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**Laboratory Comings & Goings**

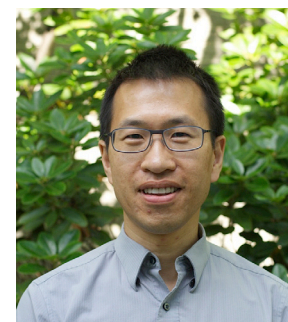


**Dr. Isaac-Renton has retired!**

After 15 years as Public Health Laboratory Director, as well as Program Head for the Parasitology and the Environmental Microbiology Labs at the BC Public Health Microbiology and Reference Laboratory (BCPHMRL), Dr. Isaac-Renton is now “planning not to plan”. She retired early September and wanted to thank you all for your collegiality, generosity and support over the years.

**Dr. Tang is going on another adventure!**

After 8 years as Program Head (Medical Microbiologist lead) of Mycobacteriology/TB and Molecular Services, Patrick is off on another microbiological adventure (working in our public health lab was his first) in Qata’r. Dr. Tang’s work and career will rise to greater heights, and expect this will involve microbial Whole Genome Sequencing.



**Dr. Jassem has arrived!**

Please join us in welcoming Agatha who is working with Dr. Mel Krajden in the Virology Program at the BCPHMRL. Agatha comes to us from the National Institute of Health, but hers is a name many of you will recognize from previous positions she’s held at the University of British Columbia, Vancouver General Hospital, and the BCPHMRL. We are glad she is here.



## **Strongyloides Infections: Rare but Potentially Life-Threatening**

Infections caused by the nematode *Strongyloides stercoralis* are widespread in many developing countries. In British Columbia, while rare (between 2-10 cases per year, mean 5 per year), strongyloidiasis may result in significant morbidity/mortality in some patient populations.

This potential for harm relates to the *Strongyloides* lifecycle in which autoinfection perpetuates intestinal infections (often with minimal symptoms), over many years unless treated. If an infected host's immune system is compromised, the nematode's life cycle accelerates causing a hyper-infection syndrome, with serious disease, an array of symptoms, and life-threatening other infections such as Gram-negative bacterial sepsis.

For these reasons, screening of select high risk patients for *Strongyloides* is recommended, but diagnosis is difficult. *Strongyloides stercoralis* infection can remain undetected for decades. The parasite exhibits intermittent shedding of the larvae, thus routine single stool examination by conventional ova and parasite examination (faecal concentration and microscopy) may fail to detect larvae. Immunodiagnostic assays have been developed, but cross-react with hookworm, filaria and schistosoma antigens. The agar plate culture and Baermann methods are more sensitive methods for detecting *Strongyloides* infection. In the agar plate culture method, a fresh stool sample is placed on the agar. If present, motile rhabditiform larvae will carry bacteria and leave characteristic tracks or furrows on the agar around the stool sample. In the Baermann method, a funnel is set up and a fresh stool sample is suspended in water. If present, larvae will move out of the faeces and into the water. Samples of the water are collected and examined microscopically for larvae. The agar method will only detect viable larvae, whereas the Baermann method will detect both viable and non-viable larva. Care must be taken when setting up the agar and Baermann methods, as viable larvae are infective. Although both methods can be cumbersome, labor-intensive and time consuming, both are more sensitive than conventional ova and parasite examination.

The following must be considered when testing for *Strongyloides*:

- Travel history with known exposure (walking barefoot, invasive larvae from human feces are in soil) in endemic areas (developing countries);
- Subclinical gastrointestinal infections may persist long after the initial infection ;
- Examination of fecal samples must be done by Parasitology Laboratory experts. Larvae may be few in number (entire concentrated sediments must be examined);
- Special tests are available including (on request) culture and the Baermann procedures; These increase the sensitivity of detection. Requests may be discussed with experts at the Parasitology Reference Laboratory (BC Public Health Microbiology & Reference Laboratory): Q. Wong (604-707-2612, [Quantine.Wong@bccdc.ca](mailto:Quantine.Wong@bccdc.ca)) and T. Lo (604-707-2629, [Teresa.Lo@bccdc.ca](mailto:Teresa.Lo@bccdc.ca)).
- Rarely, serology may be useful but due to the non-specific antigen and persisting antibodies, previous clinical history and parasitology examinations (above) by experts are the place to start in suspect cases. Questions on serology may be directed to Dr. M. Morshed (604-707-2622, [Mohammad.Morshed@bccdc.ca](mailto:Mohammad.Morshed@bccdc.ca)).

