

**2007-2008 Influenza Season  
Week 9, ending March 1, 2008**

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

**Synopsis:** During week 9 (February 24 – March 1, 2008), influenza activity continued to decrease in the United States.

- Two thousand four hundred one (27.2%) 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 was above the epidemic threshold for the eighth consecutive week.
- The proportion of outpatient visits for influenza-like illness (ILI) and acute respiratory illness (ARI) was above national baseline levels. ILI decreased in seven of the nine regions compared to week 8, but remained above region-specific baselines in all nine regions. The Mid-Atlantic and West North Central regions reported ARI at or above their region specific baselines.
- Forty-seven states reported widespread influenza activity; three states reported regional influenza activity; and the District of Columbia reported local 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
<b>Nation</b>	Elevated	Elevated	27.2%	50 of 51	1550	3417	13824	4742	32
<b>New England</b>	Elevated	Normal	25.4%	6 of 6	53	33	590	479	0
<b>Mid-Atlantic</b>	Elevated	Elevated	24.8%	3 of 3	71	50	700	762	4
<b>East North Central</b>	Elevated	Normal	42.8%	5 of 5	128	698	482	269	4
<b>West North Central</b>	Elevated	Elevated	31.7%	7 of 7	71	102	1683	480	4
<b>South Atlantic</b>	Elevated	Normal	33.5%	8 of 9	278	1307	3557	875	3
<b>East South Central</b>	Elevated	Normal	45.1%	4 of 4	29	493	64	22	5
<b>West South Central</b>	Elevated	Normal	30.8%	4 of 4	87	337	5428	924	6
<b>Mountain</b>	Elevated	Normal	24.5%	8 of 8	387	270	719	560	2
<b>Pacific</b>	Elevated	Normal	17.0%	5 of 5	446	127	601	371	4

\* 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

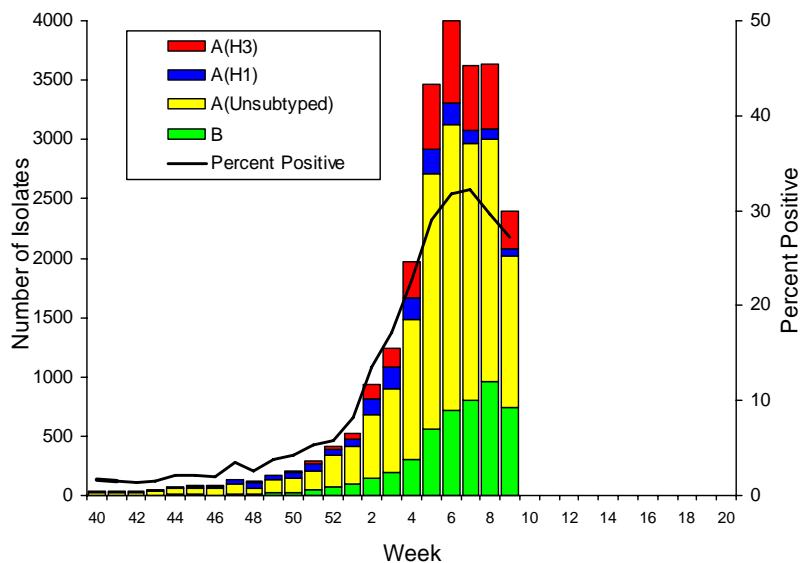
‡ Includes all 50 states and the District of Columbia

**Laboratory Surveillance:** During week 9, WHO and NREVSS laboratories reported 8,814 specimens tested for influenza viruses, 2,401 (27.2%) of which were positive, including 54 influenza A (H1) viruses, 327 influenza A (H3) viruses, 1,280 influenza A viruses that were not subtyped, and 740 influenza B viruses.

Since September 30, 2007, WHO and NREVSS laboratories have tested a total of 138,546 specimens for influenza viruses and 23,533 (17.0%) were positive. Among the 23,533 influenza viruses, 18,791 (79.8%) were influenza A viruses and 4,742 (20.2%) were influenza B viruses. Four thousand nine hundred sixty-seven (26.4%) of the 18,791 influenza A viruses have been subtyped: 1,550 (31.2%) were influenza A (H1) viruses and 3,417 (68.8%) were influenza A (H3) viruses.

