

# June 2013

## TARRANT VIRAL WATCH

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The influenza season is finally drawing to a close here in Alberta as evidenced by the steady decrease in most indicators over the last couple of months. We have summarized the season on page 2 of this newsletter.

It's been a busy season for us at TARRANT Viral Watch with over 650 samples collected for the Influenza Vaccine Effectiveness (VE) study and over 80,000 patients screened for ILI and LRTI through our weekly TARRANT reporting.

Both of our studies will continue over the summer and we ask that our sentinels carry on sending their weekly reports and swabbing all consenting patients. We will, however, stop distributing our biweekly bulletins until the start of the next season. We once again thank all of our dedicated sentinels and wish you all a wonderful summer!



## Using Social Media to Track the Flu

An innovative application of social media is its use in public health surveillance including influenza monitoring. Recently, researchers have investigated using online tools such as Google search queries, Facebook posts and Twitter data to monitor influenza rates.

Several researchers have successfully developed algorithms to track keywords in social media related to the flu and have found that online-sourced aggregate data can be a fairly accurate indicator of influenza activity when compared with national databases of laboratory-confirmed cases. Google Flu Trends and Mappy Health are two entities that create estimates of influenza activity. Google uses its search engine inquiries and Mappy Health mines Twitter feeds for specific terms associated with the flu. Geo-tagging allows for the identification of areas with increased influenza-related activity.

There are, however, several short-comings in using social media to track the flu. For example, those most affected by the flu (seniors & young children) are less likely to participate in social media. Lack of refined key-word filters may indicate increased flu activity, where there is only increased discussion of the flu. That effect was seen this year when Google Flu Trends significantly over-estimated the flu epidemic, likely due to a large number of unaffected people searching for news stories about the flu.

And finally, with several respiratory viruses capable of causing flu-like symptoms, it's impossible for social media to definitively determine if increased activity is truly due to the flu or something else. This is where important sentinel-based programs such as TARRANT take over – we are able to validate or dispute the perceptions generated by the various social media. Perhaps in the future, the capabilities of traditional and non-traditional epidemiological tools will merge, leading to improved real-time influenza surveillance.

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# 2012-2013 Influenza Season Summary

## Alberta

The season started very early in the province and was more severe than usual. From the beginning of the season (Aug 26th, 2012) until May 25th, 2013, there have been 2852 laboratory-confirmed cases of influenza in the province, representing a 108% increase over last year. The majority (2086, 73%) of cases were influenza A, with A(H3) predominating. Despite lower cumulative numbers for influenza B, this virus comprised the majority of cases towards the end of the season and in May was the only influenza virus detected. Influenza A peaked during week 2 at ~7.0 laboratory confirmed cases per 100,000 persons. Influenza B peaked during week 15 at ~1.5 laboratory-confirmed cases per 100,000 persons.

During the 2012-13 Seasonal Influenza Immunization Program (Oct 1st, 2012-Apr 30th, 2013), over 872,000 residents received at least one dose of vaccine by an AHS-associated provider. This number represents 23.0% of the population, just under last year's rate of 24.0%. Vaccine coverage rates for Alberta residents ranged from 8.0% of high-risk 9-17 year-olds to 60.0% of those over 65 years (including LTC residents).

**Other Infection Respiratory Diseases** Rhinovirus/enterovirus predominated at the start of the season, reaching a percent positive rate of over 40% before dropping to under 10% by week 1. However, since then the percent positive rate has been steadily increasing, reaching over 20% in the past 3 weeks. RSV prevailed through the mid season (week 47-week 10), with the percent positive rate climbing just over 30%. Parainfluenza, adenovirus, coronavirus and mixed infections had low levels of detection throughout the season.

