Influenza (Flu)

Weekly U.S. Influenza Surveillance Report

Key Updates for Week 7, ending February 15, 2020

Key indicators that track flu activity remain high but decreased slightly this week. Indicators that track overall severity (hospitalizations and deaths) are not high at this point in the season.

Viruses

Clinical Labs

The percentage of respiratory specimens testing positive for influenza at clinical laboratories decreased from 30.3% last week to 29.6% this week.

Public Health Labs

Numbers of influenza B/Victoria and A(H1N1)pdm09 viruses are approximately equal for the season overall, with continued increases in influenza A(H1N1)pdm09 viruses in recent weeks.

Virus Characterization

Genetic and antigenic characterization and antiviral susceptibility of influenza viruses collected in the U.S. are summarized in this report.

Illness

Outpatient Illness: ILINet

Visits to health care providers for influenza-like illness (ILI) decreased from 6.7% last week to 6.1% this week. All regions remain above their baselines.

Outpatient Illness: ILINet Activity Map
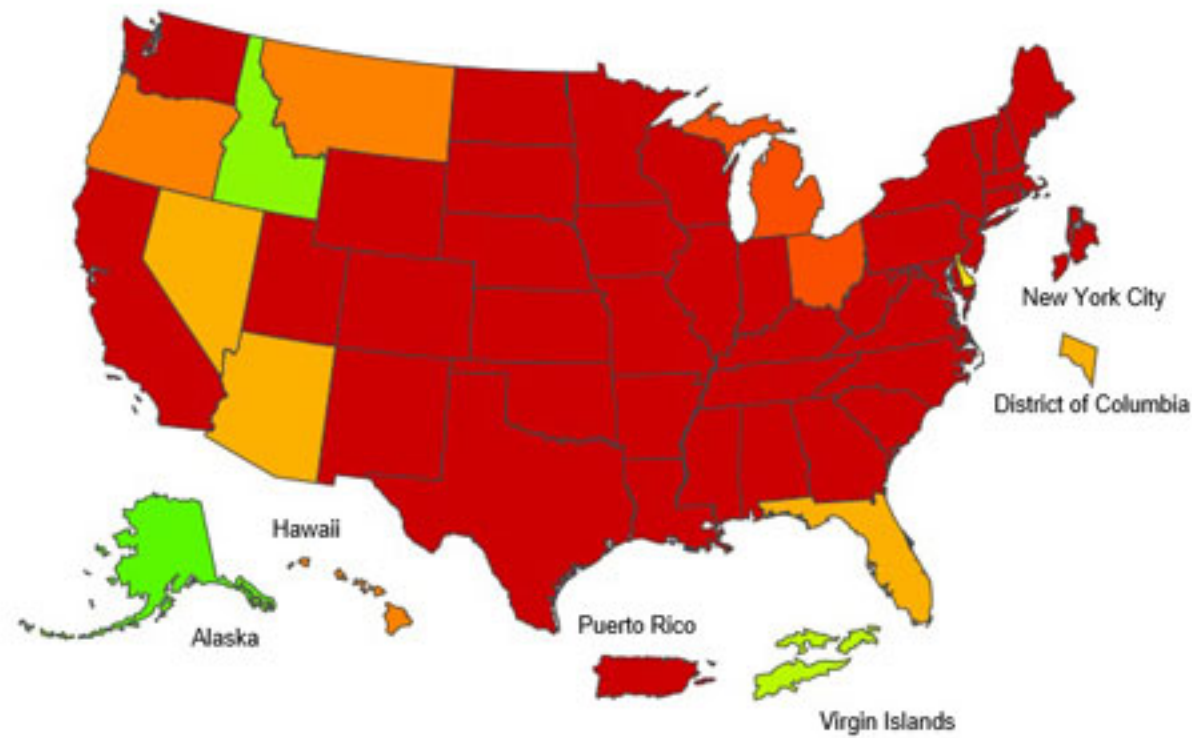
The number of jurisdictions experiencing high ILI activity remained at 46 this week.

Geographic Spread

The number of jurisdictions reporting regional or widespread influenza activity remained at 51 this week.

Severe Disease

Hospitalizations

The overall hospitalization rate for the season increased to 47.4 per 100,000. This is similar to what has been seen this time during recent seasons.

P&I Mortality

The percentage of deaths attributed to pneumonia and influenza is 6.8%, below the epidemic threshold of 7.3%.

Pediatric Deaths

13 influenza-associated pediatric deaths occurring during the 2019-2020 season were reported this week. The total for the season is 105.

