



STATE OF NEW HAMPSHIRE
DEPARTMENT OF HEALTH AND HUMAN SERVICES
DIVISION OF PUBLIC HEALTH SERVICES



**2013-14 Influenza Season
Summary Report for New Hampshire
September 29, 2013 – May 17, 2014**

In New Hampshire (NH), influenza is not a reportable disease, but surveillance systems are in place to help determine the extent of influenza morbidity and mortality in the State. During each influenza season (beginning of October through mid-May), a weekly influenza surveillance report is posted on the NH Department of Health and Human Services' website at the following link: <http://www.dhhs.nh.gov/dphs/cdcs/influenza/activity.htm>. In addition, a weekly assessment of influenza activity in NH is submitted to the Centers for Disease Control and Prevention for inclusion in the weekly U.S. influenza surveillance report.

This report summarizes outpatient illness surveillance data reported by NH participants in the U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet) and by the Automated Hospital Emergency Department Data (AHEDD) system, virologic surveillance data from the NH Public Health Laboratories, and pneumonia and influenza mortality data from the NH Division of Vital Records Administration.

Outpatient Illness Surveillance

The two components of outpatient illness surveillance in NH are as follows:

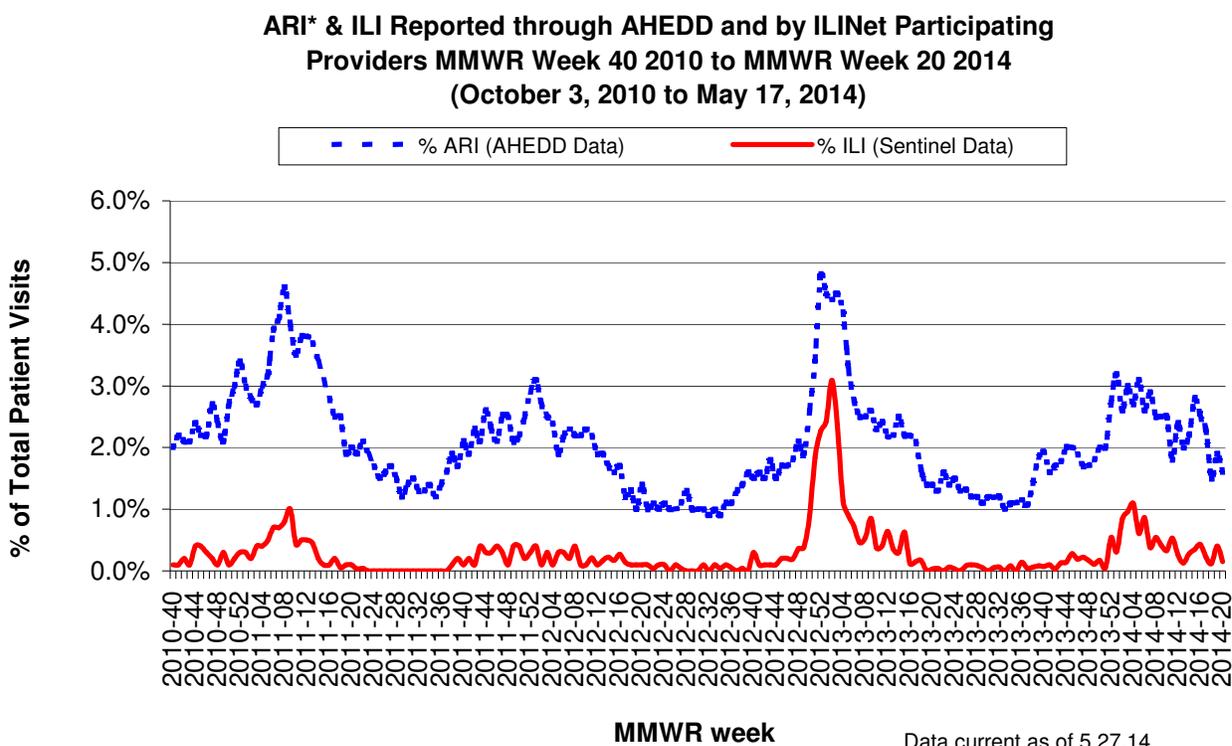
1. U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet): Beginning in 1997, NH has participated in this collaborative effort between the Centers for Disease Control and Prevention, state and local health departments, and health care providers. For the 2013-14 influenza season, 32 NH health care providers participated. ILINet sentinel providers report the proportion of patients who present with influenza-like illness (ILI) on a weekly basis, stratified into five age groups. ILI is defined as 1) a fever and 2) cough and/or sore throat, in the absence of a known cause. Sentinel providers are also asked to collect respiratory specimens from select patients and submit them to the PHL for viral subtyping.
2. The AHEDD system: This system is a collaborative effort between NH acute care hospitals and the NH DHHS. The goal is for all 26 acute care hospitals in the State to participate in this system. For the 2013-14 influenza season, 25 hospitals electronically transmitted real-time data from emergency department encounters throughout the day to NH DHHS. Chief complaint text within the system is queried for complaints of acute respiratory illness (ARI) in patients seen in emergency departments. While ARI includes encounters that fit the definition of ILI above, it also includes encounters for complaints such as acute bronchitis or otitis media. Because these two systems collect information using different methods and represent different patient populations, it is expected that the proportions of ILI and ARI seen in these systems will differ. However, the overall trend of activity is expected to be similar.

