



A CALL FOR A NATIONAL INFECTIOUS DISEASES STRATEGY

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WHY CANADA NEEDS A NATIONAL INFECTIOUS DISEASES STRATEGY

An effective National Infectious Diseases Strategy will strengthen the quality of life of Canadians and improve Canada's economy.²

WHY NOW?

- One in nine Canadian hospital patients acquires an infection during their stay³
- In Canada, it is estimated that 250,000 people (one out of nine patients) who are admitted to hospital every year pick up infections while being treated for something else.⁴
- Healthcare-associated infections kill 8,000 to 12,000 Canadians a year.⁵
- Half of visits to family doctors are caused by a common viral or bacterial infection.⁶
- Patients who die *with* cancer or heart disease commonly die *from* infection.⁷
- Although cancer is recognized as a major cause of death among the Canadian population, one of the most serious consequences associated with treatment (chemotherapy and radiotherapy) is infection:⁸ About 40 % of all children and adults receiving cancer chemotherapy will end up having a documented infection in direct relation to their treatment. About 3.5 % of all patients will die of infection following their chemotherapy or stem-cell transplantation.⁹
- Addressing infectious diseases will dramatically reduce wait times.¹⁰
- The World Health Organization advises it is only a matter of time before an avian flu virus acquires the ability to be transmitted from human to human, sparking the onset of a human influenza pandemic.¹¹
- Infections acquired in the workplace cost Canadians an estimated \$15B annually.¹²
- As Canada is recognized as one of the worlds leading exporters of agricultural products, the safety of our food chain is crucial for our economy, its survival and its growth.¹³

What is an Infectious Disease?

Infectious diseases are caused by infectious agents including bacteria, viruses, fungi, and parasites that multiply in the body. These diseases are spread through contact with someone/something carrying the infectious agent, contaminated objects, food, air or water. Depending on the type of infectious disease, the infection can emerge and spread quickly or over a long period of time.¹

DEVELOPING A NATIONAL INFECTIOUS DISEASE STRATEGY

A National Infectious Disease Strategy will ensure an enduring national commitment and application of resources to reduce the impact of infectious diseases on Canadians' good health, our healthcare system and our national social and economic interests. It will establish goals and objectives and require accountability through annual status reports.

Our National Infectious Disease Partners recommend leadership by the Government of Canada and the cooperation of all Canadians on four main areas:

1. *Controlling* Healthcare-Associated Infections (HAI)

- Set national infection control standards for hospitals and healthcare institutions
- Reduce hospital wait times and costs of hospital care
- Lessen health, social and economic impact on patients, families and employers

2. *Preventing* Community-Associated Infections (CAI)

- Enhance public health measures in workplaces, schools and community buildings to prevent spread of disease
- Boost nation wide vaccine coverage – such as the annual “flu shot”
- Expand the Canadian Pandemic Influenza Plan (“the Plan”) beyond the health sector to include detailed preventative and treatment strategies for pre-defined priority groups not limited to healthcare workers
- Improve communication with Canadian corporations about the importance of corporate pandemic preparedness to enable business continuity and economic viability during a major outbreak
- Strengthen First Nations' capacity to respond to infectious diseases on or off reserves
- Address social determinants that give rise to the disparate burden of infectious diseases such as poor housing, addiction, chronic disease, illiteracy, etc.
- Increase surveillance of zoonotic, food borne and other diseases that originate in other parts of the world

3. *Enhancing* Canada's research on infectious diseases

- Promote the development of alternative therapies to respond to antibiotic resistance
- Focus on links between infections and chronic diseases
- Encourage public/private partnerships in vaccine development
- Support collaborative research with government funding policy
- Develop infrastructure to steward Canadian infectious disease scientists' research discoveries (human resources and communication strategies)

4. *Building* Canada's capacity to identify, diagnose, prevent, control and treat known, new, emerging and reemerging infectious diseases with:
 - A National Surveillance System
 - An Inventory of experts and expert information
 - National standardized, evidence based practice guideline development
 - A Human Resources Plan to meet skills shortages
 - Surge Capacity for Infectious Diseases Emergencies (i.e. SARS)

An effective National Infectious Diseases Strategy will also recognize federal, provincial, territorial, regional and local roles in managing service delivery and:

- Bridge the gap between public health and physicians in clinical practice
- Clarify roles, promote communication and collaboration among all levels of government

Ongoing oversight by the infectious disease sector and the larger community affected by infectious diseases will be needed to ensure infectious diseases are given appropriate public and political attention to ensure funding and resources are sustained.

