FLUVIEW
A Weekly Influenza Surveillance Report Prepared by the Influenza Division

## 2012-2013 Influenza Season Surveillance Summary

*Data are preliminary and subject to change as more reports are received (data as of December 6, 2013)*

During the 2012–13 influenza season in the United States, influenza activity increased through November and December before peaking in late December. Influenza A (H3N2) viruses predominated overall, but influenza B viruses and, to a lesser extent, 2009 influenza A (H1N1) (2009 H1N1) viruses also were reported in the United States. This influenza season was moderately severe, with a higher percentage of outpatient visits for influenza-like illness (ILI), higher rates of hospitalization, and more reported deaths attributed to pneumonia and influenza compared with recent years.

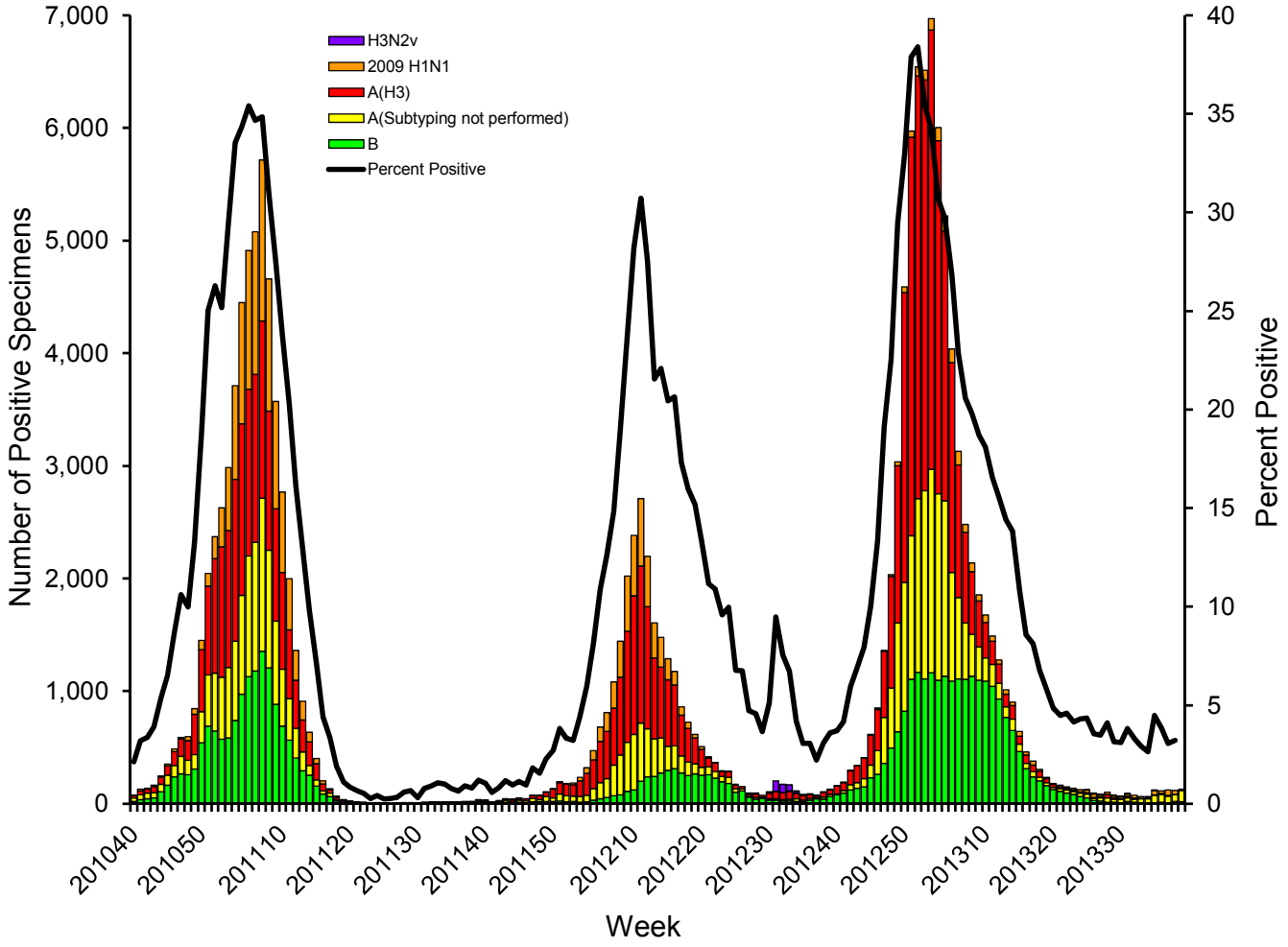
## Viral Surveillance

From September 30, 2012, to September 28 , 2013, World Health Organization (WHO) and National Respiratory and Enteric Virus Surveillance System (NREVSS) collaborating laboratories in the United States tested 368,531 respiratory specimens for influenza, 75,342 (20%) of which were positive. Of these, 53,057 (70%) were positive for influenza A viruses, and 22,285 (30%) were positive for influenza B viruses. Of the 53,057 specimens positive for influenza A viruses, 35,366 (67%) were subtyped; 33,395 (94%) of these were influenza A (H3N2) viruses, 1,951 (6%) were 2009 H1N1 viruses, and 20 (<1%) were influenza A (H3N2) variant viruses. The percentage of specimens testing positive for influenza peaked at 38% during week 52 (the week ending December 29, 2012).

The 2012-2013 influenza season was influenza A (H3N2) predominant from week 40 (the week ending October 6, 2012) through the peak of activity (week 52, the week ending December 29, 2012) until week 7 (the week ending February 16, 2013). As the activity declined, influenza B viruses were reported more frequently than influenza A viruses from mid-February to early June, and 2009 H1N1 viruses were more commonly reported than influenza A (H3N2) or influenza B viruses from mid-June to the end of the season in late September.