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 FluView Interactive.
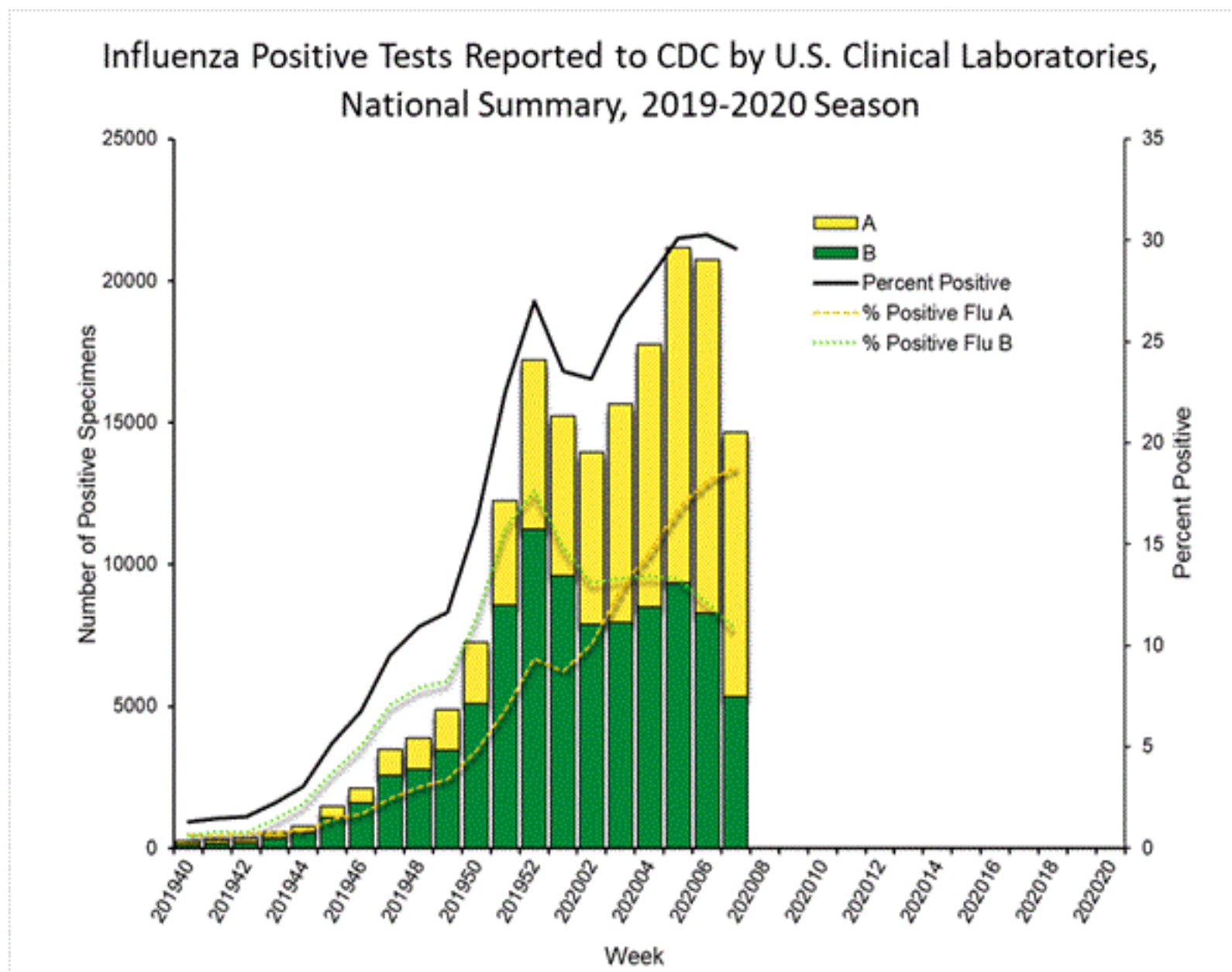
- Outpatient ILI and clinical laboratory data remain elevated but decreased slightly this week. The overall decrease in the percentage of specimens testing positive for influenza was due to a decrease in the percentage of specimens testing positive for influenza B. The percentage of specimens testing positive for influenza A continued to increase.
- Overall, hospitalization rates remain similar to this time during recent seasons, but rates among children and young adults are higher at this time than in recent seasons.
- Pneumonia and influenza mortality has been low, but 105 influenza-associated deaths in children have been reported so far this season.
- CDC estimates that so far this season there have been at least 29 million flu illnesses, 280,000 hospitalizations and 16,000 deaths from flu.
- Interim estimates of 2019-2020 flu vaccine effectiveness were released this week. So far this season, flu vaccine are reducing doctor's visits for flu illness by 45% overall and 55% in children.
- 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 laborator (the percentage of specimens tested that are positive for influenza) are used to monitor whether influenza activity is increasing or decreasing.

	Week 7	Data Cumulative since September 29, 2019 (week 40)
No. of specimens tested	49,510	888,399
No. of positive specimens (%)	14,657 (29.6%)	174,037 (19.6%)
Positive specimens by type		
Influenza A	9,305 (63.5%)	79,269 (45.5%)
Influenza B	5,352 (36.5%)	94,768 (54.5%)

Influenza Positive Tests Reported to CDC by U.S. Clinical Laboratories, National Summary, 2019-2020 Season

View Chart Data | View Full Screen

Public Health Laboratories

The results of tests performed by public health laboratories nationwide are summarized below. Data from public hea laboratories are used to monitor the proportion of circulating viruses that belong to each influenza subtype/lineage.
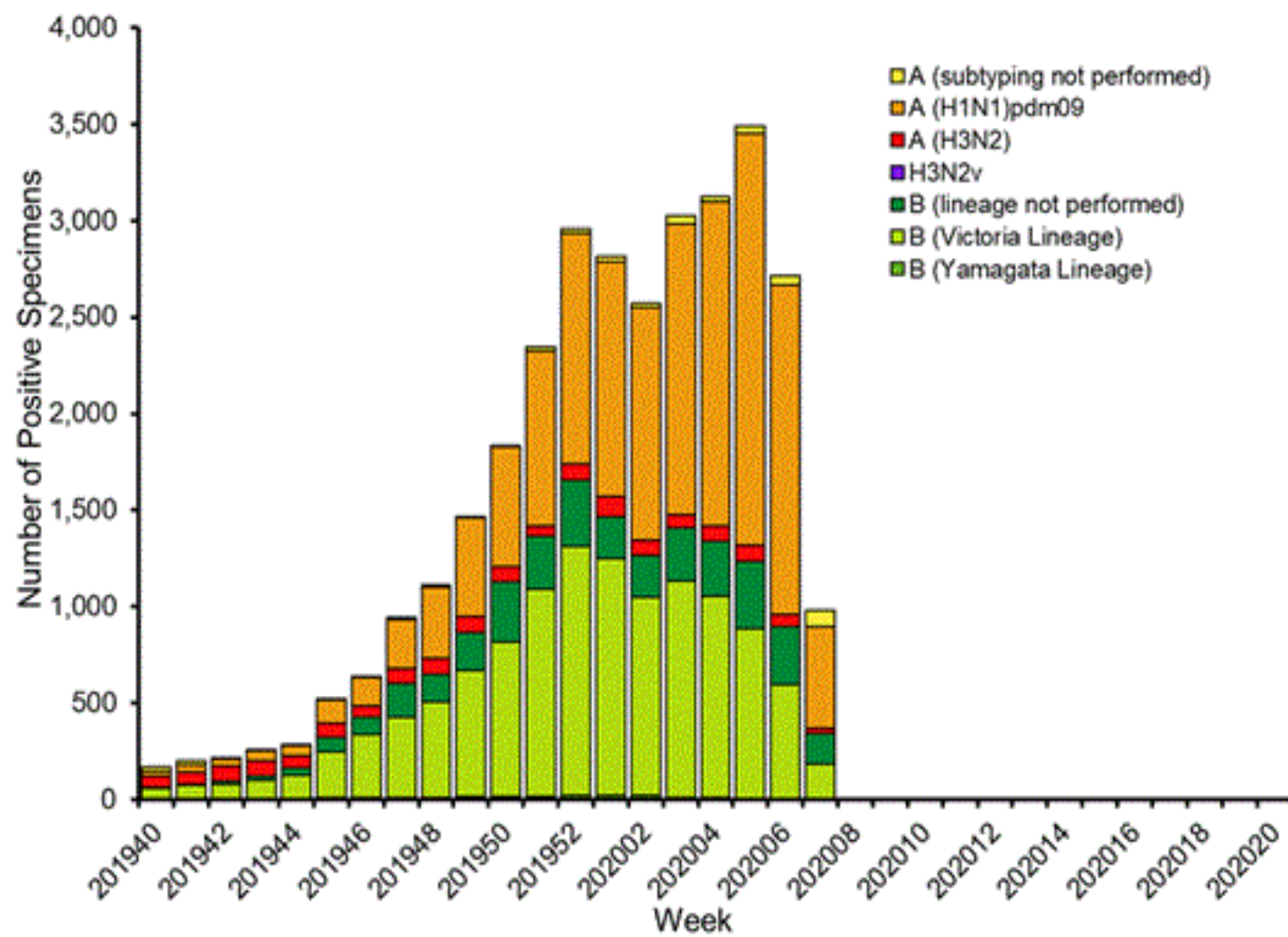
	Week 7	Data Cumulative since September 29, 2019 (week 40)

