

**REDUCING HEALTH SECTOR BURDENS TO IMPROVE OUTCOMES IN
THE FACE OF CLIMATE CHANGE**

SUBMITTED BY: INFECTION PREVENTION AND CONTROL CANADA

AUGUST 2nd, 2019

RECOMMENDATION:

1. Infection Prevention and Control Canada recommends that the federal government provide funding of \$12 million to integrate and expand Canada's national antimicrobial surveillance systems over the next five years.

BACKGROUND

The climate emergency knows no boundary.

Governments, corporations, associations and individuals rightly focus on the mitigation effects of greenhouse gas emissions, agricultural effects, natural resources implications and sovereignty issues that we expect to encounter over the coming years. Infection Prevention and Control Canada (IPAC Canada) is urging the federal government not to overlook health issues resulting from climate change that need to be addressed proactively to ensure health outcomes remain strong in Canada.

In particular, we are drawing attention to the effects climate change has on infectious diseases, including the transmission and spread of infections previously foreign to Canada. ‘Superbugs,’ as they are commonly known, are a global threat that needs to be taken seriously and that all governments must address proactively. Recent evidence suggests that their prevalence could be spurred by global warming. It is more important than ever to give front-line health workers the tools and training to prevent and contain infections, which already put tremendous strain on our health care system.

Infection Prevention and Control Canada (IPAC Canada) represents a Canada-wide membership of Infection Control Professionals (ICPs) who are at the forefront of a losing battle against antimicrobial resistance (AMR). “Resistance occurs when microorganisms such as bacteria, viruses, fungi and parasites change in ways that render the medications used to cure the infections they cause ineffective.”¹ AMR killed a considerable 700,000 people worldwide in 2014, and it has been estimated that AMR could kill as many as 10 million people per year by 2050.² As a developed country, Canada’s advanced healthcare system presents great benefits, but also expands the potential for exposure to antibiotic-resistant organisms (AROs).³ Canada, in particular, could be at a greater risk for AMR deaths due to the fact that our population is aging.⁴

This fate is not inevitable. Health professionals are doing all they can to prevent the spread of Antibiotic Resistant Organisms (AROs) and the proliferation of AMR in Canada, but the systems in place to assist them are outdated and underfunded. Our healthcare system is a point of pride for Canadians; however, the prominence of infections with AROs has the potential to undermine the effectiveness of this world class system. The climate emergency will only exacerbate this concern.

¹ World Health Organization, “[What is antimicrobial resistance?](#),” July 2017.

² O’Neill, J. “Antimicrobial Resistance: Tackling a crisis for the health and wealth of nations.” The Review on Antimicrobial Resistance. Review on Antimicrobial Resistance: Tackling drug-resistant infections globally. 2014.

³ HESA, [Evidence](#). 7 November 2017, 1600 (Dr. Neil Rau, Infectious Disease Specialist and Medical Microbiologist, Halton Healthcare).

⁴ Ibid.

RECENT DEVELOPMENTS

Candida auris has emerged as a fast-spreading fungal infection that has shown the potential to kill over one-third of patients who carry the disease. *C. auris* has been routinely found to resist anti-fungal medications and its relatively recent rise has been linked to climate change. The American Society for Microbiology has highlighted that:

*“C. auris, which is often multi-drug resistant and is a serious public health threat, may be the first example of a new fungal disease emerging from climate change.”*⁵

Fungal infections usually cannot withstand the 37-degree Celsius body temperature of humans. However, pathogens that adapt to higher temperatures over time may already be likely to infect humans and spread. The risk increases over time and will put further pressure on infection prevention and control resources that are already at capacity in Canada’s hospitals and other care settings.

Climate change will create myriad new challenges for health care in Canada. Taking pressure off the system by adding efficiencies should be a priority for governments as they seek to adapt to the climate emergency.

The House of Commons Standing Committee on Health (HESA) undertook a thorough study of the issue of AMR in Canada. IPAC Canada was grateful to be included along with other leading national organizations in HESA’s selection of expert witnesses. That study provided exceptional recommendations that would, if taken together, have a profoundly beneficial effect on the spread of AMR in our country.

Four years ago, in 2015, the Public Health Agency of Canada established the *Federal Action Plan on Antimicrobial Resistance and Use*. This action plan has so far succeeded in bringing together F/P/T partners and stakeholders to develop *“Tackling Antimicrobial Resistance and Antimicrobial Use: A Pan-Canadian Framework for Action.”* Both initiatives were well received by infection control professionals but amount only to a good first step. The government has also worked with international partners, having notably endorsed the World Health Organization’s Global Action Plan on AMR in 2015, and endorsing the Leaders’ Declarations of the G7 and G20 supporting action on AMR.

Welcome changes that we acknowledge, stemming from the 2017 report of the Canadian Antimicrobial Resistance Surveillance System (CARSS), include the decline in antimicrobials distributed for sale for use in animals on a total kilogram basis and that our rates of AMR are similar to or lower than rates reported by other developed countries.⁶

The same report also found deeply concerning facts, particularly that, in 2016, hospitals purchased more of certain antimicrobials of “last resort” (e.g., daptomycin) than in previous years.

⁵ CITATION (Press release with quote: <https://www.asm.org/Press-Releases/2019/July/Rise-of-Candida-Auris-May-be-Blamed-on-Global-Warm>; OR Study link: https://mbio.asm.org/content/10/4/e01397-19?_ga=2.207622929.2070180947.1564501373-1348778904.1564501373)

⁶ Public Health Agency of Canada (PHAC), Canadian Antimicrobial Resistance Surveillance System — Report 2017, July, 2018

For professionals working in these settings, these findings are very troubling, yet unsurprising. While there is considerable understanding of what causes AMR and what practices exacerbate its spread, there has been little action to accompany the regular dialogue and planning from government. The 2019 federal budget is an important opportunity for the government to deliver on a key support that will pay long-term dividends for our healthcare system, particularly as our population ages in lock-step with the global ascendance of AMR to one of the most prominent healthcare issues.

