



2008-2009 Influenza Season Week 31 ending August 8, 2009

All data are preliminary and may change as more reports are received.

On June 11, the World Health Organization raised the pandemic alert level from Phase 5 to Phase 6 indicating that an influenza pandemic is underway.

Synopsis: During week 31 (August 2-8, 2009), influenza activity decreased slightly in the United States; however, there were still higher levels of influenza-like illness than is normal for this time of year.

- A total of 7,511 hospitalizations and 477 deaths associated with novel influenza A (H1N1) viruses have been reported to CDC.
- During week 31:
 - 809 (19.1%) specimens tested by U.S. World Health Organization (WHO) and National Respiratory and Enteric Virus Surveillance System (NREVSS) collaborating laboratories and reported to CDC/Influenza Division were positive for influenza.
 - 98% of all subtyped influenza A viruses being reported to CDC were novel influenza A (H1N1) viruses.
 - The proportion of deaths attributed to pneumonia and influenza (P&I) was below the epidemic threshold.
 - Three influenza-associated pediatric deaths were reported and all were associated with a novel influenza A (H1N1) virus infection.
 - The proportion of outpatient visits for influenza-like illness (ILI) was below national and region-specific baseline levels.
 - Four states and Puerto Rico reported geographically widespread influenza activity, 10 states reported regional influenza activity, 10 states and the District of Columbia reported local influenza activity, and 26 states reported sporadic influenza activity.

National and Regional Summary of Select Surveillance Components

HHS Surveillance Regions*	Data for current week			Data cumulative for the season						
	Out-patient ILI†	% positive for flu‡	Number of jurisdictions reporting regional or widespread activity§	A (H1)	A (H3)	Novel A (H1N1)	A (unable to sub-type)¶	A (Subtyping not performed)	B	Pediatric Deaths
Nation	Normal	19.1%	15 of 52	8,081	2,792	29,153	751	18,190	10,742	101
Region I	Normal	5.6%	1 of 6	583	305	2,873	13	1,693	820	4
Region II	Normal	7.8%	2 of 3	296	228	1,817	21	2,379	714	19
Region III	Normal	21.9%	2 of 6	1,250	219	4,128	20	1,014	1,363	10
Region IV	Normal	23.3%	4 of 8	865	188	1,917	56	3,000	1,251	8
Region V	Normal	16.4%	0 of 6	1,659	204	8,169	191	866	1,421	16
Region VI	Normal	28.6%	0 of 5	828	300	3,185	7	4,609	2,666	15
Region VII	Normal	23.9%	0 of 4	534	83	993	99	524	537	0
Region VIII	Normal	15.5%	1 of 6	533	219	1,342	72	1,695	500	9
Region IX	Normal	19.3%	4 of 4	1,143	726	2,504	59	1,891	779	18
Region X	Normal	28.1%	1 of 4	390	320	2,225	213	519	691	2

* HHS regions (Region I: CT, ME, MA, NH, RI, VT; Region II: NJ, NY, Puerto Rico, US Virgin Islands; Region III: DE, DC, MD, PA, VA, WV; Region IV: AL, FL, GA, KY, MS, NC, SC, TN; Region V: IL, IN, MI, MN, OH, WI; Region VI: AR, LA, NM, OK, TX; Region VII: IA, KS, MO, NE; Region VIII: CO, MT, ND, SD, UT, WY; Region IX: AZ, CA, Guam, HI, NV; and Region X: AK, ID, OR, WA)

† Elevated means the % of visits for ILI is at or above the national or region-specific baseline

‡ National data are for current week; regional data are for the most recent three weeks

§ Includes all 50 states, the District of Columbia, and Puerto Rico

¶ The majority of influenza A viruses that cannot be sub-typed as seasonal influenza viruses are novel A (H1N1) influenza viruses upon further testing

U.S. Virologic Surveillance: WHO and NREVSS collaborating laboratories located in all 50 states and Washington D.C. report to CDC the number of respiratory specimens tested for influenza and the number positive by influenza type and subtype. The results of tests performed during the current week are summarized in the table below.

	Week 31
No. of specimens tested	4,246
No. of positive specimens (%)	809 (19.1%)
<i>Positive specimens by type/subtype</i>	
Influenza A	806 (99.6%)
A (novel H1N1)	516 (64.0%)
A (subtyping not performed)	264 (32.8%)
A (unable to subtype)	14 (1.7%)
A (H3)	2 (0.2%)
A (H1)	10 (1.2%)
Influenza B	3 (0.4%)

During week 31, seasonal influenza A (H1) and A (H3) and B viruses co-circulated at low levels with novel influenza A (H1N1) viruses. 98% of all subtyped influenza A viruses being reported to CDC this week were novel influenza A (H1N1) viruses.

