

**2007-2008 Influenza Season
Week 14, ending April 5, 2008**

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

Synopsis: During week 14 (March 30 – April 5, 2008), influenza activity continued to decrease in the United States.

- Three hundred seventy-six (13.2%) specimens tested by U.S. World Health Organization (WHO) and National Respiratory and Enteric Virus Surveillance System (NREVSS) collaborating laboratories were positive for influenza.
- The proportion of deaths attributed to pneumonia and influenza has been above the epidemic threshold for 13 consecutive weeks.
- The proportion of outpatient visits for influenza-like illness (ILI) and the proportion of outpatient visits for acute respiratory illness (ARI) were below national baseline levels. ILI decreased in all nine regions compared to week 13, but remained above the region-specific baselines in the East North Central and West North Central regions. The proportion of outpatient visits reported for ARI was below all region and age-specific baselines.
- Six states reported widespread influenza activity; 11 states reported regional influenza activity; 23 states reported local influenza activity; and 10 states and the District of Columbia reported sporadic influenza activity.

National and Regional Summary of Select Surveillance Components

	Data for current week				Data cumulative for the season				
	Sentinel Provider ILI*	DoD and VA ARI*	% pos. for flu†	Number of jurisdictions reporting regional or widespread activity‡	A (H1)	A (H3)	A Unsub-typed	B	Pediatric Deaths
Nation	Normal	Normal	13.2%	17 of 51	2110	5605	17741	8924	65
New England	Normal	Normal	17.3%	4 of 6	94	183	928	932	7
Mid-Atlantic	Normal	Normal	21.3%	3 of 3	209	316	1155	1262	12
East North Central	Elevated	Normal	24.0%	1 of 5	178	1297	441	489	8
West North Central	Elevated	Normal	21.7%	2 of 7	104	190	2679	1307	6
South Atlantic	Normal	Normal	18.2%	1 of 9	343	1746	4612	1483	6
East South Central	Normal	Normal	21.0%	0 of 4	37	751	100	94	6
West South Central	Normal	Normal	12.1%	0 of 4	109	484	5943	1604	8
Mountain	Normal	Normal	12.5%	1 of 8	526	442	969	1029	5
Pacific	Normal	Normal	12.6%	5 of 5	510	196	914	724	7

* Elevated means the % of visits for ILI or ARI 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

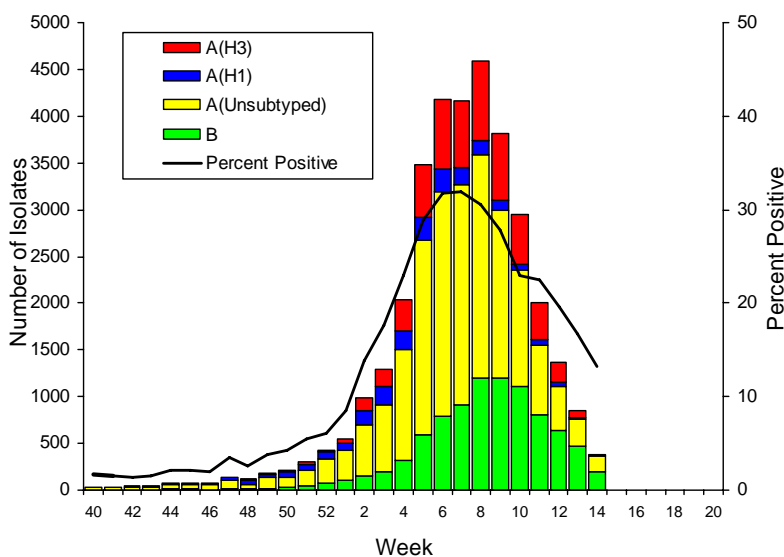
‡ Includes all 50 states and the District of Columbia

Laboratory Surveillance: During week 14, WHO and NREVSS laboratories reported 2,839 specimens tested for influenza viruses, 376 (13.2%) of which were positive, including 13 influenza A (H3) viruses, 166 influenza A viruses that were not subtyped, and 197 influenza B viruses.