For the 2013-14 season, reported ILI activity in NH reached its highest levels during MMWR weeks 3 and 4 (weeks ending January 18th and 25th 2014, respectively), when 1.0 - 1.1% of patient visits to NH ILINet providers were from patients presenting with ILI. The highest levels of ARI reported through the AHEDD system were during weeks 1 through 5 (weeks ending

January 4th through February 1st) when 2.6 – 3.2% of patient encounters in hospital emergency departments were due to ARI.

Using percent ARI and ILI together as indicators for when flu activity was highest, activity for the 2013-14 season peaked during week 3, when ARI and ILI were at 3.0% and 1.0%, respectively, which is similar but slightly later when compared to the previous 2012-13 season when highest activity was observed during week 52 (however, peaks for both seasons occurred much earlier than what is typically seen for most seasons). The 2013-14 season was not as intense as the previous 2012-13 season, as indicated by comparing the peaks for ARI and ILI. For example during the 2012-13 season ARI and ILI peaked at 4.8% and 3.1%, respectively. See Figure 1 below for ILI and ARI reported in the past four influenza seasons.

Figure 1: Acute Respiratory Illness (ARI) & Influenza-like Illness (ILI) as a Percentage of Total Patient Visits Reported through the Automated Hospital Emergency Department Data (AHEDD) System and by NH ILINet Providers, 10/03/10 - 5/17/14



Reported Influenza-like Illness (ILI) by Age Group & Practice Type

During the 2013-14 influenza season, persons in the 5-24 year age group accounted for the greatest percentage (44%) of patients presenting with ILI reported by NH ILINet providers, followed by the 25-49 year age group (24%). The next highest percentage ILI by age category was in the 50-64 year age group (14%) followed by the 0-4 year age group (12%), then the 65-plus year age group (6%). The percentages of ILI cases by age categories were observed to follow a similar ranking when compared to the 2012-13 season with the exception of the 0-4 and 50-64 year age groups, which reversed rankings for 3rd and 4th. For example the 0-4 year group decreased from 14% to 12%, and the 50-64 year old group increased from 12% to 14%. Reported ILI by age groups for the 2013-14 influenza season is shown in Figure 2 and Table 1 below.

Each year there are typically some changes in NH healthcare providers who participate in the U.S. ILINet program. For the 2013-14 influenza season there were 32 providers enrolled in the ILINet program, similar to the previous season which had 33. Twenty-seven (84%) of the 32 providers reported on a regular basis throughout the season. The majority were family practice offices, where patients of all ages are seen.

