.2.6 Sensitize regulatory agencies and policymakers to improve adherence to prescribing guidelines	# of staff by regulatory body sensitized	Yes/No	2	Annual	Reports	Observation/Document review/Key informant interview	TBD
Output 7.3: Responsible prescribing practices, Dispensing and administration principles for antimicrobials.		Indicators: Proportion of health care workers adhering to prescribing practices, dispensing and administration principles					
7.3.1 Organize ToT sessions for professionals in relevant Fields	# of professionals trained	Proportion	20	Annual	Reports	Observation/Document review/Key informant interview	TBD
7.3.2 Conduct AMR-specific CMEs through the professional associations	# of CMEs and professionals attending	Proportion	25	Annual	Reports	Observation/Document review/Key informant interview	TBD
7.3.1 Train MTCs in their functions	# of MTC members by facility trained	Proportion	1740	Annual	Reports	Observation/Document review/Key informant interview	TBD
7.3.2 Regularly undertake performance monitoring and mentoring of the therapeutic Committees	# of MTC members by facility mentored	Proportion	348	Annual	Reports	Observation/Document review/Key informant interview	TBD

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
7.4 Incorporate courses on antimicrobial stewardship and AMR		Indicators: Proportion of health, agriculture, animal and environmental professionals practicing antimicrobial stewardship					
into the continuous professional development curricula for all health, agriculture, animal and environ mental professionals with a system of ensuring accountability.							
7.4.1 Develop the antimicrobial stewardship working manuals and Procedures	MOP developed and in place	Yes/No	1	Annual	Reports	Observation/Document review/Key informant interview	TBD
7.4.2 Print and distribute antimicrobial stewardship working manuals	# of copies printed and distributed	Proportion	5000	Annual	Reports	Observation/Document review/Key informant interview	TBD
7.4.3 Tran healthcare workers on antimicrobial stewardships for both public and private workers	# of health workers trained	Proportion	1000	Annual	Reports	Observation/Document review/Key informant interview	TBD
7.5 Institute/strengthen and support pro per functioning of Medicines and Therapeutics committee s in all health care facilities		Indicators: Proportion of health care facilities with functional MTCs					
7.5.1 Share susceptibility data regularly to inform prescription	# AST reports shared by facility	Proportion	Monthly (12)	Annual	Reports	Observation/Document review/Key informant interview	TBD

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
7.5.2 Share regularly information on Antimicrobial use to all stakeholders	# of Antimicrobial use data reports shared by facility	Proportion	Monthly (12)	Annual	Reports	Observation/Document review/Key informant interview	TBD
7.5.3 Provide and share other update scientific and popular literature to improve prescribing practices	# of other information by type shared	Proportion	Monthly (12)	Annual	Reports	Observation/Document review/Key informant interview	TBD
7.6 Support the development and dissemination of antimicrobial stewardship working manuals and procedures.		Indicators: (1) Up-to-date antimicrobial manuals and procedures (2) Proportion of health care workers with the manuals					
7.6.1 Develop the antimicrobial stewardship working manuals and procedures	MOP developed and in place	Yes/No	1	Annual	Reports	Observation/Document review/Key informant interview	TBD
7.6.2 Print and distribute antimicrobial stewardship working manuals	# of copies printed and distributed	Proportion	20	Annual	Reports	Observation/Document review/Key informant interview	TBD
7.6.3 Tran healthcare workers on antimicrobial	# of health workers trained	Proportion	1000	Annual	Reports	Observation/Document review/Key informant interview	TBD
Stewardships for both public and private workers							

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
7.7 Provide up-to-date and unbiased medicine Information services to human and animal health providers.		Indicators: Proportion of human and animal health providers accessing up-to-d ate medical information					
7.7.1 Share susceptibility data regularly to inform prescription	# AST reports shared by facility	Yes/No	Monthly (12)	Annual	Reports	Observation/Document review/Key informant interview	TBD
7.7.2 Share regularly information on Antimicrobial use to all stakeholders	# of Antimicrobial use data reports shared by facility		Monthly (12)	Annual	Reports	Observation/Document review/Key informant interview	TBD
7.7.3 Provide and share other update scientific and popular literature to improve prescribing practices	# of other information by type shared	Yes/No	Monthly (12)	Annual	Reports	Observation/Document review/Key informant interview	TBD
Output 7.8: Strengthened supervision of prescribing and dispensing outlets for human and animal antimicrobials		Indicators: Proportion of prescribing and dispensing outlets for human and animal antimicrobials adhering to guidelines and standards					
7.8.1 Develop a tool for more efficient supervision and monitoring of healthcare facilities and pharmacies/drug stores	Supervision tool developed	Yes/No	1	Once	Copy of the tool	Observation/Document review/Key informant interview	TBD
7.8.2 Train professional councils and licensing organs on supervision and monitoring dispensing outlets	# of members by organ trained	Proportion	348	Annual	Training reports with list of participants	Observation/Document review/Key informant interview	TBD

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
7.8.3 Conduct CMEs to improve prescription and good pharmacy practice for health and veterinary prescribers	# of CMEs and health and veterinary prescribers trained	Proportion	1	Annual	Training reports with list of participants	Observation/Document review/Key informant interview	TBD
7.8.4 Review and update regulations on prescription of antimicrobials	Updated guideline	Yes/No	12 (monthly)	Once	Training reports with list of participants	Observation/Document review/Key informant interview	TBD
7.8.6 Develop digital/manual tools for tracking and tracing prescriptions at dispensing facilities	Digital tool for tracking prescriptions	Yes/No	5 (one per annum	Once	Copy of the tool	Observation/Document review/Key informant interview	TBD
7.8.7 Disseminate the tools for tracking and tracing prescriptions	# of persons knowledgeable about the tools	Proportion	1000	Annual	Dissemination reports	Observation/Document review/Key informant interview	TBD
Output 7.9: Incentives and reward systems for excellence in adherence to best practices and standards		Indicators: Proportion of healthcare rewards and sanctions committees that have included prescribing practices as a criteria					
7.9.1 Develop tools for the Licensing bodies and Professional Councils to track performance of adherence to best practices and standards	Performance monitoring tool	Yes/No	1	Once	Copy of the tool	Observation/Document review/Key informant interview	None