Since September 30, 2007, WHO and NREVSS laboratories have tested a total of 185,938 specimens for influenza viruses and 34,380 (18.5%) were positive. Among the 34,380 influenza viruses, 25,456 (74.0%) were influenza A viruses and 8,924 (26.0%) were influenza B viruses. Seven thousand seven hundred fifteen (30.3%) of the 25,456 influenza A viruses have been subtyped: 2,110 (27.3%) were influenza A (H1) viruses and 5,605 (72.7%) were influenza A (H3) viruses.

During the 2007-08 season, influenza A (H1), A (H3), and B viruses have co-circulated in the United States. Influenza A (H3) viruses have predominated during the season overall, however, the most commonly reported influenza virus has varied by week. From week 40 through week 3 (September 30, 2007 – January 19, 2008) influenza A (H1) viruses were more frequently reported; from week 4 through week 12 (January 20 – March 22, 2008), influenza A (H3) viruses were more commonly reported; and for weeks 13 through 14 (March 23 – April 5, 2008), more influenza B than influenza A viruses were reported. The predominant virus has also varied by region. Influenza A (H3) viruses have been reported more frequently than A (H1) viruses in seven of the nine surveillance regions (East North Central, East South Central, Mid-Atlantic, New England, South Atlantic, West North Central, and West South Central) while influenza A (H1) viruses have predominated circulation this season in two regions (Mountain and Pacific).

U.S. WHO/NREVSS Collaborating Laboratories
National Summary, 2007-08



Composition of the 2008-09 Influenza Vaccine: WHO and FDA have recommended that the 2008-09 trivalent influenza vaccine for the Northern Hemisphere contain A/Brisbane/59/2007-like (H1N1), A/Brisbane/10/2007-like (H3N2), and B/Florida/4/2006-like viruses. All three components have been changed from the 2007-08 Northern Hemisphere vaccine formulation. A/Brisbane/10/2007-like (H3N2) and B/Florida/4/2006-like viruses are currently included in the 2008 Southern Hemisphere vaccines. This recommendation was based on surveillance data related to epidemiology and antigenic characteristics, serological responses to 2007-08 vaccines, and the availability of candidate strains and reagents.

Antigenic Characterization: CDC has antigenically characterized 608 influenza viruses [290 influenza A (H1N1), 161 influenza A (H3N2), and 157 influenza B viruses] collected by U.S. laboratories since September 30, 2007.

Influenza A (H1N1) [290]

- Two hundred (69%) of the 290 viruses were characterized as A/Solomon Islands/3/2006-like, the influenza A (H1N1) component of the 2007-08 influenza vaccine for the Northern Hemisphere and the 2008 influenza A (H1N1) component for the Southern Hemisphere.
- Twenty (7%) of the 290 viruses showed somewhat reduced titers with antisera produced against A/Solomon Islands/3/2006.
- Seventy (24%) of the 290 viruses were characterized as A/Brisbane/59/2007-like. A/Brisbane/59/2007 is a recent genetic/antigenic variant which evolved from A/Solomon Islands/03/2006. An A/Brisbane/59/2007-like virus is the WHO recommended strain for the 2008-09 Northern Hemisphere vaccine formulation.

Influenza A (H3N2) [161]

- Thirty-five (22%) of the 161 viruses were characterized as A/Wisconsin/67/2005-like, the influenza A (H3N2) component of the 2007-08 influenza vaccine for the Northern Hemisphere.
- One hundred fifteen (71%) of the 161 viruses were characterized as A/Brisbane/10/2007-like. A/Brisbane/10/2007-like viruses are a recent antigenic variant which evolved from, but are antigenically distinct from, A/Wisconsin/67/2005-like viruses. A/Brisbane/10/2007-like virus is the recommended influenza A (H3N2) component for the 2008 Southern Hemisphere and 2008-09 Northern Hemisphere vaccines.
- Eleven (7%) of the 161 viruses showed somewhat reduced titers with antisera produced against A/Wisconsin/67/2005 and A/Brisbane/10/2007.

