



Retro 3: A feasibility pilot study for the development of a laboratory-based surveillance system for vector-borne diseases



Vector-borne diseases (VBD) are rapidly expanding globally¹. In addition to emerging sporadic domestically-acquired VBD, hundreds of cases occur among Canadian travellers annually^{2,3}. Yet, several emerging VBD are not reportable and/or nationally notifiable in Canada.

The Retro 3 pilot study was a collaboration between the Public Health Agency of Canada (PHAC) and participating provincial public health laboratories to assess the feasibility of leveraging routine laboratory data for surveillance of these diseases, through a retrospective analysis of dengue, Zika and chikungunya.

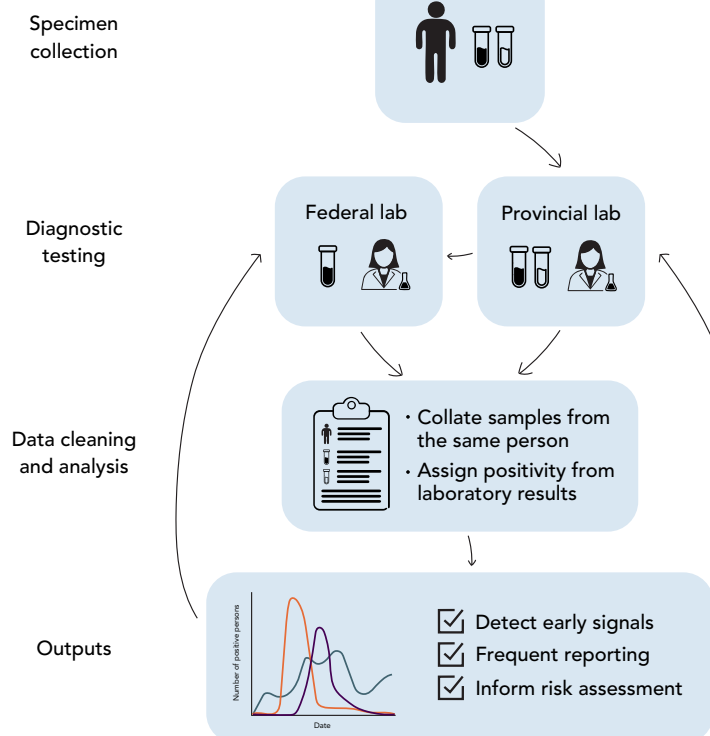
Vision

To identify and monitor early outbreak signals and gather data to assess the long-term trends and epidemiology of VBD of interest

Project objective

To assess the feasibility of leveraging routinely collected national and provincial laboratory data to conduct surveillance on VBD of interest

Pilot study overview



Data sources

- Provincial/national public health laboratory requisition and testing data

Data elements

- Non-nominal sample/person tags, dates, basic demographics, test results for diseases of interest, available travel and clinical data

Data analysis

- Laboratory-based definitions classify individuals as positive or negative for the disease of interest based on diagnostic test results

Feasibility pilot study key findings⁴

- Routine disparate lab data can be linked
- Data quality/completeness are sufficient
- Laboratory-only disease definitions can be used to classify positive persons
- Epidemiological patterns match global trends
- Data gathered allow for basic epidemiological analyses to inform public health initiatives

This feasibility pilot study demonstrated that laboratory requisition and testing data on dengue, Zika and chikungunya can be leveraged to conduct analyses compatible to those from a surveillance system, thus indicating the viability of a laboratory-based surveillance system for such diseases. Such a system would need to remain flexible to expand to other VBD in the future using a phased approach and could ultimately complement existing traditional case-based surveillance efforts and address critical gaps in Canada's VBD monitoring.

Laboratory-based surveillance represents an innovative, collaborative and efficient approach to leverage, integrate and disseminate routine laboratory data to support targeted public health actions and significantly enhance Canada's capacity to detect and respond to emerging VBD threats.



BC Centre for Disease Control
An agency of the Provincial Health Services Authority



Alberta Health
Services

Public
Health
Ontario

Santé
publique
Ontario

1. World Health Organization. Global Arbovirus Initiative. 2022. <https://www.who.int/news-room/events/detail/2022/03/31/default-calendar/global-arbovirus-initiative>. 2. Ogden NH, Gachon P. Climate change and infectious diseases: What can we expect? Can Commun Dis Rep 2019;45(4):76-80. <https://doi.org/10.14745/ccdr.v45i04a01>. 3. Government of Canada. Dengue fever: Surveillance. 2024. <https://www.canada.ca/en/public-health/services/infectious-diseases/viral-haemorrhagic-fevers/dengue-fever/surveillance.html>. 4. Public Health Agency of Canada, BCCDC Public Health Laboratory, Alberta Health Services Laboratory Services, Public Health Ontario Laboratory. Travel-related dengue, Zika, and chikungunya in Canada, 2012-2023: Results from a feasibility pilot study on laboratory-based surveillance. Can Commun Dis Rep 2025;51(5):212.

Public Health Agency of Canada, BCCDC Public Health Laboratory, Alberta Health Services Laboratory Services, Public Health Ontario Laboratory. Retro 3: A feasibility pilot study for the development of laboratory-based surveillance system for vector-borne diseases. Can Commun Dis Rep 2025;51(5):213.



Public Health
Agency of Canada

Agence de la santé
publique du Canada

Canada