



Ministry of Health and Social Protection of Population of the Republic of Tajikistan

Ministry of Agriculture of the Republic of Tajikistan

Committee on Food Security under Government of the Republic of Tajikistan

NATIONAL ACTION PLAN

to Tackle Antimicrobial Resistance

in the Republic of Tajikistan



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Contents

Abbreviations	3
Foreword	4
An abstract of the main aspects of the document	5
Background	6
Introduction	6
Situational analyses and assessment	6
Country response	8
Strategic Guidelines	8
Strategic plan, operational plan and, M&E plan	9
Strategic plan	9
Operational plan (linked to the strategic plan)	15
References.....	32

Abbreviations

AMC	Antimicrobial Medicines Consumption
AMR	Antimicrobial Resistance
CAESAR	Central Asian and Eastern European Surveillance of Antimicrobial Resistance (CAESAR) network
CFS	Committee on Food Security under the Republic of Tajikistan
CoEP	Committee for Environmental Protection
FAO	Food and Agriculture Organization
EUCAST	European Committee of Antimicrobial Susceptibility Testing
MoA	Ministry of Agriculture
MoHSPP	Ministry of Health and Social Protection of Population
MoES	Ministry of Education and Science
MoINT	Ministry of Industry and New Technology
MoEWR	Ministry of Energy and Water Resources
NCVD	National Centre for Veterinary Diagnostics
(OIE)	World Organisation for Animal Health
PHC	Primary Health Care
SHSSPPS	State for Health Surveillance and Social Protection of Population Service
Tajikstandard	Agency of Standardization, Metrology, Certification and Trade Inspection
WASH	Water Sanitation and Hygiene
WHO	World Health Organization

Foreword

The present National action plan on antimicrobial resistance (AMR) with component of antimicrobial consumption (AMC) covering both human and agriculture sectors was developed based on the World Health Organization's (WHO) Global plan on AMR dated 2015. With the purpose to develop this plan, in May 2016 an intersectoral and interagency working group was established under coordination of the State Sanitary and Epidemiological Surveillance Service (SSESS), the Ministry of Health and Social Protection of Population (MoHSPP) of the Republic of Tajikistan. With technical assistance from the WHO a number of seminars, consultation meetings and workshops were conducted to identify country's priority areas and required actions for AMR containment and AMC and control.

Following reforms targeted MoHSPP and Ministry of Agriculture (MoA) the Government has created a National Food Security Committee under the President of the Republic of Tajikistan responsible for food security and safety including AMR and AMC from food and agriculture perspective with abolished former States for Veterinary Phytosanitary Surveillance and Plant Protection Services in the country since 2018.

At the same time three MoHSPP States on Sanitary epidemiology, pharmaceutical, and medical surveillance services are abolished and a single State Surveillance Service for Health and Social Protection of Population (SSSHSP) has been established, which is the directly responsible institution for AMC and AMR human-related issues in the Republic of Tajikistan. Special gratitude goes to WHO staff and experts, all specialists from the MoHSPP, MoA and other ministries involved in the plan development process, as well as partners in particular FAO and OIE in this area.

An abstract of the main aspects of the document

Antimicrobial resistance is a major global threat to public health. If the challenge is not met, common infections will again become threats in everyday life, and the advancement of health care, both in human and animal health, will be severely set back.

At the World Health Assembly in May 2015, a Global Action Plan was adopted by all WHO Member States, which also agreed to bring forward their own National Action Plans on AMR. The concept of “One Health” emphasises that no sector of society can solve this problem by itself – the solutions have to be sought in close collaboration between human health, animal health and agriculture, and also other sectors. In Tajikistan, this work has been on-going since 2015, with the nomination by the Minister of Health and Social Protection of the Population of a National Focal Point to coordinate the process, and to lead the work of an Intersectoral Coordinating Group on AMR.

The Group has, after analysis of the situation of Tajikistan, and considering international experiences, worked on a National Action Plan. The Plan has four strategic objectives, all covering both human health aspects as well as animal health and agriculture:

- 1) To raise awareness and improve education on AMR;
- 2) To improve surveillance of the resistance situation in Tajikistan, and of the strongest driving force, antimicrobial medicines use;
- 3) To improve Infection Prevention and Control through adequate measures for water supply, sanitation and hygiene;
- 4) To achieve a more rational use of antimicrobial medicines.

To bring the Plan one step closer to realization, the overarching strategic objectives are broken down into some detail, pointing out who is to carry out what activities, and who is responsible for implementation, following up, and also broadly touching on what budget source should be covering costs, when such occur. Many of the more important activities are not in need of a price tag, such as regulatory changes and establishing routines for information exchange and flow.

At the end, there is also a Monitoring and Evaluation part to facilitate following up of the implementation of the Plan.

Background

Introduction

The European strategic action plan on antibiotic resistance was adopted by Member States of the WHO European Region in September 2011.

In line with this, WHO EURO commenced work to support the member states in their efforts to contain antibiotic resistance. In May 2015, the Sixty-eighth World Health Assembly adopted the Global action plan on antimicrobial resistance (AMR). The goal of the Global action plan is to ensure, for as long as possible, continuity of successful treatment and prevention of infectious diseases with effective and safe medicines that are quality-assured, used in a responsible way and accessible to all who need them.

