CANADA'S AMR TASK FORCE

AN INTRODUCTION TO CANADA'S AMR ADVISORY GROUP

PRESENTATION TO PACCARB PUBLIC MEETING

MARCH 23, 2023

Public Health Agency of Canada | Agence de la santé publique du Canada

Canada

PURPOSE

- Present Canada's federal AMR strategy
- Provide an overview of Canada's National Action Plan, the 5 pillars of action and the desired outcomes
- Describe Canada's Advisory Group on AMR
- Identifying current Canadian environmental/AMR interests
- Discuss opportunities for US-Canada Advisory Group collaboration

Key Takeaways

Canada's **three-pronged strategy** to combat AMR is grounded on a **One Health** perspective and focuses on securing access, preserving effectiveness and demonstrating leadership

The role of **Canada's Advisory Group** is critical in supporting Canada's federal strategy to secure access to antimicrobials and preserving their effectiveness

Advisory Group provides critical input on **Canada's Pan-Canadian Action Plan:** Research & Innovation, Surveillance, Stewardship, Infection Prevention & Control, and Leadership

US **PACCARB** and the Canada **AG-AMR collaboration** can support implementation of both countries' action plans

CANADA'S FEDERAL AMR STRATEGY

THREE PRIORITY AREAS OF ACTION

01 Securing Access & Strengthening Innovation

Objective

Implement incentives to bring new antimicrobials to Canadians and address the failure of the market

Support research and innovation to develop new antimicrobials and alternatives

02 Preserving Effectiveness

Objective

Enable appropriate antimicrobial use through surveillance, stewardship, and infection prevention and control initiatives that prioritize the unique needs of at-risk populations

03 Demonstrating Leadership At Home and Abroad

Objective

At Home: Finalize the Pan-Canadian Action Plan

Abroad: Increase Canada's contributions to global efforts to advance key bilateral and multilateral commitments

THE PAN-CANADIAN ACTION PLAN

THE PILLARS OF ACTION

RESEARCH & INNOVATION

SURVEILLANCE

STEWARDSHIP

INFECTION PREVENTION & CONTROL

LEADERSHIP

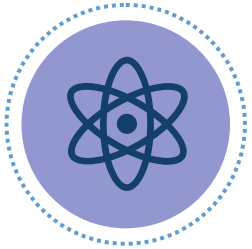
- Canada's national 5-year plan for **collective action** on AMR through a **One Health** approach
- The Pan-Canadian Action Plan (PCAP) is a **shared commitment** between the Federal and Provincial/Territorial Ministers of Health and Agriculture
- The PCAP consists of five (5) pillars of actions, with two (2) desired outcomes and two (2) associated actions to achieve the outcomes

CANADA'S ADVISORY GROUP ON AMR

- **Uses a One Health approach to AMR that recognizes the important relationship of AMR/AMU in humans, animals and their shared environment.**

MEMBERSHIP

Thirteen (13) members for a volunteer term of three (3) years



EXPERTISE

Highly respected academics, health care professionals, and clinicians in the fields of infectious diseases, microbiology, environmental microbiology, biotechnology, veterinary medicine and human-animal heath

MANDATE

Provide relevant, multi-disciplinary and timely expert advice to the Public Health Agency of Canada's AMR Task Force

AREAS OF DISCUSSION

- Prioritization of securing access to antimicrobials in Canada
- Approaches to preserving the effectiveness of existing antimicrobials
- Approaches to develop a One Health data strategy to monitor AMR threats.

CANADA'S ADVISORY GROUP ON AMR

WHAT WE HEARD ON THE PAN-CANADIAN ACTION PLAN

GENERAL

- **Overall support** for PCAP draft – recognition of importance of completing this work
- More **specificity and clarity** required in certain pillars of action
- Recognition of the **linkages**/interdependencies among pillars of action
- **Moving beyond actions**, specific additional activities were proposed to advance PCAP actions

CONSIDERATIONS

- Address **research** and **data gaps** in the **environmental sector**, with focus on AMR transmission in the environment
- Expand on economic feasibility of **push/pull incentives** for the development of new antibiotics
- **Sustained funding** is key to advance actions particularly stewardship initiatives

AREAS OF IMPROVEMENT

- Expand research purview to address data gaps in the **environment** and **agriculture** sector
- Include **implementation details** such as timelines, roles and responsibilities and planned activities across pillars
- Elaborate on **Indigenous** landscape and **recognize data gaps** (e.g., background data on AMR rates, AMU and resources)