Influenza B (B/Victoria/02/87 and B/Yamagata/16/88 lineages) [157]

Victoria lineage [8]

- Eight (5%) of the 157 influenza B viruses characterized belong to the B/Victoria lineage of viruses.
 - Six (75%) of these 8 viruses were characterized as B/Ohio/01/2005-like. The recommended influenza B component for the 2007-08 influenza vaccine is a B/Malaysia/2506/2004-like virus, belonging to the B/Victoria lineage. B/Ohio/01/2005 is a recent B/Malaysia/2506/2004-like reference strain.
 - Two (25%) of these 8 viruses showed somewhat reduced titers with antisera produced against B/Ohio/01/2005 and B/Malaysia/2506/2004.

Yamagata lineage [149]

- One hundred forty-nine (95%) of the 157 influenza B viruses characterized belong to the B/Yamagata lineage of viruses.
 - One hundred forty-eight (99%) of these 149 viruses were identified as B/Florida/04/2006-like, the recommended influenza B component for the 2008-09 Northern Hemisphere vaccine formulation.
 - One (1%) of these 149 viruses showed a somewhat reduced titer with antiserum produced against B/Florida/04/2006.

These data indicate similarities and differences between a sample of circulating strains and this year's vaccine strains as determined by laboratory studies. Clinical vaccine effectiveness cannot be accurately predicted using these data, and in previous years, influenza vaccination has been shown

to provide measurable protection against influenza illness and influenza-related complications, even when vaccine strains are antigenically distinct from circulating strains.

Antiviral Resistance: In the United States, two groups of antiviral drugs have been approved by FDA for use in treating or preventing influenza virus infections. These two groups of antiviral drugs are: neuraminidase inhibitors (oseltamivir and zanamivir) and adamantanes (amantadine and rimantadine). A description of these drugs can be found at: <http://www.cdc.gov/flu/protect/antiviral/index.htm>.

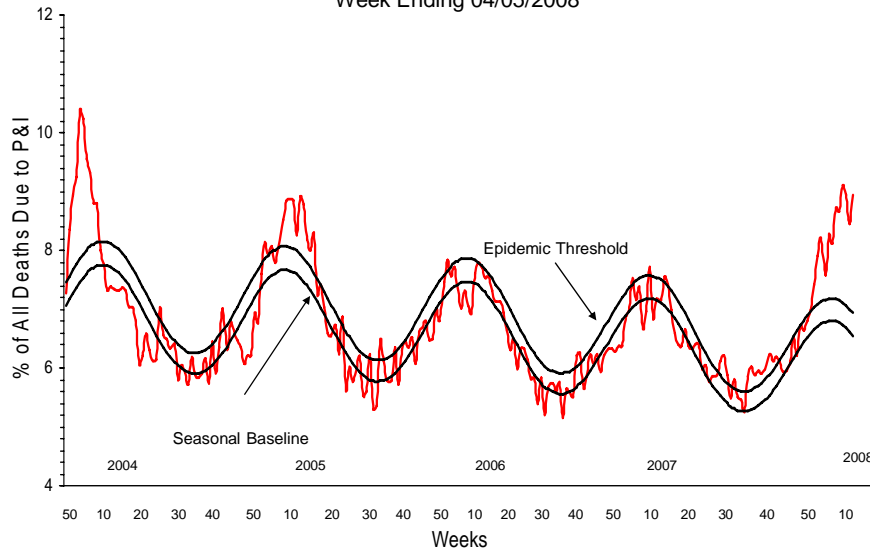
Neuraminidase Inhibitor Antiviral Drugs: So far this season, 1,153 influenza A and B viruses from the United States have been tested for antiviral resistance. Eighty-four (8.3%) of 1,018 influenza A viruses tested, and 0 (0.0%) of 135 influenza B viruses tested have been found to be resistant to oseltamivir. Currently all of the resistant viruses are influenza A (H1N1) viruses, with 84 (10.2%) of 824 influenza A (H1N1) viruses tested exhibiting a genetic mutation that confers oseltamivir resistance. All tested viruses retain their sensitivity to zanamivir. Additional information on antiviral resistance can be found at: <http://www.cdc.gov/flu/about/qa/antiviralresistance.htm>

