Canadian Laboratory Surveillance Network (CLSN)

Enhancing Laboratory Surveillance

As part of the Canadian Laboratory Surveillance Network, PulseNet Canada has enabled the reduction of human and economic impacts of foodborne disease.

Background

- In 1998, Canadian public health laboratories established a standardized protocol for fingerprinting and comparing MRSA, enabling standardized analysis nationally and internationally.

- In 2000, PulseNet Canada was established for identifying clusters of foodborne pathogens based on their DNA fingerprints.

- PulseNet Canada is an electronic network developed to harmonize with PulseNet USA. PulseNet USA was developed by the Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia. PulseNet allows for the rapid exchange of molecular sub-typing data and associated isolate information among laboratories, epidemiologists, hospitals and other organizations working with human, animal, and environmental enteric pathogens.

- Canadian Laboratory Surveillance Network (CLSN) is an umbrella encompassing PulseNet Canada and other molecular epidemiology networks monitoring infectious agents. With the constant threat of emerging and re-emerging infectious disease outbreaks and potential for bioterrorism, the ability to rapidly determine the relatedness of strains is the key to initiate investigations by appropriate authorities.

Current Status

- The provinces and appropriate federal departments work very closely together monitoring food and waterborne pathogens that emerge anywhere across the country on an ongoing basis.

- PulseNet Canada enables the comparison of DNA fingerprints in real time allowing the identification of foodborne illness originating from a common source. PulseNet has demonstrated timely mitigation through quicker intervention, thereby reducing human disease burden and greater economic loss.

- If an outbreak occurs in more than one province, the Public Health Agency of Canada (PHAC) would take the lead on the investigation. PHAC also assists in outbreak investigations when requested by the province or territory.

Next Steps

- Fully implemented, the CLSN is expected to achieve earlier identification of infectious disease outbreaks, leading to quicker responses, targeted intervention strategies, and a significantly lower human disease and economic burden.

- The information technology (IT) infrastructure implemented for PulseNet Canada will be used for surveillance and response for other infectious diseases, e.g. influenza, Severe Acute Respiratory Syndrome (SARS), nosocomial acquired infections.

- PHAC will continue to improve the molecular epidemiological system by developing and using cutting edge technologies and by harmonizing standardized operation procedures with international partners.

- PulseNet USA and PulseNet Canada will sign agreements with other jurisdictions to permit real-time interrogation of databases globally.

- CLSN will continue to develop and improve web-based tools for secure data dissemination and will enable real-time alerting among national and international public health stakeholders.

Image courtesy of CDC – National Center for Infectious Disease: *Escherichia coli* Infection

Canada

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Mission

The mission of the Canadian Laboratory Surveillance Network (CLSN) program is to continually improve the molecular epidemiological system enabling early recognition, timely investigation, and rapid emergency response to public health threats stemming from emerging and re-emerging disease outbreaks, thus reducing the disease burden on Canadians.

recognition
investigation
response

Connecting Public Health Laboratories to Fight Foodborne Illness

The detection and control of intentional and natural outbreaks and epidemics of infectious diseases requires rapid and specific identification of the pathogens and their source. With the increase of international trade and travel, foodborne outbreaks affect many people in many countries. Pulsed-field gel electrophoresis is the current gold standard for generating bacterial DNA fingerprints for the monitoring of strains from farm to fork. These fingerprints are being shared through the internet for inter-laboratory comparison. PulseNet USA and PulseNet Canada are virtual laboratory networks with central national databases housed at the Centers for Disease Control and Prevention and the Public Health Agency of Canada's National Microbiology Laboratory. The connection of both databases permits real-time comparison of fingerprints as they are generated in different laboratories across North America. The server-to-server connection between the two countries is a break-through for real-time laboratory data sharing between USA and Canada.

PulseNet Canada Laboratories

- British Columbia Centre for Disease Control, Laboratory Services
- Cadham Provincial Laboratory (MB)
- Central Public Health Laboratory (ON)
- Laboratoire de la santé publique du Québec
- Newfoundland and Labrador Public Health Labs
- ProvLab Alberta
- Queen Elizabeth Hospital (PE)

- Saskatchewan Provincial Laboratory Services
- St. John Regional Hospital (NB)
- QE II Health Sciences Centre (NS)
- National Microbiology Laboratory (Public Health Agency of Canada)
- Laboratory for Foodborne Zoonoses (Public Health Agency of Canada)
- Bureau of Microbial Hazards, Food Directorate (Health Canada)