



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



**2012-13 Influenza Season
Summary Report for New Hampshire
September 30, 2012 – May 18, 2013**

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:

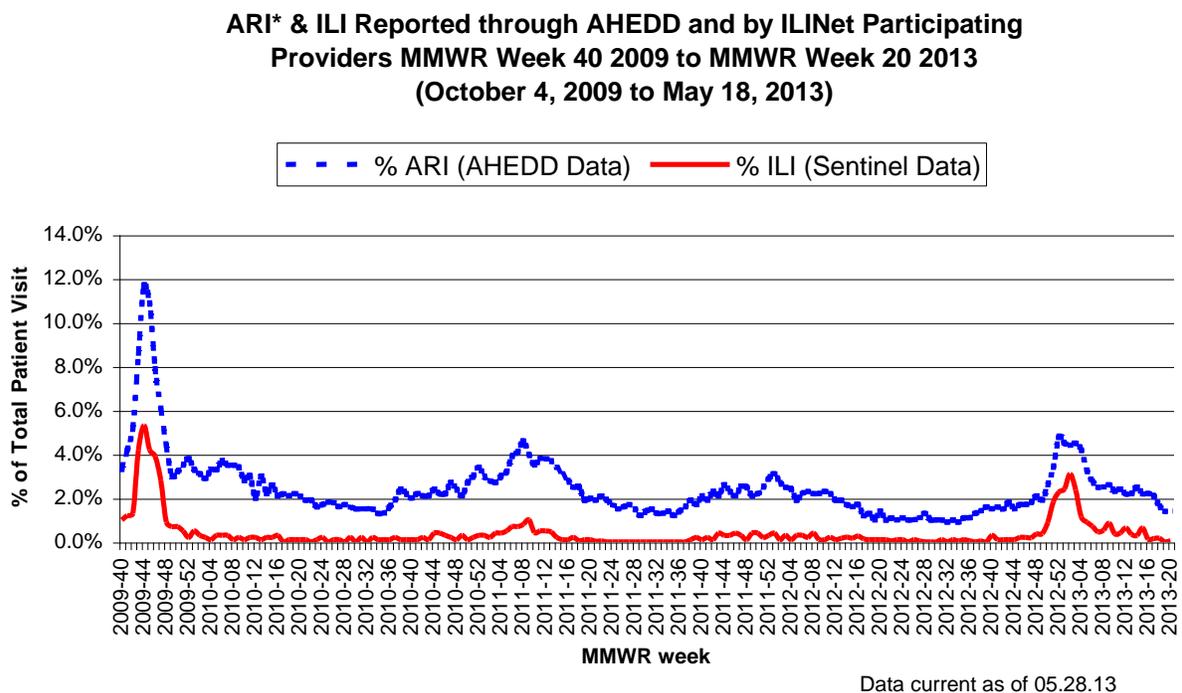
1. U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet): Beginning in 1997, NH has participated in this collaborative effort between the Centers for Disease Control and Prevention, state and local health departments, and health care providers. For the 2012-13 influenza season, 33 NH health 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 2012-13 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 2012-13 season, reported ILI activity in NH reached its highest levels during MMWR weeks 52 through week 3 (weeks ending December 29th 2012 through January 19th 2013), when 2.3 - 3.1% 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 52 through

week 4 (week ending December 29th through January 26th) when 4.2 - 4.8% of patient encounters in hospital emergency departments were due to ARI.

Using percent ILI and ARI together as an indicator for when flu activity was highest, activity for the 2012-13 season peaked during week 52 (based on percent ARI at 4.8%) or week 2 (based on percent ILI at 3.1%), which is chronologically similar to the previous 2011-12 season when highest activity was observed during week 1 (peaks for both seasons occurred much earlier than what is typically seen for most seasons). The 2012-13 season was much more intense than the previous 2011-12 season, and was also more intense than the 2010-11 season (at least as measured by percent ILI and other parameters such as percent of P&I related deaths discussed below). Peaks in both ILI and ARI during the 2012-13 season were also more pronounced compared to the previous 2011-12 season. The 2010-11 season peaked during weeks eight and nine with ILI and ARI at 0.8–1.0% and 4.0–4.6%, respectively. For the 2008-09 season ILI and ARI both peaked during week seven at 1.4% and 6.6%, 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 & by NH ILINet Providers, 10/4/09 to 5/19/12