HEALTHCARE-ASSOCIATED INFECTIONS

COSTS OF HEALTHCARE-ASSOCIATED INFECTIONS

Infections associated with healthcare are one of the most significant infectious disease challenges in Canada. One in nine Canadian patients admitted to hospital each year will acquire an infectious disease¹⁴. Estimates are that hospital infections will kill 8,000 to 12,000 Canadians each year.¹⁵

These diseases will complicate and delay patients' recovery, stress their families, and cause substantial costs to them and to their employers. HAIs are also eroding public trust in Canada's hospitals.

Healthcare-associated infections also place burdens on institutions and their healthcare workers. As a result, hospital patient loads increase and wait times are prolonged, which adds to healthcare costs. It is estimated that a serious HAI costs an additional \$12,000 to \$35,000 per patient.¹⁶

One HAI is quickly becoming a crisis in Canada's hospitals. Though MRSA (methicillin-resistant *Staphylococcus aureus*) in Canada is not a reportable disease, laboratory-based surveillance of MRSA in 38 sentinel Canadian hospitals has been carried out since 1995. From 1995 to 2004 the total incidence of MRSA (infection and colonization) increased 13-fold in these hospitals from 0.44 cases per 1000 admissions to 5.86 per 1000 admissions, with most of the increase occurring in Ontario and Quebec. Overall, in 2005, in Canadian hospitals, 11.2% of *S. aureus* isolates are MRSA.¹⁷

Increasing numbers of patients with MRSA places considerable economic burden on the Canadian healthcare system. It is estimated that the cost of MRSA in Canada ranges from \$41.7 million to \$58.7 million (in 1998 dollars). Managing a patient with MRSA infection is estimated to cost between \$16,836 and \$35,000 (2004 dollars), and the costs associated with managing a patient with MRSA colonization is at least \$1,634 (2004 dollars). Costs would be considerably greater in the event of an MRSA outbreak.¹⁸

DEVELOPING INFECTION CONTROL STANDARDS FOR HEALTHCARE

Infection prevention and control programs promote safe environments and improve outcomes for patients as they relate to infections. They are a necessary and integral part of a culture of safety in healthcare.

Patients and their families have a right and must be able to access publicly reported infection rates for healthcare institutions. A policy of openness will demonstrate commitment to infection control and measure our institutions' individual performance. This will be of value only if the information is collected according to rigorous standards and is meaningfully interpreted by experts. Coordination of infection surveillance methods including data collection, analysis and reporting, can be standardized with a common E-record.

Many healthcare settings do not have on-site or other access to infection prevention and control professionals or the resources to contract those services. Infection prevention and control standards developed for other settings and applied in those settings will address their needs.

Without immediate action, healthcare-associated infections such as MRSA and *Clostridium difficile* (*C. difficile*) will persist and present greater challenges to the health of Canadians and to Canada's healthcare system.

COMMUNITY-ASSOCIATED INFECTIONS

COMMON INFECTIOUS DISEASES

Community acquired infections may result in severe consequences. Community-Associated Methicillin Resistant *Staphylococcus aureus* (CA-MRSA) has emerged recently in Canada causing severe pneumonia, bloodstream infection and severe soft tissue infections, resulting in 8,000 deaths per year. Once again, due to lack of national surveillance the prevalence of CA-MRSA is unknown.

