



LABORATORY TRENDS



February 19, 2013

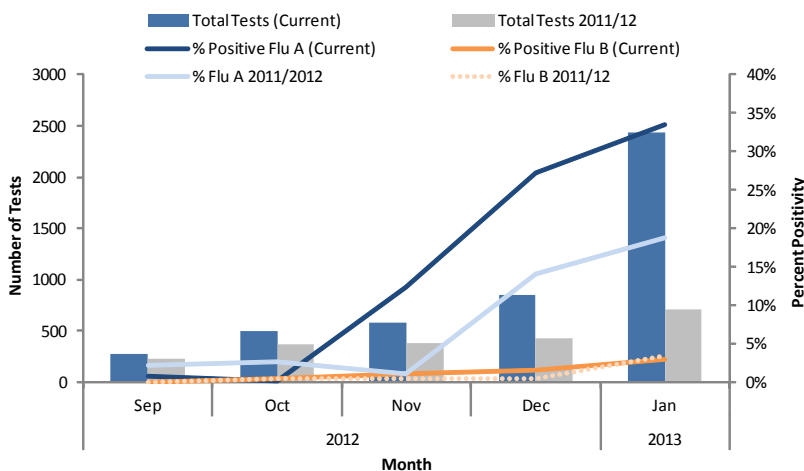
Influenza Surveillance Update

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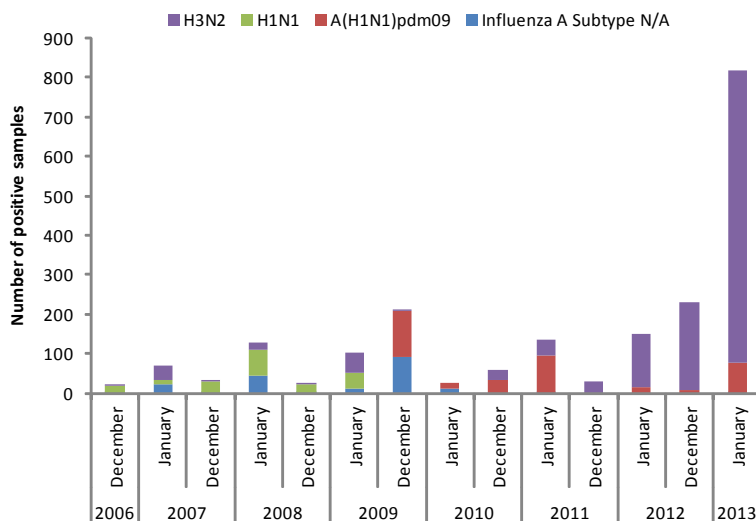
January has been an extremely busy month in the Virology Program of the BC Public Health Microbiology & Reference Laboratory (PHMRL) due to dramatic increases in respiratory test volumes as well as the number of positive influenza cases. At this

Figure 1
Respiratory testing volumes and influenza percent positivity, Virology Program, PHMRL.



time last season, there were 711 tests performed compared to 2440 tests this season, an increase in 243%; the positivity rate of influenza A in January was 18.8% in the 2011/12 season compared to 33.5% this season (Figure 1). Rates of influenza B this season have been comparable to those seen in 2011/12 thus far (Figure 1). The dominant subtype this season has been influenza A(H3N2). This is the highest incidence of influenza A(H3N2) seen at this time of the year than what has been observed over the previous 6 respiratory seasons (Figure 2). Since September, 2012, 92.3% of all influenza A detections have been A(H3N2) and 7.2% have been pH1N1. The number of A(H1N1)pdm09 detections were 2.6% of the influenza A subtypes in December and increased to 9.2% of the influenza A subtypes in January (Figure 2).

Figure 2
Positive influenza A detected by the Virology Program, PHMRL in December and January, 2006-2013.