The World Health Assembly also urged all Member States to develop and have in place by 2017 a national action plan on AMR that is aligned with the objectives of the Global action plan. A main aspect of the Global action plan is the "One Health" approach, emphasizing the need for all relevant sectors to come together in a multisectoral approach on all levels, including a strong collaboration of WHO with FAO and OIE.

Situational analyses and assessment

There is presently a paucity of data on the AMR situation in Tajikistan, on the human side as well as from the veterinary/agricultural sector.

It is necessary to improve the surveillance of AMR in health care, as a shared responsibility to assess the global situation, as well as the protection of the population right on a proper treatment by providing a proper basis for the updated reports of treatment of infectious diseases. Also in this regard, data from the veterinary sector and agriculture are important for inclusion in the national surveillance system. High-quality data are necessary for the optimal direction of countermeasures against the AMR problem and for evaluating the effect of such measures. To do this, it is also important to improve the equipment of laboratories and train specialists.

It is very important to maintain a national system of AMR and AMC surveillances in the veterinary environmental and agriculture sectors, and in food production chain, as they interact with the health sector and can have a significant impact on the situation in it and vice versa.

Infection prevention and control plays an important role in water supply, water sanitation and hygiene (WASH), especially in hospitals, to reduce the spread of resistant bacteria and can help reduce the number of infections and reduce the need for antibiotics. IPC and adequate WASH are also needed in outpatient settings and Primary Health Care (PHC) settings, and the prevention of infections among certain population groups, such as nursing care facilities and day care centers, can reduce the need for antimicrobial treatment.

It is also important to reduce the emission of untreated sewage from municipal sewerage, hospitals, antimicrobial production waste and animal manures, and improve environmental surveillance.

Since the number of animals in the world is much larger than humans, irresponsible and non-rational use of antibiotics in the production of agricultural food products negatively affect the bacteriological flora of the environment. Responsible and rational use of antibiotics in farm animals is necessary to minimize the potential harm to human health, in particular, the formation of resistance to antibiotics, while ensuring the safe and effective use of antibiotics in veterinary sector.

Apparently, this corresponds to a generally high level of antibiotic use, according to a survey conducted by the WHO / European Antimicrobial Supervision Project (EASP) published in the Lancet Infectious Diseases Magazine in 2013. By results of this survey, Tajikistan ranks third in the general use of antibiotics by people in comparative list of twelve European countries and Kosovo.

It is necessary to improve the monitoring of data system on antimicrobial medicines consumption and drug procurement policy, which are used both in the sectors of health, veterinary and agricultural at the national, regional and local levels. Thus, the input and analysis of data in this context is important for the national control system. In-patient treatment guidelines are available for at least the most serious infectious diseases. They will need to be updated regularly, also taking into account the development of resistance to drugs. A great importance is the availability of appropriate guidelines for the use of antimicrobial medicines in actively using clinics that do not specialize in infectious diseases, including every common indication for the use of antimicrobial medicines.

At the national level, it is necessary to use international recommendations on the rational use of antibiotics, adapted to the specific conditions of each country. Professional communities of veterinary workers should develop recommendations for the rational use of antibiotics in agricultural animals of various species, including indications for the use of antibiotics of the first, second and reserve lines in the treatment of various bacterial infections.

Country response

Strategic Guidelines

Tajikistan responded to the challenge of AMR by appointing a national AMR coordinator since 2015 by order of the Minister of Health and Social Protection to coordinate national work and contact WHO on this topic. In 2016, an intersectoral working group was established, whose task was to draw up a national action plan for Tajikistan to tackle growing AMR problems in Republic of Tajikistan.

The national intersectoral coordination group or the formal way of responding to the AMR problem provides the concept of "One Health" and monitors the implementation of strategic measures.

Strategic plan, operational plan and, M&E plan

Strategic plan

Global action plan strategic objective 1: Improve awareness and understanding of antimicrobial resistance through effective communication, education and training.

Awareness-raising and risk communication

Objective 1	Increase national awareness of AMR	
	Strategic interventions	Activities
	1.1. Establish a public communications programme targeting audiences in human health practice. Milestone: Significant change in awareness levels by mid-2020.	1.1.1. Estimate awareness and knowledge through behavioural studies in different social and professional groups. 1.1.2. Develop and implement campaigns on the AMR directed to health care workers and empowering communities, nurses to demand improved water, sanitation and hygiene (WASH) services in health facilities and hand hygiene by caregivers.
	1.2. Establish a public communications programme targeting the public; synchronized with (after) 1.1. Milestone: Significant change in awareness levels by end of 2022.	1.2.1. Estimate awareness and knowledge through behavioural studies in different social and occupational groups. 1.2.2. Develop and implement campaigns directed to the public.

Education

Objective 2	Improve knowledge of antimicrobial resistance, responsible use of antimicrobials, and related topics	
	Strategic interventions	Activities
	2.1. Include AMR and related topics as a core component of professional education, training, certification and development.	2.1.1. Include antimicrobial resistance, responsible use of antimicrobials, and related topics in undergraduate curricula for human health professionals, animal health professionals and food industry and agriculture professionals. 2.1.2. Include antimicrobial resistance, responsible use of antimicrobials, and related topics in postgraduate curricula for human health professionals, animal health professionals and food industry and agriculture professionals, and specialists in the field of education.
	2.2. Include lessons to increase knowledge on antimicrobial resistance, responsible use of antimicrobials, as a component of general education.	2.2.1. Include antimicrobial resistance, responsible use of antimicrobials, in the curricula for school children.

