

April 18 to April 24, 2010 (Week 16)

- Overall influenza activity continued to be low for at least 18 consecutive weeks.
- Only two specimens (out of 1,713) tested positive for pandemic H1N1 2009 this week. The specimens were from ON and QC. Respiratory syncytial virus detections have been high since the beginning of 2010, but the proportion of positive RSV (8.7%) continued to decline.
- Given the consistently low levels of H1N1 circulating in Canada, the Public Health Agency of Canada has decided it is no longer necessary to report on weekly hospitalizations and deaths associated with the pandemic H1N1 2009 virus. The Immunization Monitoring Program - Active (IMPACT) and the Canadian Nosocomial Illness Surveillance Program (CNISP) will continue to provide reports on hospitalizations and outcomes related to all types of influenza for children and adults.
- No new H1N1-related hospitalizations and deaths have been reported this week. To date, only 14 hospitalizations (BC, ON, QC & NS) and two deaths (ON) have occurred since the beginning of 2010.

Summary : Pandemic H1N1 2009 virus Surveillance and Epidemiology

A total of 8,678 hospitalized cases including 1,473 (17.0%) cases admitted to ICU and 428 (4.9%) deaths with pandemic H1N1 2009 were reported to PHAC since the beginning of the pandemic. Core data was available for 8,227 (94.8%) hospitalizations, 1,473 (100%) ICU admissions and 423 (98.8%) deaths. Among the 1,117 ICU cases from whom we had detailed information regarding ventilation status, 58.5% (n=654) required ventilation since the beginning of the pandemic. No new H1N1-related hospitalizations and deaths have been reported this week. To date, only 14 hospitalizations (BC, ON, QC & NS) and two deaths (ON) have occurred since the beginning of 2010.

Canada experienced two distinct waves of pandemic H1N1 2009, a spring and a fall wave which peaked respectively in early June 2009 (week 23) and early November 2009 (week 44). The second wave was substantially larger than the first and resulted in a 4 to 5 times increased for hospitalizations and deaths compared to the first wave (see Table 1 and Figure 1). All provinces and territories showed higher levels of transmission during the second wave with the exception of Manitoba and Nunavut which reported higher hospitalization rates in the first wave than the second wave.

To date, the national cumulative crude hospitalization rate was 25.7 per 100,000 population with the highest rates in children less than 5 years of age (100.4 per 100,000). The cumulative crude mortality rate was 1.3 per 100,000 population with those 45 years and older having the highest mortality rate (2.1 per 100,000). The national crude ICU admission rate was 4.4 per 100,000 population. The ICU admission rate was highest in adults 45 to 64 years (6.4 per 100,000) as well as children under five years of age (6.2 per 100,000).

Having at least one underlying medical condition, being pregnant and being of Aboriginal origin were all associated with an increased rate of hospitalization, ICU admission and mortality. However, it should be noted that the risk for Aboriginals and pregnant women has decreased considerably in the second wave compared to the first wave (Table 2).

Table 1. Weekly and cumulative numbers of hospitalized cases, ICU admissions and deaths among pandemic H1N1 2009 confirmed cases, Canada, April 12, 2009 to April 24, 2010†

Province/Territory	TOTAL (From Apr. 12, 2009 to Apr. 24, 2010)			2ND WAVE (From Aug. 30, 2009 to Apr. 24, 2010)*			1ST WAVE (From April 12 to August 29, 2009)*		
	Hospitalized cases	ICU admissions	Deaths	Hospitalized cases	ICU admissions	Deaths	Hospitalized cases	ICU admissions	Deaths
BC ¹	1084	168	57	1035	149	52	49	19	5
AB	1276	239	71	1147	210	64	129	29	7
SK	67	52	15	44	40	11	23	12	4
MB	379	61	11	166	18	4	213	43	7
ON	1843	319	128	1444	250	103	399	69	25
QC	3063	465	108	2491	361	81	572	104	27
NB ¹	163	34	8	161	33	8	2	1	0
NS	293	50	7	276	42	6	17	8	1
PE	50	9	0	49	9	0	1	0	0
NL	308	60	18	305	59	18	3	1	0
YT	15	3	3	15	3	3	0	0	0
NT	52	7	1	46	7	1	6	0	0
NU ¹	85	6	1	9	0	0	76	6	1
Canada	8678	1473	428	7188	1181	351	1490	292	77

*Based on epidemiological date, hospitalization date, death date and reporting date. ¹Aggregate counts were reported by these two provinces. †Note that due to reporting delays, some provinces and territories reported retrospectively on first and second wave cases.

Table 2. Descriptive characteristics of laboratory-confirmed Canadian pandemic H1N1 2009 hospitalized cases, ICU-admitted cases and deaths with core information available, reported to PHAC as of April 24, 2010†

