

2010-2011 Influenza Season Week 4 ending January 29, 2011

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

Synopsis: During week 4 (January 23-29, 2011), influenza activity in the United States increased.

- Of the 6,209 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, 2,044 (32.9%) were positive for influenza.
- One human infection with a novel influenza A virus was reported.
- The proportion of deaths attributed to pneumonia and influenza (P&I) was above the epidemic threshold.
- Six influenza-associated pediatric deaths were reported. Four of these deaths were associated with influenza B viruses, one of these deaths was associated with an influenza A (H3) virus, and one was associated with a 2009 influenza A (H1N1) virus.
- The proportion of outpatient visits for influenza-like illness (ILI) was 4.0%, which is above the national baseline of 2.5%. Seven of the 10 regions (Regions 1, 2, 3, 4, 5, 6, and 7) reported ILI at or above region-specific baseline levels. Seventeen states experienced high ILI activity; three states experienced moderate ILI activity; New York City and 10 states experienced low ILI activity; the District of Columbia and 19 states experienced minimal ILI activity, and one state had insufficient data.
- The geographic spread of influenza in 30 states was reported as widespread; 15 states reported regional influenza activity; the District of Columbia and one state reported local influenza activity; Puerto Rico, the U.S. Virgin Islands, and four states reported sporadic influenza activity, and Guam reported no influenza activity.

National and Regional Summary of Select Surveillance Components

HHS Surveillance Regions*	Data for current week			Data cumulative since October 3, 2010 (Week 40)				
	Out-patient ILI†	% positive for flu‡	Number of jurisdictions reporting regional or widespread activity§	A (H3)	2009 A (H1N1)	A (Subtyping not performed)	B	Pediatric Deaths
Nation	Elevated	32.9%	45 of 54	6,784	2,325	4,217	5,128	19
Region 1	Elevated	41.3%	6 of 6	665	119	4	54	0
Region 2	Elevated	22.2%	2 of 4	313	49	379	45	4
Region 3	Elevated	39.8%	4 of 6	737	486	179	128	2
Region 4	Elevated	24.4%	8 of 8	672	438	1,557	2,776	4
Region 5	Elevated	57.9%	6 of 6	743	479	106	254	0
Region 6	Elevated	33.8%	5 of 5	1,024	106	890	927	4
Region 7	Elevated	33.2%	4 of 4	250	163	227	161	0
Region 8	Normal	24.7%	5 of 6	1,159	173	719	181	3
Region 9	Normal	37.3%	3 of 5	965	231	133	561	2
Region 10	Normal	20.8%	2 of 4	256	81	23	41	0

*HHS regions (Region 1 CT, ME, MA, NH, RI, VT; Region 2: NJ, NY, Puerto Rico, U.S. Virgin Islands; Region 3: DE, DC, MD, PA, VA, WV; Region 4: AL, FL, GA, KY, MS, NC, SC, TN; Region 5: IL, IN, MI, MN, OH, WI; Region 6: AR, LA, NM, OK, TX; Region 7: IA, KS, MO, NE; Region 8: CO, MT, ND, SD, UT, WY; Region 9: AZ, CA, Guam, HI, NV; and Region 10: 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.

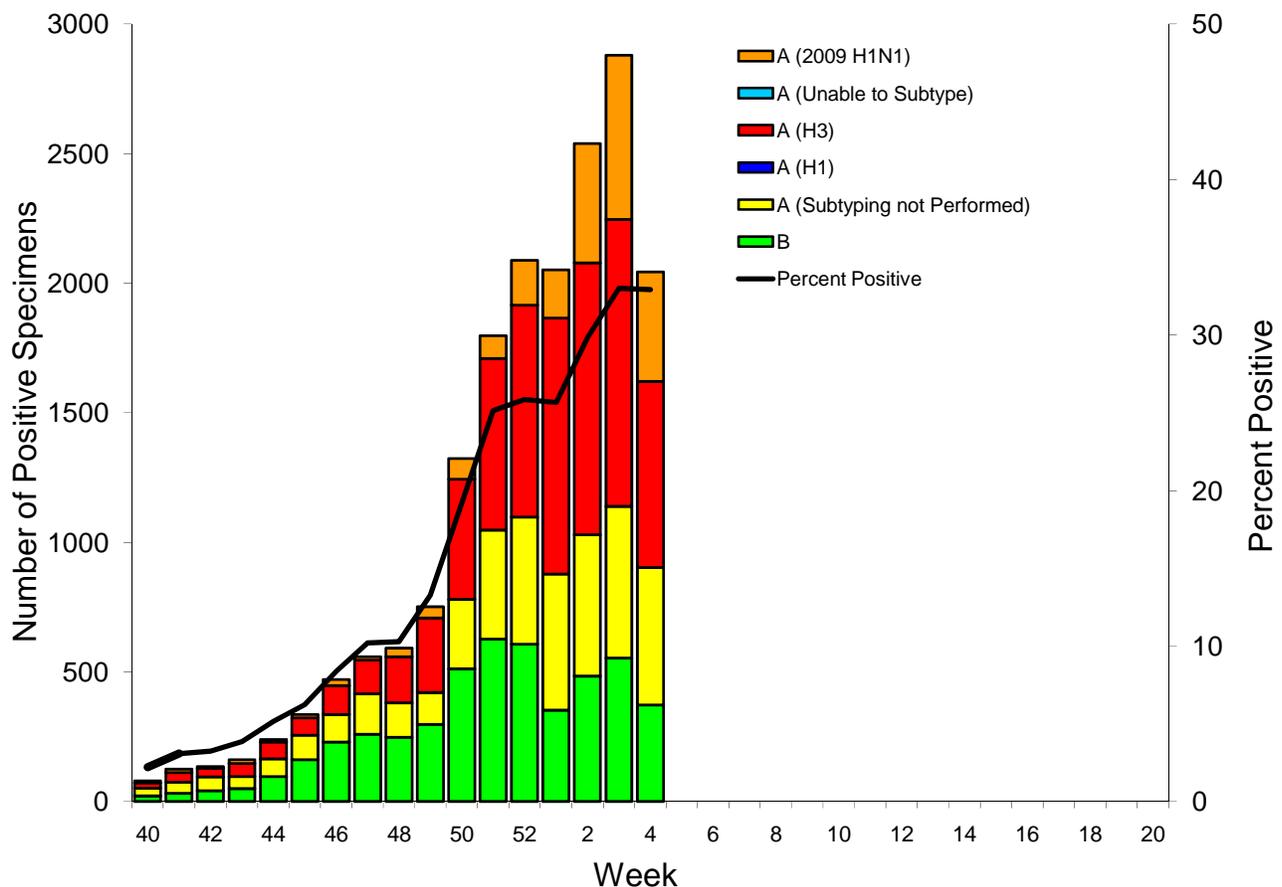
§ Includes all 50 states, the District of Columbia, Guam, Puerto Rico, and the U.S. Virgin Islands.

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 4
No. of specimens tested	6,209
No. of positive specimens (%)	2,044 (32.9%)
Positive specimens by type/subtype	
Influenza A	1,671 (81.8%)
A (2009 H1N1)	423 (25.3%)
A (subtyping not performed)	530 (31.7%)
A (H3)	718 (43.0%)
Influenza B	373 (18.2%)

All 50 states and the District of Columbia have reported laboratory-confirmed influenza this season.

