GOVERMENT OF SIERRA LEONE

NATIONAL STRATEGIC PLAN FOR COMBATING ANTIMICROBIAL RESISTANCE

2018-2022

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ABBREVIATIONS AND ACRONYMS

AMR	Antimicrobial resistance
AMS	Antimicrobial Stewardship
AST	Antibiotic sensitivity testing
CIA	Critically Important Antimicrobials
CPG	Clinical Practice Guidelines
DRI	Drug-Resistance Infections
DTC	Drugs and Therapeutics Committee
EIA	Environmental Impact Assessment
EML	Essential Medicines List
EPA	Environment Protection Agency
FAO	Food and Agricultural Organisation
GAP	Global Action Plan
GHSA	Global Health Security Agenda
GLASS	Global Antimicrobial Resistance Surveillance System
HCAI	Health care-associated infections
IHR	International Health regulation
IPC	Infection Prevention and Control
JEE	Joint External Evaluation
MAFFS	Ministry of Agriculture Forestry and Food Security
MDR	Multi-drug resistant
MOHS	Ministry of Health and Sanitation
NMCG	National Multi-Sectoral Coordinating Group
PBSL	Pharmacy Board of Sierra Leone
WHA	World Health Assembly
WHO	World Health Organisation

FOREWORD

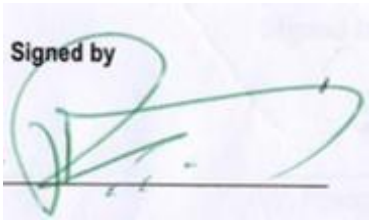
Antimicrobial resistance (AMR) threatens the effective prevention and treatment of infectious diseases by reducing the effectiveness of antimicrobial medicines. The impact on health and well-being are longer duration of illness, longer treatment, higher mortality, treatment with expensive medicines, increased burden on health system and huge economic consequences. Safe, good quality and effective antimicrobial medicines are required for protecting patients from potentially fatal diseases and ensuring that intricate procedures, such as surgery and chemotherapy, can be provided at low risk. The development and implementation of a national strategic plan is required to curb the emergence and spread of AMR and this should also take into consideration collection of accurate information and strong inter-sectoral collaboration.

In recognition of the urgency of combating AMR in Sierra Leone, the Ministries of Health and Sanitation (MOHS), Agriculture, Forestry and Food Security (MAFFS) and the Environment Protection Agency (EPA) put in place an inter-sectoral AMR Working Group in 2017. The MOHS, MAFFS, EPA and partners conducted a preliminary country situational analysis on AMR in 2017. The situational analysis preliminary findings recognised various issues that may contribute to AMR in Sierra Leone, including the absence of a comprehensive national policy and national strategic plan to combat AMR.

To address these deficiencies, the findings from the situation analysis were used to develop the AMR strategic plan. This strategic plan underscores the need for an effective “one health” approach involving coordination among numerous sectors and partners, including human and veterinary medicine, agriculture and the environment. This national AMR strategic plan will enable the Government of Sierra Leone to curb antimicrobial resistance and improve patient outcomes.

Signed by

Dr. Abu Bakarr Fofanah
Minister of Health and Sanitation



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PREAMBLE ON BEHALF OF THE MOHS, MAFFS AND EPA

Antimicrobials have been valuable in fighting organisms causing infectious diseases in Sierra Leone for decades, but because of the irrational use of these medicines, an increasing number of these organisms may have developed resistance to them. From a global perspective, the problem was controllable as the growth of resistance was slow and the pharmaceutical industry continued to create novel antimicrobials. Over the past years, this problem has become a global concern since the development of antimicrobial resistance is happening at an alarming rate and is outdoing the development of new antimicrobials capable of fighting infections in humans and animals.

Sierra Leone like other low-income countries, may already be encountering the challenges of AMR. It is an emerging national health concern which calls for an imperative inter-sectoral collaboration to proffer solutions that will address this looming threat.

Therefore, Ministry of Health and Sanitation, together with the Ministry of Agriculture, Forestry and Food Security and the Environment Protection Agency and other stakeholders and international partners, led the development of the Sierra Leone National Strategic Plan on AMR based on the objectives of the global action plan (GAP) developed by the World Health Organisation and also the Food and Agricultural Organisation action plan on AMR (2016-2020). The congregation of the aforementioned Ministries, stakeholders and partners to develop this plan is a testament of their support to translated this plan into action. This is a multidimensional and all-inclusive strategy based on the "one health approach" which aims to consolidate all efforts in the fight against AMR in the country through this platform.

If we want to avoid a post antibiotic era, we need to change our approach with respect to the way we handle antimicrobial agents. Action is needed now to prevent and control the spread of antibiotic resistance. This is an achievable venture and we charge all of us to participate in combating AMR in Sierra Leone.

Signed by

Dr. Brima Kargbo
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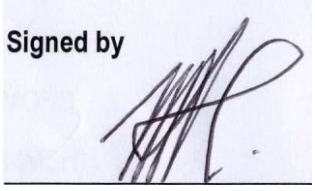
Signed by



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This strategic plan was derived from interactive discussions during the various consultative meetings.

EXECUTIVE SUMMARY

Antimicrobials have been a critical public health tool since the discovery of penicillin in 1928, saving the lives of millions of people around the world. Today, however, the emergence of drug resistance is reversing the miracles of the past eighty years, with drug choices for the treatment of many infections becoming increasingly limited, expensive, and, in some cases, non-existent.

Conscious of the public health threats of AMR to both humans, animals and the environment, the ministries of health and sanitation, agriculture forestry and food security and the environmental protection agency put together a national multi-sectoral coordinating group tasked with the responsibility of establishing mechanisms to integrate all initiatives into a single concerted action and development of the national AMR strategic plan (2018-2022). The National Strategic Plan on Antimicrobial Resistance is the first approach which addresses AMR specifically.

The drafting process began in the February, 2017 with full involvement of multi-stakeholders. The draft versions have gone through several rounds of consultations. Through these processes, the draft plan was finalized in October, 2017 endorsed by the ministers of health and sanitation, agriculture forestry and food security and the executive chairperson of the environment protection agency. The plan is guided by the 'One Health' approach which recognizes the interconnectivity across human, animal and environmental health.

The objectives of the national strategic plan include: 1. To establish an AMR governance structure 2. To improve AMR awareness and education 3. To strengthen Laboratory and Surveillance 4. To reduce incidence of infection through IPC 5. To optimize antimicrobial use in all sectors 6. Ensure sustainable investment through research and development.

Although the primary purpose of the plan is to provide direction for the activities of Government, the national strategic plan is also intended to guide action by the human, animal and environmental sectors and partners in a common effort to address urgent and serious drug-resistant threats that affect the population of Sierra Leone. This will also promote Government's effort in support of the World Health Assembly resolution 67.25 (Antimicrobial Resistance), which urges countries to take urgent action at the national, regional, and local levels to combat resistance.

The strategic plan will also result in improved antibiotic stewardship in healthcare settings, prevention of the spread of drug-resistant threats, elimination of the use of medically-important antibiotics for growth promotion in food animals, and expanded surveillance for drug-resistant infections in humans and animals. Other significant outcomes include creation of an AMR reference public health laboratory, establishment of a AMR database that can be accessed by government, industrial and academic researchers.

Implementation of the objectives and activities in the plan requires continued, synchronised, and complementary efforts of government and partners, including healthcare professionals, healthcare leaders, veterinarians, agriculture industry leaders, environmentalists, manufacturers, policymakers, and patients. All of us who depend on antimicrobials must join in a common effort to detect, stop, and prevent the emergence and spread of resistant infections.

1. INTRODUCTION

Since the discovery of penicillin by Sir Alexander Fleming in 1928, antimicrobial drugs have led to significant advancement in medicine and surgery, saved millions of lives all across the world, substantially reduced the burden of diseases, improved the quality of life and increased life expectancy. In recent years the emergence and spread of antimicrobial resistance (AMR) in several microorganisms has rendered the management of many infectious diseases difficult. The development of resistance to drugs commonly used to treat malaria, TB and HIV is of particular concern and an impediment in achieving the Sustainable Development Goals of 2021.

AMR is the ability of an organism to change in ways that render the medications used to cure the infections they cause ineffective. When the microorganisms become resistant to most antimicrobials they are often referred to as “superbugs”. Resistant microorganisms (including bacteria, fungi, viruses and parasites) are able to withstand attack by antimicrobial drugs, such as antibiotics, antifungals, antivirals, and anti-parasitics. The standard treatments become ineffective and infections persist, increasing the risk of spread to others.

Antimicrobial resistance is a natural biological phenomenon that is accelerated by a variety of factors, one of which is human practices. The use of an antimicrobial for any infection in any dose and over any time period, forces microbes to either adapt or die in a phenomenon known as "selective pressure". The microbes which adapt and survive carry genes for resistance, which can be passed on. When antimicrobials are used incorrectly: for too short a time, at too low a dose, or for the wrong disease; the likelihood that bacteria and other microbes will adapt and replicate rather than be killed is greatly enhanced. Much evidence supports the view that the total consumption of antimicrobials is a critical factor in the development of AMR. Paradoxically, under use through lack of access, inadequate dosing, poor adherence, and substandard antimicrobials may play as important a role as overuse. Its Emergence is a result of the use, overuse and misuse both in humans and animals.

AMR has multiple implications not only for the patients and family, but also on more broadly terms, the health system of any country. As microbes become more resistant to common, inexpensive antimicrobials, there is a tendency to move on to more expensive and often multidrug treatment including the use of second or third line antimicrobial agents, increasing the cost of health care. AMR thus diminishes the therapeutic choices available to patients and healthcare providers. Other

untoward effects of AMR include increased mortality rates, long hospital stays, admission to the intensive unit and the spread of resistant microorganism to other patients.

The containment and prevention of antimicrobial resistance is a biological, behavioral, technical, economic, regulatory and educational problem, and requires a comprehensive, integrated well-coordinated response employing evidence based strategies, with active support and participation from national level. In addressing AMR, the Government of Sierra Leone adopted the Agenda of the Sixty-eighth (68^{th}) World Health Assembly (WHA) of May 2015, where the global action plan on antimicrobial resistance was adopted and Member States urged to develop National Action Plans (NAP) for AMR using a "One Health Approach". The NAP will outline the key strategic objectives, interventions and activities to slow the development and spread of AMR and improve patient outcome. The NAP provides a structure for a coordinated response to strengthening national stewardship among the numerous sectors and actors, including human, animal, agriculture, finance and the environment.