*Data Source: AHW, AHS*

## Canada

Influenza activity was high throughout Canada over the season, with over 31,000 laboratory-confirmed cases identified. This represents a 170% increase over last year. Cumulatively, almost 27,000 specimens tested positive for influenza A (85.6%), and over 4500 have tested positive for influenza B (14.4%). Of all the positive cases of influenza A, 34.4% were A(H3), 4.6% were A(H1N1), and 60.9% were unsubtype. The majority of influenza cases (42.7%) were from the 65+ years age-group, with the second highest group comprised of those 45-64 years (16.9%). Over 300 influenza-associated deaths have been reported nationally: 82.2% in seniors 65+ years, 15.2% in adults 20-64 years and 2.6% in children 0-19 years.

Each year the National Microbiology Laboratory (NML) characterizes a proportion of positive influenza lab specimens to compare circulating strains to the seasonal vaccine. This season, over 1300 isolates were tested. All influenza A viruses were covered by the vaccine but only 78% of influenza B viruses were covered. The NML also undertakes antiviral testing of a select number of specimens. Approximately 1300 specimens were tested for oseltamivir and zanamivir resistance; one A(H3N2) sample was resistant to both medications and one A(H1N1) sample was resistant to oseltamivir. No influenza B specimens were resistant. Of all of the influenza A viruses tested, all but one A(H3N2) sample was resistant to amantadine. B viruses are not tested against amantadine as resistance is inferred.

*Data Source: FluWatch*

## International

Influenza activity was high during early to mid-season in most of the temperate northern hemisphere. Influenza A(H3N2) predominated in North America and most of temperate Asia while A(H1N1) predominated in Europe, North Africa, and the Middle East. Influenza B predominated early in the season in Mexico and Central America and late in the season for the rest of North America and Europe. Currently, the temperate southern hemisphere shows low influenza levels overall but increasing activity in South America & South Africa.

Other key international developments included human infections with avian influenza A(H7N9) in China (see page 3) and a novel coronavirus (MERS-CoV) in the Arabian Peninsula (see page 4).

*Data Source: WHO*

# Influenza A(H7N9)

## About A(H7N9 )

Influenza A(H7N9) is part of a larger group of H7 avian influenza viruses. H7 viruses have occasionally infected humans in Canada, the U.S.A, Mexico, Italy, the Netherlands and the U.K. usually in association with poultry outbreaks of the virus. However, until this year, the subtype A(H7N9) has never been found to infect humans. This new strain carries several mutations associated with facilitated animal to human transmission. Surveillance of A(H7N9) is difficult due to the fact that animal infections with A(H7N9) occur naturally and are by and large asymptomatic. A(H7N9) viral replication takes place in the respiratory and digestive tracts and can be transmitted via droplets or direct contact.

## Human Infections in China

Health authorities in China reported three cases of laboratory-confirmed infection with A(H7N9) on March 31<sup>st</sup>, 2013. Over the next two months, a total of 132 confirmed cases of A(H7N9) were reported, included 37 deaths, a case-fatality rate of 25%. Several patients remain hospitalized and it's possible that many asymptomatic or milder infections remain undetected. As of May 31<sup>st</sup>, investigations had not uncovered definitive evidence of person to person transmission of the virus. However, limited person to person transmission could not be excluded in several cases. Many of the infected individuals were in direct contact with live poultry suggesting direct animal to person transmission. This prompted the closure of live poultry markets in Shanghai and other areas where human infections have been detected. Chinese authorities also expanded surveillance in other bird markets and poultry farms as well as swine farms and slaughterhouses. Out of tens of thousands of tested samples, only 51 poultry samples tested positive for A(H7N9). Surveillance of poultry and wild birds continues in an attempt to detect and control the spread of virus to humans. Swine farms continue to be surveyed due to swine susceptibility to infection by some avian H7 viruses such as influenza A

## Clinical Features of Patients with Laboratory-Confirmed Influenza A(H7N9) Infection

Median Age of Infected Patients	61 years
Male:Female Infection Ratio	2.4:1
Symptoms at Admission	High fever, non-productive/productive cough, shortness of breath, dyspnea, hypoxia, and lower respiratory tract disease.
Complications	Septic shock, respiratory failure, acute respiratory distress syndrome, refractory hypoxemia, acute renal dysfunction, multiple organ dysfunction, rhabdomyolysis, encephalopathy, bacterial and fungal infections.
Median time from onset to hospital admission	4.5 days
Median time from illness onset to death	11.0 days

