



Mr. Bill Casey
Chair, Standing Committee on Health
The House of Commons
Ottawa, Ontario K1A 0A4

Dear Mr. Casey,

Pursuant to Standing Order 109 of the House of Commons, we are pleased to respond, on behalf of the Government of Canada, to the Report of the Standing Committee on Health, entitled *A Study on the Status of Antimicrobial Resistance in Canada and Related Recommendations*.

The Government commends the members of the Committee for undertaking this study and thanks the witnesses who provided their valuable expertise and research, through testimony delivered to the Committee, and those individuals and organizations who submitted written briefs outlining their perspectives on the topic.

Our Government is committed to collaborative action domestically and globally to reduce the threats to public health from antimicrobial resistance (AMR). Canada believes in the fundamental importance of the "One Health" approach to this challenge. The intersections among human, animal, and ecosystem health are drivers of an integrated approach to finding and implementing solutions to protect public health.

As this response illustrates, several federal departments and agencies play integral roles in facilitating coordinated action to combat AMR. We will continue to focus on actions to preserve the effectiveness of antimicrobials. Our work to mobilize sectors and disciplines in collaborative action through the pan-Canadian Action Plan, currently under development, will undoubtedly benefit from the insights in the Committee's report and its recommendations.

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The Government's Response demonstrates how a range of complementary initiatives align with the Committee's recommendations. It also highlights our ongoing commitment to address the global threat presented by antimicrobial resistance.

Yours sincerely,

A handwritten signature in cursive script, appearing to read "Ginette Petitpas Taylor".

The Honourable Ginette Petitpas Taylor, P.C., M.P.
Minister of Health

A handwritten signature in cursive script, appearing to read "Lawrence MacAulay".

The Honourable Lawrence MacAulay, P.C., M.P.
Minister of Agriculture and Agri-Food

INTRODUCTION

The Government of Canada welcomes the Report of the Standing Committee on Health and agrees with the spirit and intent of its recommendations. Antimicrobial resistance (AMR) is a global health threat, and countries around the world – including Canada – are mobilizing and taking action. The Government of Canada is advancing a range of complementary initiatives, including coordination, surveillance, research and regulation to address AMR and protect the health of Canadians.

Inappropriate use of antibiotics is the main contributor to resistance and this occurs in healthcare and agricultural settings.

In recognition of the multi-jurisdictional and multi-sectoral nature of AMR, the Government of Canada convened federal, provincial and territorial (F/P/T) partners, as well as human and animal health, agri-food and industry stakeholders to develop an inclusive pan-Canadian framework to address AMR and to encourage the prudent use of antimicrobials: *Tackling Antimicrobial Resistance and Antimicrobial Use: A Pan-Canadian Framework for Action*. This One Health approach recognizes the need to address AMR through a holistic and multi-sectoral approach that integrates human, animal, and environmental perspectives.

Recommendation 1: Accelerate development of the pan-Canadian Action Plan, with the Action Plan to include concrete goals and timelines

The Government of Canada agrees with this recommendation.

The pan-Canadian Action Plan will provide a roadmap for collaborative and coordinated work to address the growing threat of AMR. It will identify concrete actions, results and timelines to achieve them.

The value of the Action Plan lies in the commitments of many stakeholders and, consequently, its development depends on an open and inclusive process of engagement and dialogue. Concurrently, initiatives are advancing in specific areas as described in this response. We expect the pan-Canadian Action Plan to be completed by the summer of 2019.

Recommendation 2: Appoint a federal advisor to be a national champion

The Government of Canada agrees with this recommendation to have a national champion for combatting AMR. However, rather than appointing a new federal advisor, the Government of Canada will continue to rely on the leadership of the Chief Public Health Officer (CPHO) of Canada as a federal advisor and national champion for reducing AMR.

As Canada's lead public health professional, the CPHO advises the Minister of Health, works with provincial and territorial public health leaders, international

organizations and non-governmental organizations to advance public health issues. The CPHO is engaging stakeholders through the development of the pan-Canadian Action Plan and bringing multiple sectors together to identify tangible action and timelines to reduce AMR.

