



**MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH**  
**WEEKLY INFLUENZA UPDATE**  
**December 10, 2009**

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

**Sentinel Provider Surveillance: Influenza-like illness activity**

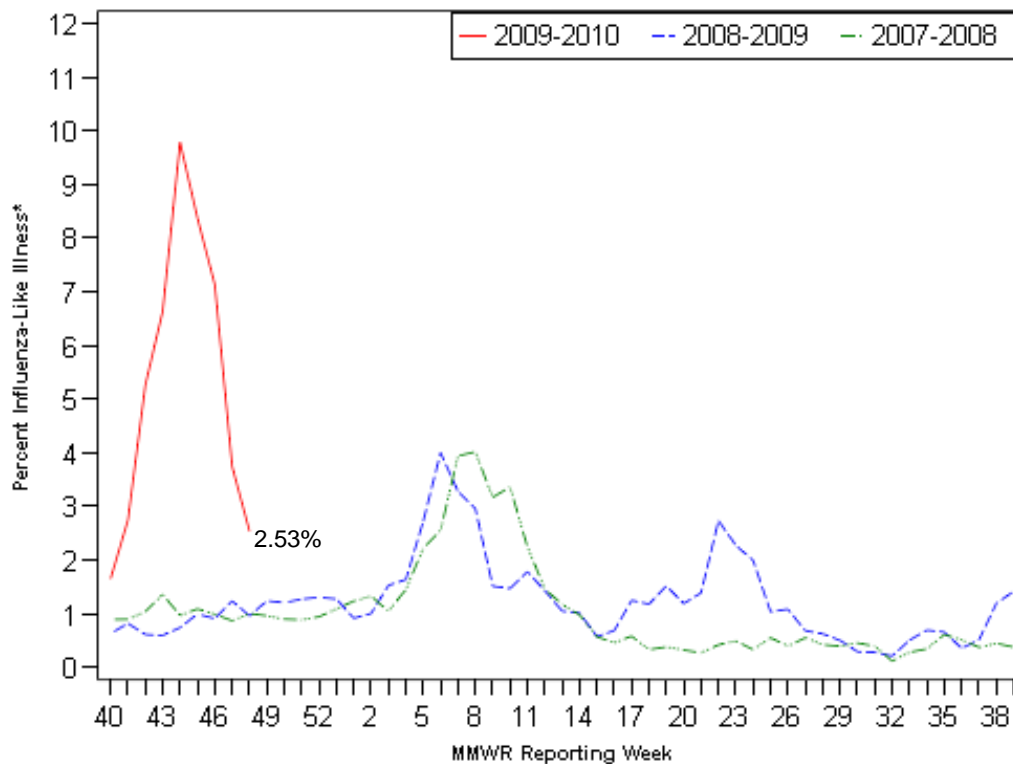
Week 48 activity level: Regional

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 100.0<sup>2</sup> 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 a steep decline in influenza activity over the past few weeks; however, the percentage of ILI visits being reported remains higher than what was seen during the two previous seasons of influenza.

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

<sup>2</sup> 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 ILI levels vary throughout the state, with the majority of regions still reporting elevated ILI.

**Table 1: Percent ILI reported weekly by Massachusetts sentinel sites**

|                           | 2009-2010 |               |               | 2008-2009 |               |               |
|---------------------------|-----------|---------------|---------------|-----------|---------------|---------------|
|                           | %ILI      | Report. Sites | Total enroll. | %ILI      | Report. Sites | Total enroll. |
| <b>Boston</b>             | 1.44      | 4             | 7             | 1.23      | 4             | 5             |
| <b>Central</b>            | 2.43      | 6             | 12            | 2.36      | 6             | 8             |
| <b>Inner Metro Boston</b> | 1.91      | 4             | 9             | 0.35      | 2             | 2             |
| <b>Northeast</b>          | 2.35      | 6             | 12            | 0.78      | 8             | 9             |
| <b>Outer Metro Boston</b> | 5.21      | 2             | 4             | 0.96      | 2             | 2             |
| <b>Southeast</b>          | 0.75      | 3             | 6             | 0.88      | 6             | 6             |
| <b>West</b>               | 3.16      | 6             | 9             | 1.03      | 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 continuous decline in influenza-like illness in recent weeks.

