BARBADOS NATIONAL ACTION PLAN ON COMBATTING ANTIMICROBIAL RESISTANCE 2017-2022

MINISTRY OF HEALTH, BARBADOS

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Version 6

Foreword

The rise in antimicrobial resistance has been described as one of the most alarming trends that threatens the future use of antimicrobial agents. Antimicrobial resistance is now a serious problem in all areas of infectious diseases including viral, bacterial, fungal and parasitic diseases. Because of the lack of systematic surveillance, this public health problem has only recently been emphasised.

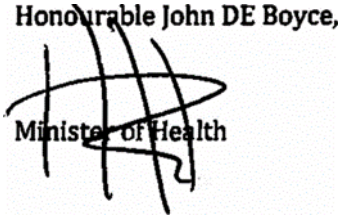
Following the approval of the Global Action Plan for Antimicrobial Resistance at the 68th World Health Assembly in May 2015 and the subsequent high-level meeting of the UN General Assembly on Antimicrobial Resistance held in September 2016 which called for national, regional and international political commitment to addressing the issue, Member States agreed on the importance of moving forward to develop national action plans by May 2017.

The Barbados National Action Plan on Combatting Antimicrobial Resistance 2017-2022 was therefore produced with this target in mind. This action plan is a product of multi-sectoral collaboration among national stakeholders. As with almost all health care interventions, sharing the responsibility with other sectors has proven to be essential to achieving desired outcomes. I am therefore pleased that the Ministry of Health will take the lead in this initiative. I must make mention however, of the strategically chosen oversight committee comprising of but not limited to representatives from Surveillance, Health Promotion, Infection Prevention and Control, Drug Service, Laboratories, Agriculture, Customs, Commerce, Environmental Protection and the Pan American Health Organisation.

A recent assessment of the current situation in Barbados with respect to antimicrobial resistance pointed out the need for improved management with respect to antibiotics in healthcare settings, prevention of the spread of drug-resistant micro-organisms, elimination of the use of medically-important antibiotics for promoting growth in livestock, and expanded surveillance for drug-resistant bacteria in humans and animals.

I am sure that as a result of this action plan, appropriate health promotion on antimicrobial medicines would be put in place. This will be combined with strategic surveillance and research, resulting in the desired outcome of optimal use of antimicrobial medicines and a reduction in the incidence of antimicrobial resistance in humans and animals in Barbados. The realisation of these desired outcomes will require sustained and coordinated efforts of the oversight committee headed by the Ministry of Health.

I therefore want to express my gratitude to all of those who contributed to the development of this plan. It proposes actions which will help to further strengthen health care delivery in Barbados. I pledge my full support to this plan and eagerly look forward to its implementation.



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Acknowledgements

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ABBREVIATIONS

AMR	Antimicrobial Resistance
AMS	Antimicrobial Stewardship
BAMP	Barbados Association of Medical Practitioners
BARP	Barbados Association of Retired Persons
BDA	Barbados Dental Association
BDS	Barbados Drug Service
BNA	Barbados Nurses Association
CAO	Chief Agricultural Officer
CARPHA	Caribbean Public Health Agency
COHSOD	Council for Human and Social Development
CLO	Chief Labour Officer
CME	Continuing Medical Education
CMO	Chief Medical Officer
CRS	Caribbean Regulatory System
CSA	Country Situation Analysis
CVO	Chief Veterinary Officer
EPD	Environmental Protection Department
FAO	Food and Agriculture Organization of the United Nations
GAP	Global Action Plan
GAS	Government Analytical Services
GC	Neisseria gonorrhoea
IPC	Infection Prevention and Control
MA	Ministry of Agriculture, Food, Fisheries and Water Resources Management
MED	Ministry of the Environment and Drainage
MH	Ministry of Health
MT	Ministry of Tourism

MIICSBD	Ministry of Industry, International Business, Commerce and Small Business Development
MRSA	Methicillin Resistant Staphlococcus aureus
NAHFCP	National Agricultural, Health and Food Control Programme
NAP	National Action Plan
OIE	World Organization for Animal Health
PAHO	Pan American Health Organization
PHL	Public Health Laboratory
QEH	Queen Elizabeth Hospital
SMOH(N)	Senior Medical Officer of Health (N)
TCDPO	Town and County Development and Planning Office
UWI	University of the West Indies
VRE	Vancomycin Resistant Enterococcus
WHA	World Health Assembly
WHO	World Health Organization

INTRODUCTION

Background

For several decades, antimicrobial resistance (AMR) has been a growing threat to effective treatment of an ever-increasing range of infections caused by bacteria, parasites, viruses and fungi. AMR results in reduced efficacy of antibacterial, anti-parasitic, antiviral and antifungal drugs, making the treatment of patients difficult, costly, or even impossible. The impact on particularly vulnerable patients is most obvious, resulting in prolonged illness and increased mortality. The magnitude of the problem worldwide and the impact of AMR on human health, on costs for the health-care sector and the wider society are still largely unknown. *(WHO, 2014)* In response to this developing public health issue, a global action plan on antimicrobial resistance has been developed and at the 68th World Health Assembly in May 2015, Member States approved the resolution to implement the Global Action Plan (GAP). *(WHO, WHA decision point: WHA A/68/20, A68/VR/9, May 2015)*The GAP embraces the 'One Health' concept for integrated management of AMR in the food chain.