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

During the 2012-13 influenza season, persons in the 5-24 year age group accounted for the greatest percentage (49%) of patients presenting with ILI reported by NH ILINet providers, followed by the 25-49 year age group (19%). The next highest percentage ILI by age category was in the 0-4 year age group (14%) followed by the 50-64 year age group at 12%, then the 65-plus year age group at 6%. The percentages of ILI cases by age categories were observed to follow a similar ranking when compared to the 2011-12 season with the exception of the categories 50–64 and 0-4 years of age, which reversed rankings for 3rd and 4th. For example the 0-4 year group increased from 9% to 14%, and the 50-64 year old group decreased from

18% to 12%. The 65+ year old age group remained the last of the five categories showing a slight increase from 4% to 6%. Reported ILI by age groups for the 2012-13 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 2012-13 influenza season there were 33 providers enrolled in the ILINet program, similar to the previous season which had 34 enrolled. Twenty-eight (85%) of the 33 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, 2012-13 Influenza Season (9/30/12 – 5/18/13)

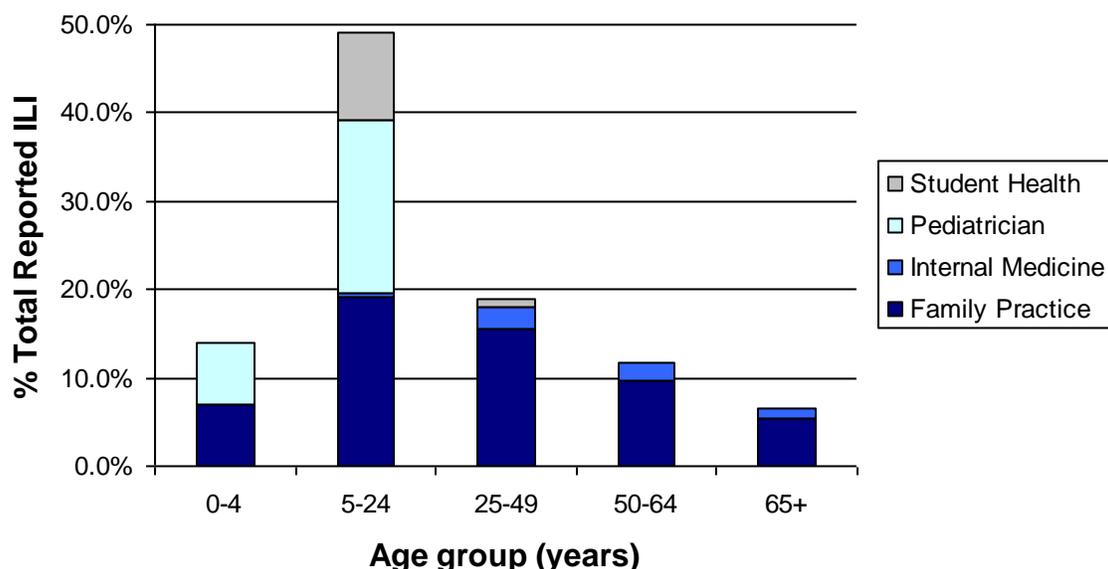


Table 1: Patient Visits for Influenza-like Illness (ILI) by Age Group and Practice Type, NH ILINet Providers, 2012-13 Influenza Season (9/30/12 – 5/18/13)