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
7.9.2 Develop guidelines for award of incentives for excellence in prescription practices	Guideline	Yes/No	1	Once	Copy of the Guideline	Observation/Document review/Key informant interview	None
Output 7.10: Functional stewardship committees at all health care facilities		Indicators: Proportion of health care facilities with functional stewardship committees					
7.10.1 Develop procedures and protocols for antimicrobial prescriptions at both public and private facilities	MOP	Yes/No	1	Departments of Clinical services	Cope of the manual	Observation/Document review/Key informant interview	None
				(MOH), UNHLS			
7.10.2 Establish stewardship committees at health care facilities	Stewardship committees	Proportion	348	Hospital Administration	List of members and minutes	Observation/Document review/Key informant interview	TBD
7.10.3 Update National guidelines for handling resistant microorganism to prevent transmission	MOP	Yes/No	1	Departments of Clinical services (MOH), UNHLS	Copy of the MOP	Observation/Document review/Key informant interview	TBD
7.10.4 Integrate data from different committees (IPC, MTC, QA etc.) to inform best practices for containment of resistant organisms at health facilities	Integrated data	Yes/No	12 (monthly)	Departments of Clinical services (MOH), UNHLS	Reports	Observation/Document review/Key informant interview	TBD

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
7.10.5 Develop a tool for auditing antimicrobial prescriptions practices at health care facilities	Audit tool	Yes/No	1	Departments of Clinical services (MOH), UNHLS	Copy of the tool	Observation/Document review/Key informant interview	TBD
7.10.7 Conduct audits of antimicrobial prescriptions practices at health care facilities	Facilities adhering to prescription guidelines	Proportion	5 (one per annum	Departments of Clinical services (MOH), UNHLS	Reports	Observation/Document review/Key informant interview	TBD
7.10.8 Training prescribers, pharmacists, nurses, and laboratory personnel about good antimicrobial prescribing practices and antimicrobial resistance	Prescribing professionals trained	Proportion	1000	Departments of Clinical services (MOH), UNHLS	Training reports with list of participants	Observation/Document review/Key informant interview	TBD
Objective 8: Optimize Access to Effective Antimicrobial Medicines and Diagnostics in Human and Animal Health		Desired Outcome: Effective and timely treatment of infectious diseases					
Output 8.1: Affordable and accurate diagnostic tools available at all health facilities		Indicators: Proportion of healthcare facilities with diagnostic tools					
8.1.1 Procure adequate diagnostic tools (equipment, supplies, services) for infectious diseases at both public and private facilities and animal health facilities	Amount of supplies/equipment delivered by category by facility	Proportion	assorted	Annual	Reports	Observation/Document review/Key informant interview	TBD

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
8.1.2 Establish a subcommittee that evaluates/recommends appropriate/affordable and accurate diagnostic tools	# Committees with list of members established by facility	Proportion	348	Annual	Reports	Observation/Document review/Key informant interview	TBD
Output 8.2: Financing mechanisms for antimicrobial medicines or preventative AMR programmes enhanced		Indicators: Proportion of the medicine budget allocated to financing antimicrobials medicine					
8.2.2 Lobby for financing for adequate antibiotics at all health care facilities	Amount of funds available for antibiotics	Proportion	TBD	Annual	Reports	Observation/Document review/Key informant interview	TBD
Output 8.3: Timely and efficient distribution mechanisms for provision of antimicrobials to health care providers		Indicators: Proportion of deliveries of antimicrobials to health care facilities do ne on time					
8.3.1 Identify best practices for efficient medicines distribution system	Report of best practices available	Yes/No	1	Annual	Reports	Observation/Document review/Key informant interview	TBD
8.3.2 Integrate antimicrobials into the commodities security group activities to ensure efficiency in supply chain management of antimicrobials	Updated commodity activity plan	Yes/No	1	Annual	Reports	Observation/Document review/Key informant interview	TBD
8.3.3 Adopt digital automated system for timely ordering of drugs	# of health facilities with digital drug ordering system	Yes/No	1	Annual	Reports	Observation/Document review/Key informant interview	TBD

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
8.3.4 Train distributors and health workers (from both public and private sector) on distribution mechanisms of antimicrobials	# trained	Proportion	1000	Annual	Reports	Observation/Document review/Key informant interview	TBD
Output 8.4: Supply chain management for antimicrobials at the national, regional and local levels improved		Indicators: Proportion of facilities having all the required antimicrobials procured and available on time					
8.4.1 Train suppliers of antimicrobials at national levels in efficient supply chain management	# supplies managers trained at national level	Proportion	50	Annual	Reports	Observation/Document review/Key informant interview	TBD
8.4.2 Train health facility procurement officers in procurement management of antimicrobials to ensure availability of appropriate antimicrobials and related supplies	# of procurement officers trained by facility	Proportion	348	Annual	Reports	Observation/Document review/Key informant interview	TBD
8.4.3 Train facility pharmacists in antimicrobial chain management and forecasting of need antimicrobials at their facilities							
Output 8.5: Capacity of local producer s/manufacturers of antimicrobials enhanced.		Indicators: Proportion of local antimicrobial manufacturers with increased capabilities					

