



Building Momentum: Activities Underway to Address Antimicrobial Resistance in Canada

**Compendium to the Pan-Canadian Action Plan on
Antimicrobial Resistance**

**TO PROMOTE AND PROTECT THE HEALTH OF CANADIANS THROUGH LEADERSHIP, PARTNERSHIP,
INNOVATION AND ACTION IN PUBLIC HEALTH.**

— Public Health Agency of Canada

Également disponible en français sous le titre :

*Donner de l'élan : Activités en cours pour lutter contre la résistance aux antimicrobiens au Canada
Compendium du Plan d'action pancanadien sur la résistance aux antimicrobiens*

To obtain additional copies, please contact:

Public Health Agency of Canada
Address Locator 0900C2
Ottawa, ON K1A 0K9

Tel.: 613-957-2991
Toll free: 1-866-225-0709
Fax.: 613-941-5366
TTY: 1-800-465-7735
E-mail: publications@canada.ca

This publication can be made available in alternative formats upon request.

© His Majesty the King in Right of Canada, as represented by the Minister of Health, 2023

This publication may be reproduced for personal or internal use only without permission provided the source is fully acknowledged.

Catalogue Number: HP40-338/2024E-PDF
ISBN/ISSN: 978-0-660-69440-5
Pub. Num.: 230661



Table of Contents

Chapter 1: Introduction to the Pan-Canadian Action Plan on Antimicrobial Resistance.....	1
Chapter 2: Establishing next steps for the action plan	4
Chapter 3: Building on momentum: Activities underway to address AMR in Canada.....	5
Research and innovation pillar	5
Surveillance pillar.....	9
Stewardship pillar.....	13
Infection prevention and control pillar.....	18
Leadership	22
Chapter 4: Conclusion	25
Annex: List of acronyms	26

Chapter 1: Introduction to the Pan-Canadian Action Plan on Antimicrobial Resistance

The Pan-Canadian Action Plan on Antimicrobial Resistance (the “action plan”) is a 5-year (2023 to 2027) blueprint for strengthening Canada’s collective preparedness and response on antimicrobial resistance (AMR) across the One Health spectrum.

The action plan establishes 10 federal, provincial¹ and territorial (FPT) priority action commitments on AMR. It responds to calls to action from non-governmental organizations, the healthcare and veterinary sectors, the scientific and research community, and industry to work together to combat the growing threat of AMR. FPT governments will work with Indigenous Peoples and partners across multiple sectors to implement the action plan across 5 pillars of work: research and innovation; surveillance; stewardship; infection prevention and control (IPC); and leadership.

The action plan and its implementation will be guided by the following principles:

- **One Health** – actions recognize and consider each sector and the interplay between human health, animal health and their shared environment
- **Equity** – AMR disproportionately impacts certain populations and at-risk demographics. Tailored approaches are necessary to ensure programs and initiatives are equitable and mitigate disproportionate impacts of antimicrobial use (AMU) and AMR
- **Collaboration (domestic & international)** – no one entity or order of government can effectively address AMR alone. Coordination across jurisdictions, sectors, partners and the public is essential to effectively address AMR
- **Momentum** – implementation should build on existing successes to achieve continuous improvement toward stated outcomes

¹ Quebec shares the federal government’s objectives regarding the appropriate use of antimicrobials and the fight against AMR. Considering the importance of this issue, Quebec has developed its own action plans in human and animal health through which Quebec will be able to collaborate with the federal, provincial and territorial governments on these priority issues when they require intergovernmental coordination.



5 pillars of the action plan and associated priority actions

Research and innovation

- Develop and implement economic and/or regulatory incentives to support innovation and facilitate sustainable access to new and existing antimicrobials, diagnostics, and alternatives to antimicrobials.
- Develop a One Health, national research strategy for combatting AMR across all action plan pillars.

Surveillance

- Expand sources, coverage and integration of AMR and AMU surveillance data, including the use of 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 population groups disproportionately impacted by AMR and inappropriate AMU.
- Work with partners to (a) establish baselines and targets for national, provincial and territorial levels of AMR and appropriate AMU in human health, and (b) establish baselines, goals and measures of progress for increasing appropriate AMU and reducing AMR in the agriculture and agri-food sectors.

Stewardship

- 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.
- 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 policy and regulatory initiatives.

Infection prevention and control

- Increase effective implementation of infection prevention measures, particularly for populations disproportionately impacted by AMR such as remote, northern and isolated communities, First Nations, Inuit and Métis populations, long-term care residents, and hospitalized patients by developing, updating and promoting uptake of guidelines/best practices for human health.
- Support the increased implementation of enhanced 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.

Leadership

- Build on existing One Health AMR governance structures to create a “network of networks” with inclusive representation to support action plan implementation and share progress and lessons learned within and across the 5 pillars of action, prioritizing strengthened FPT, First Nations, Inuit and Métis collaboration to co-develop AMR actions.
- Increase Canada’s contributions to global efforts to advance key bilateral and multilateral commitments by prioritizing:
 - » generating improved data/evidence on AMR/AMU and strengthening surveillance systems and data standards
 - » expanding efforts to support low- and middle-income countries by advancing equitable access, stewardship and IPC initiatives.

