



LABORATORY TRENDS



February 16, 2012

Laboratory News

Canadian Tuberculosis Laboratory Technical Network

The Canadian Tuberculosis Laboratory Technical Network (CTLTN) is a national network made up of a technical head of each Provincial or Territorial laboratory that performs Mycobacteriology testing, a representative from the National Reference Centre for Mycobacteriology, Public Health Agency of Canada (PHAC), a designee from the Tuberculosis Prevention and Control, PHAC, and a designee of the National Microbiology Laboratory.

The network recently convened in Vancouver during their annual meeting to review the previous year's targets and to define goals for this year. Dr. Mabel Rodrigues, TB/Mycobacteriology Section Head, Public Health Microbiology & Reference Laboratory (PHMRL) attended as the BC and Yukon Territory representative.

For BC and the Yukon Territory, the mandate to continue to improve molecular methods for detection was accomplished by implementing real-time PCR of *M. tuberculosis* complex in 2011. TB PCR is now a daily test at the PHMRL, improving timeliness of results reporting. Implementation of the Mycobacterial Interspersed Repetitive Units - Variable Number of Tandem Repeats (MIRU-VNTR) fingerprinting method of *M. tuberculosis* isolates has also begun. A BioNumerics database has been built for housing all the fingerprinting data.

Through its pool of expertise from each province/territory, the CTLTN continues to strive towards goals of:

- Standardization of methodologies (conventional and state-of-the-art);
- Better biosafety operational practices and physical requirements;



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- Implementation of biosafety guidelines;
- Participation in the national surveillance and proficiency programs; and,
- Exchange of services and information regarding new technologies.

The main discussion this year was the *M. tuberculosis* complex (MTBC) *Biosafety Guidelines*. A draft document was disseminated in November, 2011 with the opportunity for CTLTN members' review and input. The other discussion was surrounding the changes to the recently published CLSI M24-A2, *Susceptibility Testing of Mycobacteria*. Members enjoyed another successful meeting with sights towards next year.



Toxoplasma PCR: A Supplemental Test for Diagnosing Active Infection from Unusual Clinical Samples

Toxoplasma gondii is an obligate intracellular protozoan that infects most species of warm-blooded animals, including humans. Humans can be infected in many different ways such as by ingestion of raw or undercooked meat containing *T. gondii* cysts, by contaminated water, or congenitally by placental transmission from the mother with acute or disseminated infection. Transmission may also occur through organ transplant or blood transfusion.

A serological test is the most common clinical practice although histopathology and culture have been considered as part of the gold standard for the diagnosis of active disease. For *T. gondii* specific serology, the PHMRL offers both IgM and IgG tests, followed by IgG avidity testing when appropriate.

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T. gondii may be detected prenatally by PCR testing of amniotic fluid. This test is offered in select cases and done by very few clinical laboratories in North America. The PHMRL has developed a PCR test for toxoplasmosis targeting the B1 gene and is currently running parallel testing with the reference laboratory. Validation of this test, however, is challenging since positive cases are rarely seen by PCR. Once this validation is completed, clients may submit a wider range of suspected samples for toxoplasmosis diagnosis. The PHMRL is always on hand to assist clinicians with suspected cases of toxoplasmosis.

Carbapenemase Resistant Enterobacteriaceae (CRE)

The latest counts for cases of carbapenemase resistance in BC can be found in Table 1 (updated from our December 2011 issue). Fourteen cases with the New Delhi Metallo-β-lactamase gene (NDM) endemic to South Asia have been detected since this work began in 2010. Two cases had the *Klebsiella pneumoniae* carbapenem (KPC) β-lactamase gene (one case with KPC as well as a Verona integron-encoded metallo-β-lactamase (VIM) gene) and three cases with only the VIM gene. One case with the IMP-type β-lactamase has also been detected.

Table 1. Carbapenem Resistant Enterobacteriaceae Detected, Bacteriology & Mycology Program, PHMRL.

Type	No. of Cases	Comments
NDM	14	
KPC	2	1 case also harboured the VIM gene
VIM	3	In addition to above KPC/VIM case
IMP	1	

Across Canada, Ontario and British Columbia have the highest number of NDM positive samples since surveillance began in 2010. Quebec leads in the number of KPC positive samples followed by Ontario (Figure 1).