Adamantane Antiviral Drugs: Resistance to the adamantanes continues to be high among influenza A (H3N2) viruses with 260 (99.6%) of 261 influenza A (H3N2) viruses tested resistant to the adamantanes. Adamantane resistance among influenza A (H1N1) viruses has also been detected but at a lower level. Of 729 influenza A (H1N1) viruses tested, 81 (11.1%) were resistant to the adamantanes. The adamantanes are not effective against influenza B viruses. Since late January, influenza A (H3N2) viruses have predominated in the United States, and during week 14, 100% of influenza A viruses subtyped were A (H3N2).

Based on the level of oseltamivir resistance observed in only one influenza subtype, H1N1, persisting high levels of resistance to the adamantanes in H3N2 viruses, and the predominance of H3N2 viruses circulating in the United States during the 2007-08 season with co-circulation of influenza B viruses, CDC continues to recommend the use of oseltamivir and zanamivir for the treatment or prevention of influenza. Use of amantadine or rimantadine is not recommended. Guidance on influenza antiviral use can be found at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5606a1.htm>

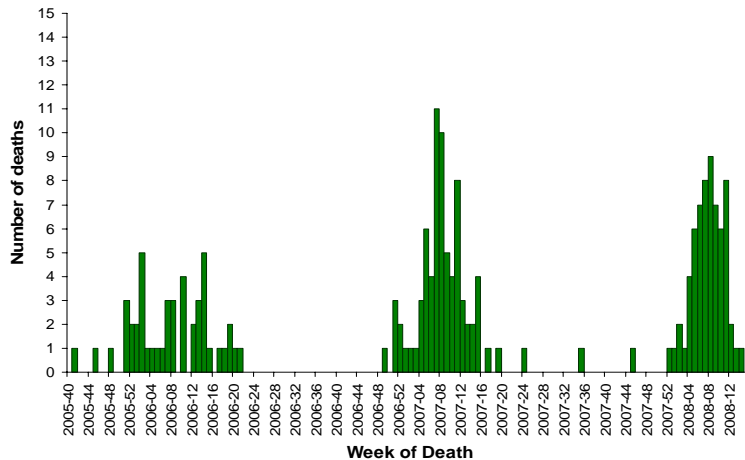
Pneumonia and Influenza (P&I) Mortality Surveillance: During week 14, 8.9% of all deaths reported through the 122 Cities Mortality Reporting System were reported as due to P&I. This percentage is above the epidemic threshold of 6.9% for week 14. Including week 14, P&I mortality has been above epidemic threshold for 13 consecutive weeks.

**Pneumonia and Influenza Mortality
for 122 U.S. Cities**
Week Ending 04/05/2008



Influenza-Associated Pediatric Mortality: Six influenza-associated pediatric deaths were reported to CDC during week 14 (CT, IL, NY, TN, TX, and VA). These deaths occurred between February 5 and March 30, 2008. Since September 30, 2007, CDC has received a total of 65 reports of influenza-associated pediatric deaths that occurred during the current season.

