ANTIMICROBIAL RESISTANCE AND USE IN CANADA

A FEDERAL FRAMEWORK FOR ACTION

Government of Canada Gouvernement du Canada

Canada

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

—Public Health Agency of Canada

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MINISTER'S MESSAGE

Antimicrobial resistance is a global public health concern. The loss of effective antimicrobials is reducing our ability to protect Canadians from infectious diseases, with profound impacts on our healthcare system, global trade, agriculture, environment and health sectors.

Through decisive action, the escalating rate of antimicrobial resistance can be minimized. We know that resistance is largely due to inappropriate use of antimicrobial treatment, patients not finishing prescription regimens, and improper use in livestock or crops. Working together to find more effective solutions to these problems, we can make a difference. To set the stage for broader, more cohesive engagement and action, the Government of Canada is presenting *Antimicrobial Resistance and Use in Canada: A Federal Framework for Action*.

This *Framework* maps out a coordinated, collaborative federal approach to responding to the threat of antimicrobial resistance. It also lays a foundation for action from all sectors, underscoring the need to work together more than ever before, on a local, national and global scale. And it outlines the Government's key focus areas and plans for action.

I'm proud of the actions Canada is taking to address this emerging public health threat. The Government of Canada continues to lead activities to prevent, limit and control the emergence and spread of antimicrobial resistance in humans, animals and food. Within Canada, for example, the health portfolio works collaboratively on surveillance, research, disease management, and regulations for both drug approval and our food supply. Internationally we are working with other governments and organizations to share information and learn from work on this global issue. All told, through these activities Canada is moving forward to address this threat head-on, within our own borders and abroad.

The provinces and territories are working hard on a demanding issue that crosses borders, sectors and expertise and we are pleased to continue collaborating. With this framework laying the groundwork for enhanced action, I am confident we can build on our momentum and tackle antimicrobial resistance together.

Rona Ambrose

The Honourable Rona Ambrose
Minister of Health

"Without urgent, coordinated action by many stakeholders, the world is headed for a post-antibiotic era, in which common infections and minor injuries which have been treatable for decades can once again kill."

—Dr Keiji Fukuda, Assistant Director-General, World Health Organisation

INTRODUCTION

Antimicrobial resistance is a serious and growing global public health threat.

Governments and health organizations around the world are paying increasingly more attention to the significant threat that this problem poses to modern medicine and the health of the global population. A post-antibiotic era where common infections and minor injuries are once again deadly is a very real possibility for the 21st century. In Canada and around the world, fewer antimicrobials remain effective in preventing and controlling infection as more microbes become resistant in both human and animal settings.

The modern antimicrobial revolution started in the 1920s with the discovery of penicillin by Alexander Fleming, followed by its development as a treatment for bacterial infections in the 1940s. By the 1950s, many of the gains of the prior decade were being threatened as bacteria were already becoming resistant and some infections no longer cured by penicillin. The development of new drugs has allowed us to continue to successfully treat a range of infections. That has now changed as microbes continue to develop resistance and few new antimicrobials are being brought to market. This is a critical situation for both human and animal health.

Antimicrobial Resistance and Use in Canada: A Federal Framework for Action outlines the Government of Canada's response to the threat of antimicrobial resistance. It provides a cohesive and collaborative approach across federal departments with mandates to address and mitigate antimicrobial resistance. Within Canada, this Framework will serve as a starting point for cohesive engagement and mobilization of all who are accountable for action on antimicrobial resistance and use. Given the global nature of this issue, the Framework highlights the need for Canada to work with international organizations and groups to develop solutions both domestically and globally.

This Framework is presented in three sections. The first section explains what antimicrobial resistance is, how it is spread and why it is a problem. Section two outlines three strategic areas of focus for the Government of Canada and associated priority actions. The third section describes how the Government of Canada will move forward on these actions.

ANTIMICROBIAL RESISTANCE

- Antimicrobials are the most effective treatment for infectious diseases; they are generally safe, effective and to date, relatively inexpensive.
- Antimicrobial resistance is a natural microbial survival mechanism; however, the overuse and misuse of antimicrobials has increased the rate of resistance development and spread.
- Many available antimicrobials are now less effective for treating disease.

What is an antimicrobial?

An antimicrobial is a natural, semisynthetic or synthetic substance that is capable of killing or inhibiting the growth of microbes. The term antimicrobial will be used throughout this document to refer to: antibiotics, antivirals, antifungals, and antiparasitics.

