



LABORATORY TRENDS



January 16, 2014

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Influenza Season Hits the Province

The influenza season has started in North America with widespread activity in Canada, the majority of the United States and Mexico. In Canada, influenza activity increased at the end of December, particularly in Ontario and Western Canada.

In BC, the number of requests for respiratory testing had been steady so far this season until week 1 (first week of January) when volumes more than doubled from the previous week. This is comparable to the trend from the previous season, although the volume for week 1 this season was 30% greater (Figure 1). The detection rate of influenza A had been very low until the start of the season in December when positivity increased from 10-43%. Over 89% of influenza detected thus far has been A(H1N1)pdm09. Detection rates of influenza B have been below 2%. There has been a notable absence of outbreaks at care facilities in December (page 5). This is consistent with A(H1N1)pdm09 being more common in the teenager to adult cohort, a change from the previous season when A(H3N2) dominated and predominantly impacted those over 60 years old.

To meet current and to prepare for even higher volumes of respiratory requests, the Virology Program of the BC Public Health Microbiology and Reference Laboratory (BCPHMRL) has changed operations to accommodate 2-3 daily runs of the influenza/RSV PCR assay. Like other BCPHMRL programs, Virology staff work 7 days a week. The Molecular Microbiology & Genomics Program is assisting by performing influenza subtyping. Other BCPHMRL program staff are cross-trained and also ready to lend surge support.

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

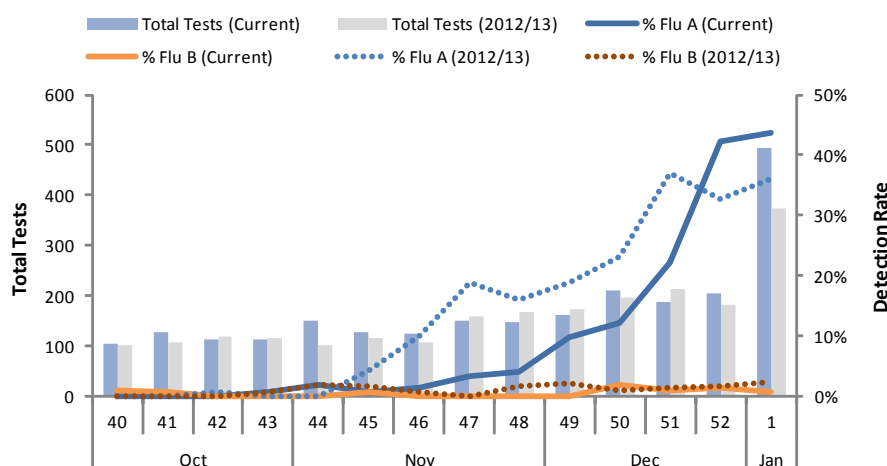
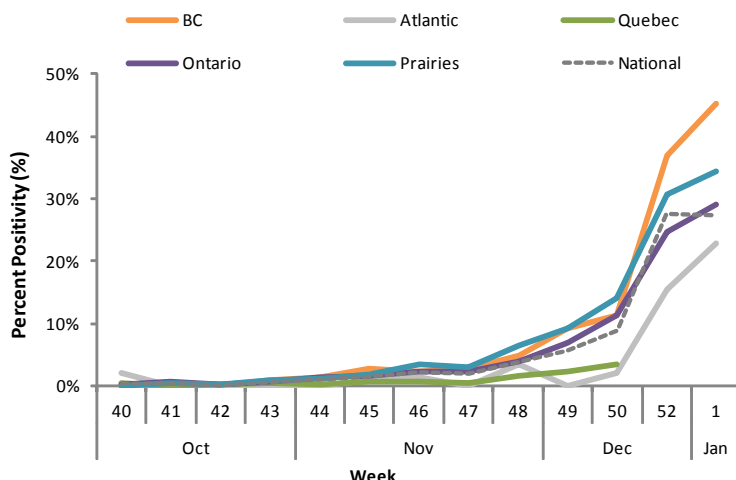


Figure 2 Influenza A percent positivity across Canada. Data derived from FluWatch reports.