2. SUMMARY OF PRELIMINARY SITUATIONAL ANALYSIS

A preliminary country situational analysis was conducted in 2017 led by an informal AMR National Multi-Sectoral Coordinating Group (NMCG) with focal points for human, environment and animal health, to provide baseline information on the status of AMR in Sierra Leone and to identify gaps and challenges in curbing AMR. The situational analysis was drawn out of a literature review of published and unpublished data as well as interviews of key informant across relevant sectors. Information was also collected from the 2016 joint external evaluation report for Sierra Leone. The findings of the situational analysis informed the development of the NAP, and are summarized below:

1. Awareness and education

- No public awareness on AMR
- Non-inclusion of AMR in pre-service or in-service programmes for professionals in the veterinary, human health, agriculture sectors.
- Civil society groups, faith-based organizations, Non-governmental organizations (NGO) or other consumer or professional groups rarely involved with AMR activities.
- AMR not included in primary or secondary school curricula.
- No commemoration of the WHO antibiotic awareness week or any other world/regional AMR awareness campaign.

2. Laboratory and surveillance

- No national plan for detection and reporting of priority antimicrobial resistant pathogens as stipulated by WHO.
- No laboratory has been formally designated as AMR laboratory.
- The National Health Laboratory Strategic Plan (2016–2020) does not address antimicrobial resistance.
- Information on resistance patterns to common bacteria is available in a few private clinical laboratories, where drug susceptibility testing is provided on request such as when patients fail to respond to treatment. In such instances, epidemiological data is not mandatorily collected.
- Capacity for bacteriological culture and antimicrobial susceptibility testing (AST) is limited by lack of skilled laboratory personnel, limited supply of reagents and a weak supply chain system for laboratory commodities, lack of equipment and standard operating procedures.
- There is limited participation in internal or external quality assurance program for microbiology, being limited to only the Central reference laboratory and Connaught hospital.
- Disease specific surveillance systems exist for malaria and HIV, but as in the case of malaria, are not linked to entomological data from the vectors.

- Monitoring of use of antimicrobial agents in humans, animals and plants is not undertaken.
- No centre responsible for coordination of surveillance activities for AMR.
- Few published studies on antimicrobial use.

3. Infection prevention and control (IPC)

- A national IPC policy and plan are available, with IPC SOPs, guidelines and protocols implemented in selected health facilities.
- A national programme for Health care-associated infections (HCAI) surveillance is soon to be rolled out.
- Trained IPC professionals are in all tertiary hospitals
- IPC committees are present at tertiary hospitals and regional government owned health facilities.
- IPC programs are non-existent in congregate settings (boarding homes and hostels, correctional facilities).
- IPC and hygiene topics are not included as core components of pre-service education curricula for students in human health or veterinary programmes neither are they components of in-service training for health, environment, agriculture or veterinary professionals.
- There are no policies, guidelines or standards on pharmaceutical waste management.
- No IPC programmes in agriculture and animal health.

4. Antimicrobial use

- No national policy and regulation for antimicrobial stewardship, although essential treatment guidelines exist and are in use.
- No national guidance on appropriate antimicrobial use in humans and animals.
- Weak capacity for improving antibiotic prescribing and consumption in humans because antibiotics are available without prescription.
- No guidance of antimicrobial use in animals and plants and no national guideline on monitoring and regulation of drug residues in animal products.
- Inadequate monitoring of antibiotic consumption and use in human, environmental and animal health sectors.
- No Drugs and Therapeutics Committee (DTC) carrying out AMR related activities

3. NATIONAL STRATEGIC PLAN

1. Vision

A society where antimicrobials are handled as a valuable asset for present and future generations in the treatment of infections in humans, animals, environment and the agricultural sector.

2. Mission

To effectively combat the development and spread of antimicrobial resistance in Sierra Leone so that it no longer constitutes a public health threat, using a one health approach that integrates infection prevention and control, rational use of antimicrobials, availability of safe and effective antimicrobials of good quality, diagnostic stewardship and surveillance.

3. Goal

The overarching goal of the NAP is to ensure, for as long as possible in Sierra Leone, continuity of successful treatment and prevention of infectious diseases with medicines that are quality-assured, prescribed and used responsibly, and accessible to all who need them at a price that they can afford.

4. Objectives

The following are the specific objectives of the NAP-:

1. Define the strategic priorities, key actions, responsibilities, timelines and budget for AMR activities, define and strengthen organizational & management structures for intra- and inter-sectoral coordination within a One Health approach;
2. Achieve better understanding and awareness of AMR, strengthened surveillance, prevention of emergence and spread of resistant microbes through infection prevention and control, optimized use of antibiotics in all sectors, and enhanced investments for AMR activities, communications, research and innovations.
3. Improve international collaboration and capacities for antimicrobial resistance prevention, surveillance, control and antibiotic research and development.
4. Enable monitoring and evaluation (M&E) of the NAP implementation.

5. Guiding Principles

The guiding principles as outlined in the GAP and the resolution of the WHA describes the common approach for all stakeholders at the national, institutional, and individual levels. Such actions are linked to regional and global efforts.

The principles are as follows:

i. Whole-of-society engagement

Antimicrobial resistance affects human health, animal health, agriculture, food security, water and sanitation and economic development. Therefore, all sectors and disciplines should be actively engaged in the fight against AMR.

ii. Prevention first

Prevention of infection in the first instance is cost effective and can be implemented in all settings. Good sanitation, hygiene and other infection prevention measures that can slow the development and restrict the spread of difficult-to-treat antibiotic-resistant infections are key to combatting AMR.

iii. Access

Successful implementation of NAP depends on access and appropriate use of existing and new antimicrobial medicines, health facilities, health care professionals, veterinarians, preventive technologies and diagnostic tools, education and information.

iv. Sustainability

The implementation of the NAP requires long-term investment in all the strategies in the plan. Political commitment and international collaboration are needed to promote the technical and financial investment necessary for effective development and implementation.

v. Incremental targets for implementation

That NAP offers an opportunity for the country to determine the priority actions that it needs to take to attain each strategic objective in a stepwise manner that meets both local needs and global priorities.

6. Strategies

The NAP articulates the priorities and interventions to be implemented between 2018–2022.

The focus areas of the NAP are:

1. Establish a governance structure for the implementation of the AMR strategic plan
2. Improve awareness and understanding of antimicrobial resistance through effective communication, education and training.
3. Strengthen the knowledge and evidence base through laboratory, surveillance and research

4. Reduce the incidence of infection through effective sanitation, hygiene and infection prevention measures
5. Optimize the use of antimicrobial agents in human, animal and plant health
6. Develop the economic case for sustainable investment and actions to combat AMR

7. Strategic Objectives

Strategic Objective 1: Establish a governance structure for the implementation of the NAP

Concerted and nationally coordinated efforts are needed to bring together various stakeholders under the umbrella of one health to harness their expertise and resources under a strong political leadership.

Priority action 1: Governance

Objective 1: Establish an AMR governance structure at national level	
Interventions	**Activities**
1.1 Establish AMR national multi-sectoral coordinating group (NMCG)	1.1.1 Define membership to be representative of all stakeholders and appoint persons into the NMCG
	1.1.2 Develop and approve TOR
	1.1.3 Designate national focal persons for AMR in the health, animal and environmental sectors
	1.1.4 Establish a secretariat for the NMCG
	1.1.5 Organise quarterly meetings to review progress towards implementation of NAP
1.2 Include AMR into the existing 'one health structure'	1.2.1 Expand terms of reference (TOR) of National one health committee to include AMR
1.3 Develop an implementation plan for the AMR strategic plan	1.3.1 Develop a roadmap for the implementation of the AMR strategic plan
	1.3.2 Cost the AMR strategic plan

Strategic Objective 2: Improve awareness and understanding of antimicrobial resistance through effective communication, education and training.

Urgent steps are required to raise awareness on AMR and promote behavioural change, through public communication programmes for audiences in human, environmental, animal and plant health. Inclusion of the AMR and related topics in primary and secondary school curricula will

promote understanding and awareness from an early age, likewise making AMR a core component of professional education, training, certification, continuing education and development in the health, veterinary sectors and agricultural practice, will promote understanding and awareness among professionals.

The priority actions in this strategic objective are as follows:

• Awareness-raising and risk communication

• Education

Priority action 2: Awareness raising and risk communication

Objective 2: Increase awareness on AMR	
Interventions	**Activities**
2.1 Establish evidence based public communication programmes targeting audiences in the human, animal health and crop production sectors	2.1.1. Estimate awareness and knowledge through knowledge, attitude, practice and behavioural studies in the general populace and professional groups- human health, veterinary, farmers and food processing sector
	2.1.2 Develop and disseminate national communication strategy for AMR
2.2. Develop communication strategies, messages and materials to promote AMR awareness	2.2.1 Carry out advocacy and sensitization meetings for parliamentarians, local government, chiefdom chiefs, at national, district and chiefdom levels
	2.2.2 Develop and disseminate communication messages in the print and broadcast media and IEC materials (including billboards, posters, radio spots) to guide health workers, pharmacists communities on prevention of drug resistance
	2.2.3 Engage non-governmental organizations, Civil Society Organizations and the media to deliver messages on AMR
	2.2.4 Commemorate Antibiotic awareness week
2.3 Awareness on AMR is improved among food and agriculture stakeholders	2.3.1 Develop communication, advocacy products and evidence-based messaging that targets different sectors of agriculture in order to: • ensure the required understanding of the challenges and risks AMR, • safe farming practices that enable decreased use of antibiotics and antimicrobials in livestock production, • outcomes of irresponsible use of antibiotics and antimicrobials, & • detrimental effects of antibiotics in the environment,

Priority action 3: Education

Objective 3: Improve knowledge of AMR	
Interventions	**Activities**
3.1 Include AMR and related topics in school curricula across all levels of education	3.1.1. Develop modules on AMR and related topics in primary, secondary and tertiary education curricula
3.2 Include AMR continuing professional education (CPE) programmes for professionals	3.2.1 Engage professional registration boards for inclusion of AMR CPE as pre-requisite for licence renewal
	3.2.2 Conduct Annual scientific symposium on AMR for human, animal and veterinary professionals
3.3 Develop and implement in-service training programs on AMR for professionals in the human health, veterinary, environmental and agricultural sectors	3.3.1 Engage stakeholder in the educational sector in a consultative meeting to develop curriculum for AMR
	3.3.2 Train professionals, through short courses, in-service and pre-service programmes in the human health, veterinary, food production and agriculture sectors on AMR

Strategic Objective 3: strengthen the knowledge and evidence base through laboratory, surveillance and research

Surveillance of antimicrobial resistance is critical for providing data on the extent and trends of the AMR problem. Through the NAP, the national surveillance system for AMR will be established. Laboratory-based surveillance is required for national action in the monitoring of AMR and its spread. For reliable microbiological and antimicrobial susceptibility testing, it is imperative to equip laboratories with equipment, reagents and human resource. Furthermore, a coordinated mechanism for AMR reporting will be established in order to share information employing the one health approach.

