Weekly U.S. Influenza Surveillance Report

Key Updates for Week 50, ending December 14, 2019

Seasonal influenza activity in the United States continues to increase and has been elevated for six weeks now.

Viruses

Clinical Lab

The percentage of respiratory specimens testing positive for influenza at clinical laboratories increased to 16.3% this week.

Public Health Lab

Nationally, B/Victoria viruses are most common followed by A(H1N1)pdm09 viruses. The predominant virus varies by region and age group.

Virus Characterization

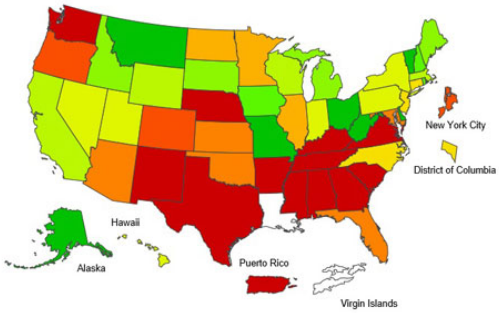
Genetic and antigenic characterization and antiviral susceptibility of viruses collected in the U.S. this season are now being reported.

Illness

Outpatient Illness: ILINet

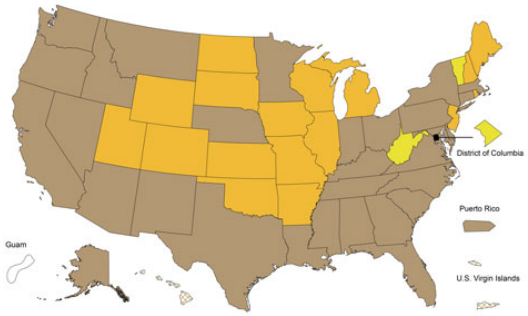
Visits to health care providers for influenza-like illness (ILI) increased to 3.9%. ILI has been at or above the national baseline of 2.4% for six weeks. All regions were at or above their baselines.

Outpatient Illness: ILI Activity Map



The number of jurisdictions experiencing high ILI activity increased to 21 this week compared to 12 last week.

Geographic Spread



The number of jurisdictions reporting regional or widespread activity increased to 48 this week from 38 last week.

Severe Disease

Hospitalizations

The overall hospitalization rate for the season increased to 5.5 per 100,000. This is similar to what has been seen at this time during recent seasons.

P&I Mortality

The percentage of deaths attributed to pneumonia and influenza increased to 5.5% but remains below the epidemic threshold.

Pediatric Deaths

Nine new influenza-associated pediatric deaths occurring during the 2019-2020 season were reported to CDC this week. The total for the season is 19.

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

A description of the CDC influenza surveillance system, including methodology and detailed descriptions of each data component is available on the surveillance methods page.

Additional information on the current and previous influenza seasons for each surveillance component are available on FluView Interactive.

Key Points

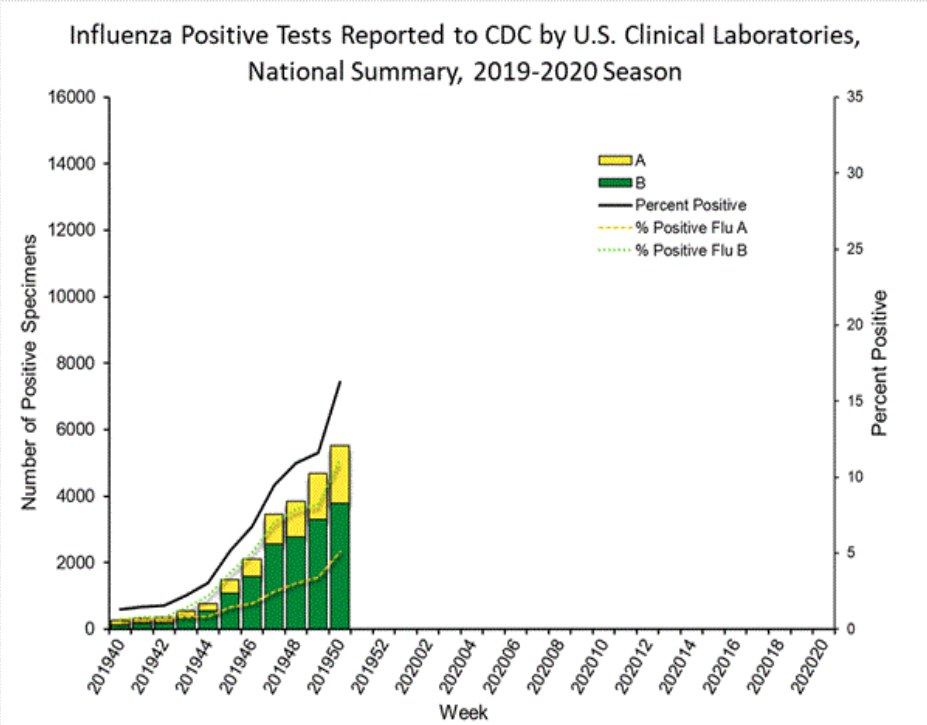
- The 2019-2020 season is underway; all regions of the country are seeing elevated levels of flu-like illness.
- Activity is being caused mostly by influenza B/Victoria viruses, which is unusual for this time of year. A(H1N1) viruses are the next most common and are increasing in proportion relative to other influenza viruses in some regions.
- CDC estimates that so far this season there have been at least 3.7 million flu illnesses, 32,000 hospitalizations and 1,800 deaths from flu.
- It's not too late to get vaccinated. Flu vaccination is always the best way to prevent flu and its potentially serious complications.
- Antiviral medications are an important adjunct to flu vaccine in the control of influenza. Almost all (>99%) of the influenza viruses tested this season are susceptible to the four FDA-approved influenza antiviral medications recommended for use in the U.S. this season.