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
8.5.1 Provide incentives (e.g. tax holidays and BUBU) for local productions of antimicrobials and compliance with standards of current good manufacturing practices	# incentives by type provided	Yes/No	5	Annual	Reports	Observation/Document review/Key informant interview	TBD
8.5.2 Train local producers of antimicrobials in compliance with standards of current good manufacturing practices	3 of producers trained	Proportion	100	Annual	Reports	Observation/Document review/Key informant interview	TBD
8.5.3 Train regulators to enhance turnaround time for registration process for local Products	# of staff by organization trained	Proportion	50	Annual	Reports	Observation/Document review/Key informant interview	TBD
Objective 9: Promote Access to and Prudent Use of Antimicrobials in Agriculture and Veterinary Medicine		Desired Outcome: Effective and timely treatment of infectious diseases in animals and agriculture					
Output 9.1: Up-to-date prescription guidelines		Indicators: Proportion of health care facilities with up-to-date prescription guidelines					
9.1.1 Develop Prescribing/treatment guidelines in animals	Prescribing/treatment guidelines in animals developed	Yes/No	1	Annual	Reports	Observation/Document review/Key informant interview	TBD
9.1.2 Print and distribute the prescribing guidelines to all health facilities	# guidelines printed and delivered to regional hubs	Proportion	5000	Annual	Reports	Observation/Document review/Key informant interview	TBD

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
9.1.3 Train veterinarians on prescription guidelines	# of veterinarians trained	Proportion	500	Annual	Reports	Observation/Document review/Key informant interview	TBD
9.1.4 Share digital animal prescribing guidelines to improve the usability	Digital guidelines available	Yes/No	5	Annual	Reports	Observation/Document review/Key informant interview	TBD
Output 9.2: Up-to-date antimicrobial stewardship working manuals and procedures for the agriculture and veterinary sector		Indicators: Proportion of agriculture and veterinary practitioners with up-to-date antimicrobial stewardship working manuals and procedures					
9.2.1 Develop antimicrobial stewardship programs for the agriculture and veterinary practice	MOP available	Yes/No	1	Annual	Reports	Observation/Document review/Key informant interview	TBD
9.2.2 Print and distribute antimicrobial stewardship working manuals	# MOPs printed and delivered	Proportion	5000	Annual	Reports	Observation/Document review/Key informant interview	TBD
9.2.3 Train veterinary and agriculture practitioners on antimicrobial stewardships for both public and private practitioners	# of veterinarians and agricultural practitioners trained	Proportion	500	Annual	Reports	Observation/Document review/Key informant interview	TBD
Output 9: Restricted broad or generalized use of antimicrobials as growth promoters or as feed additives		Indicators: pro portion of feed manufacturers not u sing antimicrobials in feeds					
9.3.1 Conduct a risk assessment on the use of growth promoters and use of antimicrobial agents as feed additives	Risk Assessment Report with identified risks	Yes/No	1	Annual	Reports	Observation/Document review/Key informant interview	TBD

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
9.3.2 Develop regulations/guidelines on the use of growth promoters and use of microbial agents as feed additives	Regulations and guidelines developed	Yes/No	1	Annual	Reports	Observation/Document review/Key informant interview	TBD
9.3.4 Print and distribute the regulation/guidelines on growth promoters and feed additives	# guidelines printed and delivered	Proportion	5000	Annual	Reports	Observation/Document review/Key informant interview	TBD
9.3.5 Sensitize farmers /animal health professionals and feed producers on growth promoters	# of farmers and professionals sensitized	Proportion	1000	Annual	Reports	Observation/Document review/Key informant interview	TBD
Output 9.4: Supply chain and use of antimicrobials in agriculture and veterinary medicine strengthened.		Indicators: Proportion of agriculture and veterinary practitioners adhering to the regulations					
9.4.1 Conduct a situational analysis of the existing regulations and their implementation / Enforcement	Baseline status of regulations	Yes/No	1	Annual	Reports	Observation/Document review/Key informant interview	TBD

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
9.4.2 Train drug supplier, pharmacists, veterinarians and agricultural suppliers to in supply chain management of the agricultural and veterinary antimicrobials	# of drug dealers trained	Yes/No	1	Annual	Reports	Observation/Document review/Key informant interview	t TBD
9.4.3 Train drug distributors and animal health workers on distribution mechanisms of antimicrobials							
Objective 10: Promote Use of Quality, Safe and Efficacious antimicrobial agents		Desired Outcome: Effective treatment of infectious diseases					
Output 10.1: Licensing, approval, regulation and oversight over the antimicrobial supply chain (pharmaceutical manufacturers, distributors, importation, wholesalers and retailers) strengthened		Indicators: Proportion of players in the antimicrobial supply chain adhering to standards and guidelines					
10.1.1 Retrain NDA staff to improve efficiency in their oversight function for to undertake their regulatory functions	# of staff recruited	Proportion	100	Annual	Reports	Observation/Document review/Key informant interview	TBD
10.1.2 Procure and install automated system for improving processes	# Automated system procured and installed	Yes/No	6	Annual	Reports	Observation/Document review/Key informant interview	TBD
10.1.3 Sensitize the public on NDA regulations to increase compliance	# of people in the public aware of regulation related to antimicrobials	Proportion	5000	Annual	Reports	Observation/Document review/Key informant interview	TBD
Output 10.2: Capacity for regular quality assessment of antimicrobial agents in the NDA quality laboratories strengthened.		Indicators: Number of analyses under taken in a y ear and Rate of turnaround time for analyses					

