

Climate Change Increases Infectious Disease Risks to Canadians

HEALTH OF CANADIANS IN A CHANGING CLIMATE: SCIENCE ASSESSMENT 2022

Infectious diseases, pathogens and vectors are sensitive to changes in the environment and climate. As temperatures increase and precipitation fluctuates in Canada, environments are likely to become more suitable for climate-driven infectious diseases to establish in new areas, expand and shift in geographic range, and/or grow in number or abundance.

Infectious diseases new to Canada may spread northward from the United States, and from elsewhere in the world, carried by people and goods, or by wild animals.

Ticks and tick-borne diseases are expected to emerge, or continue to spread within Canada, as the climate warms

- Lyme disease, transmitted by blacklegged ticks, emerged in Canada and spread northward as a result of climate change, causing a dramatic increase in human cases from 2004 to 2019
- Other illnesses transmitted by blacklegged ticks such as anaplasmosis, babesiosis, Powassan virus, and *Borrelia miyamotoi*, are also projected to spread in Canada



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Mosquitoes and vector-borne diseases they cause are also emerging and/or shifting in Canada

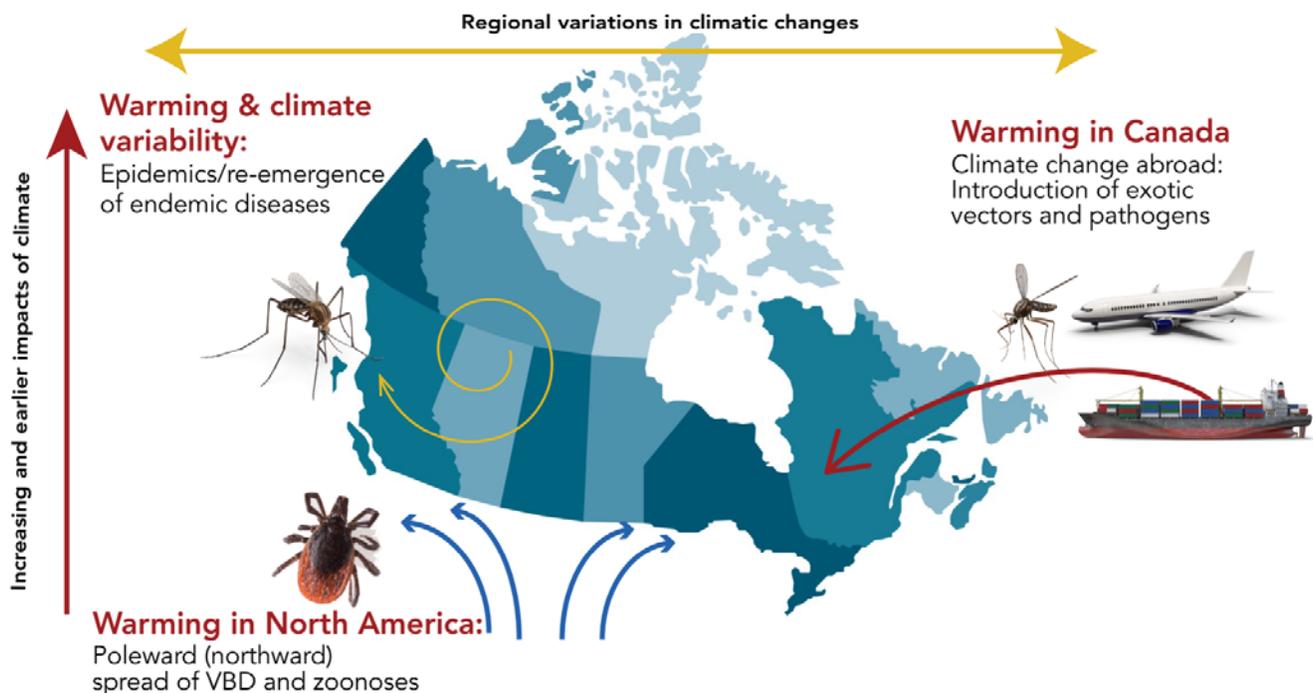
- The emergence of eastern equine encephalitis and West Nile virus infection could have been facilitated by a changing climate
- Canada also already has several diseases that can be transmitted by mosquitoes — snowshoe hare virus, and Jamestown Canyon virus, that may all be impacted by climatic changes
- Warmer temperatures mean greater survival of exotic vectors once they are carried into Canada making it more likely that the diseases they carry are transmitted here (e.g., dengue, chikungunya, Zika)

Climate change also effects diseases transmitted to humans directly by animals (i.e., zoonoses) or from the environment

- Rabies in Arctic foxes is of concern, since the Arctic is warming more quickly than Southern Canada, affecting Arctic fox ecology
- Hantavirus pulmonary syndrome, carried by mice, is a climate-sensitive disease, but it is not yet clear how climate change will affect it in Canada
- *Cryptococcus gattii*, blastomycosis, and coccidioidomycosis are fungal infections found in Canada, and risk from these is likely to change with expected changes in temperatures and rainfall

Weather and climate also affect diseases transmitted from human to human. For example, respiratory infections are often more prevalent in the winter; warmer winters can lead to more widespread influenza the following year.

A Summary of Climate Change Effects on Infectious Disease Risks for Canada



Adaptation informed by modelling and risk assessment, coupled with preventive actions, can greatly reduce health impacts

Public health professionals and individuals have a key role to play in reducing risks. Adaptation measures can include assessments of health risks and vulnerability, integrated surveillance and early warning systems, provision of accurate laboratory diagnostics, and development of guidance or public health advice and risk communications. In addition, using a One Health approach that integrates human, animal and environmental health considerations is important in addressing infectious diseases.

Individual Canadians need to understand the risks, perceive them as being worthy of acting upon, know what protective actions to take, and be willing to take them. These actions can include:

- wearing insecticide (permethrin)-treated clothing or insect repellent
- checking for ticks and promptly removing them after being outdoors

- practicing proper hand hygiene after coming into contact with wildlife, farm animals or pets
- vector-control methods or landscape management to limit vector establishment or expansion

Some populations are at greater risk, requiring an equitable approach to protecting health

There is increasing recognition that climate change will exacerbate health inequities. Individuals with determinants of ill health (e.g., low-income, living in substandard housing, food insecure) are more likely to experience disproportionate impacts of climate-related infectious diseases and have limited ability to take protective measures. First Nations, Inuit, and Métis peoples may be at increased risk of exposure due to a strong reliance on traditionally harvested foods and land-based activities, such as hunting.

Helpful resources

- [Climate Change and Infectious Diseases: The Challenges](#)
- [Climate Change and Infectious Diseases: The Solutions](#)
- [Lyme disease \(for the public and for health professionals\)](#)
- [West Nile virus \(for the public and for health professionals\)](#)

Source

Ogden, N. H., Bouchard, C., Brankston, G., Brown, E. M., Corrin, T., Dibernardo, A., Drebot, M. A., Fisman, D. N., Galanis, E., Greer, A., Jenkins, E., Kus, J. V., Leighton, P. A., Lindsay, L. R., Lowe, A.-M., Ludwig, A., Morris, S. K., Ng, V., Vrbova, L., Waddell, L., & Wood, H. (2022). Infectious Diseases. In Berry, P., & Schnitter, R. (Eds.). (2022). [Health of Canadians in a Changing Climate: Advancing our Knowledge for Action](#). Ottawa, ON: Government of Canada.