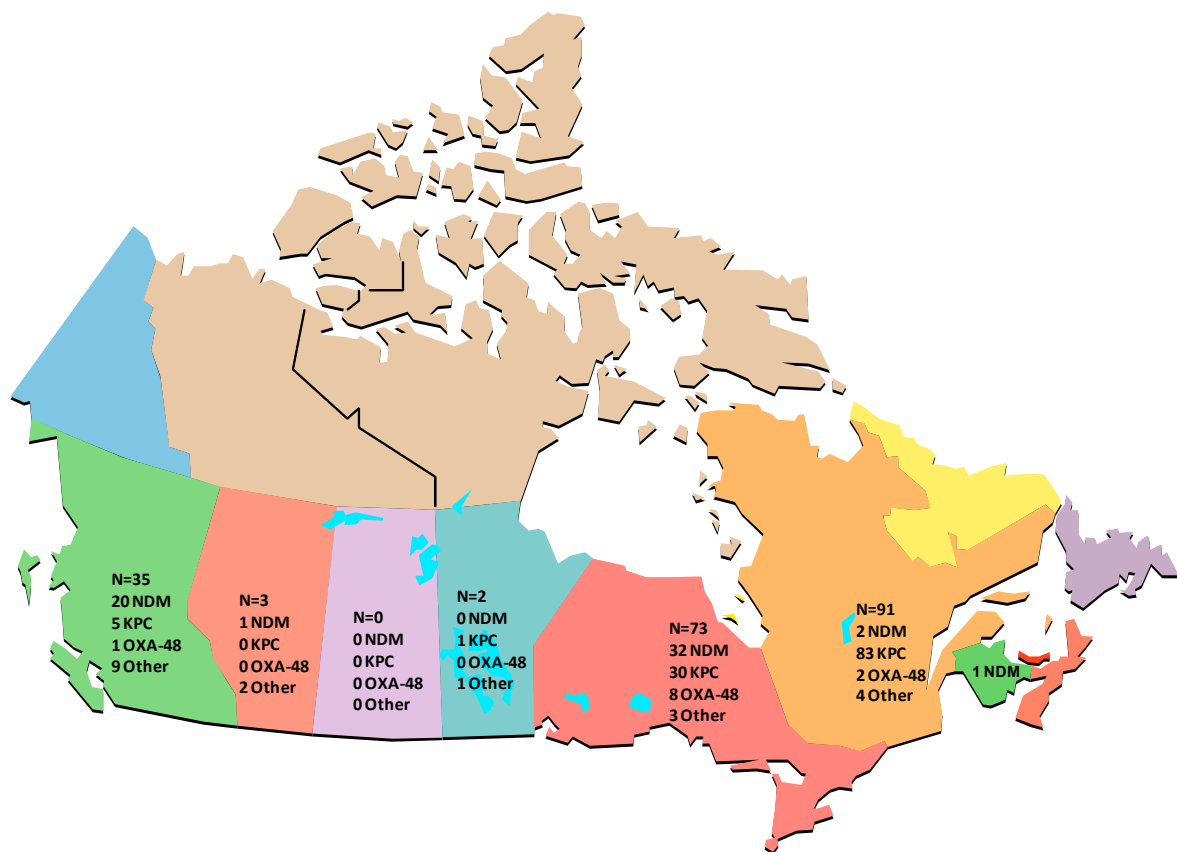


Figure 1 Enterobacteriaceae Producing Carbapenemases in Canada (n=205). Data is as of January, 2012 and represents the number of positive samples. Figure provided by Dr. M. Mulvey, National Microbiology Laboratory, Public Health Agency of Canada, February 14, 2012.

