

2007-2008 Influenza Season
Week 13, ending March 29, 2008

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

Synopsis: During week 13 (March 23 - 29, 2008), influenza activity continued to decrease in the United States.

- Seven hundred three (17.7%) 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 was above the epidemic threshold for the twelfth consecutive week.
- The proportion of outpatient visits for influenza-like illness (ILI) was at national baseline levels, while the proportion of outpatient visits for acute respiratory illness (ARI) was below national baseline levels. ILI was above the region specific baselines in the East North Central, Mountain, New England, Pacific, and West North Central regions. The proportion of outpatient visits reported for ARI was below all region and age-specific baselines.
- Seven states reported widespread influenza activity; 27 states reported regional influenza activity; 11 states reported local influenza activity; and five 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	Elevated	Normal	17.7%	34 of 51	2067	5394	17563	8323	59
New England	Elevated	Normal	16.6%	4 of 6	80	85	879	813	6
Mid-Atlantic	Normal	Normal	28.7%	3 of 3	205	304	1100	1192	11
East North Central	Elevated	Normal	33.5%	2 of 5	173	1271	603	462	7
West North Central	Elevated	Normal	24.1%	5 of 7	90	178	2614	1174	6
South Atlantic	Normal	Normal	19.6%	5 of 9	343	1746	4559	1418	5
East South Central	Normal	Normal	31.3%	1 of 4	37	747	100	84	5
West South Central	Normal	Normal	15.7%	2 of 4	109	493	5921	1575	7
Mountain	Elevated	Normal	13.4%	7 of 8	520	377	942	943	5
Pacific	Elevated	Normal	14.8%	5 of 5	510	193	845	662	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

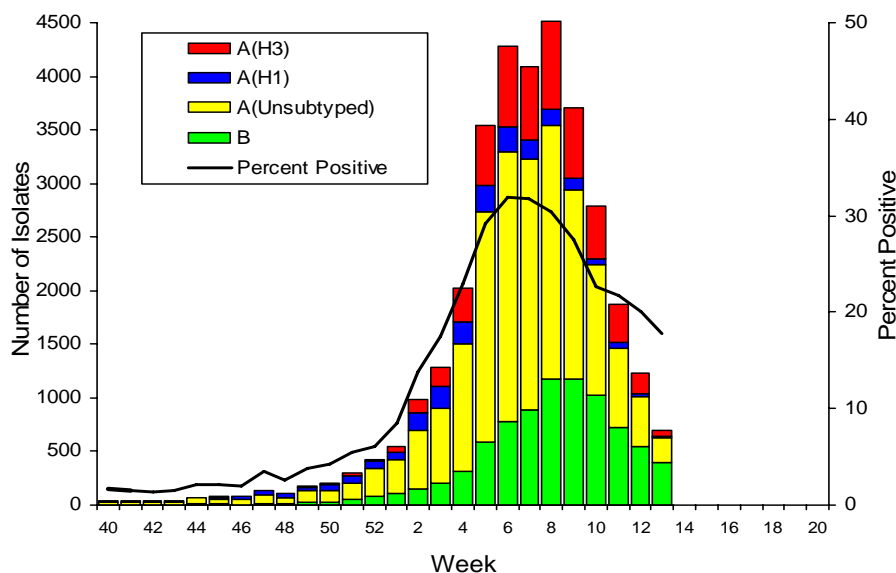
‡ Includes all 50 states and the District of Columbia

Laboratory Surveillance: During week 13, WHO and NREVSS laboratories reported 3,964 specimens tested for influenza viruses, 703 (17.7%) of which were positive, including six influenza A (H1) viruses, 61 influenza A (H3) viruses, 244 influenza A viruses that were not subtyped, and 392 influenza B viruses.

Since September 30, 2007, WHO and NREVSS laboratories have tested a total of 180,056 specimens for influenza viruses and 33,347 (18.5%) were positive. Among the 33,347 influenza viruses, 25,024 (75.0%) were influenza A viruses and 8,323 (25.0%) were influenza B viruses. Seven thousand four hundred sixty-one (29.8%) of the 25,024 influenza A viruses have been subtyped: 2,067 (27.7%) were influenza A (H1) viruses and 5,394 (72.3%) were influenza A (H3) viruses.