	2.3. Include capacity building to increase knowledge on antimicrobial resistance, responsible use of antimicrobials, as a component of public health and healthy life style promotion topic.	2.3.1. Include antimicrobial resistance, responsible use of antimicrobials, and related topics to Republican Centre for Healthy Life Style, relevant human, veterinary and agricultural institutions to increase population awareness and promoting rational and proper use of antibiotics in human and agriculture sectors.
Global action plan strategic objective 2: Strengthen the knowledge and evidence base through surveillance and research.		
Surveillance		
Objective 3	Set up a national surveillance system for antimicrobial resistance	
	<i>Strategic interventions</i>	<i>Activities</i>
	3.1. Improve a national coordination structure for surveillance of AMR. Milestone: <i>National coordinating group with appropriate mandate and terms of reference and designated focal point is strengthened by the end of 2018.</i>	3.1.1. Write and approve terms of reference for a national coordinating group for AMR surveillance with the mandate to oversee the AMR surveillance programme in the human health and environment protection sectors, including collecting, aggregating and sharing data. 3.1.2. Ensure the existence of connections to laboratory system and data from veterinary, agriculture, environment (waste, water treatment and disposal), and food safety, as well as, pharmaceutical production and procurement.
	3.2. Include AMR data from the food-borne pathogens side into the national AMR surveillance structure.	3.2.1. Strengthen a regular surveillance system of resistance in food-borne and water-borne pathogens, in particular Salmonella and Campylobacter.
	3.3. Active participation in WHO CAESAR networking.	3.3.1. Capacity building to enable national AMR surveillance (data management, analysis, implementation of surveillance methodology using the CAESAR as a starting point). 3.3.2. Share data with CAESAR network.
Objective 4	Set up a national surveillance system/monitoring centre for antibiotic consumption	
	<i>Strategic interventions</i>	<i>Activities</i>
	4.1. Strengthen a national structure for obtaining an overview of the use of antibiotics within the country.	4.1.1. Write and approve terms of reference for a national coordinating group for antibiotic consumption surveillance, including collecting, aggregating and sharing data. 4.1.2. Clarify the existence of and connections to relevant institutions and data from veterinary, agriculture, food safety and environment protection sectors.

	4.2. Investigate and monitor antibiotic use in larger hospitals and inform the pharmaceutical surveillance department of the State service for pharmaceutical activity surveillance (SSPAS).	4.2.1. Perform recurring Point Prevalence Studies on in-patients, as the patients may receive antibiotics from various sources.
Laboratory capacity		
Objective 5	Improve laboratory capacity to produce high-quality microbiological data for patient management and support surveillance activities in both human and animal health and agriculture sectors	
	<i>Strategic interventions</i>	<i>Activities</i>
	5.1. Designate a national reference laboratory for AMR surveillance. Milestone: National reference laboratory designated as responsible institution for establishment of AMR surveillance system by end of 2018.	5.1.1. Write and approve terms of reference for a national reference laboratory with expertise in methods for confirming and characterizing specific pathogens and organizing quality assurance schemes. 5.1.2. Access to quality consumables for laboratory diagnostics. 5.1.3. National accreditation system for laboratory practices.
	5.2. Improve the quality of bacteriology and AST	5.2.1. Implement standardized protocols for assessing AMR. 5.2.2. Strengthen laboratory infrastructure 5.2.3. Set up external and internal quality assurance systems. 5.2.4. Organize regular meetings with representatives of laboratories to discuss methodology and standards.
	5.3. Improve and increase the flow and testings of diagnostic microbiological samples taken in human health care, environment and agriculture sectors.	5.3.1. Assess the limiting factors 5.3.2. Participate in CAESAR and POP (Proof of Principle) Study.
Research and development		
Objective 6	Identify operational research priorities for responsible use of antimicrobial agents and better practice in infection prevention in human and animal health	
	<i>Strategic interventions</i>	<i>Activities</i>
	6.1. Prepare a national operational research agenda. Milestone: A national research institutions from health and agriculture developed the national operational research agenda by end of 2020.	6.1.1. Participation of RCFM in pharmaceutical-epidemiological surveys of type Point Prevalence Studies (PPS) of prescription patterns of antibiotics, with appropriate methodology for health and agriculture sectors (RCFM, ЦГНKBП) (possibly ESAC methodology for Primary Health Care). 6.1.2. Engage in pharmaco-epidemiological surveys, of type Point Prevalence Studies (PPS) in hospitals and in animal husbandry sector, with e.g. AMC standardized methodology. 6.1.3. Engage relevant experts to identify current gaps in knowledge and potential research topics.

Global action plan strategic objective 3: Reduce the incidence of infection through effective sanitation, hygiene and prevention measures.