Provincially, influenza A(H3N2) infection rates were highest among those samples submitted from the Northern Health Authority in December; these rates have since decreased at the end of January; A(H3N2) positivity rates of the other Health Authorities did not start increasing until later in December, peaking at about the second week before stabilizing (VCHA, FHA) or decreasing (IHA) (Figure 3).

It is evident in the infection rates by age cohorts that the elderly have been greatly affected this season by influenza A(H3N2). Figure 4 demonstrates the increase in positivity from

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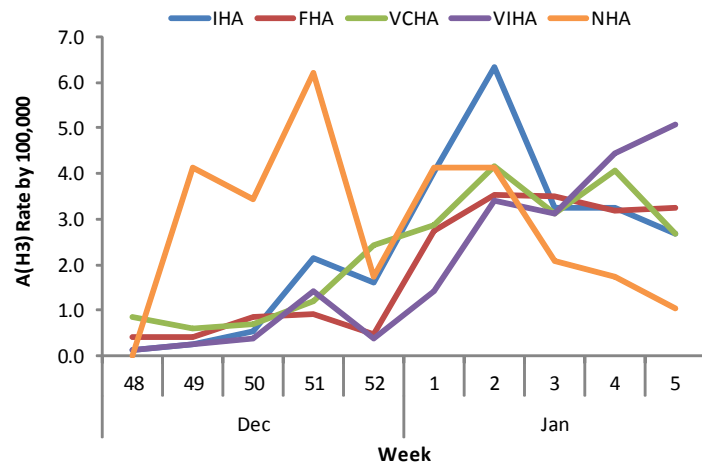
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Influenza Surveillance Update

Figure 3
Rates of influenza A(H3N2) by week based on ordering physician Health Authority. Population estimates from BC Stats, 2011. *Note: This data covers testing performed at the PHMRL only and may not be representative of provincial estimates as other laboratories also perform influenza testing.*



early January, comprised of individuals 60 years and older; the positivity rate in this cohort has decreased over the weeks but still remains high.

Nationally, influenza activity decreased in all provinces during the weeks of January with the exception of the Atlantic Provinces and BC (Figure 5). Detections of RSV have also increased in the last 2 weeks of December in the Prairies (23.7-22.4%), Quebec (21.7-26.8%), Ontario (8.3-11.9%), as well as in BC (6.7-11.1%) (FluWatch).

In the United States, influenza rates are generally declining but remain high in some parts of the country; the predominant virus has been influenza A (H3N2) (<http://www.cdc.gov/flu>). In Europe, A(H1N1)pdm09 was the most commonly detected virus across the continent and have reported general increases in influenza activity as have temperate regions of Asia (WHO, 1 Feb, 2013 Update).

Figure 4
Positive influenza A(H3N2) by week and age group. Percentages noted are for 60+ years group.

