September 2019

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

LM LABS

LABORATORY TRENDS

A Report from the BCCDC Public Health Laboratory

Inside this Issue

cap ACCREDITED™

Issues: www.bccdc.ca/publichealthlab

Provincial Toxicology Centre's new urine drug screen panel

On August 08, 2019 the BC Provincial Toxicology Centre (PTC) implemented an improved high throughput test for primary screening of drugs of abuse and related substances in urinary samples. The UDS-137 test is performed using the high pressure liquid chromatography - high resolution accurate mass spectrometry.

The improved toxicology screen features a panel of 137 psychoactive compounds including the parent drugs and metabolites. The drugs of the screening panel can be grouped into 9 different categories on basis of either chemical makeup or psychoactive effect:

Amphetamines (19 compounds)
Anti-depressants (17 compounds)
Anti-psychotics (6 compounds)
Benzodiazepines (32 compounds)
Cannabinoids (1 compound)
Cocaine (4 compounds)
Opiates/Opioids (39 compounds)
Z-drugs (3 compounds)
Other drugs (16 compounds)

The many advantages of the new UDS-137 screening test include:

- Expanded panel, which now includes 137 drugs and metabolites
- Improved specificity and sensitivity
- Improved turnaround time.

With the implementation of the UDS-137 test, the PTC is no longer offering clinical drug screens for other sample types other than urine.

The full list of the drugs covered under the new screening test can be found on the eLab handbook: http://www.elabhandbook.info/PHSA/Default.aspx.

Implementation of a Measles Vaccine Strain PCR

Acute measles is confirmed by detection of anti-measles IgM and/or detection of viral RNA from a nasopharyngeal (NP) or a throat swab and urine. Recent vaccination with MMR vaccine can also result in fever and a rash and induce a positive IgM as well as detectable measles RNA.

Individuals who experience fever and mild rash 7-12 days following their first dose of MMR and **have not been exposed to a known measles case or have not travelled to a region where measles is endemic should not be tested**. However, if indicated, a specific measles PCR will be performed to identify measles vaccine strain (genotype A) in persons with a positive measles PCR and a recent vaccination history. Please note, non-vaccine associated measles positive samples are automatically genotyped at the National Microbiology Laboratory to identify the strain relatedness to reported outbreak clusters.

Effective immediately, in addition to currently available measles RNA testing, the BCCDC Public Health Laboratory is now able to provide measles vaccine strain typing in-house to more rapidly distinguish wild type from vaccine infections when the potential of vaccine related clinical symptoms is a concern.

PCR Lab Requisition: please use the Virology Requisition form to request measles PCR testing and indicate any recent MMR vaccination
http://www.bccdc.ca/resource-gallery/Documents/Guidelines%20and%20Forms/Forms/Labs/VI%20Req.pdf

elab Handbook: further details about measles testing can be found on the specific measles pages here: http://www.elabhandbook.info/PHSA/Default.aspx

Full accreditation status from the Diagnostic Accreditation Program

In June of this year, the Diagnostic Accreditation Program (DAP) provided official reports of the full accreditation status of the BCCDC Public Health Laboratory (PHL), the Central Processing and Receiving (High Volume Serology) and the Tumour Marker Laboratory. The Provincial Toxicology Centre was also awarded full accreditation status in August.

In striving to adhere to a new checklist comprising over 2000 items, our overall compliance rate was assessed at 94.6%. Since the fall visit and assessment, the various labs have rectified deficiencies and implemented recommendations. Accreditation activities and associated onsite assessments serve as opportunities to identify areas of improvement. These checks and balances are important as we strive for excellence in our provision of laboratory services.

The DAP accredits diagnostic services (diagnostic imaging, laboratory medicine, neurodiagnostics, pulmonary function and polysomnography) in the province of British Columbia.