No. of specimens tested	1,626	57,630
No. of positive specimens	981	31,638
Positive specimens by type/subtype		
Influenza A	637 (64.9%)	16,160 (51.1%)
(H1N1)pdm09	531 (96.0%)	14,320 (90.9%)
H3N2	22 (4.0%)	1,427 (9.1%)
Subtyping not performed	84	413
Influenza B	344 (35.1%)	15,478 (48.9%)
Yamagata lineage	3 (1.6%)	191 (1.6%)
Victoria lineage	180 (98.4%)	11,796 (98.4%)
Lineage not performed	161	3,491

While influenza B/Victoria viruses predominated earlier in the season, during recent weeks, influenza A(H1N1)pdm09 viruses have been reported more frequently than B/Victoria viruses. For the season, the number of B/Victoria and A(H1N1)pdm09 viruses are approximately equal. 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, for the season overall, influenza B viruses are the most commonly reported influenza viruses among children and young adults age 0-4 years (53% of reported viruses) and 5 years (68% of reported viruses), while A(H1N1)pdm09 viruses are the most commonly reported influenza viruses among persons 25-64 years (57% of reported viruses) and 65 years of age and older (64% of reported viruses). For this season, 51% of influenza positive specimens reported by public health laboratories were among persons less than 25 years of and less than 13% were from persons age 65 and older.

Influenza Positive Tests Reported to CDC by U.S. Public Health Laboratories, National Summary, 2019-2020 Season

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 viruses. Antigenic characterization data are based on an animal model (influenza-naive ferrets), and do not reflect pre-existing protection provided by past influenza infections and vaccinations. Additional antigenic characterization studies involving people vaccinated with current influenza vaccines conducted later in the season; these data account for pre-existing protection in different populations against circulating influenza viruses. Genetic and antigenic characterization data are not used to make calculations about vaccine effectiveness (VE). CDC conducts VE studies each year to measure the benefits of flu vaccines in people. Interim estimates of 2019-2020 flu vaccine effectiveness were released this week.

CDC **genetically characterized** 1,667 influenza viruses collected in the U.S. from September 29, 2019, to February 1, 2020.

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	563				
		6B.1A	563 (100%)		
A/H3	381				
		3C.2a	365 (95.8%)	2a1	365 (95.8%)
				2a2	0
				2a3	0
				2a4	0
		3C.3a	16 (4.2%)	3a	16 (4.2%)
B/Victoria	655				
		V1A	655 (100%)	V1A	0
				V1A.1	50 (7.6%)
				V1A.3	605 (92.4%)
B/Yamagata	68				
		Y3	68 (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 244 influenza viruses collected in the United States from September 29, 2019 February 15, 2020. These data are not used to make calculations about vaccine effectiveness (VE). CDC conducts VE studies each year to measure the benefits of flu vaccines in people.

Influenza A Viruses
- **A (H1N1)pdm09:** 74 A(H1N1)pdm09 viruses were antigenically characterized by HI with ferret antisera, and all (100%) 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 Northern Hemisphere influenza vaccines.
- **A (H3N2):** 72 A(H3N2) viruses were antigenically characterized by FRA with ferret antisera, and 31 (43.1%) 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:** 88 B/Victoria lineage viruses, including viruses from both co-circulating sub-clades, were antigenically characterized by HI with ferret antisera, and 53 (60.2%) 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 (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** including the neuraminidase inhibitors (oseltamivir, zanamivir, and peramivir) and the PA endonuclease inhibitor baloxavir using next generation sequence analysis supplemented by laboratory assays. Viruses collected in the United States since September 29, 20 were tested for antiviral susceptibility as follows:
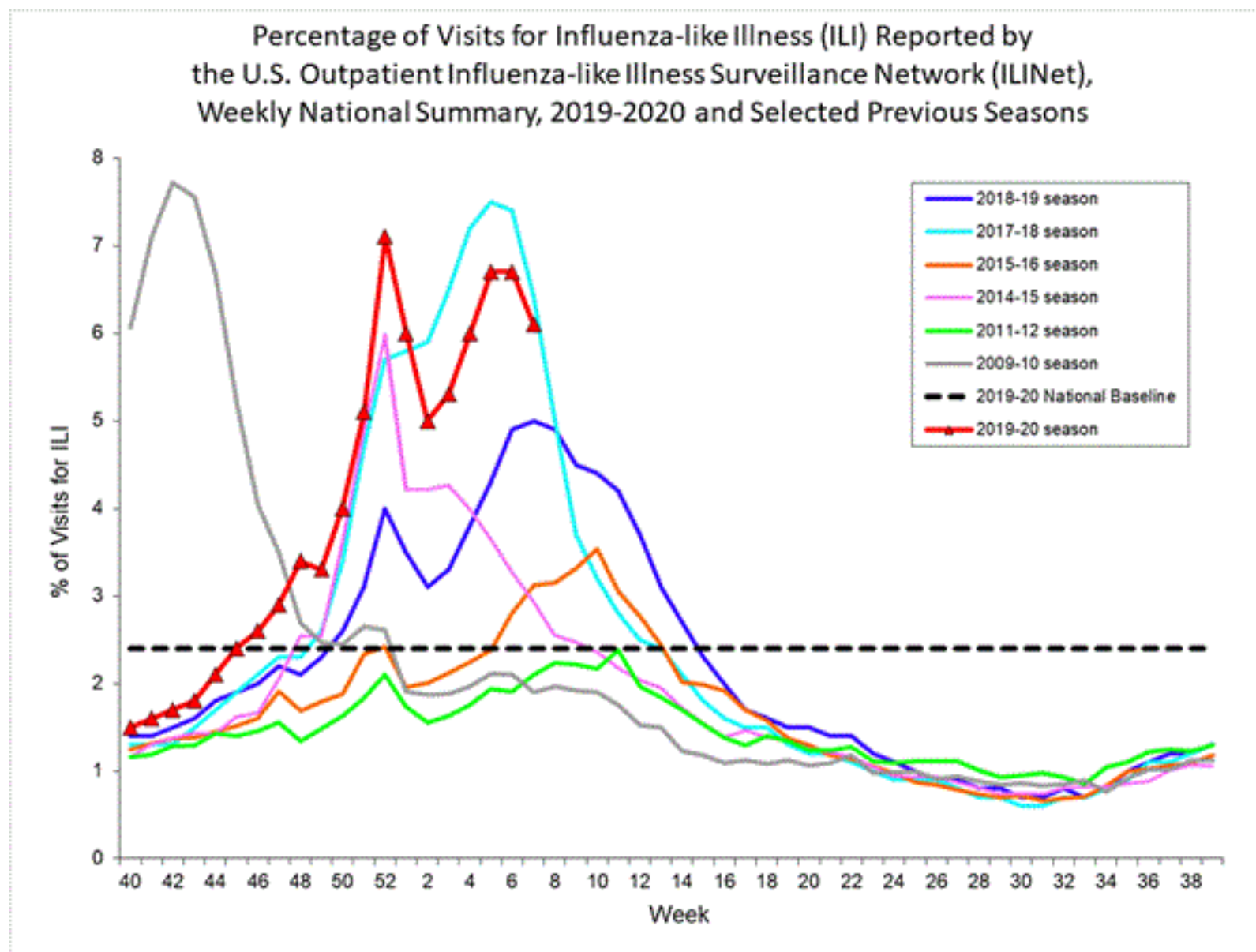
Antiviral Medication			Total Viruses	A/H1	A/H3	B/Victoria	B/Yamag
Neuraminidase Inhibitors	Oseltamivir	Viruses Tested	1,613	547	367	632	67
		Reduced Inhibition	(0.0%)	(0.0%)	(0.0%)	(0.0%)	(0.0%)
		Highly Reduced Inhibition	1 (0.1%)	1 (0.2%)	(0.0%)	(0.0%)	(0.0%)
	Peramivir	Viruses Tested	1,613	547	367	632	67
		Reduced Inhibition	(0.0%)	(0.0%)	(0.0%)	(0.0%)	(0.0%)
		Highly Reduced Inhibition	1 (0.1%)	1 (0.2%)	(0.0%)	(0.0%)	(0.0%)
	Zanamivir	Viruses Tested	1,613	547	367	632	67
		Reduced Inhibition	1 (0.1%)	(0.0%)	(0.0%)	1 (0.2%)	(0.0%)
		Highly Reduced Inhibition	(0.0%)	(0.0%)	(0.0%)	(0.0%)	(0.0%)
PA Endonuclease Inhibitor	Baloxavir	Viruses Tested	1,767	567	453	676	71
		Reduced Susceptibility	(0.0%)	(0.0%)	(0.0%)	(0.0%)	(0.0%)