## BC Carbapenemase-Producing Organism (CPO) Surveillance

The BCPHMRL Public Health Advanced Bacteriology/Mycology Program continues to provide molecular and genotypic testing of suspect isolates forwarded by medical microbiology laboratories in the province as part of the provincial surveillance program for Carbapenemase Producing Organisms (CPO).

The latest counts for cases of carbapenem-resistant Enterobacteriaceae (CRE) in BC can be found in Figure 1 (updated from our September 2014 issue). To date, there have been 285 patients with carbapenem-resistant organisms: 187 harboured the New Delhi Metallo-β-lactamase-1-gene (NDM-1), 36 cases with OXA-48 carbapenemase and 19 cases with the *Klebsiella pneumoniae* carbapenem (KPC) β-lactamase gene; some patients had multiple resistance factors including seven patients with NDM-1 and OXA-48 carbapenemase, two cases with NDM-1 and KPC genes, and one other case with the KPC β-lactamase gene as well as a the Verona integron-encoded metallo-β-lactamase (VIM) gene. Thirty-three cases with the *Serratia marcescens* enzyme (SME) resistance gene have also been identified.

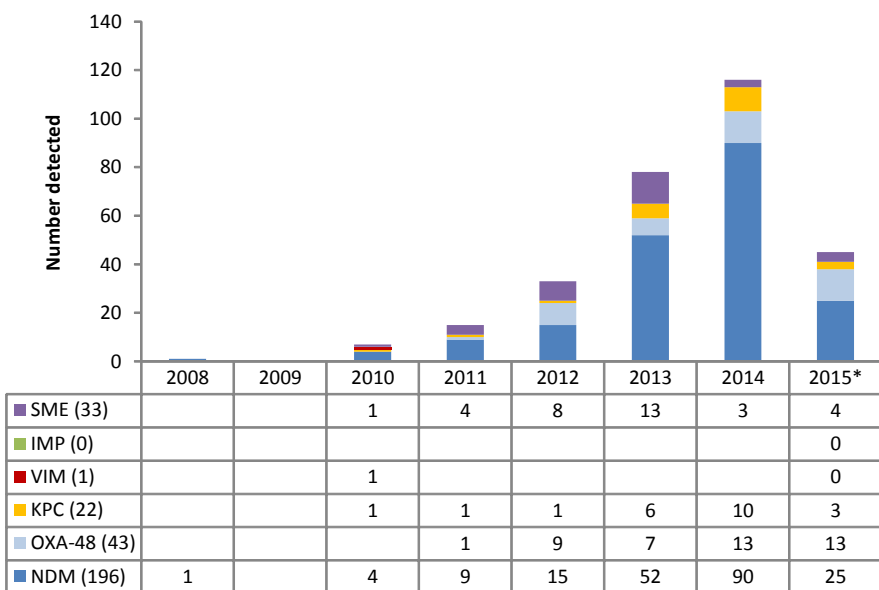


Figure 1  
Carbapenem-resistant Enterobacteriaceae detected since 2010, Public Health Advanced Bacteriology & Mycology Program, BCPHMRL. Counts include one patient with KPC and VIM in 2010, seven patients with NDM-1 and OXA-48 in 2012-2014 and two patients with NDM-1 and KPC in 2013 and 2014 (N=295).

\* Data from 2015 are until the end of June, 2015

Nationally, the National Microbiology Laboratory has summarized data through members of the Canadian Public Health Laboratory Network (CPHLN). Overall, there are increasing trends of CRE each year with KPC and NDM genes the most commonly seen in Canada (Figure 2). This is contrary to what we are seeing in BC where NDM and OXA-48-resistant organisms dominate. National data also show that CRE continue to be predominantly detected in the western and central regions of Canada with very few cases reported in Eastern Canada (Figure 3).