Infection prevention and control (IPC) through improvement of infection control, water supply, sanitation and hygiene measures in health care and other facilities

Objective 7	Improve a national infection prevention and control programme	
	Strategic interventions	Activities
	7.1. Strengthen the proper development and use of infection prevention and control policies and strategies, water supply, sanitation and hygiene in health care facilities.	7.1.1. Improve the national infection prevention and control coordinating unit with authority delegated by a relevant administrative or political jurisdiction and an identified budget.
	7.2. Ensure there are AMR/IPC, water supply, sanitation and hygiene programmes in each hospital settings.	7.2.1. Review the regulatory basis for IPC on AMR and improvement of water supply, sanitation and hygiene in health care institutions (operation and maintenance) implementation. 7.2.2. When regulation is there, use nationally developed training curriculum for adoption to hospitals. 7.2.3. Integrate AMR/WASH/IPC as an integral part of improving the quality of health services.
	7.3. Ensure there are AMR/IPC, water supply, sanitation and hygiene programmes in long term care facilities.	7.3.1. When regulation is there, use national curriculum for adoption to long term care facilities.
Objective 8	Maintain a high vaccination coverage in the national vaccination program	
	Strategic interventions	Activities
	8.1. Pronounce support from the AMR NAP/ NCG for continued vaccination efforts also from the AMR point of view	8.1.1. Improve vaccinations against communicable diseases
Objective 9	Introduce infection prevention and control programmes in veterinary settings and animal husbandry	
	Strategic interventions	Activities
	9.1. The need to use antibiotics in farm livestock must be reduced by improving animal health with biological safety measures. Include issues of water supply, sanitation, hygiene and infection prevention and control as core (mandatory) content in training and education of veterinary professionals. Milestone:	9.1.1. Include ecological sanitation hygiene and infection prevention and control in undergraduate curricula for animal health professionals. 9.1.2. Offer courses to postgraduates/active personnel 9.1.3. Improve the prevention measures for zoonotic infections, particularly brucellosis
Hygiene and sanitation at community level		
Objective 10	Limit the development and spread of AMR outside health settings by infection prevention and control.	
	Strategic interventions	Activities
	10.1. Promote personal hygiene and safe sanitation by social mobilization and behavioural change support activities. Milestone:	10.1.1. Estimate adequate knowledge of personal hygiene and sanitation in different social groups as a basis for the social mobilization campaigns. 10.1.2. Form and launch campaigns.

	10.2. Promote prevention of infections in PHC and improving water supply, sanitation and hygiene in preschool facilities.	10.2.1. Teach personnel to teach children to improve habits on hand washing and to promote the safety of water supply, sanitation and hygiene in PHC and preschool facilities.
Global action plan strategic objective 4: Optimize the use of antimicrobial medicines in human and animal health.		
Regulated access to high-quality antimicrobial medicines		
Objective 11	Ensure uninterrupted access to high-quality antimicrobial medicines	
	<i>Strategic interventions</i>	<i>Activities</i>
	11.1. Strengthen the pharmaceutical supply chain, including the procurement, supply and management system for antibiotics for human use.	11.1.1. Update current medicines legislation and regulations. 11.1.2. Cancel the state taxes and duties on production and sales of medicines
	11.2 Strengthen the pharmaceutical supply chain, including the procurement, supply and management system for antibiotics for veterinary and agricultural use.	11.2.1. Review and when applicable update current veterinary medicines legislations and regulations to international standards.
Antimicrobial stewardship		
Objective 12	Improve and measure appropriate use of antimicrobial agents in health care	
	<i>Strategic interventions</i>	<i>Activities</i>
	12.1. Create formal antimicrobial stewardship programmes in health care facilities. Milestone: <i>Antimicrobial stewardship programmes established in 50% of acute care facilities by Aug 2018?</i>	12.1.1. Write generic terms of reference for antimicrobial stewardship multidisciplinary committees and teams. 12.1.2. Ensure the establishment of such committees in each larger hospital including surrounding Primary Health Care participation. 12.1.3. Provide antimicrobial stewardship training to healthcare staff.
	12.2. Improve rational use of antibiotics through modernized National Standard Treatment Guidelines (STGs).	12.2.1. Renew the existing system of database. 12.2.2. Produce Standard Treatment Guidelines for common infections/common causes of antibiotic use.
Objective 13	Ensure public access to adequate, quality controlled information on antibiotics and their use	
	<i>Strategic interventions</i>	<i>Activities</i>
	13.1. Build up a system for neutral information.	13.1.1. Build a system for market-independent information on antibiotics /and treatment of common infections/to the public. 13.1.2. Build a system for market-independent information on antibiotics and treatment of common infections to doctors/pharmacists.
	13.2. Improve public control over the information flow from pharmaceutical industry on antibiotics.	13.2.1. Review present situation, legislation, and improve control. 13.2.2. Train specialists on collection and monitoring of data on adverse effects.

Objective 14	Ensure prudent use of antimicrobial agents in terrestrial and aquatic animals and agriculture	
	Strategic interventions	Activities
	14.1. Improve the national policies on use of antimicrobial agents in terrestrial and aquatic animals and agriculture. Milestone: Policy in place December 2018.	14.1.1. Establish policies on the use of critically important antibiotics. 14.1.2. Review the legal framework for use and prescription of antibiotics in animals for food production (with particular emphasis on poultry and aquaculture) and in agriculture. 14.1.3. Reform the legal framework in a direction that eliminates or reduces the non-human use of critically important antibiotics and improve performance and oversight 14.1.4. Prohibit or reduce substantially the amount of antibiotics used for growth promotion.
	14.2. Ensure accumulation of data on antibiotic use for non-human purposes at a national level (see also SO 2).	14.2.1. Ensure data is collected on antibiotic use in animal husbandry. 14.2.2. Ensure data is collected on antibiotic use in other sections of agriculture. 14.2.3. Ensure data is collected on antibiotic use in aquaculture.