A total of 353 additional viruses (173 A(H1N1)pdm09, 22 A(H3N2), and 158 B) collected in Alabama, Alaska, Florida, Illi
Iowa, Louisiana, Michigan, Nevada, New York, North Carolina, Pennsylvania, South Dakota, Virginia and Wisconsin we
analyzed for resistance to neuraminidase inhibitors by pyrosequencing assay. Two (1.2%) of the 173 A(H1N1)pdm09
viruses tested had the H275Y amino acid substitution in the neuraminidase that confers resistance to oseltamivir and
potential resistance to peramivir. No markers of resistance to neuraminidase inhibitors were detected in A(H3N2) an
type B viruses tested.

Outpatient Illness Surveillance

ILINet

Nationwide during week 7, 6.1% of patient visits reported through the U.S. Outpatient Influenza-like Illness Surveillan
Network (ILINet) were due to influenza-like illness (ILI). This percentage is above the national baseline of 2.4%.

Percentage of Visits for Influenza-like Illness (ILI) Reported by
the U.S. Outpatient Influenza-like Illness Surveillance Network (ILINet),
Weekly National Summary, 2019-2020 and Selected Previous Seasons

View Chart Data (current season only) | View Full Screen

On a regional level, the percentage of outpatient visits for ILI ranged from 3.4% to 9.7% during week 7. All regions
reported a percentage of outpatient visits for ILI 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 7, the following ILI activity levels were experienced:
- High – New York City, Puerto Rico, and 44 states (Alabama, Arkansas, California, Colorado, Connecticut, Georgia,

Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minneso
Mississippi, Missouri, Montana, Nebraska, 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, and Wyoming)

- Moderate – the District of Columbia and four states (Arizona, Delaware, Florida, and Nevada)
- Low - the U.S. Virgin Islands
- Minimal - two states (Alaska and Idaho)

A Weekly Influenza Surveillance Report Prepared by the Influenza Division

Influenza-Like Illness (ILI) Activity Level Indicator Determined by Data Reported to ILINet

