



MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH
WEEKLY INFLUENZA UPDATE
December 23, 2009

All data in this report are preliminary and subject to change as more information is received.

Sentinel Provider Surveillance: Influenza-like illness activity

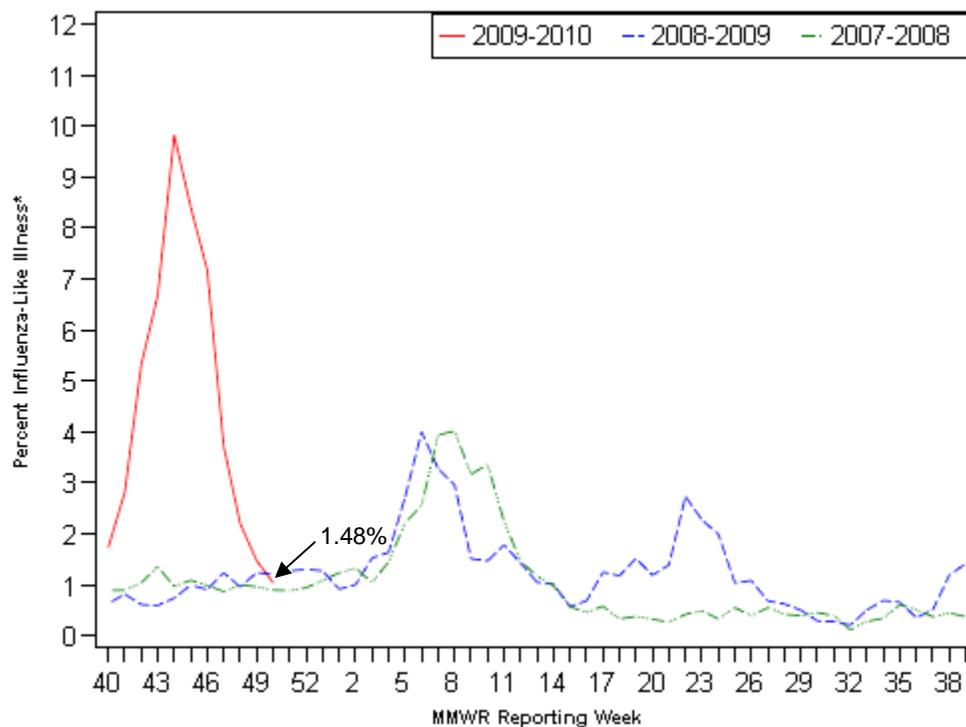
Week 50 activity level: Local

Provider offices across the US report the amount of influenza-like illness (ILI) they see in their patients each week during regular flu season. These doctors' offices are called 'sentinel sites'. Here we present Massachusetts sentinel site data. Please note that the data do not represent only confirmed influenza cases, but also those just with ILI. ILI is defined as fever above 100.0² in addition to either cough or sore throat. ILI is a marker of influenza and is used throughout the regular influenza season to monitor influenza since most people are not tested for influenza. Figure 1 shows that after an intense peak of activity associated with circulation of 2009 H1N1, ILI has continued to decrease dramatically and is in line with what is normally seen at this time of year.

¹ <http://www.cdc.gov/h1n1flu/update.htm>

² Per CDC definition for influenza-like illness: <http://www.cdc.gov/h1n1flu/casedef.htm>

Figure 1: Percentage of ILI visits reported by sentinel provider sites



*Influenza-like illness (ILI, defined by fever >100F and cough and/or sore throat), as reported by Massachusetts sentinel surveillance sites.

Table 1 below shows a geographical distribution of reported ILI in Massachusetts. Table 1 shows that in contrast to previous weeks, the majority of regions are only seeing low-level ILI activity, none are highly elevated.

