



# LABORATORY TRENDS



September 19, 2014

## In this Issue:

ERAP.....	1
Enterovirus .....	3
CPO Surveillance .....	4
Gastrointestinal Outbreaks .....	5
ILI Outbreaks .....	6
Pertussis Surveillance .....	7

## Emergency Response Action Plan (ERAP) Process for BC: Shipment of Risk Group 4 Samples

The British Columbia Public Health Microbiology Laboratory (BCPHMRL) has a BC Emergency Response Assistance Plan (ERAP) Team trained by and in close ongoing communications with the National ERAP Coordinators (located at the Public Health Agency of Canada (PHAC) National Microbiology Laboratory (NML)). NML has Canada’s only Containment Level 4 Lab (CL4) and as such is the only facility permitted to culture Risk Group 4 (RG4) agents such as Ebola virus. Work is underway to decentralize the Ebola Virus Disease (EVD) PCR assay to participating public health laboratories across Canada.

The BC ERAP Team consists of the Provincial/Territorial Response Coordinators (PTRC) (these are the BCPHMRL Medical Microbiologists On Call) and the Spill Response Team Lead (BCPHMRL Biosafety Officer). The Team is networked into the current national communications on EVD.

Current ERAP requirements and contacts for assistance are summarized below. Updates on processes and protocol changes will be communicated as required. This will be particularly important as our BC testing capacity changes and BCPHMRL validates the standardized PCR assay for EVD.

As per Transport Canada, shipment of cultures and samples suspected of containing **RG4 Viral Hemorrhagic Fever (VHF) agents** such as EVD requires activation of ERAP prior to any shipment. In practice, any sample for transport for EVD testing must activate ERAP for RG4. This must be done in coordination with the BC PTRC.

NML (Winnipeg) is the National ERAP coordinator and each province has their own response team. They have the equipment and training to decontaminate a site following an accidental RG4 sample spill from transportation incidents and are also ready to assist in TDG transport as needed of suspect RG4 cases both within BC and also from BC to Manitoba (NML). Once the BC PTRC (604-661-7033) is notified of a suspect RG4 case and samples are available for shipping, ERAP will be activated by calling the NML Operations Centre Director (1 866-262-8433) at least 24 hours prior to the actual shipment of the sample. If the sample is diagnostic and needs to be processed without delay, 24 hours prior notification may be waived. However, ERAP activation is still required.

Individuals shipping suspect RG4 samples must be Transport of Dangerous Goods (TDG) certified and must package samples correctly in Type 1A containers. The BCPHMRL ERAP Team can assist with correct packaging and documentation required (TDG Shipper’s Declaration). The BCPHMRL ERAP Team can also assist shippers on necessary vehicle placarding as well as details on courier companies who are able to ship RG4 samples (Purolator/World Courier). This process is summarized in Figure 1.