prev   Play   Pause   next

40

eks

2019-20 Influenza Season Week 7 ending Feb 15, 2020   **ILI Activity Level**

New York City

District of Columbia

Hawaii

Puerto Rico

Alaska

Virgin Islands

Season: 2019-20 ▲

Download Image   Download Data

(https://www.cdc.gov/flu/weekly/flureport.xml)View Full Screen (http://gis.cdc.gov/grasp/fluview/main.html)
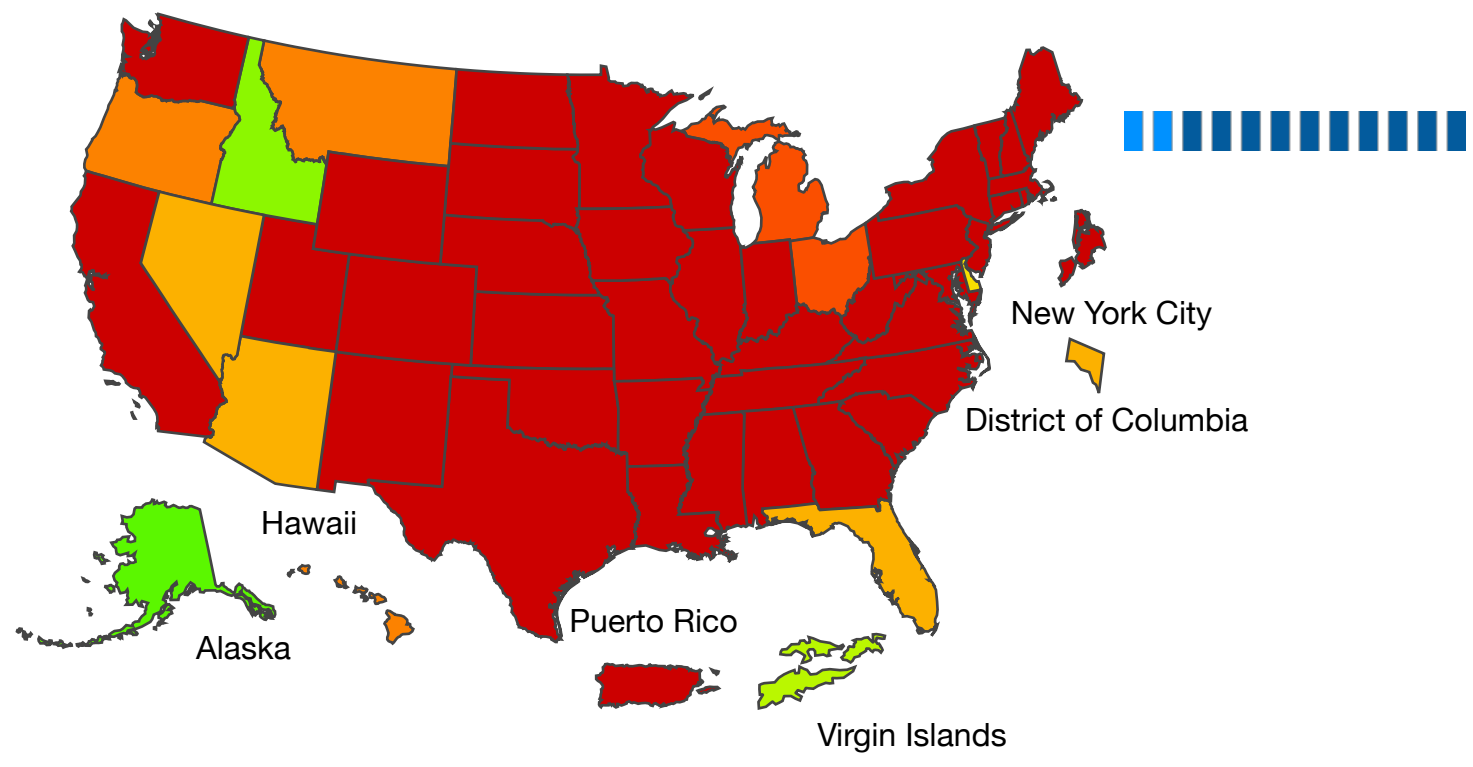
*Data collected in ILINet may disproportionally represent certain populations within a state, and therefore, may not accurately depict the full picture of influenza activity for the whole state. Differences in the data presented here by CDC and independently by some state health departments likely represe 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
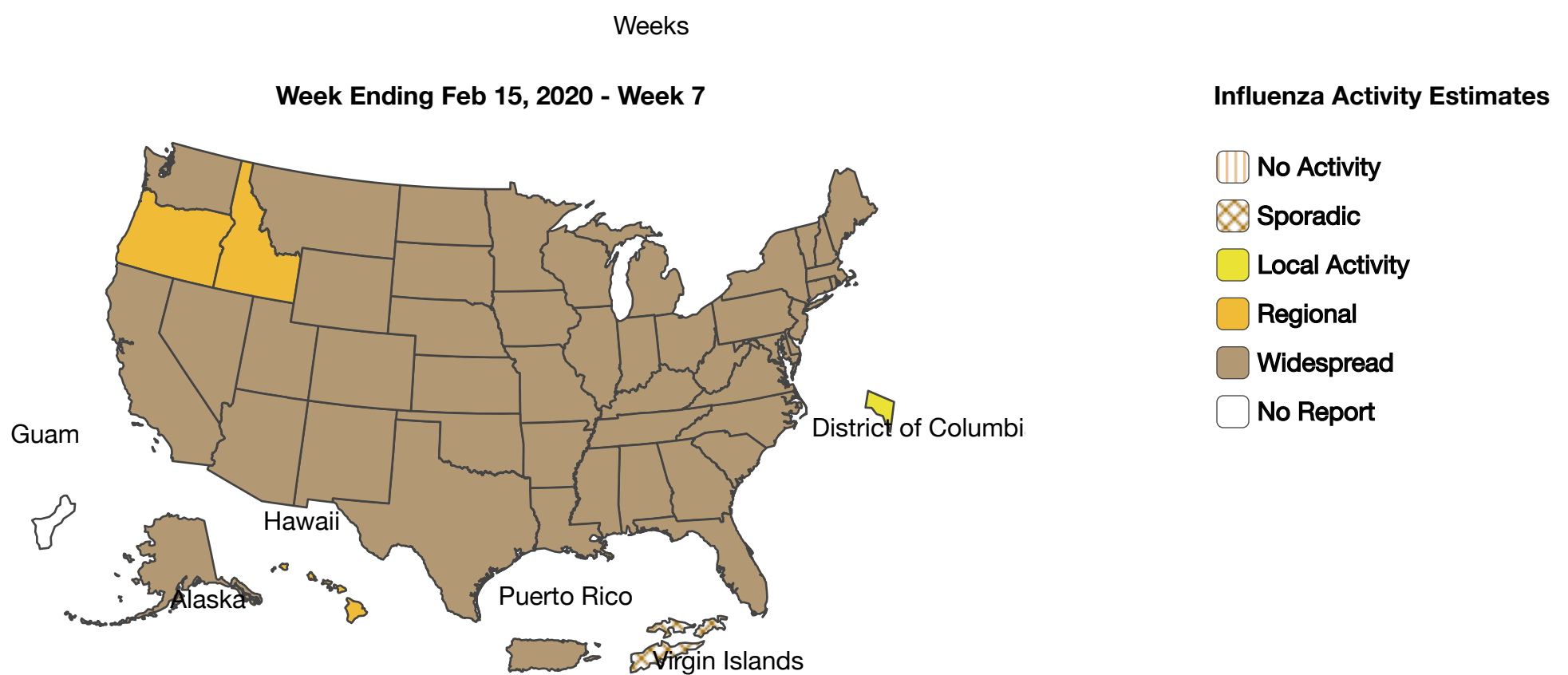
Geographic Spread of Influenza as Assessed by State and Territorial Epidemiologists

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 7, the following influenza activity was reported:

- Widespread – Puerto Rico and 47 states (Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Georgia, 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, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Wyoming)

- Regional – three states (Hawaii, Idaho and Oregon)

- Local – the District of Columbia

- Sporadic – the U.S. Virgin Islands

- Guam did not report.