All ten HHS regions were influenza A (H3N2) predominant; however, several regions also identified a high proportion of influenza B detected in influenza positive specimens (Region 6: 42% and Region 8: 37%). Additional information and data on influenza virus circulation nationally and regionally can be found on the FluView interactive site at http://gis.cdc.gov/grasp/fluview/fluportaldashboard.html.

**Influenza Positive Tests Reported to CDC by U.S. WHO/NREVSS Collaborating Laboratories, National Summary, 2010-2013**




## Novel Influenza A Virus Infection

A total of 22 infections with variant influenza A viruses that occurred during the 2012-2013 influenza season were reported; 20 associated with influenza A (H3N2) variant (H3N2v) viruses and 2 associated with influenza A (H1N1) variant (H1N1v) viruses. One of the 20 H3N2v cases was reported in November 2012, one in December 2012, and the remaining 18 cases were identified between June and August 2013. The 2 H1N1v cases were reported in September 2013.

The 22 variant cases were reported from seven states: Arkansas (2), Illinois (1), Indiana (14), Iowa (1), Michigan (2), Minnesota (1), and Ohio (1) and resulted in one hospitalization (associated with H3N2v) and no deaths. In 21 of 22 cases, contact with swine in the week prior to illness onset was reported. No ongoing community transmission of these viruses has been detected. The median age of patients was 6.5 years (range 2 - 69 years); 59% were female.

## Antigenic Characterization

CDC has antigenically characterized 2,823 influenza viruses [374 2009 H1N1 viruses, 1,413 influenza A (H3N2) viruses, and 1,036 influenza B viruses] collected by U.S. laboratories from October 1, 2012 to September 30, 2013.

**2009 H1N1 [374]**

- 369 (98.7%) of the 374 2009 H1N1 viruses tested were characterized as A/California/7/2009-like, the influenza A (H1N1) component of the 2012-2013 influenza vaccine for the Northern Hemisphere.
- 5 (1.3%) of the 374 2009 H1N1 viruses tested showed reduced titers with antiserum produced against A/California/7/2009.

**Influenza A (H3N2) [1,413]:**

- 1,408 (99.6%) of the 1,413 H3N2 influenza viruses tested have been characterized as A/Victoria/361/2011-like, the influenza A (H3N2) component of the 2012-2013 Northern Hemisphere influenza vaccine.
- 5 (0.4%) of the 1,413 H3N2 viruses tested showed reduced titers with antiserum produced against A/Victoria/361/2011.

**Influenza B (B/Yamagata/16/88 and B/Victoria/02/87 lineages) [1,036]:**

- **Yamagata Lineage [661]**: 661 (63.8%) of the 1,036 influenza B viruses tested belong to the B/Yamagata lineage of viruses and were characterized as B/Wisconsin/1/2010-like, the influenza B component of the 2012-2013 Northern Hemisphere influenza vaccine.
- **Victoria Lineage [375]**: 375 (36.2%) of 1,036 influenza B viruses tested have been from the B/Victoria lineage of viruses.

## Antiviral Resistance

High levels of resistance to the adamantanes (amantadine and rimantadine) persist among 2009 influenza A (H1N1) and A (H3N2) viruses (the adamantanes are not effective against influenza B viruses). As a result, data from adamantane resistance testing are not presented below.

**Neuraminidase Inhibitor resistance testing results on samples collected from October 1, 2012 to September 30, 2013**

| | Oseltamivir | | Zanamivir | |
|---|---|---|---|---|
| | Virus Samples tested (n) | Resistant Viruses, Number (%) | Virus Samples tested (n) | Resistant Viruses, Number (%) |
| **Influenza A (H3N2)** | 2,440* | 4 (0.2) | 2,440* | 2 (0.1) |
| **Influenza B** | 1,044 | 0 (0.0) | 1,044 | 0 (0.0) |
| **2009 H1N1** | 687* | 5 (0.7) | 384 | 0 (0.0) |

