Influenza (Flu)

Weekly U.S. Influenza Surveillance Report

Key Updates for Week 9, ending February 29, 2020

Key indicators that track flu activity remain high but decreased for the third week in a row. Severity indicators (hospitalizations and deaths) remain moderate to low overall, but hospitalization rates diffe by age group, with high rates among children and young adults.

Viruses

Clinical Labs

The percentage of respiratory specimens testing positive for influenza at clinical laboratories decreased from 28.0% last week to 24.3% this week.

Public Health Labs

Nationally, influenza A(H1N1)pdm09 viruses are now the most commonly reported influenza viruses this season.

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 5.5% last week to 5.3% this week. All regions remain above their baselines.

Outpatient Illness: ILINet Activity Map

The number of jurisdictions experiencing high ILI activity decreased from 45 last week to 42 this week.

Geographic Spread

The number of jurisdictions reporting regional or widespread influenza activity increased from 50 last week to 51 this week.

Severe Disease

Hospitalizations

The overall cumulative hospitalization rate for the season increased to 57.9 per 100,000.

P&I Mortality

The percentage of deaths attributed to pneumonia and influenza is 6.9%, below the epidemic threshold of 7.3%.

Pediatric Deaths

11 influenza-associated pediatric deaths occurring during the 2019-2020 season were reported this week. The tota
for the season is 136.

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
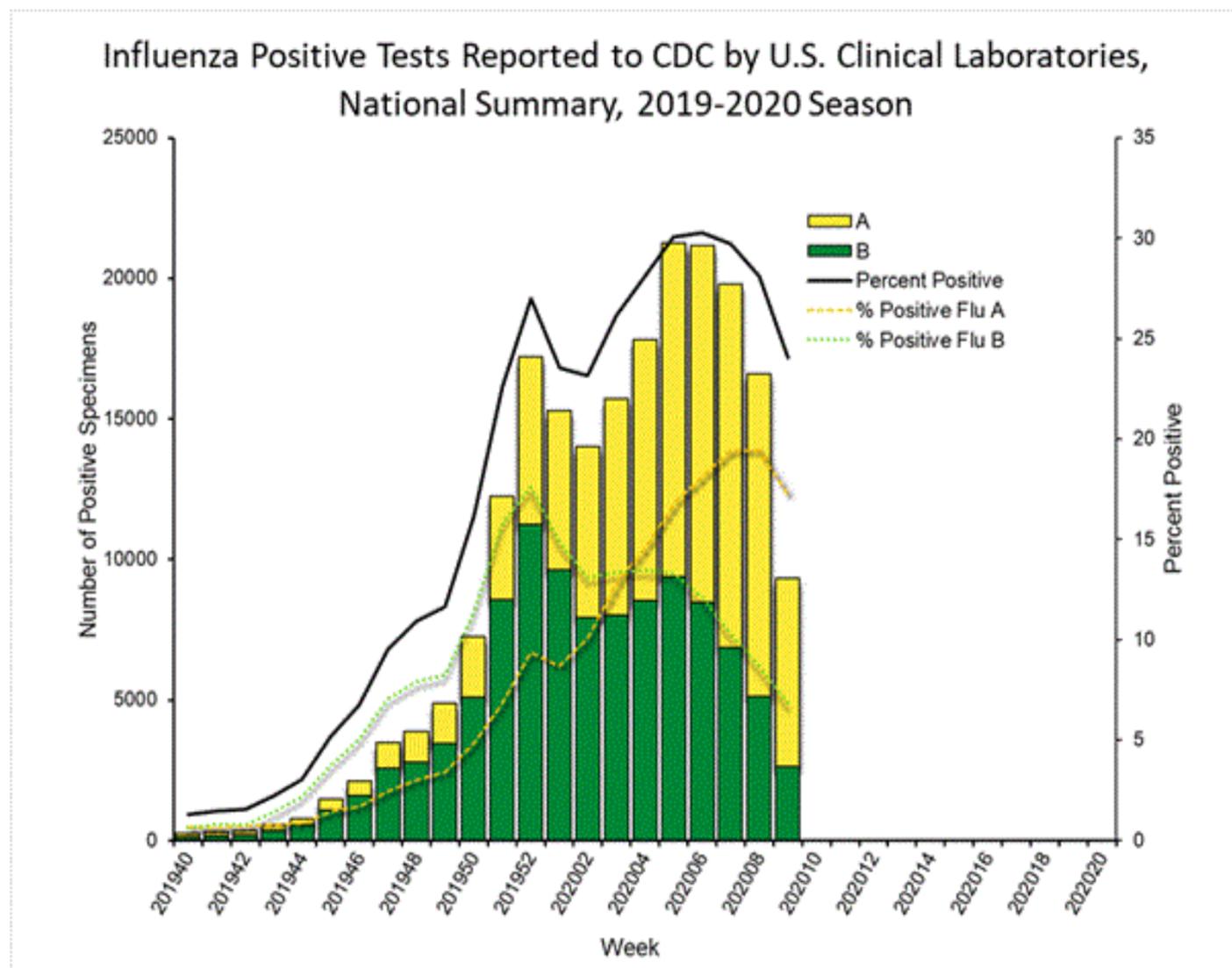FluView Interactive.*