Influenza A (H3) viruses have predominated in the United States overall during the 2007-08 season. However, each week from week 40 through week 3 (September 30, 2007 – January 19) influenza A (H1) viruses were more frequently reported than A (H3) viruses, and for the current week, (week 13) 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). Influenza A (H1) viruses have predominated circulation this season in the remaining 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 557 influenza viruses [256 influenza A (H1N1), 144 influenza A (H3N2), and 157 influenza B viruses] collected by U.S. laboratories since September 30, 2007.

Influenza A (H1N1) [256]

- One hundred seventy-five (69%) of the 256 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.
- Nineteen (7%) of the 256 viruses showed somewhat reduced titers with antisera produced against A/Solomon Islands/3/2006.
- Sixty-two (24%) of the 256 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) [144]

- Thirty-four (23%) of the 144 viruses were characterized as A/Wisconsin/67/2005-like, the influenza A (H3N2) component of the 2007-08 influenza vaccine for the Northern Hemisphere.
- Ninety-nine (69%) of the 144 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 (8%) of the 144 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>.

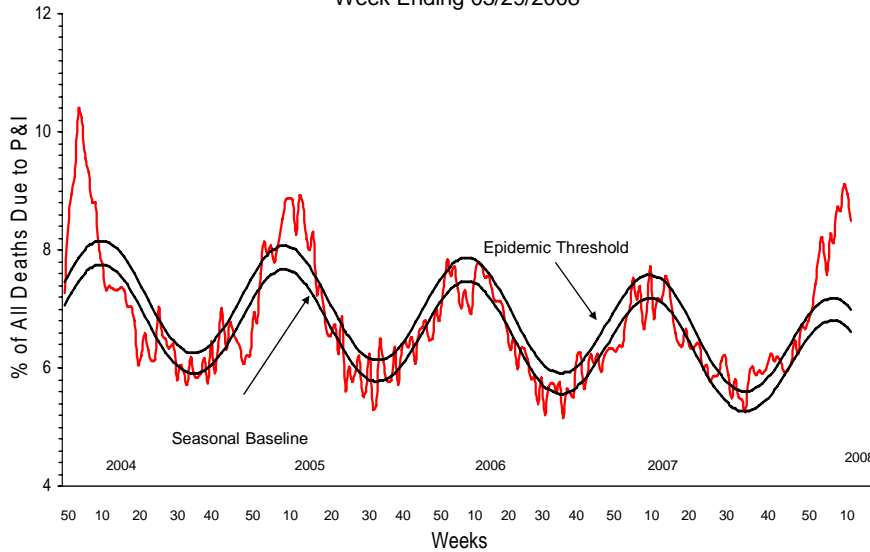
Neuraminidase Inhibitor Antiviral Drugs: So far this season, 1,117 influenza A and B viruses from the United States have been tested for antiviral resistance. Seventy-three (7.4%) of 982 influenza A viruses tested, and 0 (0.0%) of 135 influenza B viruses tested have been found to be resistant to oseltamivir. Currently all of the resistant viruses are influenza A (H1N1) viruses, with 73 (9.2%) of 797 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 219 (99.5%) of 220 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 708 influenza A (H1N1) viruses tested, 81 (11.4%) were resistant to the adamantanes. Since late January, influenza A (H3N2) viruses have predominated in the United States, and during week 13, 91.0% of influenza A viruses subtyped were A (H3N2). The adamantanes are not effective against influenza B viruses.

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>

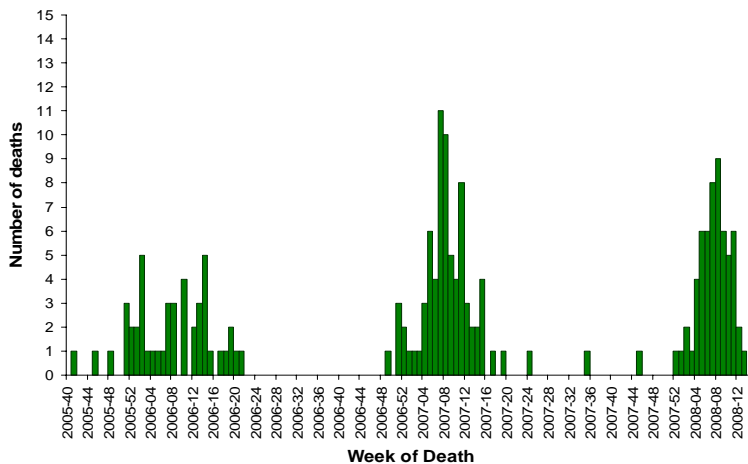
Pneumonia and Influenza (P&I) Mortality Surveillance: During week 13, 8.5% of all deaths reported through the 122 Cities Mortality Reporting System were reported as due to P&I. This percentage is above the epidemic threshold of 7.0% for week 13. Including week 13, P&I mortality has been above epidemic threshold for twelve consecutive weeks.