Chapter 2: Establishing next steps for the action plan

Effective implementation of the action plan relies on FPT governments, Indigenous Peoples, and sectoral partners working together within their respective areas of responsibility to advance the priority actions. While the 10 priority actions have been grouped into 5 distinct pillars for the purposes of the action plan, they are mutually reinforcing and designed as a suite of actions that will together have the greatest impact in the Canadian context. The implementation of any one priority action is expected to have horizontal benefits for others.

Strengthened domestic governance is one of the 10 actions in the action plan. Governance will be prioritized in the first year of implementation to enhance coordination and knowledge-sharing across all areas. FPT governments will work together and with partners to develop an effective 'network of networks' approach for supporting the successful implementation of the action plan.

Strengthened governance will also inform a pan-Canadian approach to monitoring implementation progress. Public reporting on progress will help partners adjust interventions over time and ensure best practices are shared with domestic and international stakeholders. Capturing progress achieved in each of the 10 priority actions will also help Canada establish long-term priorities on AMR beyond the 5 years of the action plan. Several sources of data can support monitoring efforts. Program and policy implementation milestones, AMR and AMU surveillance metrics, and/or stakeholder feedback, among others, can together provide a window into the progress of each of the 10 priority actions over the 5 years of the action plan. The action plan will be considered a living document over its 5-year implementation and remain flexible to reflect new evidence, challenges and/or resources.

Chapter 3: Building on momentum: Activities underway to address AMR in Canada

The action plan represents a significant milestone in strengthening a pan-Canadian response on AMR. Many activities are already underway or in development across FPT governments that support the 10 priority actions. Mapping these FPT activities to the 10 shared priority actions helps demonstrate areas of existing strength, as well as gaps that require greater attention.

This chapter provides an overview of some key FPT activities currently underway that advance the priority actions and support progress on addressing AMR in Canada. It should not be considered an exhaustive list of activities, rather a sample of current activities underway. Many activities are complementary and help advance other actions. Therefore, while some activities would fall under more than one priority action, each activity is reported only once.

Given that the action plan is set over a 5-year timeframe (2023 to 2027), current activities captured below will be built upon, and new activities initiated on an ongoing basis. Implementation of the action plan is an evergreen process that will be informed by research, analysis and engagement to identify and prioritize new activities to help advance the priority actions. Strengthened governance will support expanded engagement with jurisdictional and sectoral partners to support comprehensive multi-sectoral implementation and monitoring over the action plan's 5-year timeframe.

Roles and responsibilities of FPT governments are broadly defined for each action and will be further developed or refined as the action plan is implemented.



Research and innovation pillar

Research and innovation are critical for improving our understanding of AMR in different settings (including healthcare systems, agriculture and agri-food systems and the environment), establishing effective population-level interventions (such as legislation, policies, guidelines and educational approaches to stewardship and IPC), and stimulating the discovery of new antimicrobials, diagnostics, and alternatives to antimicrobials (for example, vaccines, adjuvants, phage therapy, and probiotics) in human and animal health. Numerous research disciplines, including social sciences, medical and life sciences, among others, support AMR mitigation efforts and health product discovery.



Shared priority action 1:

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

Federal roles and responsibilities:

- Development of economic/regulatory incentive parameters

Provincial and territorial roles and responsibilities:

- Informing needs analysis

Examples of federal activities:

- Public Health Agency of Canada (PHAC) is funding the Council of Canadian Academies (CCA) Assessment on Pull Incentives for High-Value Antimicrobials (upcoming release 2023)
- SECURE is a new global initiative with the mission to expand access to essential, life-saving antibiotics across low- and middle-income countries (LMICs). PHAC is joining international partners in providing financial support to SECURE to support equitable access to antimicrobials
- National Research Council (NRC) Human Health Therapeutics Research Centre continues to launch research initiatives to develop antimicrobial alternatives for human health, including vaccines and bacteriophages
- The International Development Research Centre (IDRC), in partnership with the United Kingdom, supports a research and innovation program that aims to develop and deploy alternatives to antimicrobial use in animal production and fish farming systems, particularly in LMICs. This and other work not only helps reduce the risk of AMR importation but also uncovers solutions that can be put into practice in Canada
- PHAC is collaborating with Innovation, Science and Economic Development Canada (ISED) to explore strengthening of domestic biomanufacturing capacity for life sciences as it relates to AMR innovation needs

- Health Canada (HC) is maintaining and updating a Pathogens of Interest List to inform sponsors and manufacturers about the pathogens creating the most urgent need for innovative therapeutic drugs and/or diagnostic devices in Canada
- HC is sponsoring an Innovation Solutions Canada challenge on AMR point-of-care diagnostic research & development

Examples of provincial and territorial activities:

- Ontario continues to encourage and foster, support and share research and innovation related to AMR, in collaboration with the University of Guelph Alliance Agreement, New Directions Research, Food Safety partners, Sustainable Canadian Agricultural Partnership (CAP), and other opportunities
- Ontario invests in research that drives improvements in surveillance, stewardship and IPC, including development of antimicrobial alternatives, vaccines and diagnostics (including genomics and bioinformatics) through these same programs

Shared priority action 2:

Develop a One Health, national research strategy for combatting AMR across all action plan pillars.