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Weeks

Week Ending Feb 15, 2020 - Week 7

Influenza Activity Estimates

- No Activity
- Sporadic
- Local Activity
- Regional
- Widespread
- No Report

Guam

District of Columbi

Hawaii

Alaska

Puerto Rico

Virgin Islands

Season: 2019-20 ▼

Download Image | Download Data

Most Recent Flu Activity data in XML Format (https://www.cdc.gov/flu/weekly/flureport.xml) | View Full Screen (http://gis.cdc.gov/grasp/fluview/FluView8.html)

*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 laborato confirmed influenza-related hospitalizations in select counties in the Emerging Infections Program (EIP) states and Influenza Hospitalization Surveillance Project (IHSP) states.

A total of 13,775 laboratory-confirmed influenza-associated hospitalizations were reported by FluSurv-NET sites betw October 1, 2019 and February 15, 2020; 9,168 (66.6%) were associated with influenza A virus, 4,529 (32.9%) with influ B virus, 42 (0.3%) with influenza A virus and influenza B virus co-infection, and 36 (0.3%) with influenza virus for which type was not determined. Among those with influenza A subtype information, 2,385 (93.3%) were A(H1N1)pdm09 viru and 172 (6.7%) were A(H3N2).

The overall cumulative hospitalization rate was 47.4 per 100,000 population which is similar to what has been seen during recent previous influenza seasons at this time of year. Rates in children and young adults are higher than at th time in recent seasons.


Cumulative Rate of Laboratory-Confirmed Influenza Hospitalizations among cases of all ages, 2011-2012 to 2019-20
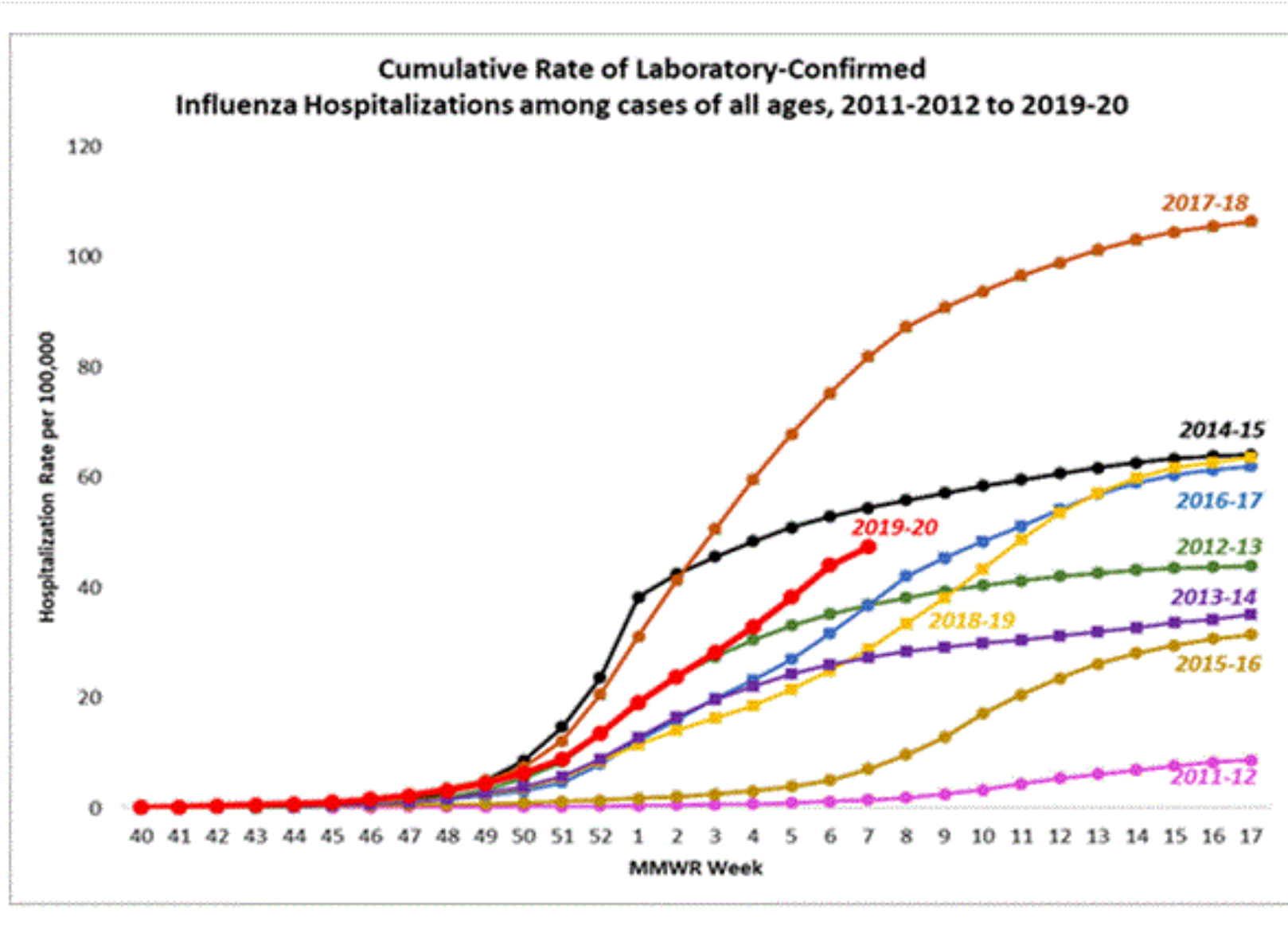
View Full Screen

The highest rate of hospitalization is among adults aged ≥65, followed by children aged 0-4 years and adults aged 50 years.

Age Group	2019-2020 Season Cumulative Rate per 100,000 Population
Overall	47.4
0-4 years	72.5
5-17 years	19.2
18-49 years	26.3
50-64 years	61.5
65+ years	116.7