Each year in Canada there are 60,000 hospitalizations and 8,000 deaths related to influenza infection and Community-Acquired Pneumonia.¹⁹ A future influenza pandemic will be a community-based outbreak which has the potential to overwhelm our healthcare system. These hospitalizations affect wait times by occupying surgical and intensive care beds.

Infectious diseases associated with low mortality but significant morbidity will continue to affect Canadians. Colds and noroviruses cause significant time loss from work, school and other activities. They are associated with worsening of chronic lung disease. Annual influenza outbreaks cause widespread work and school impact as well as severe illness.

The resultant loss of productivity and increased costs to the medical system continue to affect the Canadian economy and are not likely to be mitigated anytime soon unless focus is placed on the prevention of these diseases.

A public health strategy to prevent the transmission of common viruses and bacterial infections by communities, employers, workers and their representatives would dramatically reduce health-care, and related social and economic costs.

VACCINE COVERAGE

Vaccines against common childhood infections such as polio, measles and mumps have been responsible for dramatic reductions in the burden of infections in Canada. Nonetheless, considerable work remains to be done. Inadequate vaccine coverage, particularly among certain population groups, and inadequate number of vaccine doses in some individuals have left us vulnerable to infections. Recent outbreaks of viral infections have related to importation from abroad by unvaccinated individuals and spread in Canada in susceptible groups, e.g. rubella outbreak in 2005 in Norwich, Ontario.

Advances in vaccine development and methods for delivery of single-dose vaccines will potentially result in improved compliance and cost efficiencies.

Challenges result from lack of universal provision of and access to vaccines and variability in the rates of uptake among groups of Canadians at increased risk of developing infectious diseases. Differences in coverage provisions among provinces and territories also facilitate differences in infectious diseases protection among provincial and territorial boundaries.

Despite the clear benefit of vaccines with respect to the prevention of disease and death, the public and media attention that has been generated regarding rare occurrences of adverse vaccine reactions has distorted public perception into believing that vaccines are more dangerous than they are helpful.

Ironically, the unparalleled success of vaccination as a public health intervention has resulted in vaccines becoming the victims of their own success.

FIRST NATIONS AND INFECTIOUS DISEASES

Canada's Aboriginal people sustain a disproportionate burden of infectious diseases.²⁰ The capacity to address persisting infectious diseases varies among First Nations communities. There is no capacity to respond to an infectious disease crisis – either on or off reserves.

By addressing the social determinants (i.e. housing, addiction, chronic disease, illiteracy, etc.) among Canada's Aboriginal population, prevention and control programs will be more successful.

ZOONOTIC AND FOOD BORNE DISEASES

Zoonotic infections (transmitted from animals to humans) and infections spread through food and water will increasingly pose threats to the health of Canadians and all global citizens. Very little information is available on the magnitude of the risk, the long-term impacts in terms of premature mortality, chronic outcomes and costs associated with food borne infections.

Many zoonotic diseases do not originate in Canada but in other parts of the world, most notably Asia.²¹ For example, SARS and influenza start as zoonoses. Global travel and migration are the conduits of these diseases into Canada.

Investment into research in this area is needed.

RESEARCH

ANTIBIOTIC RESISTANCE

Antibiotic resistance is persistently and predictably increasing in the bacteria that cause common human infections.

Resistance to antibiotics in large part due to antimicrobial over-use in both human and animal healthcare and the emergence of newer antibiotic-resistant organisms now limits treatment options. Previously treatable diseases are once again becoming untreatable.²³

Little research and development is focused on producing new antimicrobials and little emphasis has been placed on identifying non-antibiotic means of addressing infections.

Given the current circumstances, healthcare-associated infections such as MRSA and community-associated infections such as multi-drug resistant tuberculosis will present greater challenges to the health of Canadians and to Canada's healthcare system. To buy time we must develop strategies to reduce demand for existing antibiotics and increase supply of new antibiotics.

A collaborative antibiotic stewardship program will balance antibiotic use with the need to conserve their effectiveness by carefully assessing actual need and selection of an agent, its dose and duration for each patient. To succeed, antibiotic stewardship must involve all stakeholders: patients, doctors, government and health insurers, hospitals and other healthcare institutions, and Canada's pharmaceutical industry.