What is antimicrobial resistance and how does it develop?

Antimicrobial resistance simply means that the antimicrobial drugs that used to be effective against a particular microbe no longer work because the microbe's biological makeup has changed; it has become resistant to the treatment. The problem can occur naturally, or when an infection is treated with an antimicrobial which kills only some of the microbes. Those that can resist the treatment survive and multiply. Over time, more and more of the resistant microbes remain in our environment, eventually leading to the emergence of new strains of disease-causing microbes that are partially or fully resistant to antimicrobial treatment.

How does antimicrobial resistance spread?

Antimicrobial resistant microbes move and spread in the same way that all infectious disease causing microbes do; through direct contact (person, animal, and environment), contaminated food or water, or contact with body fluids. Resistant microbes are generally found where antimicrobial use is higher and disease conditions more common.

> *There has been an 8-fold increase in the rate of methicillin resistant staphylococcus aureus (MRSA) infections among hospitalized patients in Canada from 1995–2012.*[1,2] *In 2012, 30% of MRSA infections identified in hospitalized patients were acquired in the community, compared to 10% in 1995. In northern Canadian communities, community-associated MRSA infection rates have been higher than anywhere in North America.*[3]

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[1] Simor AE, Gilbert N, Gravel D, Mulvey MR, Bryce E, Loeb M, Matlow A, McGeer A, Louie L, Campbell J, and the Canadian Nosocomial Infection Surveillance Program. Methicillin-Resistant *Staphylococcus aureus* in Canada: National Surveillance and Changing Epidemiology, 1995–2007. *Infect Control Hosp Epidemiol* 2010 Apr; 31(4):348–356.

[2] Antimicrobial Resistant Organisms Surveillance Report for Data from January 1 , 2007 to September 30, 2013 (Table 2.3) Accessed Sept 19 2014 www.phac-aspc.gc.ca/nois-sinp/projects/aro-mra-eng.php

[3] Community-based educational intervention to limit the dissemination of community-associated methicillin-resistant Staphylococcus aureus in Northern Saskatchewan, Canada, BMC Public Health Volume 12, Issue 1, 2012, Article number 15

Why is antimicrobial resistance a problem?

Modern medical and veterinary practice depends on the widespread availability of effective antimicrobials to prevent and treat infections in humans and animals. Without them, the ability to fight infectious disease is significantly impeded. Each year in Canada, more than 18,000 hospitalized patients acquire infections that are resistant to antimicrobials. There has been a seven-fold increase in the incidence of Vancomycin-resistant Enterococci infections between 2007–2012.[4] Deaths directly related to *Clostridium difficile* alone have increased fivefold in the past decade.[5,6]

The societal and economic costs of antimicrobial resistance are difficult to determine, since infectious diseases impact more than the affected individual. The burden of illness spreads to family members, employers, businesses and the wider economy. Based on a study conducted in the United Kingdom, it has been estimated that the loss to gross domestic product (GDP) ranges from 0.4%–1.6%.[7]

ANTIMICROBIAL RESISTANCE IS A GLOBAL CHALLENGE

The threat of antimicrobial resistance is not just a Canadian problem, it is a global problem. Travel, medical tourism, increased international food production, and shipment of food and animals between countries provide opportunities for the spread of existing and emerging antimicrobial-resistant microbes. The World Health Organization, the World Economic Forum, and numerous countries around the world consider antimicrobial resistance to be an increasingly serious threat to global public health. The World Economic Forum, in its 2013 annual report[8] on global risks, concluded "*arguably the greatest risk . . . to human health comes in the form of antibiotic-resistant bacteria*".

In May 2014, World Health Assembly Member States endorsed a resolution which identified "*the urgent need of a Global Action Plan for antimicrobial resistance*".[9] The World Health Organization has been charged with returning to the World Health Assembly with that plan in May 2015. The Government of Canada is engaged with international jurisdictions and organizations in global efforts to address antimicrobial resistance. This Framework represents an important step in responding to the global call for action on antimicrobial resistance.

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4 Public Health Agency of Canada (2014), Antimicrobial Resistant Organisms Surveillance: updated February 2014

5 *Healthcare-Associated Clostridium difficile infections in Canadian acute-care hospitals: Surveillance Report January 1, 2007 to December 31, 2012*. Centre for Communicable Diseases and Infection Control, Public Health Agency of Canada, 2014.