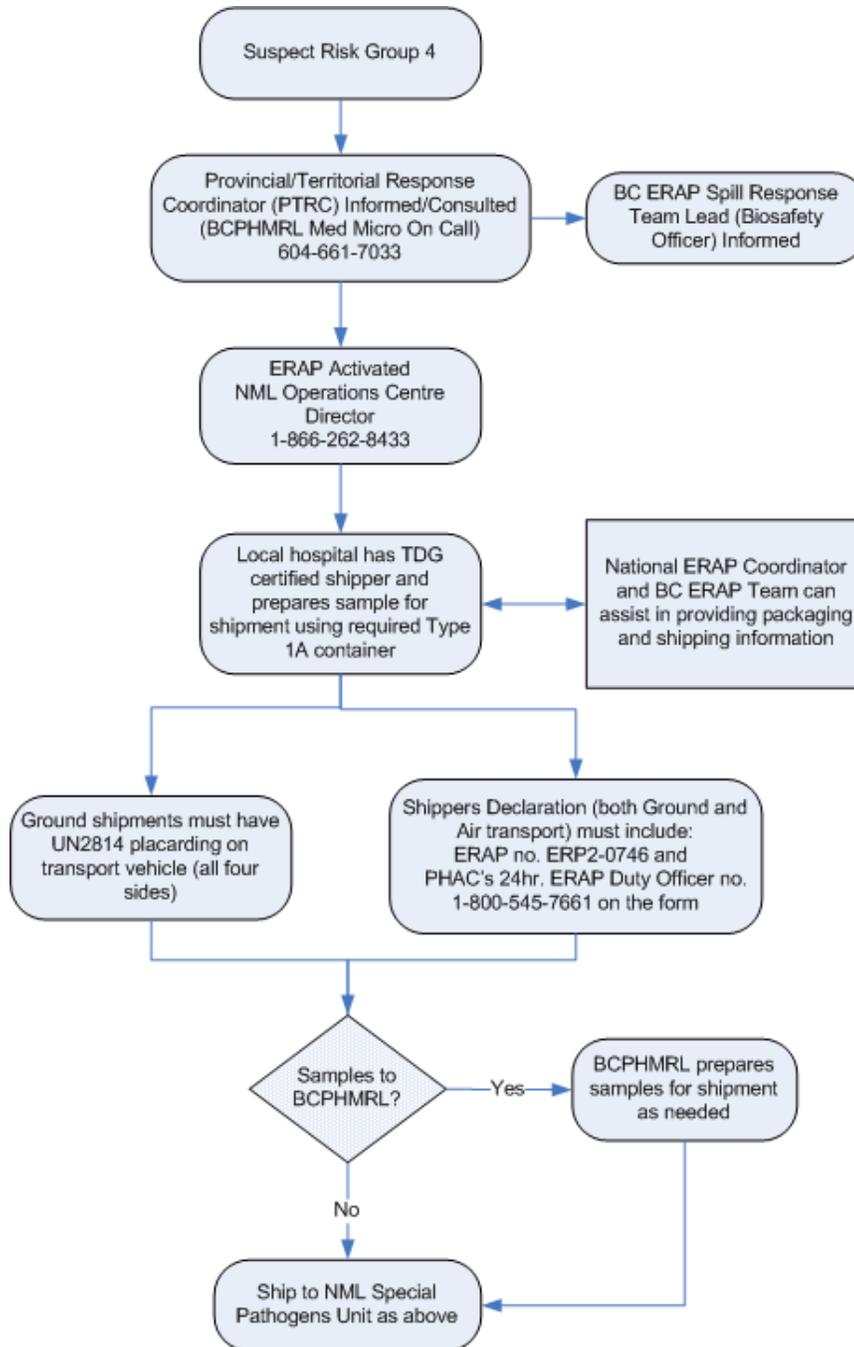


Figure 1 Activation of Emergency Response Assistance Plan (ERAP) and shipment of Risk Group 4 Samples, BCPHMRL.



## Respiratory Illness Associated with Enterovirus D68

In BC, enteroviruses are typically detected during summer and fall months, but can be the cause of infections any time of the year. Some hospitals are able to test for enteroviruses; however, for confirmation and to identify enterovirus species, specimens may be sent to the BC Public Health Microbiology & Reference Laboratory (BCPHMRL). The BCPHMRL is able to perform partial sequencing of the Viral Protein 1 (VP1) for enterovirus identification. In a small study only a limited number of species was found to be circulating at that time in the province including Coxsackie A9, Echovirus 4, Echovirus 9, Echovirus 14, Echovirus 30 and Echovirus 39.

In August, increases of severe respiratory illness with patients in pediatric intensive care units were first reported in Kansas and Illinois. The US Centers for Disease Control and Prevention (CDC) identified enterovirus D68 (EV-D68) in the majority of specimens submitted from these two states ([MMWR September 8, 2014 63\(36\); 798-799](#)). Since then, the infection has become widespread with reports of EV-D68 confirmed in 160 individuals from 22 states ([CDC, September 19, 2014](#)). EV-D68 is a rare type of enterovirus and has previously not been reported very often in the US since its first isolation in 1962.

From September 1-10, 18 cases of EV-D68 have been reported from [Alberta Health Services](#). EV-D68 has also been identified in Ontario. BC has had 7 confirmed cases as of September 19.

Enteroviruses typically infect infants, children, and teenagers and are associated with various clinical symptoms, including mild respiratory illness to neurologic illness, such as aseptic meningitis and encephalitis. EV-D68 can cause mild to severe respiratory illness and in the latest outbreak, have been associated with cases with a history of asthma or wheezing.

Health care providers should consider EV-D68 as a possible cause of acute, unexplained severe respiratory illness, particularly in children. Molecular typing can be performed on nasopharyngeal and lower respiratory specimens.