Key Points:

- Outpatient ILI and clinical laboratory data remain elevated but decreased for the third week in a row.
- Nationally, influenza A(H1N1)pdm09 viruses are now the most commonly reported influenza viruses this seaso
  Previously, influenza B/Victoria viruses predominated nationally.
- Overall, hospitalization rates remain similar to this time during recent seasons, but rates among school aged
  children and young adults are higher at this time than in recent seasons and rates among children 0-4 years ol
  are now the highest CDC has on record at this point in the season, surpassing rates reported during the secon
  wave of the 2009 H1N1 pandemic.
- Pneumonia and influenza mortality has been low, but 136 influenza-associated deaths in children have been
  reported so far this season. This number is higher for the same time period than in every season since reportin
  began in 2004-05, except for the 2009 pandemic.
- CDC estimates that so far this season there have been at least 34 million flu illnesses, 350,000 hospitalizations
  and 20,000 deaths from flu.
- 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 9	Data Cumulative since September 29, 2019 (week 40)
No. of specimens tested	44,491	1,012,509
No. of positive specimens (%)	10,829 (24.3%)	207,466 (20.5%)
Positive specimens by type		
Influenza A	7,821 (72.2%)	102,650 (49.5%)
Influenza B	3,008 (27.8%)	104,816 (50.5%)

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.

		Data Cumulative since

	Week 9	September 29, 2019 (week 40)
No. of specimens tested	1,594	67,098
No. of positive specimens	953	37,739
Positive specimens by type/subtype		
Influenza A	692 (72.6%)	20,452 (54.2%)
(H1N1)pdm09	596 (95.2%)	18,205 (92.0%)
H3N2	30 (4.8%)	1,583 (8.0%)
Subtyping not performed	66	664
Influenza B	261 (27.4%)	17,287 (45.8%)
Yamagata lineage	0 (0.0%)	213 (1.6%)
Victoria lineage	207 (100%)	13,265 (98.4%)
Lineage not performed	54	3,809

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, A(H1N1)pdm09 viruses are the predominant virus. 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 less than 25 years, while A viruses are the most commonly reported influenza viruses among persons 25 years and older. In the most recent three weeks, influenza A viruses are the most commonly reported influenza viruses in all but the school aged children and young adults (5-24 years old).

Influenza Positive Tests Reported to CDC by U.S. Public Health Laboratories, National Summary, 2019-2020 Season
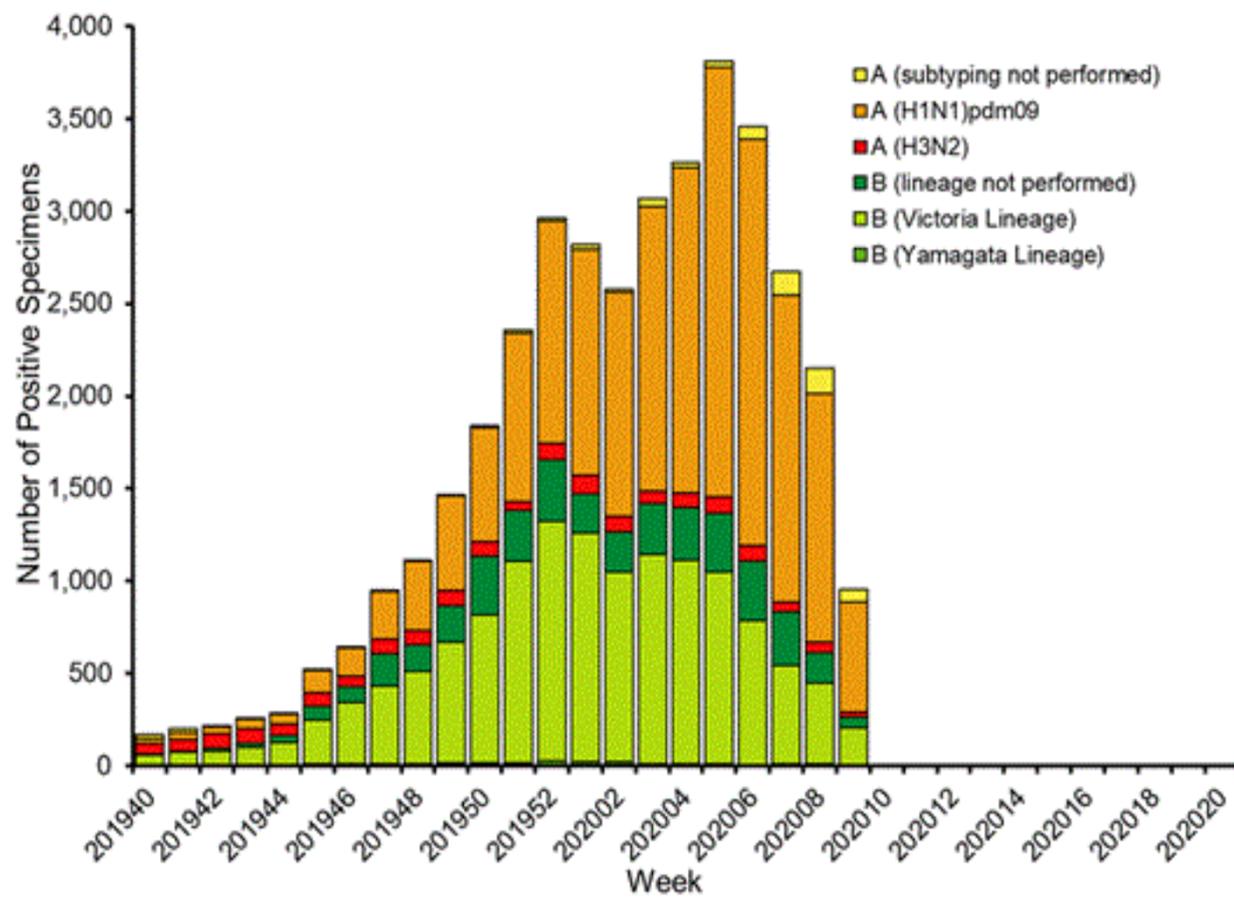
View Chart Data | View Full Screen