Among 1,833 hospitalized adults with information on underlying medical conditions, 92.5% had at least one reported underlying medical condition, the most commonly reported were cardiovascular disease, metabolic disorder, obesity chronic lung disease. Among 360 hospitalized children with information on underlying medical conditions, 47.2% had

least one underlying medical condition; the most commonly reported was asthma. Among 342 hospitalized women of childbearing age (15-44 years) with information on pregnancy status, 26% were pregnant.
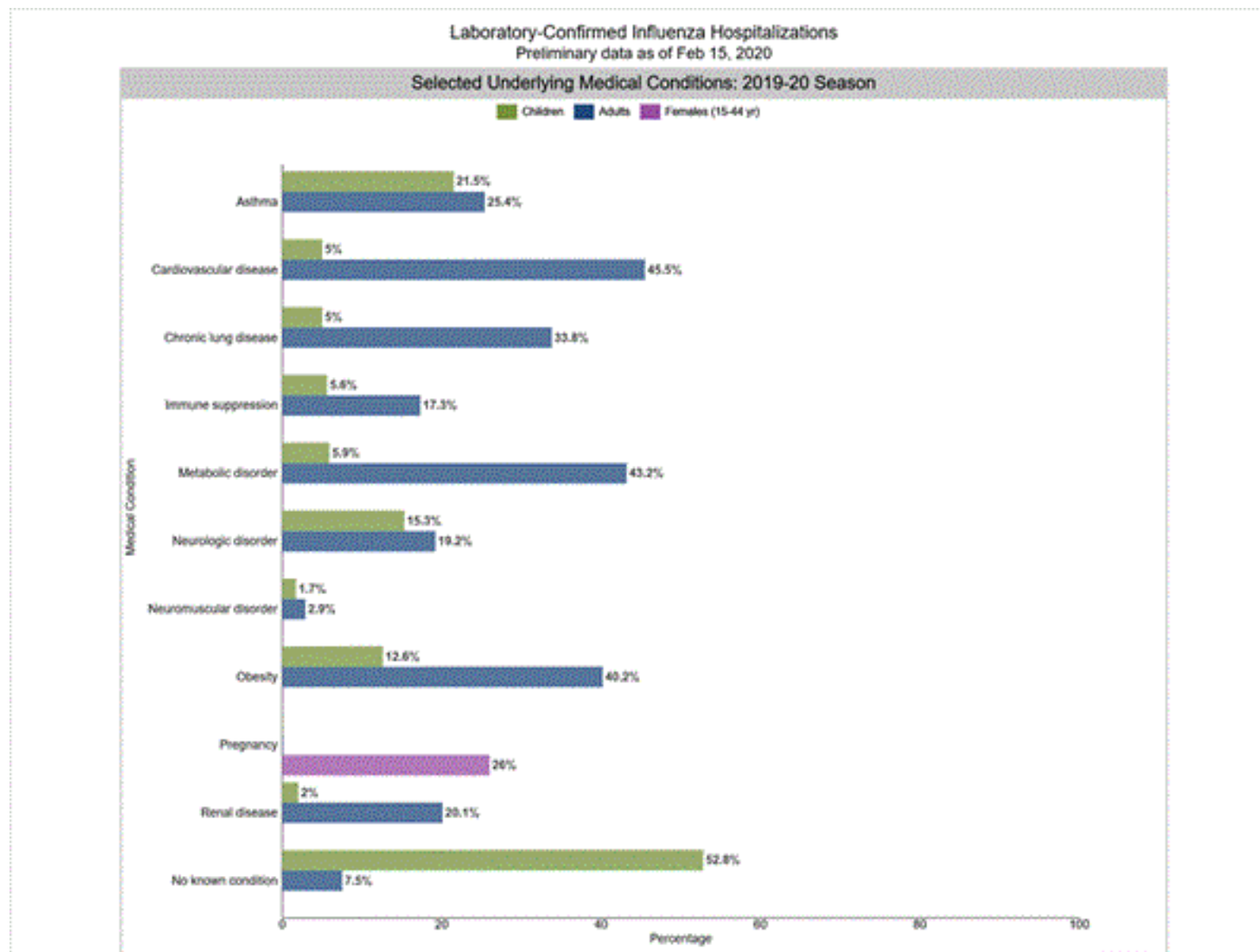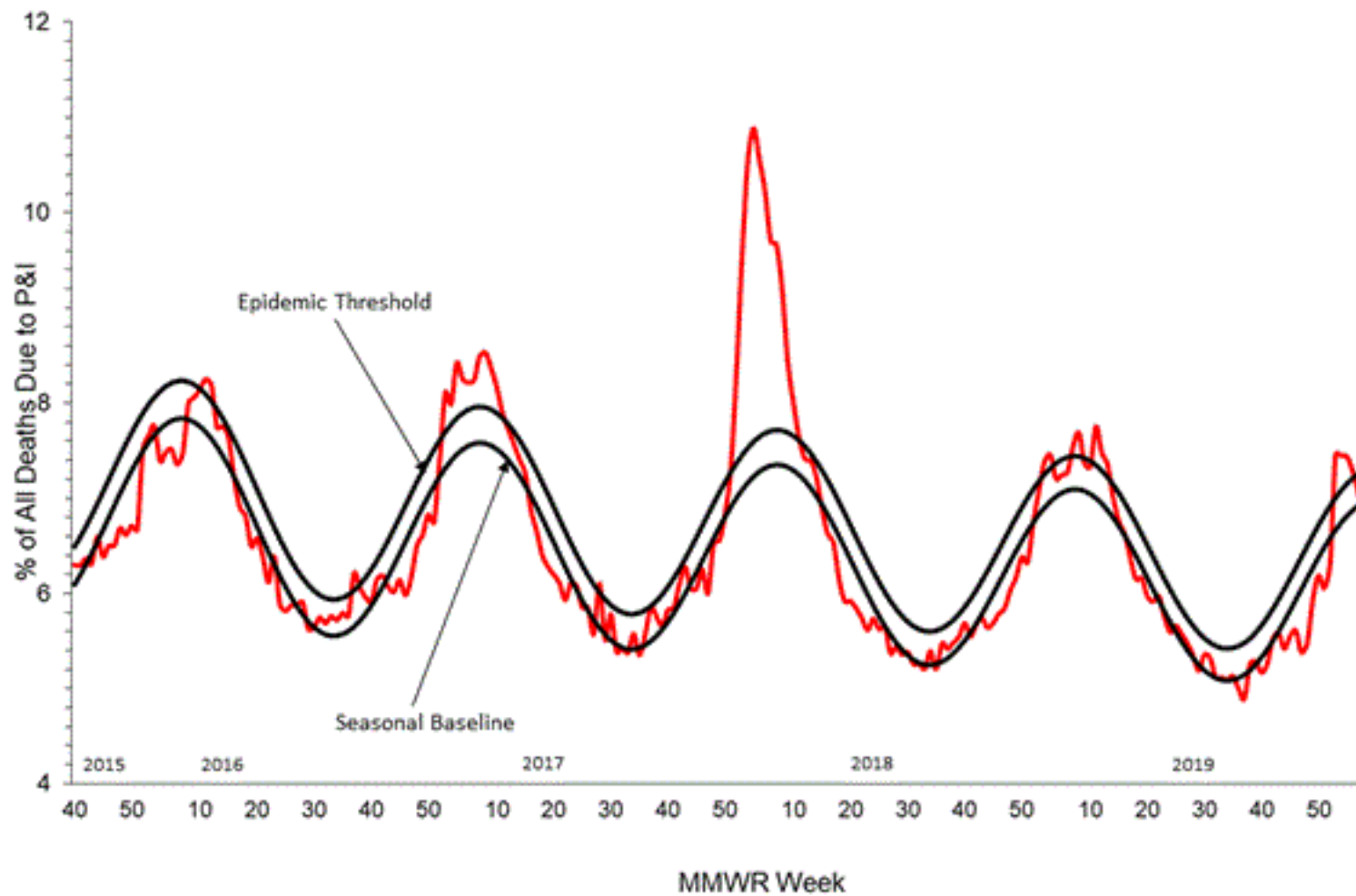