	From April 12 to August 29, 2009			From August 30, 2009 to April 24, 2010			From April 12, 2009 to April 24, 2010		
	Hospitalized cases (n=1490)	ICU-admitted (n=292)	Deaths (n=77)	Hospitalized cases (n=6737)	ICU-admitted (n=1181)	Deaths (n=346)	Hospitalized cases (n=8227)	ICU-admitted (n=1473)	Deaths (n=423)
Females, %	51.4	57.2	62.3	49.7	49.4	46.8	50.0	51.0	49.6
Median age	23.0	37.0	51.0	30.0	47.0	54.0	29.0	46.0	53.0
Aboriginal status ¹ , %	20.1-27.8	16.1-21.9	11.7-17.6	4.6-6.1	5.8-7.6	6.1-8.9	7.4-10.0	7.8-10.4	7.1-10.4
Underlying medical conditions ² , %	47.5 (653/1374)	60.2 (162/269)	73.3 (55/75)	59.7 (1969/3299)	74.4 (687/924)	85.5 (247/289)	56.1 (2622/4673)	71.2 (849/1193)	83.0 (302/364)
Pregnancy ³ , %	27.6 (75/272)	19.7 (15/76)	28.6 (4/14)	18.5 (190/1027)	8.9 (16/180)	0.0 (0/36)	20.4 (265/1299)	12.1 (31/256)	8.0 (4/50)

¹Since Aboriginal status is not reported by two provinces (which comprise 23% of the Aboriginal population) two methods were used to calculate proportions: one proportion was calculated by including ON and NS cases in the denominator (which is an underestimate of the true proportion); while the other proportion was calculated by excluding ON and NS cases in the denominator (which is an overestimate). ²Proportion of cases with at least one underlying medical condition (excluding pregnancy) among those for whom the information was available. Please note that results may differ slightly compared to the previous weeks due to updates in the national database. ³Percent of pregnant women among women 15 to 44 years of age. †All cases admitted to ICU are included in the hospitalization count; however, not all the fatal cases have been hospitalized before dying

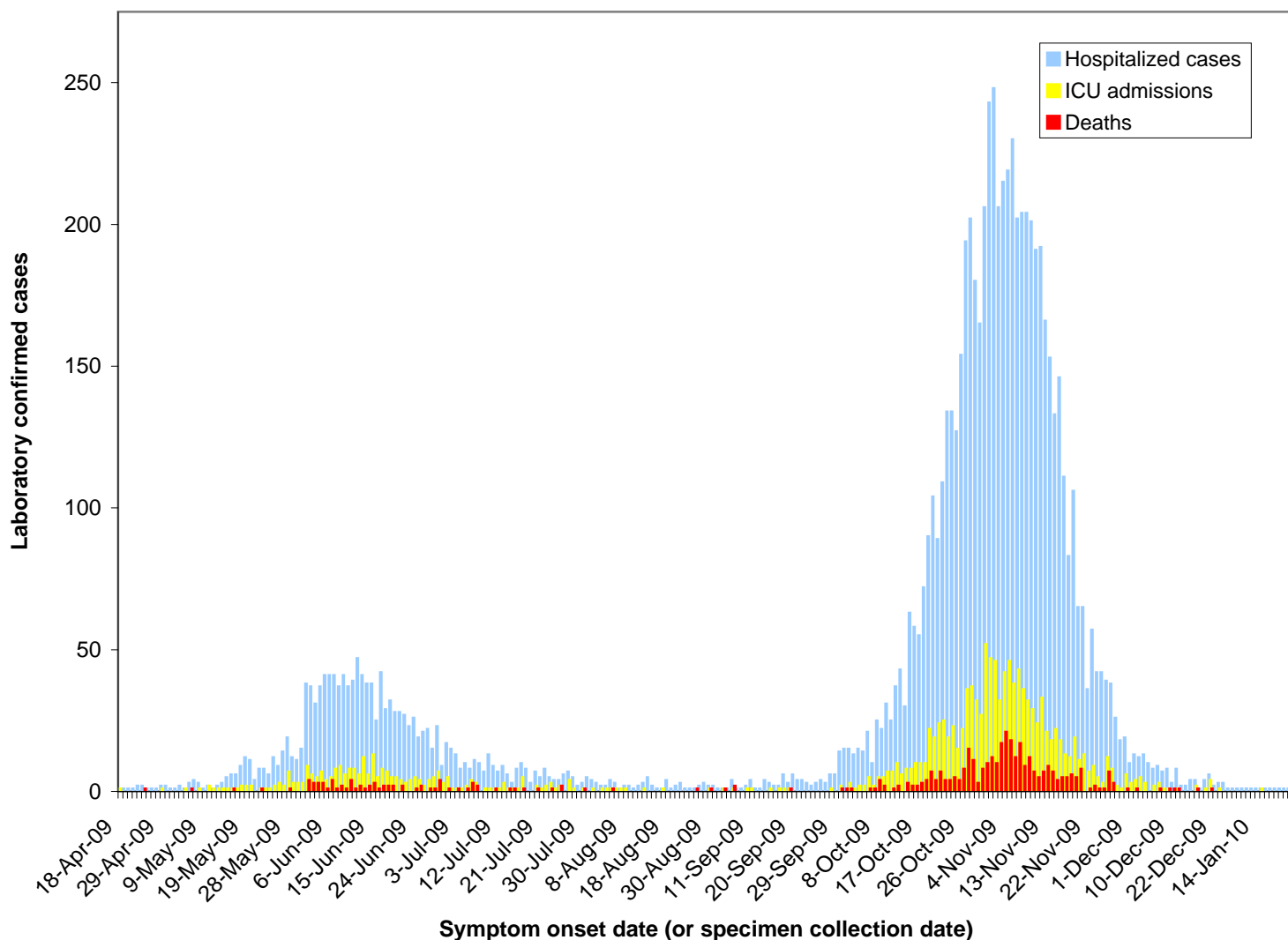


Figure 1. Number of laboratory-confirmed pandemic H1N1 2009 hospitalized cases, ICU cases and deaths in Canada by date of onset (or specimen collection date), reported to the PHAC as of April 24, 2009†