U.S. Virologic Surveillance

Clinical Laboratories

The results of tests performed by clinical laboratories nationwide are summarized below. Data from clinical laboratories (the percentage of specimens tested that are positive for influenza) are used to monitor whether influenza activity is increasing or decreasing.

	Week 50	Data Cumulative since September 29, 2019 (week 40)
No. of specimens tested	33,918	320,906
No. of positive specimens (%)	5,515 (16.3%)	23,386 (7.3%)
Positive specimens by type		
Influenza A	1,735 (31.5%)	6,891 (29.5%)
Influenza B	3,780 (68.5%)	16,495 (70.5%)



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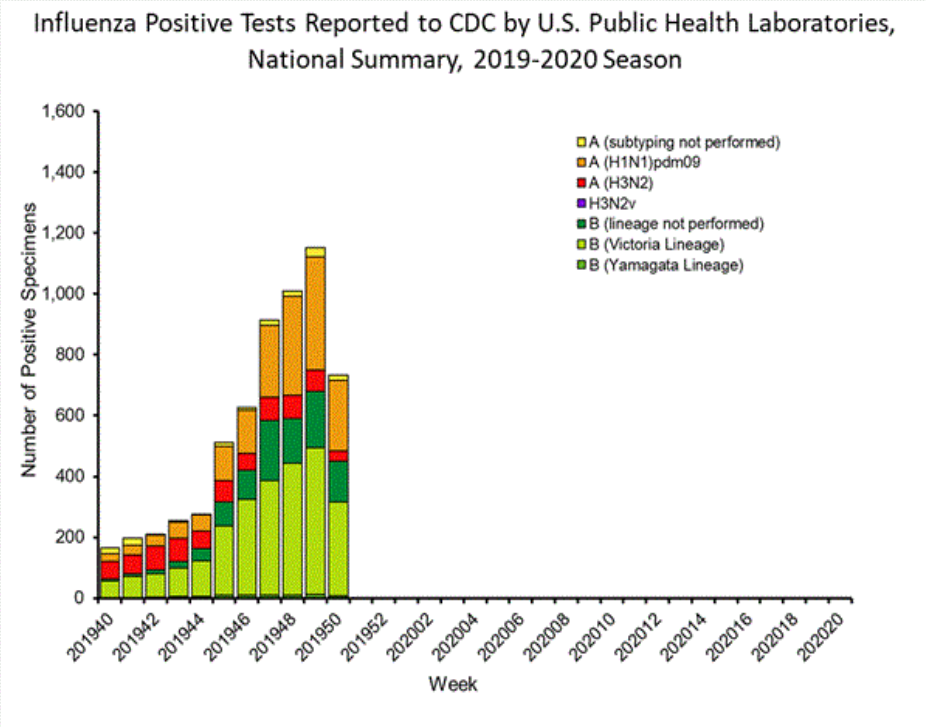
Public Health Laboratories

The results of tests performed by public health laboratories nationwide are summarized below. Data from public health laboratories are used to monitor the proportion of circulating viruses that belong to each influenza subtype/lineage.

	Week 50	Data Cumulative since September 29, 2019 (week 40)
No. of specimens tested	1,413	17,865
No. of positive specimens	733	6,045
Positive specimens by type/subtype		
Influenza A	282 (38.5%)	2,487 (41.1%)
(H1N1)pdm09	231 (87.2%)	1,617 (69.3%)
H3N2	34 (12.8%)	718 (30.7%)
Subtyping not performed	17	152
Influenza B	451 (61.5%)	3,558 (58.9%)
Yamagata lineage	7 (2.2%)	72 (2.7%)
Victoria lineage	310 (97.8%)	2,562 (97.3%)

Lineage not performed	134	924

Nationally influenza B/Victoria viruses have been reported more frequently than other influenza viruses this season followed by A(H1N1)pdm09. The predominant virus varies by region. Regional and state level data about circulating influenza viruses can be found on FluView Interactive. The predominant virus also varies by age group. Nationally, influenza B/Victoria viruses are the most commonly reported influenza viruses among children age 0-4 years (49% of reported viruses) and 5-24 years (59% of reported viruses), while A(H3N2) viruses are the most commonly reported influenza viruses among persons 65 years of age and older (42% of reported viruses). Among adults aged 25-64 years, approximately equal proportions of influenza A(H1N1)pdm09 and B/Victoria viruses (39% and 35%, respectively) have been reported. Additional age data can be found on FluView Interactive.