An important role of the CPHO is speaking to Canadians about issues affecting the population's health. AMR is one of her priorities, and the CPHO will be highlighting this issue in her dialogue with Canadians.

The CPHO works closely with the Chief Veterinary Officer for Canada and other federal leaders. On March 20, 2018, they co-hosted a One Health Roundtable bringing together key stakeholders from the human and animal health sectors to discuss action under the pan-Canadian Action Plan on AMR.

An Expert Advisory Group on AMR (EAGAR), established in 2014, is a multi-disciplinary group of experts in the fields of clinical medicine, public health, microbiology, biotechnology, pharmacology, veterinary medicine, public health policy, social marketing, epidemiology, and statistics. EAGAR provides ongoing advice to the CPHO to support Government of Canada actions on AMR and antimicrobial use (AMU), and to support work on the pan-Canadian strategy on AMR.

Recommendation 3: Emphasize global leadership, with targeted investments in research and development of drugs and other treatments for drug-related tuberculosis

The Government of Canada agrees with the Committee's recommendation on global leadership on AMR. AMR is a global threat to human health, sustainable food production, and international development. In September 2016, it became one of only four health issues ever to be discussed in a United Nations General Assembly high level meeting, with the others being HIV, Ebola, and non-communicable diseases.

In October 2017, Canada became the Chair of the Global Health Security Agenda Action Package on AMR, working with partners including Germany, the Netherlands, Japan, Sweden and the United Kingdom to support the implementation of the World Health Organization's Global Action Plan, and supporting the efforts of low-income countries in developing their own national action plans for AMR.

The Government of Canada is funding global efforts on AMR, including a \$9 million contribution in 2016 to the World Health Organization's AMR Secretariat to support its work implementing the Global Action Plan on AMR. An additional \$215,000 was provided in 2017 to support the World Organisation for Animal Health's engagement in the United Nations ad-hoc Inter-Agency Coordination Group. The federal government also contributed \$250,000 to the World Bank to support the development of its report, "Drug-

Resistant Infections: A Threat to Our Economic Future,” which analyzes the economic and development consequences of the continued global spread of AMR.

Canada’s International Development Research Centre is partnering with the United Kingdom’s Global AMR Innovation Fund on a new initiative, aimed at reducing the emerging risk that AMR in animals poses to global health and food security. Innovative Veterinary Solutions for Antimicrobial Resistance (InnoVet-AMR) will fund research to identify veterinary solutions, including vaccines and alternative solutions, to reduce the use of antimicrobials in livestock and aquaculture operations in low and middle-income countries.

Global leadership on AMR research is being advanced by the Canadian Institutes of Health Research, one of the largest financial contributors to the Joint Programming Initiative on AMR (JPIAMR). Over 25 countries are working to coordinate international research funding and support collaborative action to fill knowledge gaps on AMR. Canada plays an important strong role on the JPIAMR Management Board and Steering Committee, and has funded multinational teams on AMR transmission dynamics; prevention, control and intervention strategies for AMR infections; and transnational AMR networks. Canada is also leading efforts to establish the JPIAMR Virtual Research Institute, a dynamic global network of research facilities that will foster knowledge exchange in the field of AMR.

The Government of Canada, through the Canadian Institutes of Health Research, is supporting research on multidrug-resistant tuberculosis, with global impacts. For example, the Canadian Institutes of Health Research provided \$105,000 to explore the social determinants of multidrug-resistant tuberculosis in Peru and South Africa, areas with recent increases in reported cases. This research will help identify intervention opportunities in these countries, and potentially globally. An investment of over \$7 million is supporting researchers in advancing innovative methods to address latent tuberculosis infection and drug-resistant tuberculosis in Canada and five other countries. This research will inform the global implementation of tuberculosis diagnosis and therapy in addition to identifying new drug regimens for patients with drug-resistant tuberculosis.