6 Gravel D., Miller M., Simor A., Taylor G., Gardam M., McGeer A., Hutchinson J., Moore D., Kelly S., Boyd D., Mulvey M., Bryce E., Conly J., Dow G., Embil J., Embree J., Forgie S., Frenette C., Henderson E., John M., Johnston L., Kibsey P., Langley J., Loe, "Health care-associated Clostridium difficile infection in adults admitted to acute care hospitals in Canada: A Canadian nosocomial infection surveillance program study," *Clinical Infectious Diseases*, vol. 48, no. 5, pp. 568–76, 2009.

7 Smith, R. D., Yago, M., Millar, Coast J. Assessing the Macroeconomic Impact of a Healthcare Problem: The Application of Computable General Equilibrium Analysis to Antimicrobial Resistance. *Journal of Health Economics*, 2005, 24:1055–75.

8 World Economic Forum (2013). Global Risks 2013 Eighth Edition.

9 World Health Organization (2014). Antimicrobial drug resistance – Report by the Secretariat. Accessed Sept 15 http://apps.who.int/gb/ebwha/pdf_files/WHA67/A67_39-en.pdf

A FEDERAL COMMITMENT TO ACTION

Canada's actions on antimicrobial resistance, including those addressing antimicrobial use, are aligned with international organizations and partners. Government of Canada departments and agencies will work together and with other jurisdictions and sectors to focus on reducing the public health risks and impacts of antimicrobial resistance.

A SHARED RESPONSIBILITY

Addressing the growing threat of antimicrobial resistance is a shared responsibility in Canada. The Government of Canada's role in protecting the health of Canadians against disease threats of national concern is essential to this multi-sector collaboration. The federal role includes promoting health, preventing and controlling disease, brokering knowledge and facilitating innovation, tracking and monitoring disease threats, ensuring the safety of antimicrobial products and all foods sold and prepared in Canada, and collaboration with international partners.

The **Public Health Agency of Canada** provides national leadership on the public health aspects of antimicrobial resistance and use, and works with domestic and international partners in areas of surveillance, laboratory analysis, infectious disease outbreaks, awareness and public health guidance development.

Health Canada regulates the approval of antimicrobial drugs for sale in Canada that are used in humans and animals, and is responsible for establishing policies and standards related to the safety and nutritional quality of the food supply.

The **Canadian Food Inspection Agency** enforces Canadian regulatory requirements for the health and safety of animals and the food supply. Regulatory requirements are enforced through inspection, surveillance, and/or licensing/registration programs for livestock feeds, veterinary biologics, animal health and foods. The Canadian Food Inspection Agency contributes to the development of national biosecurity standards and leads the on-farm food safety recognition program.

The **Canadian Institutes of Health Research** promotes research related to mechanisms and processes that impact the emergence and spread of antimicrobial resistance. This includes the human-animal-environment interface, the research for new antimicrobials, alternatives to antimicrobials and development of diagnostic tests. It also supports research projects on stewardship and surveillance. The Canadian Institutes of Health Research also collaborates internationally on antimicrobial resistance research programs.

Agriculture and Agri-Food Canada supports the development and adoption of industry-led animal care, biosecurity, on-farm food safety assurance systems, and research into alternatives to antimicrobials. It also monitors trade and market access activities. Agriculture and Agri-Food Canada works closely with the animal production industry to ensure its sustainability in an increasingly competitive global marketplace.

WORKING WITH CANADIAN AND INTERNATIONAL PARTNERS

Fighting the spread of antimicrobial resistance depends on the involvement and collaboration of multiple jurisdictions and levels (local, provincial or territorial, national and international) and sectors (e.g. public health, private, and agricultural sectors). The Government of Canada is committed to working with all jurisdictions to address this problem.

Provinces and territories play a key role by virtue of their responsibility for the delivery of health care, approval of antimicrobials for medical coverage, and the regulation of antimicrobial use in agriculture and veterinary medicine. They also set standards and guidelines that support the appropriate use of antimicrobials, and undertake awareness activities. This work is often in close collaboration with professional and non-governmental organizations.

