National Action Plan on Antimicrobial Resistance

(NAP AMR) 2024-2029

Ministry of Health
Republic of Maldives

World Health Organization
Maldives

Endorsement Number

Plan/23MOH/2024/22

Endorsed by:

Aishath Samiya,
Permanant Secrerary
1st December 2024
Signature:

Verified for endorsment:

Aminath Shaina Abdulla, Deputy Director General
Policy Implementation and International relations Division
1st December 2024
Signature:

Ministry of Health
Republic of Maldives

Table of content

Foreword by Minister of Health

Antimicrobials are crucial to modern medicine for treating infections and supporting a range of medical procedures. However, misuse across human, animal, and agricultural sectors has led to rapid rise of "superbugs"—resistant pathogens that are no longer treatable with current medicines. In 2019 alone, these infections led to over 1.27 million deaths globally. Rapid spread of antimicrobial resistance (AMR), combined with a lack of new treatments, has posed AMR serious global health threat.

Recognizing this urgency, the Maldives adopted the World Health Organization's Global Action Plan (GAP) on AMR in 2015, becoming a regional leader in AMR containment efforts. The establishment of the National Multisectoral Coordination Committee in 2016 marked a crucial step, initiating our first National Action Plan (NAP) on AMR (2017–2022), which was aligned with GAP's strategic objectives. Despite challenges posed by the COVID-19 pandemic, the Maldives achieved significant progress under the first NAP, driven by the commitment of five technical committees focused on specific goals aligned with international standards.

To build on these achievements, a comprehensive review of the NAP was conducted in 2023, involving extensive stakeholder consultations and a second situation analysis to identify critical gaps and shape our next strategy. This led to the development of the second National Action Plan on AMR (2024–2029), which incorporates two new focus areas: strengthening governance structures and enhancing regulatory frameworks. These additions aim to establish a more resilient, sustainable approach, equipping the Maldives to manage AMR effectively and contribute to global containment efforts.

The importance of national AMR strategies was emphasized again on September 26, 2024, at the 79th United Nations General Assembly, where renewed commitments called for a strengthened global response to AMR through a One Health approach. As we embark on implementing the second National Action Plan on AMR (2024–2029), the Maldives reaffirms its dedication to addressing this urgent threat.

Having endorsed the first National Action Plan, I am honoured to support this second plan, which builds on past lessons and renews our commitment to combating AMR. I encourage all stakeholders to join in promoting the responsible use of antimicrobials, helping to preserve these essential medicines for future generations.

Abdulla Nazim
Minister of Health

Foreword WHO Representative

'Antimicrobial Resistance' (AMR) occurs when bacteria, viruses, fungi, and parasites change over time and no longer respond to medicines. This makes infections harder to treat and increases the risk of disease spread, severe illness and death. As a result of drug resistance, antibiotics and other antimicrobial medicines become ineffective and infections become increasingly difficult or even impossible to treat. As a result, Antimicrobial Resistance has become a huge threat to global health security, healthcare, global trade, agriculture, and the environment.

New global estimates show that in 2019, nearly 5 million human deaths worldwide were associated with bacterial Antimicrobial Resistance, of which 1.3 million human deaths were directly attributable to bacterial Antimicrobial Resistance. In a high-impact scenario, Antimicrobial Resistance will reduce global annual GDP by 3.8% by 2050. If left unchecked, in the next decade, it could result in a GDP shortfall of US$ 3.4 trillion annually, pushing 24 million more people into extreme poverty. The consequences of Antimicrobial Resistance threaten the attainment of the Sustainable Development Goals which were recently agreed upon by UN member states.

Since 2014, preventing and combating Antimicrobial Resistance has been one of eight Flagship Priorities of the WHO South-East Asia Region, which is at high risk for the emergence and spread of Antimicrobial Resistance. With WHO's support, Maldives had developed its first National Action Plan to address Antimicrobial Resistance in 2016 and has continued to implement this action plan between years 2017-2022. Multisectoral working groups and coordination committees on Antimicrobial Resistance have been established at country level, in alignment with the Global Action Plan on Antimicrobial Resistance, adopted in 2015.

To further assess the content and determine alignment with the Global Action on Antimicrobial Resistance, WHO is pleased to have supported the review and updating of existing Maldives National Action Plan on Antimicrobial Resistance. This review supports realignment of Maldives priority activities for the Antimicrobial Resistance programme and paves the way towards ensuring and enhancing the country's renewed efforts to combat antimicrobial resistance. I am pleased to note that this plan has been developed after thoroughly reviewing the current situation of the country and all activities planned. Thanks to the efforts of all partners, the plan was completed in a time-bound operational manner, following a mapping exercise conducted to identify funding gaps and resources mobilized for implementation. I commend the efforts, contribution and commitment made by numerous stakeholders such as Ministry of Health, Ministry Environment and Ministry of Fisheries and Agriculture etc. in the development and implementation of this updated plan.

For the foreseeable future, we must accelerate concerted action while continuing to increase national, regional, international, and global awareness and support towards Antimicrobial Resistance. Time is of the essence. The development of a new antimicrobial can take between 10-15 years and cost can exceed US$ 1 billion. Although Antimicrobial Resistance cannot be eradicated, it can be reasonably slowed down and contained. Therefore, WHO urges all stakeholders to continue their efforts into coordinating with the National counterparts to prevent, detect, and respond to the threat posed by Antimicrobial Resistance pathogens. As always, WHO remains a trusted technical partner to Ministry of Health and the Government of Maldives to support coordinated nationwide efforts to combat Antimicrobial Resistance in the country.

Dr Nazneen Anwar
WHO Representative to the Maldives

Acknowledgement

In 2019 alone, these infections led to over 1.27 million deaths globally. Rapid spread of antimicrobial resistance (AMR), combined with a lack of new treatments, has posed AMR serious global health threat. Recognizing this urgency, the Maldives adopted the World Health Organization's Global Action Plan (GAP) on AMR in 2015, becoming a regional leader in AMR containment efforts.

The National Multisectoral Coordination Committee in 2016 initiated the first National Action Plan on AMR, achieving significant progress despite COVID-19 challenges, with five technical committees focusing on international standards.

This AMR Action plan is the 2nd AMR plan of Maldives health sector which was formulated by the international consultant, Nazla M Luthfee, MD Msc.

In 2023, a review of the National Action Plan on AMR led to the development of a second plan, focusing on strengthening governance structures and regulatory frameworks to enhance resilience and sustainability in managing AMR effectively.

I take this opportunity to express sincere appreciation for the generous and continued support of the World Health Organization in developing this plan.

The overall formulation process was a collaborative and a consultative effort by national stakeholders (Maldives Food and Drug Authority (MFDA), Quality Assurance and Regulation Department, Ministry of Health, Health Protection Agency (HPA), Ministry of Fisheries Marine Resources and Agriculture (MoAAW & MoFOR, Ministry of Climate Change, Environment and Energy (MoCCEE), Policy Implementation and International Relations Division (PIIRD)). Consecutive meetings and discussions were carried out with stakeholders including public and private sectors by Maldives Food & Drug Authority.

The text and format verified, and the numbering was done by Policy Implementation and International Relations Division under the supervision of Aminath Shaina Abdulla, the Deputy Director General of Policy Planning and International Health Division.

The Cover page and the plan designed by Abdulla Shafraz, Political director

Executive summary

The Maldives has made significant progress in controlling and eliminating infectious diseases, including Tetanus, Polio, Leprosy, Malaria, Filaria, Measles, Rubella, and HIV/Syphilis transmission. This success is attributed to improved healthcare, sanitation, safe drinking water, and high vaccination coverage. In response to the WHO's call for action on Antimicrobial Resistance, a National Action Plan was formulated in 2017, covering 2017-2022.This initial plan, covering the period from 2017 to 2022, aligned seamlessly with the GAP AMR and delineated five primary objectives as follows:

1.Strengthen the knowledge and evidence base through surveillance and research.
2.Reduce the incidence of infection through effective sanitation, hygiene, and infection prevention measures.
3.Optimize the use of antimicrobial medicines in human and animal health.
4.Improve awareness and understanding of antimicrobial resistance through effective communication, education, and training.
5.Develop the economic case for sustainable investment that takes account of the needs of all countries, and increase investment in new medicines, diagnostic tools, vaccines, and other interventions.

In 2018, a comprehensive analysis of the NAP AMR 2017-2022 prevention and containment program was conducted, focusing on seven key areas: alignment with GAP AMR governance, awareness-raising, establishing a national AMR surveillance system, infection prevention and control, fostering research and innovation, and promoting One Health engagement. The analysis evaluated progress across 30 indicators and introduced 10 additional indicators for a more comprehensive evaluation. The 2018 situation analysis showed positive results, with indicators performing at or above phase 3.

The 2023 situation analysis of the National Action Plan on Antimicrobial Resistance (NAP AMR) for 2017-2022 revealed similar findings with only three indicators performing at or above level 3. The country's commitment to the NAP AMR plan was evident, but the lack of a proper governance structure, a dedicated AMR coordination unit, and a National Multi-Sectoral Steering Committee contributed to the inadequate implementation. The absence of trained skilled human resources and a lack of surveillance in all sectors, including human, animal, agriculture, food, and environmental, further weakened the system. A fully functional national drug regulatory authority was established to oversee regulation, licensing, pharmacovigilance, and market authorization. Initiatives include developing national standards and guidelines, strengthening infection prevention and control measures, and updating environmental protection policies. However, there is limited awareness on AMR-related environmental impact or coordination among stakeholders on NAP AMR-related activities.

The NAP AMR 2024-2029 aims to strengthen governance, enhance regulatory aspects across all sectors, and establish a communication pathway between stakeholders. It builds on the initial NAP AMR of 2017-2022, focusing on universal healthcare, animal welfare, food security, and a safe environment using the ONE HEALTH concept. The new objectives include establishing a National Multi-Sectoral Steering Committee and a National AMR Coordination Unit, digitalizing surveillance reporting, integrating AMR activities into existing programs, and developing a monitoring and evaluation framework.

Abbreviations and Acronyms

AMA	Antimicrobial Agent
AMR	Antimicrobial Resistance
AMSP	Antimicrobial Stewardship Programme
AMU	Antimicrobial Use
ARO	Antimicrobial Resistant Organism
AST	Antibiotic Susceptibility Testing
CME	Continuing Medical Education
EML	Essential Medicines List
FAO	Food and Agriculture Organization
FHS	Faculty of Health Sciences
GAP	Global Action Plan
GDP	Gross Domestic Product?
GFN	Global Foodborne Infections Network
GLASS	Global Antimicrobial Resistance Surveillance System
GMP	Good Manufacturing Practices
HAI	Healthcare Associated Infection
HPA	Health Protection Agency
IPCC	Infection Prevention and Control Committee
MFDA	Maldives Food and Drug Authority
MoCCEE	Ministry of Climate Change, Environment and Energy
MoAAW	Ministry of Agriculture and Animal Welfare
MoFOR	Ministry of Fisheries Ocean Resources
MoH	Ministry of Health
NACC	National AMR Coordination Committee
NACU	National AMR Coordination Unit
NMSC	National Multi-Sectoral Steering Committee

Background

Introduction

The availability of effective antimicrobials have substantially reduced mortality and morbidity from infectious diseases and enabled multiple advancements in modern medical and veterinary practice '–(Australian Government 2015). The rise and spread of antimicrobial resistance (AMR) are creating a new generation of 'superbugs' that cannot be treated with existing medicines. The impacts of leaving AMR unchecked are wide-ranging and extremely costly, not only in financial terms but also in terms of global health, food sustainability and security, environmental wellbeing, and socio-economic development –'(HM Government 2019, World Health Organization 2023).

Globally, unchecked antimicrobial resistance threatens many of the Sustainable Development Goals; such as ending poverty, ending hunger, ensuring healthy lives, reducing inequality, and revitalizing global development partnerships—are less likely to be achieved '(HM Government 2019). (Figure 1). According to World Bank unless AMR is contained an additional 28 million people could be forced into extreme poverty by 2050, through shortfalls in economic output (World Bank 2017). Already, AMR infections are estimated to cause 700,000 deaths each year globally. That figure is predicted to rise to 10 million, alongside a cumulative cost of $100 trillion, by 2050 if no action is taken ref

Murray et al. estimated that 4·95 million deaths were associated with bacterial antibiotic resistance, including 1·27 million deaths attributable to bacterial AMR in 2019 (Murray, Ikuta et al. 2022).

Table 1: Impact of AMR on SDGs

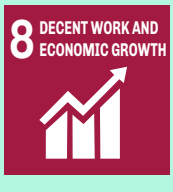
Impact of AMR on SDGs '(HM Government 2019, World Health Organization 2021)

AMR strikes hardest on the poor. Treatment of resistant infections is more expensive. Substandard care and partial treatment can drive infection

Untreatable infections in animals threatens sustainable food production for growing populations

Antimicrobials are a component of all health systems. AMR will increase treatment costs, making effective care unaffordable for many, and UHC unattainable.

Lack of access to clean water and effective sanitation results in spread of infectious diseases; in turn, this increases antibiotic use and thus drives the emergence and spread of AMR.



Cost of AMR is predicted to be US$ 100 trillion by 2050, driving extra 28 million people into poverty

It is crucial to balance access and conservation of antimicrobials with innovation, to contain AMR

To effectively tackle AMR, collaboration and partnerships are needed across all relevant sectors and at all levels

Table 2: Five Objectives of Global Action Plan on AMR, 2015-2019 (World Health Organization 2015)

1.Strengthen the knowledge and evidence base through surveillance and research

2.Reduce the incidence of infection through effective sanitation, hygiene and infection prevention measures

3.Optimize the use of antimicrobial medicines in human and animal health

4.Improve awareness and understanding of antimicrobial resistance through effective communication, education and training

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

The 2015 World Health Organization Global Action Plan and other international policy documents have stressed the need for a "whole of United Nations approach" in addressing antimicrobial resistance (AMR) (World Health Organization 2015). This action plan also emphasise the need for an effective “one health” approach involving coordination among various international sectors and actors, including human and veterinary medicine, agriculture, finance, environment, and well informed consumers (World Health Organization 2015). One Health is an integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals and ecosystems. It recognizes the health of humans, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely linked and inter-dependent *(World Health Organization 2021)*. One Health approach, linking humans, animals and the environment, addresses the full spectrum of disease control - from disease prevention to detection, preparedness, response, and management – and aim to improve and promote health and sustainability.

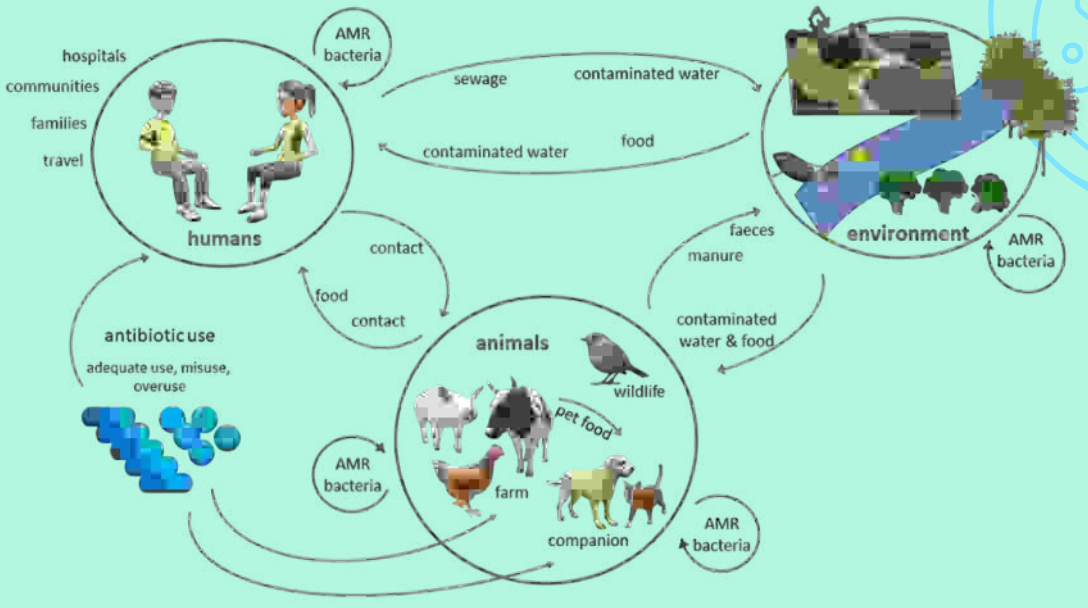


Figure 1: Schematic of potential transmission between human, environment and animal reservoirs — (Pattis, Weaver et al. 2022)

The antibiotics used to treat infections may be the same or similar in humans and animals; the manufacture, use, and disposal of antibiotics in all settings can potentially drive the emergence of resistance. When antibiotic-resistant bacteria arise, they may spread among humans, animals, and the environment.