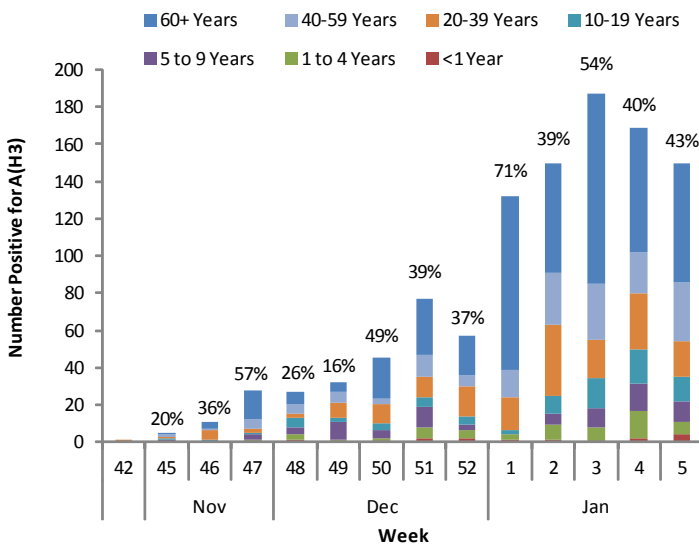
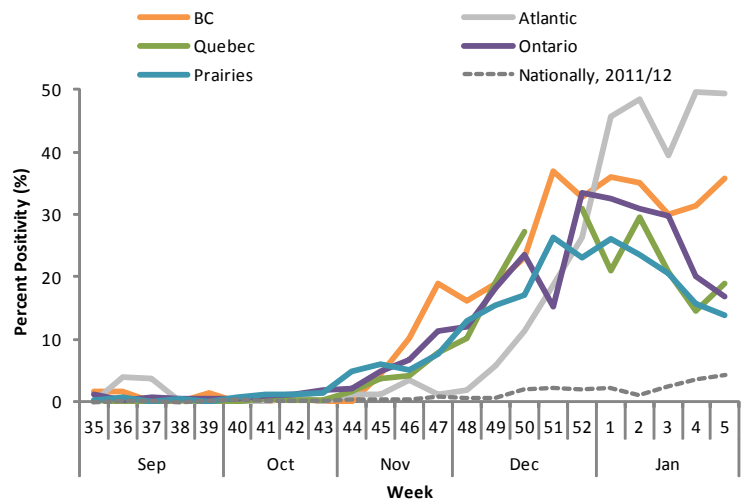


Figure 5
Influenza A percent positivity across Canada, September 2012 to present. Data derived from FluWatch reports.



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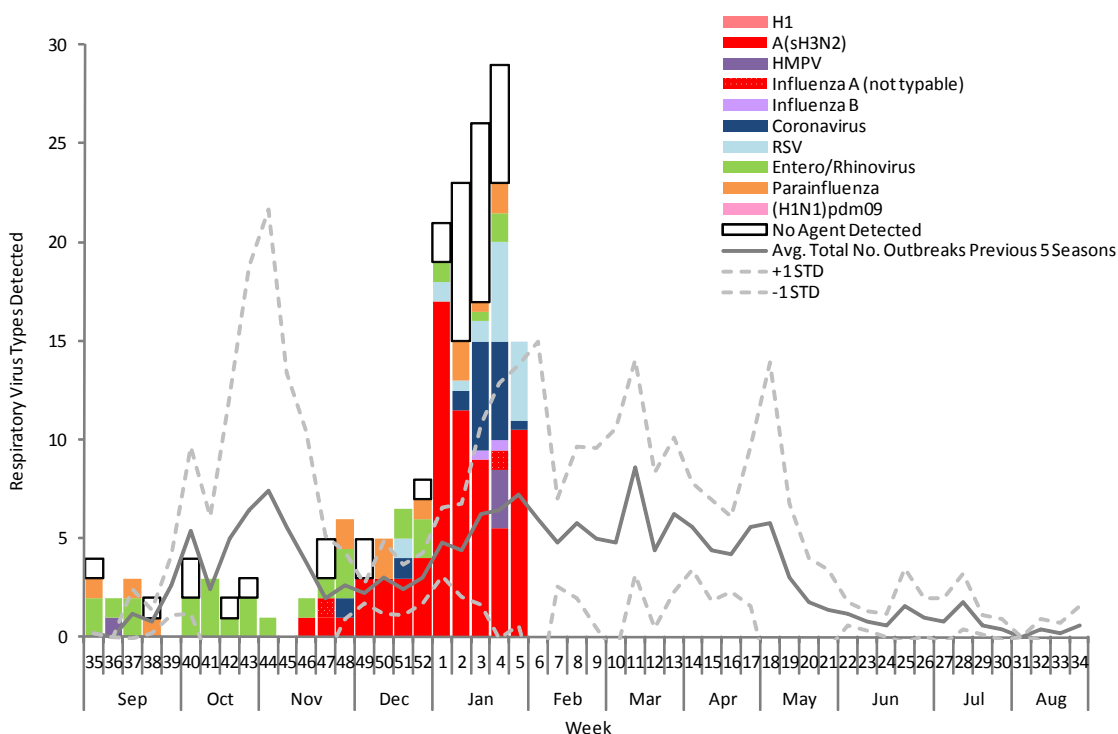
Respiratory Outbreaks