Although influenza A (H1) viruses predominated through mid-January, an increasing proportion of subtyped influenza A viruses are influenza A (H3) viruses. Influenza A (H3) viruses have been reported more frequently than influenza A (H1) viruses since week 4 (January 20-26), and during week 6 (February 3-9), influenza A (H3) became the predominant virus for the season overall. This season influenza A (H3) viruses have been reported more frequently than A (H1) viruses nationally, as well as in five of the nine surveillance regions (East North Central, East South Central, South Atlantic, West North Central, and West South Central). Influenza A (H1) viruses have predominated circulation this season in the remaining four regions (Mid-Atlantic, Mountain, New England, 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 366 influenza viruses [191 influenza A (H1N1), 86 influenza A (H3N2), and 89 influenza B viruses] collected by U.S. laboratories since September 30, 2007.

#### **Influenza A (H1N1) [191]**

- One hundred forty-seven (77%) of the 191 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 (10%) of the 191 viruses showed somewhat reduced titers with antisera produced against A/Solomon Islands/3/2006.
- Twenty-five (13%) of the 191 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) [86]**

- Twelve (14%) of the 86 viruses were characterized as A/Wisconsin/67/2005-like, the influenza A (H3N2) component of the 2007-08 influenza vaccine for the Northern Hemisphere.
- Sixty-seven (78%) of the 86 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.
- Seven (8%) of the 86 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) [89]**

##### **Victoria lineage [6]**

- Six (7%) of the 89 influenza B viruses characterized belong to the B/Victoria lineage of viruses.
  - Four (67%) of these 4 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 (33%) of these 4 viruses showed somewhat reduced titers with antisera produced against B/Ohio/01/2005 and B/Malaysia/2506/2004.

##### **Yamagata lineage [83]**

- Eighty-three (93%) of the 89 influenza B viruses characterized belong to the B/Yamagata lineage of viruses.
  - Eighty-two (99%) of these 83 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 83 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 rimantidine). A description of these drugs can be found at:

<http://www.cdc.gov/flu/protect/antiviral/index.htm>.

**Neuraminidase Inhibitor Antiviral Drugs:** Of the 743 influenza A and B viruses from the United States tested for antiviral resistance so far this season, 45 (6.1%) have been found to be resistant to oseltamivir. Currently all of the resistant viruses are H1N1 viruses, with 45 (8.7%) of 519 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>

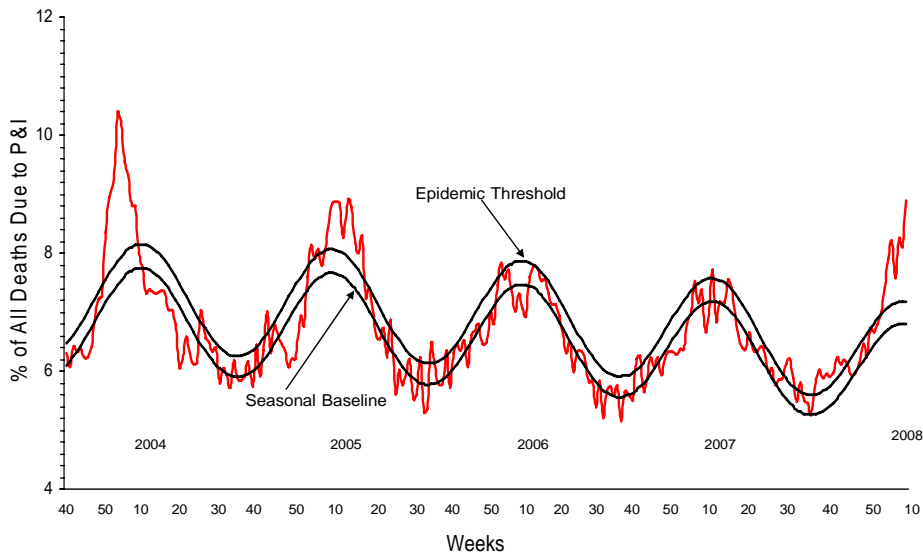
**Adamantane Antiviral Drugs:** Resistance to the adamantanes continues to be high. Among 511 influenza A viruses tested, 111 (21.7%) are resistant to adamantanes, including 98.9% of H3N2 viruses and 4.3% of H1N1 viruses. The adamantanes are not effective against influenza B viruses.