Operational plan (linked to the strategic plan)

Sub-activity	Unit	Timeline	Responsible entity	Cost estimate (currency)	Source of funding	Indicator	Comments
Sub-activity 1.1.1.1 Assess awareness and knowledge level through survey of family doctors at the PHC level	Awareness survey	March 2019 March 2020	RCFM		MoHSPP	Baseline awareness Post-intervention awareness	
Sub-activity 1.1.1.2 Assess awareness and knowledge level through survey of hospital doctors	Awareness survey	2018–2022	MoHSPP/Regional health authorities		MoHSPP	Baseline awareness Post-intervention awareness	
Sub-activity 1.1.1.3 Perform information campaigns on AMR for family doctors at the PHC level	Campaign	2018–2022	RCFM		MoHSPP	Campaign performed +Post-intervention awareness	
Sub-activity 1.1.1.4 Perform information campaigns on AMR for hospital doctors	Campaign	2018–2022	MoHSPP/Regional health authorities		MoHSPP	Campaign performed +Post-intervention awareness	
Sub-activity 1.1.1.5 Perform information campaigns on AMR for PHC nurses/non-doctor personnel .	Campaign	2018–2022	RCFM		MoHSPP	Campaign performed	
Sub-activity 1.1.1.6 Perform information campaigns on AMR for hospital nurses/non-doctor personnel	Campaign	2018–2022	MoHSPP/Regional health authorities		MoHSPP	Campaign performed	

Sub-activity	Unit	Timeline	Responsible entity	Cost estimate (currency)	Source of funding	Indicator	Comments
Sub-activity 1.1.1.7 Improve awareness and knowledge level through campaign targeting farmers	Campaign	2018–2022	MoA		MoA	Campaign performed	
Sub-activity 1.2.1.1 Assess awareness and knowledge level through survey of general population	Awareness survey	2018–2022	NCHL (Health Life Style)		MoHSPP	Baseline awareness Post-intervention awareness	
Sub-activity 1.2.1.2 Improve awareness and knowledge level through campaign target in general population	Campaign	2018–2022	NCHL (Health Life Style)		MoHSPP	Campaign performed +Post-intervention awareness	
Sub-activity 2.1.1.1 Revise undergraduate curriculum for medical doctors to incorporate AMR and related issues	Revised curriculum	2020	MoHSPP/TSMU		MoHSPP	Revised curriculum introduced	
Sub-activity 2.1.1.2 Revise undergraduate curriculum for veterinary doctors to incorporate AMR and related issues	Revised curriculum	2021	MoA		MoA	Revised curriculum introduced	
Sub-activity 2.1.1.3 Revise undergraduate curriculum for food industry and agriculture professionals to incorporate AMR and related issues	Revised curriculum	2022	MoA		MoA	Revised curriculum introduced	

Sub-activity 2.1.2.1 Integrate AMR and related topics in the /postgraduate/ curricula of family medicine training	Revised curriculum	2019	RCFM		MoHSPP	Revised curriculum introduced	
Sub-activity 2.1.2.2 Integrate AMR and related topics in the /postgraduate/ curricula of hospital specialists training	Revised curriculum	2020	MoHSPP + TSMU		MoHSPP	Revised curriculum introduced	
Sub-activity 2.1.2.3 Integrate AMR and related topics in the curricula of family medicine retraining	Revised curriculum	2021	RCFM		MoHSPP	Revised curriculum introduced	
Sub-activity 2.1.2.4 Integrate AMR and related topics in the curricula of the professional development courses for family doctors	Revised curriculum	2019	RCFM		MoHSPP	Revised curriculum introduced	
Sub-activity 2.1.2.5 Revise postgraduate curriculum for veterinary doctors to incorporate AMR and related issues, promoting rational use (preventing excessive and inappropriate use), prohibiting the use as growth promoters and use of narrow spectrum antibiotics when possible	Revised curriculum	2021	MoA		MoA	Revised curriculum introduced	

Sub-activity	Unit	Timeline	Responsible entity	Cost estimate (currency)	Source of funding	Indicator	Comments
Sub-activity 2.1.2.6 Revise postgraduate curriculum for food industry and agriculture professionals to incorporate AMR and related issues, promoting rational use prohibiting the use as growth promoters (preventing excessive and inappropriate use), and use of narrow spectrum antibiotics when possible	Revised curriculum	2022	MoA		MoA	Revised curriculum introduced	
Sub-activity 2.1.2.7 Revise postgraduate curriculum for specialists in the field of education to incorporate AMR and related issues.	Revised curriculum	2022	Ministry of Education and Science (MoES)		MoES	Revised curriculum introduced	
Sub-activity 2.2.1.1 Develop suitable AMR education materials for school children	Revised curriculum	2020	Ministry of Education and Science (MoES)		MoES	Revised curriculum developed	
Sub-activity 2.2.1.2 New AMR education materials in school children's curriculum introduced	Revised curriculum introduced	2021	Ministry of Education and Science (MoES)		MoES	Revised curriculum implemented	
Sub-activity 3.1.1.1 Prepare terms of reference for AMR surveillance	National coordinating centre terms of reference	January 2019	NCG on AMR; MoHSPP; Ministry of Agriculture		Ministry of health, Ministry of Agriculture	National coordinating group terms of reference ready for approval	