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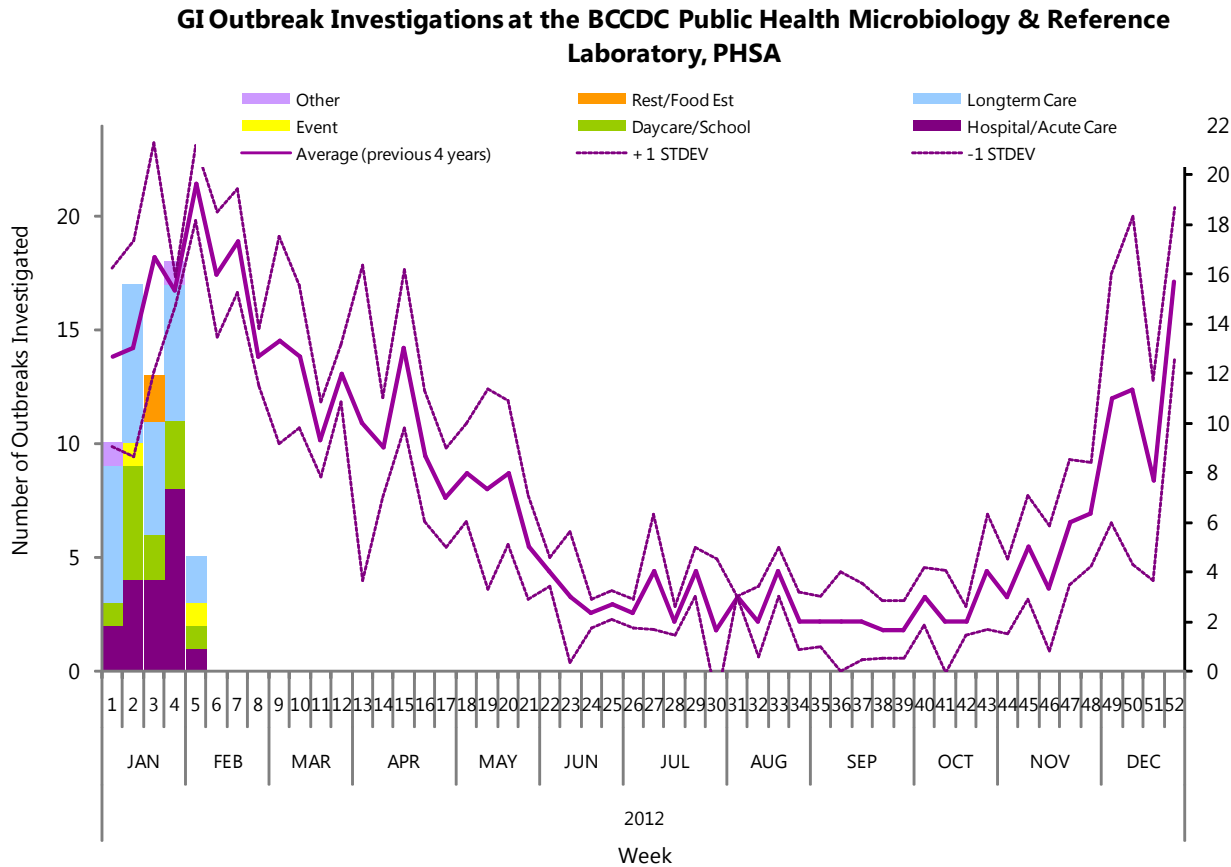


Gastrointestinal Outbreaks

In January, there were 63 gastrointestinal (GI) outbreaks investigated at the PHMRL. The number is consistent with the volumes typically seen at this time in past years (Figure 2). Outbreaks were identified from 26 longterm care facilities, 12 daycare/schools, 19 hospitals, 2 events, 2 restaurants and 2 other locations. Samples for laboratory testing were submitted for 54 (86%) of these outbreaks. Of these, norovirus was confirmed in 41 (76%) outbreaks.

The data available are from outbreaks in which the PHMRL has been notified. Some acute care microbiology laboratories are also testing for norovirus in the province and these data do not include outbreaks from Vancouver Island Health Authority. Given the nature of GI outbreaks, samples are not always available for testing.

Figure 2
Gastrointestinal outbreaks investigated since January, 2011, Environmental Microbiology, Bacteriology & Mycology, Parasitology and Virology Programs, PHMRL.



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Enteric Surveillance

Salmonella Infantis was the fifth most commonly isolated serotype of *Salmonella enterica* in 2011 at the PHMRL behind, *S. Enteritidis*, *S. Typhimurium*, *S. Heidelberg*, and *S. Typhi* (Figure 3). A cluster of *S. Infantis* has been investigated from mid-November, 2011 with higher than expected counts from that of previous years (Figure 4). Cases in the cluster had a common restaurant association.