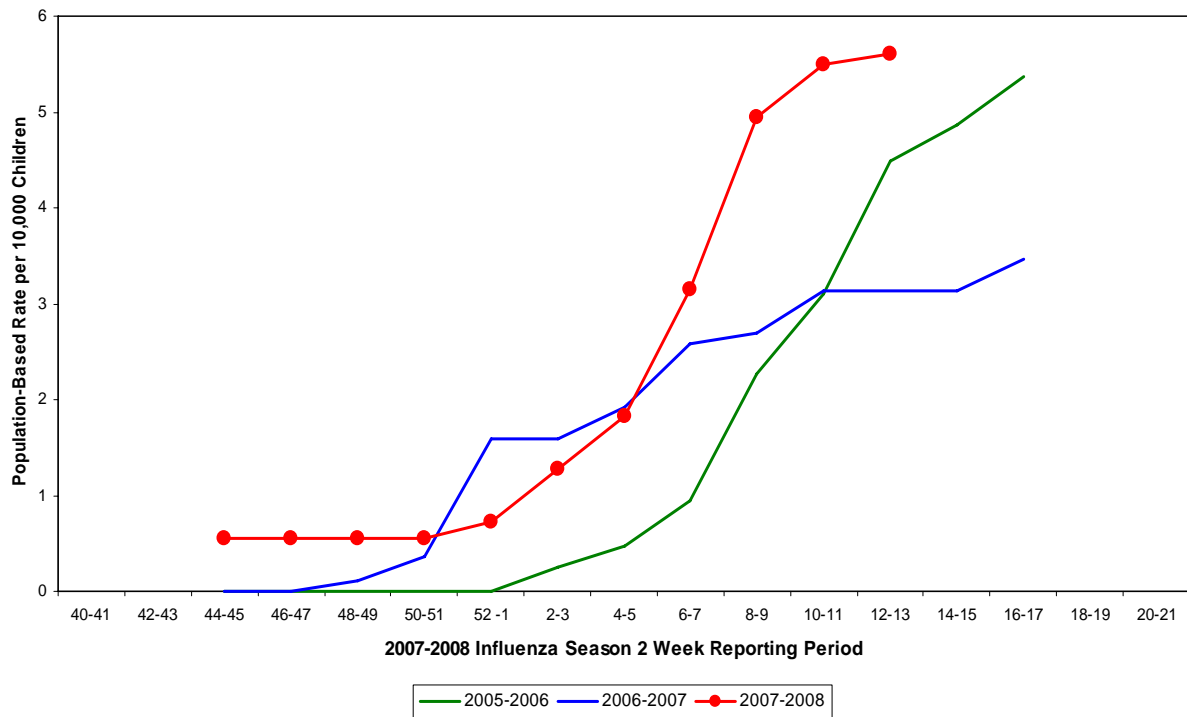
**Number of Influenza-Associated Pediatric Deaths
by Week of Death:**
2005-06 season to present



Influenza-Associated Pediatric Hospitalizations: Laboratory-confirmed influenza-associated pediatric hospitalizations are monitored in two population-based surveillance networks: the New Vaccine Surveillance Network (NVSN) and the Emerging Infections Program (EIP). These two systems provide updates of surveillance data every two weeks. As a result of differing dates for initiating surveillance in the 2007-08 season, these updates occur on alternating weeks.