Influenza Positive Tests Reported to CDC by U.S. WHO/NREVSS Collaborating Laboratories, National Summary, 2010-11 Season

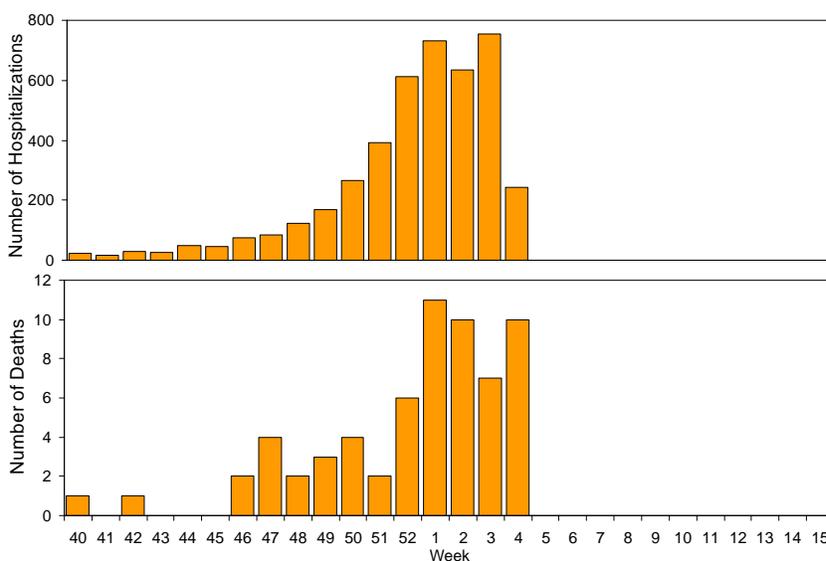


Novel Influenza A Virus: One case of human infection with a novel influenza A virus was reported by the Pennsylvania Department of Health. The patient was infected with a swine origin influenza A (H3N2) virus. The patient reported contact with pigs in the week preceding symptom onset on September 6, 2010, did not require hospitalization, and has since fully recovered. Initial testing of the specimen indicated a seasonal influenza A (H3N2) virus and the specimen was submitted to CDC as a routine surveillance sample. The delay from onset to detection occurred because attempts to culture the virus were unsuccessful. RT-PCR testing confirmed swine-origin influenza A (H3N2). Six other human infections with swine origin influenza A (H3N2) viruses have been identified in the United States during 2009 through 2010, including one other case from Pennsylvania in week 44 of 2010. No epidemiologic links between this case and any of the other cases of swine-origin H3N2 infection have been identified and the viruses from all seven cases have genetic differences indicating different sources of infection.

There is no evidence of human-to-human transmission with this virus; however, early identification and investigation of all human infections with novel influenza A viruses is critical to evaluate the extent of the outbreak and possible human-to-human transmission. Surveillance for human infections with novel influenza A viruses continues year round.

Aggregate Hospitalization and Death Reporting Activity (AHDRA): This system tracks weekly counts of laboratory-confirmed influenza-associated hospitalizations and deaths and was implemented on August 30, 2009, during the 2009 pandemic, and ended on April 4, 2010. AHDRA surveillance during the 2010-11 season is being continued on a voluntary basis and 13 jurisdictions reported during week 4. From October 3, 2010 – January 29, 2011, 4,263 laboratory-confirmed influenza associated hospitalizations and 63 laboratory-confirmed influenza associated deaths were reported to CDC.

Weekly Laboratory-Confirmed Influenza-Associated Hospitalizations and Deaths, National Summary, 2010-11 Season



Antigenic Characterization: CDC has antigenically characterized 416 influenza viruses [46 2009 influenza A (H1N1) viruses, 188 influenza A (H3N2) viruses, and 182 influenza B viruses] collected by U.S. laboratories since October 1, 2010.

2009 Influenza A (H1N1) [46]

- All 46 were characterized as A/California/7/2009-like, the influenza A (H1N1) component of the 2010-11 influenza vaccine for the Northern Hemisphere.

Influenza A (H3N2) [188]

- All 188 were characterized as A/Perth/16/2009-like, the influenza A (H3N2) component of the 2010-11 influenza vaccine for the Northern Hemisphere.

Influenza B (B/Victoria/02/87 and B/Yamagata/16/88 lineages) [182]

Victoria Lineage [170]

- One hundred seventy (93%) of the 182 influenza B viruses tested belong to the B/Victoria lineage of viruses.
 - 169 (99.4%) of these 170 viruses were characterized as B/Brisbane/60/2008-like, the recommended influenza B component for the 2010-11 Northern Hemisphere influenza vaccine.
 - One (0.6%) of these 170 viruses showed somewhat reduced titers with antisera produced against B/Brisbane/60/2008.

Yamagata Lineage [12]

- Twelve (7%) of the 182 viruses were identified as belonging to the B/Yamagata lineage of viruses.

Antiviral Resistance: Testing of 2009 influenza A (H1N1), influenza A (H3N2), and influenza B virus isolates for resistance to neuraminidase inhibitors (oseltamivir and zanamivir) is performed at CDC using a functional assay. Additional 2009 influenza A (H1N1) clinical samples are tested for a single known mutation in the neuraminidase protein of the virus that confers oseltamivir resistance (H275Y). The data summarized below combine the results of both test methods and includes samples that were tested as part of routine surveillance purposes; it does not include diagnostic testing specifically done because of clinical suspicion of 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) circulating globally. As a result of the sustained high levels of resistance, data from adamantane resistance testing are not presented weekly in the table below.

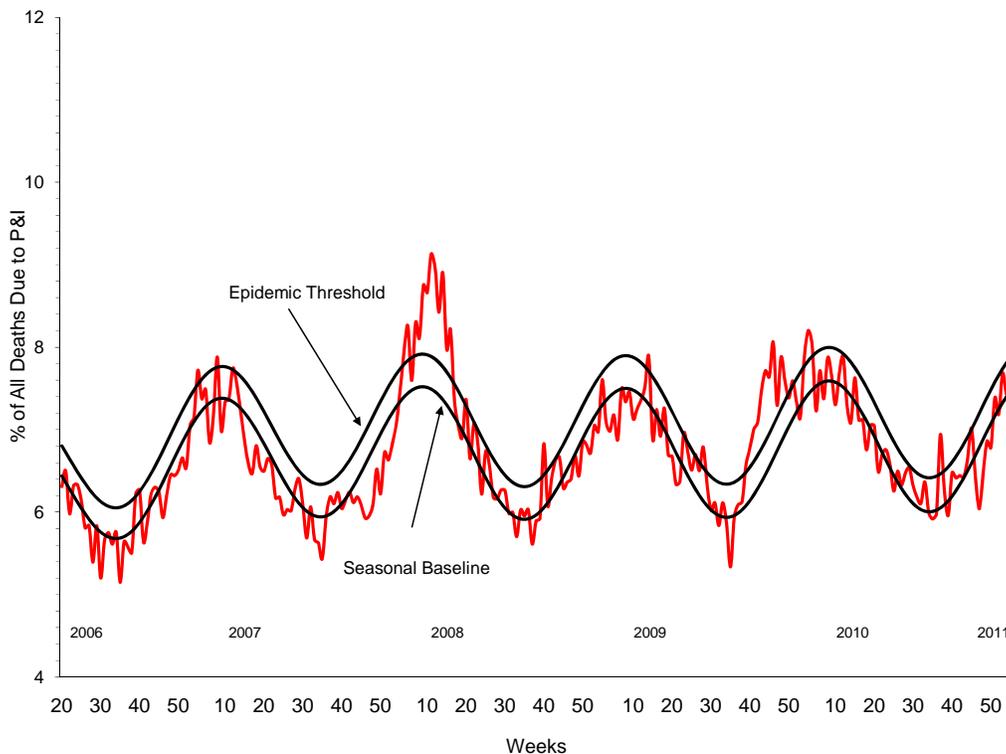
**Neuraminidase Inhibitor Resistance Testing Results
on Samples Collected Since October 1, 2010.**