## BC Carbapenemase-Producing Organism (CPO) Surveillance

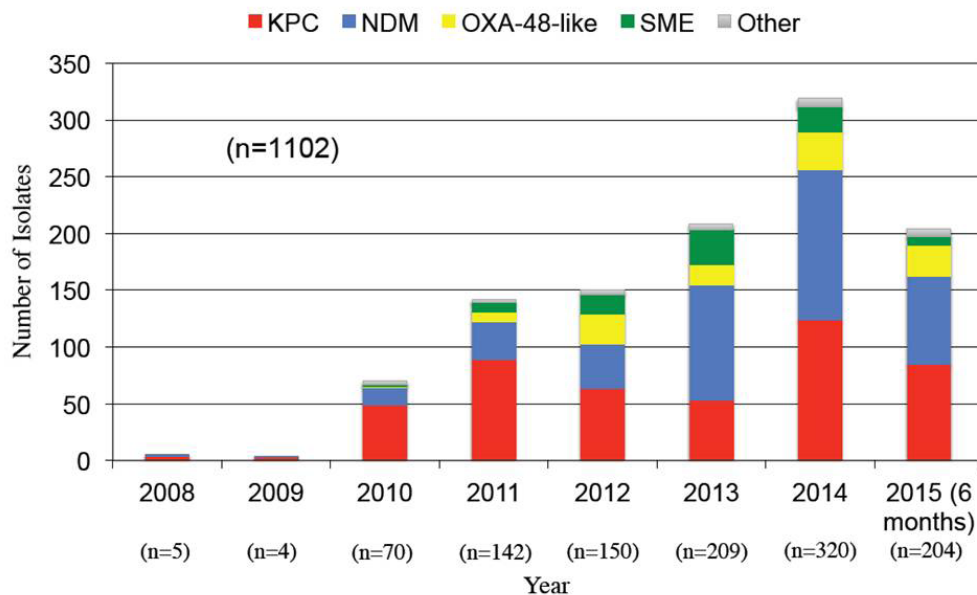


Figure 2  
Carbapenem-resistant Enterobacteriaceae detected by year. Data from the National Microbiology Laboratory and CPHLN.