Based on the level of oseltamivir resistance observed in only one influenza subtype, H1N1, and persisting high levels of resistance to the adamantanes in both H3N2 and H1N1 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>

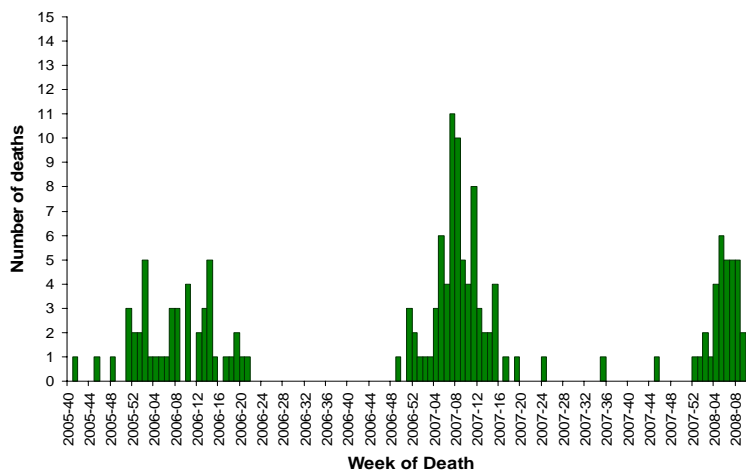
**Pneumonia and Influenza (P&I) Mortality Surveillance:** During week 9, 8.9% of all deaths reported through the 122 Cities Mortality Reporting System were reported as due to P&I. This percentage is above the epidemic threshold of 7.2% for week 9. Including week 9, P&I mortality has been above epidemic threshold for eight consecutive weeks.

**Pneumonia and Influenza Mortality  
for 122 U.S. Cities**  
Week Ending 03/01/2008



**Influenza-Associated Pediatric Mortality:** Nine influenza-associated pediatric deaths were reported to CDC during week 9 [GA (2), IA (3), MN, MS, NY, and OH]. One of these deaths occurred during the 2006-07 season, bringing the total number of cases occurring during that season to 75. Since September 30, 2007, CDC has received a total of 32 reports of influenza-associated pediatric deaths that occurred during the current season.

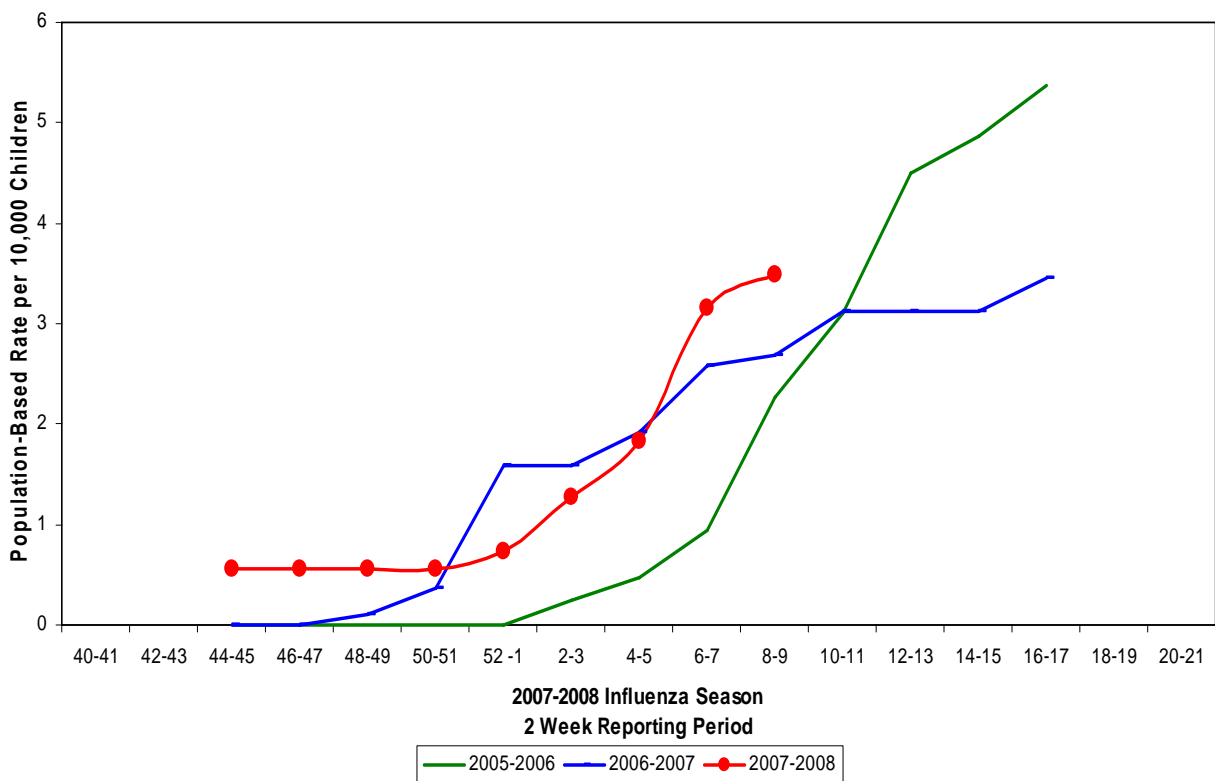
**Number of Influenza-Associated Pediatric Deaths  
by Week of Death:**  
2005-06 season to present