Table 1: Percent ILI reported weekly by Massachusetts sentinel sites

	2009-2010			2008-2009		
	%ILI	Report. Sites	Total enroll.	%ILI	Report. Sites	Total enroll.
Boston	0.36	2	7	0.88	4	5
Central	1.64	4	12	1.70	6	8
Inner Metro Boston	0.78	4	9	1.02	3	2
Northeast	1.91	7	12	0.87	8	9
Outer Metro Boston	1.69	1	4	3.58	2	2
Southeast	0.00	2	6	0.85	6	6
West	1.23	5	9	1.27	8	10

Automated Epidemiologic Geotemporal Integrated Surveillance System (AEGIS)

Flu Data

The AEGIS System is the syndromic surveillance system for MDPH, and performs automated, real-time surveillance for infectious disease outbreaks. As an adaptation of the AEGIS surveillance system, AEGIS Flu is designed to provide early warning of influenza epidemics and pandemics. With special focus on demographic and spatial patterns of illness, AEGIS Flu provides automated, real-time surveillance of influenza rates, location, and spread. Emergency department (ED) ILI data are collected from 19 hospitals in Massachusetts. Visits from emergency departments can be affected by several factors, including how worried people are about the flu, whether people can see their own doctor, media announcements, etc. The data are most useful for following trends over several days or weeks. In Figure 2 below, we can see current rates of total visits to emergency departments in MA due to flu-like symptoms compared to historical trends. Similar to Massachusetts Sentinel Site data, AEGIS data suggests a dramatic decrease in influenza-like illness in recent weeks. The case for the slight upturn at the end is not known at this time, though it may be influenced by the circulation of many other respiratory illnesses common at this time of year.

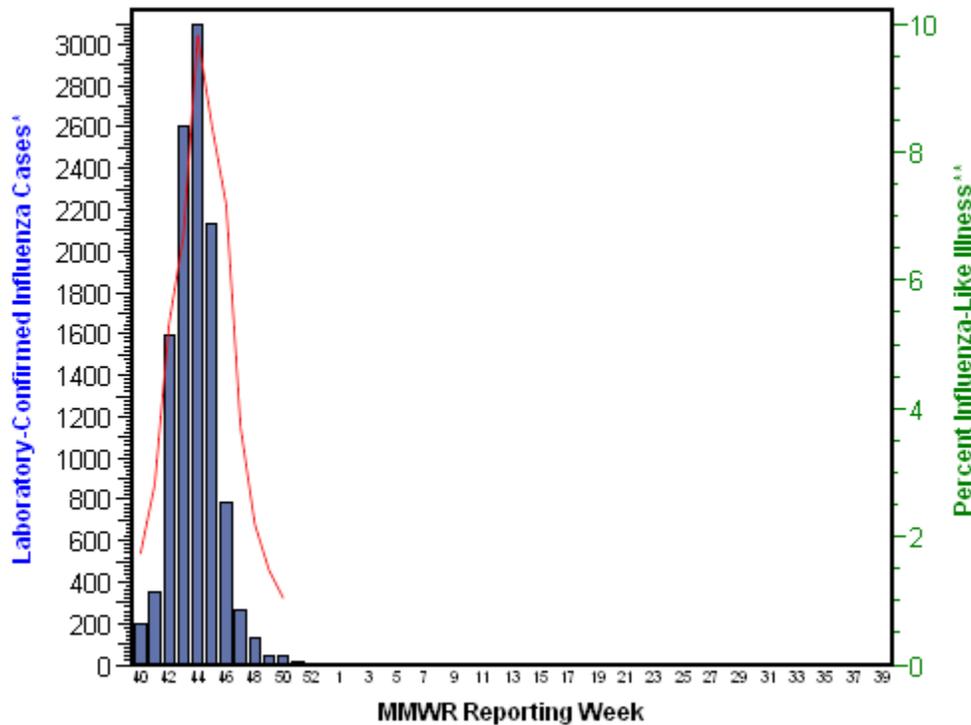
Figure 2: Percentage of Total Visits to MA Emergency Departments Due to Flu-Like Symptoms



Laboratory testing for influenza

The William A. Hinton State Laboratory Institute has been doing confirmatory testing of H1N1 since mid-April, which is typically the late part of the influenza season. The number of 'confirmed' cases does not reflect the overall incidence of H1N1 flu. The majority of cases are not tested. This is true during seasonal flu as well. Below are two tables reflecting current laboratory data.

Figure 3: Laboratory-confirmed Influenza Cases and Influenza-like Illness Massachusetts, October 4, 2009 - December 23, 2009



*Influenza cases confirmed via viral culture, PCR or rapid test by specimen collection date.

**Influenza-like illness (ILI, defined as fever >100F and cough and/or sore throat), as reported by Massachusetts sentinel surveillance sites by CDC week date.