The WHO Global Antimicrobial Resistance and Use Surveillance System (GLASS) was launched in 2015 to foster AMR surveillance and inform strategies to contain AMR (World Health Organization 2022). The GLASS 2022 report highlighted effect of COVID-19 pandemic and reiterated the need to Enhanced collective efforts to ensure the continuity of crucial programmes such as AMR and AMC surveillance and to seize the opportunity to develop more sustainable infection prevention and control programmes, promote integrated antibiotic stewardship guidance, and leverage increased laboratory capabilities and other system-strengthening efforts (World Health Organization 2022).

The GLASS 2022 report found an increase in AMR rates by more than 15% in 2020 compared with 2017 for meropenem and third-generation cephalosporin resistance in bloodstream E. coli BCIs, ciprofloxacin resistance in Salmonella spp. bloodstream bacteriologically confirmed infections (BCIs), and azithromycin resistance in gonorrhoea BCIs (Section 3.3). Although further studies would be needed to verify whether a real upward trend occurred for these combinations, the negative impact of the COVID-19 pandemic on both AMR surveillance activities and AMR rates has been reported previously and may have contributed, at least in part, to these findings. The very high 2020 levels of AMR in pathogens causing bloodstream infections, regardless of testing coverage, are of major concern. Third-generation cephalosporins are recommended as a first-line empiric treatment for this type of infection. High levels of third-generation cephalosporin resistance have been reported in Klebsiella pneumoniae, the third most frequent pathogen causing bloodstream infections, which may drive the increase in the use of 'last resort' carbapenems. Although the reported rate of carbapenems resistance in K. pneumoniae was lower in countries, territorials and areas (CTAs) with better testing coverage, the pooled rates from all reporting CTAs showed carbapenem resistance in more than 8% of bloodstream infections caused by this pathogen and may indicate the emergence of this type of resistance worldwide. The global spread of carbapenemase producing Enterobacteriaceae and the high rates of carbapenem and aminoglycoside resistance in Acinetobacter spp. (≥56% regardless of testing coverage) are of great concern. Carbapenem resistant isolates are usually multidrug-resistant and are often associated with treatment failure (World Health Organization 2022)

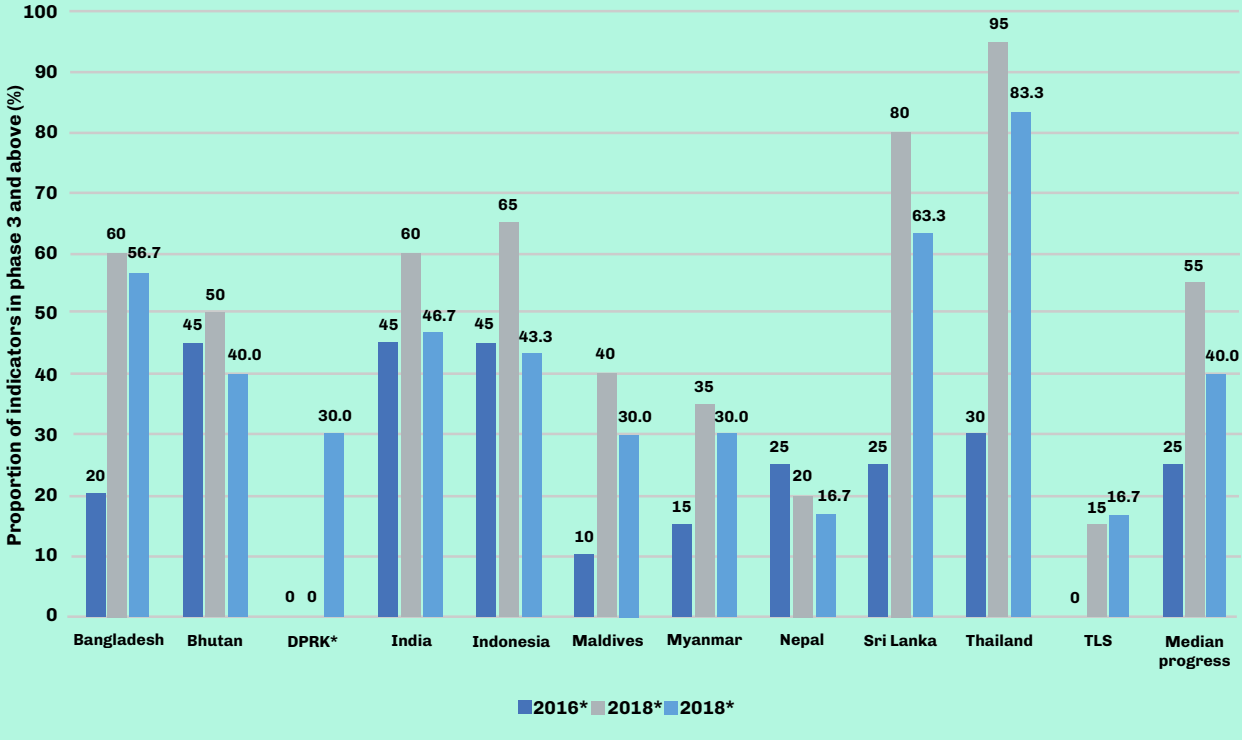
Lower respiratory infections accounted for more than 1·5 million deaths associated with resistance in 2019, making it the most burdensome infectious syndrome. The six leading pathogens for deaths associated with resistance (Escherichia coli, followed by ***Staphylococcus aureus, Klebsiella***

pneumoniae, Streptococcus pneumoniae, Acinetobacter baumannii, and Pseudomonas aeruginosa) were responsible for 929 000 (660 000–1 270 000) deaths attributable to AMR and 3·57 million (2·62–4·78) deaths associated with AMR in 2019 (Murray, Ikuta et al. 2022). The broad benefits of AMR surveillance include the opportunity to introduce evidence-based policies and interventions data and information on levels and patterns of resistance. Such evidence based interventions in turn contribute to reduced disease burden, lower treatment costs, and reduced mortality (World Bank 2017).

It is a concern that in many low-income settings where the threat of AMR is very high there is serious data gaps, emphasising the need to expand microbiology laboratory capacity and data collection systems to improve our understanding of this important human health threat (Murray, Ikuta et al. 2022).

Though the Global Action Plan on AMR of 2015 while extensive in its scope some issues that have since emerged as it was not addressed include: governance, laboratory strengthening, the patient perspective and the need to integrate AMR into broader health systems such as primary health care, universal health coverage and pandemic preparedness (World Health Organization 2022).

In response, WHO is now encouraging a programmatic public health approach that recognizes the interdependence of the six building blocks: political commitment and governance that brings leadership, funding, education, human resources and use of data; access to early diagnosis in a quality assured laboratory network; access to appropriate treatment; prevention of infection including IPC and vaccination; an uninterrupted supply chain for both treatment and diagnostics; and, surveillance and evidence generation.



***Progress assessed for 20 indicators based on Situation Analysis was not conducted in DPRK in 2016 and compared in 2018**
***progress assessed for 30 indicators (10 newly introduced indicators) based on Situation Analysis toll 2016**

Figure 2: Progress of NAP-AMR implementation by country (2016-18)

Situation analysis of NAPAMR implementation in SEARO region done on the basis of the 30 indicators (including the 10 additional indicators), The median country progress in 2018 was at 30% (on basis of 30 indicators assessed); maximum country progress was in Thailand at 83.3% and minimum in Nepal and Timor-Leste at 16.7% (World Health Organization 2019).

Situation locally

The first NAP AMR was endorsed in 2016 the Maldives and released in the year 2017 as NAP AMR 2017 to 2022. The 2017 NAP on AMR was structured around the five strategic objectives and five principles which are embodied by the GAP AMR.

Within the five strategic objectives of the GAP AMR, 12 specific objectives have been included. Each of these specific objectives has been described in terms of a Strategic Intervention, with a defined set of key activities to be carried out successfully to execute the strategic intervention and eventually to fulfil the strategic objective. Key Monitoring & Evaluation (M&E) indicators were listed for activities under each of the strategic interventions with the operational plan comprising of broad planning by activity. Formalized AMR multisectoral coordination mechanism with dedicated leadership, clear terms of reference, technical working groups, and adequate funding creates the basic foundation for NAP AMR implementation, AMR advocacy and sustainability. The NAP AMR 2017 states that the country response for Maldives will be mounted based on a well-appointed governance mechanism. Each of its aspects have been detailed with clearly assigned roles and responsibilities; this comprises of a High Level National Multi-Sectoral Steering Committee (NMSC), for Antibiotic Resistances. The NMSC will be supported by a National AMR Coordinating Committee (NACC) and multi-sectoral Technical Sub Committees (TSC) who will address the strategic objectives of GAP through specialised Working groups related to the five strategic objectives of GAP. The NAP AMR detailed out governance structure for its implementation with high-level National Multi-Sectoral Steering Committee (NMSC) chaired by Minister of health with involvement of other ministers from other relevant sectors was proposed. Unfortunately, the NMSC have not been formed and there is no dedicated unit in the country with dedicated staff to ensure NAP AMR implementation. NACC was formed and the technical committees and few meetings were conducted, but without a dedicated unit or staff support for the AMR program, and without a stronger political support, the country's implementation of NAP AMR lacks so far behind the targets.

Global analysis of TrACSS indicators also shows there is a lack of a programmatic approach to NAP implementation with a focus on ad-hoc interventions, showcased by certain indicators having more progress over the years, while others have seen little to no progress. The report highlighted lack of leadership capacity to ensure the effective functioning of AMR multisectoral coordination structures in the country.

Situation analysis by WHO was done on AMR related activities and NAP AMR implementation in 2016 and again in 2018 (World Health Organization 2019). Using the assessment tool used in 2018 current situation of analysis of 2023 was undertaken and comparison provided for the past two assessments done in 2016 and 2018 (table 3). The 2018 tool assessed the progress against 30 indicators as a proxy for strategic interventions/ programmes across eight focus areas. These included 20 indicators used in 2016 and 10 new introduced indicators). The focused areas of 2018 situational analysis tool included seven from the 2016 tool, are as follows:(1) NAP being in line with GAP-AMR governance; (2) raising of awareness; (3) national AMR surveillance system; (4) rational use of antimicrobials and surveillance of use/sales (community-based); (5) infection, prevention control and AMR stewardship; (6) research and innovation; and (7) One Health engagement. An additional area, (8) Overarching coordination mechanisms for One health engagement (was introduced in the 2018 tool).

The situation analysis was undertaken in 2023 for development of the NAPAMR by consultation with stakeholders from, MoH-(MDFA, QARD, HPA), MoAAW & MoFOR, MoCCEE Similar to 2018 assessment report, Phase 3 or initial implementation was used as the minimum threshold for assessing progress.

The key focus areas with the sub indicators were analysed against the five phases of implementation.

Table 2: Phases of implementation

- Phase 1: Exploration and adoption
    - oCountry initiates design of a program to combat AMR
- Phase 2: Program installation
    - oThe country decides to implement an AMR program after completing a set of core activities
- Phase 3: Initial implementation
    - oThe country initiates an AMR prevention and control program at national level
- Phase 4: Full operation
    - oThe country scales up to a successful model of an AMR program that utilizers accepted prevention and control programs. There is nationwide or large scale adoption of the program. There is evidence that the AMR program is functional and regularly generates outcomes
- Phase 5: Sustainable program
    - oThe country operates its AMR program efficiently and there is

Assessment on the 8 key focus areas using theNAP AMR assessment tool 2018 are below

Table 3: Situation analysis of NAPAMR implementation

S.No	Focus area and sub-indicators	2023	Explanation on the score change for 2018 to 2023	2018	2016
1	**National AMR plan and governance**				
1.1	NAP in line with GAP-AMR	4	-	4	2
2	**Raising awareness**				
2.1	Campaigns to raise public awareness	3	-	3	2
2.2	Education and training strategies for professionals	3	-	3	1
3	**National AMR surveillance system**				
3.1	National Human AMR surveillance	2	-	2	2
3.2	National laboratory network strengthening	2	-	2	1
3.3	Early warning system	1	-	1	1
4	**Rational use of antimicrobials and surveillance of use / sales (community based)**				
4.1	A national AMR containment policy for control of human use of antimicrobials: AMR stewardship	3	Stewardship policy and guideline document development but dissemination and implementation poor	2	2
4.2	National regularity authority or drug regulatory authorities	4	-	4	3
4.3	Surveillance of antimicrobial use and sales in human	3	Monitoring of antimicrobial import being done and entered in GLASS-AMC since 2017 but not sales from pharmacies or utilization at facility or community level	3	2

4.4	Regulation of finished antibiotic products and active pharmaceutical ingredients (APIs)	3	-	4	2
4.5	Regulation of OTC sales and inappropriate sales of antibiotics and Apls by pharmacies	4	-	4	2
5	**Infection Prevention and Control and AMR stewardship program**				
5.1	AMSP in healthcare setting	2	In GMR assessed (n=2) AMS activity average score 42% peripheral: <10% (need better clarification from responders from Atoll)	1	1
5.2	IPC program in healthcare setting	3	Central 2 major hospitals assessed 4 components (IPC program, leadership support, education and training and HAI score GMR (n=2) 84% Peripheral <10%	2	2
5.3	National HAI and related AMR surveillance	3	HAI prevention and surveillance guideline developed- one training conducted	2	1
5.4	Sanitation and hygiene	4	-	4	2
5.5	Vaccination	2	Rota viral vaccine and pneumococcal vaccine in pipeline as per National Immunization program- NIP, Ongoing discussion to put influenza vaccine on Universal insurance scheme- Vaccination like COVID-19, influenza and optional (rota and pneumococcal) vaccine awareness and acceptance very good . Parent buy these vaccines currently. COVID-19 vaccination first, second, third and fourth dose 88%, 85%, 37% and 0.35% of above 12 years respectively (as per publicly release date on 10.6.23 via the official the Health Protection Agency (HPA), Maldives, twitter account and viber group).	1	NA

6	**Research and innovation**				
6.1	R&D and innovation on AMR prevention, containment and research funding	**1**	AMR research priority areas not defined and there is no plan or budget dedicated for such research	**2**	**1**
7	**One health engagment**				
7.1	A national AMR containment policy and regulatory framework for control and registration of use in animal sector	**3**	Policy available, currently implementation not fully operational as per the policy and available guidelines	**1**	**2**
7.2	National surveillance of AMR ,and use and sale of antimicrobials at national level in the veterinary sector	AMU-2 AMR-1	Monitoring antibiotic use in veterinary practice in installation phase	AMU-2 AMR-1	**3**
7.3	Biosecurity (infection prevention and control) in the animal sector	**2**	Policy and guideline available. In process of initiating the implementation	**1**	**1**
7.4	AMR awareness generation and education in the animal sector	**1**	-	**1**	**1**
7.5	A national AMR containment policy and regulatory framework to control release of AR and AMR into the environment and management	**1**	-	**1**	**NA**
7.6	National surveillance of AR and AMR in waste water from manufacture and human/animal/fish use and disposal in institutions and the home	**1**	-	**1**	**NA**
7.7	Raising awareness on AMR and education in the environmental sector	**1**	No specific AMR awareness from the Environmental sector. Currently in exploratory phase	**2**	**NA**
8	**Overarching coordination mechanisms for One Health engagement**				
8.1	Overarching AMR coordination mechanisms between all relevant sectors	**2**	-	**2**	**NA**