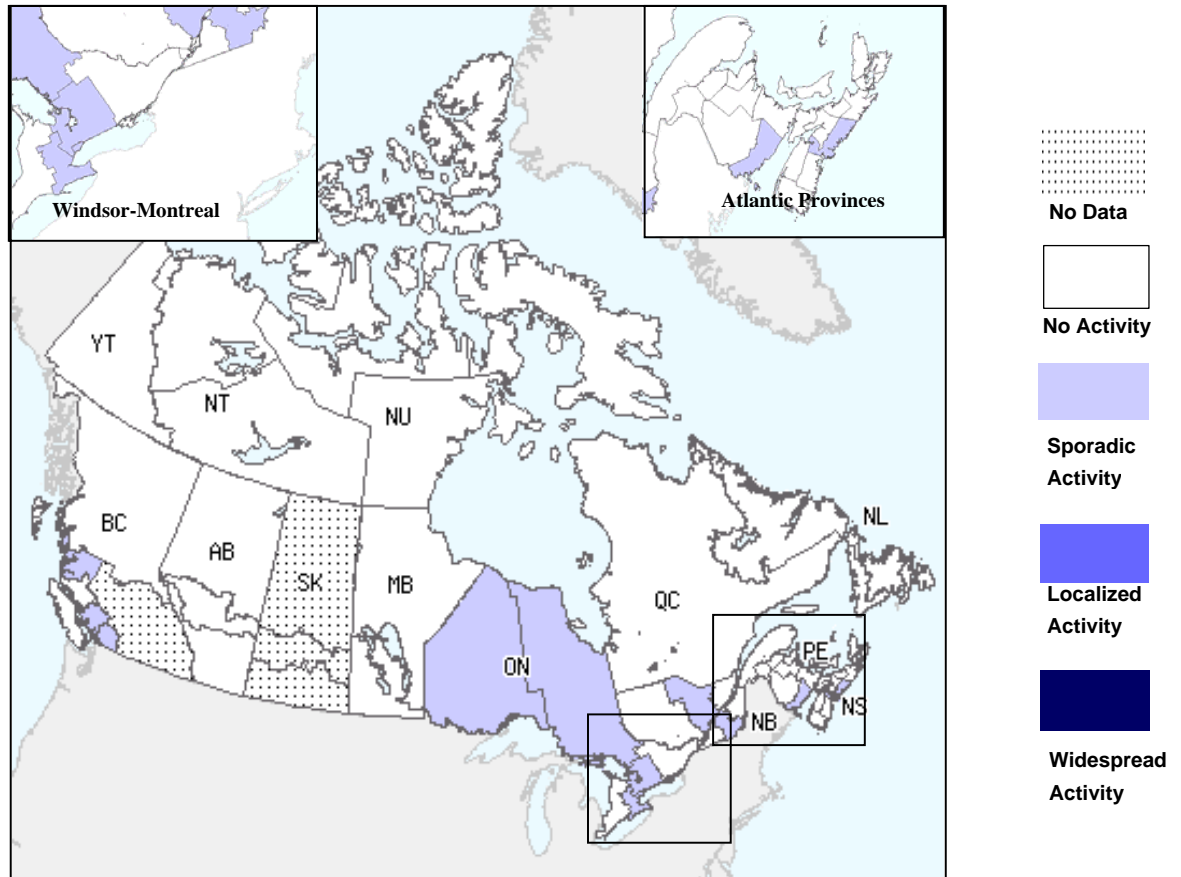
†Symptom onset date/specimen collection date was available for 99.1% of deaths, 97.2% of ICU cases and 97.8% of hospitalized cases for whom core information was available.

Overall Influenza Summary - Week 16 (April 18 to April 24, 2010)

Overall influenza activity continued to be low for at least 18 consecutive weeks. Only two specimens (out of 1,713) tested positive for pandemic H1N1 2009 this week. The specimens were from ON and QC. Respiratory syncytial virus detections have been high since the beginning of 2010. However, the proportion of positive RSV (8.7%) continued to decline for the last 9 weeks.

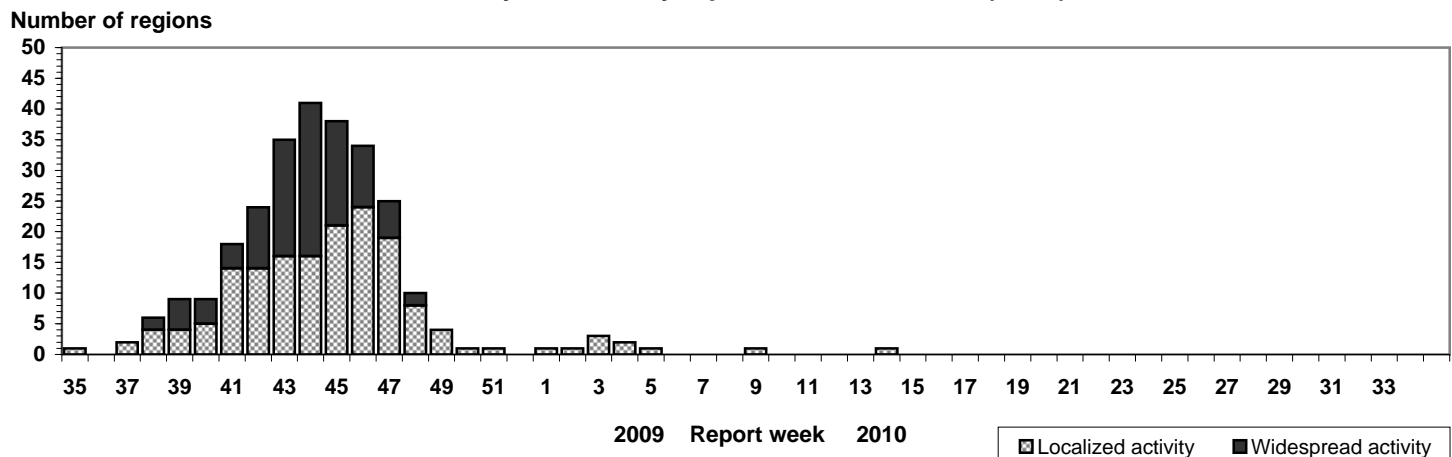
In week 16, eleven regions (in BC, AB, ON, QC, NB & NS) reported sporadic activity and 39 regions reported no activity. One region in BC, and all three regions in SK are not reporting for the remainder of the season. No influenza outbreaks were reported this week.