Figure 2: Influenza-like Illness (ILI) by Age Group and Practice Type as Reported by NH ILINet Providers, 2013-14 Influenza Season (9/29/13 – 5/17/14)

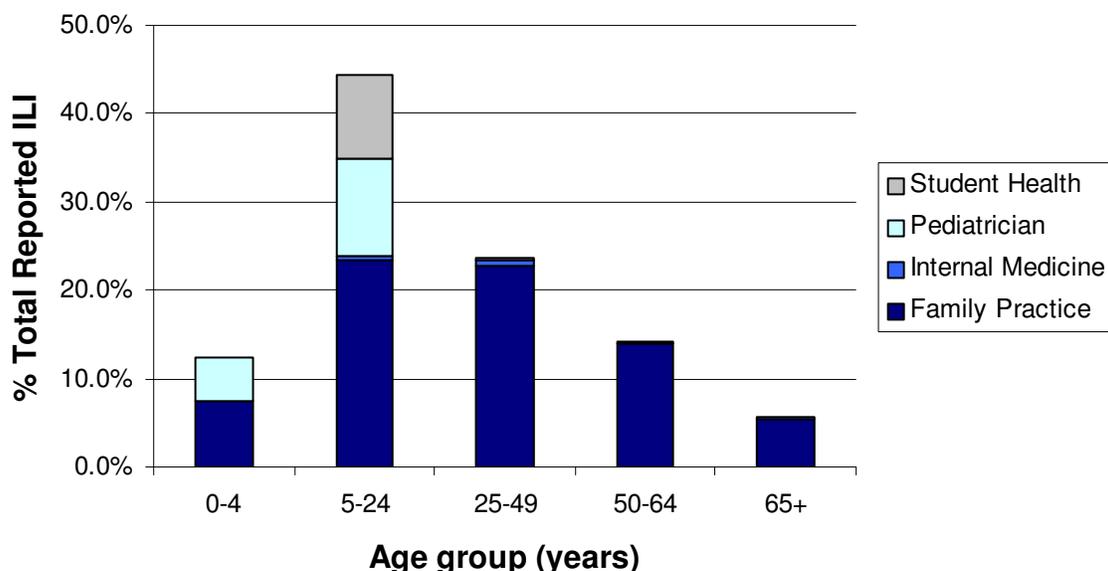


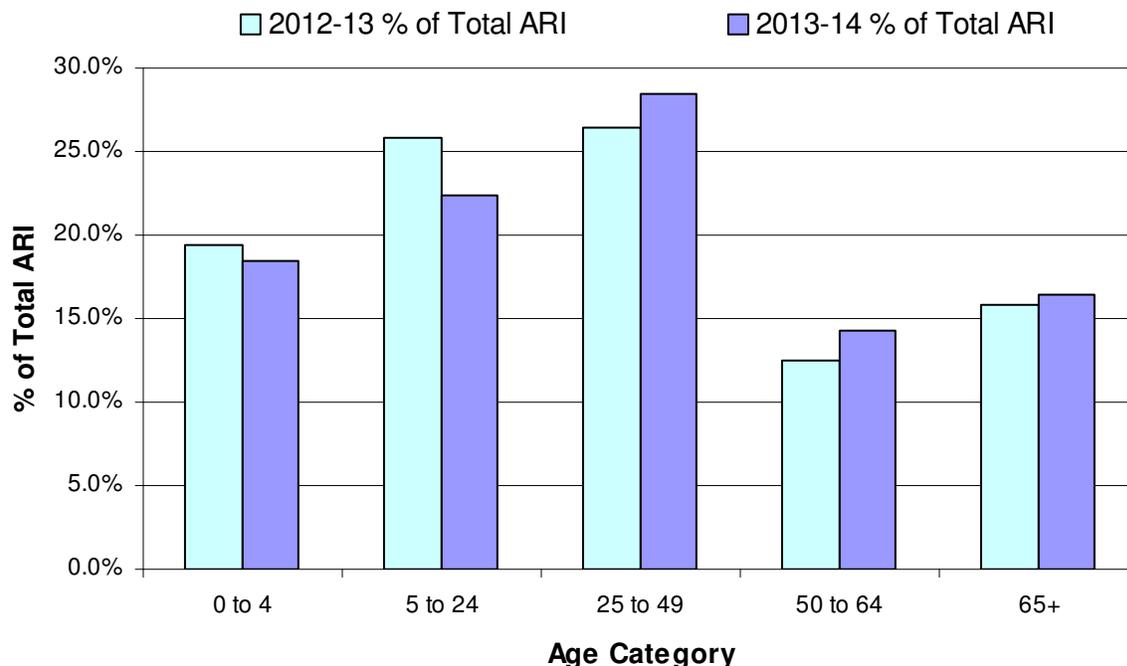
Table 1: Patient Visits for Influenza-like Illness (ILI) by Age Group and Practice Type, NH ILINet Providers, 2013-14 Influenza Season (9/29/13 – 5/17/14)