Surveillance of antimicrobial consumption is an important aspect in combating AMR, and will be undertaken in humans, animals, plants and environment.

The interventions under surveillance and research include the following priority actions:

- Laboratory capacity
- Surveillance
- Research and development

Priority action 4: Laboratory capacity

Objective 4: Build laboratory capacity to produce high-quality microbiological data for patient management and support surveillance activities in the human, veterinary, animal and environmental sectors.	
Interventions	**Activities**
4.1 Strengthen laboratory capacity to monitor AMR at national and regional level in the human health sector	4.1.1 Designate a national laboratory for AMR surveillance with clearly articulated TOR
	4.1.2 Appoint a focal person for AMR surveillance in the national AMR laboratory with defined roles and responsibilities
	4.1.3 Standardize SOPs for laboratory testing for AMR
	4.1.4. Conduct training, competency and external proficiency program for all sites in the surveillance network conducting Antibiotic sensitivity testing (AST) for sentinel sites.
	4.1.5 Identify, designate and support regional laboratories for AMR sentinel surveillance
	4.1.6 Standardize AMR reporting system across laboratories
	4.1.7 Enrol national and regional laboratories in external quality assurance schemes, monitor and evaluate their performance, and implement corrective actions.
	4.1.8 Enrol national and regional laboratories in GLASS
	4.1.9 Support an uninterrupted supply of quality laboratory reagents and supplies.
	4.1.10 Conduct molecular characterization of any resistance determinants from Multi-drug resistance (MDR) organisms
	4.1.1 Establish Repository of MDR isolates
4.2 Strengthen laboratory and diagnostic capacity to monitor AMR and antimicrobial residue at national and regional level in the animal health and agricultural sector	4.2.1 Assess existing capacities for monitoring AMR and detecting antimicrobial residues;
	4.2.2 Establish laboratory capacity for screening of antibiotic residues in food products locally produced or imported and AMR in pathogens isolated from food products.
	4.2.3 Establish AMR laboratory capacity to conduct antibiotic surveillance in pathogens isolated from food-producing animals
	4.2.4 Strengthen national laboratory capacity to monitor AMR and detect antimicrobial residues in food products and the environment;
	4.2.5 Training of lab personnel to make analyses – microbiological and physiochemical testing of animals and

	animal products;
	4.2.6 Field testing of antibiotics for active ingredients.
4.3 Strengthen laboratory capacity to monitor AMR at national and regional level in the environment sector.	4.3.1 Develop a laboratory capacity to analyzed water and Soil samples for possible AM residue
	4.3.2 Capacity building via training of EPA-SL to analyze potential AM contaminated samples.
	4.3.3 Conduct an inventory aimed at identifying AMR contaminated site in country.
4.4 Develop a Geographic Information System (GIS) Map indicating contaminated and sampling sites in Sierra Leone.	4.4.1 Establish a monitoring and surveillance plan
	4.4.2 Establish an electronic database to assess trend.

Priority action 5: Surveillance systems

Objective 5: Set-up a national antimicrobial resistance surveillance system	
Interventions	**Activities**
5.1 Establish an integrated AMR surveillance system	5.1.1 Establish coordinating centre for AMR to systematically collect, analyse and report antimicrobial use and resistance
	5.1.2 Develop an AMR one health surveillance plan through the establishment a surveillance technical group with an endorsed TOR to develop the One Health surveillance system to include routine, sentinel and surveys
	5.1.3Develop forms, tracking software and reports on the use of antibiotics and drug resistance
	5.1.4 Organize regular review meetings among relevant groups of stakeholders to review data on both antimicrobial use and resistance, and take practical steps to translate those data into actions, such as informing new or revision of policies and practice guidelines
	5.1.5 Establish a mandatory requirement for submission of all AMR data including i.e. from vertical programmes, animal health and food safety in the public, NGO, and private sectors
5.2 Establish antimicrobial use surveillance in animal health and agriculture sectors	5.2.1 Develop plans to monitor antimicrobial use in animals and crop production
	5.2.2 Conduct antimicrobial use surveys/studies at national, district and community level, and also in veterinary and agricultural settings
	5.2.3 Strengthen mechanisms to check for levels of antimicrobial agents in imported as well as locally produced animal and plant food products, and also levels of antimicrobial discharge in the environment such as waterways.
	5.2.4 Establish systems to collect data on national level sales or consumption of antibiotics, prescribing practices and appropriate antibiotic use at selected health care settings,

5.3 Establish AMR surveillance in environmental sector	5.3.1 Identify and implement 'clean up' of AMR Contaminated sites
	5.3.2 Incorporate the concept of AMR into the waste managment policies of companies and Industries
	5.3.3 Strengthen mechanisms to check for levels of antimicrobial discharge in the environment such as waterways
	5.3.4 Incorporate AMR Concept into the Terms and Conditions of EIA Licenced Holders.
	5.3.5 Develop and popularise guidelines on the safe disposal of AMR products at industries and health facilities
5.4 Improve information dissemination for antimicrobial surveillance and antimicrobial use	5.4.1 Disseminate monthly AMR reports to the antimicrobial stewardship committee in healthcare facilities
	5.4.2 Disseminate quarterly AMR reports among facility health providers and DHMTs to increase awareness of AMR profiles among circulating pathogens
	5.4.3 Provide annual AMR surveillance reports to committees responsible for revising standard treatment guidelines, Clinical Practice Guidelines (CPGs), Essential Medicines List (EML), and Infection Prevention and Control (IPC) guidelines.

Priority action 6: Research and development

Objective 6: Identify operational research priorities in human, environmental and animal health	
Interventions	**Activities**
6.1 Develop a national research agenda on AMR	6.1.1 Engage relevant experts to identify current gaps in knowledge and potential research topics.
	6.1.2 Develop research guidelines on AMR
	6.1.3 Undertake research on AMR
6.2 Establish a system for sharing data on AMR research	6.2.1 Organize multisector national AMR scientific symposiums
	6.2.2 Establish a national AMR data repository

Strategic Objective 4: Reduce the incidence of infection through effective sanitation, hygiene and infection prevention control (IPC) measures

Better hygiene and infection prevention measures are essential to limit the development and spread of antimicrobial resistant infection and multi-drug resistant pathogens. Drug resistant does not only occur in health care setting but also at the household level. IPC with proper training of health personnel and education in the community level is needed to combat AMR. To facilitate IPC in health care, there is a need to strengthen the national infection prevention and control programme at all levels. The use of vaccines can reduce the infection rates and dependency on antimicrobial agents as well as the risk that antimicrobial resistant pathogens will develop and spread through food chain.

Four priority areas are identified:

- Infection prevention and control in health care
- Infection prevention in animal health
- Hygiene, sanitation and infection prevention in the community
- Health care waste management

Priority action 7: Infection prevention and control in human health

Objective 7: Strengthen the national infection prevention programme for human health	
Interventions	**Activities**
7.1 improve sensitization and monitoring of IPC practices	7.1.1 Carry out awareness meetings on hand hygiene and prevention of healthcare-associated infections at training institutions, health facilities, and veterinary services
	7.1.2 Conduct Hand hygiene audits
	7.1.3 Strengthen IPC measures in human health facilities, including long-term care and congregate settings
	7.1.4 Upgrade training curriculum for IPC training to include AMR
	7.1.5 Education and training of healthcare workers on AMR
	7.1.6 Establish HAI surveillance programmes
	7.1.7 Conduct supervision of IPC implementation
	7.1.8 Monitor implementation of IPC quarterly with timely feedback.

Priority action 8: Infection prevention in animal health and agriculture

Objective 8: Introduce infection prevention and control programmes in agricultural settings and animal husbandry.	
Interventions	**Activities**
8.1 Include hygiene and infection prevention and control as core (mandatory) content in training and education of veterinary professionals.	8.1.1 Include hygiene and infection prevention and control in undergraduate curricula for animal health professionals.
8.2 Implement IPC programmes across the agricultural and fisheries sectors	8.2.1 Establish IPC programmes in animal health, agriculture and fisheries, including health inspections of abattoirs, farms and communities, and monitor and improve adherence to national/facility IPC policies and standards

Priority action 9: Hygiene, sanitation and infection prevention in the Community

Objective 9: Limit the development and spread of AMR in the community by infection prevention and control measures	
Interventions	**Activities**
9.1 Promote personal hygiene by social mobilization and behavioural change activities.	9.1.1 Estimate knowledge of personal hygiene in different social groups as a basis for the social mobilization campaigns.
	9.1.2 Promote hygiene, sanitation and other behaviours that contribute to infection prevention in the community
9.2 Encourage continued increases in vaccination rates at veterinary and human health facilities to prevent infection	9.2.1 Promote vaccination amongst veterinary, human health workers and the general public.

Priority action 10: Waste management

Objective 10: Strengthen waste management in all sectors	
Interventions	**Activities**
10.1 Reduce environmental contamination with resistant pathogens and antimicrobial residues	10.1.1 Develop systems for safe collection, transport and disposal of waste from human health, animal and agricultural facilities through the establishment an effective waste management system, specifically addressing water sewage and landfills (solid waste) involving agricultural, medical and pharmaceutical waste
	10.1.2: Establish national and sub-national monitoring system for waste management

Strategic Objective 5: **Optimize the use of antimicrobial agents in human, animal and plant health**

Indiscriminate use of antimicrobials gives rise to development of antimicrobial resistance. The indiscriminate use may be on human health or in animal husbandry. Therefore, rational use of antimicrobials in human as well as in animal health is of utmost importance to reduce development of resistance to antimicrobials thus the need for developing antimicrobial stewardship programmes. Antimicrobial stewardship includes not only limiting inappropriate use but also optimizing antimicrobial selection, dosing, route, and duration of therapy to maximize clinical cure or prevention of infection, while limiting the unintended consequences.