FACTS

- Just one ‘superbug,’ Methicillin-resistant *Staphylococcus aureus* (MRSA), has been estimated to **cost hospitals between \$42 million and \$59 million annually**.
- People with MRSA are estimated to be **64% more likely to die** than people with a non-resistant form of the infection.
- Resistance increases the cost of healthcare with **lengthier stays in hospital and more intensive care required**.
- Some bacteria (e.g. carbapenemase-producing *Enterobacteriaceae* or CPE) **have become resistant to almost all, and in some cases, all known antibiotics**—these bacteria are increasing in Canada.

SURVEILLANCE

A national surveillance system will help Canadian healthcare professionals combat AMR proactively. Right now, it is increasingly difficult for even highly trained professionals to prevent or limit the spread of superbugs before they are established in places like hospitals and long-term care facilities—places where they can spread rapidly. AMR is taking a massive toll on healthcare systems across the country. As the climate changes, and pressures on the healthcare system increase, Canada needs to give Infection Control Professionals better tools to do their work.

Establishing a truly national, integrated surveillance system is the single most effective step the government could take to make sure the problem does not get worse.

Understanding the pan-Canadian incidence of AMR and regional patterns of resistance will allow governments and healthcare providers to better understand the national breadth of AMR.

For instance, *Candida auris* doesn't have a 'typical' presentation and has caused invasive infections and outbreaks in healthcare settings worldwide. Lack of awareness of it can lead to unnoticed transmission and outbreaks in healthcare settings. It also seems to be more inclined to patient-to-patient transmission in healthcare settings (unlike other *Candida*).

Better surveillance will allow for earlier identification of regional patterns of resistance which will assist in understanding risk factors and support development of prevention and risk mitigation strategies. Such an advancement will take substantial pressure off the healthcare system and, more importantly, save lives.

POWERFUL EVIDENCE OF SURVEILLANCE EFFECTIVENESS

In the United States, the National Healthcare Safety Network, which provides over 17,000 healthcare facilities with data needed to treat and prevent healthcare-associated infections shows that there has been a drastic decrease in the number of infections.

From 2008 to 2014 a **50% decline** in central line-associated bloodstream infections was observed, along with an 8% decrease in hospital onset *C. difficile* and a 13% decrease in hospital onset MRSA between 2011-2014. (Centers for Disease Control and Prevention: <https://www.cdc.gov/hai/surveillance/index.html>)

CARSS was the focus of the Standing Committee on Health's recommendations for surveillance. However, in the opinion of leading infection control professionals, the Canadian Nosocomial Infection Surveillance Program (CNISP) can provide even better data. CNISP is a collaborative effort of the Canadian Hospital Epidemiology Committee, a subcommittee of the Association of Medical Microbiology and Infectious Disease (AMMI) Canada and the Centre for Communicable Diseases and Infection Control of the Public Health Agency of Canada (PHAC).

The objectives of CNISP are to provide rates and trends of HAIs in Canadian healthcare facilities, thus enabling comparison of rates (benchmarking), and providing data that can be used in the development of national guidelines and to drive practice improvement initiatives. CNISP gathers data that is considered highly reliable yet covers only a very small fraction of the many healthcare facilities in Canada; most hospitals and all long-term care facilities are not currently able to participate in CNISP surveillance. CNISP lacks the human resources support and technical infrastructure it needs to reach its full potential, but the government has an opportunity in Budget 2020 to invest in valuable improvements.

THE GOVERNMENT RESPONSE

Following the Report tabled by the Standing Committee on Health, the government agreed with the committee's recommendations to:

- Accelerate development of the pan-Canadian Action Plan with the Action Plan to include concrete goals for timelines;
- Scale up best practices in antimicrobial stewardship across Canada; and
- Expand the Canadian Antimicrobial Resistance Surveillance System to integrate and expand existing data systems.

The government acknowledges that:

“Antimicrobial-resistant infections are becoming more frequent and more difficult to treat.”⁷

And that:

“Coordinated and sustained action is necessary to preserve the effectiveness of the antimicrobials we rely on to treat infectious diseases.”⁸

⁷ MacAulay, L. (P.C., M.P.) and Petitpas Taylor, G. (P.C., M.P.). Letter to Mr. Bill Casey, Chair of the House of Commons Standing Committee on Health. *Undated*. Published July 18, 2018. http://www.ourcommons.ca/content/Committee/421/HESA/GovResponse/RP10003524/421_HESA_Rpt16_GR/421_HESA_Rpt16_GR-e.pdf

⁸ Ibid.

IPAC CANADA RECOMMENDS

Infection Prevention and Control Canada recommends that **the federal government act on its previous findings and provide funding of \$12 million to integrate and expand Canada's national antimicrobial surveillance systems over the next five years.** These investments will help Infection Control Professionals better cope with the pressures brought on by the climate emergency, while improving overall health outcomes.

An initial investment of \$6 million in year one will facilitate needed work in system integration, data harmonization and partnerships between CARSS and the Canadian Nosocomial Infection Surveillance Program. That funding will also establish supports to hospitals and other care facilities not currently involved in data collection. A commitment of \$1.5 million in each of the following four years will facilitate needed upkeep and continuing education for healthcare professionals using the surveillance network.