Map of overall Influenza activity level by provinces and territories, Canada, Week 16



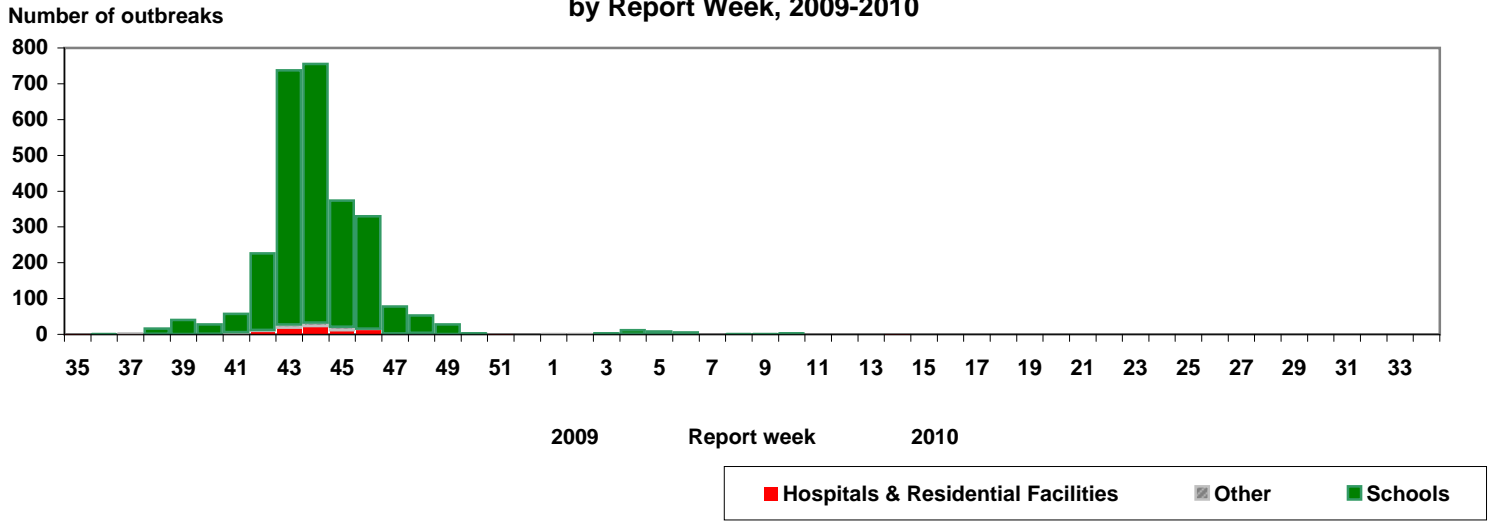
Note: Influenza activity levels, as represented on this map, are assigned and reported by Provincial and Territorial Ministries of Health, based on laboratory confirmations, sentinel ILI rates (see graphs and tables) and reported outbreaks. Please refer to detailed definitions on the last page. For areas where no data is reported, late reports from these provinces and territories will appear on the FluWatch website.

Number of influenza surveillance regions† reporting widespread or localized influenza activity, Canada, by report week, 2009-2010 (N=54)



† sub-regions within the province or territory as defined by the provincial/territorial epidemiologist. Graph may change as late returns come in.