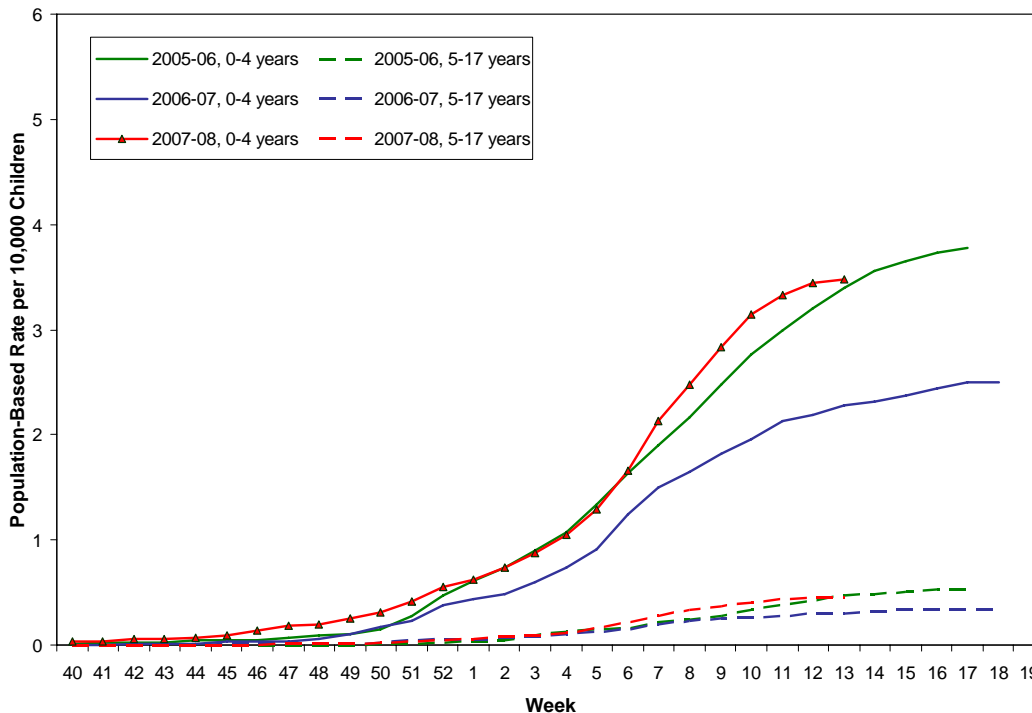
During November 4, 2007-March 22, 2008, the preliminary laboratory-confirmed influenza-associated hospitalization rate reported by the NVSN for children 0-4 years old was 5.61 per 10,000.

NVSN Influenza Laboratory-Confirmed Cumulative Hospitalization Rates for Children 0 - 4 Years, 2007- 08 and Previous 2 Seasons



During September 30 – March 29, 2008, the preliminary laboratory-confirmed influenza-associated hospitalization rate reported by the EIP for children 0–17 years old was 1.32 per 10,000. For children aged 0-4 years and 5-17 years, the rate was 3.47 per 10,000 and 0.45 per 10,000, respectively.

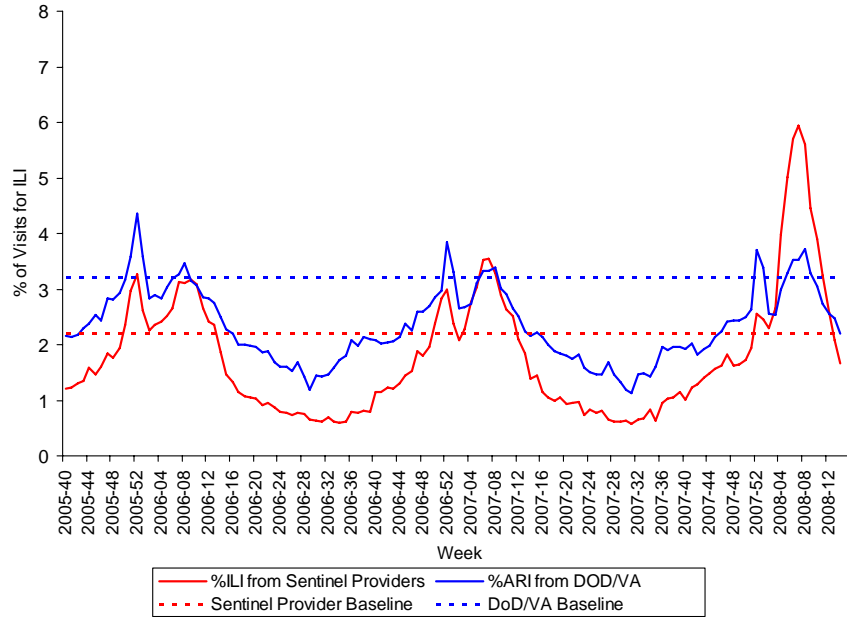
EIP Influenza Laboratory-Confirmed Cumulative Hospitalization Rates for Children Aged 0-4 and 5-17 yrs, 2007-2008 and Previous 2 Seasons