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 have been released.

CDC **genetically characterized** 1,903 influenza viruses collected in the U.S. from September 29, 2019, to February 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	645				
		6B.1A	645 (100%)		
A/H3	425				
		3C.2a	402 (94.6%)	2a1	402 (94.6%)
				2a2	0
				2a3	0
				2a4	0
		3C.3a	23 (5.4%)	3a	23 (5.4%)
B/Victoria	754				
		V1A	754 (100%)	V1A	0
				V1A.1	53 (7.0%)
				V1A.3	701 (93.0%)
B/Yamagata	79				
		Y3	79 (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 363 influenza viruses collected in the United States from September 29, 2019 February 29, 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:** 131 A(H1N1)pdm09 viruses were antigenically characterized by HI with ferret antisera, and 11 (86.3%) 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):** 76 A(H3N2) viruses were antigenically characterized by FRA with ferret antisera, and 31 (40.8%) 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:** 146 B/Victoria lineage viruses, including viruses from both co-circulating sub-clades, were antigenically characterized by HI with ferret antisera, and 95 (65.1%) 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 also 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:

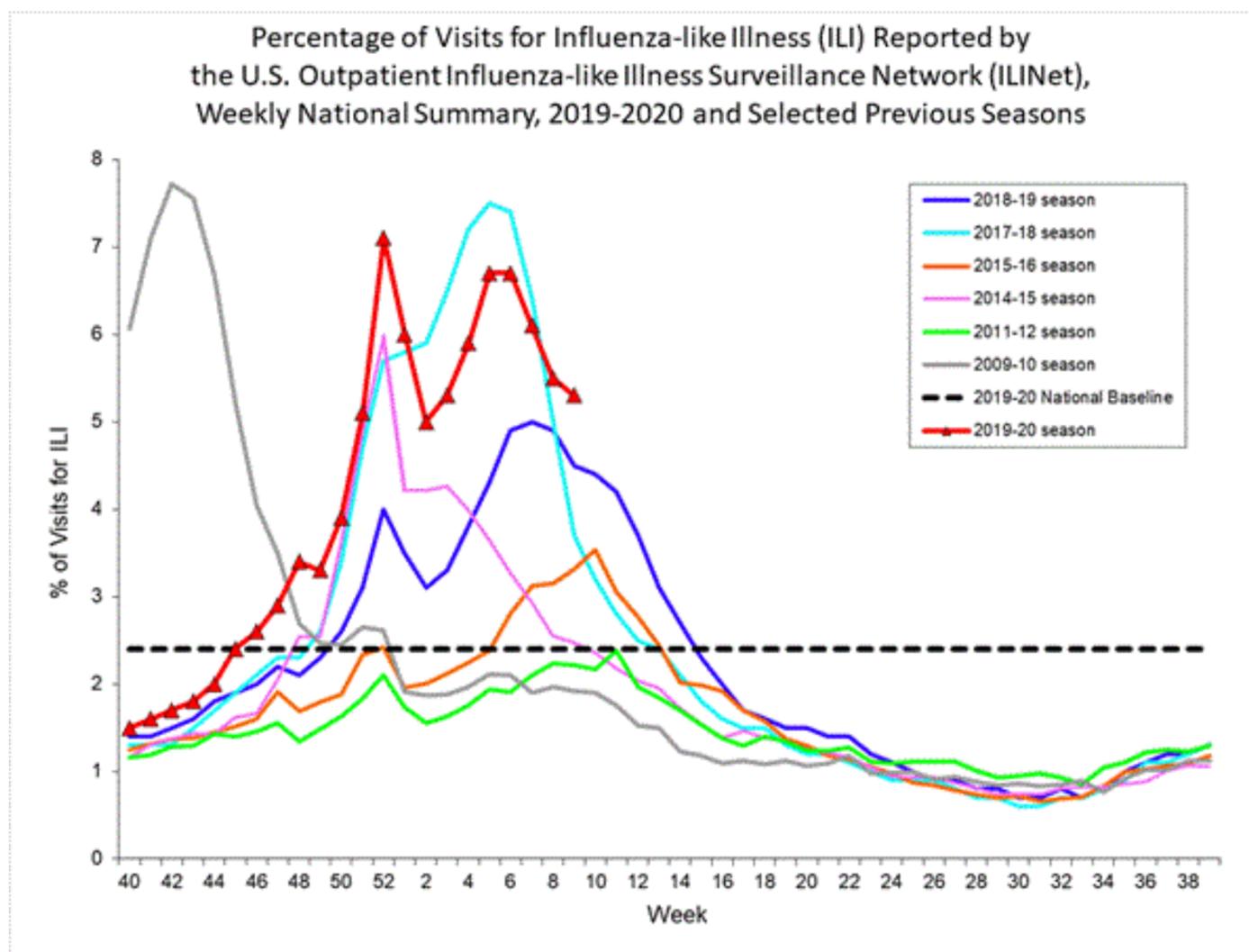| Antiviral Medication			Total Viruses	A/H1	A/H3	B/Victoria	B/Yamag
Neuraminidase Inhibitors	Oseltamivir	Viruses Tested	1,884	643	418	744	79
		Reduced Inhibition	1 (0.1%)	(0.0%)	(0.0%)	1 (0.1%)	(0.0%)
		Highly Reduced Inhibition	4 (0.2%)	4 (0.6%)	(0.0%)	(0.0%)	(0.0%)
	Peramivir	Viruses Tested	1,884	643	418	744	79
		Reduced Inhibition	(0.0%)	(0.0%)	(0.0%)	(0.0%)	(0.0%)
		Highly Reduced Inhibition	5 (0.3%)	4 (0.6%)	(0.0%)	1 (0.1%)	(0.0%)
	Zanamivir	Viruses Tested	1,884	643	418	744	79
		Reduced Inhibition	2 (0.1%)	(0.0%)	(0.0%)	2 (0.3%)	(0.0%)
		Highly Reduced Inhibition	(0.0%)	(0.0%)	(0.0%)	(0.0%)	(0.0%)
PA Endonuclease Inhibitor	Baloxavir	Viruses Tested	2,039	663	502	792	82
		Reduced Susceptibility	(0.0%)	(0.0%)	(0.0%)	(0.0%)	(0.0%)