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Additional virologic surveillance information for current and past seasons:
Surveillance Methods | FluView Interactive: National, Regional, and State Data or Age Data

Influenza Virus Characterization

CDC performs genetic and antigenic characterization of U.S. viruses submitted from state and local health laboratories using Right Size Roadmap submission guidance. These data are used to compare how similar the currently circulating influenza viruses are to the reference viruses used for developing new influenza vaccines and to monitor evolutionary changes that continually occur in circulating influenza. CDC also tests susceptibility of influenza viruses to antiviral medications including the neuraminidase inhibitors (oseltamivir, zanamivir, and peramivir) and the PA endonuclease inhibitor baloxavir.

CDC **genetically characterized** 501 influenza viruses collected in the U.S. from September 29, 2019 to December 14, 2019.

Virus Subtype or Lineage	Genetic Characterization				
	Total No. of Subtype/Lineage Tested	Clade	Number (% of subtype/lineage tested)	Subclade	Number (% of subtype/lineage tested)
A/H1	123				
		6B.1A	123 (100%)		
A/H3	162				
		3C.2a	162 (100%)	2a1	162 (100%)
				2a2	0
				2a3	0
				2a4	0
		3C.3a	0	3a	0
B/Victoria	197				
		V1A	197 (100%)	V1A	0
				V1A.1	23 (11.7%)
				V1A.3	174 (88.3%)
B/Yamagata	19				
		Y3	19 (100%)		

CDC **antigenically characterizes** a subset of influenza viruses by hemagglutination inhibition (HI) or neutralization based Focus Reduction assays (FRA). Antigenic drift is evaluated by comparing antigenic properties of cell-propagated reference viruses representing currently recommended vaccine components with those of cell-propagated circulating viruses. CDC antigenically characterized 94 influenza viruses collected in the United States from September 29, 2019, to December 14, 2019.

Influenza A Viruses

- **A (H1N1)pdm09:** 42 A(H1N1)pdm09 viruses were antigenically characterized by HI with ferret antisera, and all were antigenically similar (reacting at titers that were within 4-fold of the homologous virus titer) to cell-propagated A/Brisbane/02/2018-like reference viruses representing the A(H1N1)pdm09 component for the 2019-20 Northern Hemisphere influenza vaccines.
- **A (H3N2):** 17 A(H3N2) viruses were antigenically characterized by FRA with ferret antisera, and 12 (70.6%) were antigenically similar to cell-propagated A/Kansas/14/2017-like reference viruses representing the A(H3N2) component for the 2019-20 Northern Hemisphere influenza vaccines.

Influenza B Viruses

- **B/Victoria:** 25 B/Victoria lineage viruses, including viruses from both co-circulating sub-clades, were antigenically characterized by HI with ferret antisera, and 19 (76%) were antigenically similar to cell-propagated B/Colorado/06/2017-like reference viruses representing the B/Victoria component for the 2019-20 Northern Hemisphere influenza vaccines.
- **B/Yamagata:** 10 B/Yamagata lineage viruses were antigenically characterized by HI with ferret antisera, and all 10 (100%) were antigenically similar to cell-propagated B/Phuket/3073/2013-like reference viruses representing the B/Yamagata component for the 2019-20 Northern Hemisphere influenza vaccines.