8.2	Inclusion and engagement of all relevant sectors in the NAP-AMR	**1**	-	**2**	**NA**
8.3	A platform and/or mechanism for sharing of AMU monitoring data from all relevant sectors	**1**	-	**1**	**NA**
8.4	A platform and/or mechanism for sharing of AMR surveillance data from al relevant sectors	**1**	-	**1**	**NA**
8.5	AAW is nationally coordinated and celebrated, with involvement of and contribution from all relevant sectors	**3**	Need better coordination between sectors specially to bring the environmental sector more on board	**3**	**NA**
8.5	A mechanism for co-sharing of resources for AMR initiatives in the country	**1**	Need to establish proper mechanism to share resources for AMR. Digitalization and inter sector/interdepartmental connection strengthening needed	**2**	**NA**
	NA- not assessed 1+ - Discussion in Phase 2 allocation inconclusive				

Situation analysis of progress in AMR prevention and containment 2016 - 2023

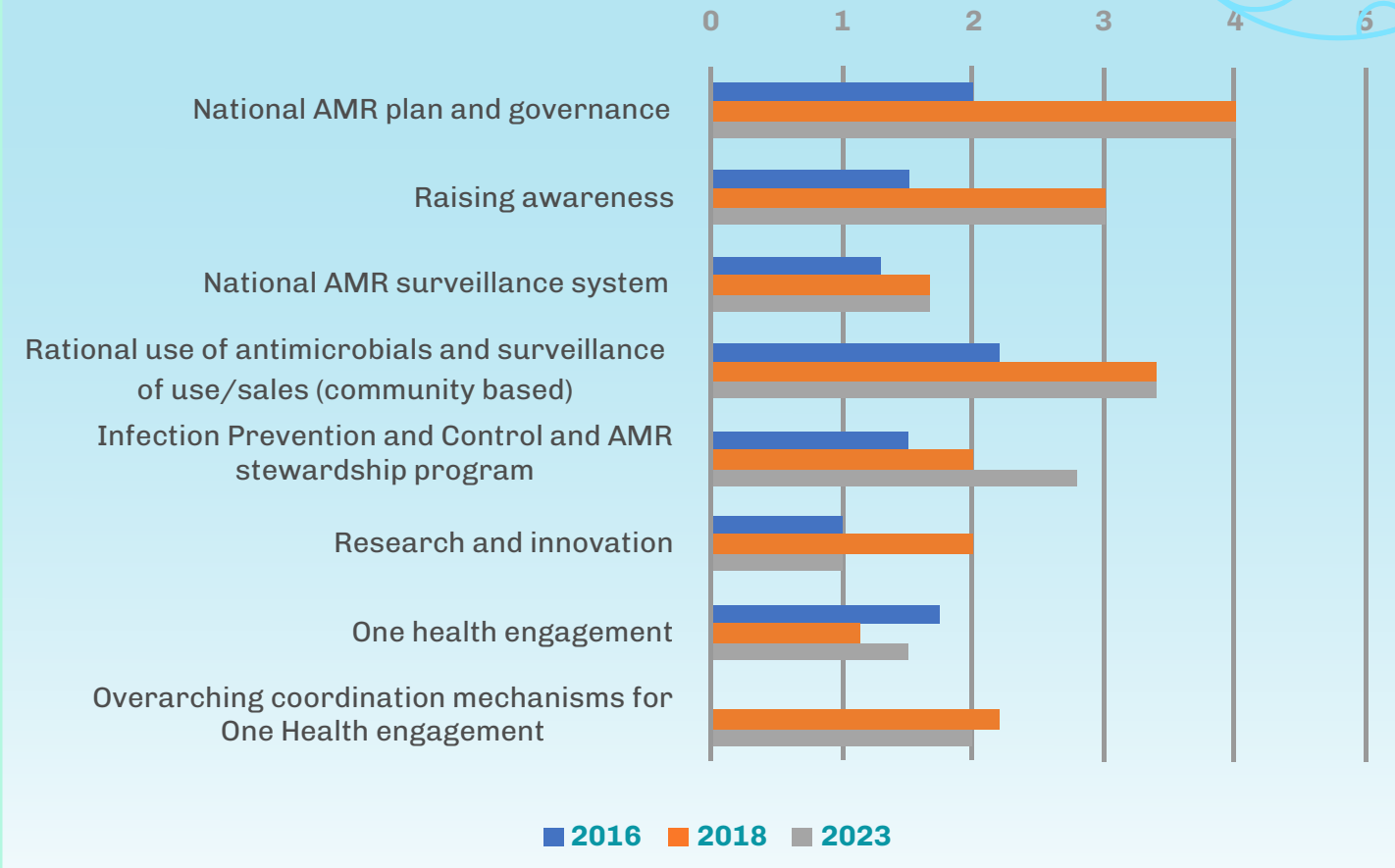


Figure : Situation analysis in AMR prevention and containment (shows an average of phase-grading for all indicators in different focus areas; for 2016 using 20 indicators and for 2018 and 2023 30 indicators assessed), purely for pictorial representation Key findings from the Situation Analysis for 2023

Main points

- Lack of poor governance structure for AMR related activity
- Many regulatory provisions related to AMR in place or being established; implementational weakness noted in some areas which are already in place
- Poor AMR related surveillance in all sectors (human, animal, agriculture, food and environmental)
- Work being done for strengthening of IPC related measures in all sectors
- Lack of monitoring and reporting framework for AMR related activities

There is lack of governance structure for NAP AMR activities as evidenced through lack of formation of a dedicated unit with dedicated staff for AMR related activities and lack of formation of High-level National Multi-Sectoral Steering committee (NMSC). Even without proper structural support MFDA and other stakeholders have undertaken some AMR containment efforts, evidenced through the formation of a National Multi-sectoral AMR Coordination Committee and initiation some NAPAMR stipulated activities. A fully functional national drug regulatory authority had been set up to oversee regulation and licensing, pharmacovigilance and market authorisation. Similarly, Water, Sanitation and Hygiene (WASH) related initiatives in human health along with high vaccination coverage were found to be significant infection control mechanisms within community settings. Compared to 2018 assessment improvement in areas of infection control initiatives in healthcare institutions by Ministry of Health Quality Assurance Division with the development of the national IPC and HAI prevention and surveillance guidelines (refer table 4). The Situation Analysis also threw light on other initiatives that are being taken to develop and draft national standards and guidelines, such as the national drug policies, updated essential medicines lists and standard treatment guidelines.

Traditionally, lack of animal populations and commercial orientation of food animal production systems based on terrestrial animals has led to limited development and capacity of veterinary health services. Accordingly, majority of the food consumed in Maldives is imported into the country. Recently, the Government of Maldives laid emphasis on diversification into poultry and goat farming as well as aquaculture with the objective of attaining greater food security and the country have seen expansion of the veterinary health sector in the last few years. During the last two years agricultural and animal health sector have been working on policies and guidelines for strengthening infection prevention and control and antibiotic utilization measures in this field. These guidelines, which are planned to go for implementation soon, include; Guideline on Good Farming Practices In Aquaculture, Hatchery Sanitation Guidelines, Guidelines For Importation Of Hatching Eggs, Waste disposal related to animal farms; Collection, Procedure For Identifying Disease Area And Quarantine Area And Disease Reporting, Preservation and transportation of specimens for Laboratory diagnosis of Animal Diseases; Establishment of central and regional Veterinary Investigation and Diagnostic Laboratory network etc.

During the discussion with stakeholders, it was noted that the environmental sector, MoCCEE, is in the process of updating different policies and guidelines related to environmental protection including proper waste management system in the country, though currently there is limited awareness on AMR related environmental surveillance and therefore no plans in pipelines for such in the country. Strengthening surveillance for AMR in human, animals, food industry and environment require one health concept, with improved coordination, knowledge and data sharing between these sectors.

Efforts from all sectors clearly highlighted strong elements that having potential to be leveraged as building blocks for an effective NAP AMR implementation and emphasize the need for proper infrastructural support system to coordinate, update and sustain these activities.

Rationale of the action Plan

Antimicrobial resistance is a multifaceted problem and requires a comprehensive response. Considering the crosscutting nature of the problem and its wider implications, efforts must be made from all stakeholders to prevent and contain resistance. There is a need to strengthen the national level response to AMR and ensure the implementation of National action plan and national policies to ensure rational use of antimicrobials. This national action plan shall help in prioritizing the limited national resources, strengthening the governance structure and promote a united drive against AMR.

Scope

This national action plan shall be applicable to all sectors related to human health, animal health and agriculture practice dealing with antimicrobials. In addition, this action plan is applicable to the environment sector which relates to impact of antimicrobials released into the environment. The future actions and activities on AMR shall be within the strategies outlined in this document

Guiding principles

The national action plan is based on the following guiding principles:

1.Awareness of the antimicrobial resistance at the global, regional and national level
2.Promoting the rational use of the available antimicrobial agents;
3.Preventing emergence of resistance through appropriate control and regulatory measures;
4.Changing the behaviour of the prescribers and communities in the use of antimicrobials; and
5.Promoting the active participation of various stakeholders and bringing them on board to take ownership in the national effort

Considering the key findings from the 2023 situational analysis of NAP AMR 2017 implementation, the main changes brought to the current NAP include;

·Addition of 2 more main objectives in addition to five already in the NAP as per GAP
oEstablishment of governance structure for AMR
oStrengthen implementation of regulatory aspects of NAP AMR
•Establishment of National AMR coordination unit (NACU) in MFDA with relevant staff including AMR program manager and Assistant AMR program manager
•Establishment of National AMR Steering Committee and AMR Coordination Committee to be chaired by representative from main stakeholders on a rotational basis (MoH, MOAAW, MOFOR and MoCCEE)
•Integrate AMR related activities into the other existing programs to function with support and guidance from related technical subcommittees.
•Establishment of a communication pathway from stakeholders to main National AMR coordination unit (NACU) in MOH and vice versa.
•Establishment of AMR related surveillance reporting pathway and mechanism for analysing and data sharing
•Developed the Monitoring and evaluation frame work with measurable out comes for each activity in NAP AMR

Objectives

While developing the NAP-AMR for Maldives, a strategic plan has been formulated, keeping in mind its geographical aspects as also its public health and other socio-cultural and economic status. The NAP AMR has been based on the implementation of seven strategic objectives, each of which has its objectives, strategic interventions and key activities:

Objective 2: Strengthen the regulatory system related to AMR
Objective 3: Improve awareness and understanding of AMR through effective communication, education and training
Objective 4: Establish Surveillance and monitoring system for AMR
Objective 5: Reduce the incidence of infection through effective sanitation, hygiene and infection prevention measures
Objective 6: Optimize and monitor use of antimicrobial medicines
Objective 7: Develop the economic case for sustainable investment by taking into account the needs of the country regarding new medicines, diagnostic tools, vaccines, research, and other interventions

Objective 1: Establish Governance structure for NAPAMR implementation

The country response for Maldives will be mounted based on a well-appointed governance mechanism as proposed in the NAPAMR 2017 with some additional key changes included in the structure i.e. formation of the National AMR coordination unit (NACU) in MFDA and integration of some activities into existing national programs.

NACU will be responsible unit for overall coordination and monitoring of NAP AMR implementation and NACU will report to National AMR Coordination Committee (NACC). A focal person each for human and animal health shall be designated to provide technical assistant related to functioning of NACU. The focal person of the MoH shall act as the national focal point for AMR

A national multi-sectoral governance mechanism will serve as the central intervention around which all the AMR-related activities occur, ensuring a one health approach by formation of the National Multi-Sectoral Steering committee (NMSC) at the top. The NMSC will be supported by a National AMR Coordinating Committee (NACC) and multi-sectoral Technical Sub Committees (TSC). The TSC depending on its role will be linked to lead agencies implementing the objectives and TSC may seek to form special Taskforce to address any issue. Each of its aspects have been detailed with clearly assigned roles and responsibilities. Implementation of the NAP AMR and its associated committees will be supervised by NACU.

Table : Objective 1- Establish Governance structure for AMR implementation

Objective 1: Establish Governance structure for NAPAMR implementation						
Strategy	Activities	Performance indicator	Target	Timeline	Lead agency	Implementing partners
1.1 The government shall allocate adequate resources for the operationa-lization of the National Action Plan	1.1.1 NAPAMR 2024-2029 released	1.1.1.1 NAPAMR 2024-2029 endorsement by Minister of Health after proper sensitization and advocacy (targeted for all relevant policy level stakeholders)	1	4Q2024	MoH	QARD, MFDA, HPA, MoAAw & MoFOR, MoCCEE, MoHE, MoF, MoE
		1.1.1.2 NAP AMR disseminated	Awareness session for main four stakeholders. Online access, Print 100	4Q2024		
	1.1.2 Develop a budget plan for implemen-tation of NAPAMR activities (including monitoring and evaluation) and identify funding sources	1.1.2.1 Consultation with key stakeholders undertaken to develop costed budget plan WHO costing and budgeting tool)	1	4Q2024		QARD,HPA, MoAAw & MoFOR, MoCCEE, MoHE, MoF, MoE
1.2 A High Level National Multi Sectorial Steering Committee (NMSC) shall be instituted at the highest level of the government for policy related decisions	1.2.1 Institute National multi-sectorial steering Committee for AMR	1.2.1.1 TOR of NMSC updated and endorsed by Minister of Health	1	4Q2024	MFDA Minister of Health	MoH, MFDA, QARD, HPA, MoAAW & MoFOR, MoCCEE, MoF, MoE
		1.2.1.2 NMSC formed and endorsed by Minister of health	1			

1.2 A High Level National Multi Sectorial Steering Committee (NMSC) shall be instituted at the highest level of the government for policy related decisions	1.2.2 Conduct Steering Committee meetings	1.2.2.1 Number of meetings conducted NMSC	Minimum 8 (bi-annually)	4Q2024 (starting date)	NMSC NACU	MFDA MoAAW & MoFOR MoCCEE MoE MoHE MFDA MoAAW & MoFOR MoCCEE MoE MoHE
		1.2.2.2 Costed budget plan endorsed by NMSC	1	4Q2024		
		1.2.2.3 Number of documents endorsed & reviewed	8(1 per meeting)	4Q2024 (starting date)		
1.3 There shall be a designated National AMR Coordination unit (NACU) within MoH with provision of adequate infrastruct-ural support	1.3.1 National AMR Coordination Unit (NACU) established in relevant department of MoH with proper communication pathway between NACU and other stakeholders	1.3.1.1 ToR for the NACU developed & endorsed by MoH	1	4Q2024	Minister of Health MFDA	MFDA MoAAW & MoFOR MoCCEE MoE MoHE MoH HR
		1.3.1.2 Provision of adequate number of staff in NACU	2 technical & 1 admin staff (minimum)	4Q2024		
		1.3.1.3 Develop and online integrated platform for AMR related data collection	1	4Q2024		QARD, HPA, MoAAW & MoFOR, MoCCEE,
	1.3.2 Designate AMR focal points in relevant agencies to support NACU	1.3.2.1 FP in MFDA (National AMR focal Point and from Human health)	1	4Q2024		MFDA
		1.3.2.2 FP from MoAAW, MoFOR & MoCCEE (from animal/plant health & environment)	1	4Q2024	MOH MFDA	MoAAW, MoCCEE