*In the 1960s and 1970s, powerful antibiotic drugs and vaccines appeared to have banished the major plagues from the industrialized world, leading to a mood of complacency and the neglect of programs for disease surveillance and prevention. Over the past few decades, however, infectious diseases have returned with a vengeance.*²²

LINKS BETWEEN INFECTIOUS DISEASES AND CHRONIC DISEASES

The association between infectious and chronic diseases is complex and requires an intensified research focus. Although the roles of infectious diseases such as the human papilloma virus (HPV) in cervical cancer, hepatitis C virus in liver cancer, and *Helicobacter pylori* in duodenal ulcers are now understood, the association between infectious and chronic diseases remains a largely under-researched area.

The impact of prevention by immunization, or provision of early treatment for infectious diseases that may lead to chronic diseases, thereby, will reduce the occurrence of chronic diseases and their costs to the healthcare system. This is an area of great promise.

PUBLIC/PRIVATE PARTNERSHIPS IN VACCINE DEVELOPMENT

The financial, intellectual and time investments require for vaccine research requires strong collaborations to ensure successful vaccine discoveries. Although vaccines may be technologically feasible, liability concerns are making research and development of vaccines less attractive to private companies. This needs to be addressed by a universal "no-fault" system of compensation for those who have suffered adverse consequences from vaccination.

KNOWLEDGE AND TECHNOLOGY TRANSFER AND COMMERCIALIZATION OF DISCOVERIES

Canada is recognized for the quality of its intellectual capacity, research findings and state of the art technical facilities. Ironically, the greatest challenge is transferring the fruits of technology from research to the bedside of Canadians. Until there is an effective conduit of research findings into accessible and usable infectious disease interventions for patients, the true potential of research discoveries in the area of infectious diseases will not be realized.

By not taking stewardship of our scientists' research discoveries, Canada is losing not only opportunities to achieve a healthier population, but also losing out on significant economic benefits to the country.

BUILDING CANADA'S INFECTIOUS DISEASES CAPACITY

A NATIONAL SURVEILLANCE SYSTEM

Infectious disease surveillance is critical in identifying new, emerging pathogens and trends, community and healthcare-associated resistant organisms and in monitoring rates of infections to ensure that management strategies can be developed and applied.

Over the past 5 years, the problem has grown faster than have actions to contain it. A true, population-based national surveillance network for community-associated drug resistant microorganisms does not exist, but it represents the most pressing current need.

Available data sets and reports provide a fragmented and incomplete picture to guide our understanding of the evolving situation.²⁴

Without an early warning system Canada cannot be prepared to adequately identify, diagnose, prevent and treat infectious diseases. A national surveillance system that captures laboratory and hospital data, public and chronic health-based data and contextual information is the essential cornerstone of a Canadian infectious disease strategy.

A NATIONAL INVENTORY OF EXPERTS AND EXPERT INFORMATION

Canada has exceptional healthcare professionals and researchers who rely on human networks for knowledge exchange, especially with respect to the prevention, treatment and control of patients with infections. To expedite patient diagnosis, treatment and recovery, a national inventory of infectious disease experts is needed.

A HUMAN RESOURCES PLAN TO ADDRESS SKILLS SHORTAGES

Canada's public health and laboratory professionals require continual training and upgrading of their educational qualifications to respond to the ever changing challenges from infectious diseases. That need is country wide; we do not know which province or territory of residence, or urban or rural settings will be the setting for the next epidemic.

As the current professional population "grays", a sufficient number of replacements must be ready and able to take their places. Shortages of these professionals will result in downsizing, lab closures and outsourcing leading to delays in reporting results. That will translate into reduced and delayed care for patients, longer wait times and increased treatment costs to our healthcare system.

Furthermore, Canada's infectious disease professionals of all disciplines require continual training and upgrading of their educational qualifications to respond to the ever-changing challenges from infectious diseases. Training should be made available in all provinces and territories, in both urban and rural settings.