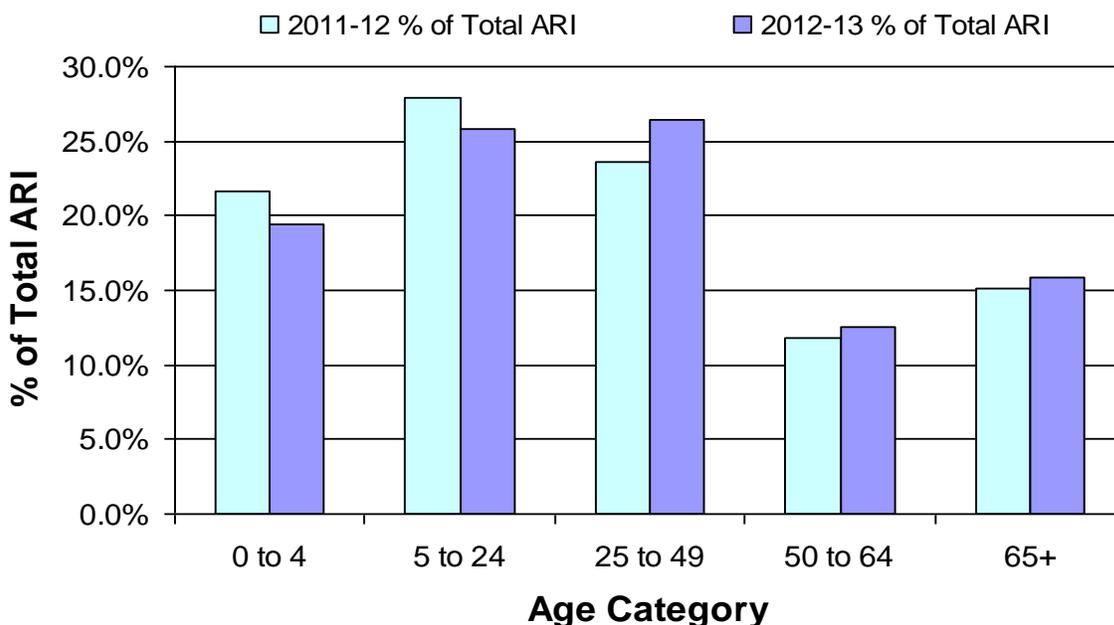
Practice type	Age Group (years)					Total ILI	Total Patient Visits
	0-4	5-24	25-49	50-64	65+		
Family Practice	67	181	147	92	52	539	92,973
Internal Medicine	0	5	24	19	9	57	9,976
Pediatrics	65	185	0	0	0	250	20,221
Student Health	0	92	7	0	0	99	11,825
Total	132	463	178	111	61	945	134,995

Reported Acute Respiratory Illness (ARI) by Age Group

In the 2012-13 influenza season, persons in the 25-49 year age group accounted for the largest percent (26.4%) of all ARI encounters in hospital emergency departments (see Figure 3 below) but was relatively similar to the percentage of ARI encounters observed in the 5-24 year age

group (25.8% of ARI encounters and second largest percentage). These were followed by persons 0-4 years of age (19.4%), 65-plus years of age (15.9%), then 50-64 years of age (12.5%). As seen in Figure 3 the percentage distributions by age category were similar to the previous 2011-12 influenza season, only with slight increases observed in the three oldest age categories and slight decreases in the two youngest categories.

Figure 3: Acute Respiratory Illness (ARI) by Age Group as Reported by NH Automated Hospital Emergency Department Data (AHEDD) System, 2012-13 Influenza Season (9/30/12-5/18/13) (N = 11,793 ARI encounters) and 2011-12 Influenza Season (10/02/11-5/19/12; N = 8,722 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 previous seasons such as the 2010-11 and 2011-12 seasons when 42% and 40% of total submitted specimens, respectively, tested positive. During the 2012-13 season 59% (n=294) of 501 total specimens submitted tested positive for influenza.

The number of positive specimens and subtypes reported for each MMWR week of the 2012-13 season is shown in Figure 4. The first positive specimens were detected at the start of the flu season during MMWR week 40 in the beginning of October, when one specimen tested positive for influenza A (H3). This is consistent with the usual timeframe, or perhaps somewhat earlier, than when positive specimens are typically first observed during a regular flu season (e.g., first positive specimen was reported during week 44 the previous 2010-11 flu season). The chart depicts a clear peak for the number of positive specimens during week 51 which is somewhat

early compared to other regular flu seasons when the highest number of positives tend to occur in the month of February (e.g., sometime during weeks 6 through 9). The peak week for positive specimens (week 51) is close to the peak week for ARI activity (week 52), and is consistent with what is normally observed over past regular flu seasons.