1.4 Form the AMR National coordination committee (NACC) and TSC. NACC function to advise the government on all matters related to AMR	1.4.1 Re-establish AMR National coordination committee (NACC)	1.4.1.1 Endorse NACC TOR by NMSC	1	4Q2024	MFDA NACU	QARD, HPA MoAAW & MoFOR, MoCCEE MoE, MoHE
		1.4.1.2 Identify members of NACC and hold first meeting of NACC	1			
	1.4.2 Develop TSC	1.4.2.1 Develop the 5 relevant TSC according to NAPAMR structure	1	4Q2024	NACC MACU	MFDA QARD HPA MOAAW & MOFOR MoCCEE
		1.4.2.2 Establish lead agencies to collaborate with TSC according to NAPAMR structure	1	4Q2024		
	1.4.3 Conduct regular meetings of NACC	1.4.3.1 Number of meetings held	14 (minimum)	4Q2024 (start date)	NACU	MFDA
		1.4.3.2 Endorsed documents / recommendations given	14 (1 per meeting)			

Ministry of Health
Ministry of Agriculture & Animal Welfare
Ministry of Fisheries and Ocean Resources
Ministry of Climate Change, Environment & Energy
Ministry of Education
Ministry of Finance

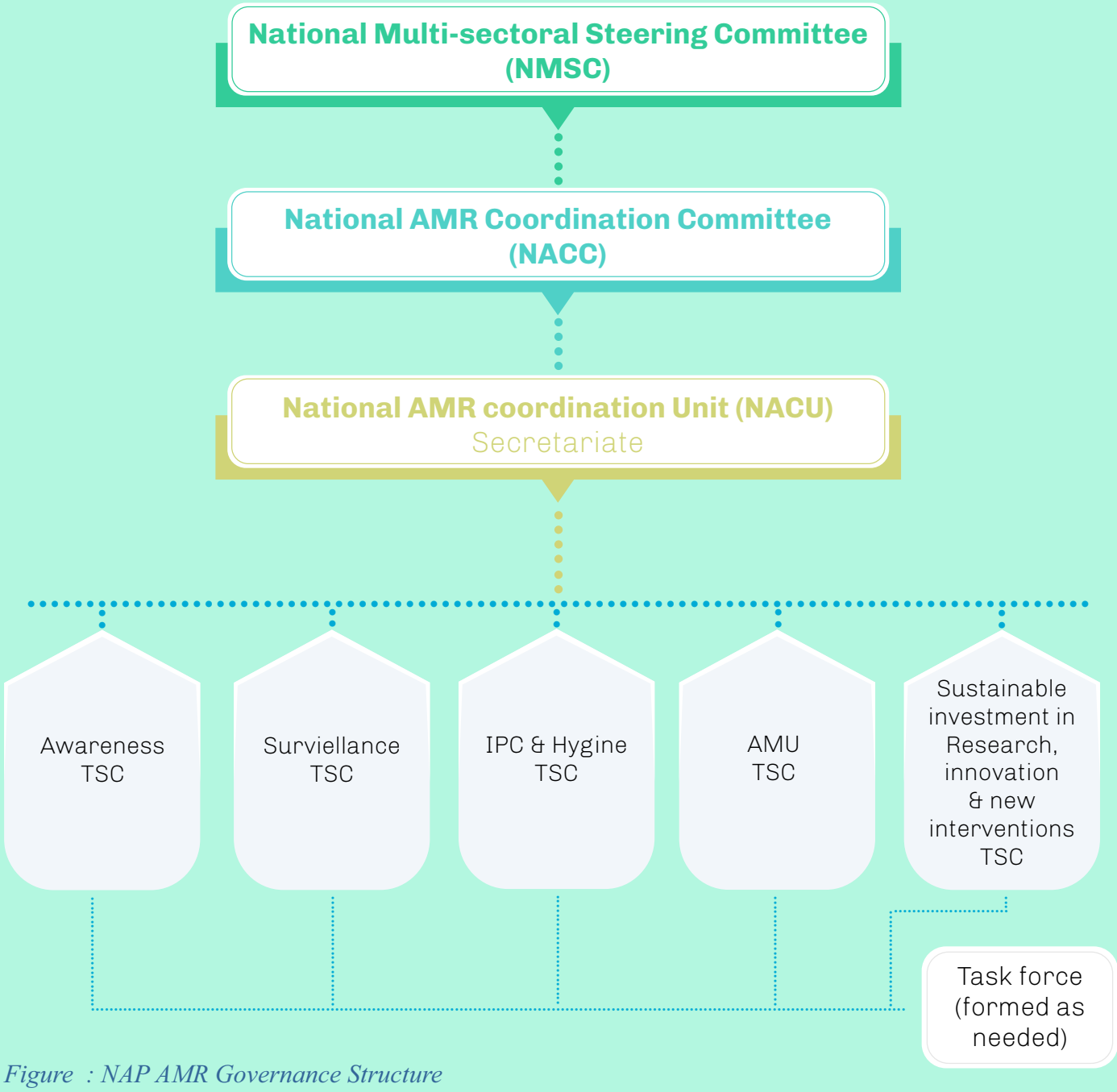


Figure : NAP AMR Governance Structure

National Multi-Sectoral Steering Committee (NMSC) for Antimicrobial Resistance

The NMSC will provide the necessary political commitment and support for national AMR containment efforts in Maldives and to the international global health community. Given the ultimate goal of AMR containment efforts that are geared to improve human health outcomes, the NMSC will be formed under the leadership of MoH with Minister of Health as the Chairperson.

Composition of NMSC

The NMSC will be chaired by Minister for Health and Co-Chaired by Minister of Fisheries and Ocean Resources and Minister of Agriculture and Animal Welfare. Its membership will be as follows:

- Minister of Health (Chairman) or Ministers representative
- Minister of Minister of Fisheries and Ocean Resources or Ministers representative
- Minister of Agriculture and Animal Welfare or Ministers representative
- Minister of Climate Change, Environment and Energy or Ministers representative
- Minister of Education or Ministers representative
- Minister of Finance or Ministers representative or Ministers representative

Logistics of the NMSC

The NMSC will meet bi-annually when it will be appraised of AMR control efforts in the country. NMSC will provide necessary political support to avail financial and human resource for programme implementation. The secretariat of NMSC will be National AMR Coordination Unit (NACU) in MFDA and the technical support will be provided by National AMR Coordination Committee (NACC).

National AMR Coordinating Committee (NACC)

The NACC will be support and monitor NACU in implementation of NAP AMR and will draw its powers and mandate from the Decree by Minster of Health while NMSC will provide strategic vision to AMR control efforts. The NACC will provide the platform for programme planning and implementation through a supporting structure comprising of stakeholders in relevant ministries and technical working groups for individual strategic objectives.

The NACC is envisioned as a multi-sectoral group of senior officials from different ministries with adequate representation of non-governmental agencies, cooperatives, civil society representatives, media, international agencies (WHO/FAO/OIE). By way of its multi-sectoral composition, it will ensure adequate integration of AMR containment efforts into the existing health system, public health and disease-specific programmes, animal health and food production sector and other environmental initiatives.

The chair and vice chair will be appointed by the Minister of Health, and its Secretariat will be NACU in MFDA. Its membership will be drawn from the:

- Ministry for Health (MFDA, HPA, QARD) (CORE members)
- Ministry of Fisheries and Ocean Resources (CORE members)
- Ministry of Agriculture and Animal Welfare (CORE members)
- Ministry of Climate Change, Environment and Energy (CORE members)
- Ministry of Education (CORE members)
- Ministry of Finance (CORE members)
- Regulatory authorities- EPA, Utility Regulatory Authority (with ENVIRONMENT)
- Professional associations Maldivian Medical Association, Nursing and Allied health association, animal health, environmental association and relevant councils.
- Representatives from major hospitals to include at least one Microbiologists, ID specialist consultant (x2) IPC nurse(x1)
- Representative from NRL
- Veterinarian
- Academia representative x 1 MNU,1 Villa (1 count as one for quorum)

Note: Committee can be amended or revised as per functionality within THE 5-year period. Quorum to be finalize in NACC first meeting and to decide the core members and non-core members). Suggested: Core members should include those from the relevant ministries and representative from clinical background x 2 (minimum).

Logistics of the NACC

The NACC will meet regularly once every 4 months and or as required. The NACC will have a rotatory Chairmanship between Ministry for Health, Ministry of Fisheries and Ocean Resources and Ministry of Agriculture and Animal Welfare. The rotation will happen annually. If any member is unable to attend 3 consecutive meetings of the committee NACU needs to inform the relevant ministry/organization.

Roles and responsibilities of NACC:

Roles and responsibilities of the NACC have been mentioned in the Strategic Plan. Broadly, it will be responsible for:

- Finalise the NAP AMR Operational plan and budget
  Planning, monitoring & evaluation of different strategic interventions and activities of NAP AMR
- Support NACU on the implementation, coordination and monitoring of NAP AMR objectives
- Constitute technical working groups for main objectives that include providing technical input for program support and decision-making
- Facilitate collaborations with internal and external agencies and organizations in the field of surveillance and innovations
- Advocate for prevention and containment of AMR

National AMR Coordinating Unit (NACU)

The National AMR coordination unit (NACU) in MFDA will be the implementation agency for NAP AMR objectives. The NACU will provide the platform for programme implementation, coordination and monitoring with support from the National AMR Coordination committee (NACC). NACU will also act as the secretariat for NMSC and NACC. The AMR program manager in NACU will be overall responsible for the functioning of NACU with support from NACC and NMSC

The main functions of NACU are:

- Act as the main coordination unit and responsible for regular monitoring and evaluation of NAP AMR implementation
- Ensure regular data collection and information sharing by instituting effective communication and coordination among all stakeholders, the members of NACC and their constituencies, sectors and disciplines;
- Coordinate national activities for establishment of AMR surveillance systems
- Reporting implementation status to NACC, national agencies and international partners as required including Report on prevalence of and trends in AMR to the global AMR surveillance system (GLASS)
- Lead the drafting and update of a national action plan for containment of AMR
- Provide secretariate support to NACC, NMSC and all TSCs

Composition (minimum requirement)

- AMR program manager (technical background)
- AMR assistant program manager (technical background)
- Admin support at least one

Appointing a National Focal Point

National AMR focal (National F.P) will be assigned by MoH. National F.P point shall be responsible for coordinating AMR activities and tasks in the health, animal, fisheries, food production and environment sectors. The responsibilities of NFP will be to:

- Build sustained partnerships and work nationally and internationally on containment of AMR;
- Identify stakeholders and facilitate formation of an inclusive NACC
- Support and facilitate formation of the National AMR coordination unit (NACU) with appointment of AMR program manager, assistant program manager and admin support for the unit.
- Support NACU on drafting of a national action plan for containment of AMR
- Monitor and support the regular data collection and information sharing and facilitate provision of required resources to NACU
- Support and advocacy for AMR related activities

Forming Technical Sub Committees

Technical Sub Committees (TSC) will form an integral part of the governance mechanism in Maldives. These will be multi-sectoral in composition and will report to the NACC. They will be formed as a priority and will be mandated with specific tasks such as providing technical input, conducting situational analysis, assist in drafting NAPs, support agencies in planning and budgeting, commissioning specialised working groups and overseeing implementation of strategic interventions and corresponding key activities under the five objectives of GAP in the NAP. The Chairperson of each TSC will automatically become a member of NACC.

The proposed thematic TSCs that will be formed include:

1. Awareness
2. Surveillance
3. Infection Prevention and Control and Hygiene
4. Optimizing Antimicrobial Use
5. Research and Innovation

Each of the TSCs will be responsible for supporting the lead agencies in programme planning and budgeting referring to NAP on AMR while focusing on One Health and for coordinating between the different agencies and secretariat. They will be responsible for monitoring and evaluation and based on their interactions and review mechanisms come up with a set of workable recommendations for the relevant key agencies.

The 5 TSCs will be mandated by the NACC and will report to their chairpersons and to the AMR program manager in NACU. The organisational structure, composition, locus of coordination centre and general terms of reference are listed below. Specific jobs of individual TSCs have been detailed in the Strategic Plan document. If any member is unable to attend 3 consecutive meetings of the committee, NACU needs to inform the relevant ministry/organization.

General Terms of references of Technical Sub Committee

Technical Sub Committee (TSC) will be multi-sectoral in composition and will report to the NACC. In their respective strategic objective, the TSC will:

- Implement proposed activities by the National AMR Coordination committee in line with NAP
- Draft detailed annual plan and revise annually at sub activity level NAP
- Provide strategic direction by identifying intervention and key activities
- Conduct situational analyses
- Support lead agencies in planning and developing budget for different activities
- Monitor and evaluate implementation of strategic interventions and corresponding key activities
- Provide technical input
- Commission specialised working groups working groups

Specialised working groups will be commissioned by the TSCs for delivering on specific tasks in the respective strategic areas. The working groups will work under technical guidance and supervision of respective TSC and will comprise of in-country as well as international experts, including those from WHO/FAO/OIE. The Working groups will be tasked with functions such as evaluation of existing policies, frameworks, interventions and guidelines and the development of guidelines and standards.

Integration of NAP AMR activities into existing programs/activities

Lead agencies and supporting agencies will be identified for implementation of each of the main 7 objectives of NAP aim to integrate the activity into existing programs where possible. The lead agency will be responsible for implementation of the specific component of the NAP AMR objective, programme planning and budgeting while focusing on One Health approach. The lead agencies will be supported by TSC for implementation of the 5 main GAP objectives in NAP AMR as mentioned before.

Table 5 : NAPAMR objectives and responsibilities of stakeholder agencies

S.No	Objective	Lead Agency for implementation	Supporting agencies	implementation support
1	Establish governance structure for AMR	MoH-MFDA/NACU	QARD, HPA, MoAAW & MoFOR, MoCCEE, MoE, MoF	NMSC (Monitored by NACC)
2	Strengthen the regulatory system related to AMR	MFDA- MTG (Human)	MoAAW & MoFOR: (Terrestrial, marine and aquatic animals & Plants) MoCCEE: environmental MFDA-Food safety	NMSC (Monitored by NACC)
3	Improve awareness and understanding of antimicrobial resistance through effective communication, education and training	NACU	QARD, HPA MoAAW & MoFOR, MoCCEE MoE, Associations, MNU, NGO/ Red Cresent	TSC for Awareness
4	Strengthen the knowledge and evidence base through surveillance	NACU	QARD (HAI), MoAAW & MoFOR, MoCCEE, MFDA-Food safety HPA-disease	TSC for Surveillance
5	Reduce the incidence of infection through effective sanitation, hygiene and infection prevention measures	QARD/ NACU (IPC & patient safety incident reporting system)	HPA (WASH), MFDA-food safety, MoAAW & MoFOR, MoCCEE	TSC for IPC and hygeine
6	Optimize use of antimicrobials	QARD & MTG	MoAAW & MoFOR, MFDA	TSC for optimizing antimicrobial use
7	Sustainable investment in research, innovation and new interventions.	NACU	QARD, HPA, MoAAW & MoFOR, MoCCEE, MoE, Associations, MNU, Villa College	TSC for research and innovation

Objective 2: Strengthen The Regulatory System Related to AMR

The regulatory process of ensuring quality, safety and efficacy of antimicrobials in the country shall be implemented. Antimicrobial use in animal feeds and other non-therapeutic uses shall be restricted and the discharge of antimicrobial compounds into the environment shall be regulated. Define the regulatory role of:

1.MFDA
2. QARD
3. HPA
4. MoAAW
5.MoFOR
6.MoCCEE
7.URA (Utility Regulatory Authority)