New interim perinatal syphilis testing guidelines

Recent epidemiologic syphilis trends seen in BC – including increased overall rates, increased rates in women of childbearing age, along with an increasing number of infectious syphilis cases among males who report both male and female sexual partners as well as two congenital syphilis cases in 2019 (the first in BC since 2013) – have motivated a revision of the current approach to prenatal syphilis screening in the province.

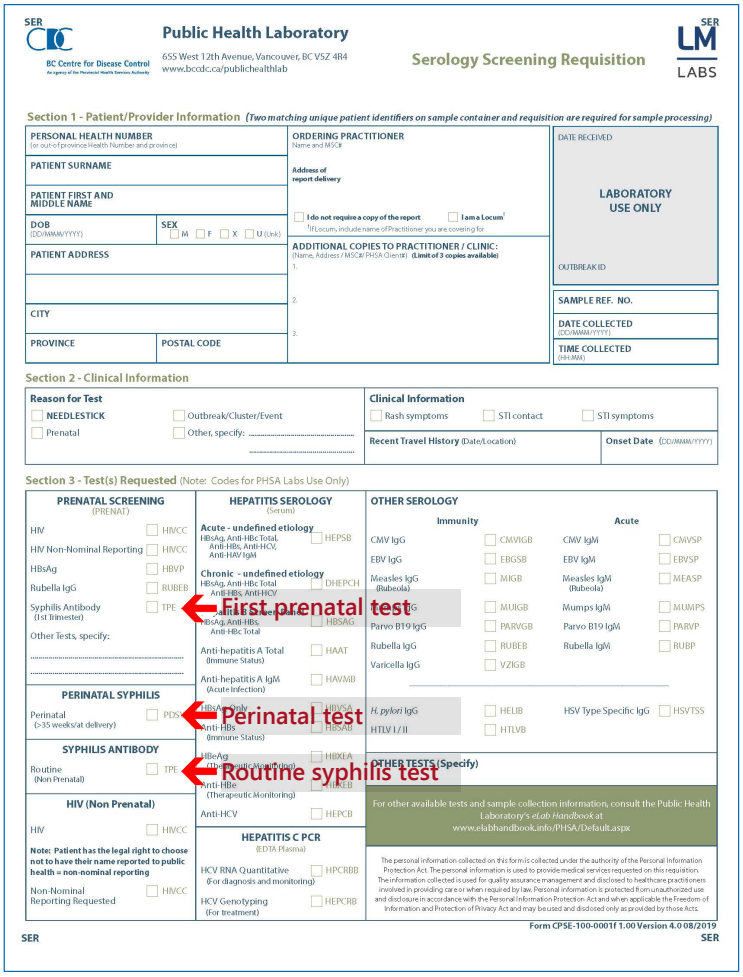
The following interim algorithm for prenatal syphilis screening in BC has been recommended:

All pregnant individuals should have syphilis screening performed at the following two time points:

1. During the first trimester of pregnancy or at first prenatal visit (current recommendation); and
2. At delivery (at time of admission for delivery or any time after 35 weeks for those planning home births) (new recommendation).

These guidelines were communicated on September 9, 2019 and will be in place for approximately one year, after which an evaluation will be performed.

Practitioners should use the updated BCCDC PHL Serology Screening requisition to order the prenatal syphilis tests (first trimester or perinatal). For those laboratories interfaced with our LIS or use alternate means of ordering, an indication of the perinatal syphilis order and gestational age is necessary to differentiate these from the first prenatal or routine syphilis orders.