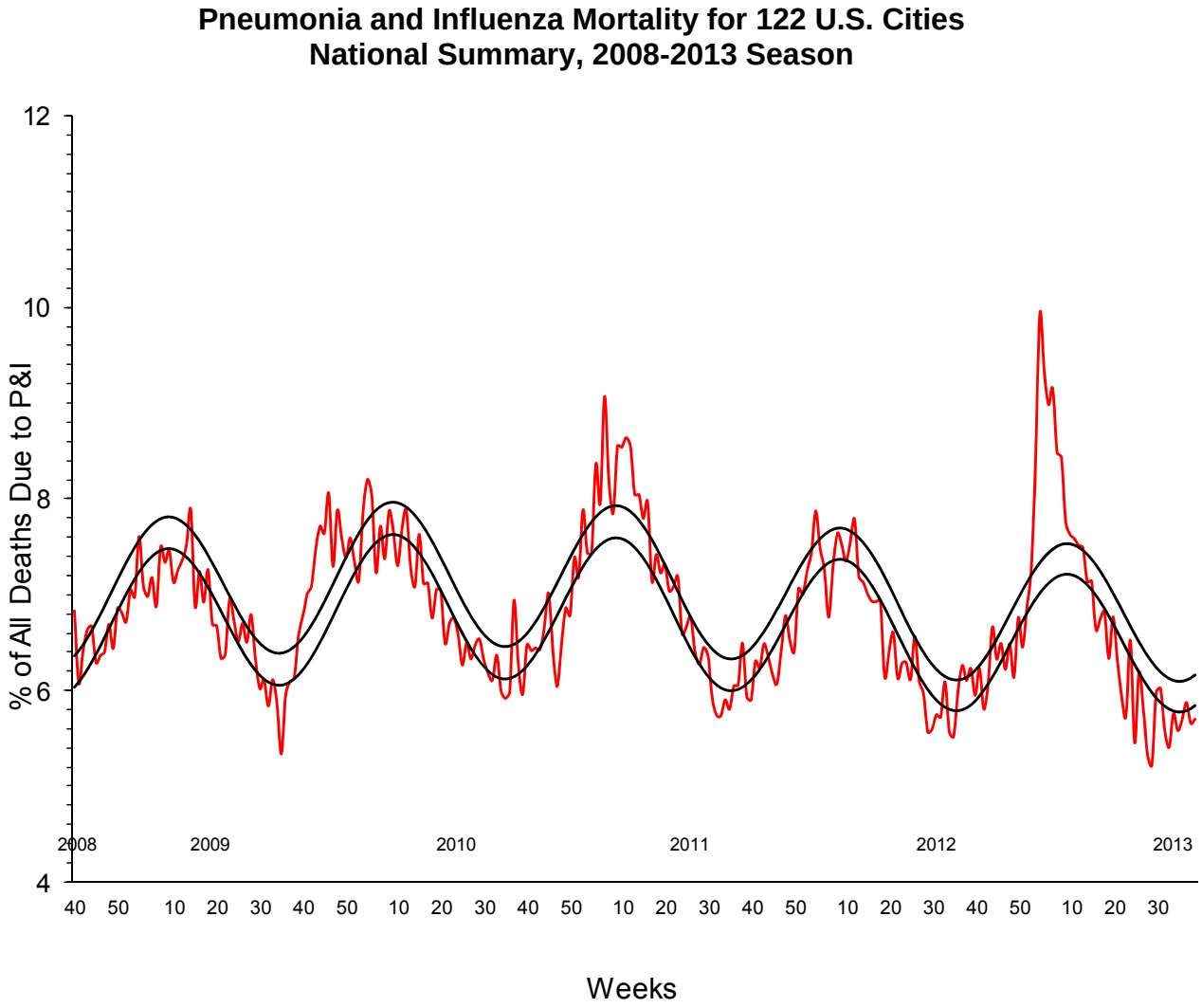
*Includes specimens tested in national surveillance and additional specimens tested at public health laboratories in 13 states (AZ, CA, DE, HI, ME, MD, MA, MI, MN, NY, PA, WA, and WI) who share testing results with CDC.

The majority of currently circulating influenza viruses are susceptible to the neuraminidase inhibitor antiviral medications, oseltamivir and zanamivir; however, rare sporadic cases of oseltamivir-resistant 2009 H1N1 and A (H3N2) viruses have been detected worldwide. Antiviral treatment with

oseltamivir or zanamivir as early as possible is recommended for patients with confirmed or suspected influenza who have severe, complicated, or progressive illness; who require hospitalization; or who are at greater risk for serious influenza-related complications. Additional information on recommendations for treatment and chemoprophylaxis of influenza virus infection with antiviral agents is available at http://www.cdc.gov/flu/antivirals/index.htm.

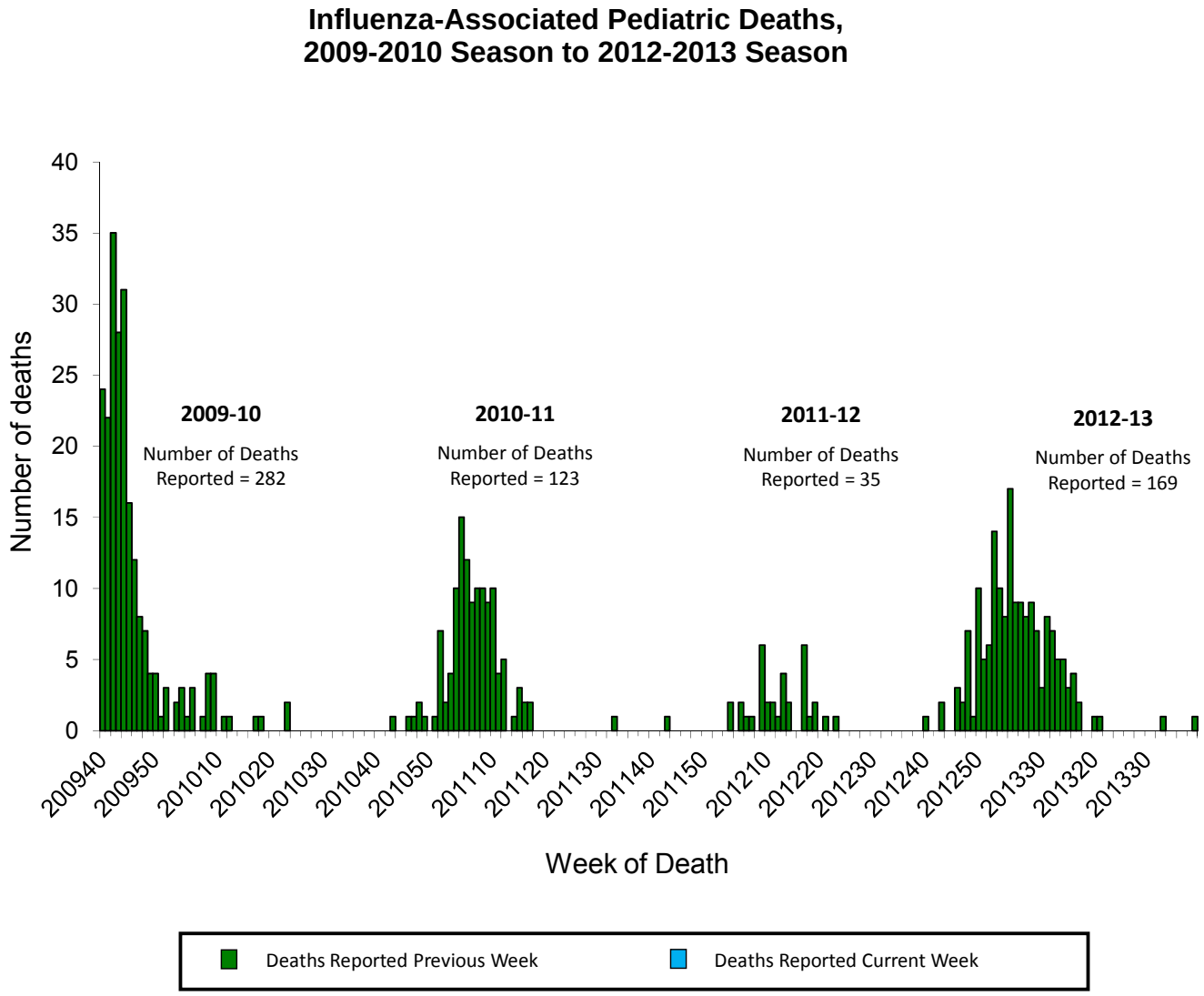
**Pneumonia and Influenza (P&I) Mortality Surveillance**