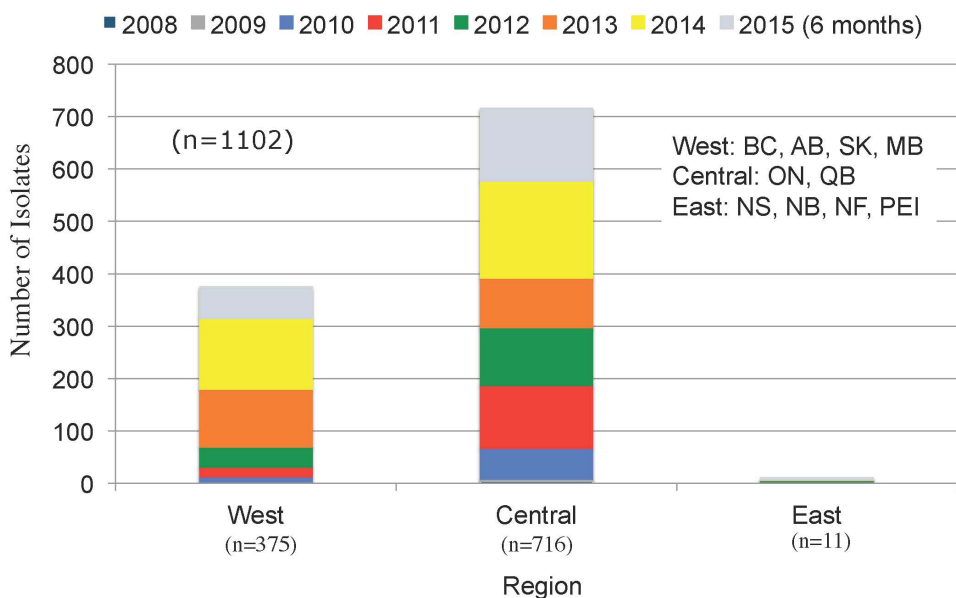
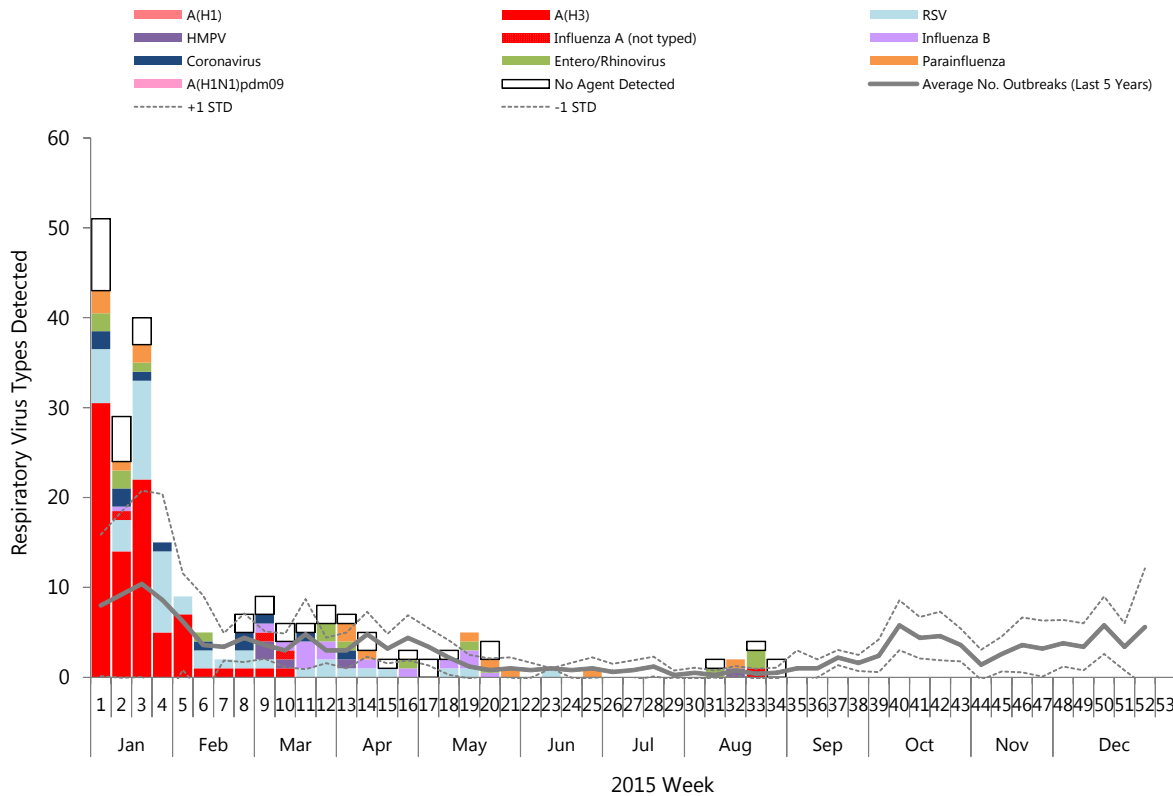


Figure 3  
Carbapenem-resistant Enterobacteriaceae detected in each region of Canada. Data from the National Microbiology Laboratory and CPHLN.

## Influenza-Like Illness Outbreaks

There were no influenza-like illness outbreaks investigated by the Virology Program in July. In August, activity picked up and 10 influenza-like illness outbreaks were investigated (Figure 4). All outbreaks occurred at longterm care facilities with the following detected: three (30%) outbreaks of entero/rhinovirus, one (10%) outbreak of parainfluenza virus, one outbreak of human metapneumovirus and one (10%) outbreak of influenza A(H3).

Figure 4  
Influenza-like illness outbreaks investigated\* in 2015, Virology Program, BCPHMRL.