Table 6: Objective 2- Strengthen the regulatory system related to AMR

Objective 2: Strengthen the regulatory system related to AMR						
Strategy	Activiteis	Performance indicator	Target	Time line	Lead agency	Implementing partners
2.1 Strengthen regulatory provisions on import, sale and storage of antimicrobials in human, animal health, agricultural practices and environment	2.1.1 Update the national AMR containment policy (of antimicrobials in human, animal health, agricultural practices and environment) and organizational framework within the charter of the Policy	2.1.1.1 Develop a national AMR containment policy and propose a formal organisational structure responsible for implementation of the National AMR containment policy. The Policy will mandate provisions for the five strategic objectives enshrined in GAP and NAP AMR for Maldives	1	1Q2025	NACU	MOH, MoAAW & MoFOR, MoCCEE, URA
		2.1.1.2 Required regulatory provisions updated on availability, import, sales storage and disposal of antimicrobials				

		Evaluate essential medical list (EML) to assess the antimicrobial agents. Antimicrobial agents in the EML will be considered for inclusion based on Maldives's situation of current levels of AMR, availability, supply chains, financial outlays, international guidelines and standard treatment guidelines in human medicine, veterinary medicine and aquaculture (including antimicrobial growth promoters; AGPs). Existing EML to be reviewed in light of the National AMR Containment Regulation and Policy?				
	2.1.2 Strengthen routine inspection of	2.1.2.1 Inspection reports from pharmacies (human &	Facilities at central level annually once	Annually	MTG-MFDA/ MoAAW NACU/ MFDA	MoAAW & MoFOR QARD

	the pharmacies & godowns	animal) and medication handling/storage facilities generated	Peripheral all facilities at least once before end of 2028.			
2.2 The antimicrobials in the country shall be appropriate and of proven quality, safety and efficacy	2.2.1 Ensure availability of essential antibiotics	2.2.1 Audit on availability of essential antimicrobials in market (as per the essential antimicrobial list-EAL)	80% of EAL available in market central and peripheral (take represent-ative sampling method)	Start 2024	MoH (QARD, MTG-MFDA) NACU	MoH procurement Board run hospital MoAAW & MoFOR QARD
	2.2.2 Approve market authorization for antimicrobials based on evidence of safety and efficacy and GMP audit of the manufacturers.	2.2.2.1 Market authorization issued and GMP audit reports	Annual Audit report: showing 100% of medications used are GMP verified	Annually (from 2025)	MTG-MFDA NACU	MoAAW & MoFOR QARD
	2.2.3 Conduct QC testing of antimicrobials	2.2.3.1 Antimicrobials tested	Sampling of antibiotics done according to approved sampling method (including	Annual target defined by TSC (from 2025)	MTG-MFDA and MFDA-NHL NACU	MoAAW & MoFOR QARD

			post market surveillance for substandard and falsified antimicrobial)			
2.3 The non-therapeutic use of antimicrobials in animal feed and agricultural practice including residues in food products shall be restricted	2.3.1 Regulatory provision for non-therapeutic use of antimicrobials in animal feeds/ as growth promoters	2.3.1.1 Include Regulatory provisions for non-therapeutic use of antimicrobials in animal feed in place	1	2Q2025	MoAAW & MoFOR MFDA and NACU	
2.4 Regulate antimicrobial compounds discharged into the environment	2.4.1 To strengthen regulations disposal of antimicrobials and monitoring of including waste and wastewater discharge contaminated with antimicrobials from human and agricultural usage.	2.4.1.1 Regulatory provisions to prevent contamination of the environment with antimicrobial compounds	1	2Q2025	MoCCEE NACU/ MFDA	NACU -MFDA HPA MoAAW & MoFOR MFDA Food Safety URA

2.5. Institute an effective overall M&E system of the NAP AMR components	2.5.1 Develop and implement periodic monitoring (project status check) plan for AMRNAP	2.5.1.1 Develop NAP AMR M&E tool	1	2Q2025	NACU/MFDA	MoAAW & MoFOR, HPA, QARD, MoCCEE
		2.5.1.2 Program Personnel trained on M&E	3	1Q2025		MoAAW & MoFOR, HPA, QARD, MoCCEE
		2.5.1.3 No. of monitoring reports generated	10	Bi annually (start 2025)		MoAAW & MoFOR, HPA, QARD, MoCCEE
	2.5.2 Conduct end of plan period evaluation with technical assistant from an evaluation expert and generate an evaluation report	2.5.2.1 No. of post implementation (end of plan period) evaluations conducted and report generated	1	2029 (project end period)		

Strategic Objective 3: Improve awareness and understanding of AMR through effective communication, education and training

The GAP AMR has identified the need to raise awareness of AMR and promote behavioural change through public communication programmes that target different audiences in human health, animal health (terrestrial, aquatic and marine) and agricultural practices as well as a wide range of consumers related to these sectors. The GAP AMR has also focused on making AMR as a core component of the professional education training, certification, continuing education and development in the health and veterinary sectors and agricultural practice. This approach is expected to foster proper understanding and awareness amongst professionals.

The Situation Analysis in Maldives revealed that awareness campaigns on AMR have initiated by MFDA. Awareness campaigns have been targeted to including general public and professionals in health sector and to some level AMR related awareness has been targeted to animal and food safety sector during antimicrobial awareness week.

Introduction of AMR in curricular interventions in schools has been started and some work has been done to incorporation AMR related materials into curriculum of health and allied health services. Regarding animal health and agricultural practices guidelines related to IPC and AMR in livestock and fisheries sectors are being finalized and following which conduction of awareness and training sessions for those in this field has been planned from MoAAW & MoFOR

Activities related to the third objective “Improve awareness and understanding of AMR through effective communication, education and training “will depend on the communication plan. The following activities and timeline give a suggestion for the way forward and minimum targets.

Table 7: Objective 3- Improve awareness and understanding of AMR through effective communication, education and training

Objective 3: Improve awareness and understanding of AMR through effective communication, education and training						
Strategy	Activiteis	Performance indicator	Target	Time line	Lead agency	Implementing partners
3.1 The public education and awareness shall be promoted through appropriate medium on AMR related topics; AMR, IPC, hygiene (WaSH), food safety, vaccination in human and animals etc.	3.1.1 Update the AMR communication and education strategy	3.1.1.1 Update and endorse the AMR communication and advocation strategy by AMR NACC	1	2Q2025	NACU Supported by Awareness & Education TSC	MFDA, QARD, HPA, MoAAW & MoFOR, MoCCEE, MoE, MoHE
	3.1.1.2 Develop and endorse AMR communication plan with targets for 2025-2029	3.1.1.1 TV program developed and aired	8	Bi-Annually (from 2024)		MFDA, QARD HPA, MoAAW & MoFOR, MoCCEE, MoE, MoHE
		3.1.1.2 Radio Program developed and aired3.1.1 Develop TV/radio Program on AMR and broadcast	8			
	3.1.2 Design, develop designated social media profile for AMR	3.1.2.1 Twitter handle for AMR Maldives	1	3Q2025		MFDA, QARD HPA, MoAAW & MoFOR, MoCCEE, MoE, MoHE
		3.1.2.2 Number of social media posts designed, developed, and released	50	From 2024 monthly one		
	3.1.3 Utilization of influential personalities for AMR awareness	3.1.3.1 Number of AMR ambassadors (Social media influencers, community and political level influencers) from different key areas	3	5 years (depend on comm-unication strategy)		MFDA, QARD HPA, MoAAW & MoFOR, MoCCEE, MoE, MoHE
	3.1.4 Create awareness among	3.1.4.1 Awareness sessions for school	Cover 60% of schools	Annually (from 2025)		MFDA, QARD

	students, teachers and staff	3.1.4.2 Awareness sessions for students 3.1.4.3 implementation of the AMR content in curriculum	Cover 60% of schools	Annually (from 2025)		HPA, MoAAW & MoFOR, MoCCEE, MoE, MoHE
	3.1.4. Observe Antibiotic awareness week	3.1.4.1 Awareness week observed	4	Annually (from 2024)		MFDA, QARD HPA, MoAAW & MoFOR, MoCCEE, MoE, MoHE
3.2 Education and training of healthcare and professionals	3.2.1 Incorporate in Undergraduate and post graduate curriculum for health-related fields (animal, human and environment)	3.2.1.1 AMR should be a core component in the syllabus of all relevant higher education programmes	Human health x 5 fields Animal x 1 Agricult-ure x1 Environ-ment x 1 field	4Q2027		MoE, MoHE QARD, Nursing Council, Medical & Dental Council, Allied health council
	3.2.2 CME on AMR related topics for professionals (human and animal health)- physical or online depend on communication plan	3.2.2.1 No of CMEs healthcare institutes. Depend on communication plan- develop/ provide access to online platform for healthcare professions CME on AMR	8 (minimum) for all hospitals	Biannually (start 2025)		MFDA, QARD HPA, MoAAW & MoFOR, MoCCEE, MoE, MoHE, Nursing Council, Medical & Dental Council, Allied health council
		3.2.2.2 Healthcare facilities conducting regular AMR related CMES	> 50% of hospitals	Start 2025		
	3.2.3 Educational sessions to relevant stakeholders in ministries	3.2.3.1 Number of AMR related sessions for MoH, MoAAW & MoFOR, MoCCEE, MoE staff	4	Annually		MFDA, QARD HPA, MoAAW & MoFOR, MoCCEE, MoE, MoHE, disaster, defense

	3.2.4 Evaluate and ensure AMR related fields are incorporated in the training priority list for the country	3.2.4.1 Conduct a needs based assessment to develop human capacity for AMR related fields (for eg: Microbiology, Infectious diseases, Clinical Pharmacy, Infectious control nurse training, CSSD technicians, veterinarian, Food safety specialist, environment scientists etc.). priority list developed training in AMR related fields and shared with relevant authorities:	1	1Q2025		MFDA, QARD HPA, MoAAW & MoFOR, MoCCEE
		3.2.4.2 Ensure that the priority fields are included in annual training opportunities announced by Ministry of Higher Education				
3.3 Information on IPC, AMR and antimicrobial stewardship (human and health) for staff in healthcare and other relevant institutes	3.3.1 Develop AMR related content for staff orientation program at the time of joining (hospitals, pharmacy, clinics, institutes etc. related to human and animal). This maybe an online platform for staff to participate.	3.3.1.1 AMR module developed for In-service orientation	1 (human)	2Q2025		MFDA QARD HPA MoAAW & MoFOR MoCCEE
			1 (animal)			
		3.3.1.2 Participation of newly joined healthcare staff	> 50 % of newly joined staff from health care facilities	Annually from 2025		MFDA QARD HPA MoAAW & MoFOR MoCCEE

	3.3.2 AMR sessions for staff in key agencies	3.3.2.1 Number of AMR related sessions for MoH, MoAAW & MoFOR, MoCCEE, MoE staff	20	Annually from 2025		MFDA QARD HPA MoAAW & MoFOR MoCCEE
	3.4.1 Evaluate effectiveness of AMR related trainings and awareness activities through effective evaluation tools	3.4.1.1 KAP studies on AMR awareness	4	Annually from 2025		
	3.4.2 Evaluate cultural drivers of health-seeking and health-providing behaviours, which affect the management of drug-resistant infections and patient outcomes	3.4.2.1 KAP study to evaluate cultural drivers of health seeking and health providing behaviour				

Strategic Objective 4: Establish Surveillance and monitoring system for AMR

The GAP AMR identifies the need to establish evidence-based surveillance for AMR in the nation and identifies the following critical information/evidence gaps:

- Descriptive epidemiology of resistant organisms as they emerge
- Understanding how resistance develops and spreads
- The ability to rapidly characterise the emergent resistant organisms
- Understanding social sciences, behavioural and other research needed for holistic fulfilment of all five strategic objectives
- Treatment and prevention of infections, especially in the low resource settings
- Basic and translational research to support the development of new treatments, diagnostic tools, vaccines and other interventions
- Alternatives to non-therapeutic uses of antimicrobial agents in the context of agriculture, aquaculture and their use in crop protection
- Economic research

The situation analysis revealed that several elements of systematic AMR surveillance are not in place in different sectors such as required surveillance standards or guidelines, laboratory standards, systematic data collection and analysis including electronic reporting, recording and linkage with HAI surveillance. Human health sector is ahead with an institutional level bacterial AST and initial efforts to put quality assurance system in selected laboratories performing AMR testing. However, animal health sector has no AMR surveillance in the emerging food animal production systems of poultry, goat farms and aquaculture.

Maldives will consolidate and strengthen the AMR surveillance. Initially by strengthening the current lab-based reporting from healthcare institutes for informed decision and amend policies. It is planned to develop a high-quality AMR surveillance system that will integrate AMR surveillance in laboratories, hospitals, AMU and surveillance in animal and environmental sectors by second quarter of 2025, together with mechanism for early warning system for timely identification of emergence of resistance in priority pathogens and to critical antimicrobials. The Plan will be rolled out as below:

Table 8: Objective 4- Establish Surveillance and Monitoring System for AMR

Objective 4: Establish Surveillance and Monitoring System for AMR						
Strategy	Activiteis	Performance indicator	Target	Time line	Lead agency	Implementing partners
4.1 Lab-based AMR surveillance shall be established	4.1.1 Establish Microbiology testing facilities at all major Hospitals/Labs (including government and private)	4.1.1.1 Microbiology testing facilities equipped and strengthened	All hospitals	1Q2025	QARD	NACU
		4.1.1.2 No. of Lab personnel trained	2 from each hospital	Annually	QARD	
		4.1.1.3 Adherence to National Clinical laboratory Standard	50% of government/ 20 % private	1Q2025	QARD	
		4.1.1.4 Participated in External quality assessment	20% government	Annually	QARD	
	4.1.2 Lab based AMR surveillance training and networking	4.1.2.1 Develop SOP on lab-based surveillance, with defined priority pathogens and mechanism for early detection of outbreaks	1	1Q2025	QARD/HPA	
		4.1.2.2 No. of training conducted	3 (from 2024)	Annually	QARD/HPA	
		4.1.2.3 Lab testing standardized	100% 2025	Annually	QARD	
		4.1.2.4 Number of labs releasing monthly antibiograms	IGMH & ADK (with location OPD/ IPD)	3Q2024	QARD/HPA	
			Other hospitals to release monthly antibiograms (with location IPD/OPD)	4Q2027		