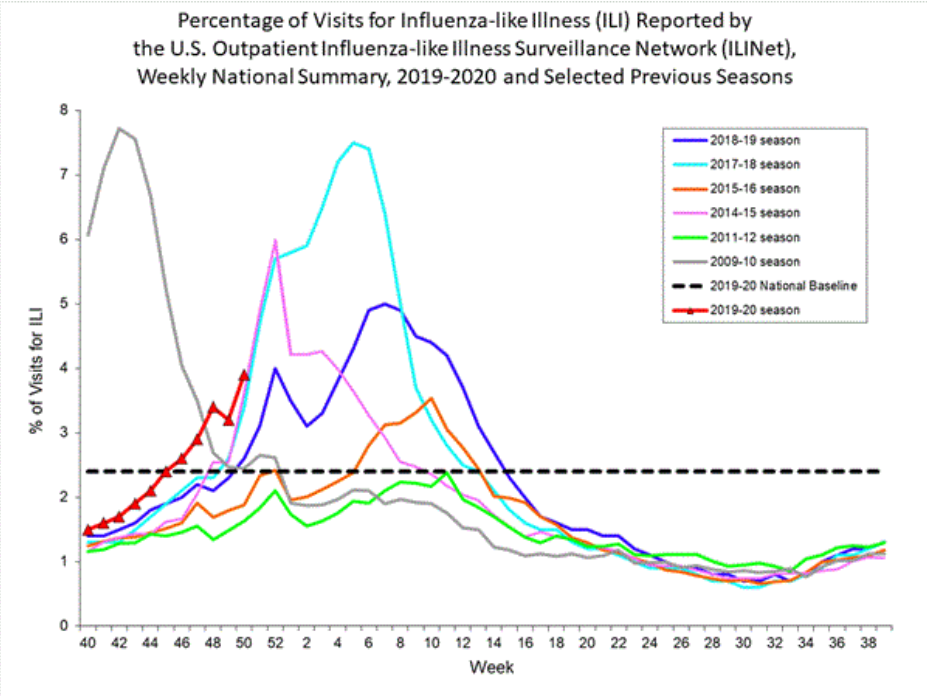
CDC assesses **susceptibility of influenza viruses to the antiviral medications** oseltamivir, zanamivir, peramivir, and baloxavir using next generation sequence analysis supplemented by laboratory assays. Viruses collected in the United States since September 29, 2019, were tested for antiviral susceptibility as follows:

Antiviral Medication			Total Viruses	A/H1	A/H3	B/Victoria	B/Yamagata
Neuraminidase Inhibitors	Oseltamivir	Viruses Tested	462	103	152	190	17
		Reduced Inhibition	(0.0%)	(0.0%)	(0.0%)	(0.0%)	(0.0%)
		Highly Reduced Inhibition	1 (0.2%)	1 (1.0%)	(0.0%)	(0.0%)	(0.0%)
	Peramivir	Viruses Tested	462	103	152	190	17
		Reduced Inhibition	(0.0%)	(0.0%)	(0.0%)	(0.0%)	(0.0%)
		Highly Reduced Inhibition	1 (0.2%)	1 (1.0%)	(0.0%)	(0.0%)	(0.0%)
	Zanamivir	Viruses Tested	462	103	152	190	17
		Reduced Inhibition	1 (0.2%)	(0.0%)	(0.0%)	1 (0.5%)	(0.0%)
		Highly Reduced Inhibition	(0.0%)	(0.0%)	(0.0%)	(0.0%)	(0.0%)
PA Endonuclease Inhibitor	Baloxavir	Viruses Tested	423	92	149	167	15
		Reduced Susceptibility	(0.0%)	(0.0%)	(0.0%)	(0.0%)	(0.0%)

Outpatient Illness Surveillance

ILINet

Nationwide during week 50, 3.9% 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 2.4%.



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On a regional level, the percentage of outpatient visits for ILI ranged from 1.9% to 7.8% during week 50. All regions reported a percentage of outpatient visits for ILI which is equal to or above their region-specific baselines.