Figure 4 summarizes the testing conducted at the HSLI since MMWR week 35 or the week ending September 5, 2009. On October 1, 2009 influenza B testing resumed in preparation for the start of the 2009-2010 season (MMWR wk 40); the first influenza B result for the new season was reported on October 22, 2009 of MMWR week 42 as indicated in Table 2. There have been no positive specimens for seasonal influenza A since early June 2009. The majority of specimens tested at the HSLI continue to be novel influenza A (H1N1) 2009 virus as indicated in Figure 4 and Table 2. Complete strain surveillance testing for seasonal influenza A/H1, A/H3, and influenza A (H1N1) 2009 virus occurred throughout the 2009 summer with the exception of influenza B testing which resumed MMWR week 40. The number of confirmed influenza specimens continues to decline in parallel with regional and national data.

Antiviral resistance surveillance of five confirmed influenza A (2009) virus samples per week is ongoing as of October 24, 2009, and is part of CDC's national antiviral surveillance screening program. Surveillance samples are being tested for presence of oseltamivir resistance by evaluating a point mutation in the N1 NA gene target, which results in a histidine replaced by tyrosine at residue 275 (H275Y) in the NA protein. To date there has been one specimen from MA with this mutation conferring oseltamivir-resistance.

Virus surveillance of five or more representative influenza samples every two weeks is ongoing as of July 20, 2009 and is part of the CDC's national viral surveillance program. Specimens representing all influenza types are submitted to CDC for antigenic characterization by hemagglutination inhibition (HI), genetic analysis (sequencing) and sensitivity to FDA-approved drugs. Currently, all novel influenza A (H1N1) 2009 virus samples from MA have been characterized as A/California/07/2009-like (H1N1)v. The influenza B isolate from MA has been characterized as B/Brisbane/60/2008-like.