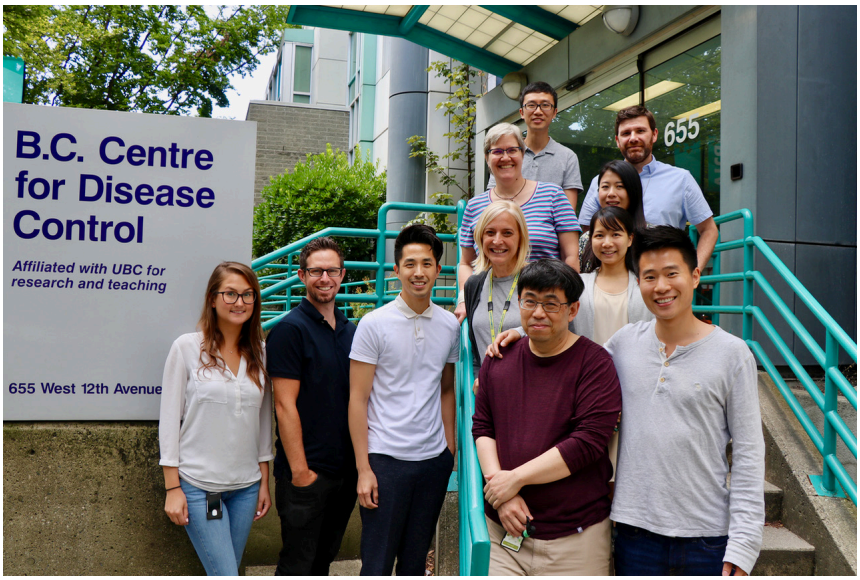


Oxford Nanopore Technologies workshop

In July, BCCDC PHL held a two-day workshop provided by Oxford Nanopore Technologies (ONT). Through the support of the BCGEU union's Professional Development Fund ten technologists and technical coordinators from diverse molecular laboratories in the building were able to attend.

The aim of this workshop was focused on an ONT device called the MinION which uses relatively new third generation sequencing technology. Attendees heard about the science behind the device, and how to plan and perform experiments on it including the basics of library preparation and running the instrument. The main aim of the course, however, was to learn how to analyze the data output of the MinION as staff at the BCCDC PHL are more familiar with Illumina technology and outputs. There are many programs available to manipulate the large amount of data generated from this third generation sequencing technology; however, it is ever changing with very complex bioinformatics. Both commercially available and open source (command line) bioinformatics tools were described.

With bioinformatics now becoming a more required skill for the average laboratory worker, attendees left with the groundwork to perform their own bioinformatics on MinION data. Hopefully in the future, this unique knowledge will lead to further innovation at BCCDC PHL as third generation sequencing finds its place in molecular laboratories.

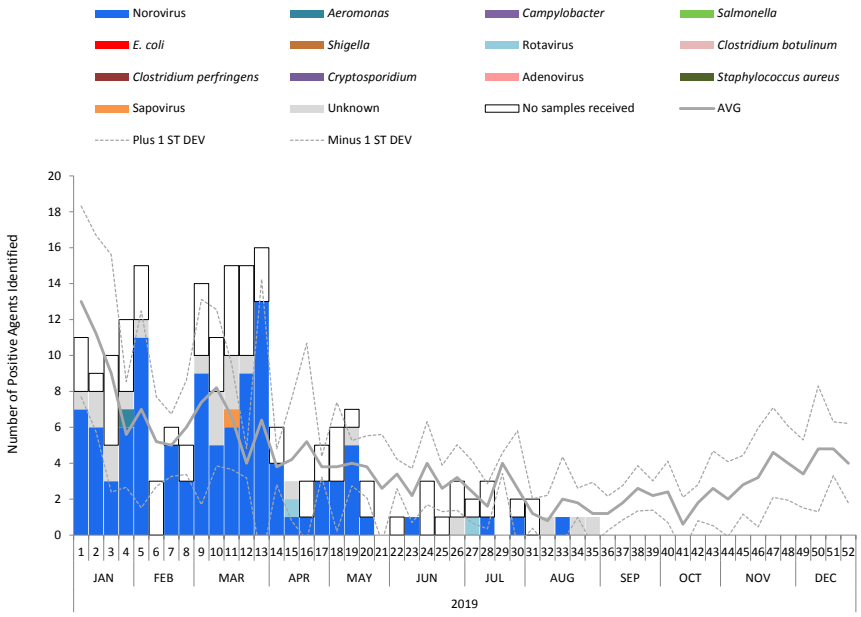


Front row (L-R): Becky Hickman, Trevor Hird, Robert Azana, Min-Kuang Lee, Martin Cheung
Second stairs: Loretta Janz, Tracy Chan
Third stairs: Diane Eisler, Stephanie Man
Back row: Frankie Tsang, Michael Micorescu (Oxford Nanopore Technologies)