THE PAN-CANADIAN ACTION PLAN

RESEARCH & INNOVATION

DESIRED OUTCOME 1
Improved, sustainable access to antimicrobials, diagnostics, and alternatives to antimicrobials to better mitigate AMR

ACTION

Develop and implement economic and/or regulatory incentives to support innovation and facilitate sustained access to new and existing antimicrobials, diagnostics, and alternatives to antimicrobials

ADVISORY GROUP INPUT OPPORTUNITIES:

How can we develop a framework for continuous risk assessment and prioritization for access to existing or new solutions for Canadians?

DESIRED OUTCOME 2
Expand scientific knowledge base and tools to inform effective AMR/AMU interventions

ACTION

Develop a One Health, national research strategy for combatting AMR across all PCAP pillars

ADVISORY GROUP INPUT OPPORTUNITIES:

How can we break down the silos that exist among sectors to identify and address knowledge gaps to support Action Plan implementation?

THE PAN-CANADIAN ACTION PLAN

SURVEILLANCE

DESIRED OUTCOME 1
Canada has a robust, integrated One Health AMR/AMU surveillance infrastructure allowing for accessible, reliable, timely and nationally representative data that is capable of detecting emerging threats

ACTION

Expand sources, coverage and integration of AMR and AMU surveillance data, including through modern laboratory technologies and standardized reporting, to help monitor AMR/AMU across One Health sectors, with specific focus on improving data from the environment; transmission pathways between sectors; and populations groups disproportionately impacted by AMR and inappropriate AMU

ADVISORY GROUP INPUT OPPORTUNITIES:

- What does the ideal integrated surveillance system look like?
- How do we balance the need to be cost effective with the need for adequate breadth and depth of coverage to detect, monitor and assess AMR and AMU risks?
- What level of environmental AMR and antimicrobial residual surveillance is required to mitigate AMR risks?

THE PAN-CANADIAN ACTION PLAN

SURVEILLANCE

DESIRED OUTCOME 2
Canada has a comprehensive understanding of AMR and AMU trends at national, regional and local levels to support evidence-based decision-making and to monitor the impacts of interventions

ACTION

Work with partners to:

- Establish baselines and targets for national, provincial, and territorial levels of AMR and appropriate AMU in human health
- Develop goals, baselines, and measures of progress for increasing appropriate AMU and reducing AMR in the agriculture and agri-food sectors

ADVISORY GROUP INPUT OPPORTUNITIES:

- What are appropriate metrics and targets for AMR and AMU in the human and animal health sectors?
- How can Canada address the gaps in animal AMU metrics to move beyond quantitative measures and monitor appropriateness of use?

THE PAN-CANADIAN ACTION PLAN

STEWARDSHIP

DESIRED OUTCOME 1

Prescribers and other professionals in Canada have the resources, training, and tools to facilitate appropriate AMU in humans and animals

ACTION

Develop, implement, and promote guidelines/standards for appropriate AMU in humans and animals through policy and regulatory initiatives, monitoring and educational interventions/accreditation requirements for health professionals and prescribers

ADVISORY GROUP INPUT OPPORTUNITIES:

How can we leverage behavioural science data and knowledge mobilization tools to ensure uptake of new resources and tools by prescribers for appropriate AMU in humans and animals?

THE PAN-CANADIAN ACTION PLAN

STEWARDSHIP

DESIRED OUTCOME 2
Canadians understand the importance of the appropriate use of antimicrobials

ACTION

Foster understanding of the risks of AMR and the importance of appropriate use of antimicrobials in humans and animals amongst the public, patients and producers through awareness/education campaigns, feedback mechanisms and regulatory initiatives

ADVISORY GROUP INPUT OPPORTUNITIES:

How can we move beyond broad based awareness campaigns to targeted and measurable interventions that impact appropriate use of antimicrobials and encourage behavioral changes?

THE PAN-CANADIAN ACTION PLAN

INFECTION PREVENTION & CONTROL

DESIRED OUTCOME 1

Canada has IPC programs in place across community and institutional health sectors, including for populations disproportionately impacted by AMR

ACTION

Increase effective implementation of IPC measures, particularly for at-risk populations such as remote, northern, and isolated communities, First Nations, Inuit, and Metis communities, and long-term care facilities by developing, updating, and promoting uptake of guidelines/best practices for human health

ADVISORY GROUP INPUT OPPORTUNITIES:

How can we effectively engage with key populations to ensure impactful programs such as increasing rates of adult vaccination?