## BC Carbapenemase-Producing Organism (CPO) Surveillance Program

Surveillance of carbapenemase-producing organisms (CPO) continues in BC through the Provincial CPO Surveillance Program using enhanced admission screening processes and capture of laboratory as well as epidemiological data.

The latest counts for cases of carbapenem-resistant Enterobacteriaceae (CRE) in BC can be found in Table 1 (updated from our April 2014 issue). To date, there have been 190 patients with carbapenem-resistant organisms: 118 harboured the New Delhi Metallo-β-lactamase-1-gene (NDM-1), 20 cases with OXA-48 carbapenemase and 14 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 the Verona integron-encoded metallo-β-lactamase (VIM) gene. There have been 28 cases with *Serratia marcescens* enzyme (SME) resistance genes (Table 1).

Table 1  
Carbapenem-resistant Enterobacteriaceae detected since 2010 until the end of March, 2014, 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=200).

Type	Collection Year						
	2008	2009	2010	2011	2012	2013	2014
NDM-1	1		3	8	13 <sup>^</sup>	48 <sup>^#</sup>	54 <sup>^#</sup>
KPC			1 <sup>*</sup>	1	1	6 <sup>#</sup>	8 <sup>#</sup>
VIM			1 <sup>*</sup>				
IMP							
OXA-48				1	9 <sup>^</sup>	7	10 <sup>^</sup>
SME			1	4	8	13	2
<b>Total</b>	<b>1</b>	<b>1</b>	<b>6</b>	<b>14</b>	<b>31</b>	<b>74</b>	<b>74</b>

Figure 2 demonstrates that at least 6 and up to 13 new cases have been identified each month in 2014 so far. The most commonly detected resistance gene continues to be NDM-1.

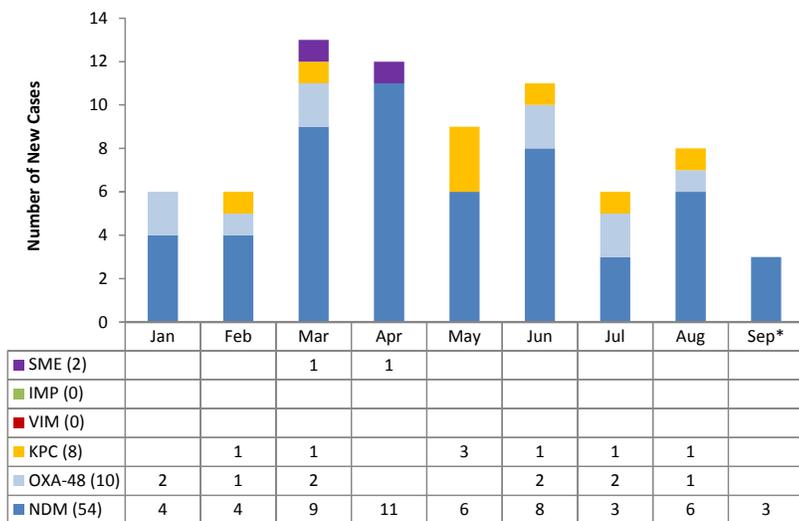


Figure 2  
Carbapenemase-producing organisms detected in 2014\*, Public Health Advanced Bacteriology & Mycology, BCPHMRL.