In January, samples were submitted for 104 respiratory outbreak investigations at the PHMRL from 81 (77.9%) longterm care facilities, 16 (15.4%) hospitals, 5 (4.8%) community clinics and 2 (1.9%) schools/daycare (Figure 6). The number of outbreaks investigated in January have been over 100 times higher than what has been observed in 2007, the year with the previous highest number of respiratory outbreaks (Figure 6).

Influenza A has been detected in 54 (52%) of these outbreaks. Using PCR and Luminex methods, influenza A(H3N2) was detected in 39 longterm care facilities, 11 hospitals, 2 schools/daycares and from 1 community clinic. Coronavirus was detected in outbreaks at 12 longterm care facilities and 1 community clinic; RSV was detected in outbreaks at 10 longterm care facilities and 2 hospitals; parainfluenza detected in 5 longterm care facilities; enterovirus/rhinovirus was detected in 3 longterm care facilities and HMPV in another 3 longterm care facilities.

The PHMRL Virology Program continues to use the Luminex test for outbreak samples. Since mid-December, 2012, this multiplex test is only applied to other subpopulations including hospitalized patients, those under 5 years old, and a subset of sentinel physicians. All respiratory samples are tested using a PCR assay that detects influenza A, B and RSV.

Figure 6
Respiratory outbreaks investigated* by respiratory season, Virology Program, PHMRL.



* Figure 6 reflects respiratory sample results submitted for investigation to the PHMRL and is not representative of respiratory outbreaks in the entire BC community.

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Enteric Surveillance

All enteric *Salmonella*, *Shigella*, Shiga-toxin producing *E. coli* and some *Campylobacter* are routinely forwarded to PHMRL by frontline laboratories for subtyping and fingerprinting studies. *Salmonella* is the primary enteric pathogen identified at the PHMRL Public health Advanced Bacteriology & Mycology Program with 933 cases in 2012 (Figure 7). Although *Campylobacter* is the second most common enteric pathogen forwarded to our laboratory, it is the provincial cause of enteric bacterial illness. In 2012, *S. Enteritidis* accounted for about 37% of all *Salmonella* species isolated or received at the PHMRL and constituted 54% (358 cases) of all enterica serovars (Figure 8). The next most common serovar in 2012 was *S. Heidelberg*, about 10% (88 cases) of all *Salmonella* species isolated and 13% of all enterica serovars (Figure 8). In 2012, *S. Typhimurium* only accounted for 7% of *Salmonella* cases.

There were 184 cases of *E. coli* in 2012 with *E. coli* O157:H7 the predominant serotype, representing about 53% (55 cases) of all *E. coli* subtyped; *E. coli* O157:NM was identified in a further 5% (5 cases). Non-O157 serotypes accounted for 42% (43 cases) with *E. coli* O121:H19 the second most common serotype overall at 17% (Figure 9).

Figure 7
Enteric organisms identified from clinical samples in 2012.