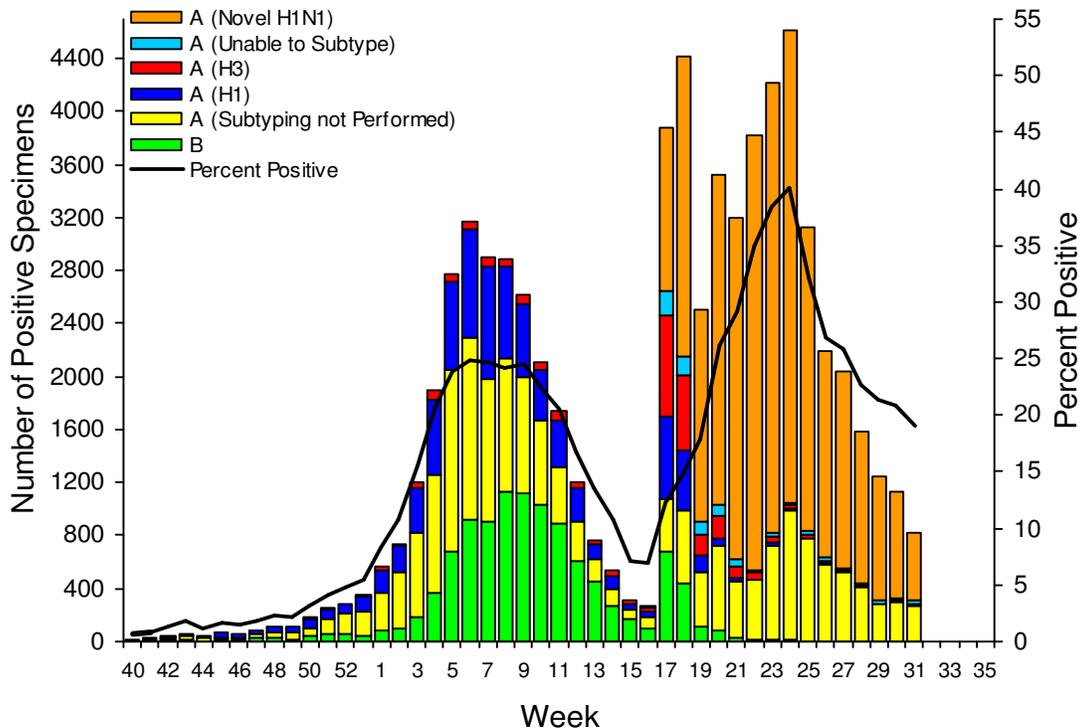
The unusually high percentage of specimens testing positive for influenza by WHO and NREVSS collaborating laboratories remained higher during week 31 than is typically seen this time of year, and may be due in part to changes in testing practices by health care providers, triaging of specimens by public health laboratories, an increase in the number of specimens collected from outbreaks, and other factors.

During the 2008-09 influenza season, influenza A (H1), A (H3), and B viruses have co-circulated in the United States. On April 15 and 17, 2009, CDC confirmed the first two cases of novel influenza A (H1N1) virus infection in the United States, and this virus has been the predominant circulating influenza strain since testing and reporting of novel influenza A (H1N1) viruses by U.S. WHO collaborating laboratories began during week 17 (week ending May 2, 2009).

Because of the extensive spread of novel influenza A (H1N1) within the United States, it has become extremely resource intensive for local and state health departments to count individual cases. In addition, since only a small proportion of persons with respiratory illness are tested for novel influenza A (H1N1) infection, confirmed and probable case counts represent a significant underestimate of the true number of novel influenza A (H1N1) cases in the United States. As a result, CDC no longer reports individual case counts; only hospitalizations and deaths associated with confirmed novel influenza A (H1N1) are reported each week on the CDC H1N1 influenza website (<http://www.cdc.gov/h1n1flu/update.htm>).

As of August 14, 2009, 7,511 hospitalizations and 477 deaths (10 deaths in individuals 0-4 years, 67 deaths in individuals 5-24 years, 203 deaths in adults 25-49 years, 135 deaths in adults 50-64 years, 45 deaths in adults age 65 and older, and 17 deaths with unknown age) associated with novel influenza A (H1N1) virus have been identified by CDC and state and local public health departments.

Influenza Positive Tests Reported to CDC by U.S. WHO/NREVSS Collaborating Laboratories, National Summary, 2008-09



Antigenic Characterization: CDC has antigenically characterized 2,036 seasonal human influenza viruses [1,186 influenza A (H1), 201 influenza A (H3) and 649 influenza B viruses] collected by U.S. laboratories since October 1, 2008, and 280 novel influenza A (H1N1) viruses.

All 1,186 seasonal influenza A (H1) viruses are related to the influenza A (H1N1) component of the 2008-09 influenza vaccine (A/Brisbane/59/2007). One hundred ninety-three (96%) of 201 influenza A (H3N2) viruses tested are related to the A (H3N2) vaccine component (A/Brisbane/10/2007) and eight viruses (4%) tested showed reduced titers with antisera produced against A/Brisbane/10/2007.

All 280 novel influenza A (H1N1) viruses are related to the A/California/07/2009 (H1N1) reference virus selected by WHO as a potential candidate for novel influenza A (H1N1) vaccine.

Influenza B viruses currently circulating can be divided into two distinct lineages represented by the B/Yamagata/16/88 and B/Victoria/02/87 viruses. Seventy-four (11%) of 649 influenza B viruses tested belong to the B/Yamagata lineage and are related to the vaccine strain (B/Florida/04/2006). The remaining 575 (89%) viruses belong to the B/Victoria lineage and are not related to the vaccine strain.

Data on antigenic characterization should be interpreted with caution given that antigenic characterization data are based on hemagglutination inhibition (HI) testing using a panel of reference ferret antisera, and results may not correlate with clinical protection against circulating viruses provided by influenza vaccination.