Notably, Member States agreed on the importance of moving forward to develop national action plans by May 2017. These plans would be aligned with the GAPfor the use of antimicrobial medicines in animal health, agriculture and human health. *(WHO, Global Action Plan for Antimicrobial Resistance (GAP-AMR), 2015)*

This National Action Plan on Combatting AMR was influenced by a national multi-sectoral stakeholder consultation which included representatives from government, the private sector, University of West Indies and non-governmental organizations. It conforms to the principles of the National Strategic Plan 2006-2025 especially in goal 4 which speaks to preserving a healthy environment and the Barbados Growth and Development Strategy 2013 – 2020 which addresses the sustainable production of safe food through agriculture and fisheries production and the protection and maintenance of human health throughout the life course.

Alignment with AMR global action plan

The goal of the Global Action Plan for Antimicrobial Resistance (GAP-AMR) is: "To ensure, for as long as possible, continuity of successful treatment and prevention of infectious diseases with effective and safe medicines that are quality-assured, used in a responsible way, and accessible to all who need them".

The five (5) Strategic Objectives of the GAP-AMR are:

Objective 1: Improve awareness and understanding of antimicrobial resistance through effective communication, education and training.

Objective 2: Strengthen the knowledge and evidence base through surveillance and research.

Objective 3: Reduce the incidence of infection through effective sanitation, hygiene and infection prevention measures.

Objective 4: Optimize the use of antimicrobial medicines in human and animal health.

Objective 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 particular, all action plans should reflect the following principles identified in the GAP:

1. Whole-of society engagement including "One Health" approach
2. Prevention first
3. Access
4. Sustainability
5. Incremental Targets for implementation

Multi-sectoral systems approach

Ensuring ownership of activities across the sectors of health, agriculture, food security, animal health and economic development, is essential to achieve the desired outcome of containing antimicrobial resistance. The "One Health" approach acknowledges that the health of humans is directly linked to the health of animals and the environment.

STRATEGIC VISION

Vision

Integrated health care systems in Barbados that by 2027, work to prevent, detect, and control illness and death related to infections caused by antimicrobial resistance through shared responsibility whilst ensuring sustainable medical care.

Scope of the National Action Plan

Antimicrobial resistance encompasses resistance to drugs utilized in the treatment of infections caused by different types of pathogenic organisms. This *National Action Plan,* will mainly focus on resistant bacteria that present an urgent or serious threat to public health. This plan will serve as a guide for partners in human, veterinary and environmental health to address this problem.

Governance

Development and implementation of the *National Action Plan* will be guided by an inter-sectoral coordinating mechanism named the National Antimicrobial Oversight Committee, with Terms of Reference as at Appendix 3. The Ministry of Health will take the lead in this initiative and the oversight Committee will comprise but not be limited to representatives from the following areas and departments: National Epidemiology/Surveillance, Health Promotion, Infection Prevention and Control, Barbados Drug Service, Laboratories, Agriculture, Customs, Commerce, Environmental Protection Department and PAHO.

Current Country Situation

Antibiotics are used in the health sector, (community and hospitals) the agricultural sector (livestock and cultivation) and are found in environmental media including ground, surface, marine and waste water.

Carbapenem-resistant Klebsiella pneumonia (CRKP), recently classified by WHO as a priority 1 resistant organism, was detected in a cluster of cases in the Queen Elizabeth Hospital (QEH) in 2013. Resultant active surveillance of cultures to assess the burden of CRKP at the QEH, revealed that 18% of patients sampled were either infected or colonised by CRKP. Specific antibiotics, flouroquinolones and piperacillin-tazobactam, were significantly associated with infection/colonization. In 2014, the 12 month period prevalence of CRKP in Barbados was 50 per 100, 000 population and incidence of blood stream infection was 4 per 100,000 population (QEH, 2013).

In the two year period 2015- 2017 at the Veterinary Services Laboratory, clinical and surveillance isolates from varying organ systems in varied domestic animals – dogs, horse, parrot and a primate, revealed a small number (11 cases) of multi-drug resistance. Gram positive and gram negative bacteria were identified in which resistance was detected over a

wide class of antimicrobial agents inclusive of aminoglycosides, cephalosporins, macrolides, penicillins, phenicols, polypeptides, quinolones, sulphonamidesand tetracyclines (Personal communication, VSL).