Norovirus Also in Full Swing

by Brian Auk, Section Head, Environmental Microbiology Program

Each year, with the arrival of winter, there is usually an increase in norovirus outbreaks across the province of British Columbia. This year is no exception where reported gastrointestinal outbreaks in December were nearly triple those in November (Figure 3). Many hospitals, day cares and care facilities have been affected. Thus far in December more than 80% of gastrointestinal outbreaks tested have been confirmed to be norovirus.

The norovirus strain GII.4 Sydney 2012 that was first observed in 2012 continues to be the dominant DNA genotype this season (61% of norovirus outbreaks, Figure 4). This strain is predominant worldwide as well.

Figure 3 Gastrointestinal outbreak testing, Environmental Microbiology, BCPHML.

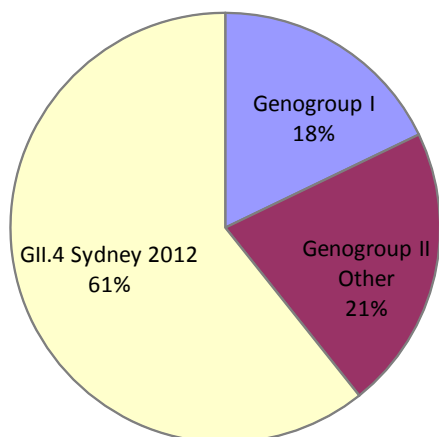
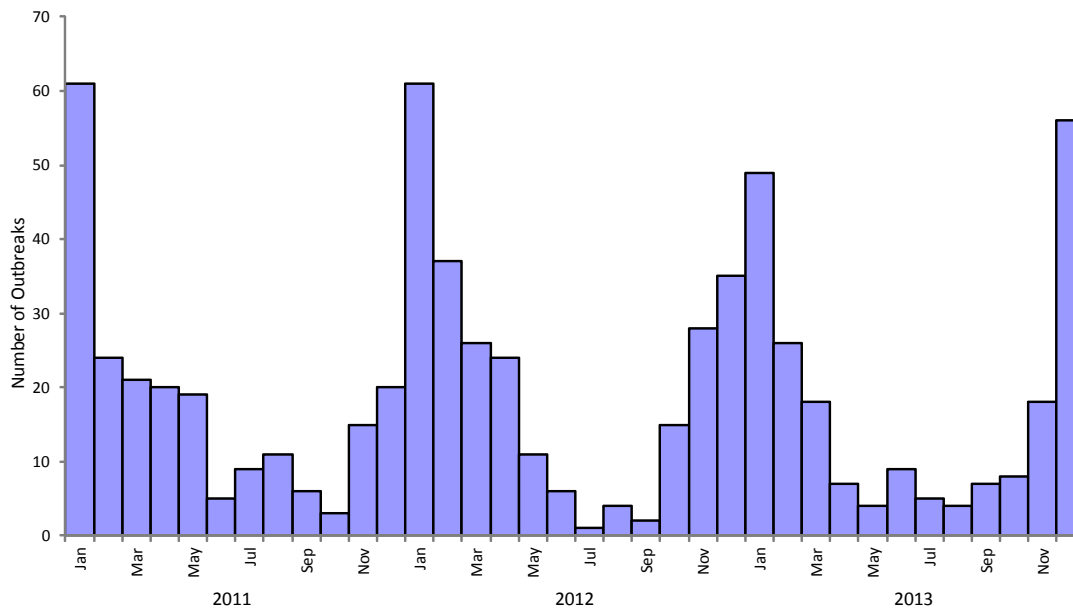


Figure 4 Ratio of norovirus strains (July - December, 2013).