The judicious use of antimicrobials (AMs) in both human and veterinary settings is an important strategy to reduce the possibility of emergence of resistance. Overuse and misuse resulting from poor prescribing and dispensing behaviour, uninformed patient demand and lack of adherence to treatment regimen prescribed, low-quality drug formulations, inadequate dosage regimens, and insufficient duration of therapy are also important contributors to AMR

Three specific objectives are defined under this strategic objective:

- Regulated access
- Antimicrobial stewardship
- Antimicrobial use in human and animal health

Priority action 11: Regulated access to high quality antimicrobials

Objective 11: Ensure uninterrupted access to high-quality antimicrobial medicines	
Interventions	**Activities**
11.1 Improve access, strengthen regulation and supply chain management for antimicrobial agents.	11.1.1 Strengthen the quality management system for the supply of medicines, covering storage, transport, distribution and inventory management
	11.1.2 Strengthen national mechanisms for registration of antimicrobial medicines through the Pharmacy Board of Sierra Leone(PBSL)
	11.1.3 Conduct monitoring and post marketing surveillance of antimicrobials circulating in the market (public and private sectors)
	11.1.4 Build capacity for effective and enforceable regulation of antimicrobial management, including quality assurance of all imported products including antimicrobials, reagents and pesticides and standardization of diagnostic equipment

	11.1.5 Review and enforce use of a national and institutional essential medicine list guided by the WHO model list of essential medicines and national AMR data
	11.1.6 Develop clinical practice guidelines such a national formulary, standard treatment guidelines with participation of relevant stakeholders
	11.1.7 Provide appropriate training for personnel engaged in supply chain management and medicines regulation
	11.1.8 Conduct audit inspections of pharmaceutical importers to check on the quantities of antimicrobial agents (for human and animal use) imported and distributed as well as the quantity remaining (if any)
	11.1.9 Conduct follow - up audit inspections of medical prescriptions, prescription registers of community retail pharmacy outlets and government dispensaries to check whether antimicrobial agents were dispensed on prescription or not.
	11.1.10 Development of antimicrobial prescription and utilization registers for deployment at public and private pharmacies and drugstores
	11.1.11 Equip the national medicines quality control laboratory to perform quality assays and strengthen the national pharmacovigilance reporting systems
	11.1.12. Develop guidelines related to the prescription, sales, dispensation, and administration of antimicrobials.

Priority action 12: Antimicrobial stewardship (AMS)

Objective 12: Improve and measure appropriate use of antimicrobial agents in health care	
Interventions	**Activities**
12.1 Create formal AMS programmes in health care facilities	12.1.1 Develop policy and regulations for AMS
	12.1.2 Establish AMS committees in health facilities
	12.1.3 Develop a list of critical antibiotics to human health whose access should be controlled (e.g. Fluoroquinolones, third and fourth generation cephalosporins, carbapenems, amikacin, vancomycin).
	12.1.4 Develop and implement national and facility-level antimicrobial stewardship programs, including medicine use reviews/evaluations, and implementation and monitoring of the use of STGs in both human and veterinary settings.
	12.1.5 Promote and monitor the use of evidence-based rapid diagnostic tests to facilitate diagnosis and optimal antimicrobial treatment

	12.1.6 Establish or strengthen capacity of existing drug and therapeutics committees (DTCs) in carrying out antimicrobial stewardship containment activities
	12.1.7 Establish drug information centres (DICs) to provide information on antibiotic use and resistant

Priority action 13: Antimicrobial use in animal health and agriculture

Objective 13: Ensure prudent use of antimicrobial agents in terrestrial and aquatic animals and agriculture	
interventions	**Activities**
13.1 Establish national policies on use of antimicrobial agents in animals, agriculture and fisheries.	13.1.1 Develop guidelines for the use of antimicrobials in food-producing animals based on the WHO list of Critically Important Antimicrobials(CIA)
	13.1.2 Establish a strong regulatory framework for authorization and control of the quality of veterinary medicines.
	13.1.3 Establish regulation for the restriction of non-therapeutic use of antimicrobials (e.g. growth promoters) in food-producing animals and use of critically important antimicrobials for human medicine in food- producing animals.
	13.1.4 Develop/review national medicines, pesticides and national livestock policy to address AMR

Strategic Objective 6: Develop the economic case for sustainable investment and increase investment in new medicines, diagnostic tools, vaccines and other interventions

Targeted and interdisciplinary research efforts are needed to fill gaps that still exist in understanding of prevalence of antimicrobial resistance, patterns and its epidemiological impact on human and animal pathogens and diseases. New medicines, diagnostic tools and vaccines are needed to combat emerging and spreading antimicrobial resistant pathogens. Studies are needed to determine the economical case for further investment in research for new drug discoveries, development and piloting of new diagnostic tools, vaccines and alternative interventions.

To prepare the economic case for sustainable investment on AMR intervention, investment required will be identified, priorities on scientific research on AMR will be set and international collaboration will be fostered to support investigation and testing of new innovative technologies in the respective areas.

Priority action 14: sustainability of antimicrobial resistance interventions

Objective 14: Prepare the economic case for sustainable investment and actions to fight AMR.	
interventions	**Activities**
14.1. Prepare a plan to secure and use financing for implementation of the AMR strategic plan	14.1.1 Assess investment requirements for implementation of the strategic plan.
14.2 Strengthen partnership and governance to support and enhance AMR containment efforts	14.2.1 Build and expand local, national, regional and international partnerships and coalitions in support of AMR containment, including public-private partnerships
	14.2.2 Strengthen AMR containment-related governance through a national multi-sectoral and multi-disciplinary coordinating team, and focal points at different levels with clearly defined terms of reference, mandates and accountability
14.3 Strengthen advocacy for funding and support for AMR containment	14.3.1 Advocate for budgetary funding for AMR containment efforts from government, donors, and the private sector
	14.3.2 Include relevant AMR related activities into MoHS annual operational plan and MoHS strategy
	14.3.3 Include relevant AMR related activities into MAFFS annual operational plan and MAFFS strategy
	14.3.4 Include relevant AMR related activities into EPA annual operational plan and EPA strategy
14.4 Coordinate national research efforts and information sharing	14.4.1 Conduct research and promote information sharing with regard to various aspects of AMR containment including understanding and awareness of AMR, surveillance of antimicrobial use and resistance, infection prevention/control, optimized use of antimicrobials, and development and diffusion of new antimicrobials, vaccines, diagnostics, and novel delivery methods
	14.4.2 Develop AMR research Agenda for human, animal and environmental health
	14.4.3 Provide incentive and research funding for researches on AMR

4. OPERATIONAL FRAMEWORK FOR STRATEGIC OBJECTIVES

The operational plan matrix consists of activities, key outputs, responsible institutions/ agencies and projected timeline for implementation. The AMR Plan will be reviewed every two years or more frequently if necessary.

GLOBAL STRATEGIC OBJECTIVE 1. ESTABLISH A GOVERNANCE STRUCTURE FOR THE IMPLEMENTATION OF THE AMR STRATEGIC PLAN								
Objective 1: Establish an AMR governance structure at national levels								
	Governance							
	Strategic interventions	**Activities**	**Responsible institution/agency**	**Yr 1**	**Yr2**	**Yr3**	**Yr4**	**Yr5**
	1.1 Establish AMR national multi-sectoral coordinating group (NMCG)	1.1.1 Define membership to be representative of all stakeholders and appoint persons into the NMCG	MOHS, MAFFS, EPA					
		1.1.2 Develop and approve TOR	AMR NMCG					
		1.1.3 Designate national focal persons for AMR in the health, animal and environmental sectors	MOHS, MAFFS, EPA					
		1.1.4 Establish a secretariat for the NMCG	MOHS, MAFFS, EPA					
		1.1.5 Organise quarterly meetings to review progress towards implementation of NAP	AMR NMCG					
	1.2 Include AMR into the existing 'one health structure'	1.2.1 Expand terms of reference (TOR) of National one health committee to include AMR	MOHS, MAFFS, EPA					
	1.3 Develop an implementation plan for the AMR strategic plan	1.3.1 Develop a roadmap for the implementation of the AMR strategic plan	MOHS, MAFFS, EPA					
		1.3.2 Cost the AMR strategic plan	MOHS, MAFFS, EPA					

	GLOBAL STRATEGIC OBJECTIVE 2: IMPROVE AWARENESS AND UNDERSTANDING OF ANTIMICROBIAL RESISTANCE THROUGH EFFECTIVE COMMUNICATION, EDUCATION AND TRAINING.								
	Objective 2: Increase awareness on AMR								
	Awareness and Risk communication								
	Strategic interventions	**Activities**		**Responsible institution/agency**	**Yr 1**	**Yr2**	**Yr3**	**Yr4**	**Yr5**
	2.1 Establish evidence based public communication programmes targeting audiences in the human, animal health and crop production sectors	2.1.1. Estimate awareness and knowledge through knowledge, attitude, practice and behavioural studies in the general populace and professional groups- health, veterinary, farmers and food processing sector, pharmaceuticals.		AMR NMCG, MOHS, MAFFS, Professional councils					
		2.1.2 Develop and disseminate national communication strategy for AMR		AMR NMCG, MOHS, MAFFS, EPA					
	2.2 Develop communication strategies, messages and materials to promote AMR awareness	2.2.1 Carry out advocacy and sensitization meetings for parliamentarians, local government, chiefdom chiefs, at national, district and chiefdom levels		AMR NMCG, MOHS, MAFFS, EPA					
		2.2.2 Develop and disseminate communication messages in the print and broadcast media and IEC materials (including posters, billboards, radio spots) to guide health workers, pharmacists, communities on prevention of drug resistance.		AMR NMCG, MOHS, MAFFS, EPA					
		2.2.3 Engage non-governmental organizations, Civil Society Organizations and the media to deliver messages on AMR.		AMR NMCG, MOHS, MAFFS, EPA					
		2.2.4 Commemorate Antibiotic awareness week		AMR NMCG, MOHS, MAFFS, EPA, Media and partners					
	2.3 Awareness on AMR is improved among food and agriculture stakeholders	2.3.1 Develop communication, advocacy products and evidence-based messaging that targets different sectors of agriculture in order to: • ensure the required understanding of the		MAFFS					

		challenges and risks AMR • safe farming practices that enable decreased use of antibiotics and antimicrobials in livestock production • outcomes of irresponsible use of antibiotics and antimicrobials • detrimental effects of antibiotics in the environment							
	GLOBAL STRATEGIC OBJECTIVE 2: IMPROVE AWARENESS AND UNDERSTANDING OF ANTIMICROBIAL RESISTANCE THROUGH EFFECTIVE COMMUNICATION, EDUCATION AND TRAINING.								
	Objective 3: Improve knowledge of AMR								
	Education								
	Strategic interventions	**Activities**		**Responsible institution/agency**	**Yr 1**	**Yr2**	**Yr3**	**Yr4**	**Yr5**
	3.1 Include AMR and related topics in school curricula across all levels of education	3.1.1. Develop modules on AMR and related topics in primary, secondary and tertiary education curricula		MOH, MAFFS, EPA, MEST					
	3.2 Include AMR continuing professional education (CPE) programmes for professionals	3.2.1 Engage professional registration boards for inclusion of AMR CPE as pre-requisite for licence renewal		MOHS, MAFFS, EPA, Professional councils					
		3.2.2 Conduct Annual scientific symposium on AMR for human, animal and veterinary professionals		MOHS, MAFFS, EPA, Professional councils, Academic institutions					
	3.3 Develop and implement in-service training programs on AMR for professionals in the human health, veterinary, environmental and agricultural sectors	3.3.1 Engage stakeholder in the educational sector in a consultative meeting to develop curriculum for AMR		MEST, Academic institutions, AMR NMCG, MOHS, MAFFS, EPA					