Annual influenza vaccination is expected to provide the best protection against those virus strains that are related to the vaccine strains, but limited to no protection may be expected when the vaccine and circulating virus strains are so different as to be from different lineages, as is seen with the two lineages of influenza B viruses. Antigenic characterization of novel influenza A (H1N1) viruses indicates that these viruses are antigenically and genetically unrelated to seasonal influenza A (H1N1) viruses, suggesting that little to no protection would be expected from vaccination with seasonal influenza vaccine.

Antiviral Resistance: Since October 1, 2008, 1,142 seasonal influenza A (H1N1), 241 influenza A (H3N2), and 646 influenza B viruses have been tested for resistance to the neuraminidase inhibitors (oseltamivir and zanamivir). Also, 1,148 seasonal influenza A (H1N1) and 235 influenza A (H3N2) viruses have been tested for resistance to the adamantanes (amantadine and rimantadine). Three hundred sixteen novel influenza A (H1N1) viruses have been tested for resistance to the neuraminidase inhibitors (oseltamivir and zanamivir). Three hundred seventy-one novel influenza A (H1N1) viruses have been tested for resistance to the adamantanes (amantadine and rimantadine). The results of antiviral resistance testing performed on these viruses are summarized in the table below.

	Isolates tested (n)	Resistant Viruses, Number (%)		Isolates tested (n)	Resistant Viruses, Number (%)
		Oseltamivir	Zanamivir		Adamantanes
Seasonal Influenza A (H1N1)	1,142	1,137 (99.6%)	0 (0)	1,148	6 (0.5%)
Influenza A (H3N2)	241	0 (0)	0 (0)	235	235 (100%)
Influenza B	646	0 (0)	0 (0)	N/A*	N/A*
Novel Influenza A (H1N1)	318	2 (0.6)	0 (0)	371	371 (100%)

*The adamantanes (amantadine and rimantadine) are not effective against influenza B viruses.

The novel influenza A (H1N1) virus is susceptible to both neuraminidase inhibitor antiviral medications zanamivir and oseltamivir. It is resistant to the adamantane antiviral medications, amantadine and rimantadine. Antiviral treatment with either oseltamivir or zanamivir is recommended for all patients with confirmed, probable or suspected cases of novel influenza A (H1N1) virus infection who are hospitalized or who are at higher risk for seasonal influenza complications.

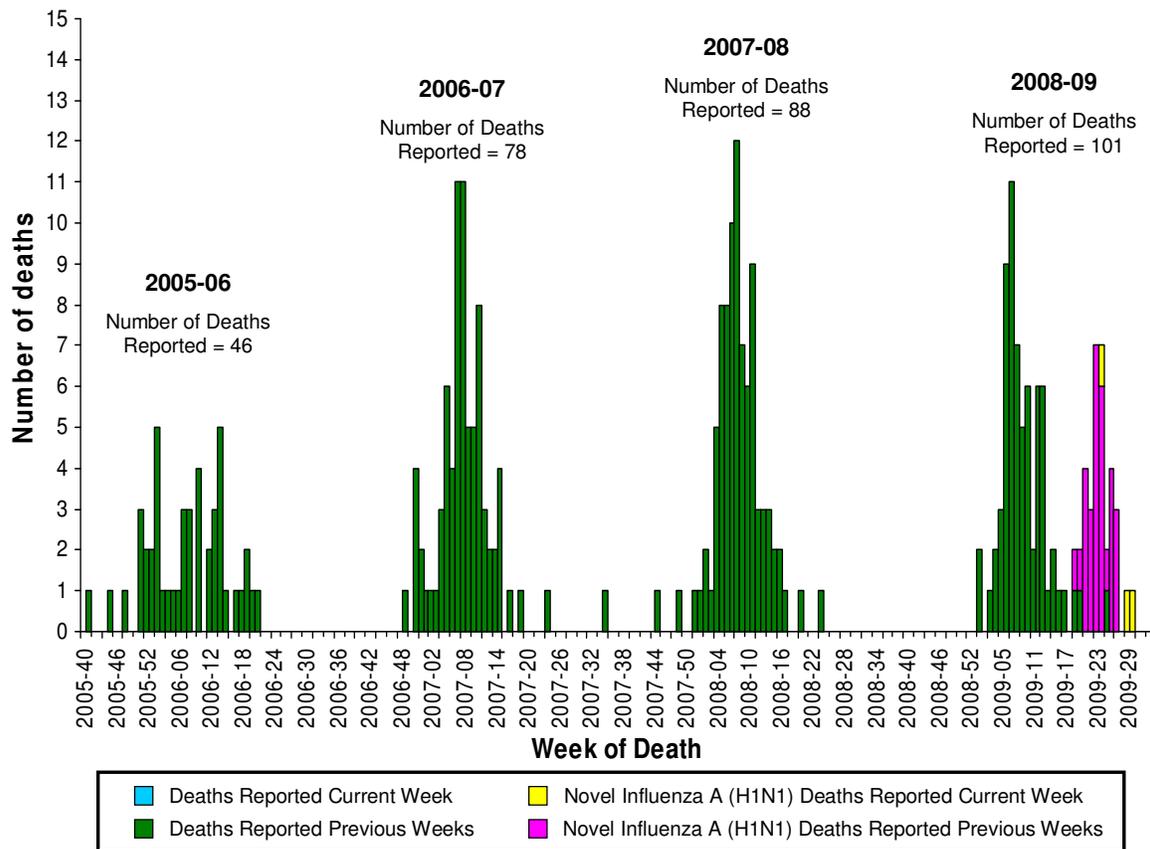
Rare sporadic cases of oseltamivir resistant novel influenza A (H1N1) viruses have been detected worldwide, including two viruses in the United States. Additional information on antiviral recommendations for treatment and chemoprophylaxis of novel influenza A (H1N1) infection is available at <http://www.cdc.gov/h1n1flu/recommendations.htm>.