Laboratory News

Locally-Acquired Chikungunya in the Caribbean

Chikungunya virus is an arbovirus (alphavirus) transmitted by infected *Aedes* species of mosquitoes. This mosquito genus also transmits dengue virus and both diseases share many common signs and symptoms such as high fever, headache and joint pain. Although chikungunya virus is prevalent in Africa, Southern Europe, Southeast Asia, and islands in the Indian and Pacific Oceans, it has recently been found on islands in the Caribbean. As of January 10, 2014, a total of 286 cases were confirmed in the Caribbean (http://www.paho.org/hq/index.php?option=com_content&view=article&id=9053&Itemid=39843).

Clinicians and health care providers are thus requested to add chikungunya virus to the differential for persons recently returning from the Caribbean and exhibiting signs and symptoms related to dengue virus infection. For dengue and chikungunya viruses, serology is the primary diagnostic test using a gold top serum separator tube. For those acutely ill patients with recent travel to the Caribbean, an additional EDTA tube is preferred; PCR may also be a consideration in these cases.

Automated Nucleic Acid Testing for Gonorrhea and Chlamydia

In December, 2013 the Public Health Advanced Bacteriology and Mycology Program of the BCPHRML improved its automation process for nucleic acid testing (NAT) of gonorrhea and chlamydia by implementing the Hologic Gen-Probe PANTHER. Based on the same NAT platform, the new system is more efficient, flexible and allows for random access in application which will in the near future allow implementation of *Trichomonas* testing from the same specimens currently used for gonorrhea and chlamydia. There is no change to specimen collection system or testing parameters with this upgrade.

Lyme Disease Tick Testing: Move to Real Time PCR

The BCPHRML ZEP and Parasitology Programs have been collaborating with regional health authorities and epidemiologists in performing tick surveillance since 1995 in a program initiated by ZEP and BC Centre for Disease Control Communicable Disease Prevention and Control Services. Since its inception, the midgut of all *Ixodes* ticks from samples received has been used to recover *Borrelia burgdorferi*. *B. burgdorferi* is a very slow growing organism and requires highly specialized media. Moreover, culturing *B. burgdorferi* has poor sensitivity. Recently, we implemented a real-time pooled PCR method to detect *B. burgdorferi* DNA (up to 5 ticks of the same species from the same source will be pooled for each PCR test). This is a more robust and sensitive test and TAT is significantly decreased.