		3.3.2 Train professionals, through short courses, in-service and pre-service programmes in the human health, veterinary, food production and agriculture sectors on AMR		MOHS, EPA, MAFFS					
	GLOBAL STRATEGIC OBJECTIVE 3: STRENGTHEN THE KNOWLEDGE AND EVIDENCE BASE THROUGH LABORATORY, SURVEILLANCE AND RESEARCH								
	Objective 4: Build laboratory capacity to produce high-quality microbiological data for patient management and support surveillance activities in both human and animal sectors.								
	Laboratory capacity								
	Strategic interventions	**Activities**		**Responsible institution/agency**	**Yr 1**	**Yr2**	**Yr3**	**Yr4**	**Yr5**
	4.1 Strengthen laboratory capacity to monitor AMR at national and regional level in the human health sector	4.1.1 Designate a national laboratory for AMR surveillance with clearly articulated TOR		MOHS,					
		4.1.2 Appoint a focal person for AMR surveillance in the national AMR laboratory with defined roles and responsibilities		MOHS,					
		4.1.3 Standardize SOPs for laboratory testing for AMR		MOHS,					
		4.1.4. Conduct training, competency and external proficiency program for all sites in the surveillance network conducting Antibiotic sensitivity testing (AST) for sentinel sites.		MOHS,					
		4.1.5 Identify, designate and support regional		MOHS,					

		laboratories for AMR sentinel surveillance							
		4.1.6 Standardize AMR reporting system across laboratories		MOHS,					
		4.1.7 Enrol national and regional laboratories in external quality assurance schemes, monitor and evaluate their performance, and implement corrective actions.		MOHS,					
		4.1.8 Enrol national and regional laboratories in Global Antimicrobial Resistance Surveillance System (GLASS)		MOHS,					
		4.1.9 Support an uninterrupted supply of quality laboratory reagents and supplies.		MOHS,					
		4.1.13 Conduct molecular characterization of any resistance determinants from Multi-drug resistance (MDR) organisms		MOHS					
		4.1.14 Establish Repository of MDR isolates		MOHS					
	4.2 Strengthen laboratory and diagnostic capacity to monitor AMR and antimicrobial residue at national and regional level in the animal health and agricultural sector	4.2.1 Assess existing capacities for monitoring AMR and detecting antimicrobial residues;		MAFFS					
		4.2.2 Establish laboratory capacity for screening of antibiotic residues in food products locally produced or imported and AMR in pathogens isolated from food products. 4.2.3 Establish AMR laboratory capacity to conduct antibiotic surveillance in pathogens isolated from food-producing animals		MAFFS					

		4.2.4 Strengthen national laboratory capacity to monitor AMR and detect antimicrobial residues in food products and the environment;		MAFFS						
		4.2.5 Training of lab personnel to make analyses – microbiological and physiochemical testing of animals and animal products;		MAFFS						
		4.2.6 Field testing of antibiotics for active ingredients.		MAFFS						
	4.3 Strengthen laboratory capacity to monitor AMR at national and regional level in the environment sector.	4.3.1 Develop a laboratory capacity to analyzed water and Soil samples for possible AM residue		EPA						
		4.3.2 Capacity building via training of EPA-SL to analyze potential AM contaminated samples.		EPA						
		4.3.3 Conduct an inventory aimed at identifying AMR contaminated site in country.		EPA						
	4.4 Develop a Geographic Information System (GIS) Map indicating contaminated and sampling sites in Sierra Leone.	4.4.1 Establish a monitoring and surveillance plan		EPA						
		4.4.2 Establish an electronic database to assess trend.		EPA						
	Objective 5: Set-up a national antimicrobial resistance surveillance system									
	Surveillance									

	Strategic interventions	Activities		Responsible institution/agency	Yr 1	Yr2	Yr3	Yr4	Yr5
	5.1 Establish an integrated AMR surveillance system	5.1.1 Establish coordinating centre for AMR to systematically collect, analyse and report antimicrobial use and resistance		MOHS, MAFFS, EPA					
		5.1.2 Develop an AMR one health surveillance plan through the establishment a surveillance technical group with an endorsed TOR to develop the One Health surveillance system to include routine, sentinel and surveys		MOHS, MAFFS, EPA					
		5.1.3Develop forms, tracking software and reports on the use of antibiotics and drug resistance.		MOHS, MAFFS, EPA					
		5.1.4 Organize regular review meetings among relevant groups of stakeholders to review data on both antimicrobial use and resistance, and take practical steps to translate those data into actions, such as informing new or revision of policies and practice guidelines.		MOHS, MAFFS, EPA					
		5.1.5 Establish a mandatory requirement for submission of all AMR data including i.e. from vertical programmes, animal health and food safety in the public, NGO, and private sectors		MOHS, MAFFS, EPA					
	5.2 Establish antimicrobial use surveillance in animal health and agriculture sectors	5.2.1 Develop plans to monitor antimicrobial use in animals and crop production.		MOHS, MAFFS, EPA					
		5.2.2 Conduct antimicrobial use surveys/studies at national, district and community level, and also in veterinary and agricultural settings.		MOHS, MAFFS, EPA					
		5.2.3 Strengthen mechanisms to check for levels of antimicrobial agents in imported as well as locally produced animal and plant food products, and also levels of antimicrobial discharge in the environment such as waterways.		MOHS, MAFFS, EPA					

		5.2.4 Establish systems to collect data on national level sales or consumption of antibiotics, prescribing practices and appropriate antibiotic use at selected health care settings,		MOHS, MAFFS, EPA					
	5.3 Establish AMR surveillance in environmental sector	5.3.1 Identify and implement 'clean up' of AMR Contaminated sites.		MOHS, MAFFS, EPA					
		5.3.2 Incorporate the concept of AMR into the waste managment policies of companies and Industries.		MOHS, MAFFS, EPA					
		5.3.3 Strengthen mechanisms to check for levels of antimicrobial discharge in the environment such as waterways		MOHS, MAFFS, EPA					
		5.3.4 Incorporate AMR Concept into the Terms and Conditions of EIA Licenced Holders.		MOHS, MAFFS, EPA					
		5.3.5 Develop and popularise guidelines on the safe disposal of AMR product at industries and health Facilities.		MOHS, MAFFS, EPA					
	5.4 Improve information dissemination for antimicrobial surveillance and antimicrobial use	5.4.1 Disseminate monthly AMR reports to the antimicrobial stewardship committee in healthcare facilities		MOHS, MAFFS, EPA					
		5.4.2 Disseminate quarterly AMR reports among facility health providers and DHMTs to increase awareness of AMR profiles among circulating pathogens		MOHS, MAFFS, EPA					
		5.4.3 Provide annual AMR surveillance reports to committees responsible for revising standard treatment guidelines, Clinical Practice Guidelines (CPGs), Essential Medicines List (EML), and Infection Prevention and Control (IPC) guidelines.		MOHS, MAFFS, EPA					

	GLOBAL STRATEGIC OBJECTIVE 4: REDUCE THE INCIDENCE OF INFECTION THROUGH EFFECTIVE SANITATION, HYGIENE AND INFECTION PREVENTION MEASURES								
	Objective 6: Identify operational research priorities for responsible use of antimicrobial agents and better practice in infection prevention in human and animal health								
	Research and development								
	Strategic interventions	**Activities**		**Responsible institution/agency**	**Yr 1**	**Yr2**	**Yr3**	**Yr4**	**Yr5**
	6.1 Develop a national research agenda on AMR	6.1.1 Engage relevant experts to identify current gaps in knowledge and potential research topics.		MOHS, MAFFS, EPA					
		6.1.2 Develop research guidelines on AMR		MOHS, MAFFS, EPA					
		6.1.3 Undertake research on AMR		MOHS, MAFFS, EPA					
	6.2 Establish a system for sharing data on AMR research	6.2.1 Organize multisector national AMR scientific symposiums		MOHS, MAFFS, EPA					
		6.2.2 Establish a national AMR data repository		MOHS, MAFFS, EPA					
	Objective 7: Strengthen the national infection prevention and control programme for human health								
	Infection prevention and control in health care								
	Strategic interventions	**Activities**		**Responsible institution/agency**	**Yr 1**	**Yr2**	**Yr3**	**Yr4**	**Yr5**
	7.1 improve sensitization and monitoring of IPC practices	7.1.1 Carry out awareness meetings on hand hygiene and prevention of healthcare-associated infections at training institutions, health facilities, and veterinary services		MOHS, MAFFS, EPA					

		7.1.2 Conduct Hand hygiene audits		MOHS, MAFFS, EPA					
		7.1.3 Strengthen IPC measures in human health facilities, including long-term care and congregate settings		MOHS, MAFFS, EPA					
		7.1.4 Upgrade training curriculum for IPC training to include AMR		MOHS, MAFFS, EPA					
		7.1.5 Education and training of healthcare workers on AMR		MOHS, MAFFS, EPA					
		7.1.6 Establish HAI surveillance programmes		MOHS, MAFFS, EPA					
		7.1.7 Conduct supervision of IPC implementation		MOHS, MAFFS, EPA					
		7.1.8 Monitor implementation of IPC quarterly with timely feedback.		MOHS, MAFFS, EPA					
	Objective 8: Introduce infection prevention and control programmes in veterinary settings and animal husbandry.								
	Infection prevention in animal health, veterinary and agriculture								
	Strategic interventions	**Activities**		**Responsible institution/agency**	**Yr 1**	**Yr2**	**Yr3**	**Yr4**	**Yr5**
	8.1 Include hygiene and infection prevention and control as core (mandatory) content in training and education of veterinary professionals.	8.1.1 Include hygiene and infection prevention and control in undergraduate curricula for animal health professionals.		MOHS, MAFFS, EPA					
	8.2 Implement IPC programmes across the agricultural and	8.2.1 Establish IPC programmes in animal health, agriculture and fisheries, including health		MOHS, MAFFS, EPA					