Practice type	Age Group (years)					Total ILI	Total Patient Visits
	0-4	5-24	25-49	50-64	65+		
Family Practice	33	104	101	62	24	324	102,725
Internal Medicine	0	2	3	1	1	7	5,014
Pediatrics	22	50	0	0	0	72	14,784
Student Health	0	42	1	0	0	43	12,571
Total	55	198	105	63	25	446	135,094

Reported Acute Respiratory Illness (ARI) by Age Group

In the 2013-14 influenza season, persons in the 25-49 year age group accounted for the largest percent (28.4%) of all ARI encounters in hospital emergency departments (see Figure 3 below) followed by age groups 5-24 (22.4%), 0-4 (18.5%), 65-plus (16.4%), and 50-64 (14.3%). As seen in Figure 3 the percentage distributions by age category were similar to the previous 2012-13 influenza season, only with a noticeable decrease observed for composition of total ARI made up by the 5-24 year age group and slight increases observed in the 25-49 and 50-64 year age categories.

Figure 3: Acute Respiratory Illness (ARI) by Age Group as Reported by NH Automated Hospital Emergency Department Data (AHEDD) System, 2013-14 Influenza Season (9/29/13 – 5/17/14) (N = 8,097 ARI encounters) and 2012-13 Influenza Season (9/30/12 – 5/18/13; N = 11,793 ARI encounters)