Figure 4: Influenza positive tests reported to CDC by HSLI, August-November 2009

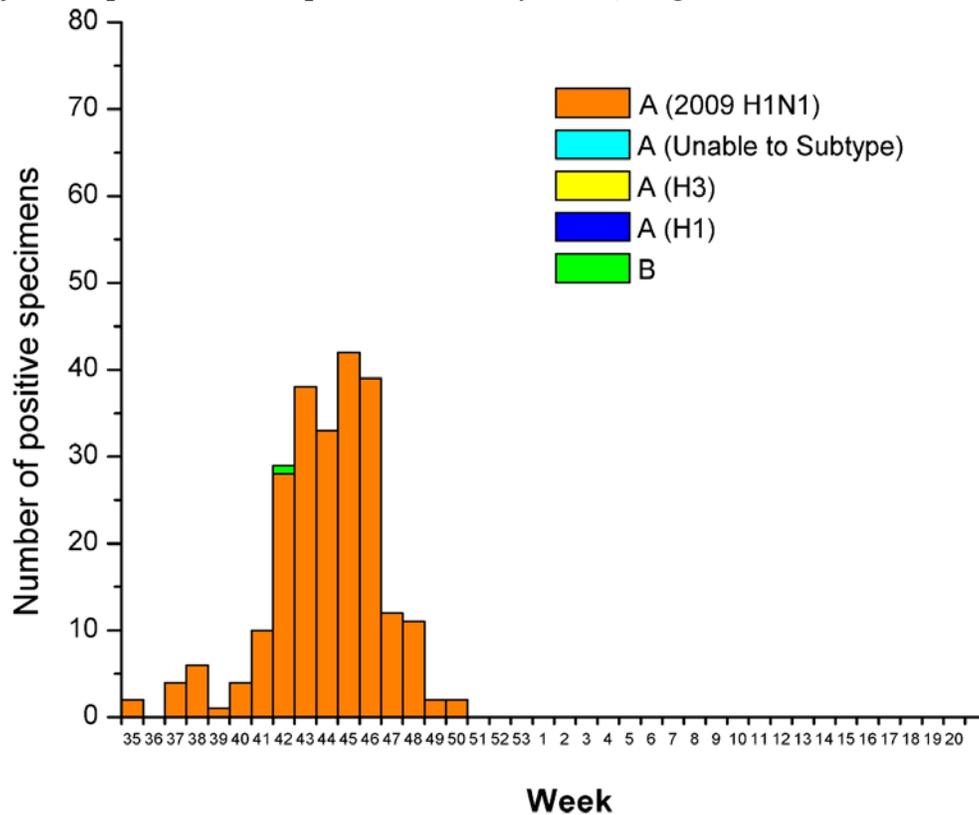


Table 2: Weekly Summary of HSLI Influenza Surveillance Test Results

2009-2010 Season: Influenza Surveillance William A. Hinton State Laboratory Institute								
MMWR Week: (Specimen Collected)	Seasonal Influenza A H1/N1	Seasonal Influenza A H3/N2	Influenza B	Swine- Origin Influenza A H1N1	Negative for Influenza	% Swine- Origin Influenza A H1N1	% Seasonal Influenza	Total Tested
40 (10/4-10/10/09)	0	0	0	4	17	19	0	21
41 (10/11-10/17/09)	0	0	0	10	18	36	0	28
42 (10/18-10/24/09)	0	0	1	28	34	44	1.6	64
43 (10/25-10/31/09)	0	0	0	38	38	48	0	79
44 (11/01-11/07/09)	0	0	0	33	37	46	0	71
45 (11/08-11/14/09)	0	0	0	42	30	58	0	72
46 (11/15-11/21/09)	0	0	0	39	42	48	0	81
47 (11/22-11/28/09)	0	0	0	12	33	25	0	48
48 (11/29-12/5/09)	0	0	0	11	21	32	0	34
49 (12/6-12/12/09)	0	0	0	2	12	14	0	14
50 (12/13-12/19/09)	0	0	0	2	10	17	0	12
Total	0	0	1	221	292	42	<1	524

2009 H1N1 influenza

As of December 23, 2009, 1885 confirmed cases of H1N1 have been reported throughout Massachusetts since April of 2009. The 2009-2010 influenza season officially started on October 4, 2009. Table 3 below represents H1N1 cases that have been confirmed in MA since October 4, 2009; the final column of this table is the number of cases of seasonal and influenza of unknown type, also since October 4. Table 4 shows the cumulative H1N1 cases that have been confirmed in MA since April 26, 2009. Both tables are updated weekly. The Centers for Disease Control and Prevention (CDC) is no longer reporting the national total of confirmed cases of H1N1 and is instead focusing on hospitalized cases and deaths. Nationally, influenza-like illness (ILI) continues to decrease. Please visit the CDC's website for up-to-date information (www.cdc.gov/h1n1).

Table 3. Confirmed Influenza cases in Massachusetts, October 4, 2009 - December 23, 2009

	H1N1: Age group (N)	H1N1: Pregnant (N)	H1N1: Hospitalized (N)	H1N1: Deaths (N)	Seasonal and Untyped Influenza by Age Group (N)
0-4 years	92	0	52	2	1673
5-12 years	101	0	58	0	3826
13-18 years	74	0	26	0	2016
19-25 years	78	3	10	0	927
26-44 years	45	3	14	2	1303
45-64 years	58	0	30	5	875
65+ years	20	0	13	6	169
Unknown	0	0	0	0	141
TOTAL	468	6	203	14	10930

Table 4. Confirmed H1N1 cases in Massachusetts, April 26, 2009 - December 23, 2009

	Age group (N)	Age group (%)	Female (%)	Pregnant (N)	Hospitalized (N)	Hospitalized (%)	Deaths (N)
0-4 years	292	15.5	40.41	0	87	29.79	2
5-12 years	496	26.3	40.12	0	89	17.94	0
13-18 years	365	19.4	49.32	6	45	12.33	1
19-25 years	219	11.6	63.01	21	27	12.33	2
26-44 years	273	14.5	66.30	33	45	16.48	5
45-64 years	201	10.7	56.22	0	65	32.34	10
65+ years	37	1.96	67.57	0	22	59.46	6
Unknown	2	0.11	50.00	0	0	0	0
TOTAL	1885	~~	50.66	60	380	20.16	26

As shown in Table 4 above, school-aged individuals (5-18 years) have been primarily affected by H1N1, with over 61% of cases age 18 or younger. The median age of cases is 13 and cases ranged from 0 to 92 years. To date, males and females have been equally impacted by H1N1. Overall, 380 cases have been hospitalized (20%), which is similar to the national hospitalization rate of 11% as of July 10, and 26 cases have died. Of the 26 deaths, 22 had underlying conditions.