	fisheries sectors	inspections of abattoirs, farms and communities, and monitor and improve adherence to national/facility IPC policies and standards							
	Objective 9: Limit the development and spread of AMR in the community by infection prevention and control measures								
	Hygiene, sanitation and infection prevention in the Community								
	Strategic interventions	**Activities**		**Responsible institution/agency**	**Yr 1**	**Yr2**	**Yr3**	**Yr4**	**Yr5**
	9.1 Promote personal hygiene by social mobilization and behavioural change activities.	9.1.1 Estimate knowledge of personal hygiene in different social groups as a basis for the social mobilization campaigns.		MOHS, MAFFS, EPA					
		9.1.2 Promote hygiene, sanitation and other behaviours that contribute to infection prevention in the community		MOHS, MAFFS, EPA					
	9.2 Encourage continued increases in vaccination rates at veterinary and human health facilities to prevent infection	9.2.1 Promote vaccination amongst veterinary, human health workers and the general public.		MOHS, MAFFS, MCPLE					
	Objective 10: Strengthen health care waste management at all levels								
	Waste management								
	Strategic interventions	**Activities**		**Responsible institution/agency**	**Yr 1**	**Yr2**	**Yr3**	**Yr4**	**Yr5**
	10.1 Reduce environmental contamination with resistant pathogens and antimicrobial residues	10.1.1 Develop systems for safe collection, transport and disposal of waste from human health, animal and agricultural facilities through the establishment an effective waste management system, specifically addressing water sewage and landfills (solid waste) involving agricultural and		MOHS, MAFFS, EPA					

		medical waste							
		10.1.2: Establish national and subnational monitoring system for waste management		MOHS, MAFFS, EPA					
GLOBAL STRATEGIC OBJECTIVE 5: OPTIMIZE THE USE OF ANTIMICROBIAL AGENTS IN HUMAN, ANIMAL AND PLANT HEALTH									
	Objective 11: Ensure uninterrupted access to high-quality antimicrobial medicines								
	Regulated access to high quality microbials								
	Strategic interventions	**Activities**		**Responsible institution/agency**	**Yr 1**	**Yr2**	**Yr3**	**Yr4**	**Yr5**
	11.1 Improve access, strengthen regulation and supply chain management for antimicrobial agents.	11.1.1 Establish or strengthen the quality management system for the supply of medicines, covering storage, transport, distribution and inventory management		MOHS, MAFFS, EPA					
		11.1.2 Strengthen national mechanisms for registration of antimicrobial medicines through the Pharmacy Board of Sierra Leone(PBSL)		MOHS, MAFFS, EPA					
		11.1.3 Conduct monitoring and post marketing surveillance of antimicrobials circulating in the market (public and private sectors)		MOHS, MAFFS, EPA					
		11.1.4 Build capacity for effective and enforceable regulation of antimicrobial management, including quality assurance of all imported products including antimicrobials, reagents and pesticides and standardization of diagnostic equipment		MOHS, MAFFS, EPA					
		11.1.5 Review and enforce use of a national and		MOHS, MAFFS, EPA					

		institutional essential medicine list guided by the WHO model list of essential medicines and national AMR data							
		11.1.6 Develop clinical practice guidelines such a national formulary, standard treatment guidelines with participation of relevant stakeholders		MOHS, MAFFS, EPA					
		11.1.7 Provide appropriate training for personnel engaged in supply chain management and medicines regulation		MOHS, MAFFS, EPA					
		11.1.8 Conduct audit inspections of pharmaceutical importers to check on the quantities of antimicrobial agents (for human use) imported and distributed as well as the quantity remaining (if any)		MOHS, MAFFS, EPA					
		11.1.9 Conduct follow - up audit inspections of medical prescriptions, prescription registers of community retail pharmacy outlets and government dispensaries to check whether antimicrobial agents were dispensed on prescription or not.		MOHS, MAFFS, EPA					
		11.1.10 Development of antimicrobial prescription and utilization registers for deployment at Pharmacies and Drugstores		MOHS, MAFFS, EPA					
		11.1.11 Equip the national quality control laboratory to perform quality assays and strengthen the national pharmacovigilance reporting systems		MOHS, MAFFS, EPA					

		11.1.12. Develop guidelines related to the prescription, sales, dispensation, and administration of antimicrobials.		MOHS, MAFFS, EPA					
	. **Objective 12:** Improve and measure appropriate use of antimicrobial agents in health care								
	Antimicrobial stewardship (AMS)								
	Strategic interventions	**Activities**		**Responsible institution/agency**	**Yr 1**	**Yr2**	**Yr3**	**Yr4**	**Yr5**
	12.1 Create formal AMS programmes in health care facilities	12.1.1 Develop policy and regulations for AMS		MOHS, MAFFS, EPA					
		12.1.2 Establish AMS committees in health facilities		MOHS, MAFFS, EPA					
		12.1.3 Develop a list of critical important antibiotics to human health whose access should be controlled (e.g. Fluoroquinolones, third and fourth generation cephalosporins, carbapenems, amikacin, vancomycin).		MOHS, MAFFS, EPA					
		12.1.4 Develop and implement national and facility-level antimicrobial stewardship programs, including medicine use reviews/evaluations, and implementation and monitoring of the use of STGs in both human and veterinary settings.		MOHS, MAFFS, EPA					
		12.1.5 Promote and monitor the use of evidence-based rapid diagnostic tests to facilitate diagnosis and optimal antimicrobial treatment		MOHS, MAFFS, EPA					
		12.1.6 Establish or strengthen capacity of existing drug and therapeutics committees (DTCs) in carrying out antimicrobial stewardship		MOHS, MAFFS, EPA					

		containment activities							
		12.1.7 Establish drug information centres (DICs) to provide information on antibiotic use and resistant		MOHS, MAFFS, EPA					
	Objective 13: Ensure prudent use of antimicrobial agents in terrestrial and aquatic animals and agriculture								
	Antimicrobial use in animal health and agriculture								
	Strategic interventions	**Activities**		**Responsible institution/agency**	**Yr 1**	**Yr2**	**Yr3**	**Yr4**	**Yr5**
	13.1 Establish national policies on use of antimicrobial agents in animals, agriculture and fisheries.	13.1.1 Develop guidelines for the use of antimicrobials in food-producing animals based on the WHO list of Critically Important Antimicrobials(CIA)		MOHS, MAFFS, EPA					
		13.1.2 Establish a strong regulatory framework for authorization and control of the quality of veterinary medicines.		MOHS, MAFFS, EPA					
		13.1.3 Establish regulation for the restriction of non-therapeutic use of antimicrobials (e.g. growth promoters) in food-producing animals and use of critically important antimicrobials for human medicine in food- producing animals.		MOHS, MAFFS, EPA					
		13.1.4 Develop/review National Medicines, pesticides and national livestock Policy to address AMR		MOHS, MAFFS, EPA					
	GLOBAL STRATEGIC OBJECTIVE 6: DEVELOP THE ECONOMIC CASE FOR SUSTAINABLE INVESTMENT AND ACTIONS TO COMBAT AMR								
	Objective 14: Prepare the economic case for sustainable investment and actions to fight AMR.								

	Sustainability of antimicrobial resistance interventions								
	Strategic interventions	**Activities**		**Responsible institution/agency**	**Yr 1**	**Yr2**	**Yr3**	**Yr4**	**Yr5**
	14.1. Prepare a plan to secure and use financing for implementation of the AMR strategic plan	14.1.1 Assess investment requirements for implementation of the strategic plan.		MOHS, MAFFS, EPA					
	14.2 Strengthen partnership and governance to support and enhance AMR containment efforts	14.2.1 Build and expand local, national, regional and international partnerships and coalitions in support of AMR containment, including public-private partnerships		MOHS, MAFFS, EPA					
		14.2.2 Strengthen AMR containment-related governance through a national multi-sectoral and multi-disciplinary coordinating team, and focal points at different levels with clearly defined terms of reference, mandates and accountability		MOHS, MAFFS, EPA					
	14.3 Strengthen advocacy for funding and support for AMR containment	14.3.1 Advocate for budgetary funding for AMR containment efforts from government, donors, and the private sector		MOHS, MAFFS, EPA					
		14.3.2 Include relevant AMR related activities into MoHS annual operational plan and MoHS strategy		MOHS, MoFED					
		14.3.3 Include relevant AMR related activities into MAFFS annual operational plan and MAFFS strategy		MAFFS, MoFED					
		14.3.4 Include relevant AMR related activities into EPA annual operational plan and EPA strategy		EPA, MoFED					
	14.4 Coordinate national	14.4.1 Conduct research and promote information		MOHS, MAFFS, EPA					

	research efforts and information sharing	sharing with regard to various aspects of AMR containment including understanding and awareness of AMR, surveillance of antimicrobial use and resistance, infection prevention/control, optimized use of antimicrobials, and development and diffusion of new antimicrobials, vaccines, diagnostics, and novel delivery methods							
		14.4.2 Develop AMR research Agenda for human, animal and environmental health		MOHS, MAFFS, EPA					
		14.4.3 Provide incentive and research funding for researches on AMR		MOHS, MAFFS, EPA					

5. MONITORING AND EVALUATION PLAN

Monitoring and Evaluation (M and E) of the strategic plan using process and outcome indicators is critical to ascertaining objectively the effects of the interventions to combat AMR. Each activity bears a monitoring indicator to be measured in the process of its implementation. Individual Ministries/ institutions/bodies will have the responsibility for keeping tract on the relevant strategic plan activities and feeding information, findings and recommendations into the overall M and E process. A mid-term review will be done after two years to monitor the implementation of the strategic plan. End of year one review will be done in 2019 and end of term evaluation will be conducted in 2022.