4.2 Lab-based antimicrobial residual surveillance shall be established in food and food products	4.2.1 Strengthen antimicrobial residual testing facilities for food products	4.2.1.1 antimicrobial residual testing facilities equipped	1	3Q2025	MFDA-NHL and food safety	NACU
		4.2.1.2 No. of Lab personnel trained	2 (minimum)	3Q2025	MFDA-NHL and food safety	
		4.2.1.3 Sampling guideline and testing SOPs developed and sensitized	2	3Q2025	Food Safety MFDA/NHL	
		4.2.1.4 Procure updated editions of AOAC/IS	3	3Q2025	Food Safety MFDA/NHL	
		4.2.1.5Subscribe to External Quality assessment (PT/ILC) and procure QC sample	3	3Q2025	Food Safety MFDA/NHL	
		4.2.1.6 Reports generated on level of antibiotic residue in food and food products	3	4Q2025	Food Safety MFDA/NHL	
4.3 Lab-based Antimicrobial residual compound and resistance pathogens shall be established in the environment	4.3.1. Develop national risk assessment framework for antimicrobial compounds and antimicrobial resistant pathogens in environment	4.3.1.1 Develop national risk assessment framework for antimicrobial compounds and resistant pathogen testing in the environment integrated with surveillance in humans, animals and plants	1	1Q2025	MoCCEE NACU	MoAAW & MoFOR MFDA HPA QARD
	4.3.2 Strengthen antimicrobial	4.3.2.1 AMR residual testing facilities equipped	1	4Q2025	MoCCEE NACU	MFDA-NHL

	compounds and their residues testing from environment	4.3.2.2 No. of Lab personnel trained	2	1Q2025		
		4.3.2.3 Sampling guideline and testing SOPs developed and sensitized	1	1Q2025		
		4.3.2.5 Subscribe to External Quality assessment (PT/ILC) and procure QC sample	5	Annually (from 2025)		
		4.3.2.5 Reports generated on level of antimicrobial compounds and resistant pathogens environmental samples	5	Annually (from 2025)		
	4.3.3 Resistant pathogen testing in environment	4.3.3.1 Sampling guideline and testing SOPs developed and sensitized	1	2Q2025	MoCCEE	NACU
		4.3.3.2 Reports generated on antimicrobial resistant rates in defined pathogens	5	2Q2025		
4.4 Antimicrobial consumption surveillance shall be established	4.4.1 Establish monitor antimicrobial consumption	4.4.1.1 Guideline and plan developed for measuring antimicrobial consumption (regular surveillance and PPS)	2 (one for human and one for animal)	1Q2025	MTG-MFDA MoAAW & MoFOR (Agriculture, Aquaculture)	QARD NACU
		4.4.1.2 Health professionals trained on antimicrobial consumption and PPS methodology	Train minimum 2 staff from each tertiary hospital	1Q2025		
	4.4.2 Reporting of Antimicrobial consumption	4.4.2.1 Reports on antimicrobial consumption generated (may choose priority areas like ICU/ medical/ward	All Tertiary care hospitals Human once/ year	Annually (from 2025)		

		medical ward/ OT/ surgical ward etc) continuous monitoring at least 3 monthly (preferred for tertiary care hospitals) or Point prevalence survey	80% of other human health facilities once by 2028	From 2025		
			50% of Animal farms	Annually (from 2025)		
		4.4.2.2 Audit on OTC sales of antimicrobials from pharmacy	4 (Focused on islands with high population)	Annually (from 2025)		
4.5 Health Care associated Infections surveillance shall be strengthened	4.5.1 Training of health Professional on HAI surveillance (only in Human Health)	4.5.1.1 IPC teams from major hospitals trained on HAI surveillance	2 from each hospital	1Q2025	QARD	NACU
	4.5.2 HAI surveillance reports generated	4.5.2.1 HAI surveillance reports generated	25% of hospitals	1Q2025		
4.6 Develop integrated one health surveillance system for AMR	4.6.1 Develop integrate the AMR surveillance with early warning system	4.6.1.1 Develop integrated surveillance framework and system	1	1Q2025	NACU/ MFDA	QARD HPA MoAAW & MoFOR MOCCEE

For evidence-based decision making and policy amendments	in place for alerts on AMR	4.5.1.1 IPC teams from major hospitals trained on HAI surveillance	1	4Q2026		

Strategic Objective 5: Hygiene, Infection Prevention and Control (IPC)

Infection prevention and control, especially in the context of hospitals, is an important aspect of a strategic plan to contain AMR since clinical settings represent an ecosystem of high antimicrobial usage. Within this ecosystem exists patients, who may be immunologically impaired. These patients not only represent the population that is vulnerable to serious life-threatening infections and at the same time, they promote the emergence of resistance.

On the other hand, better hygiene (WASH) and Infection prevention control represent methods to cut down on the spread of infections in ambulatory human and animal care facilities, in food production systems and in the community in general. Vaccination in humans and animals and biosecurity in food production systems are specific interventions that if implemented effectively, can result in better health outcomes and reduced risk of emergence of AMR. The Situation Analysis of measures related to hygiene, infection prevention and control in human, animal and related sectors in Maldives reveals frameworks that have been developed.

With regards to standardised guidelines, awareness, training and resources, the quality and scale of implementation has been less than optimal. Health Care Quality Standards are platforms that could be capitalised. Work has been done to develop and draft national standards and guidelines, such as the national drug policies, updated essential medicines lists and standard treatment guidelines. Though implementation has been poor, work has started on stewardship programme in healthcare settings or ambulatory settings, in human and animal health and food production sectors and HAI surveillance.

Human vaccination programs are well-developed programs that will be further consolidated and animal vaccination strengthened.

Table 9: Objective 5- Reduce incidence of infection through effective sanitation, hygiene and infection prevention measures

Objective 5: Reduce the incidence of infection through effective sanitation, hygiene and infection prevention measures						
Strategy	Activiteis	Performance indicator	Target	Time line	Lead agency	Implementing partners
5.1 Infection control and prevention practices shall be strengthened	5.1.1 Working group to evaluate existing IPC and HAI (human) guideline and finalize the data flow mechanism for HAI surveillance and submit for endorsement by NACC. For animal develop IPC guideline and endorse	5.1.1.1 Endorsement of IPC and HAI guideline	1 x human health	1Q2025	QARD (Human health) MoAAW & MoFOR (Agricu-lture & Acqua-culture)	HPA with MOCCEE-WASH & waste NACU/ MFDA
			1 x animal health	1Q2025		
	5.1.2 Healthcare institutions to adapt the national IPC guideline	5.1.2.1 No. of healthcare institutes have adapted the national IPC guideline	80% healthcare monitor via annually WHO tool	1Q2025		
5.2 Facility level IPC program	5.2.1 Constitute IPC committee healthcare facilities according to national IPC guideline	5.2.1.1 IPC committee in all health care facilities (human) IPC focal point in animal health	80% of tertiary hospitals	1Q2025		
	5.2.2 Designated trained Infection Control Officer at	5.2.2.1 Centers with Infection control officer	80% of hospitals	1Q2025		

	hospital levels (clinician and / microbiologist)					
	5.2.3 Designate trained Infection Control Nurses (ICN) at healthcare facilities (minimum 1 ICN/ 250 beds for tertiary care hospitals)	5.2.3.1 Centers with dedicated ICN	80% of hospitals	1Q2025		
		5.2.3.2 Centres with designated ICN but not dedicated	80% of other health facilities			
5.1 Monitor IPC related activities human and animal health	5.3.1 Monitor IPC program at health facilities (human and animal health).	5.3.1.1 Monitor IPC program facility level with WHO tool-human	100 % of hospitals and 80% of other health facilities	Annually (start 2024)	QARD MoAAW & MoFOR	NACU/ MFDA
		5.3.1.2 Monitor IPC program facility level animal health -get tool/develop	70% of animal health facility (start 2026)			

Strategic Objective 6: Optimise and monitor Use of Antimicrobial Medicines

Use of antimicrobials in any form, even when rational and prudent, can precipitate resistance in target microbes. High antibiotic use may reflect over-prescription, easy access through over-the-counter sales, and more recently sales via the Internet which are widespread in many countries.

The situation analysis reveals that Maldives has a fully functional National Regulatory Authority that is responsible for regulation and licensing;

drug import and pharmacovigilance. Post licensing inspections including for retail pharmacies and OTC sales are carried out on national scale regularly. However, limited human and technical resources as well as the complex challenges of import-based system of procurement limit the effectiveness of regulatory activities. Import of AMAs used in food animal production sector including aquaculture is covered by the regulatory framework. The country lacks important instruments and systems such as a National AMR containment policy, AMU surveillance including surveillance of sales of antimicrobial agents. Animal health sector lags on all of the above fronts and is also constrained by lack of regulatory powers.

Maldives will establish a robust system for regulation and surveillance of use of antimicrobial agents for control of use of antimicrobial substances in human, animal and food production sectors. Some of the measures taken will include an empowered National Drug Regulatory Authority, import frameworks favourable to regulatory requirements, update (with systemic efforts to ensure medications utilized in the country have verified GMP and GHP), the National AMR Containment and Use Policy and related regulatory frameworks, finalize the standard treatment guidelines with special reference to use of antimicrobial agents, Strengthening the National Antimicrobial Stewardship Programme and AMU monitoring programme in human and food animal production systems, ambulatory and community settings and including, residues testing in food products. Formal assessments will be carried out at the end of this period before nationwide scale up. The Strategic Plan to establish the above is as outlined below:

Table 10: Objective 6- Optimize and monitor use of antimicrobial medicines

Objective 6: Optimize and monitor use of antimicrobial medicines						
Strategy	Activiteis	Performance indicator	Target	Time line	Lead agency	Implementing partners
6.1 Guidelines, protocols and clinical treatment pathways shall be developed/ updated for the management of infectious diseases to promote rational use of antimicrobials.	6.1.1 Develop and revise antibiotic guideline for human use	6.1.1.1 antibiotic treatment guideline developed and revised for human use	1	1Q2025	QARD	NACU
		6.1.1.2 Antibiotic guideline app developed	1	1Q2025	QARD	
	6.1.2 Develop antibiotic guideline for animal use	6.1.2.1 antibiotic guideline developed for animal health use	1	1Q2025	MoAAW & MoFOR	
	6.1.3 Revise the antibiotic stewardship guideline based on the antibiogram generated through laboratory surveillance	6.1.3.1 antibiotic stewardship guideline revised	1	1Q2025	MTG MFDA	
	6.1.4 Constitute the Antimicrobial Stewardship (AMS) committee or AMS team with defined TOR (to function under IPC committee or independently) to	6.1.4.1 AMS Team constituted with TOR	80% of hospitals	2Q2025	MTG-MFDA QARD	

	carry out stewardship functions in the hospital					
	6.1.5 Stewardship teams active in the hospital	6.1.5.1 Antimicrobial restriction forms being utilized in the hospital with either a pre-authorization mechanism and/or post audit feedback mechanism for providers on prescribing patterns in place	90% of care hospitals	3Q2025	MTG-MFDA QARD	

Strategic Objective 7: Develop the Economic Case for Sustainable Investments by taking into account the needs of the country regarding new Medicines, Diagnostic Tools, Vaccines, Research and Other interventions

The GAP AMR posits that the economic case should reflect the need for capacity building and training in low resource settings, while developing evidence-based interventions to reduce infections and combat AMR. The 2001 strategy for AMR containment could not achieve its goals; one of the reasons cited for the same is that there was absence of economic assessments, which evaluated the cost of doing nothing versus the cost/benefits of action at the present.

The Situational Analysis in Maldives indicates that there is some prioritization of research on AMR by both policy makers and research community, though a proper research plan is not in place. Limited evidence exists on the nature and extent of AMR as a public health threat and drivers of AMR and AMU. This calls for policy and program relevant research to support planning and implementation of public health interventions. The phase of development of the health system provides an opportunity to put in place strategic research agenda for public health research and AMR in particular to inform health system responses.

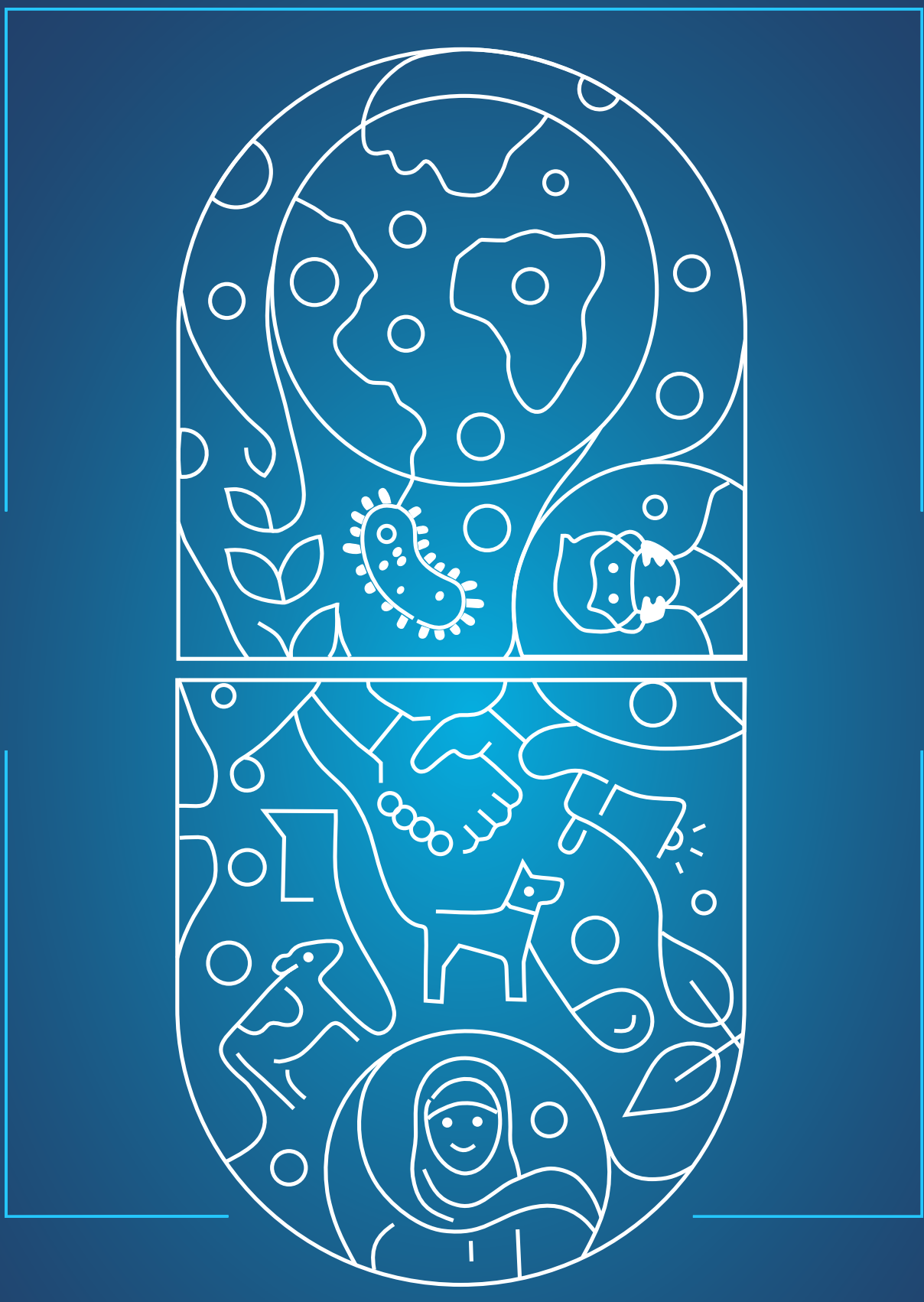
The Strategic Plan lays down a roadmap for establishing a strategic research agenda, with systematically prioritised research areas and knowledge gaps related to AMR that will feed into a national policy for research and innovation. According to NAP AMR multi-stakeholder platform and consortia will be established that will generate program and policy relevant evidence on and compare cost effectiveness of AMR control strategies. The strategic plan also envisions collaborations with national and international agencies, for implementation of strategic research agenda. This will be one of the key strategies for Maldives, given its existing nature of AMR threat and limited institutional capacity.