Figure 3
Top *Salmonella* Enterica serovars identified from clinical samples, Bacteriology & Mycology Program, PHMRL.

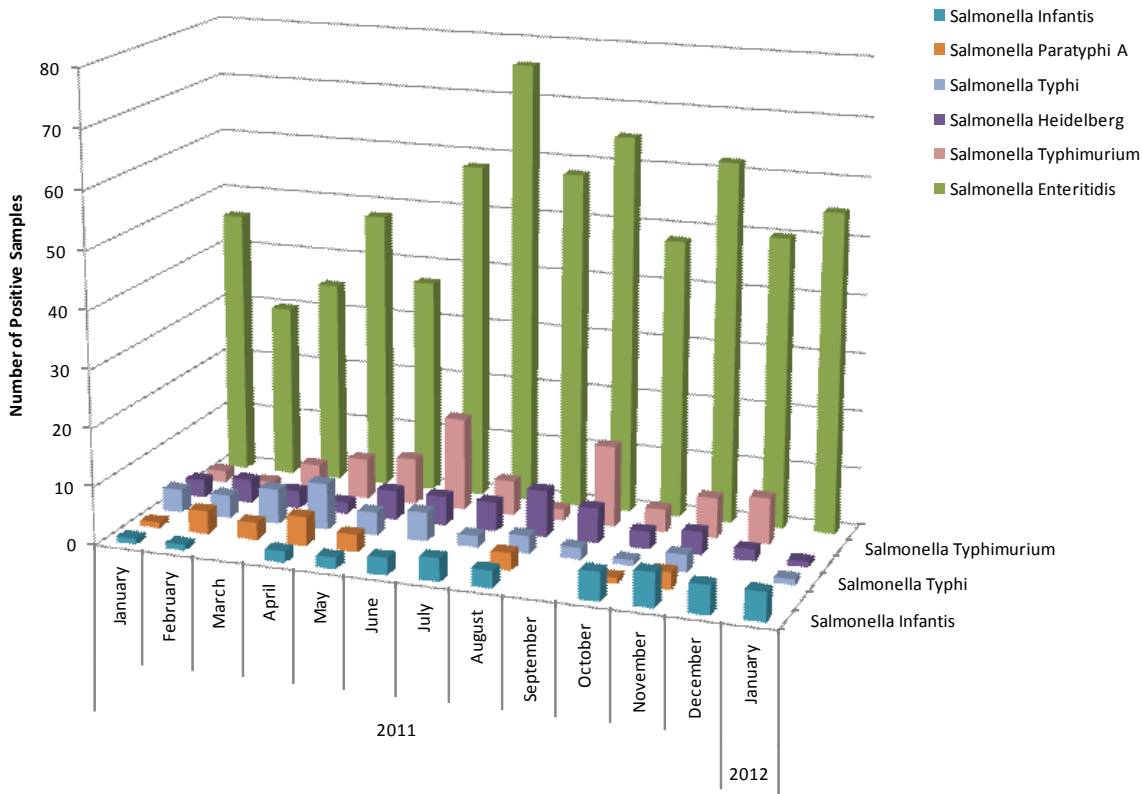
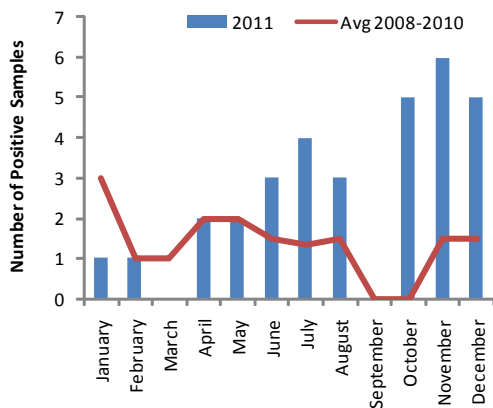


Figure 4
Salmonella Infantis isolated in 2011 compared to previous years, Bacteriology & Mycology Program, PHMRL.