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
10.2.1 Procure supplies and equipment for testing quality of antimicrobials	Amount of supplies/equipment Procured and delivered by facility	Yes/No	assorted	Annual	Reports	Observation/Document review/Key informant interview	TBD
10.2.2 Collaboration with external laboratories for testing quality of antimicrobials	# of MOU	Yes/No	5	Annual	Reports	Observation/Document review/Key informant interview	TBD
10.2.3 Undertake routine QA/QC							
checks for sustained compliance to WHO prequalification in chemical analysis and relevant international standards	# of QA/QC checks conducted	Yes/No	4	Annual	Reports	Observation/Document review/Key informant interview	TBD
10.2.4 Undertake infrastructure improvements for NDA quality control lab	Renovated laboratory facilities	Yes/No	1	Annual	Reports	Observation/Document review/Key informant interview	TBD
10.2.5 Procure and install a laboratory information management system (LIMS)	LIMS procured and installed	Yes/No	1	Annual	Reports	Observation/Document review/Key informant interview	TBD
Output 10.3: Improved supervision of Pharmacies		Indicators: Proportion of pharmacy outlets adhering to GPP					
10.3.1 Conduct inspections on pharmacies against GPP and establish compliance to OTC and self-medication prescribing	# of Pharmacies complying with GPP	Yes/No	quarterly	Annual	Reports	Observation/Document review/Key informant interview	TBD
Output 10.4: Over-the-counter availability and self-medication with antimicrobial medicines adherence to regulations improved		Indicators: Proportion of drug outlets adhering to regulations regarding OTC					
10.4.1 Enforce compliance to OTC dispensing guidelines	# of facilities adhering to OTC guidelines	Yes/No	quarterly	Annual	Reports	Observation/Document review/Key informant interview	TBD

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
Output 10.5 Strengthened regulation of the pharmaceutical companies and adherence to Good Manufacturing Practices		Indicators: Proportion of pharmaceutical companies adhering to GMPs					
10.5.1 Establish Harmonization mechanisms with WHO and other NDA on the compliance assessments for pharmaceutical companies	# of MOUs	Yes/No	3	Annual	Reports	Observation/Document review/Key informant interview	TBD
Output 10.6: Strengthened regulation of the pharmaceutical and antimicrobial waste		Indicators: Proportion of facilities adhering to guidelines for pharmaceutical and antimicrobial waste disposal					
10.6.1 Develop guidelines for disposal of pharmaceutical and antimicrobial waste by the health facilities and general public	Guidelines for waste disposal available	Yes/No	1	Annual	Reports	Observation/Document review/Key informant interview	TBD
10.6.2 Print and disseminate disposal guidelines	# of copies printed and distributed	Proportion	500	Annual	Reports	Observation/Document review/Key informant interview	TBD
10.6.3 Sensitize pharmacies and drug dealers on pharmaceutical waste disposal	# of drug dealers knowledgeable about pharmaceutical waste disposal	Proportion	500	Annual	Reports	Observation/Document review/Key informant interview	TBD
Strategic Objective 4: Surveillance		Desired Outcome: Early detection and response to emerging MDR problems					
Objective 11: Support Surveillance of AMR		Desired Outcome: Evidence-based decision on AMR					
Output 11.1 A national AMR surveillance programme in place		Indicators: A fully functional surveillance programme					
11.1.1 Establish a national Technical Working Group (TWC) for AMR surveillance (SURV TWC)	SURV TWC formed with list of members and ToR	Yes/No	1	Once	UNAMRC meeting minutes	Observation/Document review/Key informant interview	SURV TWC in place

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
11.1.2 Conduct a baseline survey and needs assessment on AMR surveillance system	Baseline data with list of the gaps and needs for AMR surveillance	Yes/No	1	Once	Baseline survey report	Observation/Document review/Key informant interview	30% conducted
11.1.3 Develop an integrated AMR surveillance plan	Approved integrated surveillance plan	Yes/No	1	Once	Copy of the plan	Observation/Document review/Key informant interview	50% completed
11.1.4 Print and distribute the AMR surveillance plan	# of copies printed and distributed	Proportion	1000	Once	Copies and delivery notes	Observation/Document review/Key informant interview	0
11.1.5 Select priority surveillance sites	List of prioritized list of surveillance site and harmonized methodologies	Proportion	14	Once	Reports	Observation/Document review/Key informant interview	TBD
Output 11.2 SOPs and methodologies f or surveillance of AMR in place		Indicators: Proportion of laboratories adhering to standard procedures to generate AST data					
11.2.1 Develop a manual of SOPs for AMR surveillance	Published MOP	Yes/No	1	Once	Copy of the MOP	Observation/Document review/Key informant interview	None
11.2.2 Identify priority organisms, samples and testing panels in coordination with international partners	List of priority organisms, samples and testing panels	Yes/No	1	Once	Reports	Observation/Document review/Key informant interview	TBD
Output 11.3: Laboratory infrastructure, human resources, supplies and equipment improved		Indicators: (1) Suitable infrastructure (2) Well trained human resource (3) Suit able equipment in place					
11.3.1 Undertake improvements in Infrastructure and equipment for microbiological isolation and susceptibility testing	# of laboratories renovated	Proportion	20	Once	Renovation reports and delivery and Installation on reports of equipment	Observation/Document review/Key informant interview	10% of basic facilities available

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
11.3.2 Equip laboratories microbiological isolation and susceptibility testing	List of equipment for each laboratory procured and installed	Yes/No	20	Once	Workshop	Observation/Document review/Key informant interview	10 % available
11.3.3 Train laboratory staff in logistics and supply management	# of staff trained in laboratory logistics	Yes/No	40	Once	Delivery Reports	Observation/Document review/Key informant interview	10 % have basic training
11.3.4 Procure and install a laboratory information management system (LIMS)	# of LIMS copies procured and installed	Yes/No	20	Once	Reports	Observation/Document review/Key informant interview	None
Output 11.4 Microbiological culture an d sensitivity tests performed routinely		Indicators: Proportion of laboratories undertaking microbiological culture and AST					
11.4.1 Re-train clinicians and veterinarians on appropriate sample collection and submission	# of clinicians and veterinarians	Proportion	70	Once	Reports	Observation/Document review/Key informant interview	20% knowledge able
11.4.2 Procure consumables for sample collection, microbiological materials and susceptibility testing panels and reagents	List of sample collection, microbiological materials and susceptibility testing panels and reagents procured	Proportion	assorted	Once	Procurement/delivery reports of sample collection, microbiological materials and susceptibility testing panels and reagents	Observation/Document review/Key informant interview	5% receive routine consumables
Output 11.5: Quality assurance systems for microbiology laboratory testing in place		Indicators: Proportion of laboratories with QA/QC system in place					