The National Antibiotic Resistance Study conducted in 2013 assessed fifty-eight (58) sample sites which included twenty-two (22) public supply wells, eighteen (18) bathing water beaches, one (1) water treatment plant, two (2) sewage treatment plants, three (3) agricultural wells, three (3) surface water sites and nine (9) polyclinics to determine if faecal coliforms had developed resistance to selected antibiotics. The study indicated that there was no significant resistance noted in these groups in Ecoli and enterococcus. In addition no Carbapenem resistance in Klebseilla was found or 3rd generation resistance suggesting ESBLs. (EPD 2015).

In the human health sector, a portion of antibiotic and other antimicrobial drug use is guided by the Barbados Drug Service (BDS) through the annual publishing of the National Drug Formulary. However, there are other antimicrobials available which are not on formulary.

Current ability to test and register antimicrobials for use in human and animals is limited. Incomplete, inappropriate and uncontrolled use of antimicrobials is thought to be the major driver of antimicrobial resistance in Barbados.

Surveillance systems for AMR are present but inconsistent, with few or no reporting systems. There is also rudimentary laboratory capacity for AMR testing and monitoring in Barbados and the Caribbean.

Knowledge of AMR amongst health care workers is limited to areas surrounding infection control in health care settings. There is also an element of over-prescribing and dispensing of antimicrobial medicines and the issue of incomplete treatment courses of antimicrobials.

The current legislation for antimicrobials comprise the Therapeutic Substances Act, Cap 330 and the Therapeutic Substances Regulations, 1950.The Act seeks to regulate the manufacture, importation, storage, sale and supply of penicillin and other antibiotics, and of sulphonamide drugs and other therapeutic substances through a licence granted by the Licensing Authority, the Chief Medical Officer. However, the Regulations exempt any preparation which is to be used solely for veterinary purposes.

Summary of Assessment

Barbados currently has a rudimentary framework and capacity to address the issue of antimicrobial resistance. There however needs to be coordination of efforts and improvement in areas where gaps have been identified.Actions required include improved antibiotic stewardship in healthcare settings, prevention of the spread of drug-resistant organisms//bacteria, elimination of the use of medically-important antibiotics for growth promotion in food animals, and expanded surveillance for drug-resistant bacteria in humans and animals.

The *National Action Plan* will provide the roadmap to guide Barbados in the effort to address the urgent and serious threat of AMR and will be organized around three goals for collaborative action.

Goals of the National Action Plan

The three (3) Goals of the NAP are:

Goal 1: Slow/Reduce the emergence of resistant bacteria and prevent the spread of resistant infections.

Goal 2: Strengthen national "One-Health" surveillance efforts to combat resistance

Goal 3: Improve international collaboration and capacities for antimicrobial resistance prevention, surveillance, control and antibiotic research and development.

Goal 1: Slow/Reduce the emergence of resistant bacteria and prevent the spread of resistant infections. Judicious use of antibiotics in healthcare and agricultural settings is essential to slow the emergence of resistance and extend the useful lifetime of effective antibiotics. Antibiotics are a precious resource, and preserving their usefulness will require cooperation and engagement by healthcare providers, healthcare leaders, pharmaceutical companies, veterinarians, the agricultural industry, and patients. Goal 1 activities include the optimal use of vaccines to prevent infections, implementation of healthcare policies and antibiotic stewardship programs that improve patient outcomes, and efforts to minimize the development of resistance by ensuring that each patient receives *the right antibiotic at the right time at the right dose for the right duration.* Prevention of resistance also requires rapid detection and control of outbreaks and regional efforts to control transmission across community and healthcare settings and international borders.

Goal 2: Strengthen national "One-Health" surveillance efforts to combat resistance. Improved detection and control of drug-resistant organisms will be achieved through an integrated, "One-Health" approach that includes the enhancement and integration of data from surveillance systems that monitor human pathogens with data that monitor animal pathogens. Goal 2 activities will enhance monitoring of antibiotic sales, usage, resistance, and management practices at multiple points along the food-production chain, from farms to processing plants to supermarkets.

Goal 3: Improve international collaboration and capacities for antimicrobial resistance prevention, surveillance, control and antibiotic research and development. Antibiotic resistance is a worldwide problem that cannot be addressed by one nation in isolation. Goal 3 activities include working with foreign ministries of health and agriculture, the World Health Organization (WHO), the Food and Agriculture Organization (FAO), the World Organization for Animal Health (OIE), and other multinational organizations to enhance global capacity to detect, analyze, report antibiotic use and resistance, create incentives for the development of therapeutics and diagnostics, and strengthen global efforts to prevent and control the emergence and spread of antibiotic-resistance.

Objectives of the National Action Plan

In alignment with those of the GAP-AMR, the five (5) Objectives of the NAP are:

Objective 1: Improve awareness and understanding of antimicrobial resistance through effective communication, education and training.