Pneumonia and Influenza Mortality
for 122 U.S. Cities
Week Ending 03/29/2008



Influenza-Associated Pediatric Mortality: Six influenza-associated pediatric deaths were reported to CDC during week 13 (AZ, CT, MN [2], NV, and TX). These deaths occurred between March 8 and March 23, 2008. Since September 30, 2007, CDC has received a total of 59 reports of influenza-associated pediatric deaths that occurred during the current season.

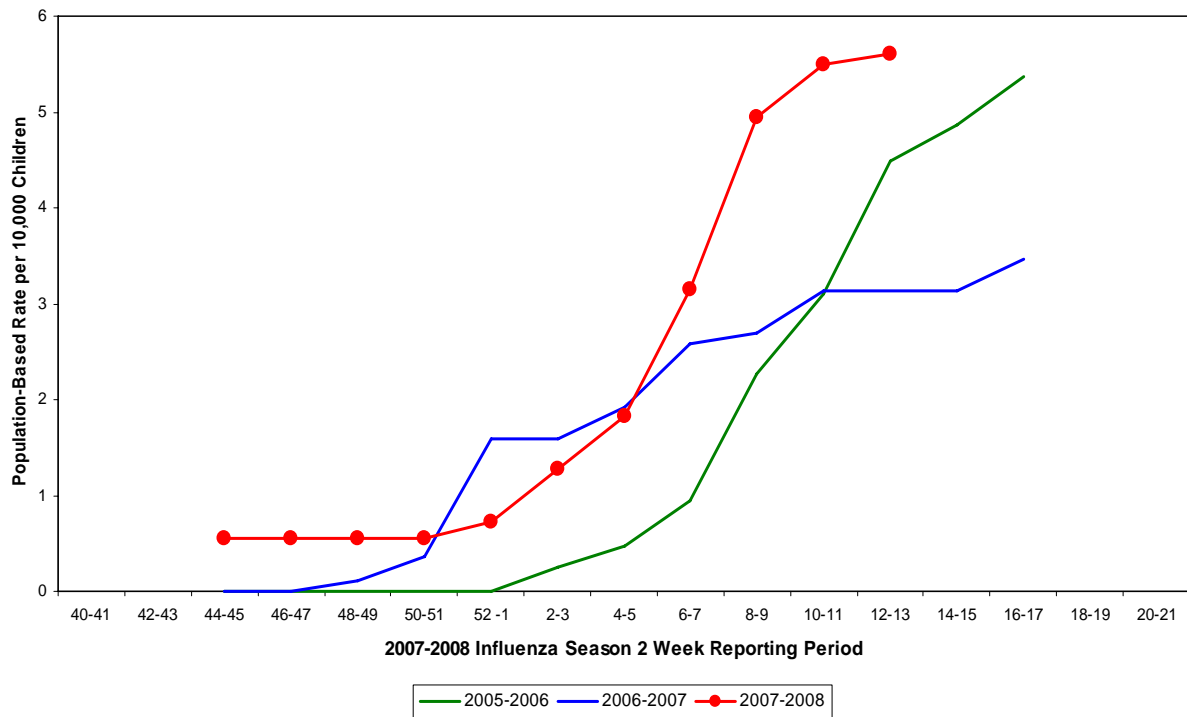
Number of Influenza-Associated Pediatric Deaths
by Week of Death:
2005-06 season to present



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.