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
11.5.1 Procure and make available control strains and reference materials	List of control strains	Proportion	assorted	Once	Procurement reports of the control strains and reference materials procured and delivered to sites	Observation/Document review/Key informant interview	10% available
11.5.2 Train laboratory staff, veterinarians and clinicians on quality control and quality assurance	# of persons trained	Proportion	100	Once	Reports	Observation/Document review/Key informant interview	20% knowledge able
Output 11.6: Laboratories enrolled in national and international external quality assurance programs		Indicators: Proportion of laboratories enrolled in external quality assurance programs					
11.6.1 Accredit the participating laboratories	# of laboratories accredited	Proportion	20	Once	Reports	Observation/Document review/Key informant interview	10 % accredited by WHO SLMTA
11.6.2 Conduct annual review of the manual of SOPs	Published revised MOP	Yes/No	1	Once	Copies	Observation/Document review/Key informant interview	None
11.6.3 Undertake regular supervision and mentorship of the hospital surveillance sites	# sites supervised and mentored	Proportion	14	Annual	Meeting reports and SOP review logs	Observation/Document review/Key informant interview	TBD
11.6.4 Designate national microbiology reference labs	List of reference laboratories with TOR	Proportion	4	Once	Reports	Observation/Document review/Key informant interview	TBD
Output 11.7: Surveillance data and information disseminated to healthcare facilities		Indicators: Proportion of health care and veterinary facilities utilizing AST data to inform their decision of choice of antimicrobials					

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
11.7.1 Procure and install computers for data management system for sharing and disseminating information to partners	# of computers procured and installed	Proportion	40	Once	Delivery Notes	Observation/Document review/Key informant interview	None
11.7.2 Train personnel on data management and reporting	# of personnel trained	Proportion	40	Once	Reports	Observation/Document review/Key informant interview	10% knowledge able
11.7.4 Share data locally, nationally and internally	# of reports shared	Yes/No	1	Once	Reports	Observation/Document review/Key informant interview	None
Output 11.8: One Health networks created to widely share data		Indicators: Number of One Health functional networks created					
11.8.1 Undertake an assessment to identify data needs for the various stakeholders to inform actions for minimizing AMR	Data needs for the various stakeholders to inform actions for minimizing AMR	Yes/No	1	Once	Reports	Observation/Document review/Key informant interview	TBD
11.8.2 Develop a tool for sharing data at different levels and to different stakeholders	Developed tool	Yes/No	1	Once	Reports	Observation/Document review/Key informant interview	None
Output 11.9: An early warning system to monitor trends off AMR established		Indicators: Proportion of facilities with an early warning system in place					
11.9.1 Adopt international standards for AMR early warning	Copy of the standards	Yes/No	1	Once	Reports	Observation/Document review/Key informant interview	10% available
11.9.2 Sensitize laboratory staff, clinicians, and veterinarians on identification and evaluation of risks	# of staff sensitized	Proportion	100	Once	Reports	Observation/Document review/Key informant interview	10% aware

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
11.9.3 Compile and provide information on identified risks	# risks identified routinely	Yes/No	4	Once	Reports	Observation/Document review/Key informant interview	TBD
Output 11.10: Countrywide utilization of data		Indicators: Proportion of health care facilities utilizing AMR data					
11.10.1 Disseminate AMR data throughout the country including remote and hard-to-reach areas	# of reports shared	Yes/No	121	Once	Reports	Observation/Document review/Key informant interview	None

Number of MDA plans with AMR as a priority in the risk register

11.11.1 Train risk registrars to incorporate risk reporting into their registers	# of risk educators trained in AMR risk reporting	Proportion	100	weekly	Training Reports	Observation/Document review/Key informant interview	TBD
Objective 12: Support Surveillance of Antimicrobial Use		Desired Outcome: Evidence based decisions on antimicrobial use					
Output 12.1: A national antimicrobial use surveillance plan in place		Indicators: A functional national antimicrobial use surveillance plan					
12.1.1 Undertake a baseline survey and needs assessment and identify gaps for implementing an antimicrobial use surveillance plan	Gaps for implementing an antimicrobial use surveillance plan	Yes/No	1	Once	Reports	Observation/Document review/Key informant interview	TBD
12.1.2 Develop an integrated antimicrobial use surveillance plan	Approved published plan	Yes/No	1	Once	Reports	Observation/Document review/Key informant interview	None
12.1.3 Print and distribute antimicrobial use plan	# of copies printed and distributed	Proportion	1000	Once	Copies	Observation/Document review/Key informant interview	None
12.1.4 Disseminate the national surveillance of antimicrobial use plan	# of stakeholders knowledgeable of the plan	Proportion	200	Once	Distribution Lists	Observation/Document review/Key informant interview	None
Output 12.2: Procedures and methodologies for monitoring antimicrobials developed		Indicators: Proportion of facilities with and using standard procedures to monitor antimicrobial use					