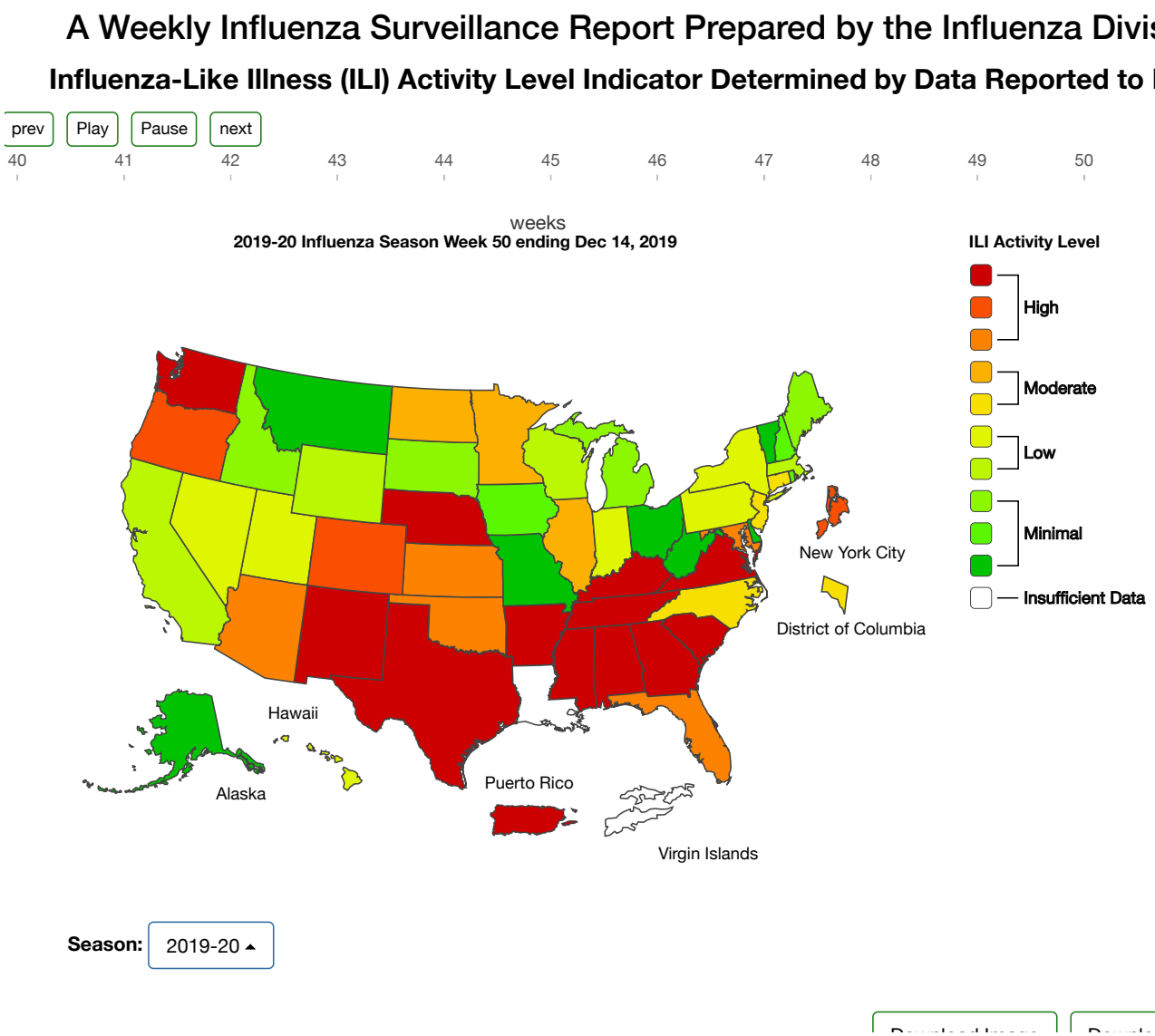
ILI Activity Map

Data collected in ILINet are used to produce a measure of ILI activity* by state.

During week 50, the following ILI activity levels were experienced:

- High – Puerto Rico, New York City, and 19 states (Alabama, Arizona, Arkansas, Colorado, Florida, Georgia, Kansas, Kentucky, Maryland, Mississippi, Nebraska, New Mexico, Oklahoma, Oregon, South Carolina, Tennessee, Texas, Virginia, and Washington)
- Moderate – the District of Columbia and six states (Connecticut, Illinois, Minnesota, New Jersey, North Carolina, and North Dakota)
- Low – 10 states (California, Hawaii, Indiana, Massachusetts, Nevada, New York, Pennsylvania, Utah, Wisconsin, and Wyoming)
- Minimal – 14 states (Alaska, Delaware, Idaho, Iowa, Maine, Michigan, Missouri, Montana, New Hampshire, Ohio, Rhode Island, South Dakota, Vermont, and West Virginia)

- Data were insufficient to calculate an ILI activity level from the U.S. Virgin Islands and Louisiana.



*Data collected in ILINet may disproportionally represent certain populations within a state, and therefore, may not accurately depict the full picture of influenza activity for the whole state. Differences in the data presented here by CDC and independently by some state health departments likely represent differing levels of data completeness with data presented by the state likely being the more complete.