The three different viral subtypes that circulated in NH during the 2012-13 influenza season are presented in table 2. Positive isolates consisted of 88% influenza A (H3), 10% influenza B, and 2% 2009 influenza A (H1N1). In comparison during NH's 2011-12 season positive isolates consisted of 62% influenza A (H3), 29% influenza B, and 9% 2009 influenza A (H1N1). Compared to the previous 2011-12 season a substantially higher percentage of specimens tested positive for influenza A(H3), a 3-fold lower percent was positive for influenza B, and a 4-fold lower percent was positive for 2009 influenza A (H1N1). Starting at week 9 (i.e., late February) the vast majority of positive specimens were influenza B. 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): 80% influenza A (H3), 18% influenza B, and 2% 2009 influenza A (H1N1). Compared to regional New England data NH had slightly higher percent positive for influenza A (H3) (88% vs. 80%), a lower percent positive for influenza B (10% vs. 18%), and the same percent positive for 2009 influenza A (H1N1) (both at 2%). Subtypeable flu results for the New England Region in turn looked slightly different than national test results, with a greater percent positive for influenza A (H3) (80% vs. 59%), a similar percent positive for 2009 influenza A (H1N1) (2% vs. 3%), and lower percent positive for influenza B (18% vs. 38%). Figure 5 below further describes PHL influenza test results for NH according to different age groups.

Figure 4: Influenza Virus Isolates, by Viral Subtype, NH Public Health Laboratories, 2012-13 Influenza Season (9/30/12 – 5/18/13) (N = 294)

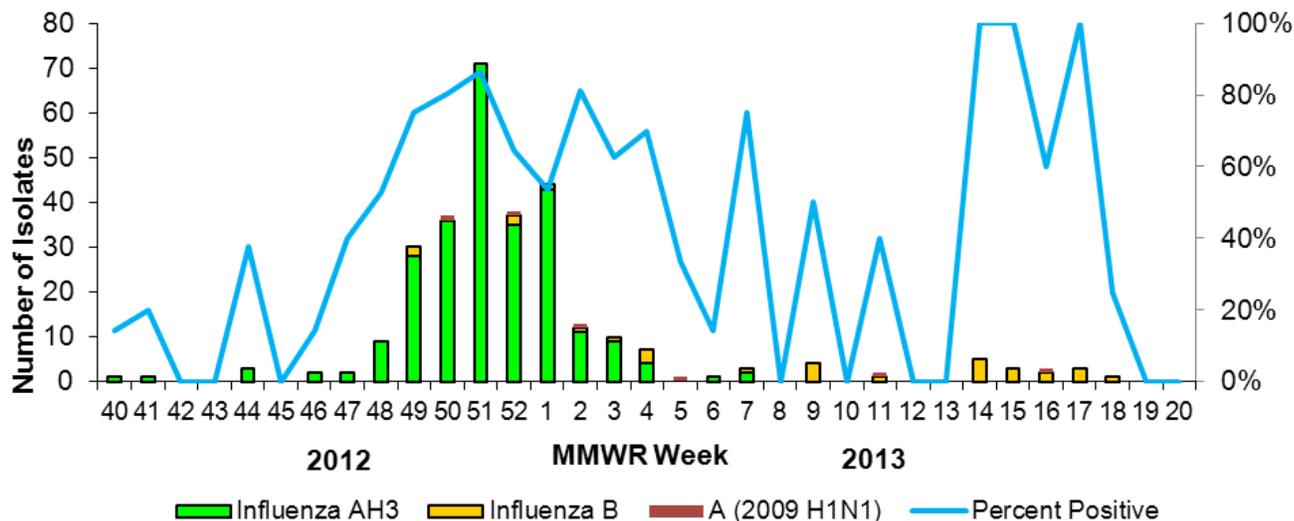
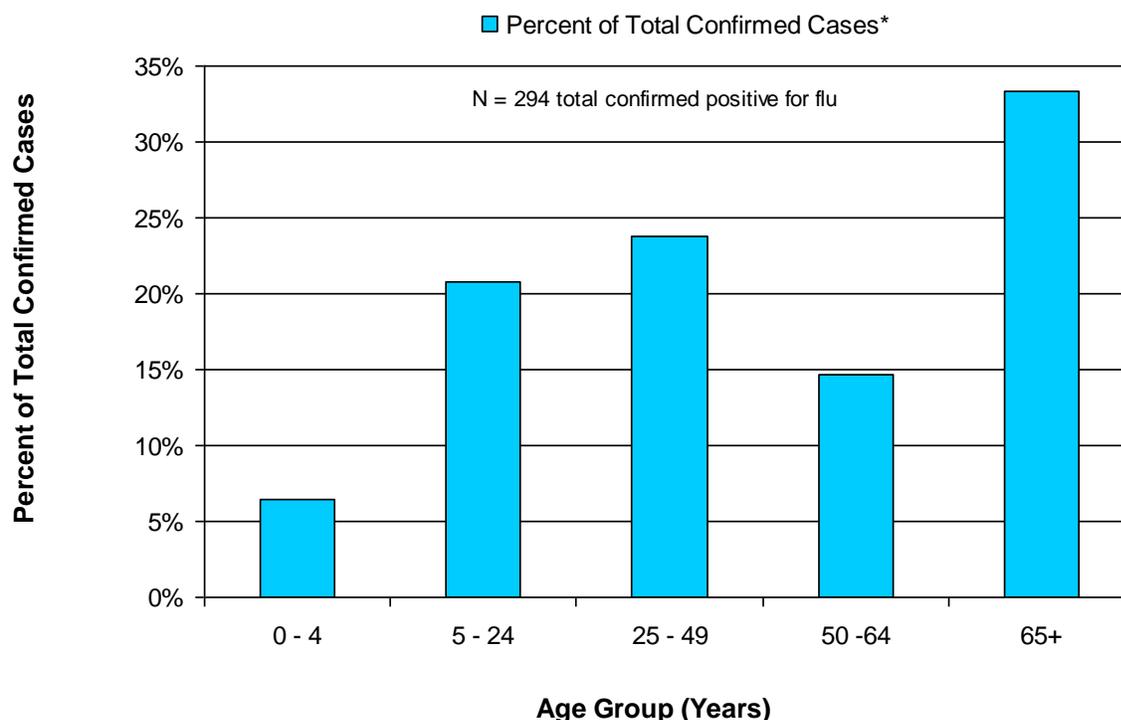