A human resources plan for medical, scientific, infection control and technologist fields is needed.

A PLAN FOR CANADA'S MICROBIOLOGY LABORATORIES

Microbiology laboratories play a pivotal role not only in the diagnosis and management of infectious diseases, but also in surveillance for communicable diseases. Rapid and accurate identification and characterization is vital to the prevention of both healthcare and community-associated infections. Critical to a strategy are national standards to ensure uniform microbiology testing and reporting across the country.

Establishing a national laboratory network among hospital, private and public health laboratories would ensure rapid responses to public health emergencies through improved surveillance, communication and strategic reallocation of resources in times of crisis.

EMERGENCY PLANNING: SURGE CAPACITY FOR EMERGENCIES

In a public health or healthcare infectious diseases emergency, we must rapidly expand beyond normal services to meet the increased demand for qualified personnel, medical care, public health and laboratory services to manage outbreaks and to meet the demand for affected patients' care.

We need only look at the SARS outbreak in Toronto where severe, chronic understaffing of Toronto-area hospitals from an infection control and microbiology standpoint became a crisis with greatly increased demands.²⁵

Sufficient surge capacity to address a particularly virulent and contagious strain of an emerging infectious disease or a bioterrorist threat is a priority.

PUBLIC EDUCATION TO PREVENT INFECTIOUS DISEASES

Most Canadians obtain their information about infectious diseases through the mass media. There is now no national capacity to expeditiously transmit vital infectious disease information to Canadians. National communication capacity is an essential tool for effective public health management of common community-associated infections.

ENDING SILOS IN HEALTHCARE DELIVERY

BRIDGING THE GAP BETWEEN PUBLIC HEALTH AND CLINICAL MEDICINE

Gaps between public health and clinicians, addressing community-associated and hospital infections, public health and emergency room physicians must be addressed. Silos prevent exchange of information between public health and infectious disease treatment and service delivery. Increased collaboration among public health and infectious disease communities is needed.

For example, community health physicians may not have access to results of hospital-based laboratory testing and to reports regarding their patients' hospitalizations. There is insufficient communication and collaboration between hospital and community physicians. Similarly, public health does not have a presence in hospital settings and there is a lack of communication and collaboration.

SARS was estimated to have cost the Canadian economy \$2 billion.²⁶

WHO'S IN CHARGE?

Confusion surrounding the roles of agencies such as the Public Health Agency of Canada, provincial Ministries of Health, regional health authorities and provincial and private laboratories persist given the division of responsibilities of Canada's Constitution Act and subsequent development of our healthcare system. Constant reorganization also contributes significantly to the confusion of users, making it difficult to identify the point of service delivery.

Confusion over leadership roles in a crisis is frustrating for Canadians and results in less effective containment and understanding of newly emerging infectious agents. The Ontario public health system's response to the SARS crisis was a "wake-up call that was never answered," with few of the recommendations of the Naylor Inquiry implemented.

Unfortunately, once the SARS crisis passed, Canadians hit the snooze button. An upcoming influenza pandemic may be our next national test.

ECONOMIC AND SOCIAL COST OF INFECTIONS TO CANADA

A challenge for our National Infectious Diseases Day Partners and the Infectious Diseases Sector is estimating the costs to Canada from infectious diseases. Canada's total cost must include the diminished quality of life, including earning potential of individuals who have infection (indirect costs), workplace absenteeism and reduced productivity.

As a country we have failed to understand or calculate the impact of infectious diseases. Statistics on deaths from infectious diseases and costs of treating patients with CAI or HAI are not well studied in Canada. The result is that we do not take infectious diseases seriously.

Benefits to addressing these infections are clear: reduced costs, reduced pressures on institutions and employees and a strong contribution to reducing wait times in healthcare.