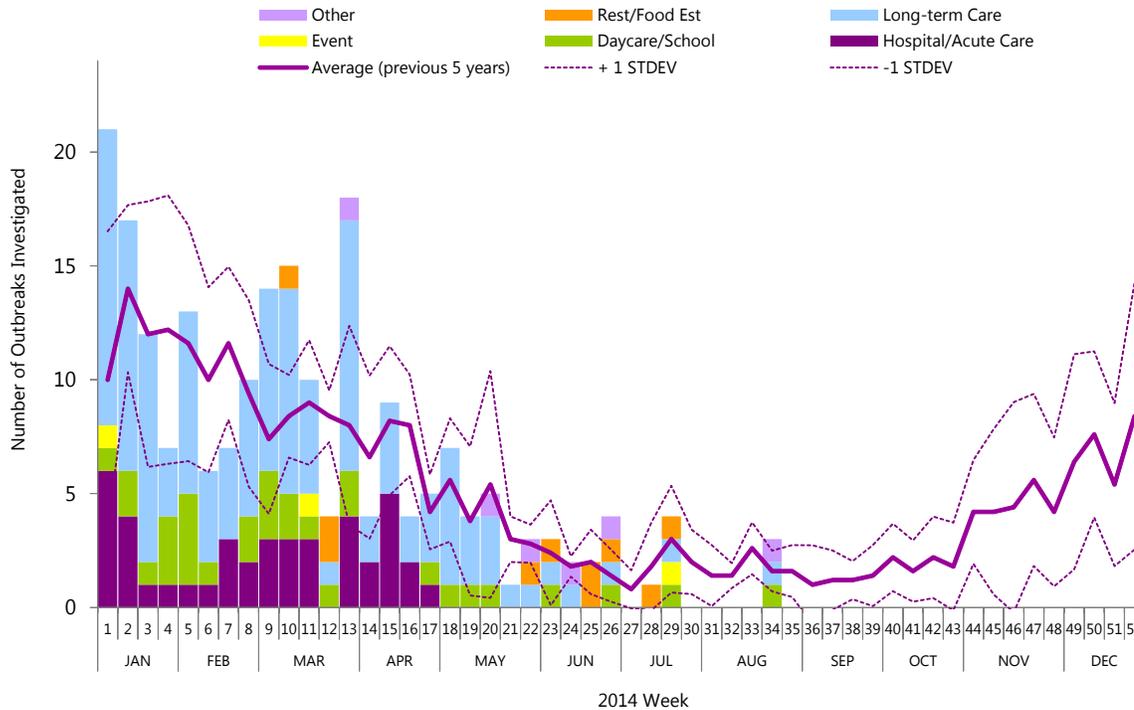
\*Collection dates to September 9, 2014



## Gastrointestinal Outbreaks

In August, the BCPHMRL investigated 3 gastrointestinal (GI) outbreaks, consistent with what is expected at this time of the year (Figure 3). Outbreaks were identified each from a longterm care facility, daycare and a camp. Samples have not yet been submitted for these outbreaks.

Figure 3  
Gastrointestinal outbreaks investigated\* in 2014, Environmental Microbiology, Public Health Advanced Bacteriology & Mycology, Parasitology and Virology Programs, BCPHMRL.



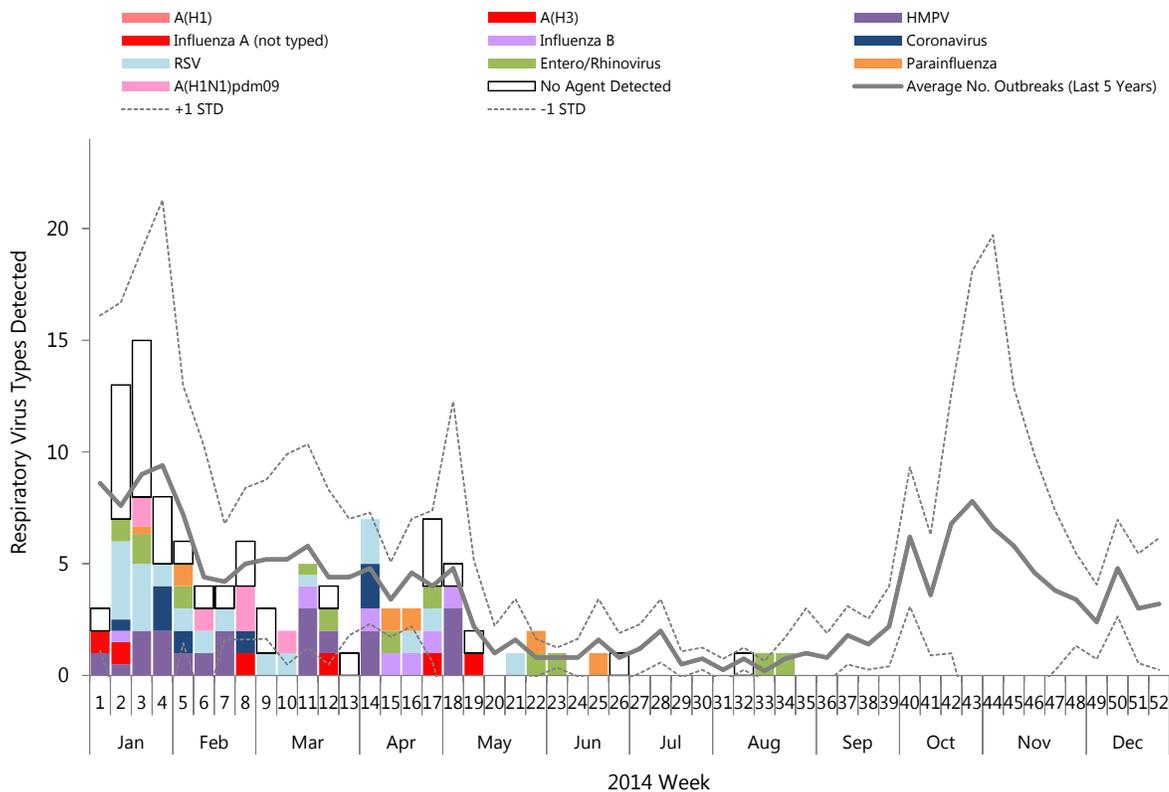
\* The data available are from outbreaks in which the BCPHMRL has been notified. Some acute care microbiology laboratories are also testing for norovirus in the province and these data may not include outbreaks from all Health Authorities. Given the nature of GI outbreaks, samples are not always available for testing.