*Six influenza viruses showed reduced or highly reduced inhibition by at least one neuraminidase inhibitor. Four A(H1N1)pdm09 viruses showed highly reduced inhibition to oseltamivir and peramivir while showing normal inhibition to zanamivir. In addition, one B/Victoria virus showed highly reduced inh to peramivir and reduced inhibition to oseltamivir and zanamivir, while another influenza B/Victoria virus showed reduced inhibition to zanamivir.

A total of 515 additional viruses (211 A(H1N1)pdm09, 32 A(H3N2), and 272 B) collected in Alabama, Alaska, Florida, Illi Iowa, Louisiana, Massachusetts, Michigan, Nevada, New York, North Carolina, Pennsylvania, South Dakota, Virginia ar Wisconsin were analyzed for resistance to neuraminidase inhibitors by pyrosequencing assay. Three (1.4%) of the 21 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 detecte A(H3N2) and type B viruses tested.

Outpatient Illness Surveillance

ILINet

Nationwide during week 9, 5.3% 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 3.9% to 8.7% during week 9. 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 9, the following ILI activity levels were experienced:

- High – New York City, Puerto Rico, and 40 states (Alabama, Arkansas, California, Colorado, Connecticut, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Wyoming)
- Moderate – seven states (Alaska, Delaware, Hawaii, Michigan, Nevada, New Hampshire, and South Dakota)
- Low - one state (Idaho)
- Minimal - the District of Columbia and two states (Arizona and Florida)
- Data were insufficient to calculate an ILI activity level from the U.S. Virgin Islands.