Professional organizations actively involved in addressing antimicrobial resistance include the Canadian Medical Association, Canadian Pharmacists Association, Canadian Pediatric Society, the Canadian Veterinary Medical Association and the Association of Medical Microbiology and Infectious Disease Canada. Non-governmental organizations include the Canadian Antimicrobial Resistance Alliance, the Community and Hospital Infection Control Association-Canada, Infection Prevention & Control Canada, Canadian Patient Safety Institute, and the National Collaborating Centre for Infectious Diseases. Other organizations issue guidelines on antimicrobial use and provide scientific, strategic and policy advice (e.g. National Farmed Animal Health and Welfare Council).

Canada's sector-specific national Value Chain Roundtables provide a forum to work directly with the animal industry on collaborative approaches to address antimicrobial resistance. Together with government, the industry advances discussions on the prudent use of antibiotics in farmed animal production, supported by a science-based regulatory system that is consistent with international standards and guidelines.

Beyond our borders, Canada is a member of the global scientific community, contributing to information and knowledge sharing on antimicrobial resistance and antimicrobial use. Canada is also present at a number of international committees working on global efforts to prevent, reduce, control and monitor the emergence and spread of antimicrobial resistance. This includes global activities by the World Health Organization, Food and Agriculture Organization, and World Organization for Animal Health.



GOAL

To protect Canadians from the health risks related to antimicrobial resistance

KEY AREAS OF FOCUS

The Government of Canada, in collaboration with its partners, seeks to reduce the health risks associated with antimicrobial resistance by focusing its efforts on three pillars: Surveillance, Stewardship, and Innovation. These pillars have been selected based on international precedent and established federal roles.

SURVEILLANCE

Detecting and monitoring trends and threats in order to inform strategies to reduce the risks and impacts of antimicrobial resistance.

Surveillance systems are designed to provide human and animal health information that is used to protect the health of human and animal populations. The timely collection and analysis of robust and reliable data support health professionals, veterinarians, food producers, and policy makers. Antimicrobial resistance and use surveillance data informs effective programs, guidelines, and policies.

Through the Public Health Agency of Canada, the Government of Canada leads national surveillance programs which monitor antimicrobial use and antimicrobial resistance in hospitalized patients (Canadian Nosocomial Infection Surveillance Program - CNISP), and in humans, animals and the food supply (Canadian Integrated Program for Antimicrobial Resistance Surveillance - CIPARS). Surveillance information informs policy decisions on the management of antimicrobials in animal food production and both pre-market and post-market risk management of antimicrobial drugs. CNISP, CIPARS and other surveillance systems across the federal government contribute important information on antimicrobial resistance and use practices in humans and animals.

ACTION 1: Establish and strengthen surveillance systems to identify new threats or changing patterns in antimicrobial resistance and use, in human and animal settings.

Canada has well-established, strong surveillance systems for antimicrobial resistance and use. Moving forward, the Government of Canada is committed to ensuring surveillance systems are better coordinated and that there is a clear plan for improving antimicrobial resistance surveillance in partnership with P/Ts and other key stakeholders. This means linkages will be made to create a complete national picture of antimicrobial resistance in human and animal settings and within the food system in Canada. Building on the surveillance successes across federal departments, systems will be expanded to support the identification of emerging threats, disease trends, and provide the information required to deal with known problems. Providing more comprehensive and early warning information to decision makers and public health professionals will help them to mitigate the effects of antimicrobial resistant microbes on human and animal health.

The Canadian Antimicrobial Resistance Surveillance System (CARSS) will be created, building on the foundation of the Public Health Agency of Canada's current antimicrobial resistance surveillance systems. CARSS will integrate available antimicrobial resistance data, clearly articulate and track antimicrobial resistance at a national level, and expand surveillance activities at the hospital and community level. The expansion of community-based surveillance will address a gap in the understanding of antimicrobial resistance and use where Canadians live. Coordination of surveillance information through CARSS will support timely decision-making and intervention at the national level to further protect the health of Canadians. CARSS will also inform the global response to antimicrobial resistance through the World Health Organization.

The Canadian Food Inspection Agency, Agriculture and Agri-Food Canada, Health Canada, and the Public Health Agency of Canada collaborate in providing data to CIPARS to develop surveillance information on antimicrobial resistance in animal agriculture. Moving forward this work will be strengthened and linked to CARSS. For example, the Canadian Food Inspection Agency and Agriculture and Agri-Food Canada are planning increased surveillance on antimicrobial use in animal settings to ensure that a comprehensive data set is available through CIPARS. This will facilitate the development of evidence-based approaches to the improved use of antimicrobials and enable the measurement of the impact of adopting these changes.