	Virus Samples tested (n)	Resistant Viruses, Number (%)	Virus Samples tested (n)	Resistant Viruses, Number (%)
		Oseltamivir		Zanamivir
Seasonal Influenza A (H1N1)	0	0 (0.0)	0	0 (0.0)
Influenza A (H3N2)	158	0 (0.0)	158	0 (0.0)
Influenza B	119	0 (0.0)	119	0 (0.0)
2009 Influenza A (H1N1)	87	0 (0.0)	33	0 (0.0)

To prevent the spread of antiviral resistant virus strains, CDC reminds clinicians and the public of the need to continue hand and cough hygiene measures for the duration of any symptoms of influenza, even while taking antiviral medications. Additional information on antiviral recommendations for treatment and chemoprophylaxis of influenza virus infection is available at <http://www.cdc.gov/flu/antivirals/index.htm>.

Pneumonia and Influenza (P&I) Mortality Surveillance: During week 4, 8.5% of all deaths reported through the 122-Cities Mortality Reporting System were due to P&I. This percentage was above the epidemic threshold of 7.9% for week 4.

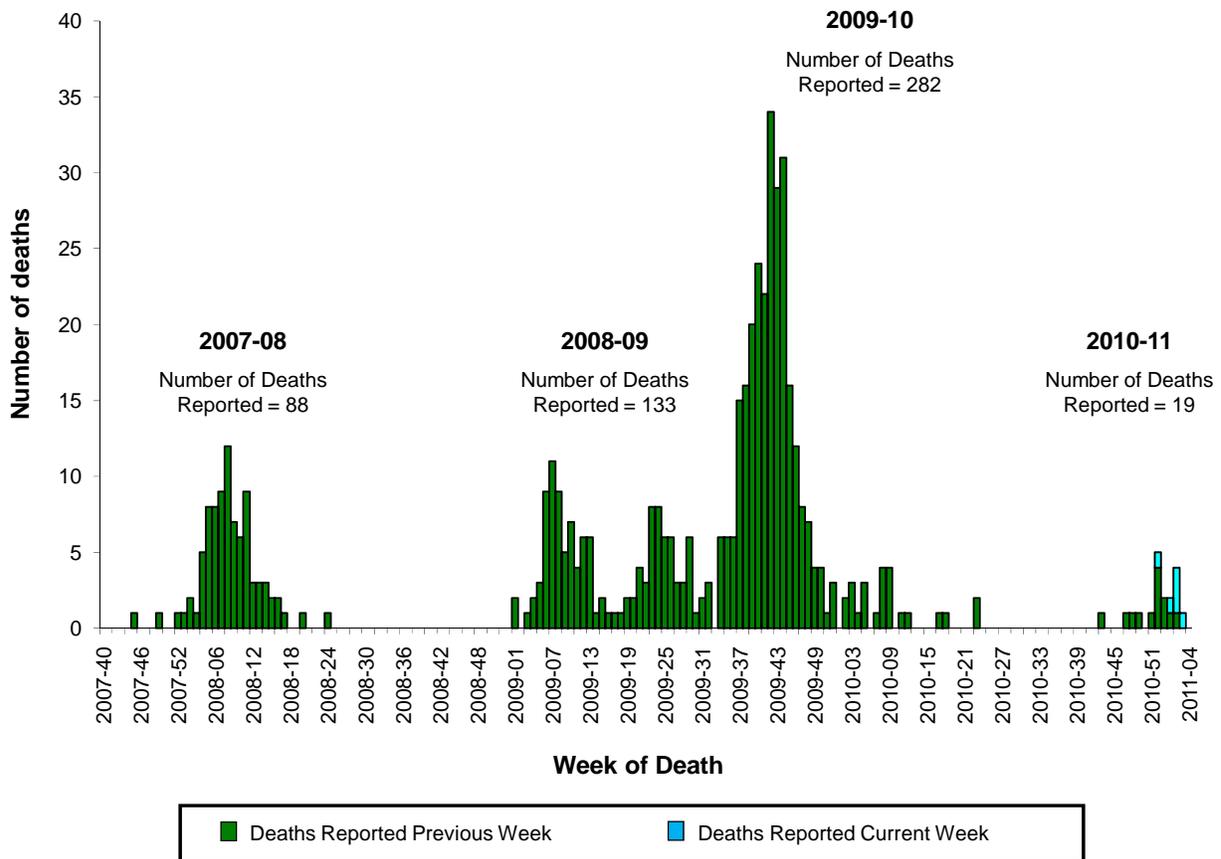
**Pneumonia and Influenza Mortality for 122 U.S. Cities
Week ending 1/29/2011**



Influenza-Associated Pediatric Mortality: Six influenza-associated pediatric deaths were reported to CDC during week 4. Four of these deaths were associated with influenza B viruses, one of these deaths was associated with influenza A (H3) virus infection, and the other death was associated with a 2009 influenza A (H1N1) virus. Nineteen deaths from 13 states (Arizona, Colorado, Florida, Georgia, Louisiana, New Jersey, New York, North Carolina, North Dakota, Pennsylvania, Texas, Utah, and West Virginia) have been reported during this influenza season.