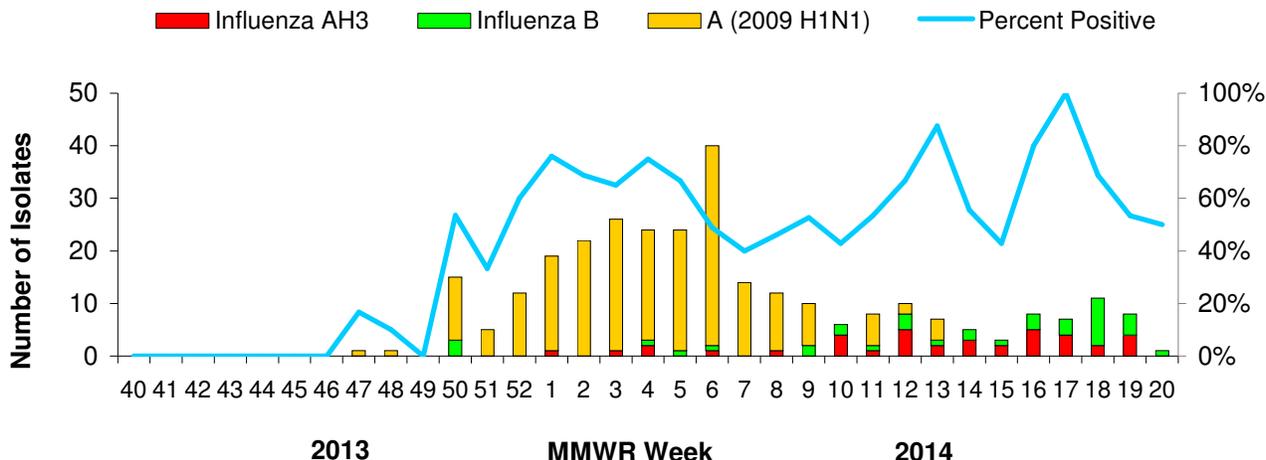


Laboratory Surveillance

The NH Public Health Laboratories (PHL) receives respiratory specimens for influenza testing from ILINet providers, as well as other health care providers and hospitals throughout the State. Testing is important to identify circulating influenza viral subtypes, and to confirm specimens that test positive by rapid test. Typically, a large majority of specimens submitted to the PHL have previously tested positive by rapid test in health care provider offices or hospital laboratories. Therefore, it is expected that a high percent of specimens received by the PHL for influenza testing will be positive. This was observed in the previous 2010-11, 2011-12, and 2012-13 seasons when 42%, 40%, and 59% of total submitted specimens, respectively, tested positive. During the 2013-14 season 54% (n=299) of 555 total specimens submitted tested positive for influenza.

The number of positive specimens and subtypes reported for each MMWR week of the 2013-14 season is shown in Figure 4. The first positive specimens were detected at the start of the flu season during MMWR week 47 in the middle of November, when one specimen tested positive for 2009 influenza A (H1N1). This is in line with the typical time frame when positive specimens are first observed during a regular flu season (e.g., first positive specimens was reported during weeks 40 and 52 during the previous 2012-13 flu season and 2011-12 flu seasons, respectively). The chart depicts a clear peak for the number of positive specimens during week 6 (first week of February) of 2014 which is consistent with other regular flu seasons when the highest number of positives tend to occur in the month of February (e.g., typically during weeks 6 through 9). The peak week for positive specimens (week 6) is three weeks away of the peak week for combined ARI and ILI activity (week 3), and is comparable with what is normally observed over past regular flu seasons.

Figure 4: Influenza Virus Isolates, by Viral Subtype, NH Public Health Laboratories, 2013-14 Influenza Season (9/29/13 – 5/17/14) (N = 299)



The three different viral subtypes that circulated in NH during the 2013-14 influenza season are presented in table 2. Positive isolates consisted of 74.6% 2009 influenza A (H1N1), 12.7% influenza A (H3), and 12.7% influenza B. In comparison during NH's 2012-13 season positive isolates consisted of 2% 2009 influenza A (H1N1), 88% influenza A (H3), and 10% influenza B. Compared to the previous 2012-13 season a much higher percentage of specimens tested positive for 2009 influenza A (H1N1), a 7-fold lower percent was positive for influenza A (H3), while a similar percentage was positive for influenza B. Starting at week 14 (i.e., late March/early April) the composition of positive specimens switched to entirely influenza A (H3) and B (i.e., no 2009 influenza A (H1N1) was detected from week 14 through 20).

Table 2: Results of Specimens Received by NH Public Health Laboratories, 2013-14 Influenza Season (9/29/13 – 5/17/14)