Three seasonal influenza A (H1N1) viruses collected between February 8 and May 11, 2009, were found to be resistant to both oseltamivir and the adamantanes (amantadine and rimantadine). All seasonal influenza A (H1N1) viruses tested retain their sensitivity to zanamivir. The three dually-resistant viruses represent less than 1% of all seasonal influenza A (H1N1) viruses tested during the 2008-09 influenza season, and as a result, no changes to the influenza antiviral treatment or prophylaxis recommendations will be made at this time. CDC will continue to monitor trends in antiviral resistance over the summer and throughout the upcoming 2009-10 influenza season.

Influenza-Associated Pediatric Mortality: Three influenza-associated pediatric deaths were reported to CDC during week 31 (Arizona, Mississippi, and Utah). These deaths were associated with novel influenza A (H1N1) virus infection. The deaths reported this week occurred between June 14 and August 1, 2009. Since September 28, 2008, CDC has received 101 reports of influenza-associated pediatric deaths that occurred during the current influenza season, 33 of which were due to novel influenza A (H1N1) virus infections.

Of the 42 children who had specimens collected for bacterial culture from normally sterile sites, 16 (38.1%) were positive; *Staphylococcus aureus* was identified in 10 (62.5%) of the 16 children. Four of the *S. aureus* isolates were sensitive to methicillin and six were methicillin resistant. Fourteen (87.5%) of the 16 children with bacterial coinfections were five years of age or older and 10 (62.5%) of the 16 children were 12 years of age or older. Eleven (33.3%) of the 33 children with confirmed novel influenza A (H1N1) infection had a specimen collected from a normally sterile site; two (18.2%) of the 11 children had a positive bacterial culture (methicillin resistant *S. aureus* and *Streptococcus constellatus*). An increase in the number of influenza-associated pediatric deaths with bacterial coinfections was first recognized during the 2006-07 influenza season. In January 2008, interim testing and reporting recommendations were released regarding influenza and bacterial coinfections in children and are available at (<http://www2a.cdc.gov/HAN/ArchiveSys/ViewMsgV.asp?AlertNum=00268>).

Number of Influenza-Associated Pediatric Deaths by Week of Death:
2005-06 season to present

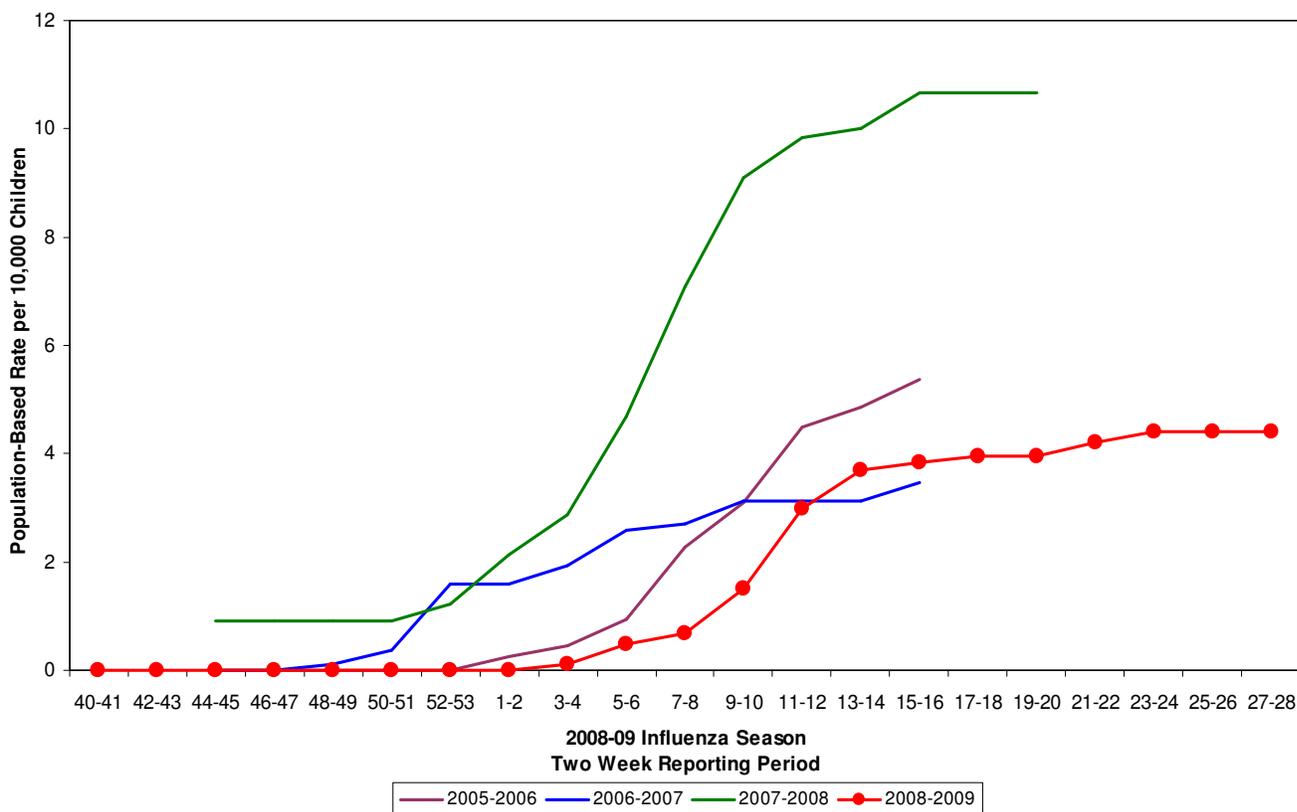


Influenza-Associated Hospitalizations: Laboratory-confirmed influenza-associated hospitalizations are monitored in two population-based surveillance networks: the New Vaccine Surveillance Network (NVSN) and the Emerging Infections Program (EIP).