Canada provides substantive technical expertise to global initiatives. Through our membership on the recently formed CODEX Intergovernmental Taskforce on AMR, we are contributing our expertise to update the code of practice for prudent AMU in food-producing animals, and the development of a guideline on integrated surveillance of AMR. Canada’s role on the Transatlantic Taskforce on Antimicrobial Resistance is strengthening collaboration with the United States, the European Union and Norway, to advance action on surveillance, appropriate stewardship in humans and animals, risk analysis, infection prevention and control, and improved antimicrobial drug development pipelines. Canada actively participates and supports the initiatives led by

World Organisation for Animal Health related to AMR in animals.

Recommendation 4: Scale up best practices in antimicrobial stewardship across Canada

The Government of Canada agrees that information on effective stewardship programs and practices must be shared with partners and stakeholders across Canada to encourage the adoption of best practices.

Effective antimicrobial stewardship requires organizations and systems to both promote and monitor the use of antimicrobials and take action to preserve their effectiveness.

We do not underestimate the complexity of this priority or the imperative for coordinated and sustained action. The Government of Canada is one important player in the “network of stewards” that must work together to achieve the impact required.

The Government of Canada initiated, in 2015, roundtable dialogues on stewardship involving human health, animal health, agri-food and industry. This engagement continues in many forms including through the Federal/Provincial/Territorial (F/P/T) Public Health Network Council, the F/P/T Policy and Regulatory Agriculture Assistant Deputy Ministers, the National Farmed Animal Health and Welfare Council and the National Value Chain Roundtables.

The Government of Canada is supporting stewardship objectives directly by using federal instruments and by facilitating the application of scientific evidence in advancing stewardship strategies.

Putting the Pieces Together: A National Action Plan on Antimicrobial Stewardship was released in January 2017 as a result of collaboration among the Public Health Agency of Canada, the federally funded National Collaborating Centre for Infectious Diseases and HealthCareCAN, the national organization representing hospitals and healthcare organizations. This Action Plan is fundamental in building the pan-Canadian Action Plan on AMR currently under development.

The Canadian Patient Safety Institute (CPSI) works with governments, health organizations, leaders, healthcare providers, patients and the public to inspire extraordinary improvement in patient safety and quality. Through awareness campaigns and capacity building activities, CPSI spreads information and supports the implementation of best practices with all jurisdictions across the country and is contributing patient safety expertise and support to national AMR activities. For example, STOP! Clean Your Hands Day; a national public awareness campaign is aimed at care providers and the public to raise awareness of the importance of proper hand hygiene – a proven method of infection prevention which can help reduce rates of AMR.

Specific regulatory measures by Health Canada to address AMR risks related to the use of antimicrobial drugs in animals include new veterinary drug AMR regulations, were published May 17, 2017. These measures increase Health Canada's oversight of antimicrobials in animals through four key changes:

1. Restricting personal importation of unapproved veterinary drugs for food-producing animals by only permitting those drugs (and in limited quantities) that Health Canada has determined do not pose a risk to public health or food safety;
2. Increasing oversight on importation and quality of active pharmaceutical ingredients (APIs) for veterinary use through Good Manufacturing Practices and Establishment Licences;
3. Collecting annual sales information of medically important antimicrobials for veterinary use to support AMR surveillance; and
4. Facilitating access to low risk veterinary health products (which are additional or alternative health management tools) through a flexible notification pathway.

Health Canada is also taking significant steps to promote the prudent use of antimicrobials in animals through existing regulatory authorities, including: requiring that all medically important antimicrobials (those antimicrobials considered of importance in human medicine) for use in animals be sold pursuant to a veterinary prescription as of December 1, 2018; removal of growth promotion claims from the labels of medically important antimicrobials; and the addition of prudent use statements on medically important antimicrobial drug labels. Health Canada is working with its key stakeholders, including provincial and territorial partners, to effectively communicate and prepare for these changes.

In support of Health Canada policy changes requiring prescription status for all medically important antimicrobials, the Canadian Food Inspection Agency updated the Compendium of Medicating Ingredient Brochures on April 1, 2018, with a transition to full implementation of the new policy on December 1, 2018.

Health Canada continues to implement initiatives to support the appropriate use of antimicrobials, including the addition of AMR precautionary statements in the labelling of human antimicrobial products.