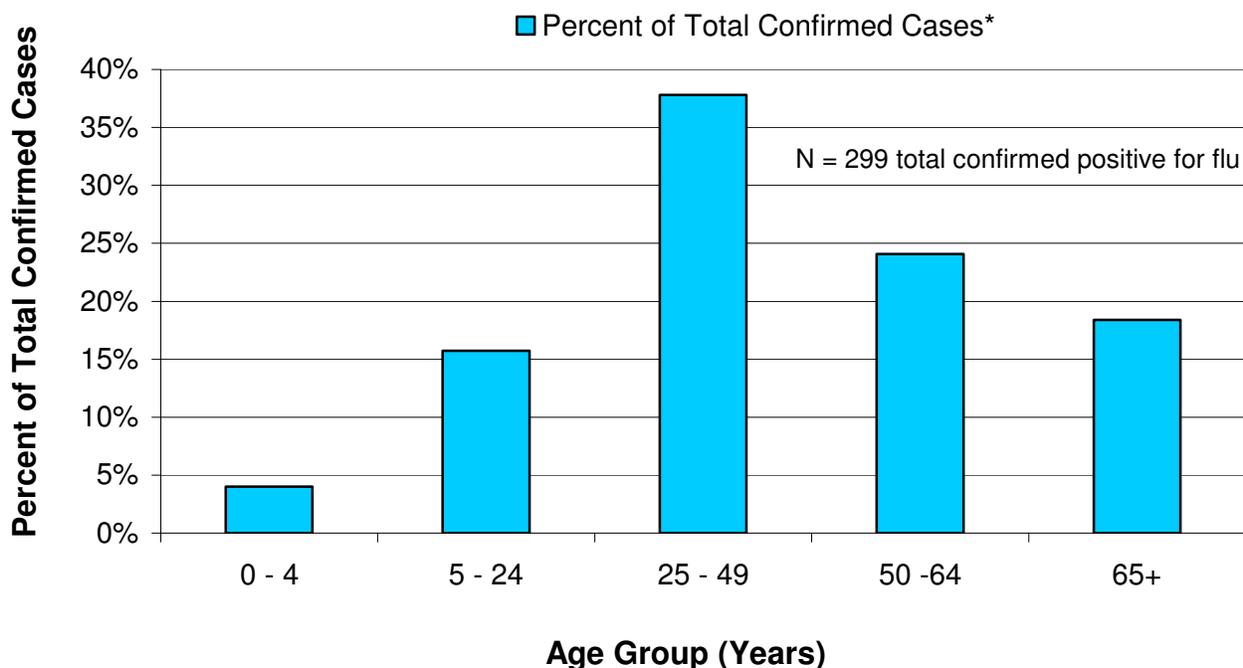
Results	Number of Specimens	Percent of Influenza Isolates Identified
Influenza A (H3)	38	12.7%
2009 influenza A (H1N1)	223	74.6%
Influenza B	38	12.7%
Negative for influenza	253	
Inconclusive/invalid	3	
Total	555	

Influenza test results reported by CDC for the New England region as a whole indicated the following percentages of each subtype (denominator equals specimens with known subtypes): 59% 2009 influenza A (H1N1), 23% influenza A (H3), and 18% influenza B. Compared to regional New England data NH had a higher percentage of total positive for 2009 influenza A (H1N1) (75% vs. 59%), and lower percent of total positives for both influenza A (H3) (13% vs. 23%), and influenza B (13% vs. 18%). Subtypeable flu results for the New England Region in turn differed somewhat when compared to the national test results, with a lower percent to total

positive for 2009 influenza A (H1N1) (59% vs. 74%), a greater percent for influenza A (H3) (23% vs. 8%), and the same percent for influenza B (18% vs. 18%).

Figure 5 below further describes PHL influenza test results for NH according to different age groups. Compared to the 2012-13 season a much greater percentage of positive specimens were observed in the 25-49 (38% vs 24%) and 50-64 (24% vs 15%) year age groups, while the 65+ year age group comprised a lower percentage of the total (18% vs. 33%).

Figure 5: Age Distribution of Laboratory Confirmed Influenza, NH Public Health Laboratories, 2013-14 Influenza Season (9/29/13 – 5/17/14)