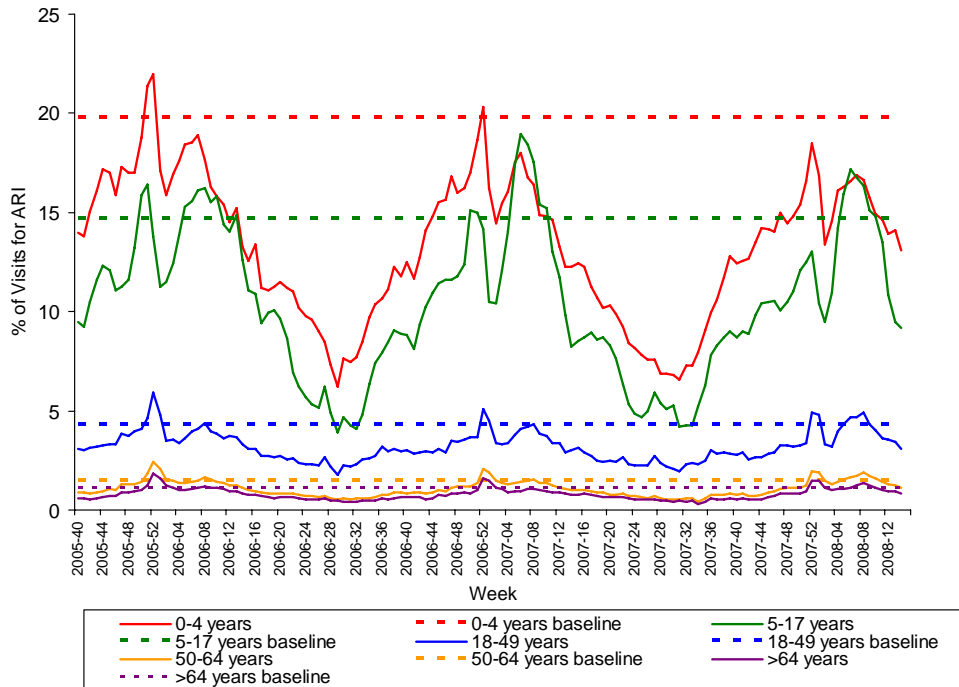
Outpatient Illness Surveillance: Nationwide during week 14, 1.7% of outpatient visits reported through the U.S. Influenza Sentinel Provider Surveillance Network were due to influenza-like illness (ILI), which was below the national baseline of 2.2%. On a regional level, the percentage of outpatient visits for ILI decreased in all nine regions compared to week 13 and ranged from 1.0% to 3.0%. Two of the nine regions reported ILI above their region-specific baselines (East North Central and West North Central), while the remaining seven regions (East South Central, Mid-Atlantic, Mountain, New England, Pacific, South Atlantic, and West South Central) reported ILI below their region-specific baselines.

During week 14, 2.2% of patient visits to Department of Veteran’s Affairs (VA) and Department of Defense (DoD) outpatient treatment facilities were for acute respiratory illness (ARI), which was below the national baseline of 3.2%. On a regional level, the percentage of visits for ARI ranged from 1.3% to 2.5%, and was below region-specific baselines in all nine regions. All five age groups reported ARI below their age-specific baselines.

Percentage of Visits for ILI & ARI Reported by Sentinel Providers and BioSense Outpatient Facilities, National Summary