Program Updates

Getting into the Hosts and Vectors: Tick Surveillance Study in BC

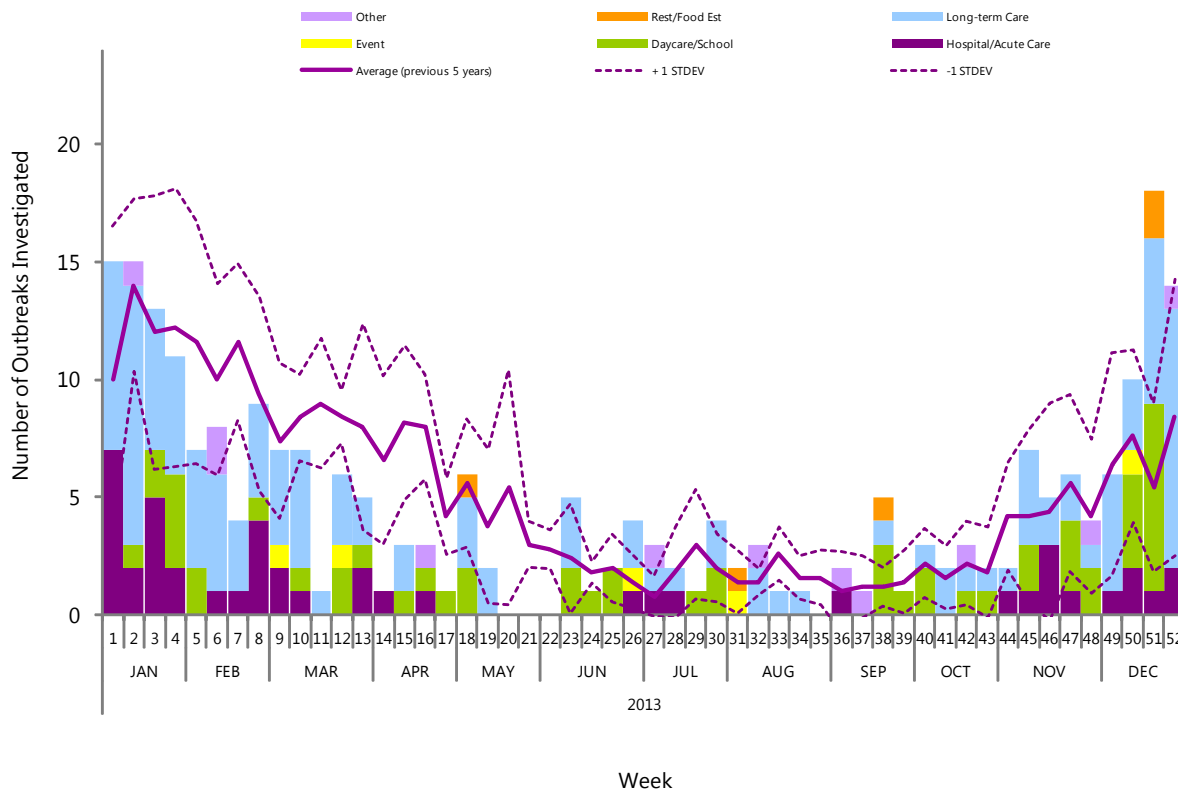
The ZEP Program initiated a two year project to study the presence of the spirochete *B. burgdorferi* and other pathogens in vector (tick) and host (deer mice) populations. Lyme disease, caused by *B. burgdorferi*, is currently the most common tick-borne disease in the United States and Canada. Human clinical symptoms of *B. burgdorferi* infection include erythema migrans, malaise, fatigue, fever, headache, neck stiffness, arthralgia, and myalgia. In Canada, Lyme disease is transmitted mainly by *Ixodes scapularis* in eastern and central regions while *Ixodes pacificus* and *Ixodes angustus* are the vectors on the West Coast. In BC we studied tick distribution patterns across the province. In previous field work, we found the distribution of *Ixodes* ticks to be mainly in the southern and central areas of the province; however, we have found ticks from as far north as Smithers and as far west as the Queen Charlotte Islands. The BC data also show that less than 1% of ticks carry *B. burgdorferi*; however, tick numbers and *B. burgdorferi*-positive ticks are increasing and expanding in the eastern parts of Canada. An updated and ongoing field study in BC will help us to determine whether *B. burgdorferi*-carrying tick populations in BC are showing a similar pattern.



Gastrointestinal Outbreaks

In December, the BCPHMRL investigated 57 gastrointestinal (GI) outbreaks. Outbreaks were identified from 31 longterm care facilities, 13 daycares, and seven hospitals, four food service establishments/events and two other facility types (Figure 5). Samples for laboratory testing were submitted for 41 (72%) of these outbreaks. Norovirus was confirmed at 20 longterm care facilities, six hospitals, four daycares and three food service establishments/events. *Clostridium perfringens* was confirmed at a food service establishment/event.

Figure 5
Gastrointestinal outbreaks investigated* since January, 2013, Environmental Microbiology, Public Health Advanced Bacteriology & Mycology, Parasitology and Virology Programs, BCPHMRL.