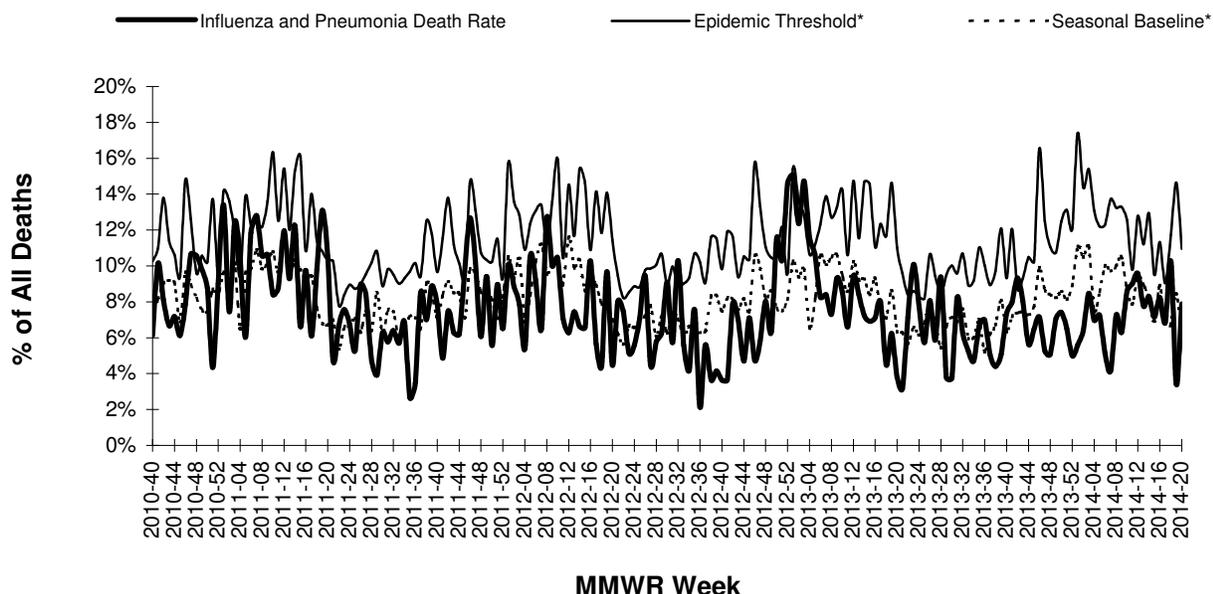


* Includes cases for whom age was reported.

Pneumonia & Influenza Mortality

Pneumonia and influenza (P&I) deaths in NH are identified through review of electronically filed death certificates by looking at the causes of death listed on each death certificate. Figure 6 below, which shows the proportion of deaths attributed to P&I, represents all deaths recorded by NH's Division of Vital Records Administration. This includes resident and non-resident deaths that occurred within NH, and may not include deaths of NH residents that occurred out-of-state, or cases being investigated by the Medical Examiner's office.

Figure 6: Pneumonia and Influenza Mortality, New Hampshire, MMWR Week 40 2010 to MMWR Week 20 2014 (10/3/10 – 5/17/14)



*Seasonal baseline is calculated using the previous 5 years of data. If the proportion of P&I deaths for a given week exceeds the baseline value for that week by a statistically significant amount (1.645 standard deviations), then P&I deaths are said to be above the epidemic threshold, and the proportion of deaths above threshold are considered attributable to influenza.

During the 2013-14 influenza season, the percent of all deaths recorded in NH that were reported as due to P&I remained below the weekly epidemic threshold, except for one week (MMWR week 42) when the threshold was exceeded (see Table 3 below).

Based on electronic surveillance of death certificates a total of 16 influenza-associated NH deaths (i.e., deaths where influenza is specifically listed as a cause or contributing cause of death on the death certificate) were observed during the 2013-14 influenza season, which is within the historical range seen during flu seasons since NH first began tracking this parameter in 1997.

Table 3. Percent of Total Reported Deaths in NH Attributed to Pneumonia and Influenza (P&I) Above the Epidemic Threshold by MMWR Week, 2013-14 Influenza Season (9/29/13– 5/17/14)

MMWR Week	Dates	P&I Deaths (Percent of Total Deaths)	Weekly Epidemic Threshold
2013-42	10/13/13 - 10/19/13	9.3%	8.7%

Influenza Activity as Assessed by State Epidemiologist

Influenza activity levels in NH are reported each week to CDC to be included in the national weekly influenza surveillance report. Such activity levels help to describe the degree of geographic distribution of influenza activity. CDC defines influenza activity levels as follows:

- No Activity: Low ILI activity and no laboratory-confirmed cases of influenza.
- Sporadic: Low ILI activity and isolated laboratory-confirmed influenza cases or a single influenza outbreak has been reported.
- Local: Increased ILI activity or influenza outbreaks in a single region of the state, and recent laboratory-confirmed influenza in that region.
- Regional: Increased ILI activity or influenza outbreaks in ≥ 2 , but less than half of state regions, and recent laboratory-confirmed influenza in affected regions.
- Widespread: Increased ILI activity or influenza outbreaks in at least half of state regions, and recent laboratory-confirmed influenza in the state.