Table 11: Objective 7- Develop the economic case for sustainable investment by taking into account the needs of the country regarding new medicines, diagnostic tools, research and other interventions

Objective 7: Develop the economic case for sustainable investment by taking into account the needs of the country regarding new medicines, diagnostic tools, vaccines, research and other interventions						
Strategy	Activiteis	Performance indicator	Target	Time line	Lead agency	Implementing partners
7.1 Research on AMR shall be a priority and need-based research shall be promoted to generate evidence for clinical practice, rational use and support policy and planning.	7.1.1 Develop a research agenda for prioritization of AMR related areas	7.1.1.1 Research agenda developed	1	2Q2025	NACU with NACC research TSC	MFDA QARD HPA MoAAW & MoFOR (Agriculture and maniculture) MoCCEE MMA MNA Allied health Societies Relevant Universities Health institutes Livestock handlers Environmental agencies
	7.1.2 Prioritize and conduct research in human health related to AMR	7.1.2.1 Human Health related AMR Study published	80% agenda	Annually (from 2025)		
	7.1.3 Prioritize and conduct research in animal, food safety and environmental surveys related to AMR	7.1.3.1 Number of animals, food safety and environmental AMR related studies published	80% of research agenda	Annually (from 2025)		
	7.1.4 Collaborative research on AMR	7.1.4.1 Number of collaboration research conducted	80% of research agenda	Annually (from 2025)		
7.2 New innovation, ensure access and supply	7.2.1 Evaluate the needed new antibiotics or diagnostics for improved	7.2.1.1 Undertake a need assessment and develop a	1	1Q2025	NACU with NACC research TSC	MFDA QARD HPA

	antimicrobial utilization and infectious disease management processes.	report for required antibiotics and new diagnostic technologies, vaccines plan				MoAAW & MoFOR (Agriculture and maniculture) MoCCEE
	7.2.2 Discuss needed vaccination for preventing AMR (adults and children) hold discussion with MTAGI	7.2.2.1 Meeting minutes of meeting with MTAGI	1	2Q2025	NACU/ MFDA with NACC research TSC	

NA= not applicable



Annexure

Annex 1. SWOT analysis on AMR program implementation

Table 12: SWOT analysis on AMR program implementation

Present factors	Helpful Strength	Harmful Weaknesses	
	Support available for critical health and environment related issues, such as pandemic response, WASH and waste management. Support for introduction of new vaccines (COVID-19, PCV, Rota)	Limited awareness of AMR, Surveillance and IPC at high level	**Awareness and political will**
	AMR committee established. Focal point in MFDA for AMR was available for some time and undertook AMR related activities and trainings. Committed staff in MoH but not dedicated to AMR	National level poor leadership support, poor coordination mechanism and governance for AMR related activities. High level Multi-Sectoral Steering Committee (NMSC) for AMR not formed AMR coordination unit not available with dedicated staff for coordinated activities	**Coordination and stakeholder engagement**
	National level budget available for certain activities: immunization, some IPC related activities, waste management.	Lack of National level dedicated budget for AMR related activities: awareness, education, surveillance, Monitoring & evaluation, Research and Development.	**Financial resources**
	Infection control and link nurses available in many health facilities. Clinicians with knowledge of AMR available in many centres. National level IPC guidelines and Stewardship guideline available. Some tertiary hospitals have trained microbiologists and clinicians with knowledge of AMR IPC training conducted for various health facilities Global guidance documents and technical support available on AMR related issues and	Limited trained staff in health care facilities in surveillance activities, high turnover of staff. Lack of knowledge on stewardship Inadequate AMR related lab knowledge	**Technical capacity**

	IPC related activities: MoH QA dedicated unit/focal point available? IPC committees established in some health facilities. Immunization related activities: MTAGI and dedicated unit in HPA available	Dedicated unit/human resource for coordination of AMR related activities at national level not available Poor coordination with other already existing programs: TB, IPC, immunization, WASH Limited number of quality microbiology labs Private animal sector not on board	**Structures or enablers for implementation**
	National AMR committee and technical subcommittees formed and few meetings conducted Training for AMR and GLASS reporting undertaken	Limited trained dedicated staff at national level and facility level for AMR related activities,	**Implementation of NAP AMR activities**
	Few tertiary level hospitals in process of collecting AMR related data. Antimicrobial import being monitored at national level	Poor reporting of HAI, AMR data to national level and international platforms (GLASS) Poor monitoring of rational use of antimicrobials. Lack of national level, regular and adequate, measurable outcome or process indicators of NAP	**Monitoring and Data**
	Opportunities	**Threats**	
Future factors	Establish AMR governance structures and generate awareness on AMC surveillance at the highest political level through advocacy	Sustaining high level political commitment & support during unstable political periods and change of high-level posts.	**Awareness and political will**
	Establish AMR governance structures and coordination mechanism with national level AMR coordination unit, National level human health AMR and Animal health AMR focal point, and improve coordination with established national level programs Involve private sector in AMR activities	High turnover of staff at different levels and lack of adequate replacements. Staff may get diverted for other work (pandemic response/ outbreaks etc)	**Coordination and stakeholder engagement**

	Donor funds can be made available for AMR related activities Identify internal donor fund streaming / better integration of AMR related issues into existing programs	Limited duration of availability of donor funds	**Financial resources**
	Conduct training and awareness on AMR (IPC, antimicrobial stewardship, animal health, aquatic animal health, food safety etc.) Integrate HAI surveillance with AMR reporting using Infection control nurses and link nurses in health facilities. Each health facility to have an infection control officer (clinician or microbiologist) responsible for AMR and antimicrobial stewardship. Animal health establish national focal point (vet), include IPC, HAI and stewardship component in animal health. Reporting of outbreaks in veterinary facilities etc. Assess laboratory capacity / integrate and support for laboratory component of animal AMR related surveillance/ Food safety: establish antimicrobial residue testing	Sustaining of IPC and AMR related activities as trained staff maybe allocated for other tasks: (pandemic preparedness, Quality related activities etc). High turnover of trained staff	**Technical capacity**
	Establish well defined AMR governance structure, with dedicated unit for coordination of AMR related activities and annual plan	Sustainability and high human turn over	**Structures or enablers for implementation**

	Establish well defined AMR governance structure, with dedicated unit for coordination of AMR related activities and annual plan		
	Identify champions at different levels (political, councils, social media, religious etc). TOTs for AMR related education and training (could be the ICN or Infection control Officer at health facility level)	Competing interest from private sector on reporting such as outbreaks etc.	**Implementation of NAP AMR activities**
	Use surveillance data for standard of care and economic case for implementing AMR activities Strengthen monitoring indicators (process and outcome based) for measuring NAP implementation and use for advocacy	Limited data (monitoring and surveillance) shared within and in-between sectors may lead to inconsistent messaging on AMR	**Monitoring and Data**

Annex 2. Situation analysis of NAPAMR 2017 to 2022 implementation

Table 13: Situation Analysis of NAP AMR 2017-2022 implementation

Strategic Objective	Planned Strategic intervention	Sub-Activities	Target	Status
1. Awareness	1.1: To improve awareness of AMR amongst the general public and professionals	Conduct KAP Studies on AMR, AMU,(human and animal) environmental relationships in different target groups (school students and teachers, general public, policy makers, clinicians, pharmacists, nursing staff, farmers in poultry/ goat/aquaculture farming, pet owners and pet shop owners)	2017	2
		Design evidence-based communication campaigns with accurate and relevant messages targeting priority groups	2018	2
		Roll out communication campaigns on AMR	2017-2018	2
		Incorporate AMR and related topics in school grade 1-12 school curricula. Limited scale testing of revised curriculum along with regular audit of courses will be conducted before planning a nationwide scale up by 2022	2019	3
		Evaluate communication campaigns followed by nationwide implementation. Pilot campaigns will be evaluated in 2019. This will be followed by nationwide scale up and scale out of awareness campaigns in 2019 with regular monitoring and evaluation		2
	1.2 Improve knowledge of AMR and related topics in professionals through professional education and training deployed at national scale	Conduct KAP Studies to assess gaps in knowledge on AMR, hygiene & IPC, environmental relationships in professional groups	2017-2018	2
		Revise and roll out professional development courses of human and animal health, the food industry and agriculture sectors to include topics on AMR and related issues. Roll out of courses will be done on a limited scale along with concurrent regular audits followed by nationwide scale up.	2019-2020	1
		Revise undergraduate and postgraduate curricula in human and animal health, Food industry and Agriculture sector to include topics on AMR and related issues. Limited scale testing of revised curriculum along with regular audit of courses will be conducted before planning a nationwide scale up in next phase of NAP	2020-2022	1

Strategic Objective	Planned Strategic intervention	Sub-Activities	Target	Status
2. Surveillance of AMR	2.1 Establish a national coordination structure for surveillance of AMR	Establish AMR Surveillance Coordination Unit, define mandates, terms of reference and identify a focal point. The ASCU will be located in the MFDA	2017	1
		Develop a One Health AMR guidelines and plan for surveillance in humans, animal and food industry based on international standards and guidelines	2017-2018	1
		Enlist priority pathogens and antimicrobials for surveillance in human, animal and food industry	2017-2018	3
		Assess and inventory of resources for sentinel environmental surveillance (ASCU with EPA and Ministry of Environment)		1
		Conduct trainings on AMR surveillance for surveillance staff		1
		Develop an integrated human and animal IT platform for AMR surveillance reporting. WHONET platform will be implemented for epidemiological and laboratory AMR surveillance data entry, storage and transmission in human clinical and food testing labs		1
		Implement National AMR Surveillance Program including sentinel environmental surveillance of antimicrobial resistance organisms and antimicrobial residues. IGMH, Regional Hospitals and Atoll Hospitals with existing Bacterial AST facility will be targeted in the pilot phase. Additionally, ADK Hospital from private sector will be included as a surveillance site. For animal surveillance selected poultry commercial, goat farms and aquaculture farms will be recruited and specimens submitted to NHL	2019-2022	2
		Establish formal linkage of National AMR Surveillance Programme and WHO GLASS	2021-2022	2
		Conduct formal assessment of National AMR Surveillance Program		1
	2.2: Build laboratory capacity under the leadership of a National Referral Laboratory (NRL) to produce high-quality microbiological data for patient and food-safety management and support surveillance activities.	Identify National Reference Laboratory (NRL) for AMR Surveillance in Maldives with expertise in methods for confirming and characterising specific pathogens, performing susceptibility testing, organising quality assurance and participating in external quality assurance schemes (EQARDS). The Microbiology Laboratory at IGMH will be identified as NRL.		2
		Identify participating laboratories of National AMR Surveillance Network that are capable of identifying target pathogens and perform susceptibility testing (centres as per section 2.1)		2
	2.3 Develop a multi-centric surveillance system on the national scale to provide early warning of emerging resistance and monitoring of secular trends at national and sub-national levels.	Establish a network of agencies for AMR hazard and risk assessment	2017-2019	1

Strategic Objective	Planned Strategic intervention	Sub-Activities	Target	Status
		Develop and disseminate guidelines and national standards for systematic collection, sharing, and assessment of AMR hazard events		1
		Enlist priority pathogens and AMAs for AMR hazard risk assessment		2
		Conduct surveys to establish baseline estimates and trends of AMR to determine risks and establish thresholds for alerts and action systems		1
		Establish a central library or database on AMR risk information	2020-2021	2
		Conduct and communicate comprehensive real time analysis of AMR hazards in the human, animal, food industry and environment sector to inform programme planning and action	2021-2022	1
3. Hygiene, Infection Prevention and Control (IPC)	3.1: To establish a national infection prevention and control programme through full implementation and compliance	Evaluate existing IPC, and Biosecurity guidelines. Develop a national IPC policy, mandating the creation and harmonization of National IPC Programmes in healthcare facilities and food production systems (poultry, goat farms, aquaculture)		2
		Develop IPC guidelines with implementation for infection prevention and control in all health care settings (hospital and ambulatory) in human sector; IPC/biosecurity in animal health facilities (hospital and ambulatory), vaccination, and biosecurity in the farm to fork chain		2
	with the IPC guidelines within c	Identify target groups to be trained in IPC from different sectors and at different levels		2
		Train target groups in different sectors in IP		2
		Roll out IPC program in human health, animal health and food industry		2
		Review existing professional curricula for content on IPC and develop training modules for their incorporation into professional courses	2019-2020	2
		Assess National IPC Programme and recommend Nationwide scale up in human, animal healthcare facilities, food production systems.	2022	2
	3.2: Decrease Hospital Acquired Infection (HAI) and associated AMR (Human Health)	Develop guidelines for Hospital Associated Infection (HAI) Surveillance	2017-2018	3
		Implement a pilot scale on HAI surveillance in select public and private healthcare facilities	2019-2022	3
		Integrate HAI surveillance network into National AMR surveillance network; Conduct formal assessment of HAI Surveillance network for nationwide scale-up	2022	1
	3.3: To limit the development and spread of AMR outside health settings	Review and evaluate the existing national campaigns on water, sanitation & hygiene (WASH), food safety, and vaccination in humans and animals	2017	2
		Implement formal campaigns for sanitation and hygiene in human, animal, food animal production sector	2018	2
				3 Human

Strategic Objective	Planned Strategic intervention	Sub-Activities	Target	Status
		Evaluate existing vaccination programme in human and animal sectors for their effectiveness and coverage		1 Animal
		Review and revise undergraduate and post graduate curricula to include course content related to water, sanitation, hygiene and food handling practices	2018-2019	2
		Evaluate campaigns on hygiene and sanitation	2019	2
4: Optimise Use of Antimicrobial Medicines	4.1: Establish a national Antimicrobial Stewardship Programme on a national scale to improve and measure the appropriate use of antimicrobials	Develop a national AMR containment policy and organizational framework within the charter of the Policy	2017-2019	3
		Formulate a regulatory framework for control of antimicrobial substances in human, animal sectors and food industry		2
		Develop standard treatment guidelines (STGs) for antimicrobial use in human and animal healthcare and food industry		2
		Conduct surveys to characterize institutional Antimicrobial Stewardship Programmes (AMSP)		2
		Develop evidence-based guidelines for a National AMSP		3
		Implement AMR containment policy for control of human and veterinary use of antimicrobial substances in human and animal health care, ambulatory and community settings and food industry	2018-2022	2
	4.2: Regulate post-marketing quality of drugs to ensure access to safe and quality antibiotics	Formulate a National Drug Policy with special reference to AMAs and AMR applicable to human, animal health, and food industry. Introduce legislation and regulations on AMAs for veterinary use.	2017	2
		Strengthen existing National Drug Regulatory Authority and establish additional regulatory frameworks. Human resource and technical capacity of National Health Laboratory of MFDA will be strengthened to establish systematic surveillance of quality of imported drugs and food at points of entry	2017-2019	3
		as well as post marketing surveillance of drugs and food. MFDA will cover drugs used in human health, extend similar regulatory framework to import medicines for animal health, aquaculture and food production		1
		Establish import procurement systems favourable to regulatory compliance		1
		Establish a system for the coordination and collation of data on drug quality		3
		Establish and implement an institutional network with the capacity for quality control and enforcement of regulatory provisions for antimicrobial agents or APIs	2017 -2022	2
		Conduct independent periodic surveys to estimate the extent of OTC and inappropriate sales of antibiotics and APIs		3

Strategic Objective	Planned Strategic intervention	Sub-Activities	Target	Status
	4.3: Establish mechanisms to monitor antimicrobial usage on a national scale to inform interventions to reduce overuse and promote prudent use of antimicrobial substances	Establish AMU Surveillance coordination structure	2017	1
		Design an AMU and residue monitoring program in humans, animals and food industry; develop guidelines to implement residue testing	2018	2 AMU humans only
		Implement AMU surveillance and residue testing	2019-2022	2 AMU only
		Conduct integrated analysis of AMU, AMR and residue surveillance data to guide programme planning		2 AMU only
5: (Economic) Case For Sustainable Investments And Increase Investments In New Medicines, Diagnostic Tools, Vaccines And Other Interventions To Reduce Antimicrobial Use	To promote sustainable investment in new medicines, diagnostic tools, vaccines and other interventions by developing a strategic research agenda and national research policy	Create an inventory of relevant networks, initiatives, institutions and experts involved in AMR research	2017-2018	2
		Develop a Strategic research agenda, with systematically prioritised research areas and knowledge gaps in the field of AMR		1
		Develop a National AMR Research Policy	2017-2018	1
		Establish a multi-stakeholder platform to guide AMR research and innovation	2018-2019	1
		Document and disseminate to different stakeholders, evidence on AMR and related issues for policy and programme intervention	2020-2022	1

Annex 3. Tripartite AMR Country Self-Assessment Survey 2022 Maldives (TrACSS)- AMR governance component

Table 14: Tripartite AMR Country Self assessment Survey 2022 Maldives (TrACSS)- AMR governance component

NAP AMR governance			
Summary of multisector indicators		**Sectors involved in AMR multisector coordination**	
Formulated multisector coordination mechanism	NO	Human health	YES
Developed NAP AMR	YES	Terrestrial animal health	YES
Implementing NAP AMR	YES	Aquatic animal heath	NO
Country in the process of revising NAP AMR or developing new one	YES	Plant health	YES
Country has a monitoring and evaluation plan for AMR	NO	Food production	NO
Country has government supported nationwide awareness campaigns	NO	Food safety	YES
Country has established or started the implementation of an integrated surveillance system for AMR	NO	Environment	YES

Annex 4: Facility level data collection tool for IPC and Antimicrobial Stewardship Program (AMSP)

Assessment on Facility level (Infection Prevention and Control (IPC) and Antimicrobial Stewardship (AMS) program (World Health 2018, World Health Organization 2018, Purva, Randeep et al. 2019)

Name of the healthcare facility: _____

Total inpatient bed number _____

Services provided by the facility:

- OPD ☐
- IPD ☐
- Surgical ☐
- Day care (dialysis etc): ☐

Date of filling the assessment form: dd /mm /year

Staff who took part in filling the form (Put the main responsible person as number one)

	Name	Designation	Job role	comment
1				
2				
3				
4				

Known published studies on IPC, HAI or AMR from the facility and/from Maldives. Please provide link below

1.