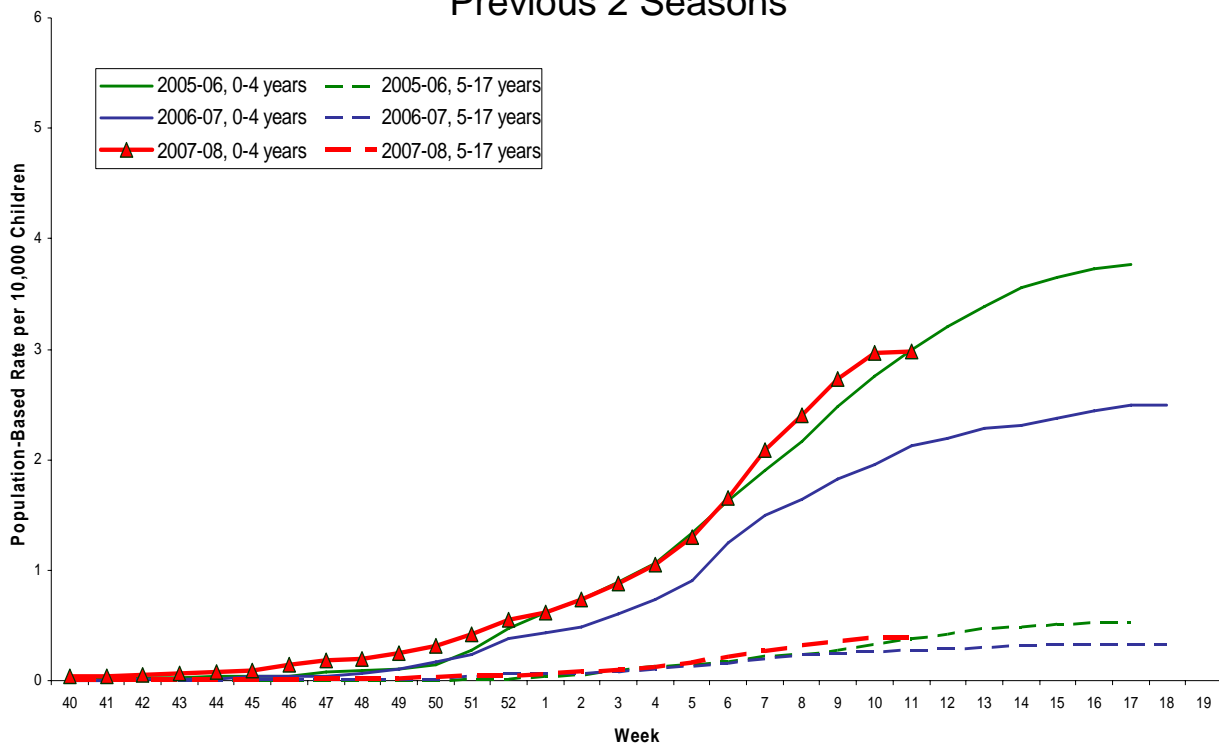
During November 4, 2007-March 22, 2008, the preliminary laboratory-confirmed influenza-associated hospitalization rate reported by the NVSN for children 0-4 years old was 5.61 per 10,000.

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



During September 30 – March 15, 2008, the preliminary laboratory-confirmed influenza-associated hospitalization rate reported by the EIP for children 0–17 years old was 1.14 per 10,000. For children aged 0-4 years and 5-17 years, the rate was 2.98 per 10,000 and 0.38 per 10,000, respectively.

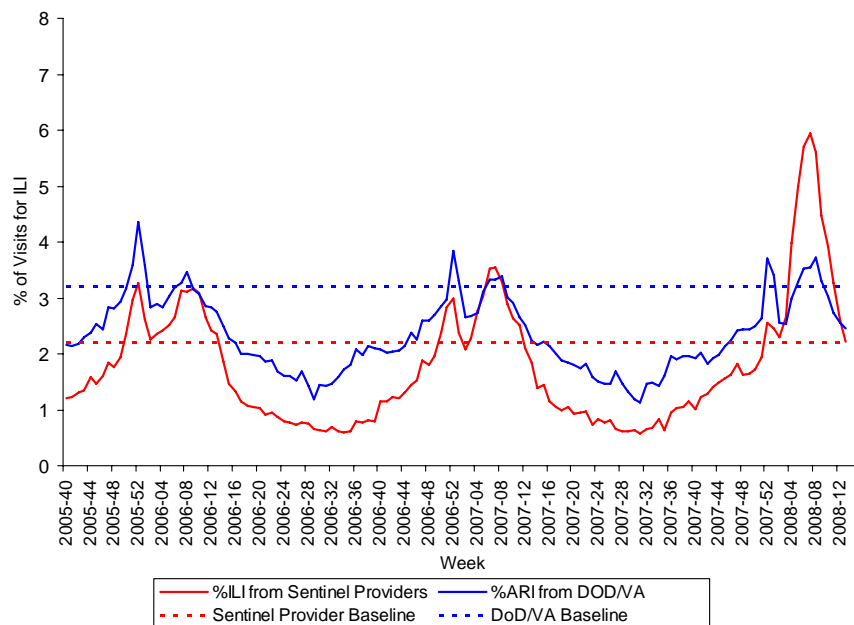
EIP Influenza Laboratory-Confirmed Cumulative Hospitalization Rates for Children Aged 0-4 and 5-17 yrs, 2007-2008 and Previous 2 Seasons