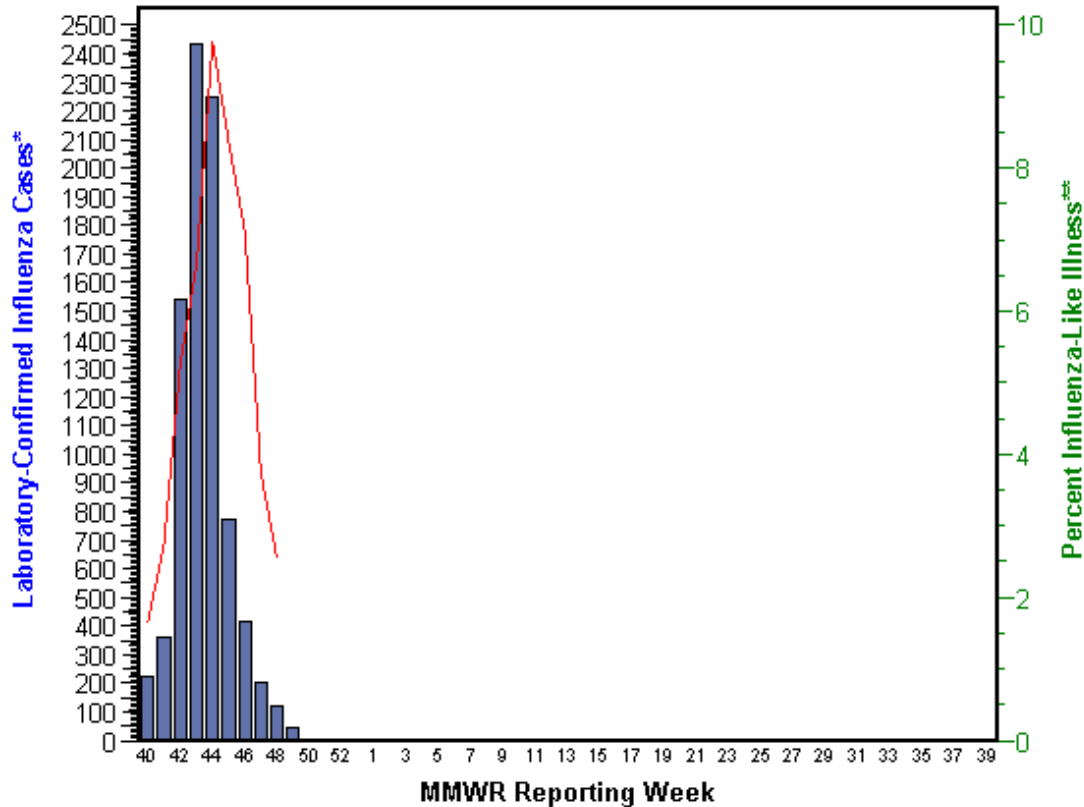
**Figure 2: Percentage of Total Visits to MA Emergency Departments Due to Flu-Like Symptoms**



## 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 10, 2009**



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

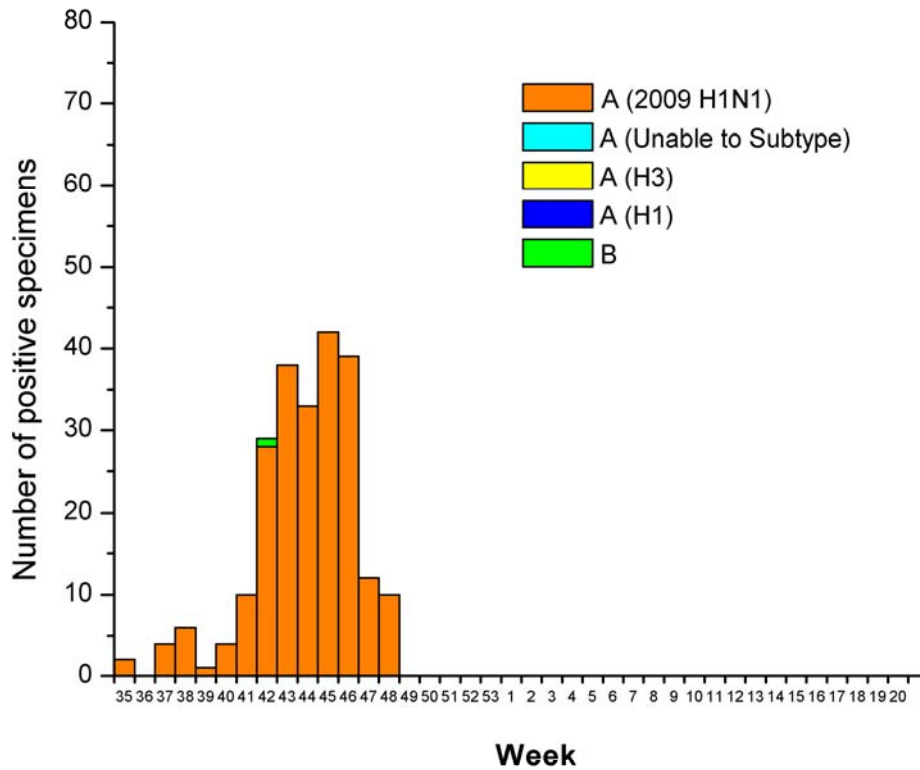
\*\*Influenza-like illness (ILI, defined as fever >100F and cough and/or sore throat), as reported by Massachusetts sentinel surveillance sites by CDC week date.