A Weekly Influenza Surveillance Report Prepared by the Influenza Division

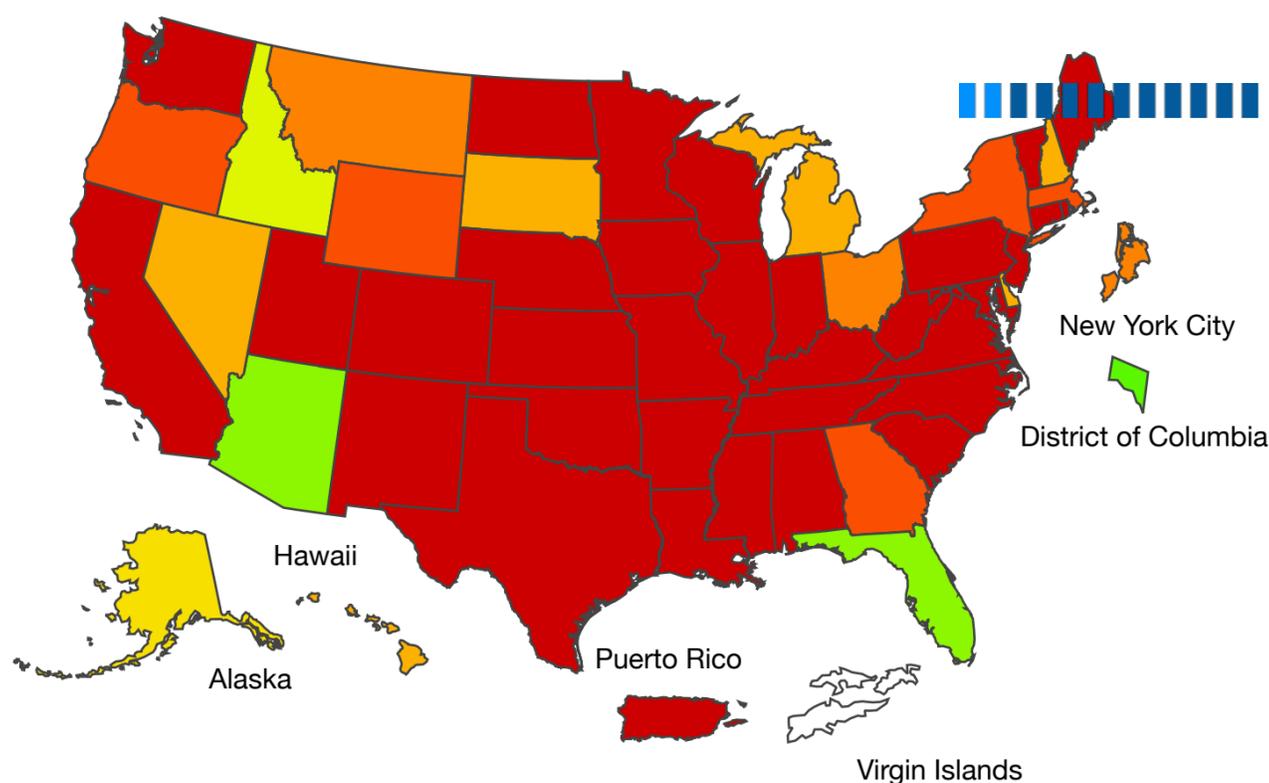## Influenza-Like Illness (ILI) Activity Level Indicator Determined by Data Reported to ILINet

prev   Play   Pause   next

40

eks

2019-20 Influenza Season Week 9 ending Feb 29, 2020   **ILI Activity Level**

New York City

District of Columbia

Hawaii

Alaska

Puerto Rico

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 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 9, the following influenza activity was reported:

- Widespread – Puerto Rico and 48 states (Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Georgia, 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, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Wyoming)

- Regional – two states (Hawaii and Oregon)

- Local – the District of Columbia

- Sporadic – the U.S. Virgin Islands

- Guam did not report.

<<40   Play   Pause   >>   50   1   9

Weeks

Week Ending Feb 29, 2020 - Week 9

Influenza Activity Estimates
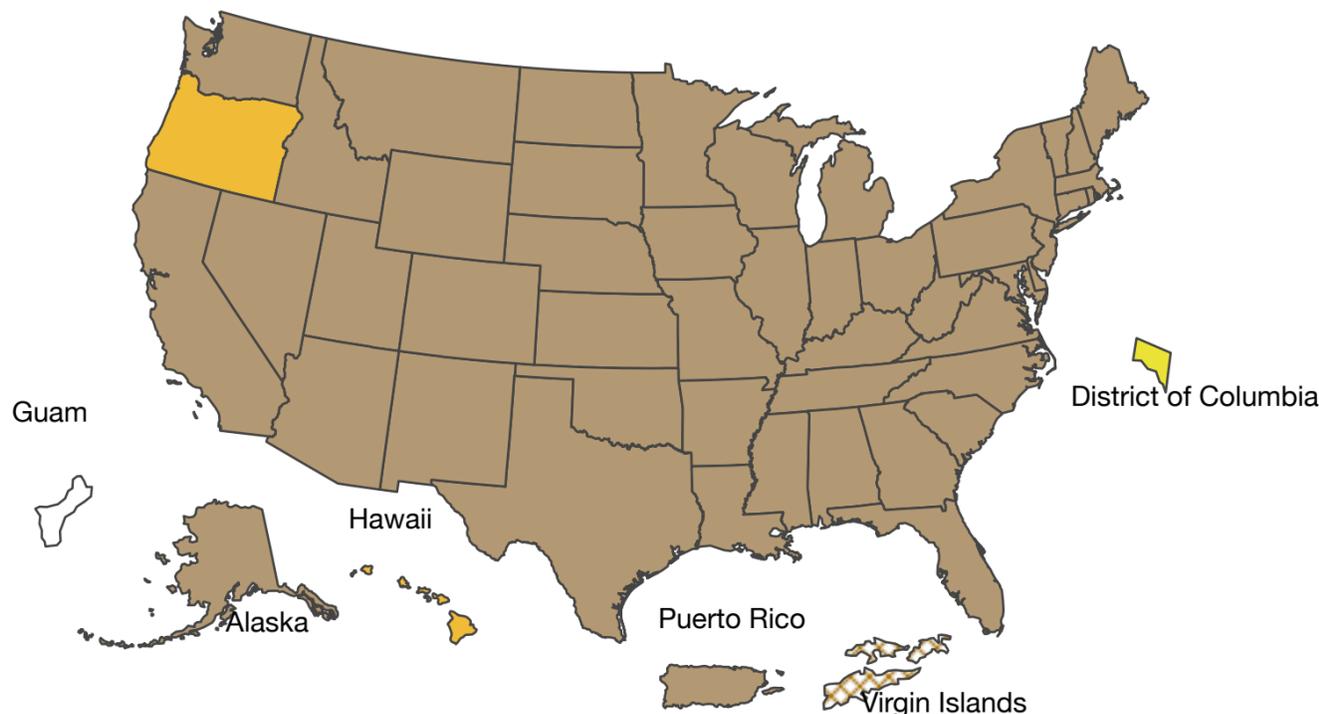
|||	No Activity
⊠	Sporadic
▢	Local Activity
▢	Regional
▢	Widespread
▢	No Report