Table 2: Results of Specimens Received by NH Public Health Laboratories, 2012-13 Influenza Season (9/30/12 – 5/18/13)

Results	Number of Specimens	Percent of Influenza Isolates Identified
Influenza A (H3)	258	88%
2009 influenza A (H1N1)	6	2%
Influenza B	30	10%
Negative for influenza	205	
Inconclusive	2	
Total	501	

Figure 5: Age Distribution of Laboratory Confirmed Influenza, NH Public Health Laboratories, 2012-13 Influenza Season (9/30/12 – 5/18/13)

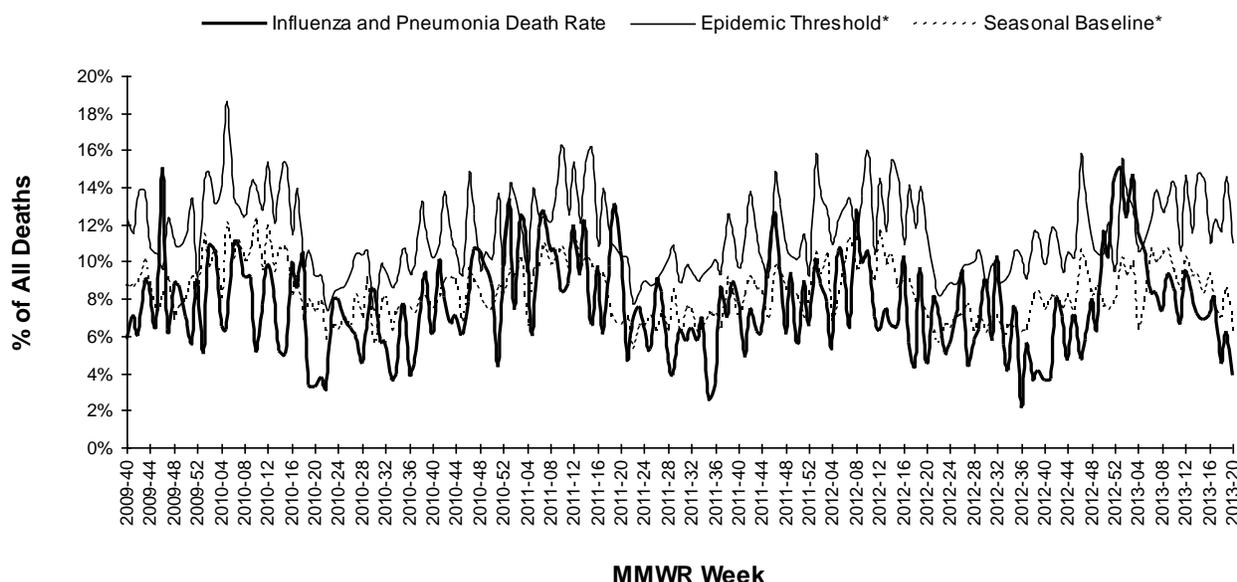


* Includes cases for whom age was reported.