Overall Number of Influenza Outbreaks, Canada, by Report Week, 2009-2010

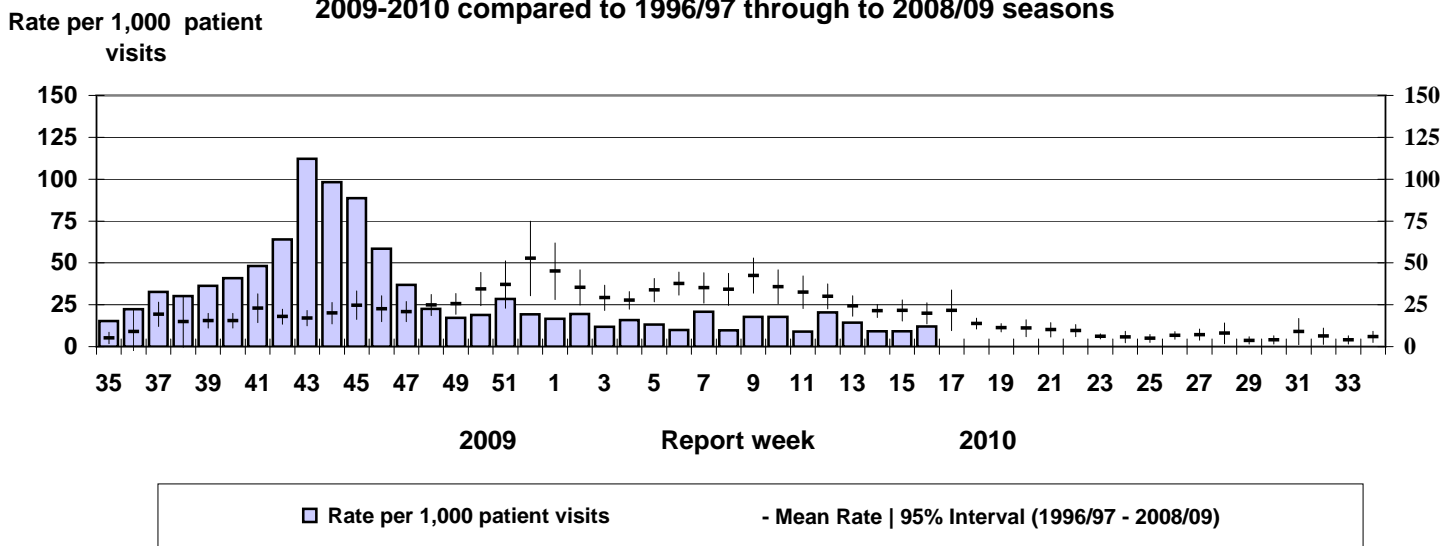


Note that this was the first year that all the provinces and territories were reporting on influenza outbreaks in schools (greater than 10% absenteeism on any day most likely due to ILI) which has increased considerably the total number of outbreaks reported compared to previous years.

ILI consultation rate

During week 16, the national ILI consultation rate was 12.1 consultations per 1,000 patient visits (see ILI graph) which was similar to the previous weeks and still remained below the expected range for this time of year (range from 13.6 to 26.1 consultations per 1,000 patient visits). All reporting provinces and territories had similar or lower ILI consultation rates compared to their respective ILI rates in the previous weeks. Children under 5 years of age had the highest consultation rates (30.2 per 1,000) followed by those over 65 years of age (10.6 per 1,000).

Influenza-like illness (ILI) consultation rates, Canada, by report week, 2009-2010 compared to 1996/97 through to 2008/09 seasons

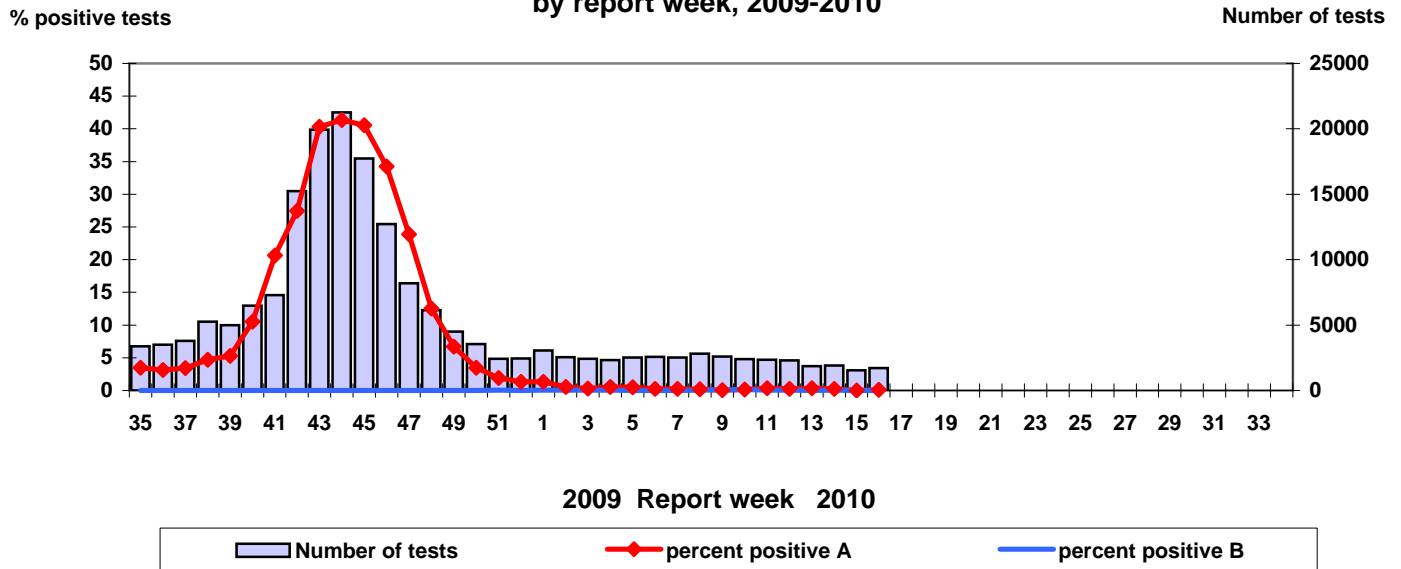


Note: No data available for mean rate in previous years for weeks 19 to 39 (1996-1997 through 2002-2003 seasons). Delays in the reporting of data may cause data to change retrospectively.