THE PAN-CANADIAN ACTION PLAN

INFECTION PREVENTION & CONTROL

DESIRED OUTCOME 2

Improved animal health and food safety along the farm-to-fork continuum to prevent and limit the spread of infection and foodborne pathogens

ACTION

Support the increased implementation of IPC, biosecurity, and food safety protocols across the agriculture and agri-food sectors, prioritizing sound animal husbandry, access to veterinary care, and access to additional health and nutritional aids to promote animal health

ADVISORY GROUP INPUT OPPORTUNITIES:

- What does successful IPC implementation look like in the animal health sector?
- Beyond antimicrobials, what tools and resources are required to improve biosecurity?

THE PAN-CANADIAN ACTION PLAN

LEADERSHIP

DESIRED OUTCOME 1
The PCAP is implemented through coordinated, multi-sectoral domestic action

ACTION

Build on existing One Health AMR governance structures to create a "network of networks" platform with diverse representation across sectors and jurisdictions to support PCAP implementation and share progress and lessons learned within and across the five pillars of action

ADVISORY GROUP INPUT OPPORTUNITIES:

- What specifically does improved governance success look like in Canada? In 1 year? In 2 years? In 5 years?
- What specific Canadian governance challenges exist within any one particular pillar of action would need to be prioritized?
- What specific Pan-Canadian governance challenges exist across pillars that would need to be prioritized?
- How can we better integrate the environment into PCAP actions

THE PAN-CANADIAN ACTION PLAN

LEADERSHIP

DESIRED OUTCOME 2

Strengthened relationships with global partners to inform Canada's interests to advance key bilateral and multilateral AMR commitments

ACTION

Increase Canadian-specific policy and programming contributions that inform and support Canada's global AMR strategic objectives:

1. Evidence – improve and integrate data/evidence on AMR/AMU and strengthen surveillance systems and data standards
2. Equity – advance access and stewardship initiatives for low-and middle-income countries
3. One Health – promote evidence-based interventions and best practices within and across sectors

ADVISORY GROUP INPUT OPPORTUNITIES:

Where should Canada focus its efforts and contributions to make the most meaningful impact internationally? (e.g. integrated surveillance, stewardship, equity)

ADDRESSING AMR IN THE ENVIRONMENT

- **The UN Environment Program "Bracing for superbugs" report has highlighted the importance of environmental contributions to AMR**
- **The Government of Canada recognizes that an action-oriented 'One Health' approach, informed by science, is urgently needed to address AMR in the environment**

- There is growing evidence that the environment plays a key role in the development, transmission, and spread of AMR
- Pollution and unsustainable production practices that include increasing use and misuse of antimicrobials can create favorable conditions for microorganisms to develop resistance, which can be transmitted and spread via environmental pathways
- Drivers of AMR in the environment include important economic sectors such as pharmaceutical and chemical manufacturing, agriculture and food production, and healthcare
- The relative importance of these and other drivers of AMR in the environment, such as extreme weather events related to climate change, remains understudied and needs to be better understood, to develop effective solutions that recognize the interdependence of human, animal and plant health and the environment
- **Canada is developing a framework to effectively integrate environmental considerations into actions aimed at managing AMR**

AMR IN THE ENVIRONMENT

CANADA'S APPROACH RELIES ON KEY QUESTIONS TO DRIVE ACTION

- What are the relevant drivers for development, transmission, and spread of AMR in the Canadian context?
- What are the critical research and analytical gaps and how do we prioritize them?
- What surveillance and monitoring systems are required to assess the risk of environmental AMR?
- What actions will mitigate these risks?