Stewardship research is building the evidence base on effective measures. Between 2012-2013 and 2016-2017, the Canadian Institutes of Health Research invested \$10.1 million in AMR stewardship research projects. To identify research gaps, in 2016, the Canadian Institutes of Health Research hosted the Antimicrobial Stewardship (AMS) Expert Forum *Current and Future*

Directions for Innovation and Research in Antimicrobial Stewardship in Canada. The report from the forum, available on the Canadian Institutes of Health Research website, guides decision-making on research investments.

In 2017, Agriculture and Agri-Food Canada provided funding to the Canadian Veterinary Medical Association for a stewardship workshop to initiate the renewal of its *Antimicrobial Prudent Use Guidelines*. The purpose of the workshop was to engage stakeholders and obtain input into defining the needs for future tools to assist veterinarians in the prudent use of antimicrobials.

Recommendation 5: Develop educational materials about appropriate use for physicians, nurses and the public

The Government of Canada agrees with the Committee's recommendation to work with provincial and territorial partners, as well as stakeholders such as professional associations, to develop educational materials about appropriate AMU. These tools are integral to antimicrobial stewardship efforts.

Since 2014, the Public Health Agency of Canada has implemented antibiotic awareness campaigns for the general public, parents and physicians and, in early 2018, launched a marketing campaign targeting adults over age 60, their caregivers (family and friends), and health professionals. The Public Health Agency of Canada has also developed a Communications Plan for 2018-2020 that aims to increase awareness of AMR, antibiotic use and the risks of AMR among Canadians and to promote the sound use of antibiotics and increase awareness of the resources available to healthcare providers.

The Public Health Agency of Canada continues to engage with partners and stakeholders to expand the *Do Bugs Need Drugs?* education program and co-host regional stewardship initiatives. In addition to these efforts, awareness campaigns during Antibiotic Awareness Week, held globally each November, provide information and education tools available through the Government of Canada web site. Specific materials for use by healthcare professionals are also available on prescribing antibiotics wisely.

Continuing professional education supports the optimal use of antimicrobials. Supported by the Government of Canada, the University of Waterloo's School of Pharmacy is creating a Continuing Professional Development Program on antimicrobial stewardship for pharmacists and prescribers. The program will provide information on the principles of antimicrobial stewardship and illustrate the importance of improved AMU in primary care. Federal support to Choosing Wisely Canada is advancing the development of a strategy across multiple health professional associations to engage clinicians and patients in conversations about the overuse of unnecessary tests and treatments, and to support patients in making informed decisions about their care.

To increase and promote better stewardship of antimicrobials for human use, Health Canada posted a Public Notice on Antimicrobial Products Labelling in November 2015, advising of its intent to enhance the education of healthcare professionals and patients and to facilitate the prudent use and prescribing of antimicrobials for human use by requiring the inclusion of AMR precautionary statements in the labelling of all antimicrobials for human use. Health Canada is in the process of requesting that drug sponsors update their product labelling with a specific focus on when and how to use antimicrobials, and promoting the choice of the correct antimicrobials to use for treatment.

Recommendation 6: Develop voluntary national prescribing guidelines for health professionals

The Government of Canada agrees with the intent of the Committee's recommendation to work with provinces, territories and other stakeholders to develop treatment and prescribing guidelines.

The pan-Canadian Framework on AMR notes that, although some jurisdictions in Canada have developed guidelines for antimicrobial prescribing, the establishment of national guidelines could improve and harmonize prescribing practices. The Framework identified developing consistent standards for prescribing as an opportunity for action, recognizing the respective roles and responsibilities of each level of government. The development of the pan-Canadian Action Plan will consider how to move ahead on these objectives.

The Public Health Agency of Canada will continue efforts to facilitate and enhance education and awareness on when and how to use antimicrobials, as well as the choice of the correct antimicrobials to use for treatment of certain conditions. For example, the Public Health Agency of Canada's work on drug-resistant strains of gonorrhea has led to the development of specific guidance for healthcare professionals. To promote appropriate AMU, the Public Health Agency of Canada has also updated Sexually Transmitted Infections Guidelines with current treatment recommendations.