Sub-activity 3.1.2.1 Ensure the existence of and connections to laboratory structure and data from veterinary, agriculture, food safety side	Data flow from veterinary and Agriculture side	June 2019	NCG on AMR; MoHSPP; Ministry of Agriculture		Ministry of health, Ministry of Agriculture	Agreements in place, data flow started	
Sub-activity 3.2.1 Establish a regular surveillance system of resistance in food-borne pathogens, in particular Salmonella	Surveillance system for AMR in food-borne pathogens	2020	MoHSPP + MoA	MoHSPP + MoA	MoHSPP + MoA	Reporting and data exchange on AMR in food-borne pathogens to AMR surveillance centre	
Sub-activity 4.1.1.1 Write terms of reference for a national coordinating group for antibiotic consumption surveillance, including collecting, aggregating and sharing data, from human and vet/agriculture side	Draft terms of reference	Mid 2019	NCG/MoHSPP			Draft in place	
Sub-activity 4.1.1.2 Approval of terms of reference for a national coordinating group for antibiotic consumption surveillance, including collecting, aggregating and sharing data, from human and vet/agriculture side. The data should be in comparable formats, in accordance with international standards (WHO EURO)	Approval of ToR	Oct 2019	MoHSPP; Ministry of Agriculture			Approved ToR.	

Sub-activity	Unit	Timeline	Responsible entity	Cost estimate (currency)	Source of funding	Indicator	Comments
Sub-activity 4.1.1.3 Investigate and monitor specifically the amount of antimicrobials used in animals for food production and in aquaculture	Yearly data	2020	National Coordination Group (NSG), MoA, Committee of Food Security (CFS)			Data delivered to NCG. Yearly reports.	
Sub-activity 4.2.1 Investigate and monitor antibiotic use in larger hospitals	Comparable data for 5–10 largest hospitals	2019	TSMU, NCG, Scientific Research Institute for Preventive Medicine		MoHSPP	Monitoring report	Yearly repeats
Sub-activity 5.1.1.1 Develop terms of reference for national reference laboratory on AMR (one designated, or two or more with clearly defined division of responsibilities) for human health	National reference laboratory terms of reference	January 2020	NCG, SHSSPPS, MoHSPP; SSES Bacteriology Laboratory, National Public Health Laboratory			National reference laboratory terms of reference ready for approval	
Sub-activity 5.1.1.2 Approval of terms of reference for national reference laboratory on AMR for human health	Approved terms of reference	May 2021	MoHSPP			Terms of reference approved	/Ministry of Agriculture well informed about process/
Sub-activity 5.1.1.3 Develop terms of reference for national reference laboratory on AMR (one designated, or two or more with clearly defined division of responsibilities) for veterinary/agricultural sector	National reference laboratory terms of reference	January 2019	MoA; Centre for Veterinary Diagnostics, CFS			National reference laboratory terms of reference ready for approval	

Sub-activity 5.1.1.4 Approval of terms of reference for national reference laboratory on AMR for veterinary/agricultural sector	Approved terms of reference	May 2020	MoA, CFS			Terms of reference approved	/MoHSPP well informed about process/
Sub-activity 5.1.2.1 Develop cooperation on methodology/standards between human and vet/agriculture side labs	Agreement on standards	May 2019	MoHSPP, MoA, CFS			Interagency plan in place	
Sub-activity 5.2.1.1 Apply standardized, up-to-date protocols to assess AMR consistently	Standardized, updated protocols in place throughout country	2020	National Reference Lab.; SHSSPPS; MoHSPP; MoA; National Centre for Veterinary Diagnostics			Protocols in place	
Sub-activity 5.2.1.2 Improve/update quality through participation in international programs, such as CAESAR, EUCAST, and including "wet lab workshops"	Number of exchanges or courses taken part in	2018–2020	National Reference Lab.; SHSSPPS; MoHSPP; MoA; National Centre for Veterinary Diagnostics			Increase of international contacts; number of personnel participated in wet lab workshops	
Sub-activity 5.2.1.3 Apply sector-specific AST guideline throughout the country	Decision on AST (antibiotic sensitivity test) guideline	2021	National Reference Lab.; SHSSPPS; MoHSPP; MoA; National Centre for Veterinary Diagnostics			Decision and protocols in place	

Sub-activity	Unit	Timeline	Responsible entity	Cost estimate (currency)	Source of funding	Indicator	Comments
Sub-activity 5.2.2.1 Strengthen laboratory infrastructure – increased availability of computers, internet access to ensure LIS or WHONET is introduced	Computers and internet access in laboratories	2019	SHSSPPS; MoHSPP; MoA; National Centre for Veterinary Diagnostics			Number of labs reporting to national centre via internet	
Sub-activity 5.2.2.2 Strengthen laboratory infrastructure – decision and implementation of harmonized purchasing of high-quality consumables (such as media, reagents, antimicrobial discs)	Harmonized equipment	2020	SHSSPPS; MoHSPP; MoA; National Centre for Veterinary Diagnostics				
Sub-activity 5.2.3.1 External quality assurance system, EQA, implemented on the national level	Participation in CAESAR EQA	2019 – continuing	SSS Bacteriology Laboratory, SHSSPPS, MoHSPP			Performance yearly	
Sub-activity 5.2.3.2 Internal quality assurance system implemented from the National Reference laboratory to the network of laboratories; developed on the basis of internal quality assessment (IQA) experience	Number of labs participating in yearly EQA	2019	MoHSPP, NRL, SHSSPPS			Number of labs participating in yearly IQA	
Sub-activity 5.2.4.1 Meetings with representatives of laboratories to discuss methodology and standards	Number of labs participating in yearly meeting	2019	SHSSPPS; MoHSPP; MoA; National Centre for Veterinary Diagnostics			Number of labs represented in yearly meeting	