**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.

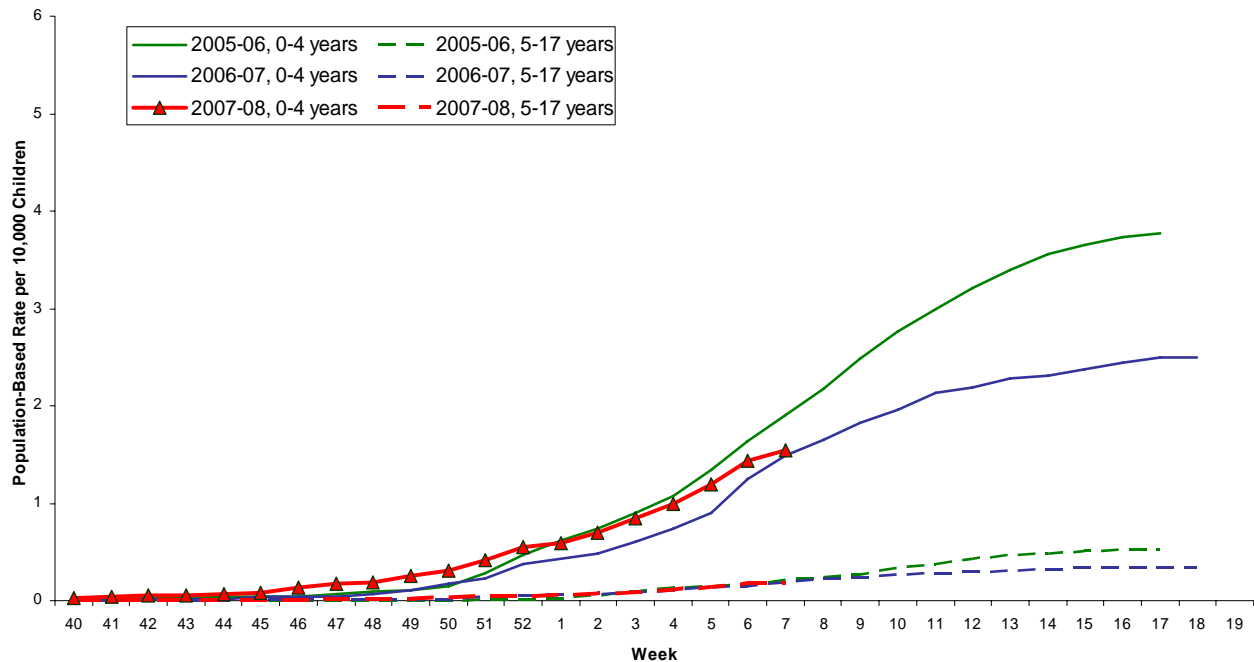
During November 4, 2007-February 23, 2008, the preliminary laboratory-confirmed influenza-associated hospitalization rate reported by the NVSN for children 0-4 years old was 3.48 per 10,000.

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



During September 30 – February 16, 2008, the preliminary laboratory-confirmed influenza-associated hospitalization rate reported by the EIP for children 0–17 years old was 0.57 per 10,000. For children aged 0-4 years and 5-17 years, the rate was 1.54 per 10,000 and 0.18 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