2.

3.

4.

PART 1: FACILITY LEVEL IPC PROGRAM

Table 15: Facility level IPC program assessment tool (adapted from WHO)

Question	Answer	Score
[illegible]	[illegible]	[illegible]
Subtotal score		[illegible]

[illegible]

[illegible] Infection Prevention and Control (IPC) guidelines

Question	Answer	Score
1. Does your facility have the expertise (in IPC and/or infectious diseases) for developing or adapting guidelines?	[illegible]	[illegible]
	[illegible]	[illegible]
2. Does your facility have guidelines available for:		
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

[illegible]

4. Are the guidelines in your facility consistent with national/regional guidelines (if they exist)?		
5. Is implementation of the guidelines adapted according to the local needs and resources while maintaining key IPC elements?		
6. Are frontline health care workers involved in both planning and ensuring the implementation of IPC guidelines in addition to IPC personnel?		
7. Are relevant stakeholders (for example, lead doctors and nurses, hospital managers, quality management) involved in the development and adaptation of the IPC guidelines to address local IPC problems?		
8. Do health care workers receive specific training needed to new or updated IPC guidelines introduced in the facility?		
9. Do you regularly monitor the implementation of at least some of the IPC guidelines in your facility?		
Subtotal score	/100	

Question	Answer	Score
1. Are there personnel with the IPC mandate (to IPC and/or infectious diseases) to lead IPC training?		
2. Are there additional non-IPC personnel with adequate skills to serve as trainers and mentors (for example, link nurses or champions)?		
3. How frequently do health care workers receive training regarding IPC in your facility?		
4. How frequently do clinical and other personnel directly involved in patient care receive training regarding IPC in your facility?		
5. Does administrative and managerial staff receive generic training regarding IPC in your facility?		
6. How are health care workers and other personnel trained?		
7. Are there periodic evaluations of the effectiveness of training programmes (for example, hand hygiene audits, other objective assessments of knowledge)?		
8. Is IPC training integrated in the clinical practice and training of other specialties (for example, training of surgeons involves aspects of IPC)?		
9. Is there specific IPC training for patients or family members to minimize the potential for health care-associated infections (for example, immunosuppressed patients, patients with invading devices, patients with multidrug-resistant infections)?		
10. Is ongoing development/education offered for IPC staff (for example, by regularly reviewing conferences, courses...)?		
Subtotal score		/[illegible]

Question	Answer	Score
1. Is surveillance a defined component of your IPC programme?		
2. Do you have personnel responsible for surveillance activities?		
3. Have the professionals responsible for surveillance activities been trained in basic epidemiology, surveillance and IPC (that is, capacity to oversee surveillance methods, data management and interpretation)?		
4. Do you have information/IT support to conduct your surveillance (for example, equipment, mobile technologies, electronic health records)?		
5. Do you go through a prioritization exercise to determine the HAIs to be targeted for surveillance according to the local context (that is, identifying infections that are major causes of morbidity and mortality in the facility)?		
6. Is your facility's surveillance conducted for:		
7. Do you regularly evaluate if your surveillance is in line with the current needs and priorities of your facility?		

8. Do you use [illegible] surveillance case definitions (defined numerator and denominator according to international definitions [e.g. CDC NHSN/ECDC]) - or if adapted, through an evidence-based adaptation process and expert consultation?	
9. Do you use standardized data collection methods (for example, active prospective surveillance) according to international surveillance protocols (for example, CDC NHSN/ECDC) or if adapted, through an evidence-based adaptation process and expert consultation?	
10. Do you have processes in place to regularly review data quality (for example, assessment of case report forms, review of microbiology results, denominator determination, etc.)?	
11. Do you have accurate microbiology and laboratory capacity to support surveillance?	
12. Are surveillance data used to inform tailored and facility-based plans for the improvement of IPC practices?	
13. Do you analyze antimicrobial drug resistance on a regular basis (for example, quarterly/half yearly/annually)?	
14. Do you regularly (for example, quarterly/half yearly/annually) feedback up-to-date surveillance information to:	
[illegible]	
[illegible]	
[illegible]	
[illegible]	
15. How do you feedback up-to-date surveillance information? (at least annually)	
[illegible]	
[illegible]	
Subtotal score	/100

PART 2: FACILITY LEVEL AMS PROGRAM

Table 16: Facility level AMS program assessment tool

Assessment of Antimicrobial Stewardship Program (AMSP) activities in the facility		**Established at facility** ✔ X	**Comment**
Leadership support	Does your facility have a formal, written statement of support from facility administration that supports efforts to improve antibiotic use (antibiotic stewardship)?		
	Does your facility receive any budgeted financial support for antibiotic stewardship activities (e.g., support for salary, training, or IT support)?		
Accountability	Is a staff member directly responsible for coordination and program outcomes of stewardship activities at your facility?		
	Does your institution have a committee to review processes and outcomes of the stewardship program?		
	Does your antibiotic stewardship committee meet at least once every 6 months? Are the minutes of the stewardship committee communicated to all stakeholders?		
Key support for the antibiotic stewardship program	Does any of the staff below participate in the stewardship program to improve antibiotic use? Tick as appropriate		
	•Clinical pharmacist or other pharmacy staff		
	•Clinical pharmacologist or pharmacology staff		
	•ID physician (specialists in medicine, paediatrics and surgery who deal with pertinent infections)		
	•Infection prevention and control team/focal persons		
	•Quality improvement staff		
	•Clinical microbiologist		
	•IT department staff (not on committee but they help us as needed)		
	•Clinical departments heads (not heads, but members. All the proceedings are communicated to the heads and they preside over the meeting when any of their units are being audited)		
	•Hospital administration staff		

Assessment of Antimicrobial Stewardship Program (AMSP) activities in the facility		Established at facility ✔ X	Comment
Policies to support optimal antibiotic use	Does your facility have a policy that requires prescribers?	☐	
	Does your facility have a policy that requires prescribers to document in the medical record a dose and duration for all antibiotic prescriptions?	☐	
	Does your facility have a policy that requires prescribers to document in the medical record an indication for each antibiotic prescription?	☐	
	Does your facility have a policy that requires prescribers to collect and submit relevant clinical specimens before an antibiotic is prescribed?	☐	
	Does your facility have a policy that requires prescribers to list the prescribed antibiotic by its generic name (instead of brand name)	☐	
Policies to support optimal antibiotic procurement	Does your facility have a policy that requires the pharmacy to maintain a facility-level antibiotic formulary (i.e., a list of the antibiotics that the institution will procure and stock)	☐	
	Does your facility have a policy that requires the pharmacy to avoid procurement of unnecessary or duplicative combinations of antibiotics? (e.g., cloxacillin and dicloxacillin)	☐	
Broad interventions to improve antibiotic use	Are the following actions to improve antibiotic prescribing conducted in your facility? Is there a procedure for reviewing the appropriateness of all empiric antibiotics 48 h after the initial orders?	☐	
	Do specified antibiotic agents (e.g., colistin, carbapenems) need to be approved by a senior physician, pharmacologist, or ID specialist prior to administration (i.e., pre-authorization) at your facility?	☐	
	Does a physician, pharmacist, or pharmacologist conduct retrospective audit with feedback for courses of therapy for specified antibiotic agents (e.g., colistin, carbapenems) at your facility	☐	

Assessment of Antimicrobial Stewardship Program (AMSP) activities in the facility		Established at facility ✔ X	Comment
Prescription-specific interventions to improve antibiotic use	•Does your facility have written guidelines or policies for the following actions? •Recommended changes from intravenous to oral antibiotic therapy in appropriate situations (e.g., switch to an appropriate antibiotic with good oral bioavailability such as a quinolone in the setting of clinical improvement)? •Dose adjustments in cases of organ dysfunction? •Dose optimization (pharmacokinetics/ pharmacodynamics) for treatment of organisms with reduced susceptibility? •Feedback in situations where therapy might be unnecessarily duplicative (e.g., double anaerobic coverage)? •Time-sensitive stop orders for specified antibiotics (e.g., colistin, carbapenems, surgical prophylaxis to be stopped after a certain number of days)? Does your facility provide written guidance for treatment of the following common infections?	☐ ☐ ☐ ☐ ☐ ☐	
Diagnosis and infections specific interventions to improve antibiotic use	Does your facility provide written guidance for treatment of the following common infections? Diagnosis and infections specific interventions to improve antibiotic use – hospitalised patients Community-acquired pneumonia Healthcare-associated pneumonia Community-acquired urinary tract infection Healthcare-associated urinary tract infection Skin- and soft-tissue infections (e.g., abscess, cellulitis) Surgical prophylaxis Acute gastrointestinal infections Meningitis Neonatal sepsis Clinical sepsis (non-neonates)	☐ ☐ ☐ ☐ ☐ ☐ ☐	

Assessment of Antimicrobial Stewardship Program (AMSP) activities in the facility		Established at facility ✔ X	Comment
	Maternal intrapartum/postpartum infections	☐	
Diagnosis and infections specific interventions to improve antibiotic use – outpatients	Upper respiratory tract infection CAP Skin- and soft-tissue infections Acute gastroenteritis Sexually transmitted infections Maternal antenatal/intrapartum/postpartum infections	☐ ☐ ☐ ☐	
Process measures	Routine monitoring allows program coordinators to assess the performance of stewardship practices at specified intervals (Does your stewardship programme routinely monitor adherence to... ...documentation of dose in inpatient antibiotic prescriptions? ...documentation of duration in inpatient antibiotic prescriptions? ...documentation of clinical indication in inpatient antibiotic prescriptions? ...facility-specific empiric treatment recommendations for at least one common inpatient infection (infections listed in Section H)? ...collecting and submitting cultures before beginning empiric antibiotic therapy for inpatient infections? ...adjusting antibiotics based on culture results for inpatient infections? ...documentation of dose in outpatient antibiotic prescriptions? ...documentation of duration in outpatient antibiotic prescriptions? ...documentation of clinical indication in outpatient antibiotic prescriptions? ...facility-specific empiric treatment recommendations for at least one common outpatient infection (infections listed in Section H)?	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	

Assessment of Antimicrobial Stewardship Program (AMSP) activities in the facility		Established at facility ✔ X	Comment
	...collecting and submitting cultures before beginning empiric antibiotic therapy for outpatient infections? ...adjusting antibiotics based on culture results for outpatient infections	☐ ☐ ☐	
Antibiotic use and outcome measures	Does your facility track rates of infections caused by antibiotic resistant pathogens (e.g., bloodstream infections caused by carbapenem-resistant Enterobacteriaceae or colistin-resistant Gram-negative bacteria)? Does your facility produce an annual cumulative antibiogram for at least one common infection (infections listed in Section H)? Does your facility monitor antibiotic use (consumption) at the unit level and/or facility-wide level by one of the following metrics: By counts of antibiotics administered to patients per day (days of therapy)? By number of grams of antibiotics used (DDD)? By overall purchasing cost of antibiotics consumed	☐ ☐ ☐ ☐ ☐	
Reporting information to staff on antibiotic use and resistance	Does your stewardship programme share unit-/department-specific reports on antibiotic use with prescribers? Has a current antibiogram for common infections been disseminated to prescribers at your facility in the past year? Do prescribers routinely receive direct, personalised communication about how they can improve their antibiotic prescribing (e.g., dose adjustments, narrowing antibiotics based on culture results)? Do prescribers receive warnings regarding clinically significant interactions between prescribed antibiotics and other medications (e.g., co-trimoxazole and phenytoin toxicity, ototoxicity induced by gentamicin in combination with loop diuretics	☐ ☐ ☐ ☐	

Assessment of Antimicrobial Stewardship Program (AMSP) activities in the facility		Established at facility ✔ X	Comment
Education	Does your stewardship program provide orientation to prescribers for facility-specific antibiotic policies? Does your stewardship program provide refresher training to prescribers for facility-specific antibiotic policies? Does your stewardship programme provide unit-/department-specific training on antibiotic policies	☐ ☐ ☐	

ID: Infectious disease, CAP: Community-acquired pneumonia, IT: Information technology, DDD: Defined daily dose

References

Australian Government (2015). "Responding to the threat of antimicrobial resistance: Australia's First National Antimicrobial Resistance Strategy 2015–2019." from http://www.health.gov.au/internet/main/publishing.nsf/Content/1803C433C71415CACA257C8400121B1F/$File/amr-strategy-2015-2019.pdf

HM Government (2019). Contained and controlled: The UK's 20-year vision for antimicrobial resistance, Global and Public Health Group, Emergency Preparedness and Health Protection Policy Directorate.

HM Government (2019). Tackling antimicrobial resistance 2019–2024: The UK's five-year national action plan. . D. o. H. a. S. care. London, Global and Public Health Group, Emergency Preparedness and Health Protection Policy Directorate.

Murray, C. J., et al. (2022). "Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis." The lancet 399(10325): 629-655.

Pattis, I., et al. (2022). "Antimicrobial Resistance in New Zealand—A One Health Perspective." Antibiotics 11(6): 778

Purva, M., et al. (2019). "Assessment of core capacities for antimicrobial stewardship practices in indian hospitals: report from a multicentric initiative of global health security agenda. " Indian journal of medical microbiology 37(3): 309-317.

World Bank (2017). Drug-resistant infections: a threat to our economic future, Washington, DC: World Bank.

World Health, O. (2018). Improving infection prevention and control at the health facility: Interim practical manual supporting implementation of the WHO

Guidelines on Core Components of Infection Prevention and Control Programmes. Geneva: World Health Organization; 2018 (WHO/HIS/SDS/2018.10).

Licence: CC BY-NC-SA 3. 0 IGO. Cataloguing-in-Publication (CIP) data. CIP data are available at http://apps. who. int/iris. .

World Health Organization (2015). Global action plan on antimicrobial resistance. Geneva, World Health Organization.

World Health Organization (2018). Infection prevention and control assessment framework at the facility level, World Health Organization.

World Health Organization (2019). Situational analysis of antimicrobial resistance in the South-East Asia Region, 2018: an update on two years implementation of national action plans. Regional Office for South-East, Asia, New Delhi, World Health Organization,.

World Health Organization (2021). "Antimicrobial resistance and the United Nations sustainable development cooperation framework: guidance for United Nations country teams."

World Health Organization (2021). "Tripartite and UNEP support OHHLEP's definition of "One Health": Joint Tripartite (FAO, OIE, WHO) and UNEP Statement." Retrieved 31 August 2023, from https://www.who.int/news/item/01-12-2021-tripartite-and-unep-support-ohhlep-s-definition-of-one-health.

World Health Organization (2022). Global antimicrobial resistance and use surveillance system (GLASS) report 2022. Geneva, World Health Organization.

World Health Organization (2022). "WHO strategic and technical advisory group for antimicrobial resistance (STAG-AMR): report of the second meeting, 14-16 June 2022."

World Health Organization (2023). "Antimicrobial Resistance." Retrieved March 24, 2023, , from https://www.who.int/health-topics/antimicrobial-resistance.