During October 12, 2008 to July 11, 2009, the preliminary laboratory-confirmed influenza-associated hospitalization rate for children 0-4 years old in the NVSN was 4.42 per 10,000. Because of case identification methods utilized in this study, there is a delay from the date of hospitalization to the date of report.

Data collection for influenza-associated hospitalizations through the NVSN has been completed for the 2008-09 influenza season. There will be no updates to this system after week 28 (the week ending July 18, 2009).

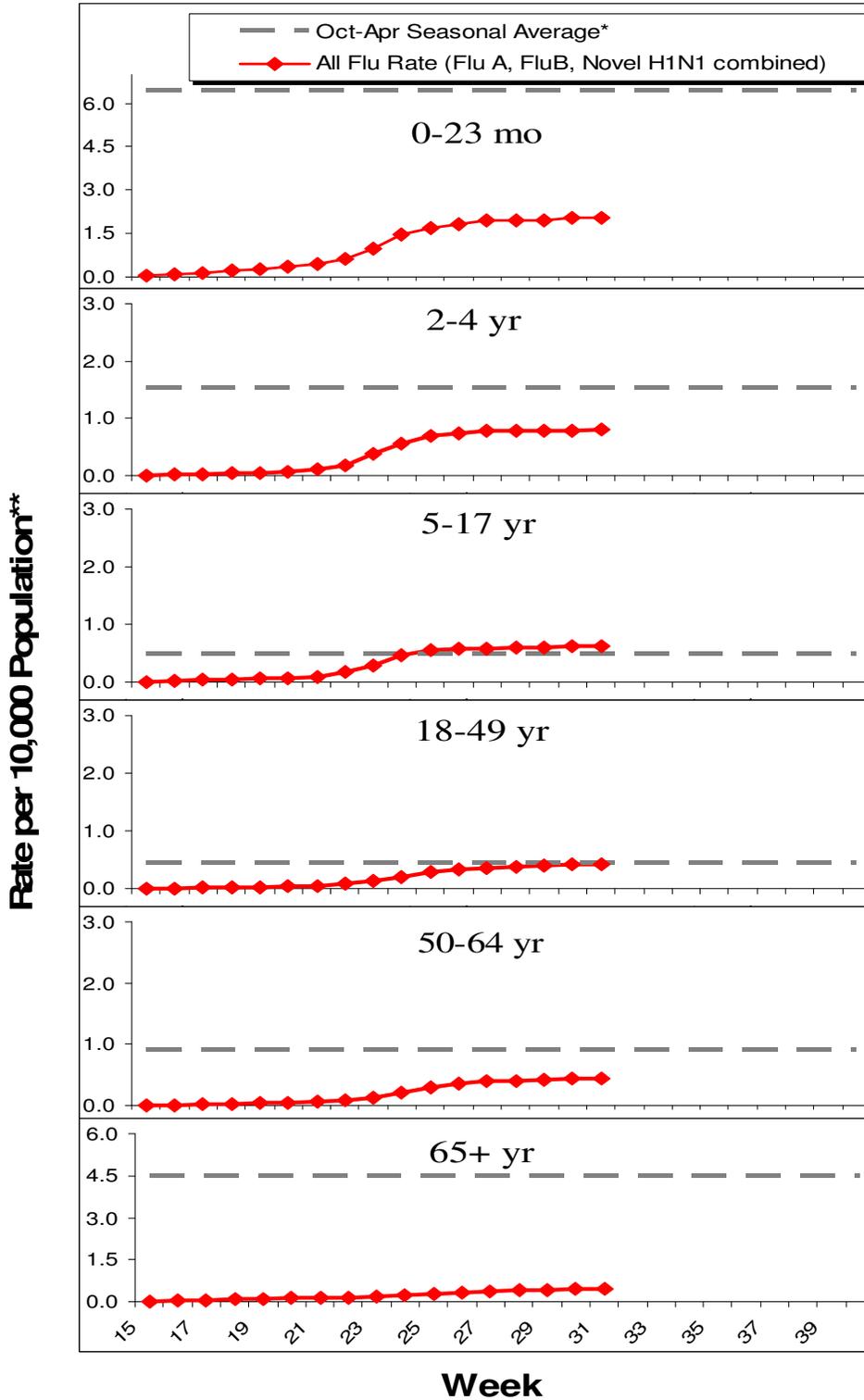
NVSN Influenza Laboratory-Confirmed Cumulative Hospitalization Rates for Children 0 - 4 Years, 2008-09 and Previous Three Seasons



During April 15, 2009 to August 8, 2009, the following preliminary laboratory-confirmed overall influenza associated hospitalization rates were reported by the EIP (*rates include type A, type B, and novel H1N1*):

Rates for children aged 0-23 months, 2-4 years, and 5-17 years were 2.0, 0.8, and 0.6 per 10,000, respectively. Rates for adults aged 18-49 years, 50-64 years, and ≥ 65 years were 0.4, 0.5, and 0.4 per 10,000, respectively.