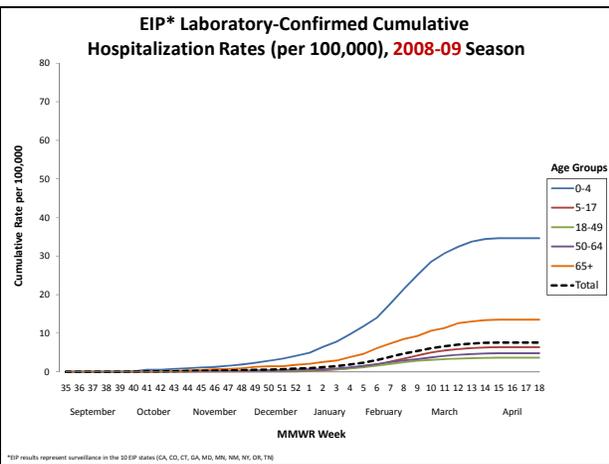
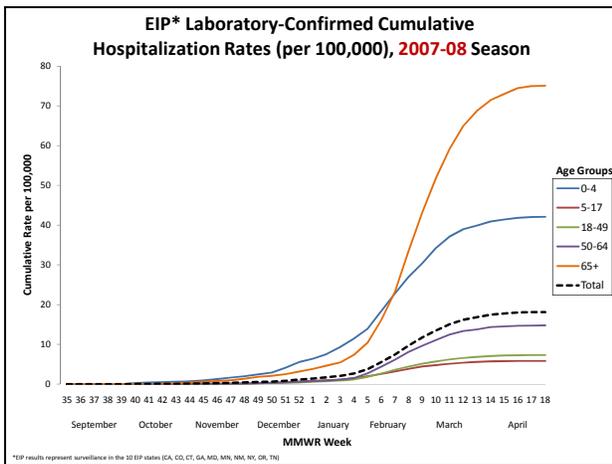
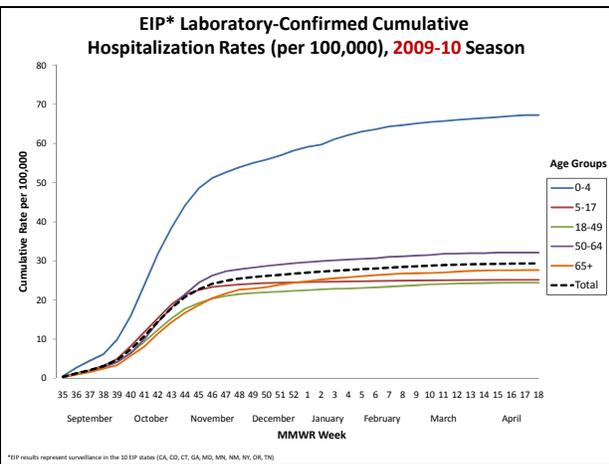
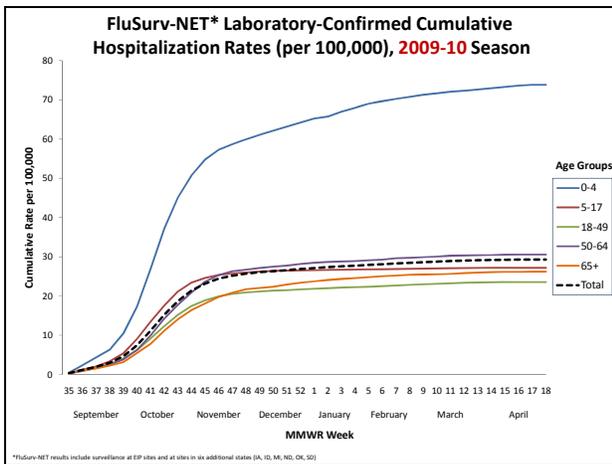
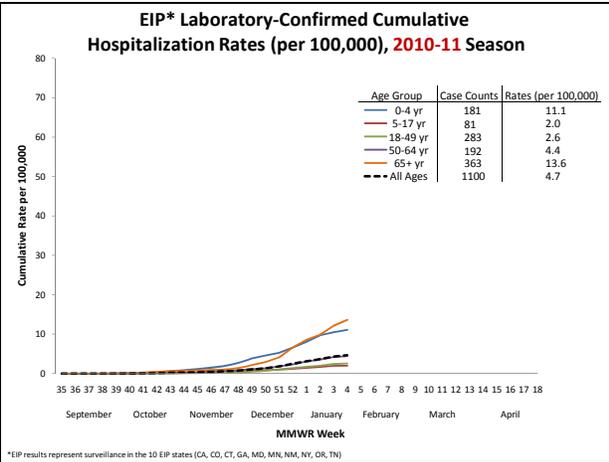
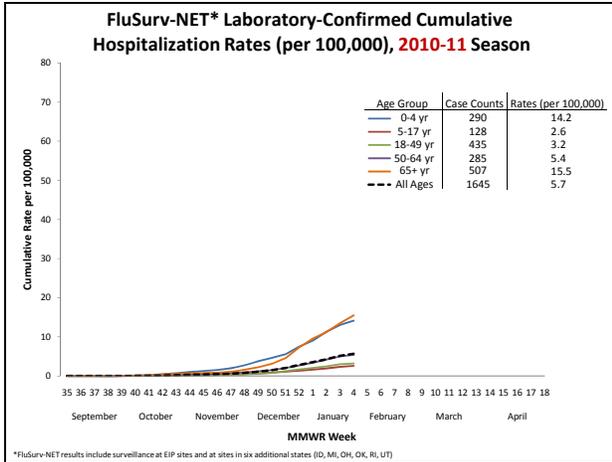
Eight of the 19 deaths reported were associated with influenza A (H3) viruses, eight deaths were associated with influenza B viruses, one was associated with a 2009 influenza A (H1N1) virus, and two were associated with an influenza A virus for which the subtype was not determined.

Number of Influenza-Associated Pediatric Deaths by Week of Death: 2007-08 season to present



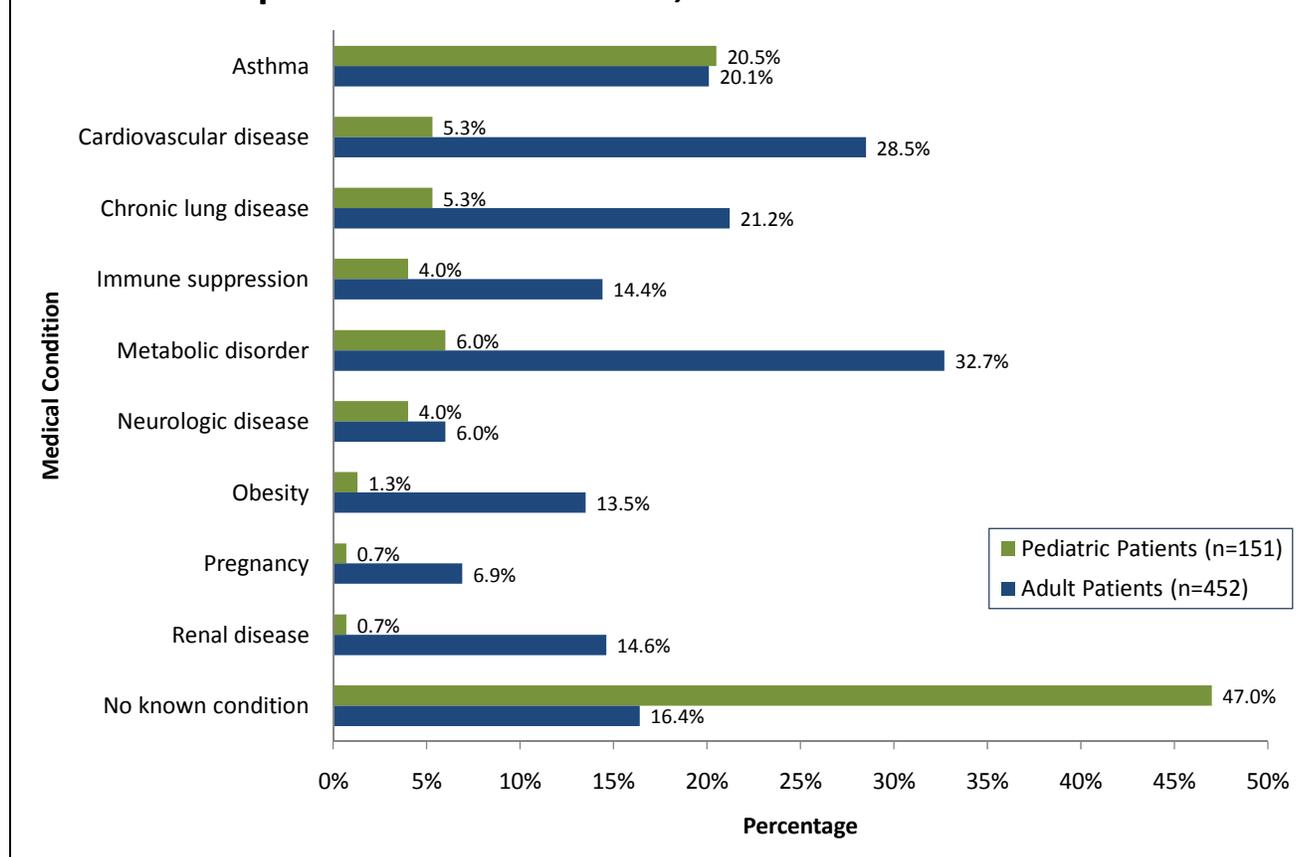
Influenza-Associated Hospitalizations: FluSurv-NET conducts population-based surveillance for laboratory-confirmed influenza-associated hospitalizations in children (persons younger than 18 years) and adults. The current network covers over 80 counties in the 10 Emerging Infections Program (EIP) states (CA, CO, CT, GA, MD, MN, NM, NY, OR, and TN) and six additional states (ID, MI, OH, OK, RI, and UT).