From September 30, 2012 to September 28, 2013, the weekly percentage of deaths attributed to pneumonia and influenza ranged from 5.5% to 9.9%, and was elevated above the epidemic threshold for 13 consecutive weeks during the peak of influenza activity from week 1 to week 13 (weeks ending January 5, 2013 and March 30, 2013.



**Influenza-Associated Pediatric Mortality**

From September 30, 2012 to September 28, 2013 169 deaths associated with laboratory-confirmed influenza infections occurred among children aged <18 years during the 2012-2013 influenza season and were reported to the CDC**.** These deaths were reported from Chicago, New York City, the District of Columbia, Puerto Rico, and 38 states. The mean and median ages of children who died were 7.8 and 7.2 respectively; 17 children were aged <6 months, 23 were aged 6-23 months, 22 were aged 2-4 years, 58 were aged 5-11 years, and 49 were aged 12-17 years. Of the 169 deaths, 78 (46%) were associated with influenza A viruses (6 were associated with 2009 H1N1, 35 with influenza A (H3N2), 37 with influenza A viruses for which subtyping was not performed), 87 (51%) with influenza B, one for which the type was not distinguished, and three influenza virus co-infections. Excluding the 2009 pandemic season (April 15, 2009 to October 2, 2010) during which 348 influenza-associated pediatric deaths were reported, the number of deaths reported each season since influenza-associated pediatric mortality became a nationally notifiable condition in 2004 has ranged from 46 to 165 with a median of 72 deaths.