EIP Influenza Laboratory-Confirmed Cumulative Hospitalization Rates, Spring/Summer 2009

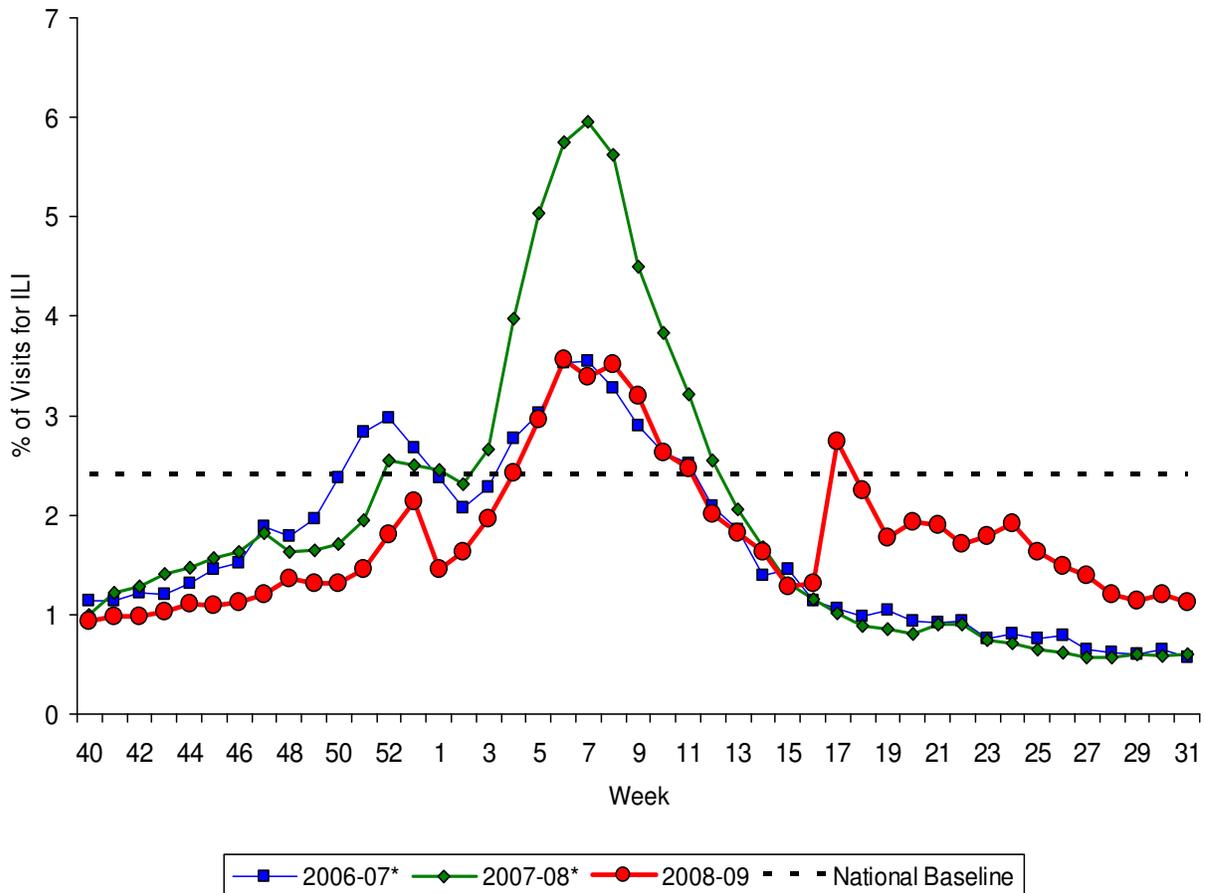


*This value represents an age group-specific average influenza rate from October 1 to April 30 from the 2005-06, 2006-07, and 2007-08 influenza seasons.