Planning element linked to strategic plan	Indicator	Frequency of data collection	Data source	Method	Baseline
1.1.1 Define membership to be representative of all stakeholders and appoint persons into the NMCG	Membership of NMCG defined	Once	Key informants at MOHS, MAFFS and EPA	AMR surveillance programme implementation report	None available
1.1.2 Develop and approve TOR of NMCG	TOR developed and published	Once	Key informants at MOHS, MAFFS and EPA	AMR surveillance programme implementation report	None available
1.2.2 Designate national focal persons for AMR in the health, animal and environmental sectors	National focal persons designated	Once	Key informants at MOHS, MAFFS and EPA	AMR surveillance programme implementation report	Available but not formalised
1.1.3 Establish a secretariat for the NMCG	Secretariat for NMCG established	Once	Key informants at MOHS, MAFFS and EPA	AMR surveillance programme implementation report	None available
1.1.4 Organise quarterly meetings to review	Minutes of	4 times/year	Key informants at	AMR surveillance	None

Planning element linked to strategic plan	Indicator	Frequency of data collection	Data source	Method	Baseline
progress towards implementation of NAP-AMR	meetings		MOHS, MAFFS and EPA	programme implementation report	available
1.2.1 Expand terms of reference (TOR) of National one health committee to include AMR	Expanded TOR	Once	Key informants at MOHS, MAFFS and EPA	AMR surveillance programme implementation report	None available
1.3.1 Develop a roadmap for the implementation of the AMR strategic plan	Roadmap	Once	Key informants at MOHS, MAFFS and EPA	AMR surveillance programme implementation report	None available
1.3.2 Cost the AMR strategic plan	Costed AMR plan	Once	Key informants at MOHS, MAFFS and EPA	AMR surveillance programme implementation report	None available
2.1.1. Estimate awareness and knowledge through knowledge, attitude, practice and behavioural studies in the general populace and professional groups- health, veterinary, farmers and food processing sector, pharmaceuticals	Report, Publication	Once	Report	Survey	None available
2.1.2 Develop and disseminate national communication strategy for AMR	Strategy developed	Once	Key informants at MOHS, MAFFS and EPA	AMR surveillance programme implementation report	None available
2.2.1 Carry out advocacy and sensitization meetings for parliamentarians, local government, chiefdom chiefs, at national, district and chiefdom levels	Minutes of meetings	Once	Key informants at MOHS, MAFFS and EPA	AMR surveillance programme implementation report	None

Planning element linked to strategic plan	Indicator	Frequency of data collection	Data source	Method	Baseline
2.2.2 Develop and disseminate communication messages in the print and broadcast media and IEC materials (including billboards, posters, radio spots)to guide health workers, pharmacists, communities on prevention of drug resistance	Communication messages and materials developed and disseminated	Once every year	Key informants at MOHS, MAFFS and EPA	AMR surveillance programme implementation report	None
2.2.3 Engage non-governmental organizations, Civil Society Organizations and the media to deliver messages on AMR	Meetings held with key stakeholders and messages published (audio, video, print, flyers etc)	Once every year	Key informants at MOHS, MAFFS and EPA	AMR surveillance programme implementation report	None
2.2.4 Commemorate Antibiotic awareness week	Improved awareness among key stakeholders	Once every year	Key informants at MOHS, MAFFS and EPA	AMR surveillance programme implementation report	None
3.1.1. Develop modules on AMR and related topics in primary, secondary and tertiary education curricula	Modules developed	Once	Key informants at MOHS, MAFFS and EPA	AMR surveillance programme implementation report	None
3.2.1 Engage professional registration boards for inclusion of AMR CPE as pre-requisite for licence renewal	Policy, guideline	Once	Key informants at MOHS, MAFFS and EPA	AMR surveillance programme implementation report	None

Planning element linked to strategic plan	Indicator	Frequency of data collection	Data source	Method	Baseline
3.2.2 Conduct Annual scientific symposium on AMR for human, animal and veterinary professionals	Report	Once every year	Key informants at MOHS, MAFFS and EPA	AMR surveillance programme implementation report	None
3.3.1 Engage stakeholder in the educational sector in a consultative meeting to develop curriculum for AMR	Curriculum	Once	Key informants at MOHS, MAFFS and EPA	AMR surveillance programme implementation report	None
3.3.2 Train Professional, through short courses, in-service and pre-service programmes in the human health, veterinary, food production and agriculture sectors on AMR	Report	Once	Key informants at MOHS, MAFFS and EPA	AMR surveillance programme implementation report	None
3.4.1. Review and include AMR and related topics in secondary and tertiary education curricula	Review curricula	Once	Key informants at MOHS, MAFFS and EPA	AMR surveillance programme implementation report	None
4.1.1 Designate a national laboratory for AMR surveillance with clearly articulated TOR	Laboratory and TOR	Once	Key informants at MOHS, MAFFS	AMR surveillance programme implementation report	None
4.1.2 Appoint a focal person for AMR surveillance in the national AMR laboratory with defined roles and responsibilities	Focal person	Once	Key informants at MOHS, MAFFS	AMR surveillance programme implementation report	None
4.1.3 Standardize SOPs for laboratory testing for AMR	SOPs	Once	Key informants at MOHS, MAFFS	AMR surveillance programme	None

Planning element linked to strategic plan	Indicator	Frequency of data collection	Data source	Method	Baseline
				implementation report	
4.1.4. Conduct capacity building for laboratory staff on AMR	Report	Once	Key informants at MOHS, MAFFS	AMR surveillance programme implementation report	None
4.1.5 Identify, designate and support regional laboratories for AMR sentinel surveillance	Lab capacitate for surveillance	Once	Key informants at MOHS, MAFFS	AMR surveillance programme implementation report	None
4.1.6 Standardize AMR reporting system across laboratories	Instructions, SOP and forms	Once	Key informants at MOHS, MAFFS	AMR surveillance programme implementation report	None
4.1.7 Enrol national and regional laboratories in external quality assurance schemes, monitor and evaluate their performance, and implement corrective actions.	Improved microbiology diagnostics including AST	Once	Key informants at MOHS, MAFFS	AMR surveillance programme implementation report	None
4.1.8 Enrol national and regional laboratories in GLASS	Improved testing proficiency	Once	Key informants at MOHS, MAFFS	AMR surveillance programme implementation report	None
4.1.8 Support an uninterrupted supply	Improved supply chain for lab	Once	Key informants at, MAFFS, MOHS, EPA	AMR surveillance programme implementation	None

Planning element linked to strategic plan	Indicator	Frequency of data collection	Data source	Method	Baseline
of quality laboratory reagents and supplies.	consumables			report	
4.2.1 Establish AMR laboratory capacity to conduct antibiotic surveillance in pathogens isolated from food-producing animals	Routine AMR surveillance	Once	Key informants at MAFFS	AMR surveillance programme implementation report	None
4.2.2 Establish laboratory capacity for screening of antibiotic residues in food products locally produced or imported and AMR in pathogens isolated from food products.	Routine screening of antibiotics in food products	Once	Key informants at, MAFFS	AMR surveillance programme implementation report	None
5.1.1 Establish coordinating centre for AMR to systematically collect, analyse and report antimicrobial use and resistance	AMR centre for data management created	Once	Key informants at MOHS, MAFFS	AMR surveillance programme implementation report	None
5.1.2 Develop an AMR one health surveillance plan through the establishment a surveillance technical group with an endorsed TOR to develop the One Health surveillance system to include routine, sentinel and surveys	TOR, One health plan developed	Once	Key informants at MOHS, MAFFS , EPA	AMR surveillance programme implementation report	None

Planning element linked to strategic plan	Indicator	Frequency of data collection	Data source	Method	Baseline
5.1.3Develop forms, tracking software and reports on the use of antibiotics and drug resistance	Forms, software and report	Once	Key informants at MOHS, MAFFS	AMR surveillance programme implementation report	None
5.1.4 Organize regular review meetings among relevant groups of stakeholders to review data on both antimicrobial use and resistance, and take practical steps to translate those data into actions, such as informing new or revision of policies and practice guidelines	Minutes	Once	Key informants at MOHS, MAFFS	AMR surveillance programme implementation report	None
5.1.5 Establish a mandatory requirement for submission of all AMR data including i.e. from vertical programmes, animal health and food safety in the public, NGO, and private sectors	Policy and guideline	Once	Key informants at MOHS, MAFFS	AMR surveillance programme implementation report	None
5.2.1 Develop plans to monitor antimicrobial use in animals and crop production	Monitoring plan	Once	Key informants at MAFFS	AMR surveillance programme implementation report	None
5.2.2 Conduct antimicrobial use surveys/studies at national, district and community level, and also in veterinary and	Report	Once	Key informants at MAFFS , Report	Survey	None

Planning element linked to strategic plan	Indicator	Frequency of data collection	Data source	Method	Baseline
agricultural settings					
5.2.3 Strengthen mechanisms to check for levels of antimicrobial agents in imported as well as locally produced animal and plant food products, and also levels of antimicrobial discharge in the environment such as waterways.	Routine monitoring of antimicrobials in food products	Once	Key informants at MOHS, MAFFS, EPA	Key informant interview	None
5.2.4 Establish systems to collect data on national level sales or consumption of antibiotics, prescribing practices and appropriate antibiotic use at selected health care settings,	Report	Once	Key informants at MOHS,	Key informant interview	None
5.3.1 Identify and implement clean-up of AMR Contaminated sites	Report	Once	Key informants at EPA	Key informant interview	None
5.3.2 Incorporate the concept of AMR into the waste managment policies of companies and Industries	Policy	Once	Key informants at EPA	Key informant interview	None
5.3.3 Strengthen mechanisms to check for levels of antimicrobial discharge in the environment such as waterways	Routine monitoring of	Once	Key informants EP A	Key informant interview	None

Planning element linked to strategic plan	Indicator	Frequency of data collection	Data source	Method	Baseline
	antimicrobial discharge				
5.3.4 Incorporate AMR Concept into the Terms and Conditions of EIA Licenced Holders.	Terms and conditions	Once	Key informants at EPA	Key informant interview	None
5.3.5 Develop and popularise guidelines on the safe disposal of AMR product at industries and Health Facilities	Guidelines	Once	Key informants at MOHS, MAFFS, EPA	Key informant interview	None
5.4.1 Disseminate monthly AMR reports to the antimicrobial stewardship committee in healthcare facilities	Report	Once	Key informants at MOHS,	Key informant interview	None
5.4.2 Disseminate quarterly AMR reports among facility health providers and DHMTs to increase awareness of AMR profiles among circulating pathogens	Report	Once	Key informants at MOHS	Key informant interview	None
5.4.3 Provide annual AMR surveillance reports to committees responsible for revising standard treatment guidelines, Clinical Practice Guidelines (CPGs), Essential Medicines List (EML), and Infection	Annual report	Once	Key informants at MOHS	Key informant interview	None

Planning element linked to strategic plan	Indicator	Frequency of data collection	Data source	Method	Baseline
Prevention and Control (IPC) guidelines.					
6.1.1 Engage relevant experts to identify current gaps in knowledge and potential research topics.	Gap identify	Once	Key informants at MOHS, MAFFS, EPA	Key informant interview	None
6.1.2 Develop research guidelines on AMR	Guidelines	Once	Key informants at MOHS, MAFFS, EPA	Key informant interview	None
6.1.3 Undertake research on AMR	Report, publication	Once	Key informants at MOHS, MAFFS, EPA	Key informant interview	None
6.2.1 Organize multisector national AMR scientific symposiums	Report	Once/year	Key informants at MOHS, MAFFS, EPA	Key informant interview	None
6.2.2 Establish a national AMR data repository	Repository	None	Key informants at MOHS, MAFFS, EPA	Key informant interview	None
7.1.1 Carry out awareness meetings on hand hygiene and prevention of healthcare-associated infections at training institutions, health facilities, and veterinary services	Report	Annually	Key informants at MOHS, MAFFS, EPA	Key informant interview	Available
7.1.2 Conduct Hand hygiene audits	Improved IPC	Annually	Key informants at	Key informant	Available