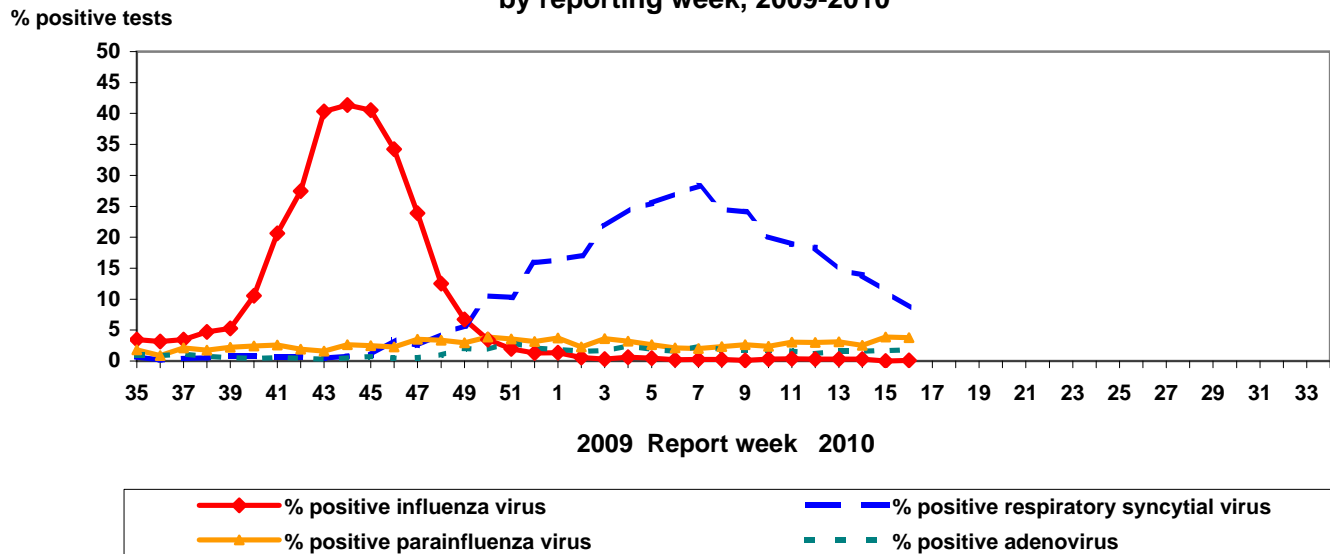
Laboratory Surveillance Summary

The proportion of tests that were positive for influenza during week 16 (0.12%, 2/1,713) was similar compared to the previous week and remained at a very low level for this time of year (see Tests table). The positive specimens were reported as pandemic H1N1 2009. ON and QC were the only provinces to report positive specimens. Note that since August 30, 2009, influenza A/H3N2 detections were highest in QC (85% or 44/52) and influenza B detections were highest in ON (52% or 12/23) and in QC (39% or 9/23). Respiratory syncytial virus detections peaked during week 7 (28.3%) and continued to decline progressively to 8.7% this week. Positive specimens for RSV were reported from all provinces (data not shown). The proportion of positive parainfluenza (3.8%) and adenovirus (1.8%) tests remained low during week 16.

Influenza tests reported and percentage of tests positive, Canada, by report week, 2009-2010



Percent positive influenza tests, compared to other respiratory viruses, Canada, by reporting week, 2009-2010



Weekly & Cumulative numbers of positive influenza specimens by Provincial Laboratories, Canada, 2009-2010

Reporting provinces	Weekly (Apr. 18 to Apr. 24, 2010)						Cumulative (Aug. 30, 2009 to Apr. 24, 2010)					
	Influenza A					B	Influenza A					B
	A Total	A(H1)	A(H3)	Pand H1N1	A (NS)*		A Total	A(H1)	A(H3)	Pand H1N1	A (NS)*	
BC	0	0	0	0	0	0	6382	0	1	5816	565	1
AB	0	0	0	0	0	0	5871	2	5	5763	101	0
SK	0	0	0	0	0	0	2598	0	1	2298	299	0
MB	0	0	0	0	0	0	1915	0	0	1788	127	0
ON	1	0	0	1	0	0	7813	4	0	3562	4247	12
QC	1	0	0	1	0	0	10701	4	44	10651	2	9
NB	0	0	0	0	0	0	1856	1	1	1835	19	0
NS	0	0	0	0	0	0	788	0	0	753	35	1
PE	0	0	0	0	0	0	97	0	0	96	1	0
NL	0	0	0	0	0	0	951	0	0	951	0	0
Canada	2	0	0	2	0	0	38972	11	52	33513	5396	23

Specimens from NT, YT, and NU are sent to reference laboratories in other provinces.

Note: Cumulative data includes updates to previous weeks; due to reporting delays, the sum of weekly report totals do not add up to cumulative totals.

* Not subtyped

Canadian situation

Paediatric and Adult Influenza Hospitalizations and Deaths

In week 16, no laboratory-confirmed influenza-associated paediatric (18 years of age and under) hospitalizations were reported through the Immunization Monitoring Program Active (IMPACT) network. A total of 1327* hospitalizations have been reported since week 17 (April 26, 2009), of which 97.0% were due to pandemic H1N1 2009. Of the 985 paediatric hospitalizations reported since week 17, 43 (4.4%) cases developed bacterial infection (namely bacteremia and pneumonia). Since the beginning of the pandemic, ten paediatric deaths due to pandemic H1N1 2009 were reported through the IMPACT network among children 18 years of age or under. Seven (70%) of those deaths reported had at least one underlying medical condition. The median delay in hospitalization of the pandemic H1N1 2009 cases (time to hospital admission since symptom onset) was 3.0 days, while for fatal cases the delay was slightly higher with 4 days. Please note that since the beginning of the 2009-2010 season IMPACT monitored paediatric hospitalizations among children up to 18 years of age instead of 16 years and under as seen during previous seasons. *Delays in the reporting of data may cause data to change retrospectively.