## Influenza-Like Illness Outbreaks

There were 3 influenza-like illness outbreaks investigated for the month of August which is consistent with the historical trend at this time of the year (Figure 4). Samples were submitted from 3 longterm care facilities with entero/rhinovirus detected from samples from two of these outbreaks.

Figure 4  
Influenza-like illness outbreaks investigated\* in 2014, Virology Program, BCPHMRL.



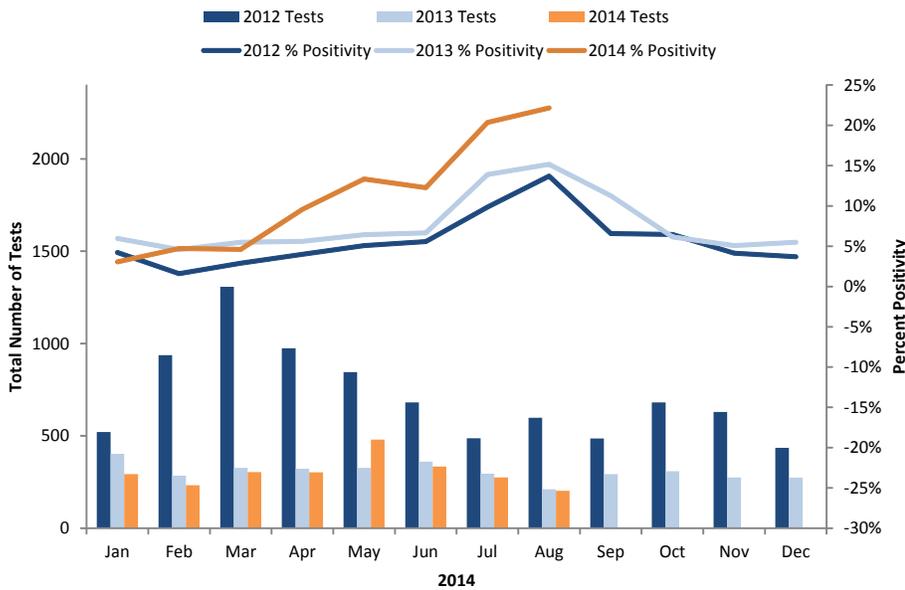
\* The data available are from outbreaks in which the BCPHMRL has been notified. Some acute care microbiology laboratories are also testing for norovirus in the province and these data may not include outbreaks from all Health Authorities. Given the nature of GI outbreaks, samples are not always available for testing.



## Pertussis Surveillance

Pertussis activity continues across the province. Though test volumes in 2014 have been consistent with patterns seen in 2013 and are lower than what was seen in 2012, the positivity rates have been substantially higher in 2014 (Figure 5). A large outbreak in the northwest of the province likely contributed to peaks in April-May and the increased activity in the summer months, reaching peak percent positivity in August, has been the pattern in each of 2012-2014.

Figure 5  
*Bordetella pertussis* Nucleic Acid Testing, 2012-2014, Public Health Advanced Bacteriology/Mycology Program, BCPHMRL.





## 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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