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 2009 to MMWR Week 20 2013 (10/4/09 – 5/18/13)



*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 2012-13 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 four weeks (MMWR weeks 50, 52, 3, and 4) when thresholds were exceeded (see Table 3 below).

There were a total of 44 deaths in NH that were associated with influenza (i.e., deaths where influenza is specifically listed as a cause or contributing cause of death on the death certificate) during the 2012-13 influenza season, and this is the highest number recorded during a flu season since the parameter was first tracked in 1997. New Hampshire reported three pediatric influenza-associated deaths to the CDC, which occurred during weeks 50 and 51 of 2012, and week 1 of 2013.

Table 3. Percent of Total Reported Deaths in NH Attributed to Pneumonia and Influenza (P&I) Above the Epidemic Threshold by MMWR Week, 2012-13 Influenza Season (9/30/12– 5/18/13)

MMWR Week	Dates	P&I Deaths (Percent of Total Deaths)	Weekly Epidemic Threshold
2012-50	12/09/12 - 12/15/12	11.5%	10.5%
2012-52	12/23/12 - 12/29/12	14.6%	9.6%
2013-03	1/13/13 – 1/19/13	14.7%	12.8%
2013-04	1/20/13 – 1/26/13	11.6%	10.7%

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 2012-13 season, geographic distribution of influenza activity reached the level of regional or widespread (i.e., two highest flu activity levels) in NH during 18 different weeks, starting at week 50 of 2012 through week 17 of 2013 (with the exception of two interspersed weeks of local activity during weeks 8 and 11), which is a fairly long period of sustained high flu activity that began earlier than what is typically seen during most (non-pandemic) seasons in NH with surveillance data (e.g., during the 2010-11 season widespread activity occurred during seven consecutive weeks, including MMWR weeks 6-12). Widespread activity occurred for nine weeks in a row spanning from week 50 (2012) to week 6 (2013). For the recent season the first sign of geographically elevated influenza activity was during weeks 40 and 41, when sporadic activity was reported two weeks in a row. During weeks 40-49 and weeks 18-20 there was either no activity, sporadic or local activity, and toward the end of the season influenza activity did not decline to a level of no activity until week 20 (i.e., final week).

National Surveillance

The 2012-13 influenza season was described by CDC as moderately severe. For example, compared with recent years there were more reported deaths attributed to pneumonia and influenza (P&I), higher rates of hospitalization (especially among people 65 years and older), and a higher percentage of outpatient visits for flu-like illness.

Based on national data reported to CDC via ILINet, for the 2012-13 influenza season, influenza activity as measured by percentage of outpatient visits for ILI peaked nationally during week 52 at 6.1% (i.e., late December), and was one of the highest peaks observed since 1997 when the current reporting format began. Percentage of outpatient visits for ILI declined below national baseline (2.2%) in late March 2013, indicating the flu season was coming to a close at that time.

The percentage of deaths (all ages) attributed to P&I exceeded the epidemic threshold for 13 consecutive weeks this season, peaking at 9.9% during week 3 (week ending January 19th). This is the highest recorded P&I in nearly a decade, although it is comparable to recorded percentages for past severe seasons, such as the 2003-04 season when P&I reached 10%. There were 149 laboratory-confirmed influenza-associated pediatric deaths reported to CDC for the 2012-13 season (three of these were in NH), and this was the highest reported (excluding

the 2009 pandemic season) since data collection began in 2004 season (range for previous years: 34–123 pediatric deaths per season).

The cumulative hospitalization rate was 191 per 100,000 population for people 65 years and older this season, which is two and a half times the highest rate previously reported for this age group (data collection began in 2007).

Of the total nationally subtyped specimens the predominant circulating strain was the influenza A (H3N2) virus, accounting for 59% of all positive subtypeable specimens, followed by influenza B (38%), then by 2009 influenza A (H1N1) (3%). Influenza A viruses predominated until the end of February (through week 7), while influenza B viruses predominated from week 8 through week 20. Overall the percent positive viruses detected was highest (> 10%) between weeks 45 – 15, and declined to less than 10% during weeks 16 – 20.

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

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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 07/16/12.