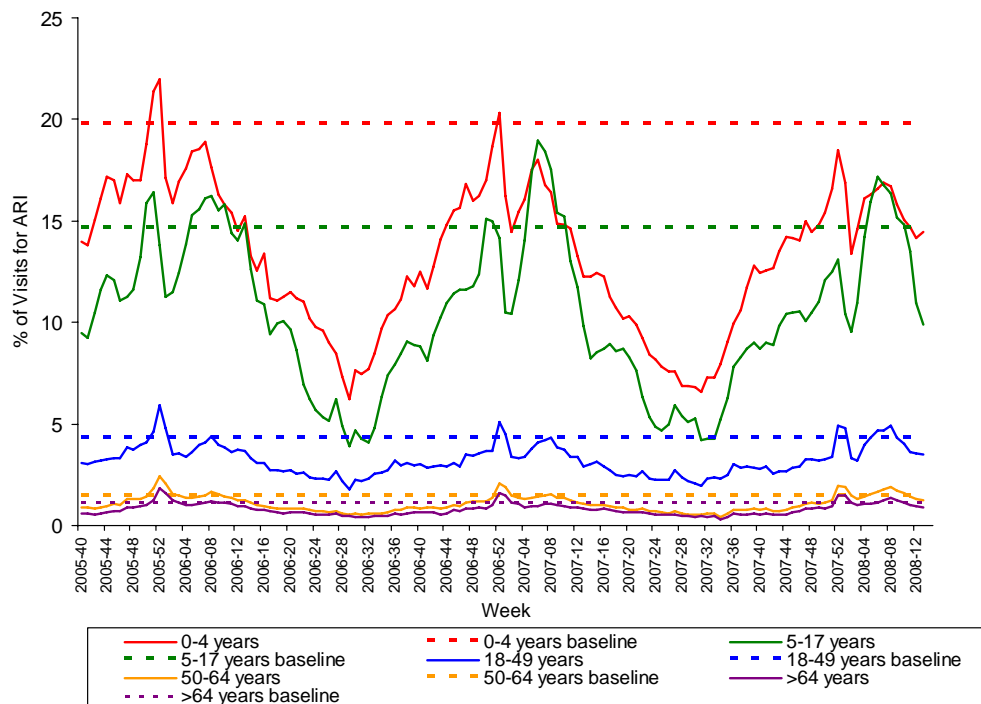
Outpatient Illness Surveillance: Nationwide during week 13, 2.2% of outpatient visits reported through the U.S. Influenza Sentinel Provider Surveillance Network were due to influenza-like illness (ILI), which was at the national baseline of 2.2%. On a regional level, the percentage of visits for ILI ranged from 1.4% to 3.6%. Five of the nine regions reported ILI above their region-specific baselines (East North Central, Mountain, New England, Pacific, and West North Central), while the remaining four regions (East South Central, Mid-Atlantic, South Atlantic, and West South Central) reported ILI below their region specific baselines.

During week 13, 2.5% 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 1.5% to 2.9%, 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