The current season's rates include cases from October 1, 2010 to January 29, 2011.



Please note the following: (i) The scale of the vertical axis on the Cumulative Hospitalization Rate figures for the current season has been adjusted on FluView to make it easier to read; (ii) FluSurv-NET was created during the 2009-2010 season when surveillance in six states was added to ongoing surveillance for influenza-associated hospitalizations in 10 EIP states. During the 2009-2010 season, FluSurv-NET included sites in the 10 EIP sites and sites in IA, ID, MI, ND, OK, and SD; (iii) the 2008-2009 EIP season ended April 14, 2009, due to the onset of the 2009 H1N1 pandemic.

Selected underlying medical conditions¹ in patients hospitalized with influenza, FluSurv-NET 2010-2011²



¹Asthma may include a diagnosis of asthma and reactive airway disease; Cardiovascular diseases may include conditions such as coronary heart disease, cardiac valve disorders, congestive heart failure, pulmonary hypertension, and aortic stenosis; Chronic lung diseases may include conditions such as bronchiolitis obliterans, chronic aspiration pneumonia, and interstitial lung disease; Immune suppression may include conditions such as immunoglobulin deficiency, leukemia, lymphoma, HIV/AIDS, and individuals taking immunosuppressive medications; Metabolic disorders may include conditions such as diabetes mellitus, thyroid dysfunction, adrenal insufficiency, and liver disease; Neurologic diseases may include conditions such as seizure disorders, neuromuscular disorders, and cognitive dysfunction; Obesity was defined as a body mass index (BMI) greater than 30 kg/m² in patients 20 years of age or older, or equal to or greater than the 95th percentile of a patient's age and sex category in patients under 20 years of age; Renal diseases may include conditions such as acute or chronic renal failure, nephrotic syndrome, glomerulonephritis, and impaired creatinine clearance.

²Data as of February 1, 2011. Includes 603 (of a total 1,672 reported) cases for which data collection has been completed through the medical chart review stage.

Demographic and clinical characteristics of laboratory-confirmed, influenza-associated hospitalizations identified in EIP¹ and FluSurv-NET² sites, 2006-2011

	2010-2011 FluSurv-NET ³ N (%)	2009-2010 FluSurv-NET ³ N (%)	2008-2009 EIP N (%)	2007-2008 EIP N (%)	2006-2007 EIP N (%)
Total Cases	1,672	7,517	1,698	3,930	1,279
Age in Years					
0-4	295 (17.6)	1,326 (17.6)	549 (32.3)	637 (16.2)	393 (30.7)
5-17	131 (7.8)	1,204 (16.0)	244 (14.4)	221 (5.6)	130 (10.2)
18-49	439 (26.3)	2,779 (37.0)	374 (22.0)	735 (18.7)	246 (19.2)
50-64	288 (17.2)	1,458 (19.4)	201 (11.8)	585 (14.9)	155 (12.1)
65+	514 (30.7)	750 (10.0)	330 (19.4)	1,749 (44.5)	355 (27.8)
Sex					
Male	770 (46.1)	3,517 (46.8)	832 (49.0)	1,825 (46.4)	631 (49.3)
Female	893 (53.4)	4,000 (53.2)	866 (51.0)	2,104 (53.5)	648 (50.7)
Flu Type and Subtype					
Influenza A	1,271 (76.0)	7,355 (97.8)	1,236 (72.8)	2,558 (65.1)	1,082 (84.6)
Specimens subtyped⁴	235	5,317	--	--	--
A (H1)	0 (0.0)	0 (0.0)	--	--	--
A (H3)	209 (88.9)	3 (0.1)	--	--	--
A (2009 H1N1)	26 (11.1)	5,314 (99.9)	--	--	--
Influenza B	312 (18.7)	52 (0.7)	382 (22.5)	1,199 (30.5)	149 (11.7)
Intensive Care Unit	94 (15.6)	1,556 (20.8)	298 (17.6)	495 (12.6)	198 (15.5)
Mechanical Ventilation	29 (4.8)	756 (10.1)	157 (9.3)	252 (6.4)	111 (8.7)
Diagnosis of Pneumonia	145 (24.1)	2,799 (37.3)	407 (24.0)	1,220 (31.0)	404 (31.6)
Died	11 (1.8)	222 (3.0)	49 (2.9)	104 (2.7)	24 (1.9)

Columns may not sum to 100% due to missing or unknown values.

¹Surveillance in EIP states (CA, CO, CT, GA, MD, MN, NM, NY, OR, TN) was conducted from 2006-2011.