Objective 2: Strengthen the knowledge and evidence base through surveillance and research including in animals, plants, the environment and food.

Objective 3: Reduce the incidence of infection through effective sanitation, hygiene and infection prevention measures.

Objective 4: Optimize the use of antimicrobial medicines in human and animal health.

Objective 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.

Table 1: Operational Framework for Objectives

No.	Objective	Operational Framework	Timeframe
1	Improve awareness and understanding of antimicrobial resistance through effective communication, education and training.	**Risk Communication:** 1. Develop a national communication strategy for AMR. 2. Engage and educate policy makers. 3. Develop advocacy materials for the general public, policy makers and health care providers.	2017-2019
		Education: 1. Develop guidelines for health care professionals on AMR (including IPC, rational use of antimicrobial medicines, surveillance, etc.) and implement in-service training. 2. Include antimicrobial use and resistance in the curricula across all levels of education.	
2	Strengthen the knowledge and evidence base through surveillance and research.	**National AMR Surveillance System:** 1. Identify/Establish a national entity with the ability to systematically collect, analyse and report data on AMR from all sources so as to inform decision-making at national and international levels. 2. Establish mechanisms for regular information sharing on AMR data across human health, animal health and environmental sectors.	2017-2019
		Laboratory Capacity: 1. Enhance laboratory capacity to ensure capability of quality assured identification and susceptibility testing and reporting, including on newly emerged resistance. 2. Ensure that all national laboratories are involved in external quality assurance (EQA) programs.	2017- 2022
		Research: 1. Identify operational research priorities for promoting responsible use of antimicrobial medicines; defining improved practices for preventing infection in human and animal health and agricultural practice.	2017-2020
3	Reduce the incidence of infection through effective sanitation, hygiene and infection prevention measures.	**Community Level Prevention:** 1. Promote good hand hygiene and personal hygiene practices through social mobilization and behaviour change activities. 2. Promote vaccination among the public and health care providers. 3. Promote universal waste water treatment and improve waste disposal practices	2017-2020

No.	Objective	Operational Framework	Timeframe
		IPC in Health Care Settings: 1. Update national policies and plans for biomedical waste management, including safe collection, storage, transportation and final disposal. 2. Develop and implement national IPC programs. 3. Establish/Strengthen IPC programs in health care facilities, particularly tertiary hospitals.	2017-2019
		Animal Health 1. Strengthen animal health and agricultural practices through implementation of standards to minimize and contain AMR. 2. Promote vaccination as a method of reducing infections in food animals.	2018-2021
		Environmental Health 1. Develop a policy on collection and disposal of obsolete (expired, unknown, banned) drugs. 2. Implement updated ground water protection policy. **3.** Regulate Wastewater Reuse practices.	2018-2020
4	Optimize the use of antimicrobial medicines in human and animal health.	**Access to quality antimicrobial medicines:** 1. Develop and enforce legislation and regulations on prescribing and dispensing of antimicrobials 2. Strengthen pharmaceutical supply chain (procurement, supply and quality management). 3. Strengthen/Establish mechanisms for registration of antimicrobial medicines within relevant national authorities. 4. Establish national mechanisms (e.g. market surveillance), which link with global mechanisms for identification and reporting on sub-standard, spurious, falsely labelled, falsified, or counterfeit medicines. 5. Develop and enforce guidelines regarding promotional practices –of the industry. 6. Develop and implement evidence- based standard treatment protocols to guide stewardship programs in human health. 7. Develop and implement a national and institutional essential antimicrobial medicines list.	2017-2022
		Animal Health Sector: 1. Identify and limit use of antibiotics in the animal sector for non-therapeutic purposes.	2018-2022

		2. Establish a supply of antibiotics formulated for animal use	
5	Develop the economic case for sustainable investment that takes account of the needs of all countries, and increase investment in new interventions.	1. Assess the investment needs for implementation of the NAP. 2. Consider and establish procedures for participation in international collaborative research to support the development of new medicines, diagnostic tools and vaccines.	2017-2019

Objective 1: Improve awareness and understanding of antimicrobial resistance through effective communication, education and training.

Risk Communication				
Interventions	**Activities**	**Current Situation**	**Timeframe**	**Lead**
Develop a national communication strategy for AMR.	• Formulate sub-committee of national working group to develop this document. • Subcommittee should comprise (All ministries)	In progress	November 2017 November 2017	Senior Health Promotion Officer, MH (MA, MFEA,METI Commerce) MA, MED, MH,
Engage and educate policy makers.	• Sensitization of Minister of Health and other Senior Health Officials. • Sensitization of Ministers and Senior Officials in Agriculture and Environment and Commerce • Coordination meeting for the	Started/ In progress	November 2017 March 2018/ May 2018 2017-2019	Oversight Committee Lab managers - Invite SMOH(N), CMO, CVO, Director, Environmental Dept., Director of Planning Unit and PS's of each ministry to meetings and to create cabinet paper to facilitate this