Federal roles and responsibilities:

- Engagement and development of national strategy

Provincial and territorial roles and responsibilities:

- Informing strategy priorities and development

While the development of an overall One Health research strategy has not yet begun, several valuable research efforts are currently in progress.

Examples of federal activities:

- Canadian Institutes of Health Research (CIHR) continues to participate as a funder for Joint Programming Initiative on Antimicrobial Resistance (JPIAMR) Transnational calls for applications to fund research projects designed to develop innovative strategies to combat AMR
- CIHR launched a national AMR call in October 2022 entitled Evaluation of Population-level Interventions to Reduce Inappropriate Antimicrobial Use and Prevent the Spread of Resistant Pathogens



- Multiple federal departments continue to participate in the Genomics Research and Development Initiative (GRDI) AMR II research program (2022 to 2027) focusing on expanding AMR research across the One Health continuum (Agriculture and Agri-Food Canada (AAFC), Environment and Climate Change Canada (ECCC), Fisheries and Oceans Canada (DFO), HC, PHAC, NRC, National Resources Canada (NRCan), Canadian Food Inspection Agency (CFIA), Indigenous Services Canada (ISC))
- DFO is conducting research to determine strategies to detect and investigate the presence and potential impact of aquaculture-related AMR in aquatic environments

Examples of provincial and territorial activities:

- In collaboration with PHAC, Alberta has developed the collaborative AMR – One Health Consortium platform to promote self-sustaining clinical, epidemiologic, basic and social sciences, and translational research on AMR using a transdisciplinary, multi-sectoral approach
- British Columbia (British Columbia Centre for Disease Control (BCCDC)/University of British Columbia (UBC)) has a research program looking at drivers and determinants of antibiotic use, impact of stewardship programs and their specific elements, impact of antibiotic use on longer term outcomes like atopic disease in humans
- Nova Scotia clinicians and researchers from Nova Scotia Health, Izaak Walton Killam (IWK) Health, and Dalhousie University are collaborating to develop and evaluate impact of antimicrobial stewardship interventions and assess AMU in a variety of human medicine settings





Surveillance pillar

Surveillance underpins Canada's ability to detect, understand and take necessary action to respond to emerging public health threats. Surveillance is closely linked to other pillars such as stewardship and IPC, as it supports and informs actions, reveals trends and gaps, and helps measure the effect of interventions. All partners in the AMR response rely on data from existing surveillance systems to inform and support evidence-based decision making.

Surveillance pillar

Shared priority action 1:

Expand sources, coverage and integration of AMR and AMU surveillance data, including the use of 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 population groups disproportionately impacted by AMR and inappropriate AMU.

Joint roles and responsibilities:

- Work with partners to identify respective opportunities to expand sources, coverage and integration of data

Federal roles and responsibilities:

- National level integration and analysis of trends/threats

Provincial and territorial roles and responsibilities:

- Work with partners on provincial, territorial and/or regional data collection, analysis and interpretation to identify trends/threats



Examples of federal activities:

- PHAC is working with provinces and territories to expand and enhance monitoring of AMR and AMU across One Health sectors including the Canadian Integrated Program for AMR Surveillance (CIPARS), Canadian Nosocomial Infection Surveillance Program (CNISP), Canadian National Antimicrobial Prescribing Survey (NAPS), Antimicrobial Resistance Network (AMRNet), and the Enhanced Surveillance of Antimicrobial Resistant Gonorrhoea program (ESAG)