Gastrointestinal outbreaks

From January to August there were 199 gastrointestinal (GI) outbreaks investigated by the BCCDC PHL (Figure 1). The number of outbreaks investigated over the summer months were consistent with the number investigated compared to previous years. Outbreaks were investigated from 107 (54%) longterm care facilities (LTCF), 47 (24%) daycares/schools, 33 (17%) hospitals, seven other facility/event types (3%) and five restaurants (2%). Samples were received from 66% of these outbreaks with norovirus detected in 105 (80%) (from 67 LTC facilities, 25 hospitals/acute care facilities, seven daycares/schools, four other facility types and two restaurants). *Aeromonas* was also detected from a LTC facility outbreak; sapovirus was detected in samples from a daycare/preschool and rotavirus was detected from a hospital and LTCF outbreak.

Figure 1. Gastrointestinal outbreaks investigated in 2019 to May, Environmental Microbiology, Public Health Advanced Bacteriology & Mycology, Parasitology and Virology Programs, BCCDC PHL. The data available are from outbreaks in which the BCCDC PHL has been notified. Some acute care microbiology laboratories are also testing for norovirus in the province and these data may not include outbreaks from all health authorities.

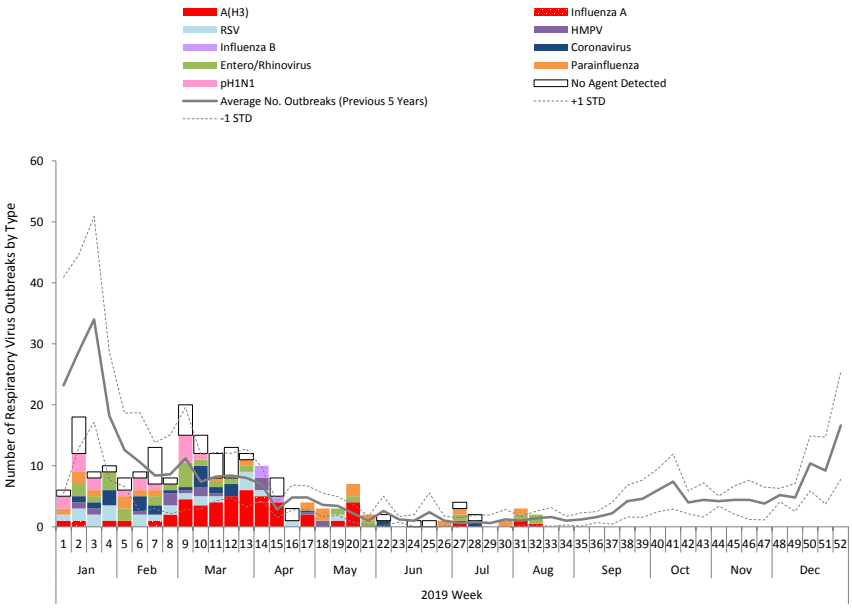


Respiratory outbreaks

From January to August there were 220 influenza-like illness (ILI) outbreaks investigated by the Virology Program of BCCDC PHL. Specimens from these outbreaks were submitted from 211 (96%) LTC facilities, six (3%) hospitals and three (1%) other facility types. Starting in March into April, the number of outbreaks was at the higher end of average weekly submissions from the past five years (Figure 2). As expected for the time of the year, from mid-April into May, the number of outbreaks then tapered off with the end of the influenza season*.