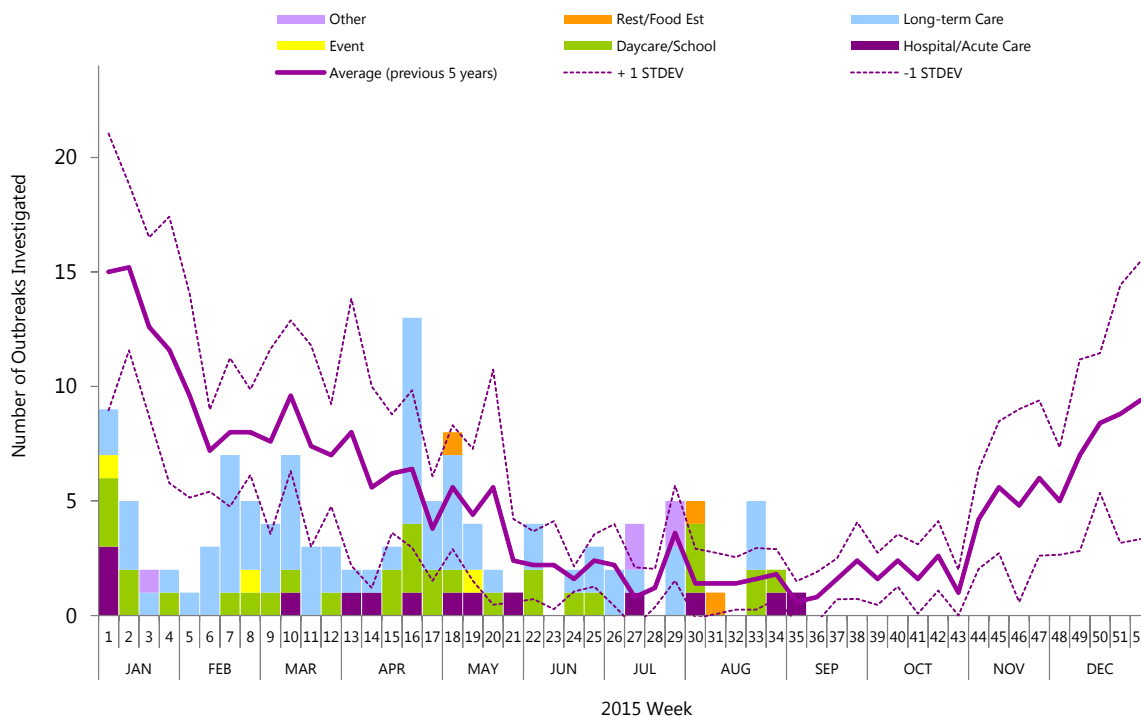


\* The data available are from outbreaks in which the BCPHMRL has been notified. Some acute care microbiology laboratories are also testing for influenza in the province.

## Gastrointestinal Outbreaks

In July and August, there were 23 gastrointestinal outbreaks investigated by the BCPHMRL (Figure 5). The number of outbreak investigations were at the high end compared to historical averages (Figure 5). Outbreaks were investigated from seven (30%) LTC facilities, six (26%) daycares/schools, four (17%) hospitals, four (17%) other facility types and two (9%) restaurants. Samples were received from 16 (70%) of these outbreaks with norovirus detected in 10 (62%).

Figure 5  
Gastrointestinal outbreaks investigated\* in 2015, Environmental Microbiology, Public Health Advanced Bacteriology & Mycology, Parasitology and Virology Programs, BCPHMRL.



\* The data available are from outbreaks in which the BCPHMRL 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. Given the nature of GI outbreaks, samples are not always available for testing.

## A Report of the BC Public Health Microbiology & Reference Laboratory, Vancouver, BC

The BC Public Health Microbiology Reference Laboratory (BCPHMRL) at the BCCDC site provides consultative, interpretative testing and analyses for clinical and environmental infectious diseases in partnership with other microbiology labs and public health workers across the province and nationally. The PHMRL is the provincial communicable disease detection, fingerprinting and molecular epidemiology centre providing advanced and specialized services along with international defined laboratory core functions province-wide.

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.

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