	Permanent Secretaries Sensitization of Cabinet and Social Partners. Cabinet presentation including Budget			Oversight Committee
Develop advocacy materials for the general public, policy makers and health care providers. (human and animal), farmers, retailers) For all stake holders (general workers	• Conduct a national public education campaign regarding the use of antimicrobial drugs and issues of antimicrobial resistance. (AMR week) • Engage the health professional bodies (Barbados Association of Medical Practitioners, Barbados Nurses Association, Barbados Dental Association, Veterinary Council, Barbados etc.) as well as the Barbados Agricultural societies and other relevant stakeholders • Develop materials and media to target farmers, retailers, and commerce regarding AMR issues	Not in place	November 2018	Senior Health Promotion Officer, Ministry of Health Data provided to SHPO for schools, GIS, METI to create booklet, brochures, jingles etc., social media (facebook, Instagram, whatsapp). Regularly updated website. Presentations to different social groups – through polyclinics to churches, PTA etc. PAHO/Barbados Retired Nurses association/UWI CME, BAMP bulletins, joint seminars and workshops (MH, MA, METI). Presentations in quarterly laboratory meetings for laboratory staff.

	• Develop Poster, logo and Slogan competitions • develop targeted messages [1]e.g tourism, agriculture, consumers, public, children, using • Social media • Jingles • Video • Skits …laff it off, Rum & Koke			

Education				
Interventions	**Activities**	**Current Situation**	**Timeframe**	**Lead**
Develop guidelines for health care professionals on AMR (including IPC, rational use of antimicrobial medicines, surveillance, etc.) and implement in-service training.	• Sensitization of health care workers through CME accredited courses on AMR and Antimicrobial Stewardship, through workshops and issuing of supporting educational material. • HIC - Free webinars, Online course on AMS	Started in public sector. Needs to be continued and extended to the private health sector.	2018 Dec2017 (depending on schedule of trainers)	NICC
Develop guidelines for disposal of unused, expired, spurious, substandard, falsified, falsely labelled and counterfeit antimicrobials	• Sensitive public re need for guidelines • Sensitize various stakeholders (environmental health, SSA, etc) using various media.	Do not exist		

[1]Messages should include Mode of Transmission etc.

Include antimicrobial use and resistance in the curricula across all levels of education.	• Engage Medical and Nursing Schools pharmacy, agricultural, environmental health, hospitality training schools, vets (University of the West Indies, Barbados Community College, SJPP, Barbados Veterinary Association etc.). • Engage Ministry of Education regarding Agricultural science curricula	Started	Jan 2018	SMOH(N) with UWI, BCC rep

Objective 2: Strengthen the knowledge and evidence base through surveillance and research.

Develop a national surveillance system for antimicrobial resistance				
Interventions	**Activities**	**Current Situation**	**Timeframe**	**Lead**
. Identify/Establish a national entity with the ability to systematically collect, analyse and report data on AMR from all sources to facilitate informed decision-making at national and international levels	• Expand and strengthen the infrastructure of the Ministry of Health's Surveillance Unit to oversee the AMR surveillance program, including collecting, aggregating and sharing data using a secured central database. • Expand and strengthen the infrastructure of the Ministry of Health's Surveillance Unit to identify what data needs to be reported from the sources. • Determine sample sources (all labs or sentinel labs – samples or pathogens – refer to WHO AMR guidelines) • Determine the antimicrobials and pathogens important to Barbados. • Expand and strengthen the national infrastructure for public health	Only Carbapenem-Resistant Klebsiella Pneumoniae (CRKP) data received. Need others - MRSA, VRE, GC Only enteric pathogens, Dengue and Malaria are reported. Not currently performed	Dec 2017 May 2018 May 2018	SMOH(N) SMOH(N) SMOH (N) CVO CVO

	surveillance and data reporting, and provide incentives for timely reporting of antibiotic-resistance and antibiotic use in all healthcare settings.(official correspondence from MH to all private and public medical facilities on reportable pathogen inclusive of list of all reportable pathogens) • Develop and publish annual antibiograms and reports on AMR. • Enhance collection and reporting of data regarding antibiotic drugs sold and distributed for use in food-producing animals. • Annual publication of enhanced summary reports on the sale and distribution of antibiotics approved for use in food-producing animals.	Not currently performed Not currently performed Not currently performed	Feb 2018 Feb 2018 Feb 2018	
Establish mechanisms for regular information sharing on AMR data across human health, animal health and	• Involve Ministry of Agriculture at Minstry of Health weekly surveillance meetings. • Involve Ministry of Environment	Not currently performed Started in July 2015.	Feb 2018	Surveillance Unit

environmental sectors.	at Minstry of Health and QEH weekly surveillance meetings. • Commence quarterly laboratory meetings between the Public Health, QEH and the Veterinary and Government Analytical Laboratories and private labs.	Not currently performed .	June 2017	Surveillance Unit Consultant Microbiologist QEH