In NH, the reported influenza activity level is based on ILI and ARI reported by the Sentinel Providers and the AHEDD surveillance systems respectively, reports of laboratory confirmed influenza, and reported outbreaks in facilities.

In the 2013-14 season, geographic distribution of influenza activity was at a level of no activity from weeks 40-46, with the first sign of an increase observed at week 47, when it reached sporadic activity. Starting at week 50, activity reached the level of regional for the first time during the season, and either regional or widespread (i.e., two highest flu activity levels) occurred during 19 different weeks, which included a stretch of 17 consecutive weeks spanning from week 52 through week 16. Activity declined to either local or sporadic during weeks 17-19, before rising back up to regional at week 20, the official end of the regular flu season. Flu activity did not decline to a level of no activity until week 24 in mid-June, approximately one month after the official end of the regular flu season and much later than what is typically seen.

National Surveillance

During the 2013-14 season, influenza A (H1N1)pdm09 (pH1N1) viruses were the predominant viruses in circulation nationally, with fewer influenza B viruses and influenza A(H3) viruses also identified. CDC reports that the season was characterized overall by lower levels of outpatient illness and mortality than influenza A (H3N2)-predominant seasons. However, a higher rate of hospitalizations was seen among adults aged 50-64 years compared with recent years.

Based on the percentage of specimens testing positive for influenza the national peak of influenza activity occurred during week 52. Whereas pH1N1 activity peaked between late December and late January, influenza B activity occurred later in the influenza season. CDC reports that influenza A viruses predominated until late March, and the influenza B viruses became the most commonly identified virus nationally starting at week 13. At the same time that B viruses began to predominate there was also an increase in the proportion of influenza A viruses that were subtyped as A (H3), such that it was the predominant A virus subtype from weeks 13–20. Interestingly, Region 1 which includes New England reported the most late season influenza A (H3) activity.

CDC antigenically characterized 2,905 influenza viruses collected and submitted by U.S. laboratories since October 1, 2013, and nearly all of the influenza virus specimens sent to CDC for antigenic characterization were similar to the components of the 2013-14 Northern Hemisphere influenza vaccine. The FDA has recommended that the 2014-15 influenza

vaccines used in the United States have the same antigenic composition as those used in 2013-14.

During the 2013-14 season, nationally the percentage of deaths attributed to P&I exceeded the epidemic threshold for 8 consecutive weeks (weeks 2-9), peaking at 8.7% during week 4. Regarding pediatric influenza associated mortality, there were 96 laboratory-confirmed such deaths reported from 30 states, New York City, and Chicago (none were reported in New Hampshire). Among these 96 deaths, 79 were associated with influenza A virus infections, 13 were associated with influenza B viruses, two were associated with an influenza A and B co-infection, and two were from viruses for which the type was not determined. As a reference, since influenza-associated pediatric deaths became nationally notifiable in 2004, the total number has ranged from 35 to 171 per season (excluding the 2009 pandemic when there were 348 such deaths reported between April 15, 2009-October 2, 2010).

Based on national data reported to CDC via ILINet, for the 2013-14 influenza season, influenza activity as measured by percentage of outpatient visits for ILI peaked nationally during week 52 at 4.6% (i.e., late December), and was somewhat lower than the previous season's peak (6.1%). Comparing the various regions, the percentage of visits for ILI was found to exceed region-specific baselines for the longest period in Region 1, where this was exceeded for 22 consecutive weeks.

The Centers for Disease Control and Prevention influenza season summary report can be found on the CDC website at <http://www.cdc.gov/flu/>.

All data in this report are based upon information provided to the New Hampshire Department of Health and Human Services under specific legislative authority. The numbers reported may represent an underestimate of the true absolute number and incidence rate of cases in the state. All population calculations and rates are based on the most recent published estimates by the U.S. Bureau of the Census and the New Hampshire Department of State Planning. Any release of personal identifying information is conditioned upon such information remaining confidential. The unauthorized disclosure of any confidential medical or scientific data is a misdemeanor under New Hampshire law. The department is not responsible for any duplication or misrepresentation of surveillance data released in accordance with this guideline. Data are complete as of 07/24/14.