## Implications for Clinicians in Canada

Due to limited possibility of person to person transmission of the virus and no detections of the virus outside of China, the Public Health Agency of Canada rates the risk of A(H7N9) to Canada as low and has not imposed any travel restrictions. However, if cases of severe respiratory illness in patients with recent travel history to China are discovered, clinicians are advised to report them to the zone Medical Officer of health, site-based Infection Prevention and Control (IPC), and ProvLab virologist for testing, as the Alberta Provincial Laboratory of Public Health has diagnostic capability to detect A(H7N9).

### References

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## TARRANT and VE Updates

**Funding** We are pleased to announce that both the TARRANT surveillance program and the Influenza Vaccine Effectiveness (VE) study have received funding to continue through the 2013-2014 season. New VE program materials for the 2013-2014 season will be mailed out in late September or early October. Until that time, please continue using materials from the 2012-2013 season.

**Sentinel Compensation** Due to unforeseen circumstances, several sentinels did not receive compensation for the period December 1st, 2011 to June 30th, 2012. We are working hard to remedy this situation with Research Accounting after which we will begin the process of distributing invoices to sentinels for the period from July 1st, 2012 to January 31st, 2013.

**Database Update** For TARRANT weekly reporting, our primary stakeholder, (AHW) requires that 90% of our sentinels report weekly. If a report is not received, we are required to contact you ensure reports are received over the subsequent weeks. In order to fulfill this mandate, we will be contacting sentinels over the next couple of months to confirm continued involvement with the program for the upcoming year. Should you be unable to continue with the program and wish to opt out, please contact us by phone at 403-220-2750 or by email at tarrant@ucalgary.ca.

## Middle East Respiratory Syndrome Coronavirus Update

Human infections with a novel coronavirus, recently renamed the Middle East respiratory syndrome coronavirus (MERS-CoV), have been reported from several countries between September 2012 and June 2013. Fifty-four cases and 30 deaths have been identified, a case-fatality rate of 55.5%. The majority of cases (39) have been from Saudi Arabia, however 8 other countries have reported confirmed human infections to the WHO including Jordan, Qatar, the United Arab Emirates, Tunisia, the U.K., France, Italy and Germany. Only cases from the Middle East have been identified as originating there; the cases from Europe and Tunisia were patients who had either been transferred from the Middle East for care or returned from the Middle East and subsequently became ill. There has been limited local transmission among patients who had not been to the Middle East but had contacts with lab-confirmed or probable cases.

PHAC rates the risk of MERS-CoV to Canada as low. However, clinicians and health care officials are encouraged to remain vigilant for cases of MERS-CoV and notify the appropriate public health authorities of persons under investigation. The PHAC defines a 'person under investigation' for MERS-CoV as follows:

### Person Under Investigation

1. A person with an acute respiratory infection, which may include history of fever and cough and indications of pulmonary parenchymal disease, based on clinical or radiological evidence of consolidation. *and any of the following:*
  - History of travel to/residence in the Arabian Peninsula/neighbouring countries within 10 days before onset of illness.
  - History of close contact with a person with acute respiratory illness of any degree who had a history of travel to, or residence in the Arabian Peninsula/neighbouring countries within 10 days before onset of illness.
  - The disease occurs as part of a cluster that occurs within a 10-day period, without regard to place of residence or history of travel, unless another etiology has been identified.
  - The disease occurs in a health care worker who has been working in an environment where patients with severe acute respiratory infections are being cared for, particularly patients requiring intensive care.
  - Develops an unexpectedly severe clinical course despite appropriate treatment, even if another etiology has been identified, if that alternate etiology does not fully explain the presentation or clinical course of the patient.
2. A person with an acute respiratory illness of any degree of severity who, within 10 days before onset of illness, had close contact with a confirmed/probable case of MERS-CoV infection, while the case was ill.

*Sources: WHO, Public Health Agency of Canada*