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
12.2.1 Develop and manual of procedures and methodologies for routine monitoring antimicrobial use	Published MOP	Yes/No	1	Once	Reports	Observation/Document review/Key informant interview	None
12.2.3 Train hospital, pharmacy and veterinary staff to collect and share antimicrobial use data routinely	# of health professionals trained	# of risk events shared	1000	Once	Reports	Observation/Document review/Key informant interview	5% knowledge able
12.2.2 Collect, collate and share antimicrobial use data regularly	# antimicrobial use data shared	# of risk events shared	1000	Once	Reports	Observation/Document review/Key informant interview	None
Output 12.3: Robust data on prescribing practices, dispensing practices, client/community use genera ted		Indicators: Proportion of facilities generating prescribing practices, dispensing practices data					
12.3.1 Identify antimicrobial use and practice indicators	Antimicrobial use and practice indicators	Yes/No	1	Once	Reports	Observation/Document review/Key informant interview	None
12.3.2 Develop a manual of procedures for monitoring prescription and dispensing practices	Published MOP	Yes/No	1	Once	Copies	Observation/Document review/Key informant interview	None
12.3.3 Regularly collect data on prescribing and dispensing practices	Data on prescribing and dispensing practices shared	Yes/No	12	Annual	Reports	Observation/Document review/Key informant interview	None
Output 12.4: Antimicrobial use data generated and shared		Indicators: Proportion of facilities generating antimicrobial use data					
12.4.1 Undertake regular data collection on antimicrobial access and use	# of Published Reports	Proportion	1000	Annual	Reports	Observation/Document review/Key informant interview	None
12.4.2 Analyze and share data with relevant stakeholders	# of Published report	Proportion	4	Once	Reports	Observation/Document review/Key informant interview	None
Output 12.5: Data on impact of pharmaceutical promotion on antimicrobial use generated		Indicators: A mount of data about imp act of pharmaceutical promotion					
12.5.1 Develop tools for monitoring the impact of pharmaceutical promotion	Approved and disseminated tools	Yes/No	1	Once	Tools and report	Observation/Document review/Key informant interview	None

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
12.5.2 Collect, evaluate, and disseminate data on the impact of pharmaceutical promotion on antimicrobial use	# of Published Report	Yes/No	4	Annual	Reports	Observation/Document review/Key informant interview	None
Objective 13: Support Surveillance for Antimicrobial Drug Residues in Foods		Desired Outcome: Reduced levels of antimicrobial drug residues in foods					
Output 13.1: A national surveillance plan for monitoring antimicrobial residues in foods and animal feeds in place		Indicators: A functional plan for monitoring antimicrobial residues in foods in place					
13.1.1 Undertake a baseline survey and needs assessment and identify gaps for surveillance of antimicrobial residues in foods and animal feeds	Needs for surveillance of antimicrobial residues in foods and animal identified	Yes/No	1	Once	Reports	Observation/Document review/Key informant interview	TBD
13.1.2 Develop a national plan for monitoring of antimicrobial residues in foods and animal feeds	Published national plan	Yes/No	1	Once	Reports	Observation/Document review/Key informant interview	None
13.1.3 Print and distribute national surveillance plan for monitoring residues in foods and animal feeds	# of copies printed and distributed	Proportion	5000	Once	Copies	Observation/Document review/Key informant interview	None
13.1.4 Disseminate the national surveillance plan	# of stakeholders knowledgeable of the plan	Proportion	500	Once	Reports	Observation/Document review/Key informant interview	None
Output 13.2: Standard procedures for monitoring antimicrobial residues in foods in place		Indicators: Nu mber of laboratories with and using standard procedures for monitoring antimicrobial residues in foods					
13.2.1 Develop or adopt international standards for antimicrobial residues in foods	Published MOP	Yes/No	1	Once	Copies of MOP	Observation/Document review/Key informant interview	None
13.2.2 Train veterinarians and laboratory personnel on monitoring antimicrobial residues in food and animal feeds	# of personnel trained	Proportion	50	Once	Reports	Observation/Document review/Key informant interview	5 % knowledgeable

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
13.2.3 Identify and prioritize samples and antimicrobial residues for testing	Published list of priority samples and residues	Yes/No	1	Once	Reports	Observation/Document review/Key informant interview	None
13.2.4 Provide the appropriate infrastructure and renovations for the laboratories	# of laboratories renovated	Proportion	2	Once	Reports	Observation/Document review/Key informant interview	20% have basic infrastructure
13.2.6 Equip national laboratories for monitoring antimicrobial residues	List of equipment for each laboratory procured and installed	Proportion	assorted	Once	Reports	Observation/Document review/Key informant interview	20% of equipment needs
12.2.5 Train personnel in laboratory logistics and supply management	# of staff trained in laboratory logistics	Yes/No	50	Once	Reports	Observation/Document review/Key informant interview	10% knowledgeable
13.2.6 Procure laboratory information management system	# of LIMS copies procured and installed	Yes/No	2	Once	Reports	Observation/Document review/Key informant interview	None
13.2.8 Procure and consumables and supplies	List of consumables procured	Proportion	assorted	Annual	Delivery Notes/Reports	Observation/Document review/Key informant interview	10% of supplies available
13.2.9 Enroll the various labs in national and international external quality assurance programs	# of labs enrolled labs in QA/QC programmes	Proportion	2	Once	Reports	Observation/Document review/Key informant interview	20% enrolled
Output 13.3: Collaborating with WHO/ FAO Codex Alimentarius and other international partner established		Indicators: An international platform for sharing data					
13.3.1 Summarise and share data in standardized formats regularly	# of reports	Proportion	12	Annual	Reports	Observation/Document review/Key informant interview	None
13.3.3 Hold regular dissemination meetings for sharing data summaries with stakeholders	# of stakeholders regularly receiving reports	Proportion	100	Annual	Reports	Observation/Document review/Key informant interview	None