View Full Screen

Additional hospitalization surveillance information for current and past seasons and additional age grou
Surveillance Methods | FluView Interactive: Rates by Age or Patient Characteristics

Pneumonia and Influenza (P&I) Mortality Surveillance

Based on National Center for Health Statistics (NCHS) mortality surveillance data available on February 20, 2020, 6.8% the deaths occurring during the week ending February 8, 2020 (week 6) were due to P&I. This percentage is below the epidemic threshold of 7.3% for week 6.

Pneumonia and Influenza Mortality from
the National Center for Health Statistics Mortality Surveillance System
Data through the week ending February 8, 2020, as of February 20, 2020

View Chart Data | View Full Screen

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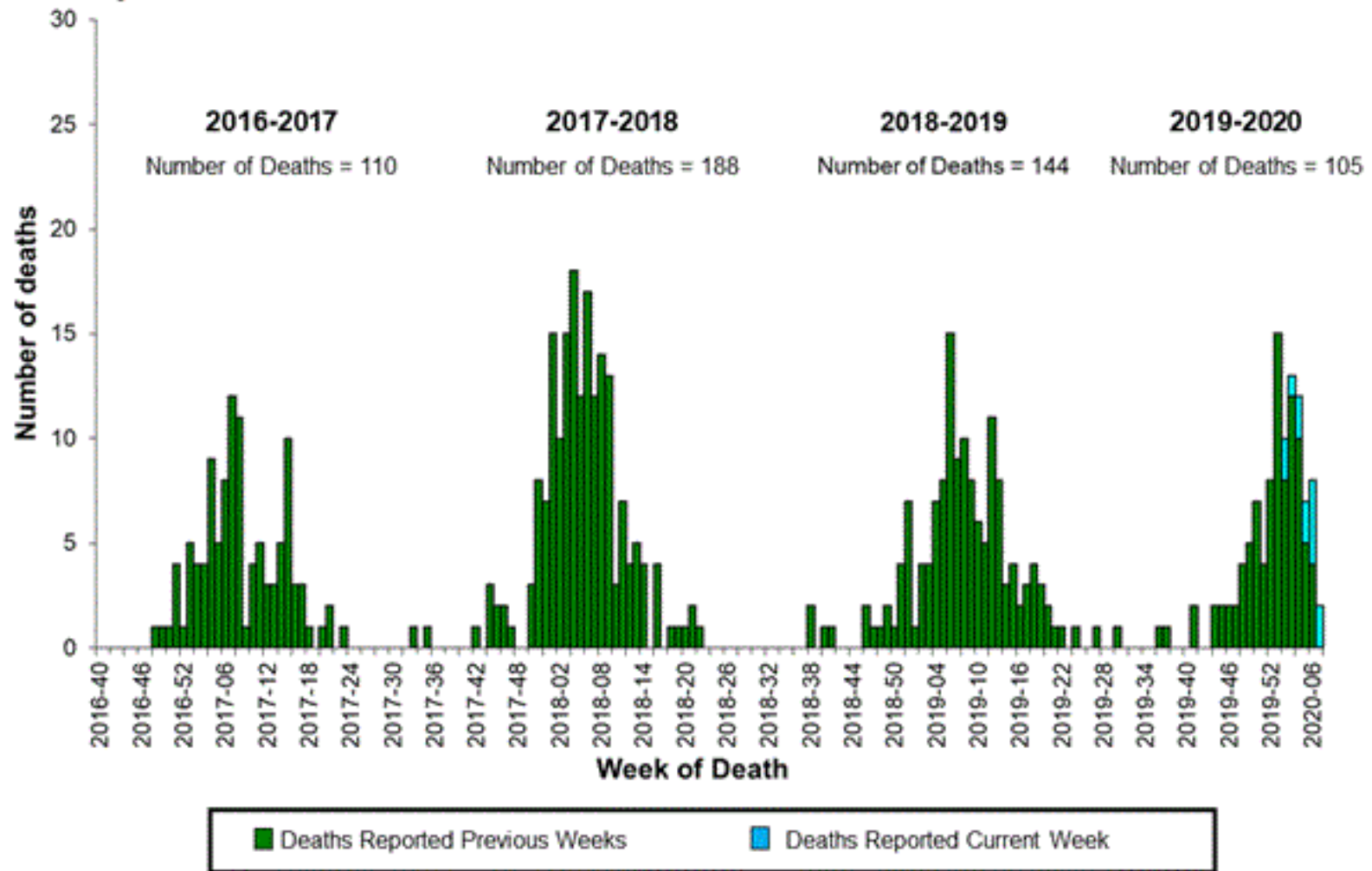Surveillance Methods | FluView Interactive

Influenza–Associated Pediatric Mortality

13 influenza-associated pediatric deaths occurring during the 2019-2020 season between weeks 2 and 7 (the weeks
ending January 11, 2020 and February 15, 2020) were reported to CDC during week 7. 10 were associated with influen
viruses, and two had a lineage determined; both B/Victoria viruses. Three were associated with influenza A viruses, a
two were subtyped; both A(H1N1)pdm09 viruses.

Of the 105 influenza-associated pediatric deaths occurring during the 2019-2020 season and reported to CDC:
- 72 deaths were associated with influenza B viruses, and 12 had a lineage determined; all were B/Victoria viruses
- 33 deaths were associated with influenza A viruses, and 20 were subtyped; 19 were A(H1N1)pdm09 viruses and
  was an A(H3) virus.

Influenza-Associated Pediatric Deaths by Week of Death, 2016-2017 season to 2019-2020 season

View Full Screen

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

Additional National and International Influenza Surveillan Information

FluView Interactive: FluView includes enhanced web-based interactive applications that can provide dynamic visua 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 gro 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 informat

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

World Health Organization: Additional influenza surveillance information from participating WHO member nation 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 Europe 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.