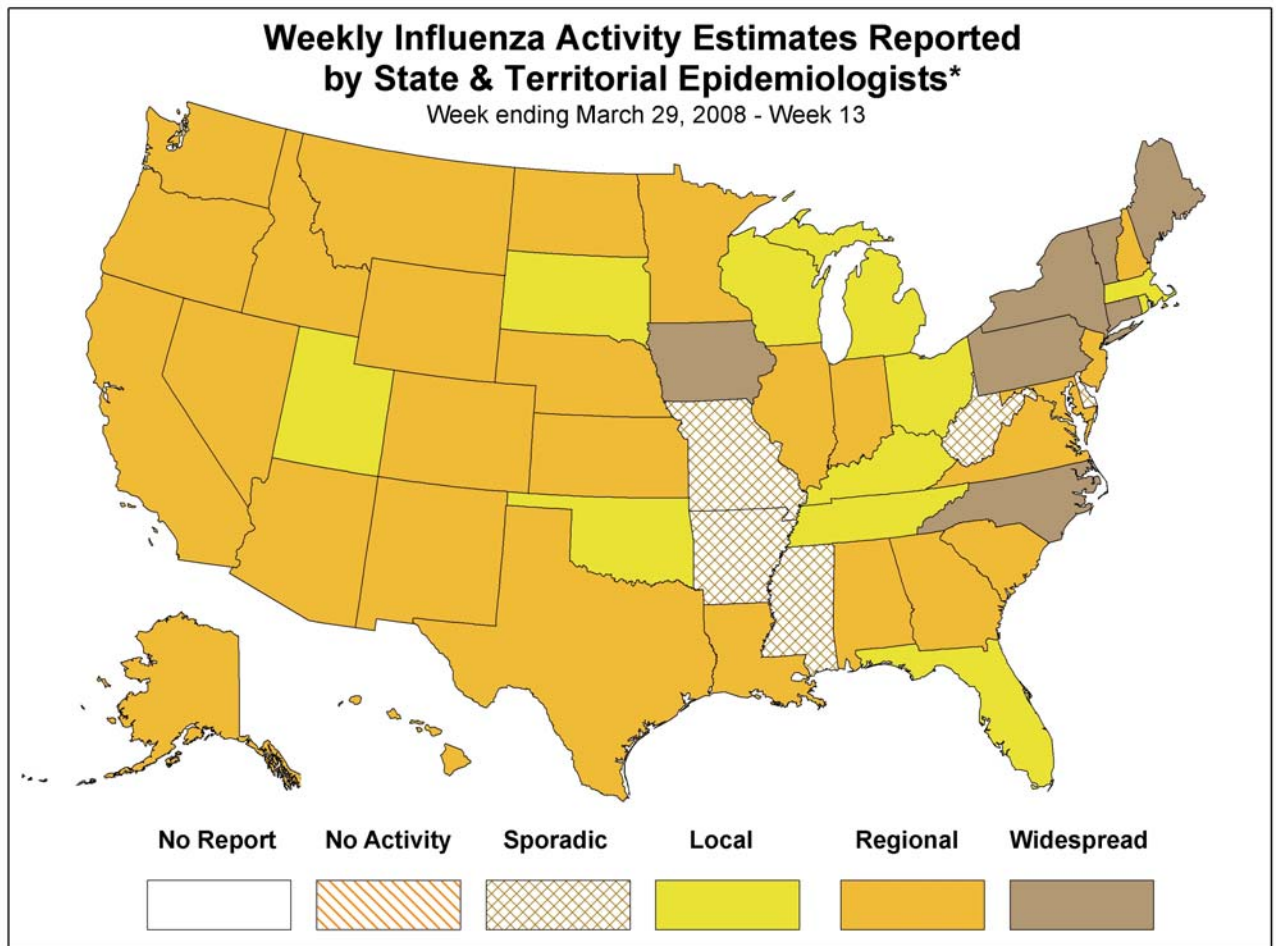


Percentage of Visits for ARI by Age Group Reported by DoD/VA Outpatient Clinics - National Summary



Geographic Spread of Influenza as Assessed by State and Territorial Epidemiologists: During week 13 the following influenza activity was reported:

- Widespread activity was reported by seven states (Connecticut, Iowa, Maine, New York, North Carolina, Pennsylvania, and Vermont).
- Regional activity was reported by 27 states (Alabama, Alaska, Arizona, California, Colorado, Georgia, Hawaii, Idaho, Illinois, Indiana, Kansas, Louisiana, Maryland, Minnesota, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, North Dakota, Oregon, South Carolina, Texas, Virginia, Washington, and Wyoming).
- Local influenza activity was reported by 11 states (Florida, Kentucky, Massachusetts, Michigan, Ohio, Oklahoma, Rhode Island, South Dakota, Tennessee, Utah, and Wisconsin).
- Sporadic influenza activity was reported by the District of Columbia and five states (Arkansas, Delaware, Mississippi, Missouri, and West Virginia).



* 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 4, 2008.