

## 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		







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





	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		
<b>4.4 Antimicrobial consumption surveillance shall be established</b>	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)		
<b>4.5 Health Care associated Infections surveillance shall be strengthened</b>	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		
<b>4.6 Develop integrated one health surveillance system for AMR</b>	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





<b>For evidence-based decision making and policy amendments</b>	in place for alerts on AMR	4.5.1.1 IPC teams from major hospitals trained on HAI surveillance	1	4Q2026		
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## 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
<b>5.1 Infection control and prevention practices shall be strengthened</b>	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)	HPA with MOCCEE-WASH & waste NACU/MFDA
			1 x animal health	1Q2025	MoAAW & MoFOR (Agriculture & Acqua-culture)	
	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		
<b>5.2 Facility level IPC program</b>	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			
<b>5.1 Monitor IPC related activities human and animal health</b>	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
<b>6.1 Guidelines, protocols and clinical treatment pathways shall be developed/ updated for the management of infectious diseases to promote rational use of antimicrobials.</b>	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	





	<b>carry out stewardship functions in the hospital</b>					
	<b>6.1.5 Stewardship teams active in the hospital</b>	<b>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</b>	<b>90% of care hospitals</b>	<b>3Q2025</b>	<b>MTG-MFDA QARD</b>	







### **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
<b>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.</b>	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)		
<b>7.2 New innovation, ensure access and supply</b>	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



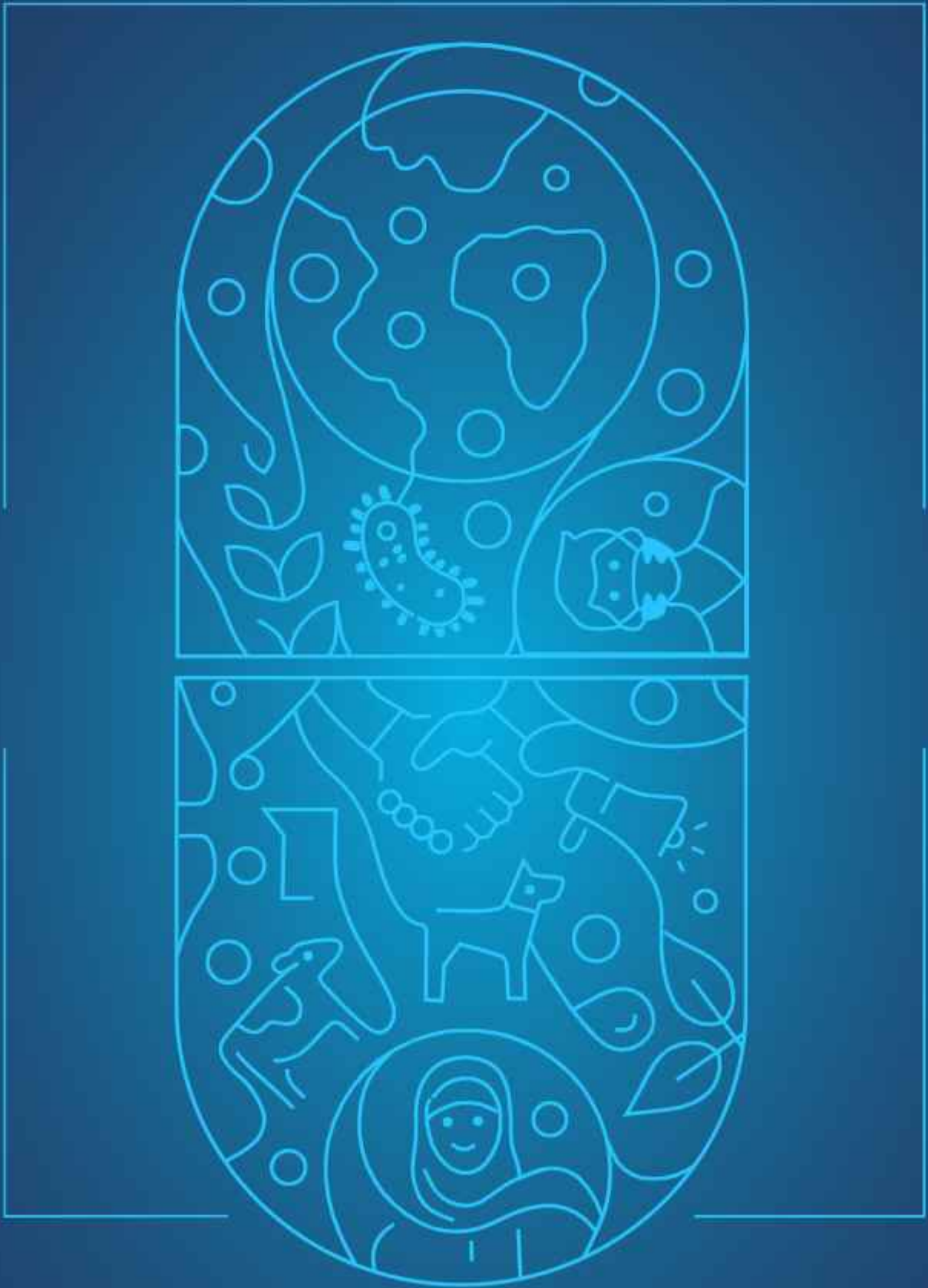




	antimicrobial utilization and infectious disease management processes.	report for required antibiotics and new diagnostic technologies, vaccines plan				MoAAW & MoFOR (Agriculture and maniculture) MoCCEE
	7.2.2 Discuss needed vaccination for preventing AMR (adults and children) hold discussion with MTAGI	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	<b>Helpful</b> <b>Strength</b>	<b>Harmful</b> <b>Weaknesses</b>	<b>Awareness and political will</b>
	<p>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)</p>	<p>Limited awareness of AMR, Surveillance and IPC at high level</p>	
	<p>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</p>	<p>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</p>	<b>Coordination and stakeholder engagement</b>
	<p>National level budget available for certain activities: immunization, some IPC related activities, waste management.</p>	<p>Lack of National level dedicated budget for AMR related activities: awareness, education, surveillance, Monitoring &amp; evaluation, Research and Development.</p>	<b>Financial resources</b>
	<p>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</p>	<p>Limited trained staff in health care facilities in surveillance activities, high turnover of staff. Lack of knowledge on stewardship Inadequate AMR related lab knowledge</p>	<b>Technical capacity</b>





<p>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</p>	<p>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</p>
<p>National AMR committee and technical subcommittees formed and few meetings conducted          Training for AMR and GLASS reporting undertaken</p>	<p>Limited trained dedicated staff at national level and facility level for AMR related activities.</p>
<p>Few tertiary level hospitals in process of collecting AMR related data. Antimicrobial import being monitored at national level</p>	<p>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</p>

**Structures or enablers for implementation**

**Implementation of NAP AMR activities**

**Monitoring and Data**

**Opportunities**

**Threats**

**Future factors**

Establish AMR governance structures and generate awareness on AMR surveillance at the highest political level through advocacy

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

Sustaining high level political commitment & support during unstable political periods and change of high-level posts.

High turnover of staff at different levels and lack of adequate replacements. Staff may get diverted for other work (pandemic response/outbreaks etc)

**Awareness and political will**

**Coordination and stakeholder engagement**