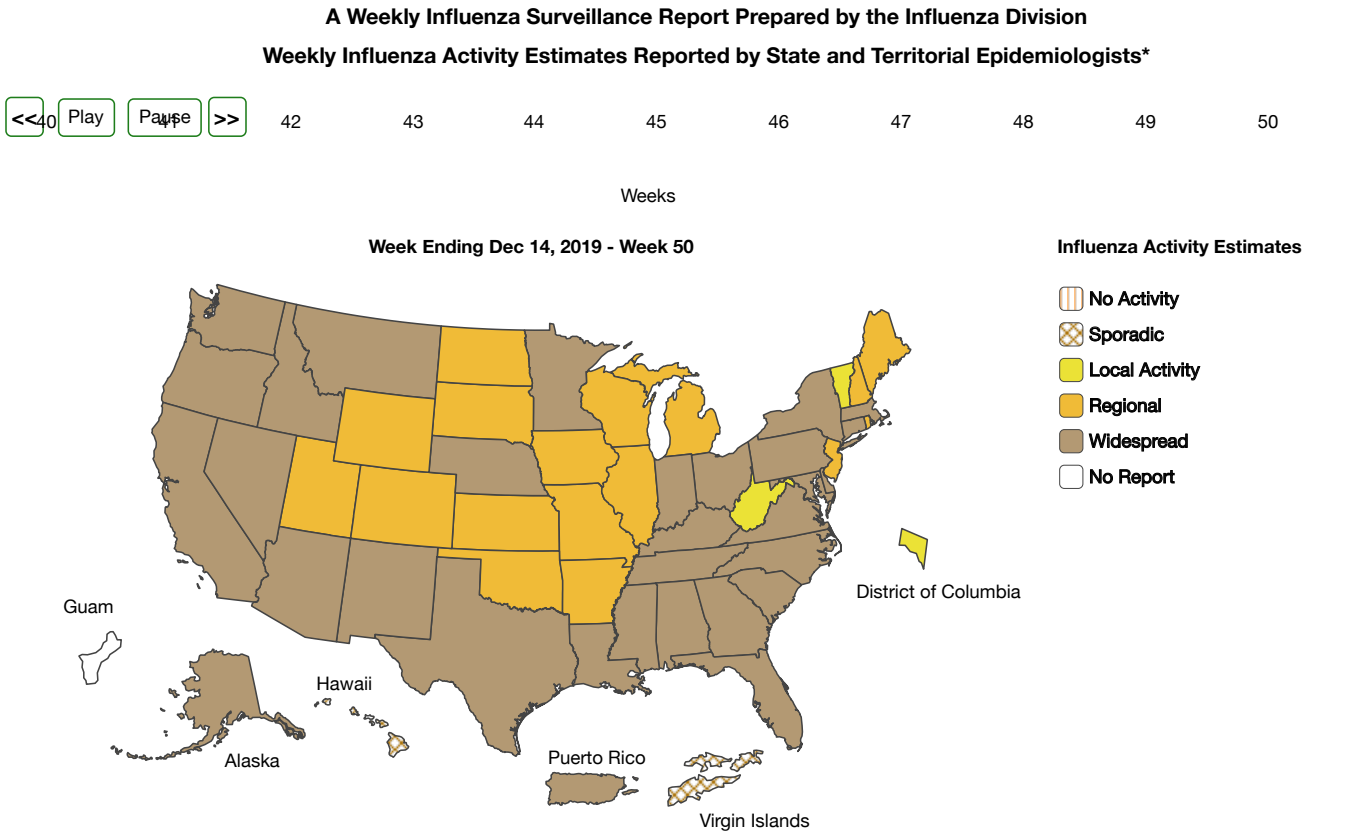
Additional information about medically attended visits for ILI for current and past seasons:
Surveillance Methods | FluView Interactive: National, Regional, and State Data or ILI Activity Map

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 50 the following influenza activity was reported:

- Widespread – Puerto Rico and 30 states (Alabama, Alaska, Arizona, California, Connecticut, Delaware, Florida, Georgia, Idaho, Indiana, Kentucky, Louisiana, Maryland, Massachusetts, Minnesota, Mississippi, Montana, Nebraska, Nevada, New Mexico, New York, North Carolina, Ohio, Oregon, Pennsylvania, South Carolina, Tennessee, Texas, Virginia, and Washington)
- Regional – 17 states (Arkansas, Colorado, Illinois, Iowa, Kansas, Maine, Michigan, Missouri, New Hampshire, New Jersey, North Dakota, Oklahoma, Rhode Island, South Dakota, Utah, Wisconsin, and Wyoming)
- Local – the District of Columbia and two states (Vermont and West Virginia)
- Sporadic – the U.S. Virgin Islands and one state (Hawaii)
- Guam did not report.



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

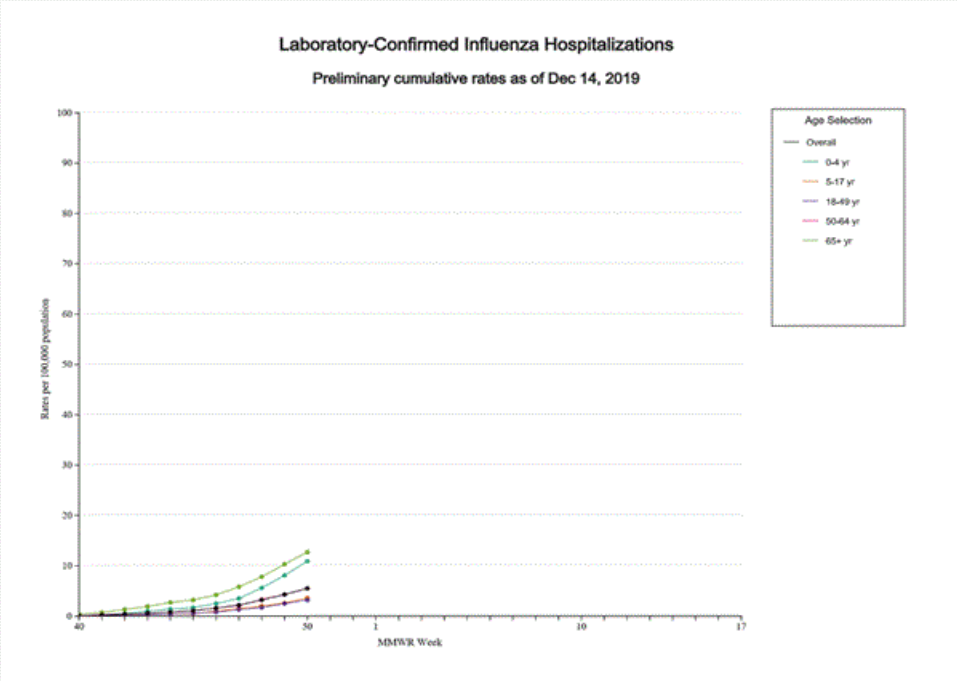
Additional geographic spread surveillance information for current and past seasons:

Surveillance Methods | FluView Interactive

Influenza-Associated Hospitalizations

The Influenza Hospitalization Surveillance Network (FluSurv-NET) conducts population-based surveillance for laboratory-confirmed influenza-related hospitalizations in select counties in the Emerging Infections Program (EIP) states and Influenza Hospitalization Surveillance Project (IHSP) states.

A total of 1,593 laboratory-confirmed influenza-associated hospitalizations were reported by FluSurv-NET sites between October 1, 2019, and December 14, 2019. The overall hospitalization rate was 5.5 per 100,000 population. The highest rate of hospitalization was among adults aged ≥65 (12.7 per 100,000 population), followed by children aged 0-4 (10.9 per 100,000 population) and adults aged 50-64 (5.5 per 100,000 population). Among 1,593 hospitalizations, 855 (53.7%) were associated with influenza A virus, 722 (45.3%) with influenza B virus, 9 (0.6%) with influenza A virus and influenza B virus co-infection, and 7 (0.4%) with influenza virus for which the type was not determined. Among those with influenza A subtype information, 137 (73.3%) were A(H1N1)pdm09 virus and 50 (26.7%) were A(H3N2).



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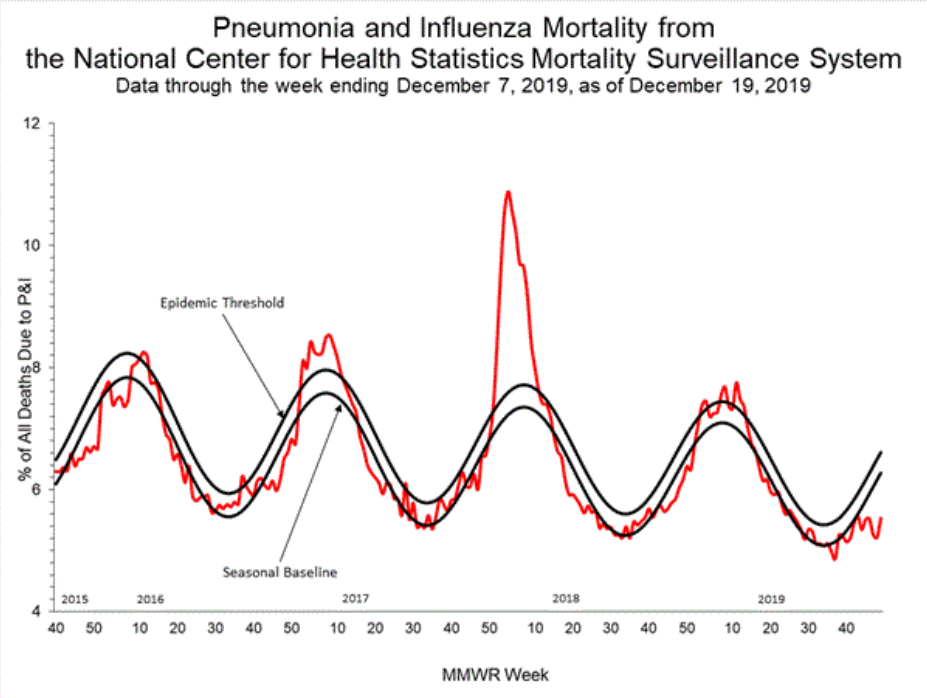
Additional hospitalization surveillance information for current and past seasons and additional age groups:
Surveillance Methods | FluView Interactive

Pneumonia and Influenza (P&I) Mortality Surveillance

Based on National Center for Health Statistics (NCHS) mortality surveillance data available on December 19, 2019, 5.5% of the deaths occurring during the week ending December 7, 2019 (week 49) were due to P&I. This percentage is below the epidemic threshold of 6.6% for week 49.