Guam

District of Columbia

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)

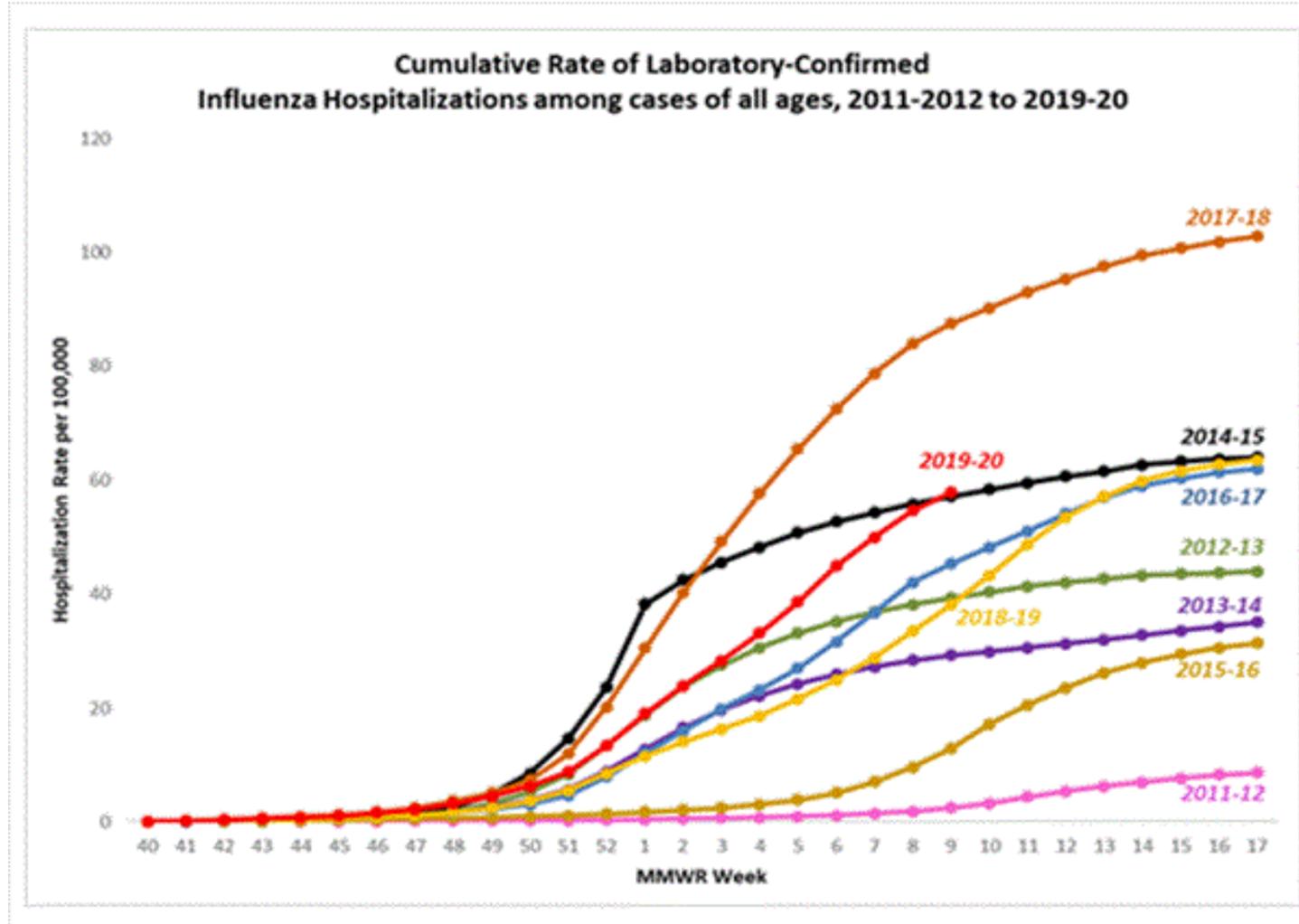***This map indicates geographic spread and does not measure the severity of influenza activity.**