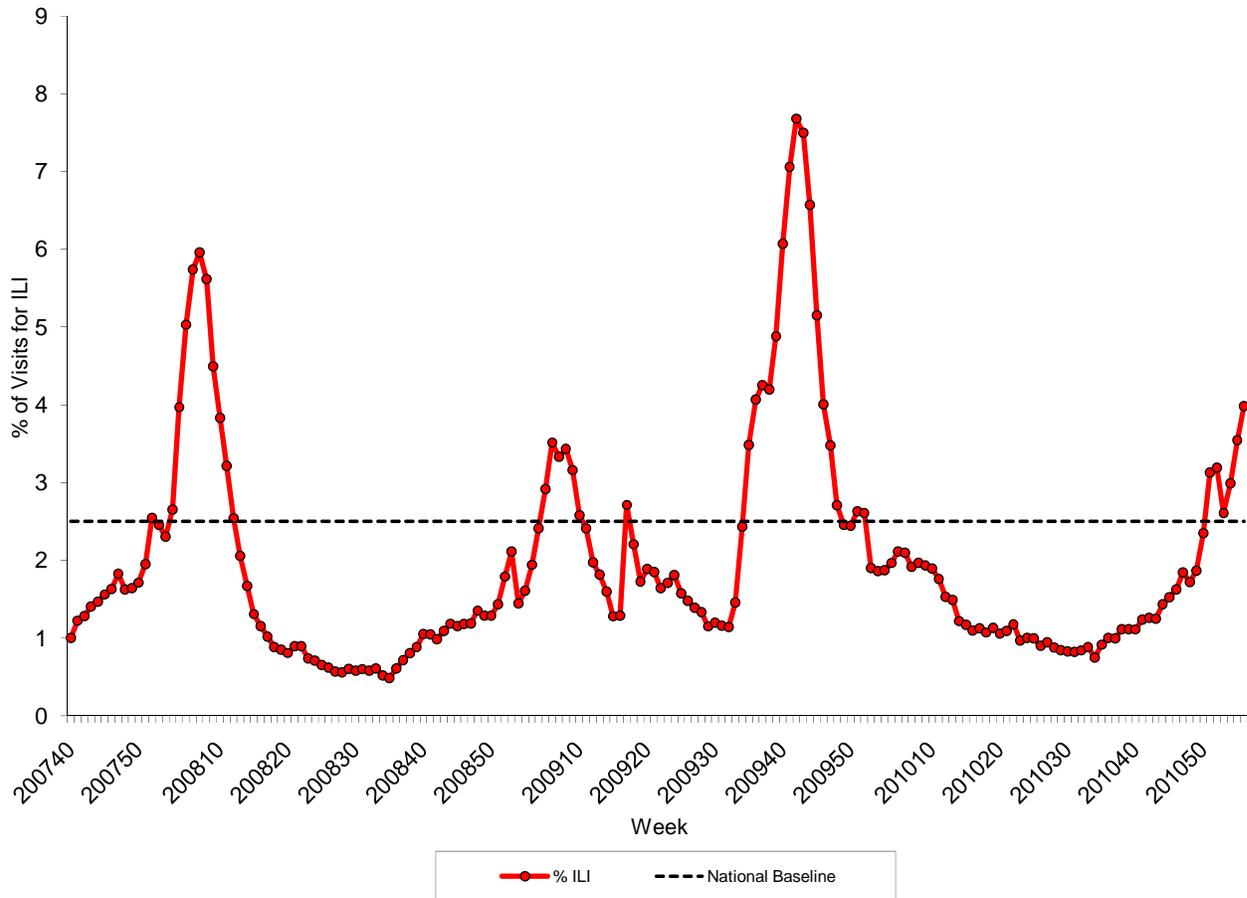
²FluSurv-Net includes surveillance at EIP sites and at sites in additional states (IA, ID, MI, ND, OK, SD in 2009-2010; ID, MI, OH, OK, RI, UT in 2010-2011).

³Data as of February 1, 2011. Results describing influenza A subtype, intensive care unit admission, mechanical ventilation, diagnosis of pneumonia, and death are from 7,497 (of a total 7,517 reported) and 603 (of a total 1,672 reported) cases for which data collection has been completed through the medical chart review stage for the 2009-2010 and 2010-2011 seasons, respectively.

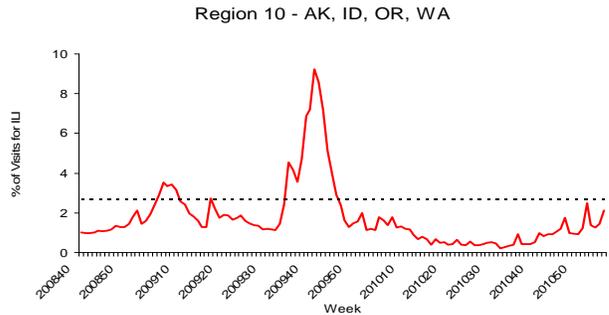
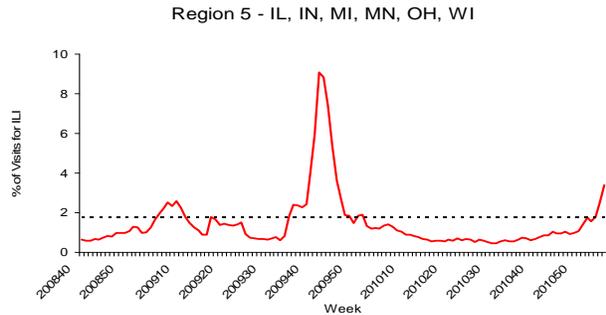
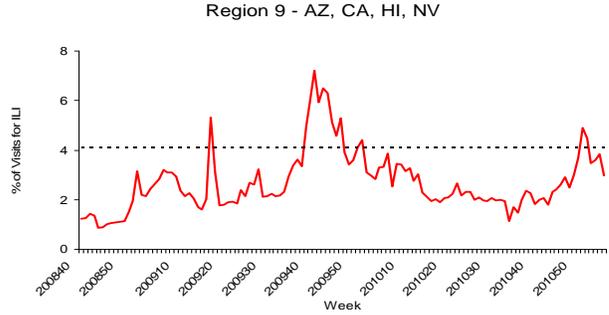
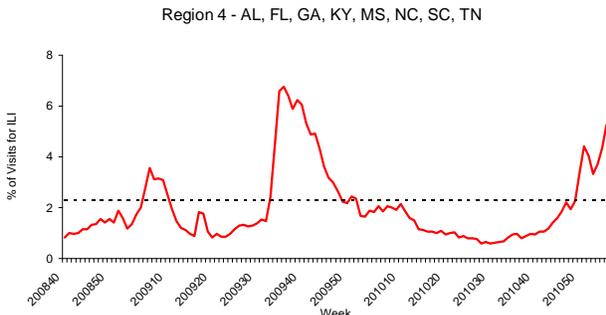
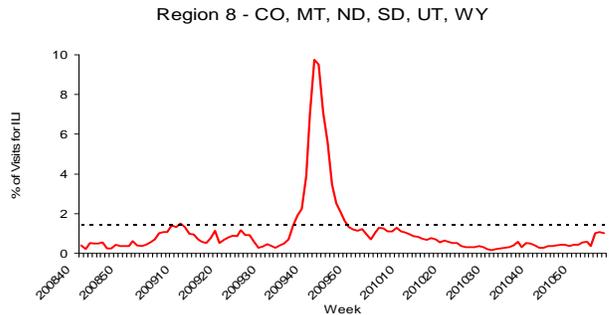
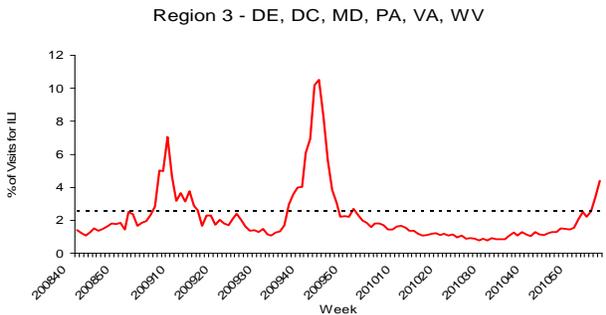
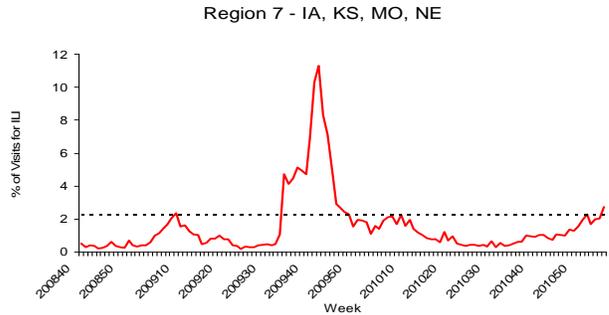
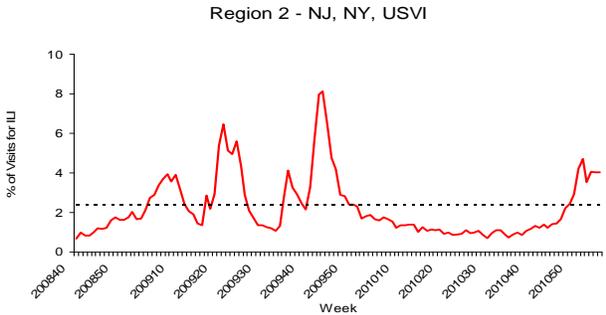
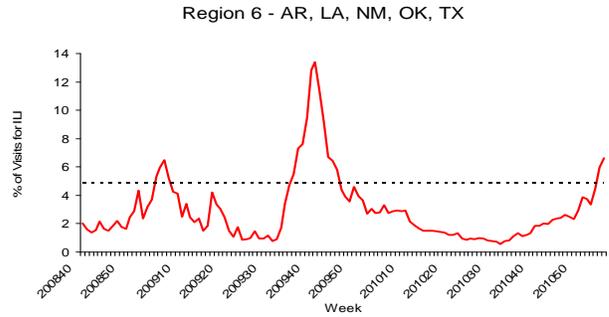
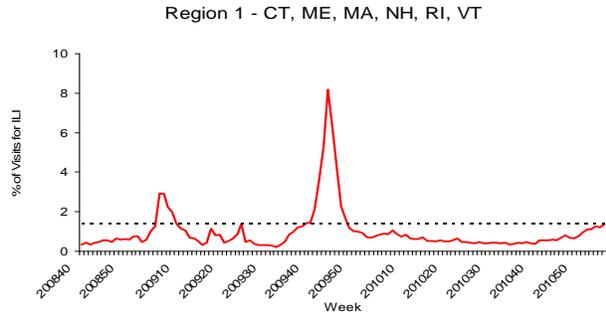
⁴Influenza A subtype results are available beginning with the 2007-2008 season. Percentages for influenza A subtypes are calculated using the number of influenza A specimens that were subtyped as a denominator.