Recommendation 7: Improve access to alternative therapies for food-producing animals

The Government of Canada agrees with the intent of this recommendation.

Promoting the health and welfare of animals can help reduce the need to use antimicrobials. Reducing the use of or reliance on antimicrobials in food-producing animals is a multi-sectoral issue that requires cross-cutting solutions, including for example: proper veterinary oversight, effective nutrition programs, improved infection prevention and control measures, and access to safe and effective products and alternatives such as health products, more nutritious animal feeds, and vaccines.

Utilizing fora such as the National Value Chain Roundtables, Agriculture and

Agri-Food Canada is working with the livestock and poultry sectors to encourage the increased adoption of better animal health (husbandry) practices that ultimately reduce the need to use antimicrobials in animal production.

In addition, the Government of Canada continues to engage with animal health and agri-food industry stakeholders on measures to promote the prudent use of antimicrobials and to facilitate access to alternative therapies to antibiotics. In particular, Agriculture and Agri-Food Canada supports industry-led research initiatives, which include the validation of the effectiveness of antibiotics used in animal feed. Agriculture and Agri-Food Canada is also conducting research on AMR in beef, dairy, poultry and swine production systems, which includes the study of improving nutritional options.

As part of the new veterinary drug AMR regulations published in 2017, new rules came into force that facilitate access to low-risk veterinary health products, such as vitamin and mineral supplements, for companion and food-producing animals. Veterinary health products can be used to keep animals healthy and may, in turn, reduce the need for antimicrobials.

Health Canada and the Canadian Food Inspection Agency are working together and engaging stakeholders to examine opportunities to improve regulatory clarity for innovative products that improve animal health and that currently cross product classifications for drugs and feeds, such as viable microbial products, which includes probiotics. These changes should facilitate access to a greater range of alternative therapies to reduce the reliance on antibiotics.

Health Canada will continue to leverage its partnerships with international regulators to encourage companies with innovative and alternative products to seek approval of these veterinary drugs in Canada. For example, in 2016, Health Canada conducted a simultaneous review with the United States Center for Veterinary Medicine and approved an innovative veterinary drug that prevents an infectious disease (mastitis) in dairy cattle and reduces the need for conventional antimicrobial drug treatment.

Recommendation 8: Expand the Canadian Antimicrobial Resistance Surveillance System to integrate and expand existing data systems

The Government of Canada agrees with the Committee's recommendation to expand the Canadian Antimicrobial Resistance Surveillance System (CARSS). This is a priority of the Public Health Agency of Canada.

Understanding the scope and spread of AMR and the associated trends in AMU is fundamental to determine the actions we must take to address AMR. Comprehensive surveillance that integrates data across the human and animal health and agriculture sectors is the goal.

AMR surveillance is a priority under the 2015 Federal Action Plan on AMR. Progress is being made in improving data collection and analysis, but we recognize that work is required to fill data gaps, ensure the validity of data and achieve timely, coordinated access by stakeholders.

The Public Health Agency of Canada developed CARSS in 2015 to provide an integrated national picture of AMR and AMU in both humans and animals. CARSS Reports have been released on an annual basis since 2015. By building on this foundation, we will fill data gaps and improve the analytics accessed by stakeholders to support stewardship. Over the next two years the Public Health Agency of Canada will: (1) develop a platform to capture antimicrobial susceptibility data on priority organisms in the community; (2) begin to capture AMR and AMU data in community settings, such as long-term care facilities; and (3) leverage other surveillance networks, such as FoodNet Canada, to capture relevant data.

The Public Health Agency of Canada systematically responds when increased levels of AMR occur. For example, enhanced surveillance of antimicrobial-resistant gonorrhoea is underway based on treatment failures for this infection.

Monitoring AMU in food animal production underpins effective stewardship programs. In October 2016, the Canadian Animal Health Surveillance System, Agriculture and Agri-Food Canada and the Canadian Food Inspection Agency hosted a workshop on surveillance of AMU in animal agriculture at the farm level. A working group, comprised of all major livestock groups, is identifying surveillance gaps in order to establish and implement surveillance protocols for animal agriculture.