Together, these actions will provide a broader understanding of antimicrobial use and resistance across humans in hospital, community, and animals in veterinary and agricultural settings, all in support of keeping antimicrobials effective.

STEWARDSHIP

Conserving the effectiveness of existing treatments through infection prevention and control guidelines, education and awareness, regulations, and oversight.

Modern medical and veterinary practice relies on the widespread availability of effective antimicrobials to prevent and treat infections in humans and animals. Conserving the effectiveness of currently available antimicrobials is a vital part of ensuring our ability to mitigate the threat posed by antimicrobial resistant organisms.

The Government of Canada plays a role in developing and disseminating information, guidance, and regulations on antimicrobial use to public health and health professionals, food producers, veterinarians and the Canadian public. Professional practice guidelines are produced for both infection prevention and treatment in a variety of human and animal settings. Regulations introduce consistency in practices on matters of high and critical importance to human and animal health. These are often complemented by learning opportunities made available by federal government departments, sometimes in collaboration with other partners.

Public awareness activities help Canadians to understand the benefits and risks of antimicrobials, and why the use of antimicrobials is not always appropriate for the treatment of infectious diseases. Through increased awareness and use of simple and effective day-to-day practices such as good hand hygiene the public plays a key role in infection prevention and control.

Two interconnected but distinct stewardship actions are Framework priorities.

ACTION 2: Strengthen the promotion of the appropriate use of antimicrobials in human and veterinary medicine.

Indiscriminate or inappropriate use of antimicrobials is a key driver in the spread of antimicrobial resistance. There is already an extensive range of guidance, education, tools and industry-sponsored initiatives to promote the responsible use of antimicrobials in humans and animals. Unfortunately, prescribing still occurs in the absence of adequate information about the nature of the infection or before the results of diagnostic testing become available. As a result, additional work and expansion of these programs is required as well as collaboration with professional organizations to develop and support more responsible use of antimicrobials. Success of these programs will require the full commitment and engagement of a range of experts, professionals, industry, and the public.

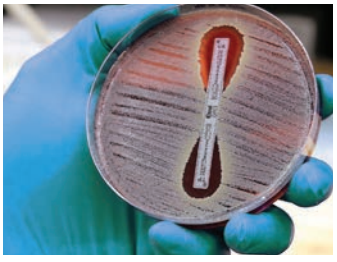
The Government of Canada will engage the public through an Antimicrobial Resistance Awareness Campaign on antimicrobial use and infection control during Antibiotic Awareness Week 2014 (November 17–21). The goal is to improve knowledge and awareness of antimicrobial resistance, responsible antibiotic use and the importance of infection prevention and control. Future awareness activities will build on lessons learned from these activities.

Health Canada is working to increase veterinary oversight of the use of medically important antimicrobials in food animal production. Efforts are also currently underway to phase out growth promotion claims on medically important antimicrobials. Both of these initiatives will help to promote the prudent use of such medically important antimicrobials in animals.

Promoting appropriate use in agricultural, veterinary and human settings, and promoting the use of antimicrobial alternatives such as vaccines, will contribute to conserving the effectiveness of the antimicrobial medicines that we currently have.

ACTION 3: Work with the animal agriculture sector partners to strengthen the regulatory framework on veterinary medicines and medicated feeds, including facilitating access to alternatives and encourage the adoption of practices in order to reduce the use of antimicrobials.

The Government of Canada has an important role in the regulation of animal health in Canada, including the sale of veterinary drugs, medicated feeds, and vaccines. Its regulatory activities present an opportunity for further advancement of stewardship and adoption of best practices. Through opportunity to modernize its legislative and regulatory authorities, the Government of Canada will engage with those who must comply with the regulations to identify innovative approaches to facilitate access to alternatives.



The Canadian Food Inspection Agency develops national biosecurity standards, protocols, and strategies with stakeholders, provincial and territorial governments, and academia to protect animal resources. The Canadian Food Inspection Agency contributes to stewardship through regulation of livestock feeds, including medicated feeds, and regulation of veterinary biologics. The Canadian Food Inspection Agency prioritizes the review of applications for new veterinary biologics for novel and emerging veterinary infectious disease threats.

Health Canada contributes to stewardship through regulation of the sale of antimicrobial drugs for usage in animals. Enhancing veterinary drug regulatory frameworks to include provisions to increase oversight over importation of drug products as well as active pharmaceutical ingredients will support stewardship.