During week 16, no new laboratory-confirmed influenza-associated adult (16 years of age and older) hospitalizations were reported through the Canadian Nosocomial Infection Surveillance Program (CNISP) from 13 reporting sites. From June 1, 2009 to March 5, 2010, 552 laboratory-confirmed influenza cases among hospitalized adults were reported through 27 of CNISP sentinel sites. Among them, 385 (70%) were pandemic H1N1 2009 cases, 156 (28%) were unsubtype influenza A and the remaining 11 (2%) were either seasonal influenza A/H1N1, influenza A/H3N2 or influenza B. Among the pandemic H1N1 2009 cases, 26% (100/385) were admitted to the ICU and 5% (20/385) died (90% of whom had at least one underlying medical condition). Only 1.3% (5/365) of the pandemic cases developed a bacterial infection. The median delay in hospitalization of the pandemic H1N1 2009 cases (time to hospital admission since symptom onset) was 2.5 days while the median length of stay was 6 days. Please note the total number of CNISP reporting sites fluctuates weekly and most of the reporting sites started surveillance in late fall 2009.

Sale of antivirals (AV)

During week 16, little change in antiviral prescription sales were observed among provinces and territories. A total of 130 new filled antiviral prescriptions were identified during the report week (Tamiflu-172, Relenza-0). Daily and weekly of antiviral data at the Health Region level demonstrated low antiviral prescription rates among all Health Regions for the report week. No Health Regions reported a rate greater than 2.5 antivirals / 1000 other prescriptions.

Antigenic Characterization

Since September 1, 2009, the National Microbiology Laboratory (NML) has antigenically characterized 848 pandemic H1N1 2009 viruses and 17 seasonal influenza viruses (3 seasonal A/H1N1, 10 A/H3N2, and 4 B) that were received from provincial laboratories. Of the 848 pandemic H1N1 2009 viruses characterized, 844 (99.5%) were antigenically related to A/California/7/2009, which is the pandemic reference virus selected by WHO for the pandemic H1N1 2009 vaccine. Four viruses (0.5%) tested showed reduced titer with antisera produced against A/California/7/09. Of the ten seasonal influenza A/H3N2 viruses characterized, two were related to A/Brisbane/10/07 (2009-10 vaccine) and eight viruses were antigenically related to A/Perth/16/09 (2010 -2011 Northern Hemisphere vaccine). Three seasonal influenza A/H1N1 viruses characterized were related to A/Brisbane/59/07 (2009-10 vaccine). Of the four influenza B viruses characterized, two were antigenically related to B/Brisbane/60/08 (2009-10 vaccine). One B virus was related to the previous vaccine virus B/Florida/4/2006 (Yamagata lineage) and one B virus was related to the 2007-2008 vaccine virus B/Malaysia/2506/2004 (Victoria lineage).

Antiviral Resistance

NML/Provinces: Since April 2009, 13 cases of oseltamivir resistant pandemic H1N1 2009 were reported to date in Canada: one in British Columbia, four in Alberta, one in Manitoba, four in Ontario, two in Quebec, and one in New Brunswick. All 13 resistant cases were associated with oseltamivir treatment or prophylaxis.

NML: All pandemic H1N1 2009 viruses tested so far have been sensitive to zanamivir (1055 samples) but resistant to amantadine (1129 samples).

International update

Global information

WHO: As of April 18, 2010, over 214 countries and overseas territories or communities worldwide reported cases of pandemic H1N1 2009 (at least 17,853 deaths). The most active areas of pandemic H1N1 2009 transmission were in parts of West and Central Africa but transmission was also still occurring in South East Asia and Central America. Seasonal influenza type B viruses have been increasingly detected over a larger area and were the predominant circulating influenza viruses across East Asia, Central Africa and Northern and Eastern Europe. Very small numbers of type B viruses have also recently been detected in Central America. Seasonal influenza A/H3N2 was still being detected in South and Southeast Asia (mainly Indonesia), as well as sporadically in several countries of West Africa, and Eastern Europe.

<http://www.who.int/csr/don/2010_04_23a/en/index.html>

Antiviral resistance: As of April 14, 2010, 285 pandemic H1N1 2009 isolates worldwide have been found to be resistant to oseltamivir. All had the same H275Y substitution and were assumed to remain sensitive to zanamivir except one case with reduced susceptibility to zanamivir and oseltamivir due to an amino-acid mutation at position 223 in the neuraminidase. <<http://www.who.int/csr/disease/swineflu/oseltamivirresistant20100416.pdf>>

Geographic update

United States: During week 15, influenza activity decreased in the United States with the majority of states reporting sporadic influenza activity. Localized activity was reported by four states. Of the 1,749 specimens tested for influenza in week 15, 37 (2.1%) were positive for influenza (majority were influenza A and 2 B). All influenza A viruses subtyped were pandemic H1N1 2009. The proportion of deaths attributed to pneumonia and influenza (7.6%) was at the epidemic threshold while the proportion of outpatient visits for ILI (1.1%) remained below baseline levels. <<http://www.cdc.gov/flu/weekly/index.htm>>

Europe: For the sixth consecutive week, all reporting countries experienced low intensity influenza activity and reported sporadic activity at most. Of the 49 positive influenza specimens collected this week, 65% were influenza B. All of the sub-typed influenza A viruses were pandemic H1N1 2009.