Improve Laboratory capacity				
Interventions	**Activities**	**Current Situation**	**Timeframe**	**Lead**
Enhance laboratory capacity to ensure capability of quality assured identification and susceptibility testing and reporting, including on newly emerged resistance.	• Develop, expand, and maintain capacity in veterinary and food safety laboratories to conduct standardized antibiotic susceptibility testing and characterize select zoonotic and animal pathogens. • Accreditation of the Veterinary and Government Analytical Laboratories is required. • Improve processes through standardization at the Queen Elizabeth Hospital and Public Health Laboratories forantibiotic susceptibility testing. • Introduction of the testing for MIC's on a routine basis for	Vet Labs – currently performed In progress Completed for public laboratories, not private labs In progress	2022 Dec 2017 2017	Lab Manager, VSL Director, GAS Lab Manager, VSL Pathology Laboratory Advisory Committee Consultant Microbiologist

	selected antibiotics in human and animal sampling			
Ensure that all national laboratories are involved in external quality assurance (EQA) programs.	• Create links with a regional public health laboratory network that uses standardized testing platforms to expand the availability of reference testing services, characterize emerging resistance patterns and bacterial strains obtained from outbreaks and other sources, and facilitate rapid data analysis and dissemination of information.	Completed		

Research				
Interventions	**Activities**	**Current Situation**	**Timeframe**	**Lead**
Identify operational research priorities for promoting responsible use of antimicrobial medicines; defining improved practices for preventing infection in human and animal health and agricultural practice.	• Conduct a retrospective analysis of antibiotic sensitivity patterns of pathogens of public health significance in the Public Health Laboratory in order to assess the current trends. • Conduct a prospective analysis of antibiotic sensitivity patterns of emerging and re-emerging pathogens of public health significance in the Public Health Laboratory in order to assess the current trends • Conduct retrospective/prospective studies on environmental samples. Set up a separate surveillance system.	Not performed	2017 2017	PHL UWI QEH

Objective 3: Reduce the incidence of infection through effective sanitation, hygiene and infection prevention measures.

Community level prevention				
Interventions	**Activities**	**Current Situation**	**Timeframe**	**Lead**
Promote hand hygiene and good personal hygiene practices through social mobilization and behaviour change activities.	• Strengthen national public education campaign to promote hand washing and good personal hygiene [2]	• Currently outbreak specific • Currently season specific	Quarterly over plan life	Senior Health Promotion Officer, Ministry of Health
Promote vaccination among the public and health care providers.	• Conduct vaccination promotion campaigns Identifying and integrating the linkages between vaccines and the importance of preventing AMR	Not currently in practice	Annually commencing 2017	Senior Health Promotion Officer, Ministry of Health and Expanded Program on Immunization (EPI) Manager

Strengthen infection prevention and control in Health Care Settings				
Interventions	**Activities**	**Current Situation**	**Timeframe**	**Lead**
Update national policies and plans for biomedical waste management, including safe collection, storage, transportation and final disposal. .	• Continue the work of the National Biomedical Waste Management Committee which was established in 2011.	Implementation of protocols to be continued.	2018	MH and EPD
Develop and implement national IPC programs.	Continue the work of the National Infection Prevention and Control Committee was established in March 2014.	Work commenced.		MH, CAO, CLO. Unions

[2]Message needs to be specific to target groups

	• Integrate ICP as a requirement for issuing of institutional Health licence under the Health Services (Private Hospitals, Nursing Homes, Senior Citizens' Homes and Maternity Homes) Regulations, 2005. • Institute continuous education programs for all categories of staff •	Not currently performed Not currently performed		
Establish/Strengthen IPC programs in health care facilities, particularly tertiary hospitals.	• A Polyclinic Committee on IPC has been established as an arm of the National IPC Committee. • Continue training of health care workers in IPC. • Link IPC knowledge management with Key performance indicators and performance appraisal systems	Work commenced. Not currently performed	2019	MH, , CAO, CLO. Unions

Animal Health				
Interventions	**Activities**	**Current Situation**	**Timeframe**	**Lead**
Strengthen animal health and agricultural practices through implementation of standards to minimize and contain AMR.	• Conduct a national awareness program to increase sanitation on agri-enterprises • Introduce a trace-back program • Develop a legal framework for the importation of animal antibiotics	Currently not in place	2019	MA NAHFCP