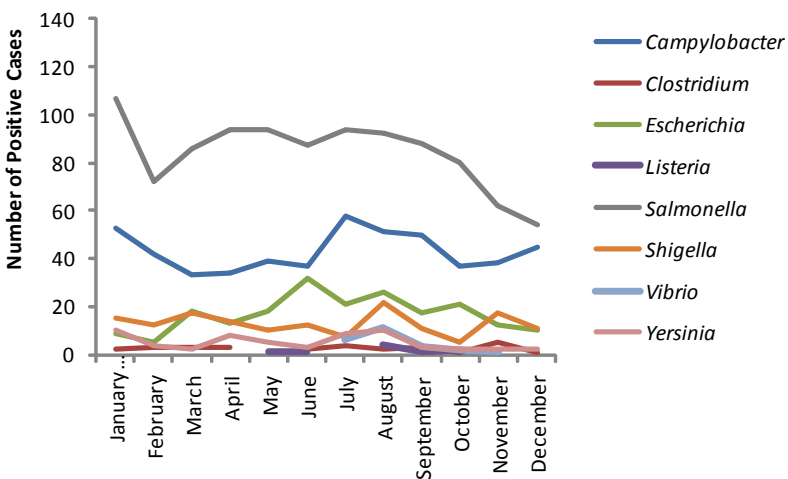


Figure 8
Top 10 *Salmonella* enterica serovars identified from clinical samples in 2012.

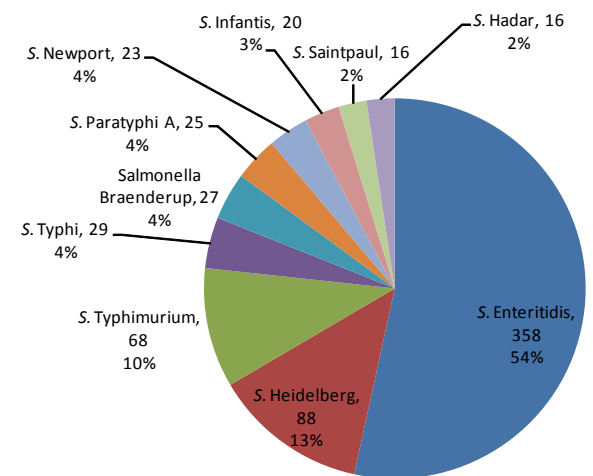
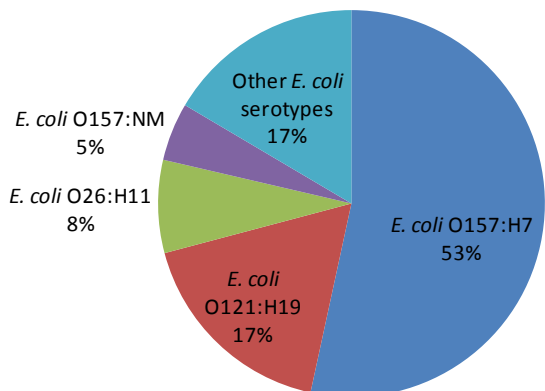


Figure 9
Top *E. coli* serotypes identified from clinical samples in 2012.



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Gastrointestinal Outbreaks

The Environmental Microbiology Program at the PHMRL investigated 60 gastrointestinal (GI) outbreaks in January 2013, consistent with what has been seen in previous years at this time (Figure 10). Outbreaks were identified from 34 (57%) longterm care facilities, 16 (27%) hospitals, 9 (15%) daycares/schools, and 1 (2%) other event type. Outbreak notifications from longterm care facilities dominated in weeks 1-3 while notifications from daycares/schools started to increase in weeks 4-5. Samples for laboratory testing to date were submitted for 51 (85%) of these outbreaks; of these, norovirus was confirmed in 38 (75%) of these outbreaks. GII.4K New Orleans (2009) was not detected in January and has been replaced by GII.4 Sydney (2012) as the dominant genotype, representing 72% of all norovirus outbreaks this month (Figure 11).

Figure 10
Gastrointestinal outbreaks investigated* since January, 2013, Environmental Microbiology, Bacteriology & Mycology, Parasitology and Virology Programs, PHMRL.