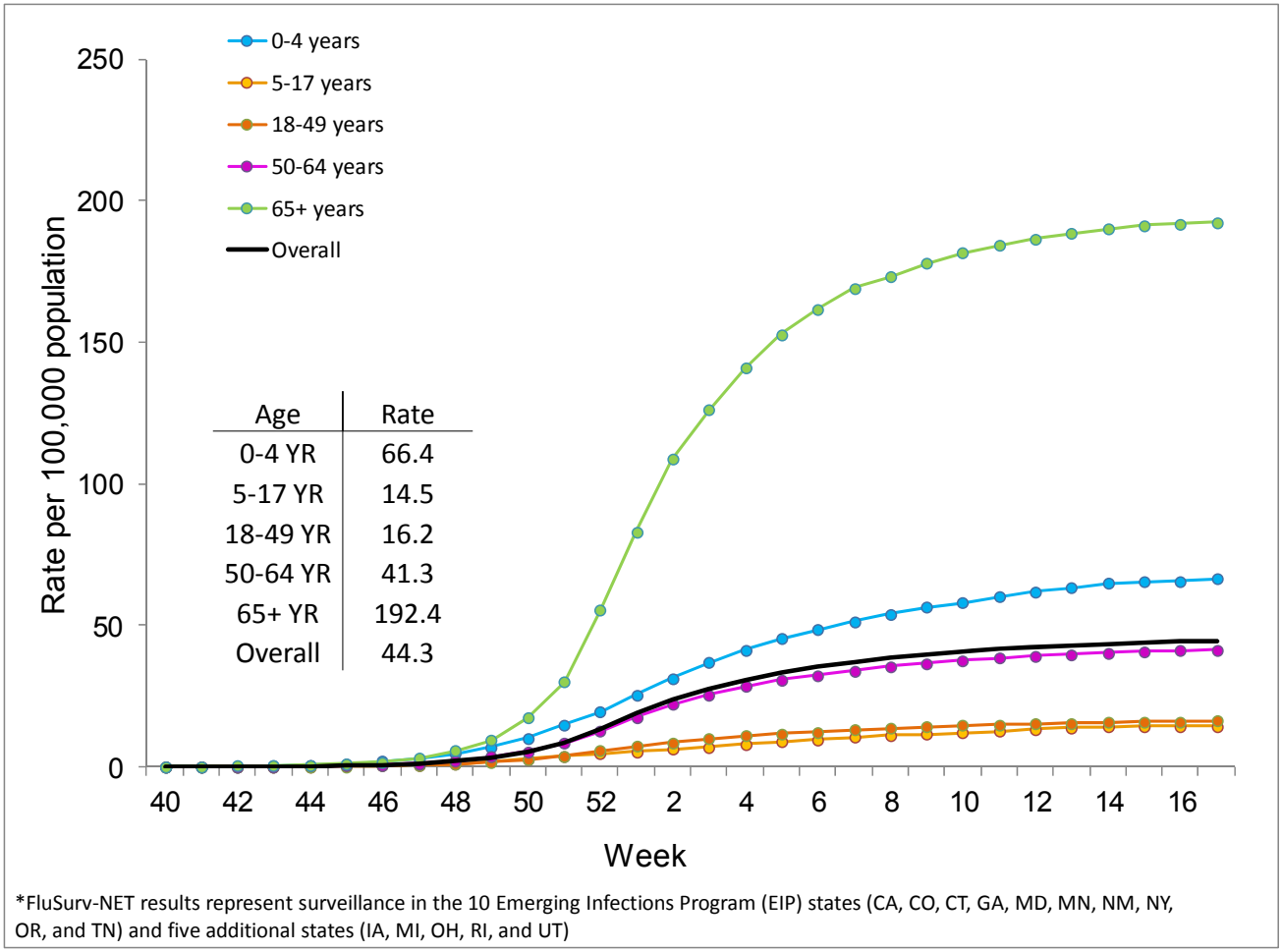


## Influenza-Associated Hospitalizations

CDC monitors hospitalizations associated with laboratory-confirmed influenza infections using the FluSurv-NET surveillance system which combines data from the Emerging Infections Program (EIP) and additional participating sites. Based on FluSurv-NET surveillance data, the cumulative hospitalization rate (per 100,000 population) for October 1, 2012-April 30, 2013 was 44.4 overall and 66.4 among children aged 0-4 years, 14.5 among children aged 5-17 years, 16.2 among adults aged 18-49 years, 41.3 among adults aged 50-64 years, and 192.4 among adults aged ≥65 years.

Influenza-associated hospitalization rates during the 2012-2013 season were higher than in previous years, particularly among aged 65 years and older where the cumulative hospitalization rate was two and half times the highest rate previously reported (75.9 during the 2007-2008 season) since surveillance began in this age group in the 2005-2006 season.

**FluSurv-NET* Laboratory-Confirmed Cumulative Hospitalization Rates (per 100,000), 2012-13 Season**



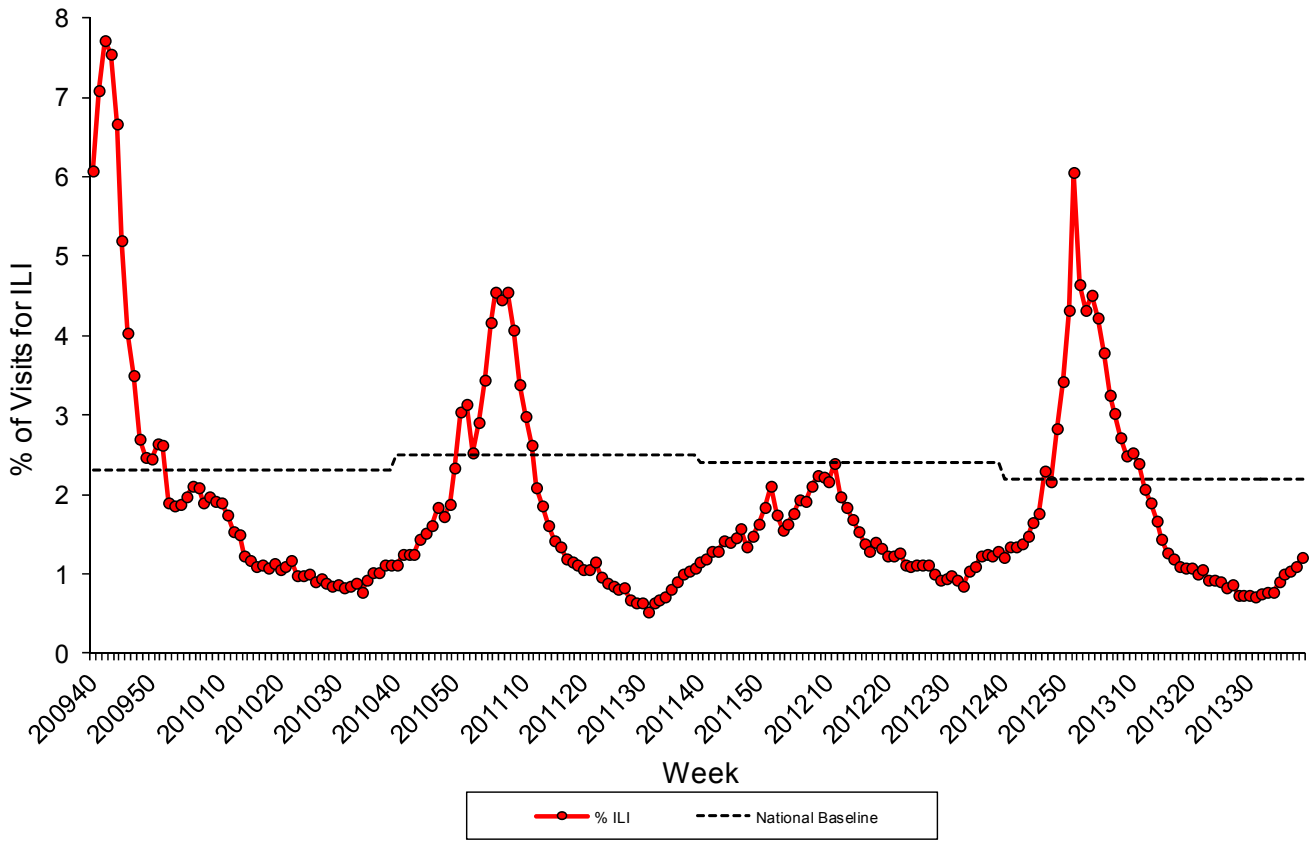

*FluSurv-NET results represent surveillance in the 10 Emerging Infections Program (EIP) states (CA, CO, CT, GA, MD, MN, NM, NY, OR, and TN) and five additional states (IA, MI, OH, RI, and UT)