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
Objective 14: Foster Collaboration and Partnerships among AMR stakeholders		Desired Outcome: Harmonized and coordinated AMR surveillance system					
Output 14.1: Harmonized surveillance and capacity to detect and monitor antimicrobial use and resistance in prioritized pathogens established		Indicators: Increased capacity for surveillance AMR and use					
14.1.1 Organize a harmonization workshop with international partners and other stakeholders on the surveillance tools and methodologies	Harmonized tools	Proportion	5	Once	Reports	Observation/Document review/Key informant interview	None
14.1.2 Participate in regional and global data sharing platforms, including GLASS	# international platforms for sharing data	Proportion	5	Annual	Reports	Observation/Document review/Key informant interview	GLASS open
Output 14.2: Mechanisms for participation international, regional and international communication of critical events established		Indicators: A platform for communicating AMR critical events					
14.2.1 Identify AMR critical events that are consistent with international standards	# of events reported	Proportion	5	Once	Reports	Observation/Document review/Key informant interview	None
14.2.2 Institute global reporting mechanisms for critical events	# of tools for global reporting	Proportion	5	Annual	Reports	Observation/Document review/Key informant interview	None
Output 14.3: National, regional and international quality assurance standards in place		Indicators: Proportion of facilities with QA/QC procedures in place					
14.3.1 Develop manual of procedures for Quality assurance mechanisms for surveillance	Published MOP	Yes/No	1	Once	Reports	Observation/Document review/Key informant interview	None
14.3.1 Train personnel in Quality assurance mechanisms for surveillance	# of personnel trained	Proportion	100	Annual	Reports	Observation/Document review/Key informant interview	10 % knowledge able
14.3.2 Enroll all laboratory surveillance partners in relevant quality assurance mechanisms	# of laboratories enrolled quality assurance programmes	Proportion	22	Once	Reports	Observation/Document review/Key informant interview	10 enrolled

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
Strategic Objective 5: Research and Innovation		Desired Outcome: Reduced emergence and spread of AMR					
Objective 15: Promote Innovation in Search for Alternative Treatments and Drug Discovery		Desired Outcome: Effective control of resistant infections					
Output 15.1: Mechanisms for coordinated research and innovation in place		Indicators: A platform (RI TWC)for coordinated research in AMR					
15.1.1 Establish a Technical Working Group (TWC) on Research and innovation (RI TWC)	TWC formed with list of members and ToR	Yes/No	1	Once	Inauguration meeting report	Observation/Document review/Key informant interview	NONE
15.1.2 Train researchers on grant writing	# of researchers trained in grant writing	Proportion	500	Annual	Training Report	Observation/Document review/Key informant interview	20% knowledge able in grant writing
15.1.3 Advocate, lobby and share information and RFPs for funding of AMR research	# proposals funded by amount	Proportion	continuous	Annual	Reports	Observation/Document review/Key informant interview	10% funding
15.1.4 Sensitize researchers on intellectual property rights and patenting	# of researchers knowledgeable in IPR and patenting	Proportion	200	Annual	Reports	Observation/Document review/Key informant interview	10% researchers knowledge able in IPR and patenting
Output 15.2: Enhance product development and laboratory capacity of the Natural Chemotherapeutics Laboratories (NCL) and other partners		Indicators: Number of new antimicrobial products developed by NCL and other partners and approved					
15.2.1 Conduct a baseline survey and needs assessment on antimicrobial resources in the country, and identify opportunities and gaps to be filled	Baseline on antimicrobial resources	Yes/No	1	Annual	Reports	Observation/Document review/Key informant interview	TBD
15.2.2 Conduct a study to identify challenges and opportunities for enhancing antimicrobial product development	Challenges and opportunities for enhancing product development	Yes/No	1	Annual	Reports	Observation/Document review/Key informant interview	TBD
Output 15.3: International collaborations in high-throughput screening of antimicrobial compounds established		Indicators: Number of international collaborations in high-throughput screening of antimicrobial compounds established					

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
15.3.1 Identify collaborators and partners in the development of antimicrobial compounds	List of collaborators	Proportion	3	Annual	Reports	Observation/Document review/Key informant interview	TBD
Output 15.4: Academia and other rese archers supported in product development		Indicators: Number of new antimicrobial products developed by academia and other researchers an d approved					
15.4.1 Provide seed funding for proposal development	# of proposals developed and submitted	Proportion	100	Annual	Reports and copies of proposals	Observation/Document review/Key informant interview	TBD
15.4.2 Post calls for funding opportunities onto institutional websites and mailing lists of stakeholders including print media	# of RFP posted	Proportion	1000	Annual	Copies of the RFPs	Observation/Document review/Key informant interview	20% of RFP routinely posted
15.4.3 Establish database of biological materials, including plants, fungi, and other compounds with suspected antimicrobial properties	# of biological materials with potential antimicrobial properties	Proportion	1000	Annual	Reports	Observation/Document review/Key informant interview	5 % of biological materials with potential antimicrobial properties known
Output 15.5: Research in alternative treatments for infections supported		Indicators: Number f alternatives for treatment of infectious diseases developed					
15.5.1 Explore and share innovative treatments to infectious diseases	# and list of alternative treatments for infectious diseases	Proportion	100	Annual	Reports	Observation/Document review/Key informant interview	5% of possible alternatives known
Output 15.6: Linkages between indigenous technical knowledge (ITK) groups to the product developme nt system established		Indicators: Number of ITKs developed into antimicrobial products					
15.6.1 Facilitate the establishment of MoUs between ITKs, the National Chemotherapeutic Laboratories and other stakeholders	# of MoUs signed	Proportion	5	Annual	Reports and copies of MOUs	Observation/Document review/Key informant interview	10%