- CIPARS will continue to collect, analyze, and communicate trends in AMU and AMR for foodborne bacteria from humans, animals, and retail meat across Canada and is expanding to include national on-farm surveillance of AMR and AMU in beef cattle, and regional surveillance in dairy cattle, adding to similar surveillance already underway in broiler chickens, turkeys and pigs. Data have been used for pre- and post-market human safety evaluations of animal antimicrobials and in AMR risk-based assessments
- CIPARS will continue to monitor national and provincial sales of antimicrobials intended for use in food animals and companion animals via the Veterinary Antimicrobial Sales Reporting System (VASR) – a surveillance component jointly operated by HC and PHAC
- CNISP continues to collect data on antimicrobial resistant infections in humans from Canadian health care settings and is expanding to collect data from more acute care hospitals as well as long-term care facilities
- NAPS is expanding its network of Canadian healthcare settings for AMR and AMU data collection
- AMRNet continues to collect data on antimicrobial susceptibility testing from human and veterinary laboratories and is expanding to include additional provincial and territorial (PT) laboratory partners to monitor AMR trends in humans and animals
- ESAG continues to collect laboratory and epidemiological linked data and antimicrobial use data on antimicrobial resistant gonorrhea cases and is recruiting additional provinces
- PHAC is expanding the collection of AMR and AMU data to include sentinel primary care settings, which will help to establish baseline information on AMR diagnoses, prescribing patterns, and the impact on vulnerable populations in the community sector
- PHAC is expanding modelling approaches to assess the impact of vaccines, antimicrobial use, on-farm IPC measures, and related interventions on the exposure of Canadians to foodborne AMR
- PHAC is leveraging the rapid implementation of urban wastewater surveillance to identify population-level AMR and AMU trends
- PHAC and ISC are implementing community-led AMR surveillance in Indigenous communities (patient testing and establishing wastewater surveillance)
- ISC is co-developing surveillance and reporting protocols to guide the application of emerging evidence of AMR prevalence in bacterial strains circulating in First Nations communities to inform regional level decisions about recommended AMU in the treatment of notifiable bacterial infections
- ISC is supporting the development of laboratory and surveillance infrastructure for routine monitoring of AMR in priority pathogens in First Nations, territorial and Inuit communities as well as to further test specimens already collected in First Nations populations for evidence of AMR
- AAFC provides funding to the Canadian Veterinary Medical Association (CVMA) to support voluntary prescription and dispensing data collection for beef, poultry and swine sectors

Examples of provincial and territorial activities:

- All provincial public health laboratories and several provincial animal health laboratories contribute to CIPARS activities (AMR sampling and surveillance). For some surveillance components (for example, farm surveillance), some provinces have contributed resources to the program
- Several provinces have developed and are engaging in ongoing animal health surveillance or research contributing to AMU/AMR surveillance. British Columbia, Alberta, Saskatchewan, and Manitoba have established the Companion Animal Surveillance Initiative while Quebec and Ontario continue to engage with Réseau d'alerte et d'information zoosanitaire (RAIZO) and Ontario Animal Health Network (OAHN), respectively
- Ontario, Saskatchewan and PEI are collaborating with PHAC to share deidentified human laboratory data necessary to establish national AMR diagnostic statistics
- Nunavut has partnered with CNISP to track inpatient methicillin-resistant *Staphylococcus aureus* (MRSA) bloodstream infections, hospital acquired *Clostridioides difficile* infections (CDI) and AMU data, as well as territorial antibiotic resistance (antibiogram) data
- Nunavut is developing antibiograms for Iqaluit, the territory and its regions to help guide clinicians, nurses and pharmacists in selecting the best empiric antimicrobial treatment
- Nova Scotia has initialized multiple activities related to AMU such as monitoring of appropriateness using NAPS and AMU surveillance among pediatric and adult inpatients
- Nova Scotia IPC in acute care tracks inpatient MRSA infections/colonization, CDI and other infections tracked by CNISP. One Patient One Record (OPOR) will facilitate better linkage between infections and AMU data
- Nova Scotia monitors and reports AMU among inpatients quarterly. Antibiograms are developed every 2 years
- Quebec has initiated the integration of AMR surveillance into the overall provincial surveillance plan
- Under the Ontario Antimicrobial Stewardship Program, AMU and resistant organisms found in human hospitals are tracked and reported on an annual basis
- BC conducts surveillance of community AMR and AMU using granular line-listed data from BC PharmaNet and LifeLabs BC
- Alberta has provided funds to the University of Calgary Faculty of Veterinary Medicine to expand and support diagnostic pathology and bacteriology for livestock species

Shared priority action 2:

Work with partners to (a) establish baselines and targets for national, provincial and territorial levels of AMR and appropriate AMU in human health; and (b) establish baselines, goals and measures of progress for increasing appropriate AMU and reducing AMR in the agriculture and agri-food sectors.

Joint roles and responsibilities:

- Collaborate with respective stakeholders and partners to develop context-appropriate targets, baselines, goals, and measures

Federal roles and responsibilities:

- Convenor for the development of national-level targets, baselines, goals, and measures

Provincial and territorial roles and responsibilities:

- Work with partners to establish provincial, territorial and/or regional targets, baselines, goals, and measures



Examples of federal activities:

- PHAC continues to collect nationally representative data for AMR and AMU across the One Health continuum
- PHAC and HC are leading the analysis of the data and trends observed via the VASR system to inform sector specific risk management measures in the agri-food sector
- PHAC is consulting extensively to develop expanded data collection strategies, as well as to establish appropriate baselines and targets for AMU in animal and human health
- DFO and ECCC are leading a project to establish a baseline for AMR in relation to aquaculture, as part of the GRDI on AMR
- CFIA will collaborate with producers and industry partners, PTs, veterinarians, and other federal departments as part of a shared process to develop objectives and measures that further support the prudent use of antimicrobials in animals

Examples of provincial and territorial activities:

- Ontario continues to encourage agriculture and agri-food industries to implement their own AMU surveillance to help establish baselines; to support teams like CIPARS, FoodNet Canada, Stewardship of Antimicrobials by Veterinarians Initiative (SAVI) and research projects that collect and monitor AMU and AMR data; and to support the provincial Animal Health Laboratory (at the University of Guelph) in general, including adoption of new diagnostic technologies and work toward standardized reporting for AMR (and other diseases)
- PEI is a founding partner with AMRNet and continues to refine antibiogram and AMU data for inpatients and outpatients overlaid by geographic data



Stewardship pillar

Antimicrobial stewardship (AMS) is a system-wide approach that recognizes the role of patients, prescribers, producers and the public in promoting appropriate AMU. It includes coordinated interventions designed to promote, improve, monitor, and evaluate appropriate AMU to preserve antimicrobial effectiveness while promoting and protecting human and animal health.

Shared priority action 1:

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.

Joint roles and responsibilities:

- Collaborate with stakeholders and partners to identify stewardship gaps and opportunities

Federal roles and responsibilities:

- Coordinate the development of national appropriate use guidelines/standards

Provincial and territorial roles and responsibilities:

- Work with partners in the development and implementation of provincial, territorial and/or regional guidelines/standards and monitoring

Examples of federal activities:

- PHAC is funding and convening communities of practice to lead the development, review, endorsement, dissemination, and promotion of national prescribing best practices/guidelines in human medicine
- PHAC is expanding on a tool for prescribers to support appropriate AMU in relation to benchmarks and to monitor progress toward achieving appropriate AMU targets in human medicine
- HC is leading the development and maintenance of a Canadian-specific list of reserve antimicrobials to provide guidance to prescribers on last-resort antimicrobial drugs for humans
- HC is leading the initiative to reviewing and updating the labels of medically important antimicrobials that are being used in animals to ensure their directions of use align with appropriate use principles
- ISC is supporting the development of Clinical Care Pathways for Primary Care nurses and building a learning management platform so providers have clinical information readily available
- ISC is strengthening AMR/AMS competencies for nurses in collaboration with Canadian Nursing Association

Examples of provincial and territorial activities:

- Saskatchewan, Nova Scotia, Alberta, PEI and BC have begun the use of the Provincial Firstline Antimicrobial Stewardship App as a platform to house guidelines for AMU and education for prescribers and health promotion to the public to reduce pressure/expectation of antibiotic use in human medicine
- Nova Scotia continues to use data from NAPS to assess guideline adherence and CNISP to compare AMU data among inpatients
- BC Provincial DARE group coordinates human hospital stewardship coordinated by Ministry of Health
- The Alberta Veterinary Medical Association developed a *Prescribing and Dispensing Handbook* and distributed it to veterinary practices across the province
- The Alberta College of Physicians and Surgeons' tracked prescription program atlas of AMU is used to monitor prescribing, dispensing and utilization practices regarding targeted medications

- The PEI Veterinary Medical Association requires AMU/AMR continuing education courses as a condition of licensure
- PEI has systematically deactivated no longer accurate penicillin allergy cross reactivity alerts with a significant reduction in clindamycin usage as part of a penicillin allergy awareness campaign
- Nunavut has established the Antimicrobial Stewardship Program committee, which has implemented several interventions to improve AMU, optimize clinical outcomes and reduce AMR in humans
- Ontario supports the development and dissemination of AMU practice standards and AMS practice competencies (for example, Farmed Animal Antimicrobial Stewardship (FAAST) initiative through the Canadian Agricultural Partnership, participation in SAVI project) as well as the development of AMR/AMU-specific continuing education (including FAAST) and university curricula, and AMS resources for veterinarians and producers through the OAHN, Ontario Ministry of Agriculture, Food, and Rural Affairs website (currently under migration) and publications

Shared priority action 2:

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 policy and regulatory initiatives.

Joint roles and responsibilities:

- Coordinate the development and implementation of national, PT, and regional initiatives to improve understanding of appropriate use

Federal roles and responsibilities:

- Develop/implement national education/awareness initiatives to improve understanding of appropriate use

Provincial and territorial roles and responsibilities:

- Work with partners to develop and implement provincial, territorial and/or regional initiatives to improve understanding of appropriate use

Examples of federal activities:

- PHAC is leveraging behavioural science expertise to engage, convene, and coordinate peer-development of awareness and education materials, tools and campaigns to better understand and improve prescription/consumption/use of antimicrobials in human medicine
- HC is developing and implementing the distribution of educational material for Canadian patients on appropriate AMU
- ISC is working with regional and community-level public health personnel to implement recommended AMU and with First Nations leadership to raise awareness about prudent use of AMU and driving forces of AMR
- ISC is providing a forum for existing working groups involving Indigenous populations in relevant AMS activities to share information on work underway within the community through co-development with Indigenous Communities/Organizations partners, ISC regions, other government departments and external organizations
- Multiple federal departments participate in annual World Antimicrobial Awareness Week communications to raise public awareness about AMR and appropriate AMU in humans and animals
- ISC participates in annual World Antimicrobial Awareness Week through distribution of information and resources to the Communicable Disease Emergency/IPC/Health Emergency Management network
- HC is funding Choosing Wisely Canada's national Using Antibiotics Wisely campaign to help clinicians and patients engage in conversations about unnecessary antibiotic use in humans
- Sector specific awareness about HC's work on veterinary drug label updates will increase understanding on the appropriate use of medically important antimicrobials in animals, which can lead to change in routine practices and behaviour and thereby reduce the use of these antimicrobials through improved biosecurity, IPC and on-farm hygiene practices
- AAFC is funding biosecurity education tools for the food animal industry
- PHAC is conducting research to determine awareness of AMR/AMS among patients, prescribers, the public, producers (food) and wholesalers as well as examining the appropriateness of prescribing in enteric infections
- CFIA, in collaboration with HC, is developing and implementing policies and guidance material to allow the addition of Veterinary Health Products into livestock feed for food-producing animals which could reduce the need to use antimicrobials
- CFIA will continue to facilitate access to livestock feed and veterinary biologics to keep animals healthy by modernizing feed regulations, developing guidance on appropriate regulatory pathways for innovative feed products, and developing regulatory and scientific guidance to improve the availability of veterinary biologics for minor animal species (for example, sheep and goats) and for less common diseases
- AAFC and DFO are promoting adoption of vaccines and alternatives to antimicrobials at the farm-level

- AAFC is promoting stewardship efforts through re-engagement with the Animal Protein Sector and forward planning activities of Animal Health Canada
- CFIA is developing videos and other tools to inform Canadians about AMU/AMR in animals and actions they can take to improve animal health

Examples of provincial and territorial activities:

- BC's Community Antimicrobial Stewardship program undertakes health promotion activities and public education curriculum with the aim of improving illness prevention strategies, increasing knowledge of appropriate antibiotic use and their potential harms, and reducing pressure/expectation of antibiotic use
- Alberta continues the "Do Bugs Need Drugs" program province-wide to raise public awareness of appropriate AMU in humans
- Quebec has funded and developed a profile of general population and antibiotic users' knowledge, attitudes, and perceptions regarding AMR/AMU to effectively guide public communication activities
- Nova Scotia provides education on AMR organisms to healthcare workers, and patients/families in healthcare settings, including a public website with information on AMR and role the public can play
- Nunavut participates in Antimicrobial Awareness Week events to increase clinician and public awareness and holds education sessions for antimicrobial prescribers in human medicine
- Ontario supports the development and dissemination of AMS resources for veterinarians and producers through the FFAST initiative and the OAHN





Infection prevention and control pillar

Antimicrobials are essential tools for modern-day medicine and animal care. They will continue to be used in human and animal health and AMR will occur naturally over time. As such, strategies to prevent the transmission of antimicrobial-resistant pathogens to vulnerable populations are critical to mitigate the impact of AMR. In healthcare settings, IPC measures can prevent and/or mitigate the risk of healthcare-associated infections caused by antimicrobial-resistant pathogens. In the community, basic measures such as hand washing, avoiding congregate settings when ill, and vaccination are important and cost-effective measures for preventing infections.

Infection prevention
and control pillar

Shared priority action 1:

Increase effective implementation of infection prevention measures, particularly for populations disproportionately impacted by AMR such as remote, northern and isolated communities, First Nations, Inuit and Métis populations, long-term care residents, and hospitalized patients by developing, updating and promoting uptake of guidelines/best practices for human health.

Joint roles and responsibilities:

- Collaborate with stakeholders and partners to identify infection prevention guideline gaps and opportunities

Federal roles and responsibilities:

- Coordinate development of national infection prevention guidelines, and implement for federal populations

Provincial and territorial roles and responsibilities:

- Work with partners to implement and promote provincial, territorial and/or regional infection prevention guidelines



Examples of federal activities:

- ISC is establishing a First Nations Inuit Health Branch (FNIHB) Antimicrobial Stewardship Steering Committee (AMS-SC), an IPC/AMR Network to develop a strategic plan that will provide direction on priority AMS activities to advance national IPC guidelines for FNIHB and finalize/oversee the critical path for AMS
- ISC is revising the IPC manual for Indigenous health facilities as well as developing a national, overarching IPC program
- ISC is supporting the development of an Integrated Oral Disease Prevention and Management training modules for health care providers
- PHAC is supporting the implementation of IPC in non-healthcare settings, specifically for enteric infections and foodborne AMR
- PHAC develops and updates national IPC guidelines for healthcare settings and for emerging and re-emerging pathogens of significance for all sectors

Examples of provincial and territorial activities:

- Nova Scotia has implemented a consultation process to improve IPC for the long-term care sector
- Nova Scotia has developed provincial policies for IPC and antibiotic resistant organisms management that are followed by all acute care sites in the province
- PEI is working to implement enhanced IPC resources in private long-term care and community care with a long-term goal to develop a provincial IPC model and surveillance program partnering with key stakeholders such as Health PEI
- Ontario has implemented the ongoing “Just Clean Your Hands” campaign in healthcare settings
- Nunavut issued an IPC Manual accessible on their public website, allowing implementation of IPC measures in Nunavut’s community health centres, which serve remote, northern and isolated First Nations, Inuit and Métis communities
- BC Provincial Infection Control Network is coordinating guidance on containing hospital pathogens

Shared priority action 2:

Support the increased implementation of enhanced 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.