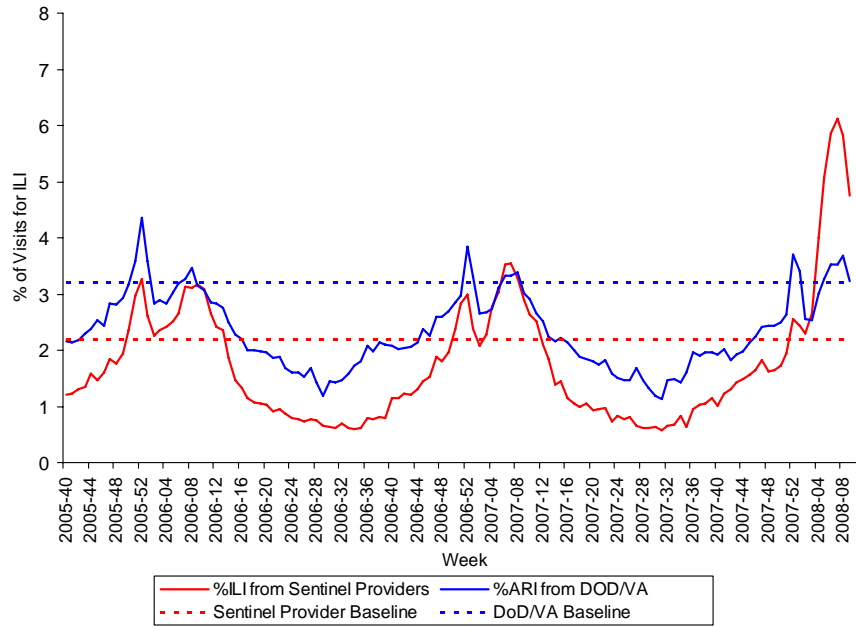


**Outpatient Illness Surveillance:** Nationwide during week 9, 4.8% of outpatient visits reported through the U.S. Influenza Sentinel Provider Surveillance Network were due to influenza-like illness (ILI), which is above the national baseline of 2.2%. On a regional level, the percentage of visits for ILI decreased in seven of the nine regions compared to last week and ranged from 3.1% to 8.9%. All nine regions reported ILI above their region-specific baselines.

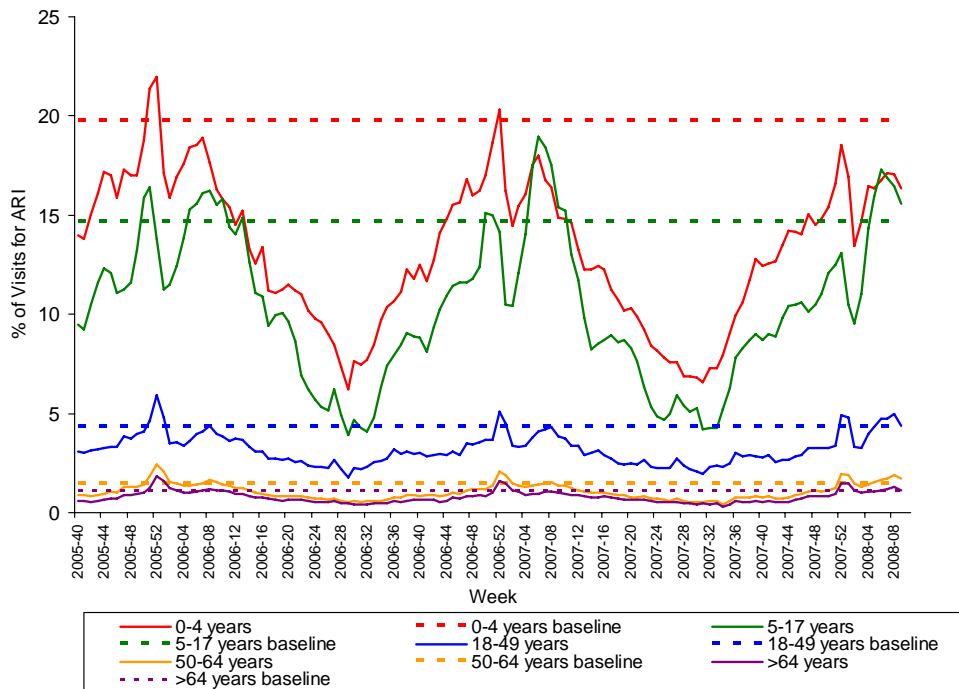
Starting in week 5, New York City began reporting ILI data collected electronically from emergency departments city-wide, adding approximately 60,000 additional patient visits per week to the U.S. Influenza Sentinel Provider Surveillance Network. Retrospective reports were submitted for all earlier weeks this season. While this change increases the total patient visits per week by approximately 15%, it is not expected to influence the national ILI outpatient visit percentage after population weighting, but may have a larger impact on the Mid-Atlantic regional ILI percentage.