Promote vaccination as a method of reducing infections in food animals.	• Foster collaborations and public-private partnerships with public health, pharmaceutical, and agricultural stakeholders to facilitate identification and implementation of interventions (e.g., good husbandry practices) to reduce the spread of antibiotic resistance. • Develop a system for monitoring Antibiotic in Animal feeds	Not currently in place Not currently in place	2022 2019	MA NAHFCP MA, Commerce
Environmental Health				
Interventions	**Activities**	**Current Situation**	**Timeframe**	**Lead**
Develop a policy on collection and disposal of obsolete (expired, unknown, banned) drugs	• Develop a legal framework to make distributors primarily responsible for obsolete drugs • Establish take-back programs • Evaluate obsolete drug disposal options (landfilling, incineration, shipping overseas) • Improve incineration capacity and treatment capability	Not Currently in place Currently not in place Currently not in place In progress	2020 2021 2019	MH, MED MH MH, MED MH

Implement updated ground water protection policy	• Finalise and implement the updated groundwater protection policy • Improve wastewater treatment capacity for sewage sludge	On going On going	2018 2018	BWA, EPD, TCDPO
Regulate wastewater reuse Practices	• Finalise the Water Reuse Policy. • Establish a legal frame work for wastewater reuse	On going No current framework	2017 2019	EPD, BWA, BNSI, EHD, TCDPO

Objective 4: Optimize the use of antimicrobial medicines in human and animal health.

Access to quality antimicrobial medicines				
Interventions	**Activities**	**Current Situation**	**Timeframe**	**Lead**
Develop and enforce legislation and regulations on prescribing and dispensing of antimicrobials.	• Implement annual reporting of antibiotic use in inpatient and outpatient settings and identify geographic variations and/or variations at the provider and/or patient level that can help guide interventions. • Update legislation for dispensing practices for human and animal health .	Limited reporting on antibiotic use in public sector and no reporting in private sector. Therapeutic Licence is required for import of all antimicrobials including antibiotics & antifungals; once on island there is no tracking of usage	2017- 2022	MH MA MC
Strengthen pharmaceutical supply chain	• To establish a system for the disposal of	Health Services (Control of	2017-2019	BDS EPD

(procurement, supply and quantity management).	expired/unused drugs (Animal and Human health).	Drugs) Regulations, 1970 includes a Destruction of Drug Certificate which is issued by Drug Inspectors on request, from all places which store and issue drugs		
Strengthen/Establish mechanisms for registration of antimicrobial medicines within relevant national authorities.	• Institute a system to regulate the importation and use of veterinary drugs.	No present system All drugs to be registered through CRS/ CARPHA The Therapeutic Substances Act CAP.30 - An Act to regulate the manufacture, importation, storage, sale and supply of penicillin and other antibiotics, and of sulphonamide drugs and other therapeutic substances.	2017-2020	Vet Services MA
Establish national mechanisms (e.g. market surveillance) which link with global mechanisms for identification and reporting on sub-standard, spurious falsified, falsely labelled, and	• Strengthen pharmacovigilance programme. • Review - and amend where necessary - existing legislation regarding sub-standard, spurious, falsified, falsely labelled, and	There is a pharmaco-vigilance program in place; it however needs to be more utilised by stakeholders.	2017-2018	BDS MC

counterfeit medicines.	counterfeit mechanisms.			
Develop and enforce guidelines regarding promotional practices of the industry	• Research and review governing legislation	Present Legislation: Health Service (Control of Drugs) Regulations Subsection 4	2017- 2019	BDS, Solicitor General
. Develop and implement evidence based standard treatment ~~guidelines~~ protocols to guide stewardship programs.	• Strengthen antibiotic stewardship in inpatient, outpatient, and long-term care settings by expanding existing programs, developing new ones, and monitoring progress and efficacy. • Identify and implement measures to foster stewardship of antibiotics in animals. • Develop and conduct educational programs that inform physicians, veterinarians, members of the agricultural industry, and the public about good antibiotic stewardship.	Inpatient (QEH) mechanism exists; no system for outpatient monitoring Nothing currently in place. Materials presently being developed Programme has started Surveillance system for drug residues in food to be developed	2017- 2019	
Develop and implement a national and institutional essential medicine list.	• Ensure clinicians receive up-to-date and timely antibiotic susceptibility data to guide antibacterial drug selection.	Currently there is a "**Criteria governing the prescribing of antibiotics**	2017-2018	

	• Collaboration with all laboratories, polyclinics, hospital, district hospitals to develop list with reference to known antimicrobial susceptibilities with antibiogram • Develop mechanism to issue list as needed to stakeholders.	**on the Barbados National Drug Formulary"** statement in the BNDF Process had previously been started by the Queen Elizabeth Hospital (update needed)		BDS

Regulate access to antimicrobial medicines in Animal Health				
Interventions	**Activities**	**Current Situation**	**Timeframe**	**Lead**
1. Identify and limit the use of antibiotics in the animal sector for non-therapeutic purposes 2. Establish a list and suppliers of antibiotics formulated for animal use 3. All local and imported feeds MUST be antibiotic free	• Assessment of current situation • Prepare technical guidelines for the appropriate legislation • Draft legislation by CPC • Eliminate the use of antibiotics for growth promotion in food- producing animals and bring other agricultural uses of antibiotics, for treatment, control, and prevention of disease, under veterinary oversight. • Request MC to institute requirement of import licences for animal feed	No present legislation	2017-2022 2017-2018	Veterinary Services

Objective 5: Develop the economic case for sustainable investment that takes account of the needs of all countries, and increase investment in new interventions.