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
15.6.2 Carry out country-wide survey of indigenous knowledge on antimicrobial solutions	# of ITKs on AMR solutions	Yes/No	1	Annual	Reports	Observation/Document review/Key informant interview	TBD
Objective 16: Promote Innovations in Diagnostic Technology		Desired Outcome: Accurate and cost effective diagnosis of infections					
Output 16.1: Capacity for research, development and testing of innovative diagnostic technologies strengthened		Indicators: Number of new innovative diagnostics developed					
16.1.1 Conduct a baseline survey and needs assessment to identify the opportunities and challenges in innovative diagnostics	Baseline on diagnostics for AMR	Yes/No	1	Annual	Reports	Observation/Document review/Key informant interview	TBD
16.1.2 Enhance the capacity of national regulatory bodies to assess and approve potentially innovative antimicrobial and diagnostic technologies	# of approved diagnostics	Yes/No	1	Annual	Reports	Observation/Document review/Key informant interview	10% diagnostics in use
Output 16.2: Point-of-care diagnostics for detection of infectious diseases and detection of resistance validated		Indicators: Number of point-of-care diagnostics validated and approved					
16.2.1 Undertake an assessment of the point of care diagnostics in different stages of development	Baseline on the point of care diagnostics in different stages of development	Yes/No	1	Annual	Reports	Observation/Document review/Key informant interview	TBD
16.2.2 Sensitize stakeholders on regulatory systems and processes for approval of diagnostic technologies	# of stakeholders knowledgeable about regulatory systems and approvals for diagnostic technologies	Proportion	100	Annual	Reports	Observation/Document review/Key informant interview	10%
16.2.3 Train regulatory agency staff in approval processes for diagnostics	# of staff knowledgeable in product approval processes	Proportion	20	Annual	Reports	Observation/Document review/Key informant interview	TBD
Output 16.3: Ugandan science leaders i n international research on AMR		Indicators: Number of Uganda scientists with leadership position in international research partnerships					

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
16.3.1 Identify and disseminate opportunities for Ugandan scientists in international research partnerships and offer mentorship	# of scientists participating in international research related to AMR	Proportion	TBD	Annual	Reports	Observation/Document review/Key informant interview	TBD
Objective 17: Collaborate with International Partners in Basic Intervention Research		Desired Outcome: High quality basic intervention research					
Output 17.1: High-risk and high-burden resistant strains identified		Indicators: Number of high-risk and high-burden resistant strains reported routinely					
17.1.1 Organize workshops to share knowledge on high-risk and high burden resistant strains	List of high burden and high risk resistant organisms	Proportion	4 (1 per year)	Annual	Reports	Observation/Document review/Key informant interview	TBD
Output 17.2: Innovations for new anti-microbial drug development, vaccines, and other innovative therapies		Indicators: Number of innovative new antimicrobial drug development, vaccines, and other innovative the rapies developed					
17.2.1 Identify and disseminate opportunities for participation in the development of antimicrobials, vaccines, and other innovative therapies	# and list of potential opportunities	Proportion	100	Annual	Reports	Observation/Document review/Key informant interview	TBD
17.2.2 Identify and twin local laboratories with foreign laboratories to support the local production of vaccines	# and list of potential twinning opportunities	Proportion	5	Annual	Reports	Observation/Document review/Key informant interview	TBD
17.2.3 Establish and maintain microbial collections and other biological resources for research and development of AMR solutions	# and list Potential funders for microbial collections	Yes/No	1	Annual	Reports	Observation/Document review/Key informant interview	TBD
Output 17.3: Collaborations in high-throughput genomics and sequencing technologies established		Indicators: Number of high-through put genomics and sequencing technologies available					

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
17.3.1 Undertake a baseline survey and needs assessment to identify current capabilities and gaps in high through put genomics and sequencing in the country	Baseline on gaps in high-through-put screening capabilities	Yes/No	1	Annual	Reports	Observation/Document review/Key informant interview	TBD
17.3.2 Establish a National Genomics and Bioinformatics Centre (NGBC) to support AMR research	Functional NGBC	Yes/No	1	Annual	Reports	Observation/Document review/Key informant interview	NONE
17.3.3 Identify and facilitate collaboration of the NGBC with other international Centre's of excellence	# of MOUs signed with partners	Proportion	3	Annual	Reports and copies of MOUs	Observation/Document review/Key informant interview	TBD
Output 17.4: The burden of AMR established		Indicators: The proportion of burden infectious diseases that is attributed to AMR					
17.4.1 Undertake research to examine the burden of AMR in the country	Knowledge on the burden of AMR	Yes/No	1	Annual	Reports	Observation/Document review/Key informant interview	TBD
Output 17.5: A research innovation fun d to support innovations that slow down AMR established.		Indicators: Size of fund					
17.5.1 Advocate and lobby for funding support for research innovations from government and pharmaceutical companies	Amount of funds available for AMR research	Yes/No	1	Annual	Reports	Observation/Document review/Key informant interview	TBD
Objective 18: Enhance Operational and Health Systems Research at the Local Level		Desired Outcome: Evidence-based health systems operations					
Output 18.1: transmission pathways between the environment, humans, animals and food supply chain established		Indicators: Elucidation of resistance transmission pathways					
18.1.1 Organize One Health workshops to identify priorities for research on resistance and transmission pathways	# and list of One Health AMR research priorities	Yes/No	1	Annual	Reports	Observation/Document review/Key informant interview	TBD

Planning Element	Indicator (n)	Performance Value (calculation of n/N))	Target (N)	Frequency of data collection	Data Source/means of verification	Method of verification	Baseline
18.1.2 Identify and disseminate opportunities for One Health research funding	List of funding opportunities for One health research on AMR	Proportion	continuous	Annual	Reports	Observation/Document review/Key informant interview	TBD
Output 18.2: Local Antimicrobial use patterns established		Indicators: Pat terns and t rends of antimicrobial use locally					
18.2.1 Identify priorities for research to establish and improve antimicrobial prescription and use patterns	List of research priorities	Proportion	1	Annual	Reports	Observation/Document review/Key informant interview	TBD
18.2.2 Conduct research to assess							
behavioral, cultural and anthropological practices on antimicrobial use in society, prescription practices and motivators	Research reports	Yes/No	5	Annual	Reports	Observation/Document review/Key informant interview	TBD