**Outpatient Illness Surveillance**

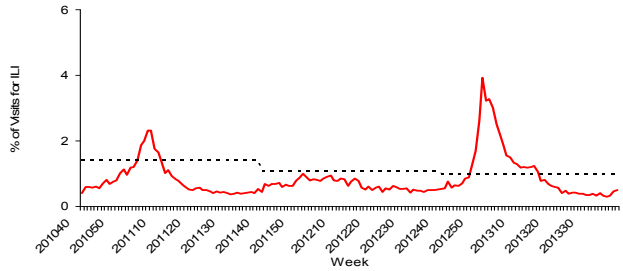
The weekly percentage of outpatient visits for influenza-like illness (ILI) reported to the U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet) peaked at 6.1% during the week ending December 29, 2012 (week 52) and was at or exceeded the national baseline (2.2%) for 17 consecutive weeks, weeks 47—11 (weeks ending November 24, 2012 to March 16, 2013).

The ten Department of Health and Human Services regions experienced a median of 14.5 weeks above region-specific baseline levels (range 9-20 weeks), and the timing of increased ILI activity was similar between regions with seven regions experiencing their peak in week 52 (Regions 1-7). The peak of ILI in Region 8 was during week 3 (the week ending January 19, 2013) and in Regions 9 and 10 week 4 (the week ending January 26, 2013) was the peak.

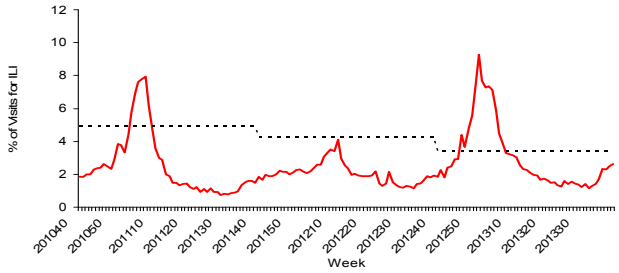
**Healthcare Visits for Influenza-like Illness (ILI) Reported by the U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet), National Summary, 2012-2013 and Selected Previous Seasons**