* 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

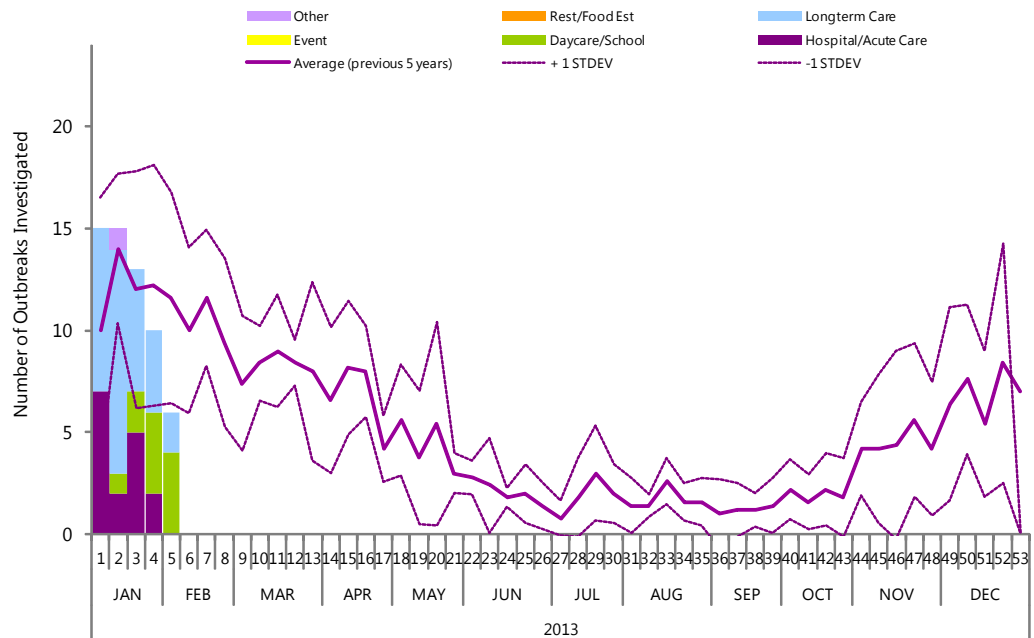
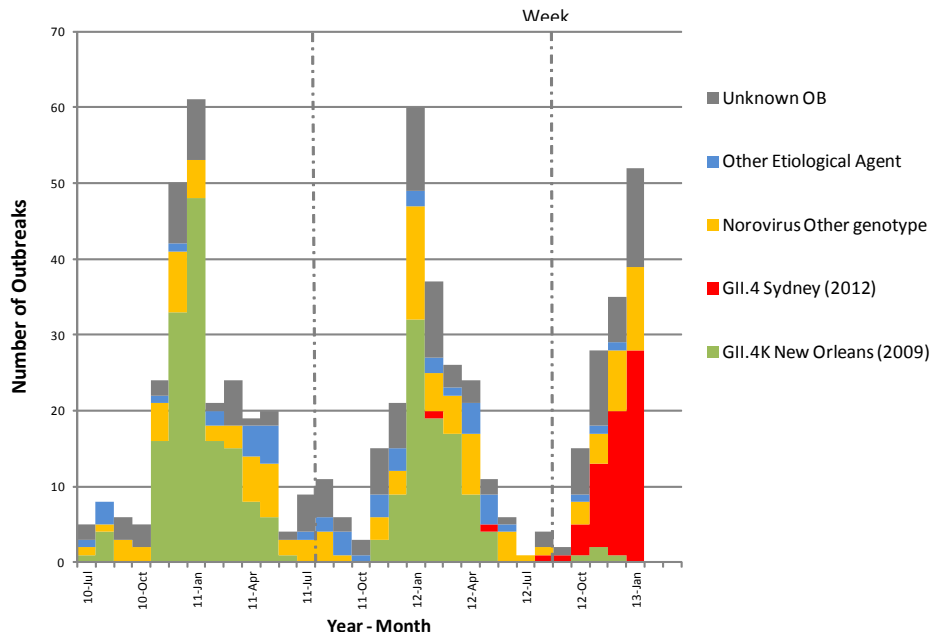


Figure 11
Genotyping data from gastrointestinal outbreaks investigated in BC in which samples have been submitted (July 2010 - January 2013), Environmental Microbiology, PHMRL. A representative sample from a positive norovirus outbreak is genotyped.





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

The Public Health Microbiology Reference Laboratory (PHMRL) 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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