Health Canada's 2017 veterinary drug AMR regulations also include the requirement for drug companies, importers and compounders to report annual sales data of medically important antimicrobials. This information will help provide a better understanding of the volume of antimicrobials available for use in animals, support the interpretation of resistance patterns and trends, and provide information to help assess the impact on human health from the use of specific antimicrobials in animals.

The Canadian Food Inspection Agency is engaging and supporting the veterinary community through the Canadian Veterinary Medical Association to develop a prototype for a prescription-based AMU surveillance system. This work complements the Canadian Animal Health Surveillance System initiative to gather farm level AMU data and is intended to be integrated into CARSS.

Agriculture and Agri-Food Canada also commissioned the development of a 'roadmap' to address data and systems gaps associated with AMU surveillance in animal agriculture, which can be used as a guide to provide a harmonized and value-added approach to surveillance. Discussions with

industry stakeholders regarding strategies to enhance surveillance are expected to continue.

As part of our engagement with international partners, Canada is enrolled in the Global Antimicrobial Resistance Surveillance System and participates in the collection, analysis and sharing of data at the global level. In addition, the Government of Canada annually reports antimicrobial use (sales) data in animals to the World Organisation for Animal Health.

Recommendation 9: Provide stable and adequate funding to support research and innovation, including support for small and medium enterprises to bridge the “valley of death”, promotion of public-private partnerships, and funding for behavioural research to address overprescribing

The Government of Canada agrees with the intent of this recommendation.

Research and innovation are key to a comprehensive, multi-sectoral approach to AMR. Federal science-based departments and agencies undertake in-house research, collaborate with experts in industry and/or academia, and fund external research to expand the knowledge base, and to develop new products and approaches. The Government of Canada also collaborates with international partners to contribute to global research efforts on AMR, AMU, novel therapies and innovative health and nutrition products.

A five-year, \$20 million, interdepartmental project has been launched under the Genomics Research and Development Initiative (GRDI) to expand our understanding of the development of AMR in food production, and the pathways by which antimicrobial-resistant bacteria reach humans. Targeted for completion in 2021, the results will inform strategies for reducing AMR in food production systems. The widespread use of antibiotics in food production make this research highly relevant to policy development.

In addition to the genomics work under GRDI, Genome Canada has funded projects on AMR through various competitions, including the 2015 Bioinformatics and Computational Biology competition, which supported a project to develop new software and database tools that will provide a near-instantaneous picture of AMR organisms in samples. In February 2016, Genome Canada, in partnership with the Canadian Food Inspection Agency, Genome Alberta and Genome BC, organized a Forum on Genomics and AMR focused on a One Health approach to tackling AMR across all sectors (agriculture, human health and environment). The two-day event brought together over sixty leading experts from academic, government, industry and commodities groups to address the challenge of AMR and discuss a path forward, including identifying opportunities to collaborate in the development of genomics tools for antimicrobial stewardship, diagnostics, monitoring and surveillance tools in human and animal health, and drug discovery.

Investments of more than \$107 million made by the Government of Canada through the Canadian Institutes of Health Research between 2012-2013 and 2016-2017 have contributed to strengthening research in areas such as antimicrobial discovery, target identification, alternatives, diagnostics, surveillance, and stewardship.

The Canadian Institutes of Health Research has invested \$1.4 million in research/industry collaboration to develop, evaluate, or implement point-of-care diagnostic tools for viral-bacterial discrimination or specific priority pathogens, and to facilitate the uptake of discoveries to market. Five research teams were funded in phase 1, and, launched in March 2018, phase 2 of this initiative aims to facilitate the uptake of projects to commercialization, direct application, or equitable implementation in a healthcare setting.