Outpatient Illness Surveillance: Nationwide during week 4, 4.0% 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 above the national baseline of 2.5%.

Percentage of Visits for Influenza-like Illness (ILI) Reported by the U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet), Weekly National Summary, September 30, 2007 – January 29, 2011



On a regional level, the percentage of outpatient visits for ILI ranged from 1.0% to 6.6% during week 4. Seven of the 10 regions (Regions 1, 2, 3, 4, 5, 6, and 7) reported a proportion of outpatient visits for ILI at or above region-specific baseline levels.



NOTE: Scales differ between regions

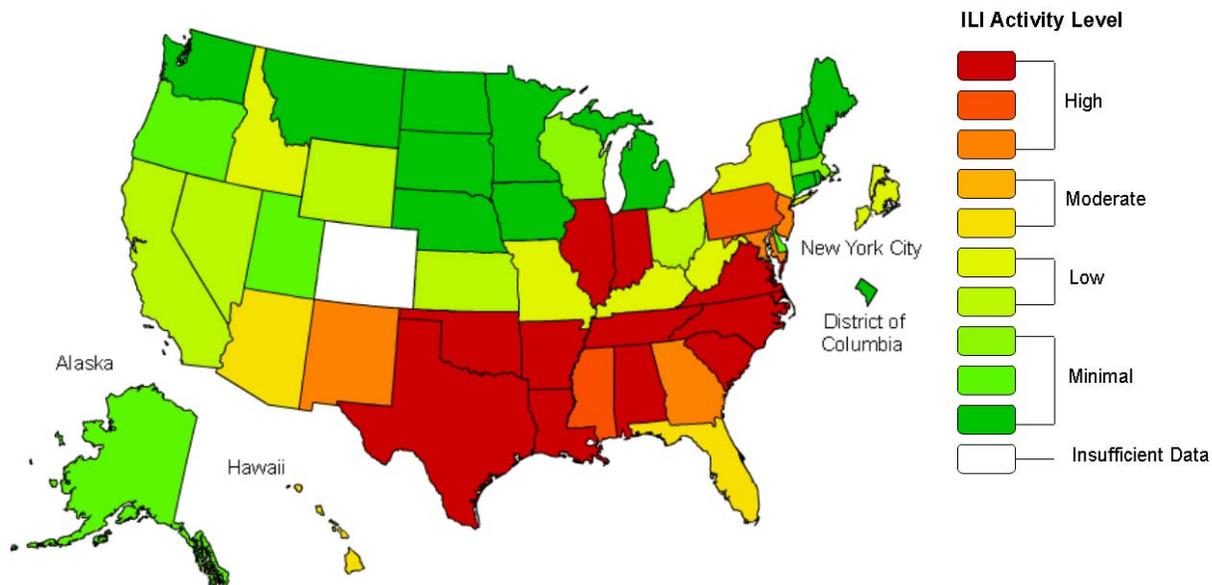
*Use of the regional baselines for state data is not appropriate.

ILINet Activity Indicator Map: Data collected in ILINet are used to produce a measure of ILI activity* by state. Activity levels are based on the percent of outpatient visits in a state due to ILI and are compared to the average percent of ILI visits that occur during spring and fall weeks with little or no influenza virus circulation. Activity levels range from minimal, which would correspond to ILI activity from outpatient clinics being below the average, to high, which would correspond to ILI activity from outpatient clinics being much higher than the average. Because the clinical definition of ILI is very general, not all ILI is caused by influenza; however, when combined with laboratory data, the information on ILI activity provides a clear picture of influenza activity in the United States.

During week 4, the following ILI activity levels were experienced:

- Seventeen states (Alabama, Arkansas, Georgia, Illinois, Indiana, Louisiana, Maryland, Mississippi, New Jersey, New Mexico, North Carolina, Oklahoma, Pennsylvania, South Carolina, Tennessee, Texas, and Virginia) experienced high ILI activity.
- Three states (Arizona, Florida, and Hawaii) experienced moderate ILI activity.
- New York City and 10 states (California, Idaho, Kansas, Kentucky, Missouri, Nevada, New York, Ohio, West Virginia, and Wyoming) experienced low ILI activity.
- Minimal ILI activity was experienced by the District of Columbia and 19 states (Alaska, Connecticut, Delaware, Iowa, Maine, Massachusetts, Michigan, Minnesota, Montana, Nebraska, New Hampshire, North Dakota, Oregon, Rhode Island, South Dakota, Utah, Vermont, Washington, and Wisconsin).
- One state (Colorado) had insufficient data to calculate an activity level.