Interventions	Activities	Current Situation	Timeframe	Lead
Assess the investment needs for implementation of the NAP.	• Solicit 'buy in' from CARICOM though its regional agencies. Present to COHSOD and annual regional meeting of Ministers of Health		2017-2019	MH, PAHO
Secure local funding for implementation of Antimicrobial Action Plan	• Request a line item in the annual estimates of expenditure	No line item	2018-2019	MH/MOF&EAMA
Consider and establish procedures for participation in international collaborative research to support the development of new medicines, diagnostic tools and vaccines.	• Develop international collaborations to gather country-specific and regional information on drivers of antibiotic resistance, identify evidence-based interventions, adapt these strategies to new settings, and evaluate their effectiveness. • Collaborate with WHO, OIE, and other international agencies focused on the development of integrated, laboratory-based surveillance to detect and	No baseline data available Limited collaboration	2018-2020 2017-2019	UWI /MH MH, VSL WHO/PAHO

	monitor antibiotic resistance in relevant animal and human foodborne pathogens.			
Invest in a sustainable vaccine programme including consideration for the agricultural sector	• Promote vaccines for vaccine preventable diseases e.g. influenza and season flu, measles	ongoing	2017-2018	MH

The National oversight committee will work with allied agencies whenever necessary including the HIV/AIDs Programme and Tuberculosis Prevention and Control programme

National Targets for Antibiotic Resistant Bacteria

Stabilise within 3 years and then demonstrate a yearly decline in the incidence of overall *Clostridium difficile* infection compared to estimates from 2011.
Stabilise within 3 years and then demonstrate a yearly decline in the rate of Carbapenem-resistant Enterobacteriaceae infections acquired during hospitalization.
Maintain the prevalence of ceftriaxone-resistant *Neisseria gonorrhoeae* below 2% compared to estimates from 2013.
Stabilise within 3 years and demonstrate a yearly decline in the rate of hospital acquired *Pseudomonas sp*p. infections.
Stabilise within 3 years and demonstrate a yearly decline in methicillin-resistant *Staphylococcus aureus (*MRSA) bloodstream infections by 2020.
Stabilise within 3 years and demonstrate a yearly decline in multidrug-resistant non-typhoidal *Salmonella i*nfections compared to estimates from 2010-2012.
Maintain the occurrence of multidrug-resistant TB infections to 0% while maintaining alertness and cooperation through Tuberculous Prevention Programme.
Determine the rate of antibiotic-resistant invasive pneumococcal disease among <5 year-olds over three years and based on this data establish a yearly decline as applicable.
Determine the rate of antibiotic-resistant invasive pneumococcal disease among >65 year-olds and based on this data establish a yearly decline as applicable.

Appendices

Appendix 1: Drafting Team for NAP on Combatting AMR 2017-2022

Name	Organisation
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Appendix 2: List of Contributors

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Appendix 3: Terms of Reference for Oversight Committee of NAP on AMR

To be agreed by Oversight Committee members

Appendix 4: WHO AMR Pathogens and Types of Resistance of Concern

WHO PRIORITY PATHOGENS LIST FOR R&D OF NEW ANTIBIOTICS

Priority 1: CRITICAL#
Acinetobacter baumannii, carbapenem-resistant
Pseudomonas aeruginosa, carbapenem-resistant
Enterobacteriaceae*, carbapenem-resistant, 3rd generation cephalosporin-resistant

Priority 2: HIGH
Enterococcus faecium, vancomycin-resistant
Staphylococcus aureus, methicillin-resistant, vancomycin intermediate and resistant
Helicobacter pylori, clarithromycin-resistant
Campylobacter, fluoroquinolone-resistant
Salmonella *spp.*, fluoroquinolone-resistant
Neisseria gonorrhoeae, 3rd generation cephalosporin-resistant, fluoroquinolone-resistant

Priority 3: MEDIUM
Streptococcus pneumoniae, penicillin-non-susceptible
Haemophilus influenzae, ampicillin-resistant
Shigella *spp.*, fluoroquinolone-resistant

#Mycobacteria (including *Mycobacterium tuberculosis*, the cause of human tuberculosis), was not subjected to review for inclusion in this prioritization exercise as it is already a globally established priority for which innovative new treatments are urgently needed.

***** Enterobacteriaceae include: *Klebsiella pneumonia*, *Escherichia coli*, *Enterobacter* spp., *Serratia* spp., *Proteus* spp., and *Providencia* spp, *Morganella* spp.

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