We know that non-routine visits by Canadians to doctors with colds and flu – upper respiratory infections – are a substantial portion of visits to family physicians. Upper respiratory tract infections (URTIs) are the most common reason for adults individuals to seek health care in the United States, and 67 % of all these visits end up with an antibiotic prescription.²⁷ Percentages in Canada probably do not differ substantially.

Provinces do not report the cost of these visits, substantial costs can be saved in addressing these common infections with an effective public health strategy that involves Canadians in preventing and controlling their infections.

The Harvard Business Review in October 2004 reported a study on the cost to employers when workers show up at work but are not fully functioning. This research and similar studies at Cornell University puts losses to the American economy of about \$150 billion. We can estimate \$15B lost to Canada when we share bacteria and viruses with colleagues in our workplaces.

The example of annual influenza is clear. The Canadian Institute of Health Information (CIHI) says, “Having one senior hospitalized with influenza costs about the same amount (excluding physician costs) as giving 260 people flu shots.” Influenza vaccine reduces the proportion of elderly people who need to be hospitalized with pneumonia by 60 per cent, the Ontario Health Insurance Plan (OHIP) says. Health Canada estimates 1.5 million workdays lost annually and a \$1B cost for this recurring infectious disease.²⁸

Strategies to reduce infectious diseases spread in our communities, in our schools and in our workplaces are a shared responsibility. In the end, they contribute to a “healthier” bottom line.

CONCLUSION

A National Infectious Disease Strategy will ensure an enduring national commitment and application of resources to reduce the impact of infectious diseases on Canadians’ good health, our health-care system and our national social and economic interests. An effective strategy will put in place measures to control healthcare-associated infections; prevent community-associated infections; enhance Canada’s research on infectious diseases; and build Canada’s resource capacity.

Many of these recommendations are not new nor are they revolutionary.

Canadians do not want to wait for the next infection crisis. The time to act is now.

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2007 NATIONAL INFECTIOUS DISEASES DAY PARTNERS AND SUPPORTERS

CANADIAN FOUNDATION FOR INFECTIOUS DISEASES (CFID)

The Canadian Foundation for Infectious Diseases (CFID) was established in 1989 to fund critical research and help protect Canadians and people worldwide from infectious diseases. CFID is the fundraising arm of the Association of Medical Microbiology and Infectious Disease (AMMI Canada) — our country's largest association of microbiologists and infectious disease specialists. CFID pledges to use every dollar raised responsibly and productively to support research, education and professional development of Canada's infectious disease experts. For more information, please visit www.researchid.com.

ASSOCIATION OF MEDICAL MICROBIOLOGY AND INFECTIOUS DISEASE CANADA

The Association of Medical Microbiology and Infectious Disease (AMMI Canada) is the national association that represents physicians and researchers specializing in the fields of medical microbiology and infectious diseases. Through research, education, and partnerships with other associations, AMMI Canada strives to protect people from existing and emerging infectious diseases and to provide treatment for those who are affected. For more information, please visit www.ammi.ca

CANADIAN ASSOCIATION FOR CLINICAL MICROBIOLOGY AND INFECTIOUS DISEASES (CACMID)

The Canadian Association for Clinical Microbiology and Infectious Diseases (CACMID) is a national association composed of physicians, researchers, technologists and students primarily focused on laboratory aspects of clinical microbiology and infectious diseases. Their goals are to enhance scientific exchange within the association, promote education and research, and support clinical microbiology standards and practices. For more information, please visit www.cacmid.ca.

COMMUNITY AND HOSPITAL INFECTION CONTROL ASSOCIATION (CHICA) – CANADA

CHICA–Canada is a national, multi-disciplinary, voluntary association of Infection Prevention and Control Professionals (IPCPs) with 20 chapters across the country dedicated to the health of Canadians by promoting excellence in the practice of infection prevention and control. For more information, please visit www.chica.org.

INTERNATIONAL CENTRE FOR INFECTIOUS DISEASES (ICID)

The International Centre for Infectious Diseases (ICID) is Canada's unique organization delivering innovative solutions to the challenges of the global fight against the infectious diseases of the 21st century. For more information, please visit www.icid.com.

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