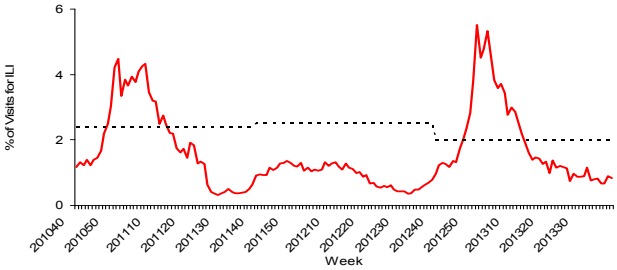
Region 1 - CT, ME, MA, NH, RI, VT



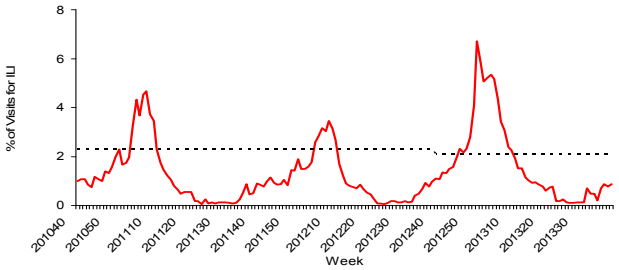

Region 6 - AR, LA, NM, OK, TX



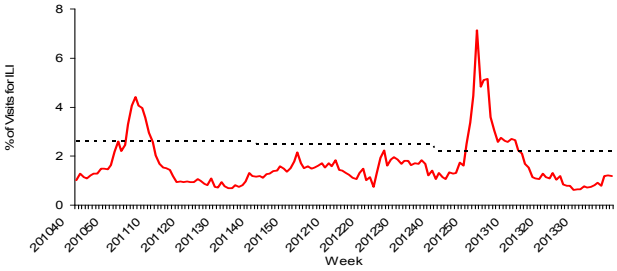

Region 2 - NJ, NY, USVI



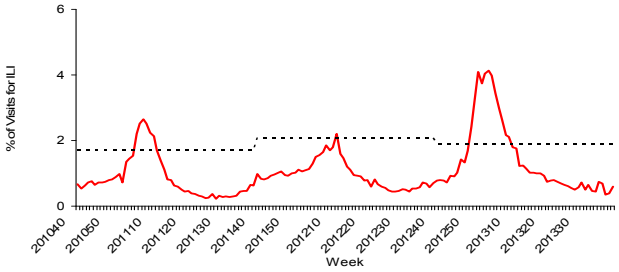

Region 7 - IA, KS, MO, NE



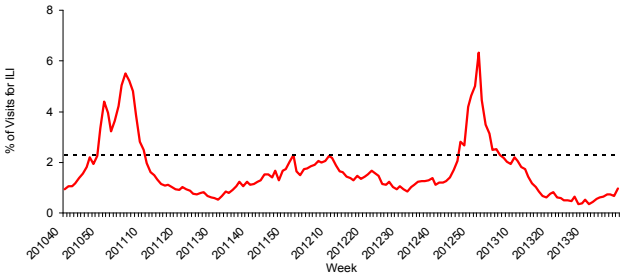

Region 3 - DE, DC, MD, PA, VA, WV



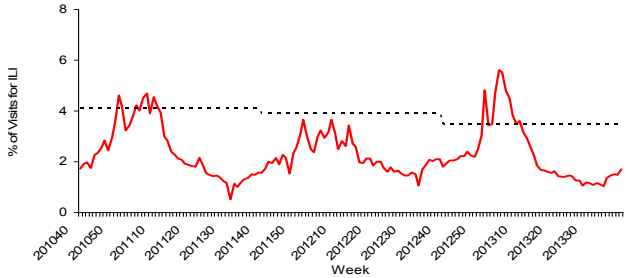

Region 8 - CO, MT, ND, SD, UT, WY



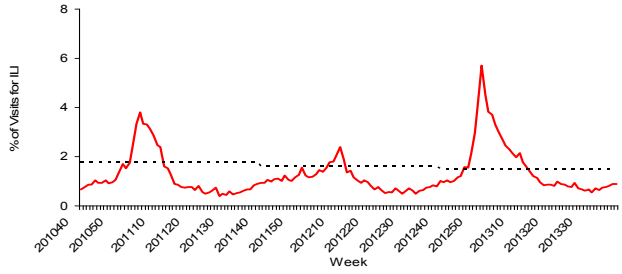

Region 4 - AL, FL, GA, KY, MS, NC, SC, TN



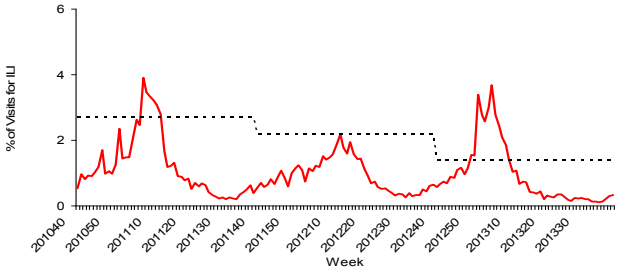

Region 9 - AZ, CA, HI, NV

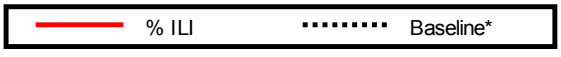



Region 5 - IL, IN, MI, MN, OH, WI




Region 10 - AK, ID, OR, WA




NOTE: Scales differ between regions

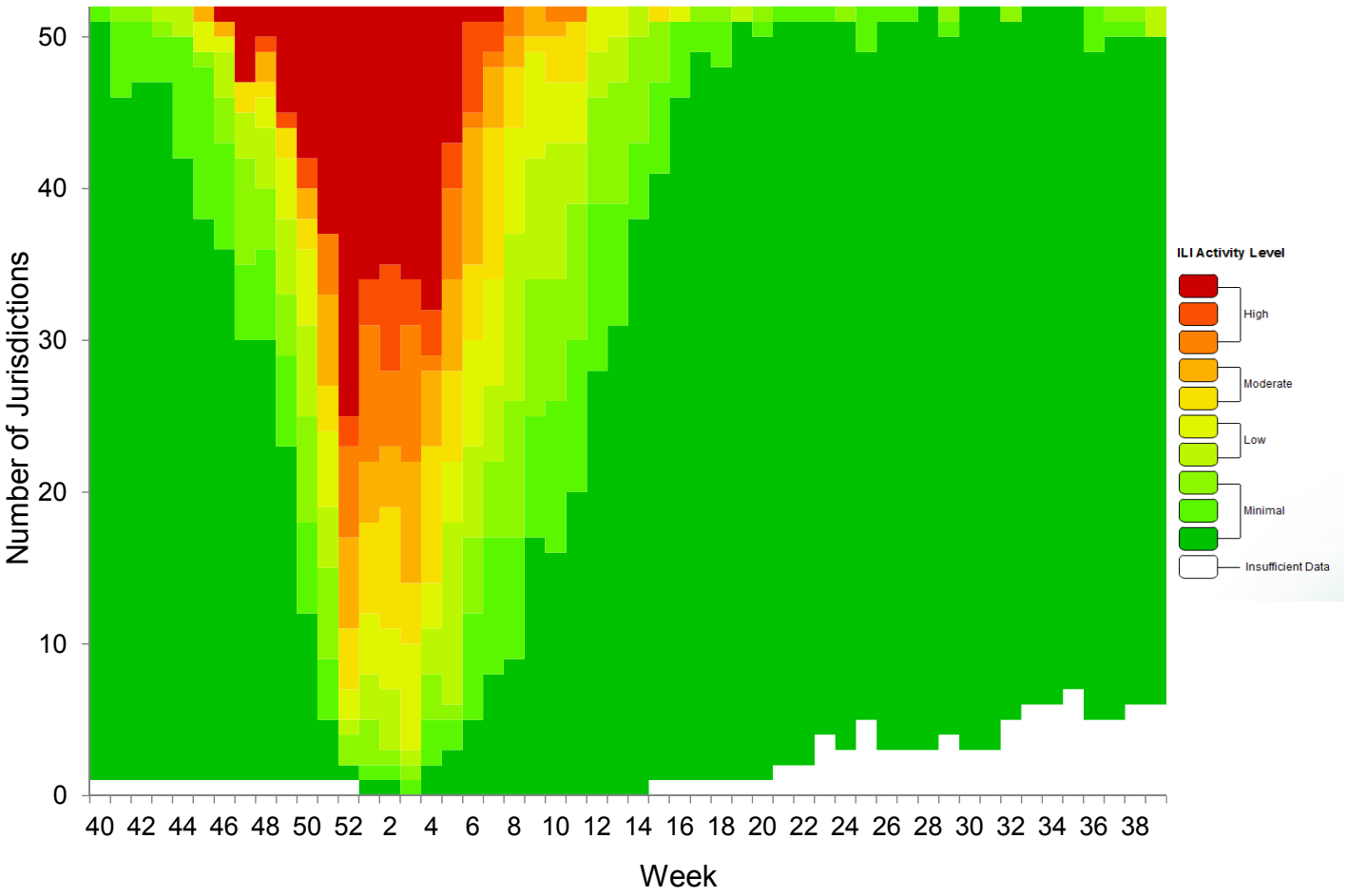
*Use of the regional baselines for state data is not appropriate.