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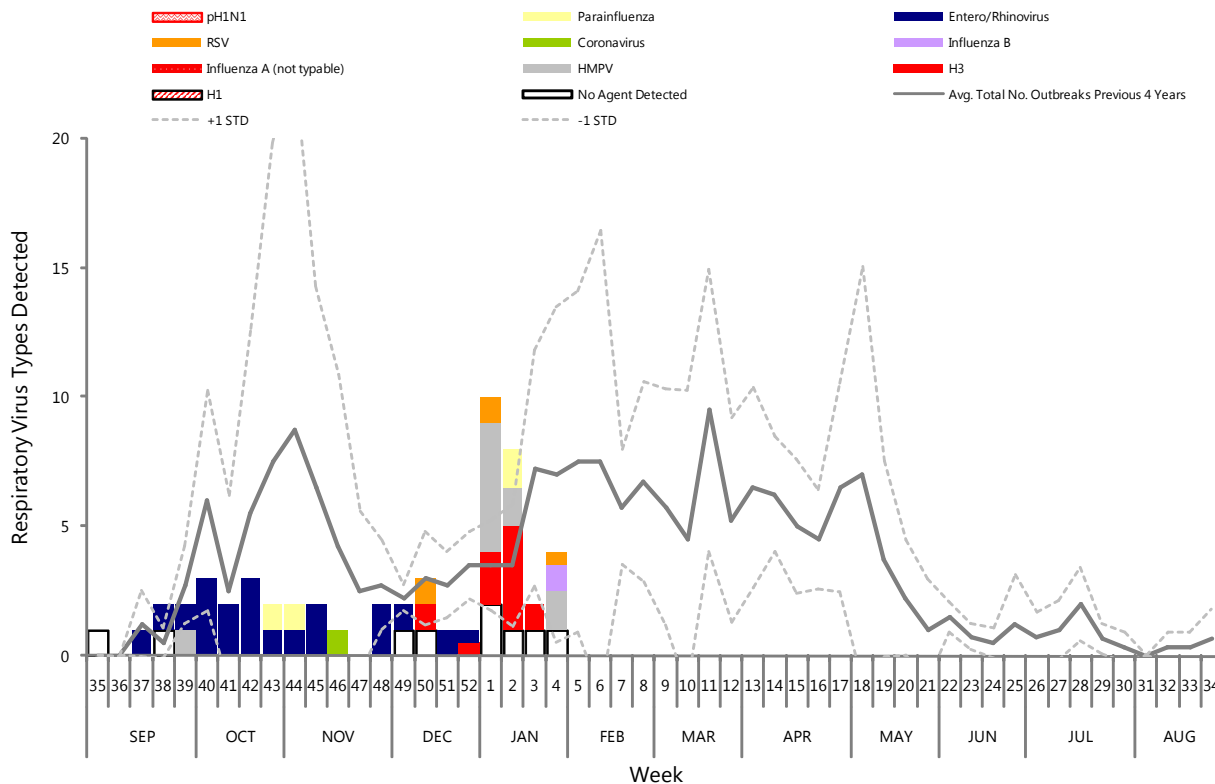


Respiratory Outbreaks

In January, samples were submitted to the PHMRL for 24 respiratory outbreak investigations from 21 longterm care facilities, 2 hospitals and 1 from the community (Figure 5). The number of outbreaks investigated was higher in the first two weeks of the month than this time in previous years; however, the last two weeks of the month saw fewer outbreaks than the average in previous years. Using PCR and Luminex methods, human metapneumovirus was detected in 8 facilities including one hospital; influenza A(H3) was detected in 5 facilities, 1 hospital and in 1 community; RSV and parainfluenza were detected in 2 facilities each; influenza B was detected in 1 facility and coronavirus in another. Figure 4 reflects respiratory sample results submitted for investigation to the PHMRL and is not representative of respiratory outbreaks in the entire BC community.

Figure 5
Respiratory outbreaks investigated by respiratory season, Virology Program, PHMRL.

Respiratory Outbreaks Investigations at the BCCDC Public Health Microbiology & Reference Laboratory, 2010-2011 Season





Influenza Surveillance

With the exception of week 1, volumes for respiratory testing have been consistent or below that of the same weeks from the 2010/11 season. In weeks 1-5, influenza positivity rates have varied from 14-22% (Table 2) and are below the rates seen in the previous season (Figure 6). Influenza A (H3N2) was the major virus type detected this period with 119 (15.26%) positive specimens; there were also 7 (0.90%) detections of (H1N1)pdm09 (Table 2). Influenza B continues to be detected in very low levels but consistent with the previous season's pattern (Figure 6).