Figure 4 summarizes the testing conducted at the HSLI since MMWR week 35 or 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 decrease, although less abruptly, 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. No oseltamivir resistant viruses have been detected to date in MA.

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, which is covered by the 2009-2010 seasonal influenza vaccine.

**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<br>William A. Hinton State Laboratory Institute |                            |                            |             |                               |                        |                                 |                      |              |
|--|----------------------------|----------------------------|-------------|-------------------------------|------------------------|---------------------------------|----------------------|--------------|
| MMWR Week:<br>(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           | 40                            | 30                     | 57                              | 0                    | 70           |
| 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           | 10                            | 19                     | 33                              | 0                    | 30           |
| <b>Total</b>   | <b>0</b>                   | <b>0</b>                   | <b>1</b>    | <b>216</b>                    | <b>268</b>             | <b>44</b>                       | <b>&lt;1</b>         | <b>494</b>   |

### **2009 H1N1 influenza**

As of December 10, 2009, 1887 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](http://www.cdc.gov/h1n1)).

***Table 3. Confirmed Influenza cases in Massachusetts, October 4, 2009 - December 10, 2009***

|              | <b>H1N1:<br/>Age<br/>group<br/>(N)</b> | <b>H1N1:<br/>Pregnant<br/>(N)</b> | <b>H1N1:<br/>Hospitalize<br/>d (N)</b> | <b>H1N1:<br/>Deaths<br/>(N)</b> | <b>Seasonal<br/>and<br/>Untyped<br/>Influenza<br/>by Age<br/>Group<br/>(N)</b> |
|--------------|--|-----------------------------------|--|---------------------------------|--|
| 0-4 years    | 91                                     | 0                                 | 52                                     | 2                               | 1102   |
| 5-12 years   | 101                                    | 0                                 | 53                                     | 0                               | 2675   |
| 13-18 years  | 76                                     | 0                                 | 26                                     | 0                               | 1550   |
| 19-25 years  | 80                                     | 3                                 | 9                                      | 0                               | 737  |
| 26-44 years  | 45                                     | 3                                 | 12                                     | 1                               | 1021   |
| 45-64 years  | 57                                     | 0                                 | 31                                     | 5                               | 680  |
| 65+ years    | 20                                     | 0                                 | 13                                     | 5                               | 130  |
| Unknown      | 0                                      | 0                                 | 0                                      | 0                               | 107  |
| <b>TOTAL</b> | <b>470</b>                             | <b>6</b>                          | <b>196</b>                             | <b>13</b>                       | <b>8002</b>  |

***Table 4. Confirmed H1N1 cases in Massachusetts, April 26, 2009 - December 10, 2009***

|              | <b>Age<br/>group<br/>(N)</b> | <b>Age<br/>group<br/>(%)</b> | <b>Female<br/>(%)</b> | <b>Pregnant<br/>(N)</b> | <b>Hospitalize<br/>d (N)</b> | <b>Hospitalize<br/>d (%)</b> | <b>Deaths<br/>(N)</b> |
|--------------|------------------------------|------------------------------|-----------------------|-------------------------|------------------------------|------------------------------|-----------------------|
| 0-4 years    | 291                          | 15.4                         | 39.86                 | 0                       | 87                           | 29.90                        | 2                     |
| 5-12 years   | 496                          | 26.3                         | 39.92                 | 0                       | 84                           | 16.94                        | 0                     |
| 13-18 years  | 367                          | 19.4                         | 49.86                 | 6                       | 45                           | 12.26                        | 1                     |
| 19-25 years  | 221                          | 11.7                         | 62.44                 | 21                      | 26                           | 11.76                        | 2                     |
| 26-44 years  | 273                          | 14.5                         | 65.93                 | 33                      | 43                           | 15.75                        | 4                     |
| 45-64 years  | 200                          | 10.6                         | 57.00                 | 0                       | 66                           | 33.00                        | 10                    |
| 65+ years    | 37                           | 1.96                         | 67.57                 | 0                       | 22                           | 59.46                        | 6                     |
| Unknown      | 2                            | 0.11                         | 50.00                 | 0                       | 0                            | 0                            | 0                     |
| <b>TOTAL</b> | <b>1887</b>                  | <b>~~</b>                    | <b>50.61</b>          | <b>60</b>               | <b>373</b>                   | <b>19.77</b>                 | <b>25</b>             |

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 15 and cases range from 0 to 92 years. To date, males and females have been equally impacted by H1N1. Overall, 373 cases have been hospitalized (20%) and 25 cases have died. Of the 25 deaths, 22 had underlying conditions.