More broadly, the Government of Canada continues to make important investments to strengthen basic research and the innovation ecosystem. Budget 2018 proposed a significant boost in support for science and research, representing the single largest investment in fundamental and discovery research in Canadian history. These measures include:

- Allocating \$925 million over the next five years for the three main research granting councils;
- Providing the Industrial Research Assistance Program with an incremental \$700 million over five years, starting in 2018-2019, and \$150 million annually thereafter. To support more, and larger, business research and development projects, Budget 2018 also announced that the Industrial Research Assistance Program will support projects up to a new threshold of \$10 million;
- Proposing to provide \$540 million over five years, starting in 2018-2019, with \$108 million annually to reinforce the National Research Council's research strengths and role as a trusted collaborative partner that can convene strategic, large-scale national teams committed to exploring disruptive technologies and cutting-edge innovation; and
- Proposing to provide \$48 million over three years, starting in 2019-2020, to the Centre for Drug Research and Development to support efforts to translate promising drug discoveries into commercialized health innovations and therapeutic products.

Budget 2017 also established the \$1.26 billion Strategic Innovation Fund to attract and support high-quality business investments across all sectors of the economy. The Fund's objective is to spur innovation, and includes advancing research through collaboration between academia, non-profit organizations, and the private sector.

While the investments announced in Budget 2017 and Budget 2018 are not specific to AMR, these resources are available to industry and academia to support their work on AMR under the terms and conditions of these federal programs.

As a key contributor to disease prevention and treatment, vaccines offer low-cost and low-risk options that increase quality of life and reduce healthcare costs. By enhancing the body's ability to fight harmful micro-organisms, vaccines reduce the incidence and spread of disease. This in turn reduces the opportunity for the development of AMR. A federal working group has successfully completed a project to identify a set of priorities for research and development of new and improved human and animal vaccines; with a special focus on AMR. Potential industry collaborators are invited to work with the Government of Canada on the development and commercialization of vaccines to prevent infectious diseases, with a focus on AMR and emerging infections, and to improve uptake of the use of existing vaccines.

Health Canada is exploring the development of new tools to facilitate the regulatory review and market authorization of innovative diagnostics and antimicrobial pharmaceutical therapies that either fulfill an unmet medical need or address an important public health need. This will support the filing of new drug submissions and medical device applications for these products in Canada, and thus increase access for Canadians.

Recommendation 10: Explore the possibility of funding a network of centres of excellence

The Government of Canada agrees with the intent of this recommendation.

The federal Networks of Centres of Excellence (NCE) programs leverage Canada's best research, development and entrepreneurial expertise to address specific issues in strategic areas. By connecting universities, industry, government and not-for-profit organizations to create a critical mass of expertise, solutions can be developed and scaled up nationally and globally. NCE funding is open to researchers across all scientific disciplines and is awarded on a competitive basis in accordance with the highest standards of excellence.

While not specific to AMR, the NCE programs provide another potential funding opportunity for researchers and innovators working in this area.

In addition, as noted in the response for recommendation 9, the Government of Canada has made a number of significant investments through Budget 2017 and 2018 to strengthen basic research and the innovation ecosystem, and to attract and support high-quality business investments across all sectors of the economy.

CONCLUSION

Antimicrobial-resistant infections are becoming more frequent and more difficult to treat. The inappropriate use of antimicrobials in human and veterinary medicine and in the agriculture industry is accelerating the emergence and spread of antimicrobial organisms. Coordinated and sustained action is necessary to preserve the effectiveness of the antimicrobials we rely on to treat infectious diseases.

Governments, industry, academia, healthcare and animal care organizations and providers, food production systems, and the public are partners in a long-term venture, each playing our role and contributing to coordinated, multi-sectoral actions to protect human and animal health. As this Government Response has illustrated, significant work is already underway and will continue as the pan-Canadian Action Plan is established.

While Canada has much to be proud of in our collective efforts to reduce the impact of antimicrobial resistance, there is significantly more work to be done. The Government of Canada will consider the Report of the Standing Committee on Health, as well as input from our partners and stakeholders, as we continue to build on the foundations that have already been established to address AMR. The Government of Canada is committed to its leadership role, and with the momentum that has already been achieved through the Federal and pan-Canadian Frameworks, will continue to work with our partners, to enhance our strengths and to make a difference in Canada and globally.