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

A total of 16,819 laboratory-confirmed influenza-associated hospitalizations were reported by FluSurv-NET sites betw October 1, 2019 and February 29, 2020; 11,707 (69.6%) were associated with influenza A virus, 5,020 (29.8%) with influenza B virus, 51 (0.3%) with influenza A virus and influenza B virus co-infection, and 41 (0.2%) with influenza virus which the type was not determined. Among those with influenza A subtype information, 3,183 (94.2%) were A(H1N1)pdm09 virus and 196 (5.8%) were A(H3N2).

The overall cumulative hospitalization rate was 57.9 per 100,000 population which is similar to what has been seen during recent previous influenza seasons at this time of year. Rates in school aged children and young adults are high than at this time in recent seasons, and rates among children 0-4 years old are now the highest CDC has on record at point in the season, surpassing rates reported during the second wave of the 2009 H1N1 pandemic.
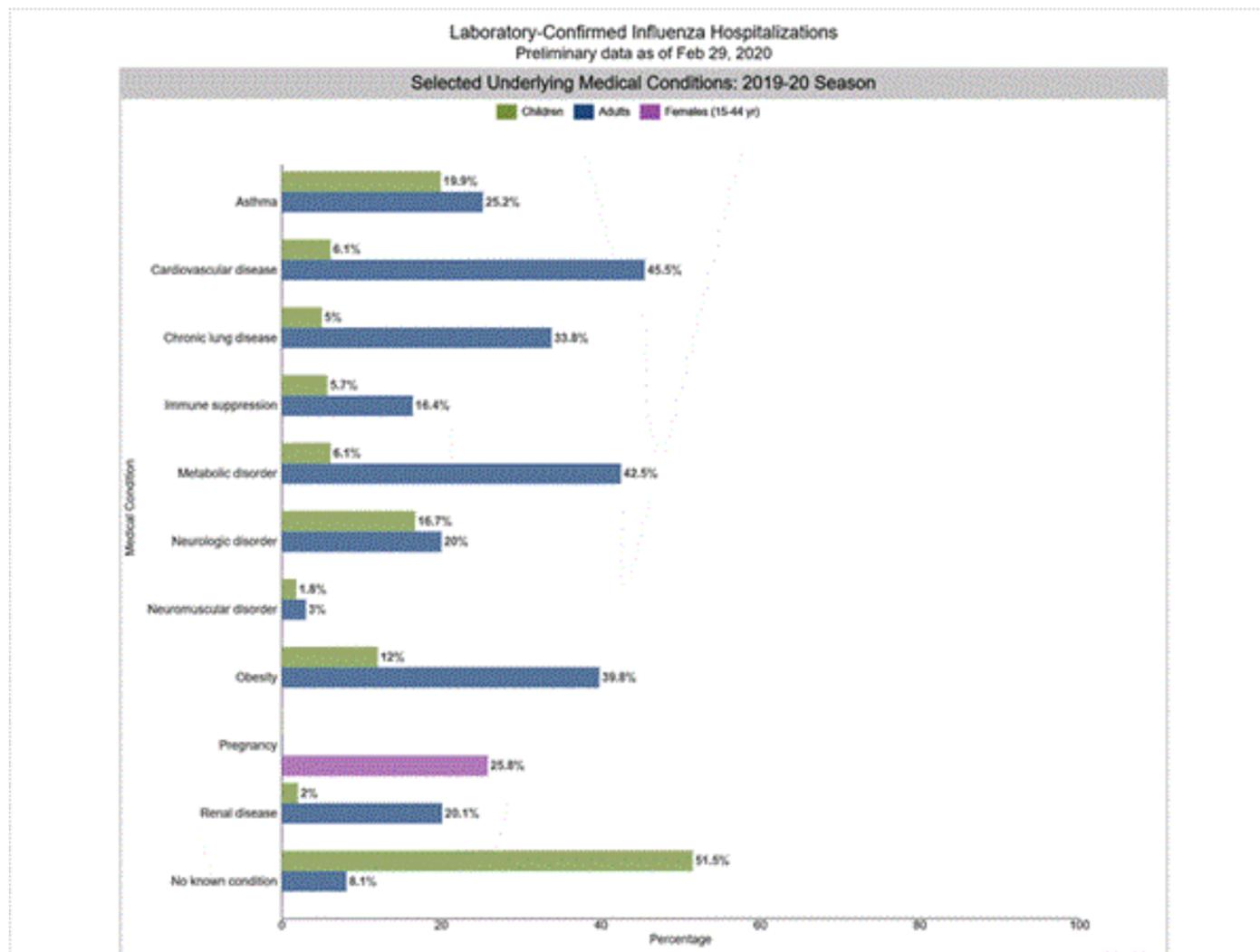