National influenza trends are seeing low levels of activity with most of the provinces having less than 5% positivity. The Prairies have seen slightly increased influenza A positivity rates of 8-9% in the last weeks of January while the Atlantic Provinces saw influenza B rates climb to nearly 9% in the second week of January and then decreasing again.

The World Health Organization (WHO) reports that with the exception of Mexico where influenza A(H1N1)pdm09 is the predominant subtype and China where influenza type B is predominant, the most common subtype circulating in the temperate, northern hemisphere continues to be influenza A(H3N2) with overall low activity (WHO, 20 Jan 2012 Update).

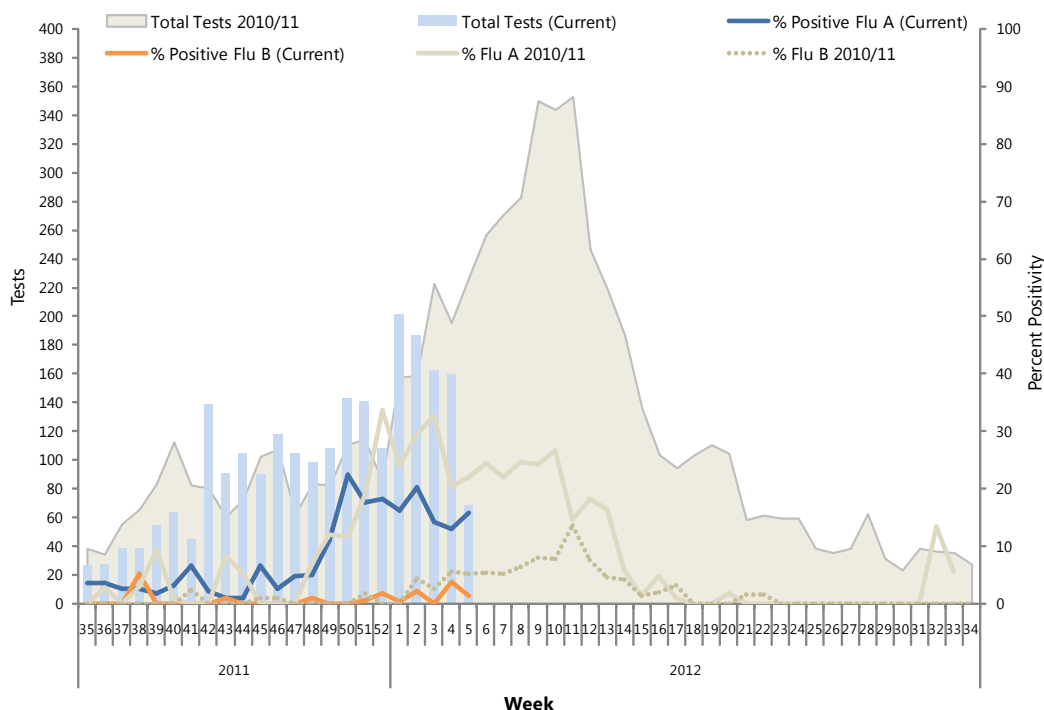
Table 2

Positive influenza A and B detections for weeks 1-4 (January 1- January 31, 2012, Virology Program, PHMRL. (H1N1)pdm09 refers to the 2009 influenza A(H1N1) pandemic virus.

	Week 1	Week 2	Week 3	Week 4	Week 5*
Number of Specimens Tested	202	187	162	160	69
Number of Positive Specimens	34 (16.83%)	42 (22.46%)	23 (14.20%)	27 (16.87%)	12 (17.39%)
Influenza A	33 (16.34%)	38 (20.32%)	23 (14.20%)	21 (13.12%)	11 (15.94%)
<i>(H1N1)pdm09</i>			2 (1.23%)		5 (7.25%)
<i>sH3N2</i>	33 (16.34%)	38 (20.32%)	21 (12.96%)	21 (13.12%)	6 (8.70%)
<i>Not typeable</i>					
Influenza B	1 (0.49%)		1 (0.68%)	6 (3.75%)	1 (1.45%)

* Week 5 is a partial week from January 29-31.

Figure 6 Respiratory testing volumes and influenza percent positivity, Virology Program, PHMRL.





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

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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