**Influenza-Like Illness (ILI) Activity Level Indicator Determined by Data Reported to ILINet
2010-11 Influenza Season Week 4 ending Jan 29, 2011**



Interactive web tool available at: <http://gis.cdc.gov/grasp/fluview/main.html>

*This map uses the proportion of outpatient visits to health care providers for influenza-like illness to measure the ILI activity level within a state. It does not, however, measure the extent of geographic spread of flu within a state. Therefore, outbreaks occurring in a single city could cause the state to display high activity levels.

Data collected in ILINet may disproportionately represent certain populations within a state, and therefore, may not accurately depict the full picture of influenza activity for the whole state.

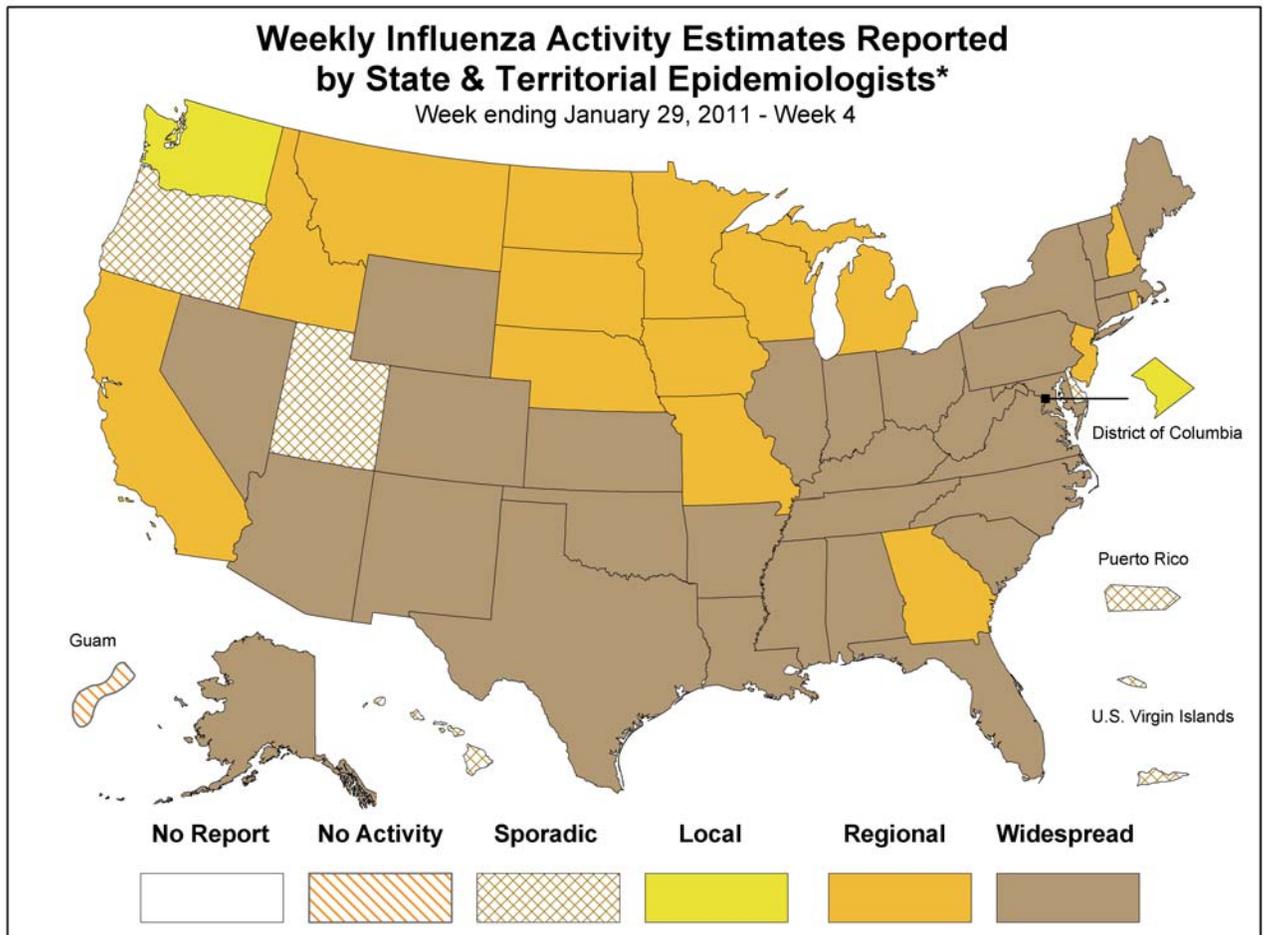
Data displayed in this map are based on data collected in ILINet, whereas the State and Territorial flu activity map are based on reports from state and territorial epidemiologists. The data presented in this map is preliminary and may change as more data is received.

Differences in the data presented by CDC and state health departments likely represent differing levels of data completeness with data presented by the state likely being the more complete.

Geographic Spread of Influenza as Assessed by State and Territorial Epidemiologists: The influenza activity reported by state and territorial epidemiologists indicates geographic spread of influenza viruses, but does not measure the severity of influenza activity.

During week 4, the following influenza activity was reported:

- Widespread influenza activity was reported by 30 states (Alabama, Alaska, Arizona, Arkansas, Colorado, Connecticut, Florida, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Mississippi, Nevada, New Mexico, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, Tennessee, Texas, Vermont, Virginia, West Virginia, and Wyoming).
- Regional influenza activity was reported by 15 states (California, Georgia, Idaho, Iowa, Michigan, Minnesota, Missouri, Montana, Nebraska, New Hampshire, New Jersey, North Dakota, Rhode Island, South Dakota, and Wisconsin).
- Local influenza activity was reported by the District of Columbia and one state (Washington).
- Sporadic influenza activity was reported by Puerto Rico, the U.S. Virgin Islands, and four states (Delaware, Hawaii, Oregon, and Utah).
- Guam reported no influenza activity.



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

Additional National and International Influenza Surveillance Information

Distribute Project: Additional information on the Distribute syndromic surveillance project, developed and piloted by the International Society for Disease Surveillance (ISDS) now working in collaboration with CDC, to enhance and support Emergency Department (ED) surveillance, is available at <http://isdsdistribute.org/>.

Google Flu Trends: Google Flu Trends uses aggregated Google search data in a model created in collaboration with CDC to estimate influenza activity in the U.S. For more information and activity estimates from the U.S. and worldwide, see <http://www.google.org/flutrends/>.

Europe: for the most recent influenza surveillance information from Europe, please see WHO/Europe at <http://www.euroflu.org/index.php> and visit the European Centre for Disease Prevention and Control at <http://ecdc.europa.eu/en/Activities/Surveillance/EISN/Pages/home.aspx>.

Public Health Agency of Canada: The most up to date influenza information from Canada is available at <http://www.phac-aspc.gc.ca/fluwatch/>.

World Health Organization FluNet: Additional influenza surveillance information from participating WHO member nations is available at <http://gamapserver.who.int/GlobalAtlas/home.asp>.

A description of surveillance methods is available at: <http://www.cdc.gov/flu/weekly/overview.htm>
Report prepared: February 4, 2011.