Joint roles and responsibilities:

- Collaborate with industry to support implementation of sector-specific approaches to enhanced IPC, biosecurity and food safety initiatives

Federal roles and responsibilities:

- Develop/implement national approaches to enhanced IPC, biosecurity and food safety initiatives

Provincial and territorial roles and responsibilities:

- Work with partners to develop/implement approaches to enhanced IPC, biosecurity and food safety initiatives

Examples of federal activities:

- Multiple federal departments continue to participate in activities to assess One Health interventions for foodborne AMR via the GRDI AMR II research program (2022 to 2027) (AAFC, CFIA, DFO, NRC, ECCC, PHAC, HC)
- AAFC and CFIA are promoting the continued improvement and expansion of existing on-farm food safety programming, which include considerations for biosecurity, product quality and animal care, with specific attention on AMR/AMU
- FoodNet Canada, National Enteric Surveillance Program, and CIPARS continue to support and inform the food safety activities of multiple federal departments including CFIA and HC
- HC is working to assess the foodborne contribution to AMR in order to evaluate mitigation strategies

Examples of provincial and territorial activities:

- Ontario continues to reinforce the need for biosecurity, vaccination and management practices that include considerations for AMR/AMU across the agri-food supply chain through ongoing extension activities (for example, producer presentations, educational modules and materials available through FAAST (www.amstewardship.ca))
- Saskatchewan developed the Assurance System Producer Program to increase participation in biosecurity and animal welfare initiatives in the apiculture, beef cattle, bison, cervids, dairy, goats, poultry, sheep, and swine sectors
- Alberta has funded several biosecurity initiatives through Agricultural Policy Framework funding and hosted the “Biosecurity Champions” initiative in collaboration with Alberta veterinarians and livestock organizations
- PEI supported CAP projects with the PEI Cattleman’s Association, and the PEI Hog Board focusing on biosecurity and husbandry





Leadership pillar

There is strong commitment among FPT governments to mobilize efforts on AMR across One Health sectors. COVID-19 demonstrated the importance of pan-Canadian collaboration, coordination and collective action to address public health threats. The federal government has clear international leadership, convenor, health promotion and protection roles. Provinces and territories similarly have clear areas of responsibility across pillars, such as the delivery of healthcare services, health promotion and protection. Indigenous partners lead the development and implementation of AMR activities that respond to the needs and cultures of First Nations, Inuit and Métis Peoples.

Leadership pillar

Shared priority action 1:

Build on existing One Health AMR governance structures to create a “network of networks” with inclusive representation to support action plan implementation and share progress and lessons learned within and across the 5 pillars of action, prioritizing strengthened FPT, First Nations, Inuit and Métis collaboration to co-develop AMR actions.

Federal roles and responsibilities:

- Lead coordination to develop/implement pan-Canadian governance model to implement the action plan

Provincial and territorial roles and responsibilities:

- Inform approach and lead PT participation in enhanced governance



Examples of federal activities:

- PHAC established a dedicated AMR Task Force to act as the coordinating body for accelerated AMR action in Canada
- The PHAC-established external Advisory Group on AMR will continue to provide the AMR Task Force with expert and multi-disciplinary advice on policies and programs to advance Canada's federal AMR strategy
- FNIHB is developing an AMS-SC composed of representatives from across FNIHB and National Indigenous Partner Organizations to coordinate AMS activities within FNIHB and support the development of strategies that reduce AMR across all Indigenous communities within Canada
- Increasing momentum on AMR and collaboration across federal organizations through the establishment and continuation of interdepartmental One Health Committees on AMR (subject matter experts, Director General, Assistant Deputy Minister, Deputy Minister levels)
- CFIA and AAFC lead an interdepartmental committee on agriculture and AMR to ensure focus and collaboration on federal AMR and AMU initiatives relating to animal health, agriculture, aquaculture, and agri-food

Examples of provincial and territorial activities:

- The Alberta Departments of Health, Agriculture, and Environment are collaborating on a Strategic Framework for Action on AMR using a One Health Approach, including an implementation plan with actions to begin within the upcoming year
- Ontario continues to participate on the Council of Chief Veterinary Officers (CCVO) subcommittee on AMU in animals, as well as the Canadian Animal Health Surveillance System (CAHSS) AMU network
- The Quebec Ministry of Health and Social Services and the Ministry of Agriculture, Fisheries and Food work together under a One Health approach, including an interdepartmental committee established in spring 2019

Shared priority action 2:

Increase Canada's contributions to global efforts to advance key bilateral and multilateral commitments by prioritizing (a) generating improved data/evidence on AMR/AMU and strengthening surveillance systems and data standards; and (b) expanding efforts to support low- and middle-income countries by advancing equitable access, stewardship and IPC initiatives.