Planning element linked to strategic plan	Indicator	Frequency of data collection	Data source	Method	Baseline
	measures		MOHS, MAFFS, EPA	interview	
7.1.3 Strengthen IPC measures in human health facilities, including long-term care and congregate settings	Improved IPC measures	Annually	Key informants at MOHS, MAFFS, EPA	Key informant interview	Available
7.1.4 Upgrade training curriculum for IPC training to include AMR	Curriculum	Once	Key informants at MOHS, MAFFS, EPA	Key informant interview	Available
7.1.5 Education and training of healthcare workers on AMR	Report	Annually	Key informants at MOHS, MAFFS, EPA	Key informant interview	Available
7.1.6 Establish HAI surveillance programmes	Routine monitoring in place	Once	Key informants at MOHS, MAFFS, EPA	Key informant interview	Available
7.1.7 Conduct supervision of IPC implementation	Report	Annually	Key informants at MOHS, MAFFS, EPA	Key informant interview	Available
7.1.8 Monitor implementation of IPC quarterly with timely feedback.	Report	Quarterly	Key informants at MOHS, MAFFS,	Key informant interview	Available

Planning element linked to strategic plan	Indicator	Frequency of data collection	Data source	Method	Baseline
			EPA		
8.1.1 Include hygiene and infection prevention and control in undergraduate curricula for animal health professionals.	Curricula	Once	Key informants at MOHS, MAFFS, EPA	Key informant interview	None
8.2.1 Establish IPC programmes in animal health, agriculture and fisheries, including health inspections of abattoirs, farms and communities, and monitor and improve adherence to national/facility IPC policies and standards	Routine monitoring improved	Annually	Key informants at MOHS, MAFFS, EPA	Key informant interview	None
9.1.1 Estimate knowledge of personal hygiene in different social groups as a basis for the social mobilization campaigns.	Report, publication	Once	Key informants at MOHS, MAFFS, EPA	Key informant interview	None
9.1.2 Promote hygiene, sanitation and other behaviours that contribute to infection prevention in the community	Improved behaviour	Annually	Key informants at MOHS, MAFFS, EPA	Key informant interview	None
9.2.1 Promote vaccination amongst veterinary, human health workers and the general public.	Improved vaccination	Annually	Key informants at MOHS, MAFFS, EPA	Key informant interview	None
10.1.1 Develop systems for safe collection, transport and disposal of waste from human health, animal and agricultural facilities	Effective waste management system	Annually	Key informants at MOHS, MAFFS,	Key informant interview	None

Planning element linked to strategic plan	Indicator	Frequency of data collection	Data source	Method	Baseline
through the establishment an effective waste management system, specifically addressing water sewage and landfills (solid waste) involving agricultural and medical waste	established		EPA		
10.1.2: Establish national and subnational monitoring system for waste management	Monitoring system established	Annually	Key informants at MOHS, MAFFS, EPA	Key informant interview	None
11.1.1 Establish or strengthen the quality management system for the supply of medicines, covering storage, transport, distribution and inventory management	Quality management system improved	Annually	Key informants at MOHS,	Key informant interview	None
11.1.2 Strengthen national mechanisms for registration of antimicrobial medicines through the Pharmacy Board of Sierra Leone(PBSL)	Mechanism improved	Annually	Key informants at MOHS PBSL	Key informant interview	Available
11.1.3 Strengthen the monitoring and post marketing surveillance of antimicrobials circulating in the market (public and private sectors)	Report	Annually	Key informants at MOHS PBSL	Key informant interview	Available

Planning element linked to strategic plan	Indicator	Frequency of data collection	Data source	Method	Baseline
11.1.4 Strengthen and build capacity for effective and enforceable regulation of antimicrobial management, including quality assurance of all imported products including antimicrobials, reagents and pesticides and standardization of diagnostic equipment	Quality assurance of antimicrobials improved	Annually	Key informants at MOHS PBSL	Key informant interview	Available
11.1.5 Review and enforce use of a national and institutional essential medicine list guided by the WHO model list of essential medicines and national AMR data	Updated EML	Every 3 years	Key informants at MOHS DDMS	Key informant interview	Available
11.1.6 Develop clinical practice guidelines such a national formulary, standard treatment guidelines with participation of relevant stakeholders	Clinical practice guidelines developed	Once	Key informants at MOHS	Key informant interview	Available
11.1.7 Provide appropriate training for personnel engaged in supply chain management and medicines regulation	Instruction materials, training manuals, Attendance sheets, certificates	Annually	Key informants at MOHS	Key informant interview	Available
11.1.8 Conduct audit inspections of pharmaceutical importers to check on the quantities of antimicrobial agents (for human use) imported and distributed as well as the	Report	Annually	Key informants at MOHS	Key informant interview	Available

Planning element linked to strategic plan	Indicator	Frequency of data collection	Data source	Method	Baseline
quantity remaining (if any)					
11.1.9 Conduct follow - up audit inspections of medical prescriptions, prescription registers of community retail pharmacy outlets and government dispensaries to check whether antimicrobial agents were dispensed on prescription or not.	Report	Annually	Key informants at MOHS	Key informant interview	Available
11.1.10 Development of antimicrobial prescription and utilization registers for deployment at Pharmacies and Drugstores	Registers	Annually	Key informants at MOHS	Key informant interview	None
11.1.11 Equip the national quality control laboratory to perform quality assays and strengthen the national pharmacovigilance reporting systems	PV and NPQC lab equipped	Annually	Key informants at MOHS	Key informant interview	None
11.1.12. Develop guidelines related to the prescription, sales, dispensation, and administration of antimicrobials.	Guidelines	Once	Key informants at MOHS	Key informant interview	None
12.1.1 Develop policy and regulations for AMS	Policy, regulation	Once	Key informants at MOHS	Key informant interview	None
12.1.2 Establish AMS committees in health facilities	Nomination letters, TOR and minutes	Once	Key informants at MOHS	Key informant interview	None
12.1.3 Develop a list of critical antibiotics to human health whose access should be controlled (e.g. Fluoroquinolones, third and	List of CIA	Once	Key informants at MOHS	Key informant interview	None

Planning element linked to strategic plan	Indicator	Frequency of data collection	Data source	Method	Baseline
fourth generation cephalosporins, carbapenems, amikacin, vancomycin).					
12.1.4 Develop and implement national and facility-level antimicrobial stewardship programs, including medicine use reviews/evaluations, and implementation and monitoring of the use of STGs in both human and veterinary settings.	Reports	Annually	Key informants at MOHS	Key informant interview	None
12.1.5 Promote and monitor the use of evidence-based rapid diagnostic tests to facilitate diagnosis and optimal antimicrobial treatment	Report	Annually	Key informants at MOHS	Key informant interview	None
12.1.6 Establish or strengthen capacity of existing drug and therapeutics committees (DTCs) in carrying out antimicrobial stewardship containment activities	Nomination letters of members, TOR and minutes	Once	Key informants at MOHS	Key informant interview	None
12.1.7 Establish drug information centres (DICs) to provide information on antibiotic use and resistant	TOR	Once	Key informants at MOHS	Key informant interview	None
13.1.1 Develop guidelines for the use of antimicrobials in food-producing animals based on the WHO list of Critically Important Antimicrobials(CIA)	Guideline	Once	Key informants at MAFFS	Key informant interview	None
13.1.2 Establish/strengthen strong regulatory framework for authorization and	Framework strengthen	Once	Key informants at MAFFS	Key informant interview	None

Planning element linked to strategic plan	Indicator	Frequency of data collection	Data source	Method	Baseline
control of the quality of veterinary medicines.					
13.1.3 Establish regulation for the restriction of non-therapeutic use of antimicrobials (e.g. growth promoters) in food-producing animals and use of critically important antimicrobials for human medicine in food-producing animals.	Policy, regulation	Once	Key informants at MAFFS	Key informant interview	None
13.1.4 Develop/review National Medicines, pesticides and national livestock Policy to address AMR	Policy	Once	Key informants at MAFFS, MOHS, EPA	Key informant interview	None
14.1.1 Assess investment requirements for implementation of the strategic plan.	Report	Once	Key informants at MAFFS, MOHS, EPA	Key informant interview, Investment need assessment report	None
14.2.1 Build and expand local, national, regional and international partnerships and coalitions in support of AMR containment, including public-private partnerships	Partnerships established, MOU	Once	Key informants at MAFFS, MOHS, EPA	Key informant interview	None
14.2.2 Strengthen AMR containment-related governance through a national multi-sectoral and multi-disciplinary coordinating team, and focal points at different levels with clearly defined terms of reference, mandates and accountability	TOR, nomination letters	Once	Key informants at MAFFS, MOHS, EPA	Key informant interview	None

Planning element linked to strategic plan	Indicator	Frequency of data collection	Data source	Method	Baseline
14.3.1 Advocate for budgetary funding for AMR containment efforts from government, donors, and the private sector	AMR activities are budgeted for in the government and donnors annual operational plan	Annually	Key informants at MAFFS, MOHS, EPA	Key informant interview	None
14.3.2 Include relevant AMR related activities into MoHS annual operational plan and MoHS strategy	AMR activities are budgeted for in the MOHS annual operational plan	Annually	Key informants at MOHS	Key informant interview	
14.3.3 Include relevant AMR related activities into MAFFS annual operational plan and MAFFS strategy	AMR activities are budgeted for in the MAFFS annual operational plan	Annually	Key informants at MAFFS	Key informant interview	
14.3.4 Include relevant AMR related activities into EPA annual operational plan and EPA strategy	AMR activities are budgeted for in the EPA annual operational plan	Annually	Key informants at EPA	Key informant interview	
14.4.1 Conduct research and promote information sharing with regard to various aspects of AMR containment including understanding and awareness of AMR, surveillance of antimicrobial use and resistance, infection prevention/control, optimized use of antimicrobials, and development and diffusion of new antimicrobials, vaccines, diagnostics, and	Report, publication	Once	Key informants at MAFFS, MOHS, EPA	Key informant interview	None

Planning element linked to strategic plan	Indicator	Frequency of data collection	Data source	Method	Baseline
novel delivery methods.					
14.4.2 Develop AMR research Agenda for human, animal and environmental health.	List of research priority areas	Once	Key informants at MAFFS, MOHS, EPA	Key informant interview	None
14.4.3 Provide incentive and research funding for researches on AMR.	Increase number of projects	Once	Key informants at MAFFS, MOHS, EPA	Key informant interview	None

6. REFERENCES

1. WHO. (2014). Antimicrobial Resistance Global Report on Surveillance.
2. WHO. (2015). Global Action Plan for Antimicrobial Resistance (GAP-AMR).
3. WHO. (May 2015). WHA decision point: WHA A/68/20, A68/VR/9.
4. Joint External Evaluation report 2016