- **Identify sectors** (e.g. health care, residential, industrial, agricultural crop and animal production systems) **and pathways** (e.g. waste water, manure application and runoff) **that are drivers for AMR in the environment globally**

- **Assess the relevance** of these sectors and pathways **in the Canadian context** via a systematic review of the available scientific evidence to **identify and prioritize research and analytical gaps**

- Implement research surveillance and monitoring to **fill critical knowledge gaps for assessing and mitigating the risk of environmental AMR**

- **Strengthen the integration of environmental considerations into Canada's actions** for managing AMR in a multisectoral, collaborative approach that is based on strong federal leadership

STRENGHTHENING ENVIRONMENTAL ACTION

ADDRESSING KNOWLEDGE GAPS IS A KEY PART OF CANADA'S ONE HEALTH RESPONSE

- **Canada's 'One Health' national action plan on AMR includes environmental considerations**
- **Prioritization of potential future action opportunities will be informed by Canada's expert advisory group on AMR**

Applying the UN Environment Program report "Bracing for superbugs" key pollution sources in the Canadian economic context:

1. **Pharmaceuticals and other chemicals manufacturing:** While manufacturing of active pharmaceutical ingredients (APIs) in Canada is limited, the potential environmental impact of associated activities (e.g. formulating of APIs into finished products) requires investigation.
2. **Terrestrial animal and crop production, aquaculture, and associated inputs:** Fundamental knowledge gaps impede the prioritization of surveillance and monitoring activities, and Canada has launched new research investments to start investigating environmental exposure pathways for AMR across sectors (e.g. food production, aquaculture, freshwater).
3. **Healthcare delivery in hospitals, medical facilities, community healthcare facilities and pharmacies:** The full environmental impact of AMR originating from Canadian healthcare systems is currently unknown, and additional targeted surveillance activities are needed (e.g. expansion of wastewater surveillance).

FUTURE PACCARB–AG-AMR DISCUSSIONS

Opportunities for discussion, collaboration, support and synergy.

ENVIRONMENT EVIDENCE GATHERING

What drivers for AMR development, transmission and spread are most relevant to consider in the Canadian context?

Which research and analytical gaps are most important to prioritize?

AMR RESEARCH STRATEGY DEVELOPMENT

What should research strategies focus on for the most meaningful impact?

- Behavioural science and new diagnostic tools to improve stewardship?
- Better laboratory approaches to improve timeliness of surveillance?
- New molecules that could address priority pathogens?

PRIORITY ANTIBIOTICS

What essential criteria have the greatest potential for assessing and quantifying the unmet need in specific pathogen-resistance combinations, and would be useful in an eventual tender for unmet needs?

How can that framework be applied with a One Health lens to address gaps in animal health?

ANNEX

AMR ADVISORY GROUP MEMBERSHIP

Consists of thirteen (13) members, nominated and appointed by Canada's Deputy Chief Public Health Officer.

Chair
Dr. Donald Sheppard

Executive Secretary
Joël Denis

Secretariat Support
AMR Task Force

- Dr. Herman Barkema, Professor (Epidemiology of Infectious Diseases), Production Animal Health, Faculty of Veterinary Medicine, University of Calgary
- Dr. John Conly, Professor of Medicine, Microbiology, Immunology & Infectious Diseases, Pathology & Laboratory Medicine, Department of Medicine (Infectious Diseases), Cumming School of Medicine, University of Calgary and Alberta Health Services
- Dr. Caroline Duchaine, Faculty Professor and Canada Research Chair on Bioaerosols, Department of Biochemistry, Microbiology and Bioinformatics, Laval University
- Dr. Sara Goulet, Associate Dean of Admissions, Max Rady college of Medicine, University of Manitoba
- Dr. Suzanne Hindmarch, Associate Professor, Director of Graduate Studies, University of New Brunswick
- Dr. Rob Jamieson, Professor and Canada Research Chair in Cold Regions Ecological Engineering, Department of Civil and Resource Engineering, Dalhousie University
- Dr. Allison McGeer, Director of Infection Control, Mount Sinai Hospital and Faculty Professor, Departments of Laboratory Medicine and Pathology, and Public Health Sciences, University of Toronto
- Dr. Simon Otto, Assistant Professor (Epidemiology of Foodborne Diseases), Environment Health, School of Public Health, University of Alberta
- Dr. Sameeh Salama, Chief Scientific Officer, Fedora Pharmaceuticals Inc.
- Dr. Makeda Semret, Associate Professor, Department of Medicine, Faculty of Medicine and Health Sciences, McGill University and Investigator, RI-MUHC Glen site Infectious Diseases and Immunity on Global Health Program
- Dr. Scott Weese, Professor, Ontario Veterinary College, University of Guelph
- Dr. Kaley Wilson, Director of Business Development, Quark Ventures
- Dr. Gerry Wright, Director, Michael G. DeGroote Institute for Infectious Disease Research and Distinguished University Professor, Department of Biochemistry and Biomedical Sciences, University of McMaster