Federal roles and responsibilities:

- Work with international tables and partners to increase Canada's contributions to key AMR priorities

Provincial and territorial roles and responsibilities:

- Inform international priorities and share PT and regional knowledge and expertise to international fora

Examples of federal activities:

- PHAC is increasing engagement and taking on leadership roles in key international fora (for example, vice chair role of the Global AMR R&D Hub)
- Canada continues to support AMR on high-level policy agendas of G7, G20, United Nations
- IDRC is engaging bilaterally and multilaterally with international leaders in AMR, including the United Kingdom, the US and the European Union to identify opportunities to advance mutual AMR priorities
- HC supports AMR as a strategic initiative through its membership of the International Coalition of Medicines Regulatory Authorities (ICMRA), collaborating with medicines regulatory authorities from over 30 countries, including LMICs for enhanced collaboration, improved communication and approaches to jointly address common challenges
- IDRC is establishing InnoVet - an initiative aimed at addressing AMR by reducing the misuse of antimicrobials in animal production in the Global South

- Multiple federal departments are providing data for global surveillance of AMR to the World Health Organization Global Antimicrobial Resistance and Use Surveillance System, the World Organization for Animal Health (WOAH) ANIMUSE, and the Food and Agriculture Organization InFARM system
- Multiple federal departments continue to participate in the Transatlantic Task Force on AMR and lead/co-lead 2 action items related to surveillance and risk assessment of AMR (PHAC, AAFC, CFIA, CIHR, HC)
- Canada has 2 members on the newly created Quadripartite Technical Group on Antimicrobial Resistance and Use Integrated Surveillance
- CIHR is funding an interdisciplinary Global One Health Network on Infectious Diseases, to strengthen Canadian leadership in improving the global governance of infectious diseases and AMR
- CFIA will continue to serve as a focal point for Canada's engagement and support for global AMR-related initiatives led by the WOAH

Chapter 4: Conclusion

AMR is an increasing public health threat that can affect anyone, anywhere and at any time. The impacts of AMR can be mitigated, but the solutions require decisive, concerted and sustained action.

Given that the action plan is set over a 5-year timeframe (2023 to 2027), successful implementation relies on collaborative action to tackle AMR between FPT governments, Indigenous Peoples and other sectoral partners.

Building on the current activities highlighted in this document, new activities will be initiated on an ongoing basis. The implementation of the action plan will be an evergreen process informed by research, analysis and engagement to identify and prioritize new activities to support meaningful and impactful action to address AMR.

Annex

AAFC	Agriculture and Agri-Food Canada	HC	Health Canada
AMR	Antimicrobial Resistance	ICMRA	International Coalition of Medicines Regulatory Authorities
AMRNet	Antimicrobial Resistance Network	IDRC	International Development Research Centre
AMS	Antimicrobial Stewardship	IPC	Infection prevention and control
AMS-SC	Antimicrobial Stewardship Steering Committee	ISC	Indigenous Services Canada
AMU	Antimicrobial Use	IWK	Izaak Walton Killam Health
BCCDC	British Columbia Centre for Disease Control	ISED	Innovation, Science and Economic Development Canada
CAHSS	Canadian Animal Health Surveillance System	JPIAMR	Joint Programming Initiative on Antimicrobial Resistance
CAP	Canadian Agricultural Partnership	LMIC	Low- and middle-income country
CCA	Council of Canadian Academies	MRSA	Methicillin-resistant <i>Staphylococcus aureus</i>
CCVO	Council of Chief Veterinary Officers	NAPS	National Antimicrobial Prescribing Survey
CDI	<i>Clostridioides difficile</i> infections	NRC	National Research Council Canada
CFIA	Canadian Food Inspection Agency	NRCan	Natural Resources Canada
CIHR	Canadian Institutes of Health Research	OAHN	Ontario Animal Health Network
CIPARS	Canadian Integrated Program for AMR Surveillance	OPOR	One Patient One Record
CNISP	Canadian Nosocomial Infection Surveillance Program	PHAC	Public Health Agency of Canada
CVMA	Canadian Veterinary Medical Association	PT	Provinces and territories
DFO	Fisheries and Oceans Canada	RAIZO	Réseau d'alerte et d'information zoosanitaire
ECCC	Environment and Climate Change Canada	SAVI	Stewardship of Antimicrobials by Veterinarians Initiative
ESAG	Enhanced Surveillance of Antimicrobial Resistant Gonorrhoea Program	UBC	University of British Columbia
FAAST	Farmed Animal Antimicrobial Stewardship	VASR	Veterinary Antimicrobial Sales Reporting System
FNIHB	First Nations Inuit Health Branch	WOAH	World Organization on Animal Health
FPT	Federal, Provincial, and Territorial		
GRDI	Genomics Research and Development Initiative		