Sub-activity 5.3.1.1 Assess limiting factors, explanations to low volume of samples taken by clinicians, e.g. through questionnaires and evaluation of experts	Report on limiting factors	2019	SHSSPPS; MoHSPP			Report	
Sub-activity 5.3.2.1 Participate in CAESAR, POP (Proof of Principle) Study to start towards implementation of sampling and routine diagnostics. Continuous training in parallel call for additional investment towards sustainable implementation of PoP.	Study and POP Study	2019–2020	SSS Bacteriology Laboratory, SHSSPPS, MoHSPP; CAESAR/WHO			Number of hospitals/ labs participating in POP study	
Sub-activity 6.1.1.1 Convene relevant experts to identify gaps in knowledge and potential research topics.	Expert meeting	May 2019	NCG; TSMU; MoHSPP			Draft research agenda developed	
Sub-activity 7.1.1.1 Prepare terms of reference for a national infection prevention and control coordinating unit.	Terms of reference for an infection prevention and control unit	May 2019	NCG, SHSSPPS, MoHSPP; National Infection Control Society (if such exists)			Infection prevention and control unit terms of reference ready for approval	

Sub-activity	Unit	Timeline	Responsible entity	Cost estimate (currency)	Source of funding	Indicator	Comments
Sub-activity 7.1.2.1 Develop a training curriculum on IPC, covering the following aspects with a hospital perspective: (i) surveillance of health-care associated infections; (ii) standard, contact, droplets, and aerosol precautions (iii) measuring compliance of IPC measures (iiii) hand hygiene (using WHO guidelines) (iv) adherence to hygiene and improved water supply and sanitation in health facilities as a basis for effective IPC (using WHO guidelines)	IPC curriculum suited for hospitals	May 2019	Department for Sanitary Epidemiology Surveillance Service			Curriculum developed and starting to be implemented	
Sub-activity 7.1.2.2 Develop a training curriculum on IPC, covering the following aspects, with a PHC perspective: – surveillance of infections associated with healthcare at PHC level; – precaution measures: standard, contact, droplet and aerosol at PHC level; – evaluation of IPC, water supply, hygiene and sanitation measures being followed at PHC level	IPC curriculum suited for PHC	May 2019	Department for Sanitary Epidemiology Surveillance Service			Curriculum developed and starting to be implemented	

Sub-activity 7.2.1.1 Review the regulatory basis for implementing IPC, water supply, sanitation and hygiene programmes in hospitals and LTCFs	May 2019	MoHSPP			Review finished	
Sub-activity 7.2.2.1 Ensure existence of locally adopted IPC, water supply, sanitation and hygiene programmes in each hospital, based on national program	December 2021	Regional health authorities; Hospital administrations			Number of hospitals with and without IPC, water supply, sanitation and hygiene programmes	
Sub-activity 7.3.1.1 Ensure existence of locally adopted IPC programmes in each long term care facility	May 2020	Regional health authorities; LCTF administrations			Number of LCTF with and without IPC programmes	
Sub-activity 9.1.1.1 Revise undergraduate curriculum for veterinary professionals to incorporate antibiotics storage, use and consumption, water supply, sanitation and hygiene and infection prevention and control	May 2019	Ministry of Agriculture		Ministry of Agriculture	Revised curriculum introduced	
Sub-activity 9.1.2.1 Develop short courses for postgraduates/active personnel incorporating antibiotics storage, use and consumption, water supply, sanitation and hygiene and infection prevention and control	May 2019	Ministry of Agriculture			Courses developed	

Sub-activity	Unit	Timeline	Responsible entity	Cost estimate (currency)	Source of funding	Indicator	Comments
Sub-activity 9.1.2.2 Implement short courses for postgraduates/active personnel	Courses given	December 2019	Ministry of Agriculture			Courses given in nr of regions	
Sub-activity 10.1.1.1 Estimate knowledge of schoolchildren about personal hygiene.	Knowledge survey	December 2019	Center for Healthy Life Style			Baseline data Post-intervention data	
Sub-activity 10.1.2.1 Form and launch campaign directed at schoolchildren	Campaign	Dec 2019	Center for Healthy Life Style			Post-intervention data showing improvement	
Sub-activity 10.2.1.1 Teach personnel to teach importance of improved hand washing habits (after toilet, before food) among children, water supply, sanitation and drawing from international experience	Campaign, Lectures to personnel in day care centers	Dec 2019	Center for Healthy Life Style			Number of day care centers per city reached by campaign	
Sub-activity 11.1.1.1 In the ongoing revision of laws and regulations dealing with medical and veterinary products and practices, ensure shifting of the emphasis of the regulatory approach from quality control to quality assurance and defining the legal provision requiring compliance with good laboratory, clinical, manufacturing, distribution and storage practices (GLP, GCP, GMP, GDP, GSP)		2019–2022	Department Agency on Pharmaceutical Control; MoHSPP		MoHSPP	Revised legislation in place	