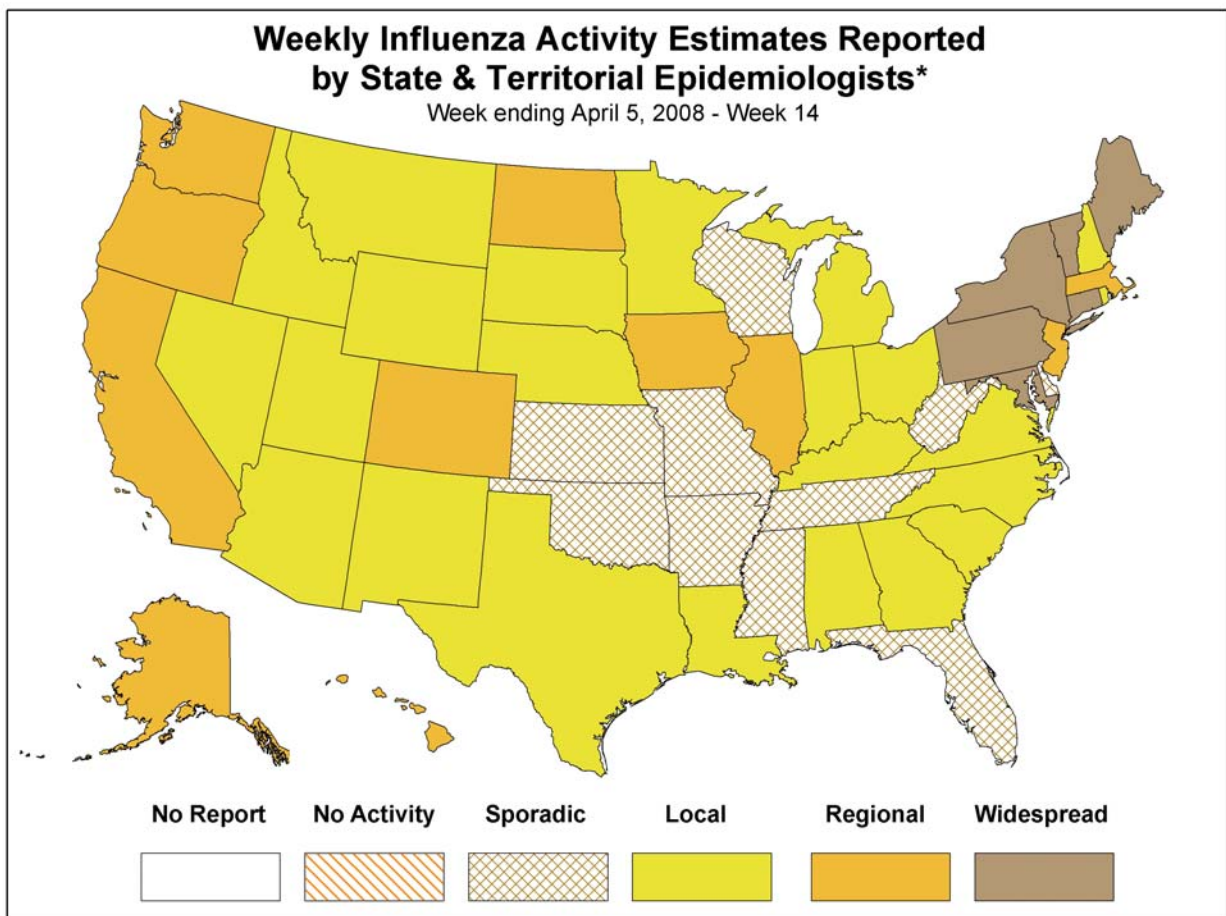


Percentage of Visits for ARI by Age Group Reported by DoD/VA Outpatient Clinics - National Summary



Geographic Spread of Influenza as Assessed by State and Territorial Epidemiologists: During week 14 the following influenza activity was reported:

- Widespread activity was reported by six states (Connecticut, Maine, Maryland, New York, Pennsylvania, and Vermont).
- Regional activity was reported by 11 states (Alaska, California, Colorado, Hawaii, Illinois, Iowa, Massachusetts, New Jersey, North Dakota, Oregon, and Washington).
- Local influenza activity was reported by 23 states (Alabama, Arizona, Georgia, Idaho, Indiana, Kentucky, Louisiana, Michigan, Minnesota, Montana, Nebraska, Nevada, New Hampshire, New Mexico, North Carolina, Ohio, Rhode Island, South Carolina, South Dakota, Texas, Utah, Virginia, and Wyoming).
- Sporadic influenza activity was reported by the District of Columbia and 10 states (Arkansas, Delaware, Florida, Kansas, Mississippi, Missouri, Oklahoma, Tennessee, West Virginia, 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>

Report prepared: April 11, 2008.