**Note: The scales for the 0-23 month and the ≥65 year age groups differ from other age groups.

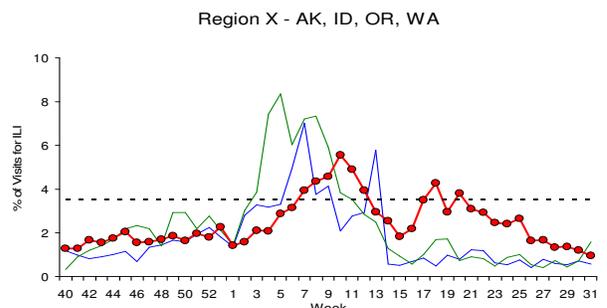
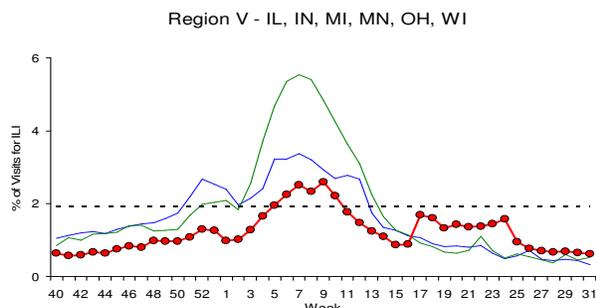
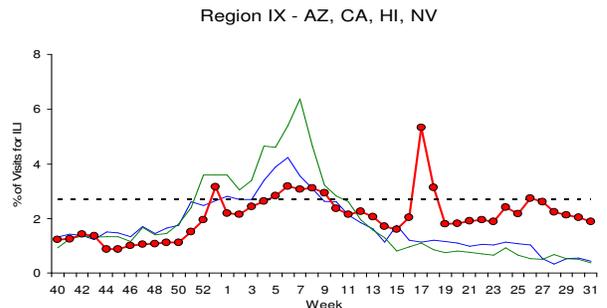
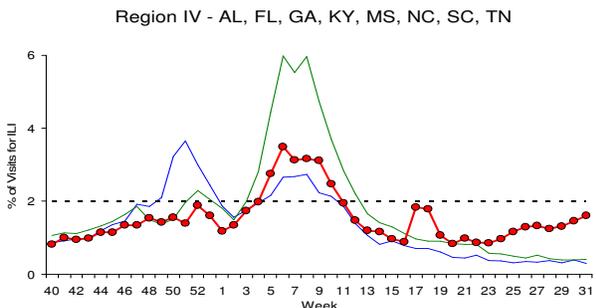
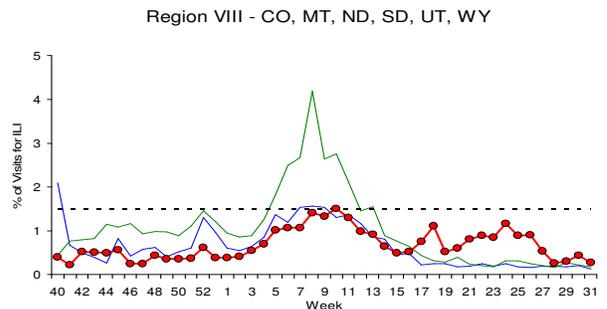
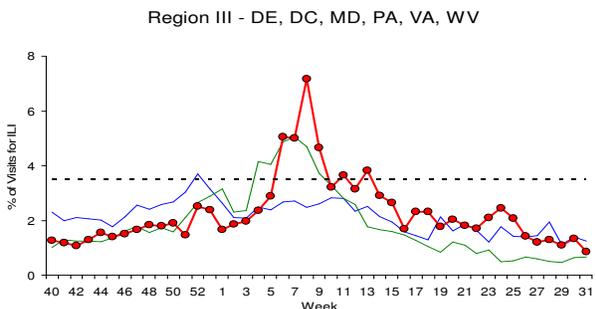
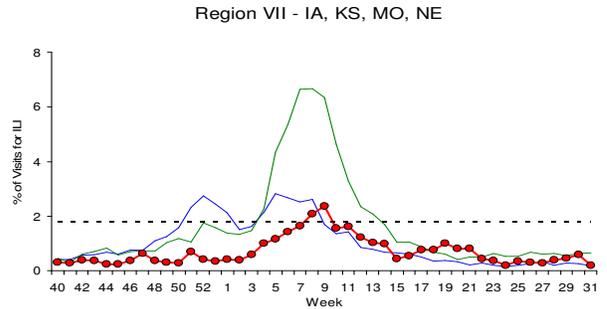
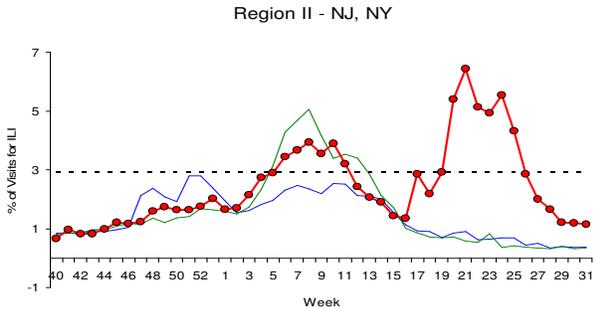
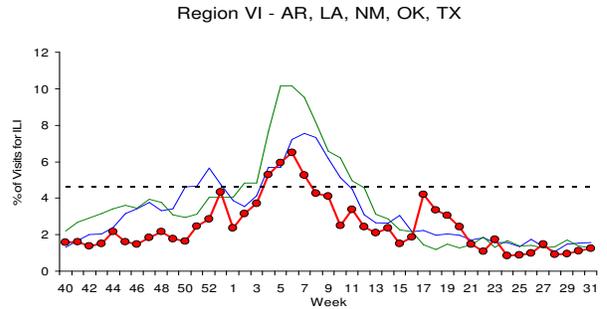
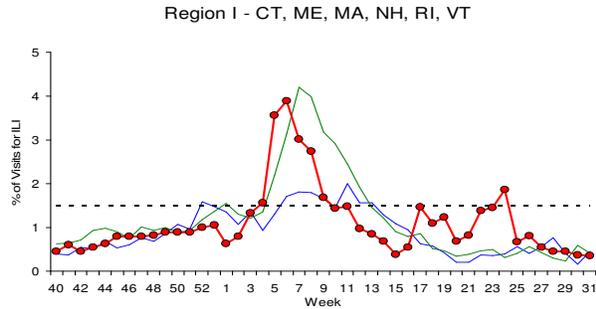
Outpatient Illness Surveillance: Nationwide during week 31, 1.1% of patient visits reported through the U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet) were due to influenza-like illness (ILI). This percentage is below the national baseline of 2.4%.