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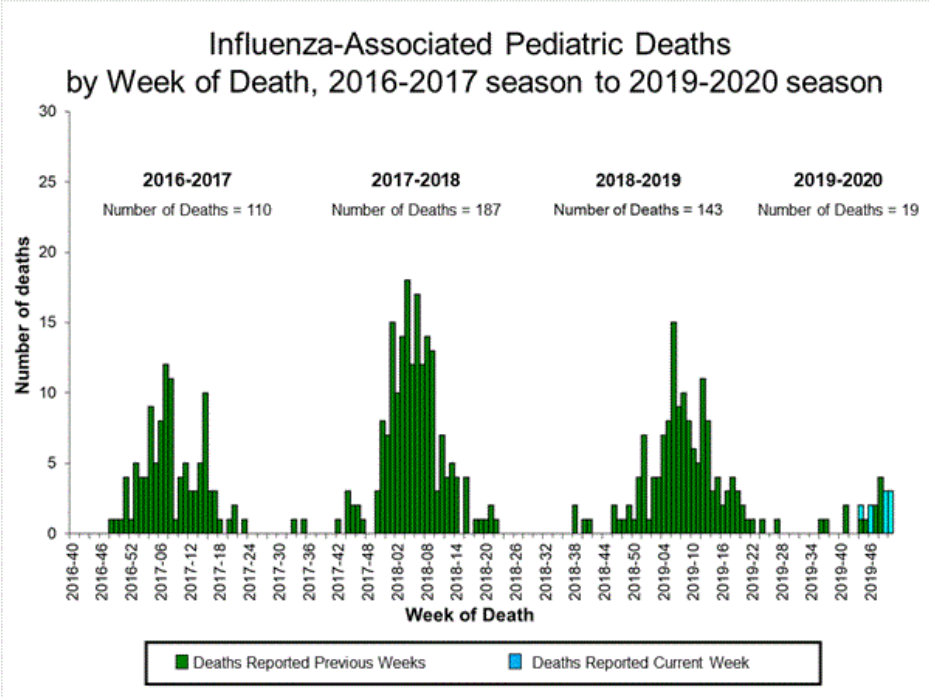
Additional pneumonia and influenza mortality surveillance information for current and past seasons:
Surveillance Methods | FluView Interactive

Influenza-Associated Pediatric Mortality

Nine influenza-associated pediatric deaths occurring between week 44 (the week ending November 2, 2019) and week 50 (the week ending December 14, 2019) were reported to CDC during week 50. Two deaths were associated with influenza A(H1N1)pdm09 virus infection and seven were associated with influenza B viruses. Two of the influenza B viruses had lineage determined and both were B/Victoria viruses.

A total of 19 influenza-associated pediatric deaths occurring during the 2019-2020 season have been reported to CDC.

- Thirteen deaths were associated with influenza B viruses. Five of these had the lineage determined and all were B/Victoria viruses.
- Six deaths were associated with influenza A viruses. Four of these had subtyping performed and all were A(H1N1)pdm09 viruses.



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Additional pediatric mortality surveillance information for current and past seasons:
Surveillance Methods | FluView Interactive

Additional National and International Influenza Surveillance Information

FluView Interactive: FluView includes enhanced web-based interactive applications that can provide dynamic visuals of the influenza data collected and analyzed by CDC. These FluView Interactive applications allow people to create customized, visual interpretations of influenza data, as well as make comparisons across flu seasons, regions, age groups and a variety of other demographics. To access these tools, visit http://www.cdc.gov/flu/weekly/fluviewinteractive.htm

National Institute for Occupational Safety and Health: Monthly surveillance data on the prevalence of health-related workplace absenteeism among full-time workers in the United States are available from NIOSH at https://www.cdc.gov/niosh/topics/absences/default.html

U.S. State and local influenza surveillance: Select a jurisdiction below to access the latest local influenza information

Alabama	Alaska	Arizona	Arkansas	California
Colorado	Connecticut	Delaware	District of Columbia	Florida
Georgia	Hawaii	Idaho	Illinois	Indiana
Iowa	Kansas	Kentucky	Louisiana	Maine
Maryland	Massachusetts	Michigan	Minnesota	Mississippi

Missouri	Montana	Nebraska	Nevada	New Hampshire
New Jersey	New Mexico	New York	North Carolina	North Dakota
Ohio	Oklahoma	Oregon	Pennsylvania	Rhode Island
South Carolina	South Dakota	Tennessee	Texas	Utah
Vermont	Virginia	Washington	West Virginia	Wisconsin
Wyoming	New York City	Puerto Rico	Virgin Islands	

World Health Organization: Additional influenza surveillance information from participating WHO member nations is available through FluNet and the Global Epidemiology Reports.

WHO Collaborating Centers for Influenza located in Australia, China, Japan, the United Kingdom, and the United States (CDC in Atlanta, Georgia).

Europe: For the most recent influenza surveillance information from Europe, please see WHO/Europe and the European Centre for Disease Prevention and Control at http://www.flunewseurope.org/.

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

Public Health England: The most up-to-date influenza information from the United Kingdom is available at https://www.gov.uk/government/statistics/weekly-national-flu-reports

An overview of the CDC influenza surveillance system, including methodology and detailed descriptions of each data component, is available at: http://www.cdc.gov/flu/weekly/overview.htm.

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