Sub-activity 12.1.1.1 Prepare generic terms of reference for multidisciplinary antimicrobial stewardship committees. Consider international experience	Terms of reference	May 2019	MoHSPP; with National Association of Pharmacists (if such exists), Pediatric Society (if such), RCFM Consumers Association		MoHSPP	Terms of reference ready for approval	
Sub-activity 12.1.1.2 Approval of generic terms of reference for multidisciplinary antimicrobial stewardship commissions	Approval	Aug 2019	MoHSPP	...	MoHSPP	Approved ToR	
Sub-activity 12.1.1.3 Renewal of multidisciplinary antimicrobial stewardship committees antimicrobial stewardship committees	Commissions	Jan 2019	MoHSPP, regional health authorities			Number of commissions established of total nr hospitals	
Sub-activity 12.2.1.1 Define, for each antibiotic-intensive hospital medical specialty, how best to make STGs credible, based on modern evidence including international, and generally accepted. Focus on common infections/indications that answer for large quantities of antibiotic consumption	Defined STG system for common infections	October 2019	MoHSPP with medical associations			Defined STG system for common infections	
Sub-activity 12.2.1.2 Create the above infrastructure	Decision	End 2019	MoHSPP with medical associations			Infrastructure decided and implemented	



Sub-activity	Unit	Timeline	Responsible entity	Cost estimate (currency)	Source of funding	Indicator	Comments
Sub-activity 12.2.2.1 Produce National Standard Treatment Guidelines for the most common indications for antibiotic use in hospitals	Guidelines	2019 – continuing	Respective STG Group/Dedicated STG responsible entity; and agreed with the MoHSP			Number of guidelines produced and implemented	
Sub-activity 12.2.2.2 Produce National Standard Treatment Guidelines for the most common indications for antibiotic use in Primary Health Care/Family Medicine	Guidelines	2019 – continuing	A dedicated STG Group for common infections in PHC, with added relevant specialists (paediatrics, ENT, infectious diseases..); RCFM; In agreement with the State Services for surveillance of pharmaceutical and medical activity			Number of guidelines produced and implemented	Guidelines should be condensed into handy format, delivered to each PHC Centre etc.
Sub-activity 13.1.1.1 Form a national board of experts entrusted with writing information on the various antibiotic substances, their spectrum and proper use	Board nominated	May 2019	MoHSPP; SAPHC			Board formed	
Sub-activity 13.1.1.2 Publish this neutral, industry-independent information on a governmental public web-site	Web-site with info	Feb 2019	MoHSPP/ Nominated Expert Board			Web-site with info open	
Sub-activity 13.2.1.1 Review present situation of antibiotic marketing, review legislation and other regulations	Review performed	May 2019	MoHSPP			Written review	

Sub-activity 13.2.1.2 Reform legislation and regulations to better control marketing of antibiotics to public and to health professionals, so that neutral information becomes the larger part	Legislation reforms	December 2019	MoHSPP			Reformed legislation and regulation Pharmacology department (for adverse effects monitoring) established.	
Sub-activity 14.1.1.1 Make a list of critically important antibiotics for human use based on WHO list.	List of critically important antibiotics for human use	June 2019	MoHSPP; MoA, CFS			List of critically important antibiotics ready for approval	
Sub-activity 14.1.2.1 Review the legal framework for use and prescription of antibiotics in animals for food production (with particular emphasis on poultry and aquaculture) and in agriculture.	Review	June 2019	MoA, CFS, MoHSPP			MoHSPP, MoA, CFS	
Sub-activity 14.1.3.1 Reform the legal framework in a direction that eliminates or reduces the non-human use of critically important antibiotics, particularly fluoroquinolones and cephalosporins of 3rd and 4th generations	Reform	December 2019	MoHSPP, MoA, CFS			Renewed legal framework In place	

Sub-activity	Unit	Timeline	Responsible entity	Cost estimate (currency)	Source of funding	Indicator	Comments
Sub-activity 14.1.3.2 Introduce pre-license assessment of safety of antibiotics intended for use in farm livestock, considering the potential development of resistance to drugs used in human healthcare	Law or regulation	December 2019	MoA, CFS			Law/regulation in place	
Sub-activity 14.1.3.3 Ensure that all antibiotic use for farm animals is by prescription by a veterinarian only, and for treatment purposes	Law or regulation	December 2019	MoA, CFS			Law/regulation in place	
Sub-activity 14.1.3.4 Ensure that economic incentives for irrational use are eliminated	Law or regulation	December 2019	MoA, CFS			Law/regulation in place	
Sub-activity 14.1.4.1 Immediate measures to eliminate or substantially reduce antibiotic use as growth stimulators	Review and reform of legislation and regulations	2020	MoA, CFS		Ministry of Agriculture	Review performed	
Sub-activity 14.1.4.2 Antibiotic use as growth stimulators phased out	Use of antibiotics as growth stimulators	2021	MoA, CFS		Ministry of Agriculture	Follow up performed	
Sub-activity 14.2.1.1 Ensure data on antibiotic use in animal husbandry is collected, and aggregated to national level/NCG	Data	May 2019	MoA; SHSSPPS, NCG			Reliable data in place with NCG	

Sub-activity 14.2.1.2. Ensure data on antibiotic use in agriculture is collected, and aggregated to national level/ NCG	Review	May 2019	Ministry of Agriculture; SHSSPPS, NCG			Reliable data in place with NCG	
Sub-activity 14.2.1.3. Ensure data on antibiotic use in aquaculture is collected, and aggregated to national level/ NCG	Review	May 2019	Ministry of Agriculture; SHSSPPS, NCG			Reliable data in place with NCG	



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