Agriculture and Agri-Food Canada facilitates the adoption of on-farm practices designed to reduce disease risk, improve animal care and/or improve food safety. In so doing the need to utilize antimicrobials is reduced.

INNOVATION

Creating new solutions to counteract loss in antimicrobial effectiveness through research and development.

Innovation fosters new methods and tools that combat antimicrobial resistance and improve antimicrobial use. Research informs health services and policy through innovative solutions ranging from new or alternative antimicrobials and therapies, faster and more accurate diagnostics. Microbes will always continue to adapt to treatments, causing naturally occurring antimicrobial resistance. Managing this reality requires the ongoing development of new approaches.

The Government of Canada supports ongoing domestic health research and innovation while collaborating with international partners to contribute to global research efforts on antimicrobial resistance, antimicrobial use, novel therapies and alternatives. Innovative vaccines under development are being prioritized to address some of the most significant threats posed by antimicrobial resistance through a Canadian Action Plan on Vaccine Research, Innovation and Development.

New diagnostic tools are in development to provide doctors and veterinarians the point-of-care information they need to accurately diagnose an infection and to promote appropriate prescription of antimicrobials. Under the Growing Forward 2 policy framework, money is available to support industry-led and/or internal research aiming to identify alternatives to antibiotics or their prudent use in livestock production.

Internationally, Canada co-leads, through the Canadian Institutes of Health Research, the European Union's Joint Programming Initiative on Antimicrobial Resistance, which supports research on novel strategies for overcoming antimicrobial resistance and the sustainable use of antimicrobials to treat infectious diseases.

ACTION 4: Promote innovation through funding collaborative research and development efforts on antimicrobial resistance both domestically and internationally

The Government of Canada is committed to increasing its research investment to support innovation. While preserving the effectiveness of existing antimicrobials, the development of innovative antimicrobial drugs is also needed. Through the Canadian Institutes of Health Research-funded Canada-UK partnership on antimicrobial resistance, and other Canadian Institutes of Health Research funded research projects, research is underway to better understand the nature of resistance, investigate novel therapies, identify alternatives to antimicrobials, develop diagnostic tools, and find new ways of using existing antimicrobials. Funding will be expanded for research clusters that bring industry and government researchers together. With vaccine development, rapid diagnostics and the discovery of alternatives to antimicrobials, the usefulness of the treatments we already have can be sustained and conserved to protect those Canadians at most risk.

Antimicrobial resistance is a global problem with a global response being mounted. Canada will contribute to innovation on a global scale through strengthened international collaboration via a wide range of governmental and non-governmental organizations and international regulatory bodies.

MOVING FORWARD

The Framework identifies concrete Government of Canada actions to reduce the threat and impact of antimicrobial resistance. Equally important, it is a vehicle to engage partners and stakeholders in discussion on collective efforts that can significantly increase the results of individual actions.

Beyond the Government of Canada, provinces and territories, academia, animal and human health professionals, food production stakeholders, animal producer groups and farmers, and private industry each hold other essential levers to reduce antimicrobial resistance. Working together will support efforts across a continuum of human and animal health settings.

Ongoing measurement of Canada's performance in reducing antimicrobial resistance is a vital part of moving forward. Progress on Framework activities will be reported to Parliament annually so that all Canadians can be aware of the challenges and progress on antimicrobial resistance.

The Government of Canada will provide leadership and support to the work of various partners in both public and private sectors. The Public Health Agency of Canada will coordinate monitoring and reporting of results by federal departments (Health Canada, Canadian Food Inspection Agency, Canadian Institutes of Health Research, and Agriculture and Agri-Food Canada). Activities will be undertaken through each department's respective mandate and with their established relationships and governance with other stakeholders.

Innovation will require collaboration with industry, Canadian and international researchers in the development of new antimicrobials or alternatives. Organizations and venues such as the national Value Chain Roundtables, the National Farmed Animal Health and Welfare Council, Rx & D Canada, provide the opportunity for dialogue between industry and governments.

CONCLUSION

Canada is already taking significant action to address the threat of antimicrobial resistance domestically and internationally. However much more remains to be done by all levels of government, industry, non-governmental sectors and the general public. By continuing to work together, we can collectively achieve greater results in reducing the risks of antimicrobial resistance and protecting the health and safety of all Canadians.