<http://ecdc.europa.eu/en/publications/Publications/100423_SUR_Weekly_Influenza_Surveillance_Overview.pdf>

Asia: In East Asia, an increased trend of respiratory disease activity associated with increasing circulation of influenza type B viruses has been reported in the Republic of Korea during the past few weeks. In South and Southeast Asia, the most active areas of transmissions of pandemic influenza were in Malaysia, Singapore, and Thailand. Although pandemic influenza virus was the predominant circulating influenza virus in the region, influenza H3N2 and influenza type B continued to co-circulate in Singapore and Thailand and Indonesia. In contrast to other countries of the area, the predominant virus circulating in Indonesia continued to be influenza A/H3N2, with few detections of influenza type B and pandemic influenza viruses.

<http://www.who.int/csr/don/2010_04_23a/en/index.html>

Africa: In West Africa, available data suggested ongoing community transmission of pandemic influenza virus. Transmission appeared to have peaked in Senegal in February but active, though decreasing, transmission continued in Ghana. Cote d'Ivoire and Niger reported increasing trends of respiratory disease activity but no virological data were available. Influenza type B has been increasingly detected in some countries of central Africa. <http://www.who.int/csr/don/2010_04_23a/en/index.html>

Latin America & the Caribbean: In the tropical zone of the Americas, Ecuador, El Salvador and Guatemala reported increases in respiratory diseases activity. In Guatemala, the number of respiratory disease consultations increased 80% compared to the previous week. Of note, co-circulation of other respiratory viruses, including respiratory syncytial virus (RSV), parainfluenza, and adenovirus has been detected in addition to small numbers of pandemic influenza virus.

<http://www.who.int/csr/don/2010_04_23a/en/index.html>

Australia & New Zealand: In Australia and New Zealand, there is no evidence yet of the start of winter-time community transmission of influenza viruses. Australia has had sporadic detections of pandemic H1N1 viruses and seasonal influenza type B viruses in low numbers. <http://www.who.int/csr/don/2010_04_23a/en/index.html>

FluWatch reports include data and information from the following sources: laboratory reports of positive influenza tests in Canada (National Microbiology Laboratory); sentinel physician reporting of influenza-like illness (ILI); provincial/territorial assessment of influenza activity based on various indicators, including laboratory surveillance, ILI reporting, and outbreaks; influenza-associated paediatric and adult hospitalizations; antiviral sales in Canada; national pandemic H1N1 2009 surveillance; and WHO and other international reports of influenza activity.

Abbreviations: Newfoundland/Labrador (NL), Prince Edward Island (PE), New Brunswick (NB), Nova Scotia (NS), Quebec (QC), Ontario (ON), Manitoba (MB), Saskatchewan (SK), Alberta (AB), British Columbia (BC), Yukon (YT), Northwest Territories (NT), Nunavut (NU).

ILI definition for the 2009-2010 season

ILI in the general population: Acute onset of respiratory illness with fever and cough and with one or more of the following - sore throat, arthralgia, myalgia, or prostration which could be due to influenza virus. In children under 5, gastrointestinal symptoms may also be present. In patients under 5 or 65 and older, fever may not be prominent.

Definitions of ILI/Influenza outbreaks for the 2009-2010 season

Schools: greater than 10% absenteeism on any day most likely due to ILI.

Hospitals and residential institutions: two or more cases of ILI within a seven-day period, including at least one laboratory confirmed case. Institutional outbreaks should be reported within 24 hours of identification. Residential institutions include but not limited to long-term care facilities (LTCF), prisons.

Other: two or more cases of ILI within a seven-day period, including at least one laboratory confirmed case; i.e. workplace, closed communities.

Influenza Activity levels are defined as:

1 = No activity: i.e. no laboratory-confirmed influenza detections during the past four weeks, however, sporadically occurring ILI may be reported

2 = Sporadic: sporadically occurring ILI and lab confirmed influenza* with NO outbreaks detected within the influenza surveillance region†

3 = Localized: sporadically occurring ILI and lab confirmed influenza* together with outbreaks of ILI in schools and worksites or laboratory confirmed influenza in residential institutions occurring in less than 50% of the influenza surveillance region(s)†

4 = Widespread: sporadically occurring ILI and lab confirmed influenza* together with outbreaks of ILI in schools and worksites or laboratory confirmed influenza in residential institutions occurring in greater than or equal to 50% of the influenza surveillance region(s)†

* confirmation of influenza within the surveillance region at any time within the prior four weeks

† sub-regions within the province or territory as defined by the provincial/territorial epidemiologist

We would like to thank all the Fluwatch surveillance partners who are participating in this year's influenza surveillance program.

This report is available on the Public Health Agency website at the following address: <http://www.phac-aspc.gc.ca/fluwatch/index.html>. Ce rapport est disponible dans les deux langues officielles. Pour en recevoir un exemplaire dans l'autre langue chaque semaine, veuillez communiquer avec Estelle Arseneault, Division de l'immunisation et des infections respiratoires au (613) 998-8862.