Over the summer months there were still some (three) facilities reporting outbreaks due to influenza A(H3). Other viral agents detected included parainfluenza virus in 4 facilities, enterovirus/rhinovirus in 3 facilities, and corona virus in two other facilities.

Figure 2. Influenza-like illness outbreaks investigated in 2019 to date, Virology Program, BCCDC PHL. Note that some outbreaks are not reflected here if they are awaiting subtyping.



The Virology Laboratory will resume screening for influenza and RSV using the usual in-house developed RT-PCR assay for influenza A/B/RSV on September 30, 2019. During the summer months, all respiratory virus requests were tested by the Luminex NxTAG Respiratory Pathogen Panel (RPP) assay only. The RPP will be performed when atypical bacteria testing is requested and for the following situations after the initial screening is negative:

- those under 5 years old
- outbreak-related samples
- by special request.

Please refer to elab Handbook for further details: http://www.elabhandbook.info/PHSA/Default.aspx

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

LABORATORY TRENDS

September 2019

LM LABS

The Public Health Laboratory at the BC Centre for Disease Control (BCCDC) provides consultative, interpretative testing and analyses for clinical and environmental infectious diseases in partnership with other microbiology laboratories and public health workers across the province and nationally. The BCCDC PHL is the provincial communicable disease detection, fingerprinting and molecular epidemiology centre providing advanced and specialized services along with international defined laboratory core functions. The Provincial Toxicology Centre conducts toxicology testing and analysis for clinical patients, including therapeutic drug monitoring, drug screening tests and forensic toxicology analyses for the BC Coroners Service.

This report may be freely distributed to your colleagues. If you would like more specific information or would like to include any figures for other reporting purposes, please contact us.

Editor: Yin Chang Contact: yin.chang@bccdc.ca Website: www.bccdc.ca/publichealthlab

Co-Editors:

Biosafety, Biosecurity, Biohazard Containment
Public Health Lead: Neil Chin
Assistant Biosafety Officer: John Tansey

Environmental Microbiology
Program Head and Environmental Microbiologist: Dr. Natalie Prystajecky
Team Lead: Christine Tchao (Temporary)

Molecular Microbiology & Genomics
Program Head and Medical Microbiologist: Dr. Linda Hoang & Dr. Mel Krajden
Team Lead: Frankie Tsang

Parasitology
Program Head and Clinical Microbiologist: Dr. Muhammad Morshed
Team Lead: Navdeep Chahil

Pre-Analytical, Central Processing & Receiving
Laboratory Manager: Quantine Wong
Site Supervisor: Brian Auk

Public Health Advanced Bacteriology/Mycology
Program Head and Medical Microbiologist: Dr. Linda Hoang
Team Lead: Ana Paccagnella

Public Health High Volume Serology
Program Head and Medical Microbiologist (Viral Serology): Dr. Mel Krajden
Clinical Microbiologist: Dr. Paul Levett
Program Head and Clinical Microbiologist (Syphilis and *H. pylori)*: Dr. Muhammad Morshed
Team Lead: Annie Mak

Laboratory Support Services
Program Head and Medical Microbiologist: Dr. Linda Hoang & Dr. Mel Krajden
Team Lead: Dr. Mabel Rodrigues

Provincial Toxicology Centre
Scientific Director: Dr. Sergei Likhodi
Associate Scientific Director: Dr. Aaron Shapiro
Team Lead: Dennis Friesen

TB/Mycobacteriology
Program Head and Medical Microbiologist: Dr. Inna Sekirov
Team Lead: Dr. Mabel Rodrigues

Virology
Program Head and Clinical Microbiologist: Dr. Agatha Jassem
Team Lead: Frankie Tsang

Zoonotic Diseases and Emerging Pathogens
Program Head and Clinical Microbiologist: Dr. Muhammad Morshed
Team Lead: Navdeep Chahil

cap ACCREDITED™