**ILINet Activity Indicator**

Data collected in ILINet are used to produce a measure of ILI activity for all 50 states, the District of Columbia, and New York City. Activity levels are based on the percent of outpatient visits in a jurisdiction due to ILI compared with the average percent of ILI visits that occur during weeks with little or no influenza virus circulation (non-influenza weeks). The 10 activity levels correspond to the level of elevation above the mean for the current week compared to the mean of the non-influenza weeks. There are 10 activity levels classified as minimal (levels 1-3), low (levels 4-5), moderate (levels 6-7), and high (levels 8-10).

High activity was first identified during the week ending November 17, 2012 (week 46) and activity peaked during the week ending December 29, 2013 (week 52), when 35 jurisdictions experienced high influenza activity. The last week after the peak of the season when a jurisdiction experienced high influenza activity was the week ending March 16, 2013 (week 11).

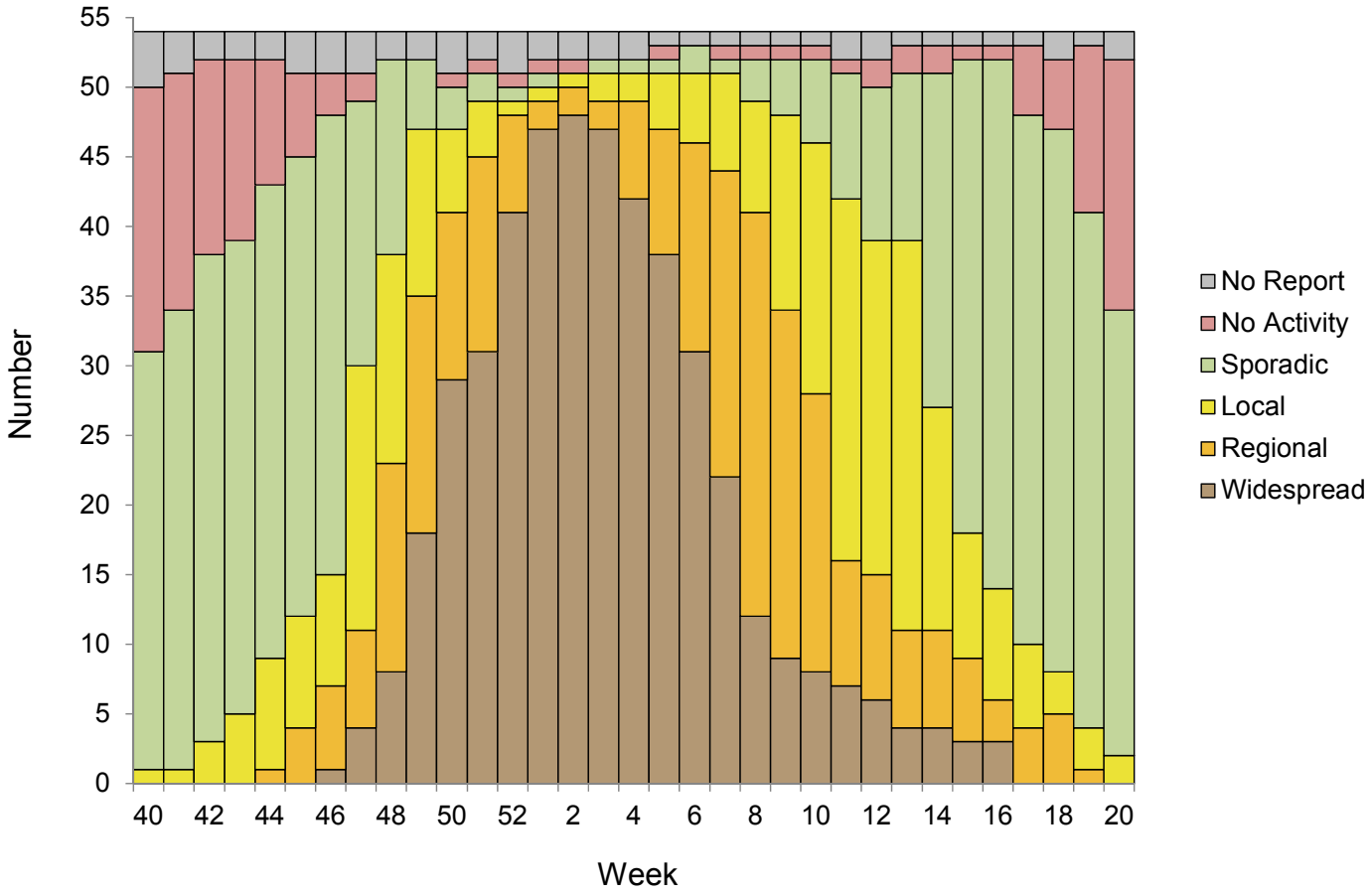
**ILINet Activity Indicator Levels, 2012-2013 Season**



**Geographic Spread of Influenza as Assessed by State and Territorial Epidemiologists**

State and territorial epidemiologists report the geographic distribution of influenza in their jurisdiction through a weekly influenza activity code. Widespread activity was first reported during the week ending November 17, 2012 (week 46). The geographic distribution of influenza activity was most extensive during the week ending January 12, 2013 (week 2), when 50 jurisdictions reported widespread or regional influenza activity (48 reported widespread and 2 reported regional influenza activity). Regional or widespread influenza activity has been reported during at least one week by 49 states. The first week after the peak of the season when no jurisdictions reported widespread influenza activity was during the week ending April 27, 2013 (week 17).

**Geographic Spread of Influenza as Reported by State and Territorial Epidemiologists, 2012-2013 Season**




A description of surveillance methods is available at: http://www.cdc.gov/flu/weekly/overview.htm