Percentage of Visits for Influenza-like Illness (ILI) Reported by the U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet), National Summary, 2008-09 and Previous Two Seasons



*There was no week 53 during the 2006-07 and 2007-08 seasons, therefore the week 53 data point for those seasons is an average of weeks 52 and 1.

On a regional level, the percentage of outpatient visits for ILI ranged from 0.2% to 1.9%. All 10 regions reported percentages of visits for ILI below their respective region-specific baselines. ILI decreased during week 31 in eight of 10 regions compared to week 30.



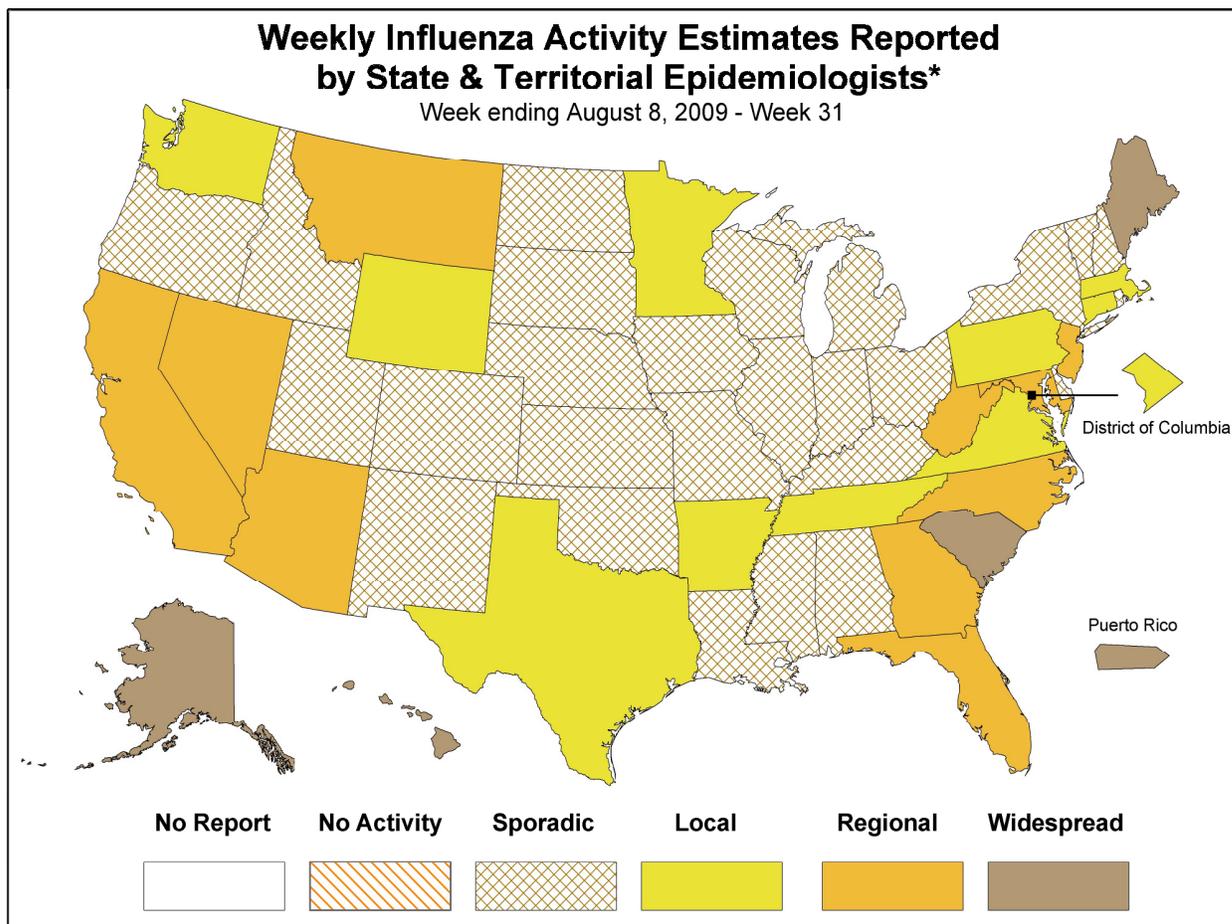
NOTE: Scales differ between regions

NOTE: There was no week 53 during the 2006-07 and 2007-08 seasons, therefore the week 53 data point for those seasons is an average of weeks 52 and 1.

Geographic Spread of Influenza as Assessed by State and Territorial Epidemiologists: The influenza activity reported by state and territorial epidemiologists indicates geographic spread of both seasonal influenza and novel influenza A (H1N1) viruses and does not measure the severity of influenza activity.

During week 31, the following influenza activity was reported:

- Widespread influenza activity was reported by Puerto Rico and four states (Alaska, Hawaii, Maine, and South Carolina).
- Regional influenza activity was reported by 10 states (Arizona, California, Florida, Georgia, Maryland, Montana, Nevada, New Jersey, North Carolina, and West Virginia).
- Local influenza activity was reported by the District of Columbia and 10 states (Arkansas, Connecticut, Massachusetts, Minnesota, Pennsylvania, Tennessee, Texas, Virginia, Washington, and Wyoming).
- Sporadic activity was reported by 26 states (Alabama, Colorado, Delaware, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Michigan, Mississippi, Missouri, Nebraska, New Hampshire, New Mexico, New York, North Dakota, Ohio, Oklahoma, Oregon, Rhode Island, South Dakota, Utah, Vermont, and Wisconsin).



* This map indicates geographic spread & does not measure the severity of influenza activity

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

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