During week 9, 3.2% 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 at the national baseline of 3.2%. On a regional level, the percentage of visits for ARI ranged from 1.8% to 3.8%, and was at or above the region-specific baselines in two of the nine regions (Mid-Atlantic and West North Central). The percentage of visits reported for ARI was at or above age-specific baselines in the 5-17 years, 18-49 years, 50-64 years, and >64 years age groups.

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



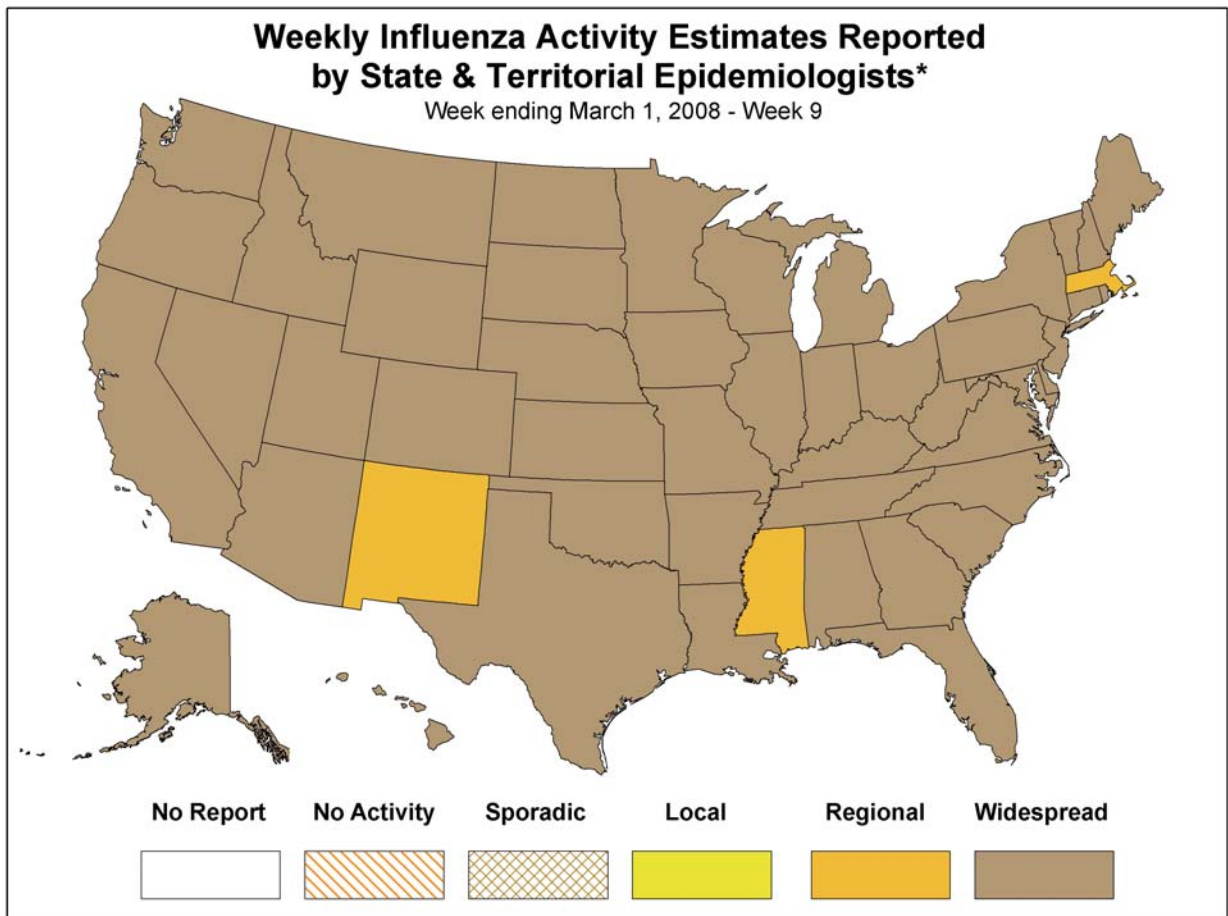
## Percentage of Visits for ARI by Age Group Reported by DoD/VA Outpatient Clinics - National Summary





**Geographic Spread of Influenza as Assessed by State and Territorial Epidemiologists:** During week 9 the following influenza activity was reported:

- Widespread activity was reported by 47 states (Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, Wisconsin, West Virginia, and Wyoming).
- Regional activity was reported by three states (Massachusetts, Mississippi, and New Mexico).
- The District of Columbia reported local influenza activity.



\* 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: March 7, 2008.