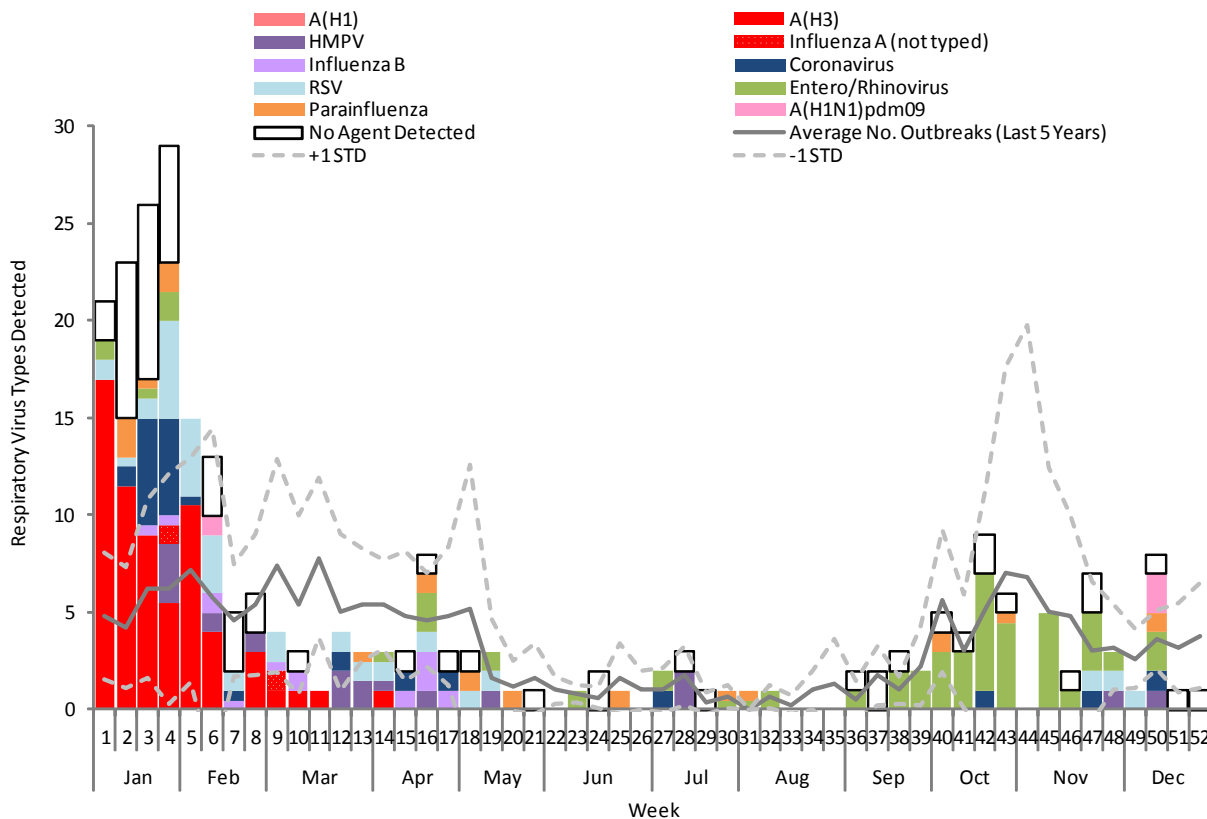
* The data available are from outbreaks in which the BCPHMRL has been notified. Some acute care microbiology laboratories are also testing for norovirus in the province and these data may not include outbreaks from all Health Authorities. Given the nature of GI outbreaks, samples are not always available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



Respiratory Outbreaks

In December, samples were submitted to the BCPHMRL for 12 respiratory outbreak investigations from 10 longterm care (LTC) facilities, from one school and and one other facility type. Six separate LTC had a variety of different respiratory pathogens detected, including enterovirus/rhinovirus (33%; 2), coronavirus (17%; 1), respiratory syncytial virus (17%; 1), parainfluenza (17%; 1) and human metapneumovirus (17%; 1). Influenza A(H1N1)pdm09 was detected in two outbreaks in a school and in a separate facility (Figure 6).

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



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



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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