Cumulative Rate of Laboratory-Confirmed Influenza Hospitalizations among cases of all ages, 2011-2012 to 2019-20

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	57.9
0-4 years	84.9
5-17 years	21.6
18-49 years	31.2
50-64 years	76.1
65+ years	147.5

Among 2,528 hospitalized adults with information on underlying medical conditions, 91.9% had at least one reported underlying medical condition, the most commonly reported were cardiovascular disease, metabolic disorder, obesity chronic lung disease. Among 443 hospitalized children with information on underlying medical conditions, 48.5% had

least one underlying medical condition; the most commonly reported was asthma. Among 427 hospitalized women of childbearing age (15-44 years) with information on pregnancy status, 25.8% were pregnant.


Laboratory-Confirmed Influenza Hospitalizations
Preliminary data as of Feb 29, 2020
Selected Underlying Medical Conditions: 2019-20 Season

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 March 5, 2020, 6.9% of deaths occurring during the week ending February 22, 2020 (week 8) were due to P&I. This percentage is below the epidemic threshold of 7.3% for week 8.

Pneumonia and Influenza Mortality from
the National Center for Health Statistics Mortality Surveillance System
Data through the week ending February 22, 2020, as of March 5, 2020
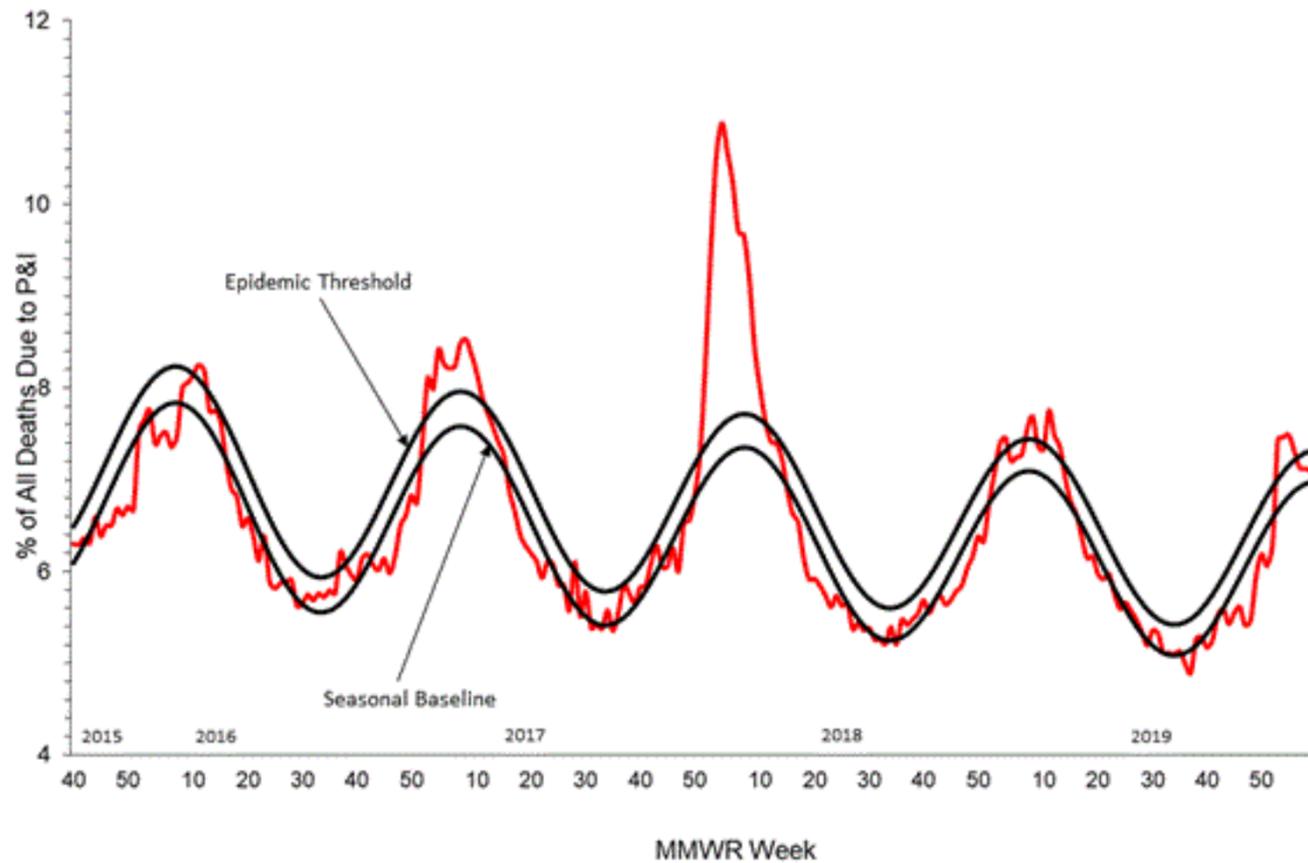
View Chart Data | View Full Screen

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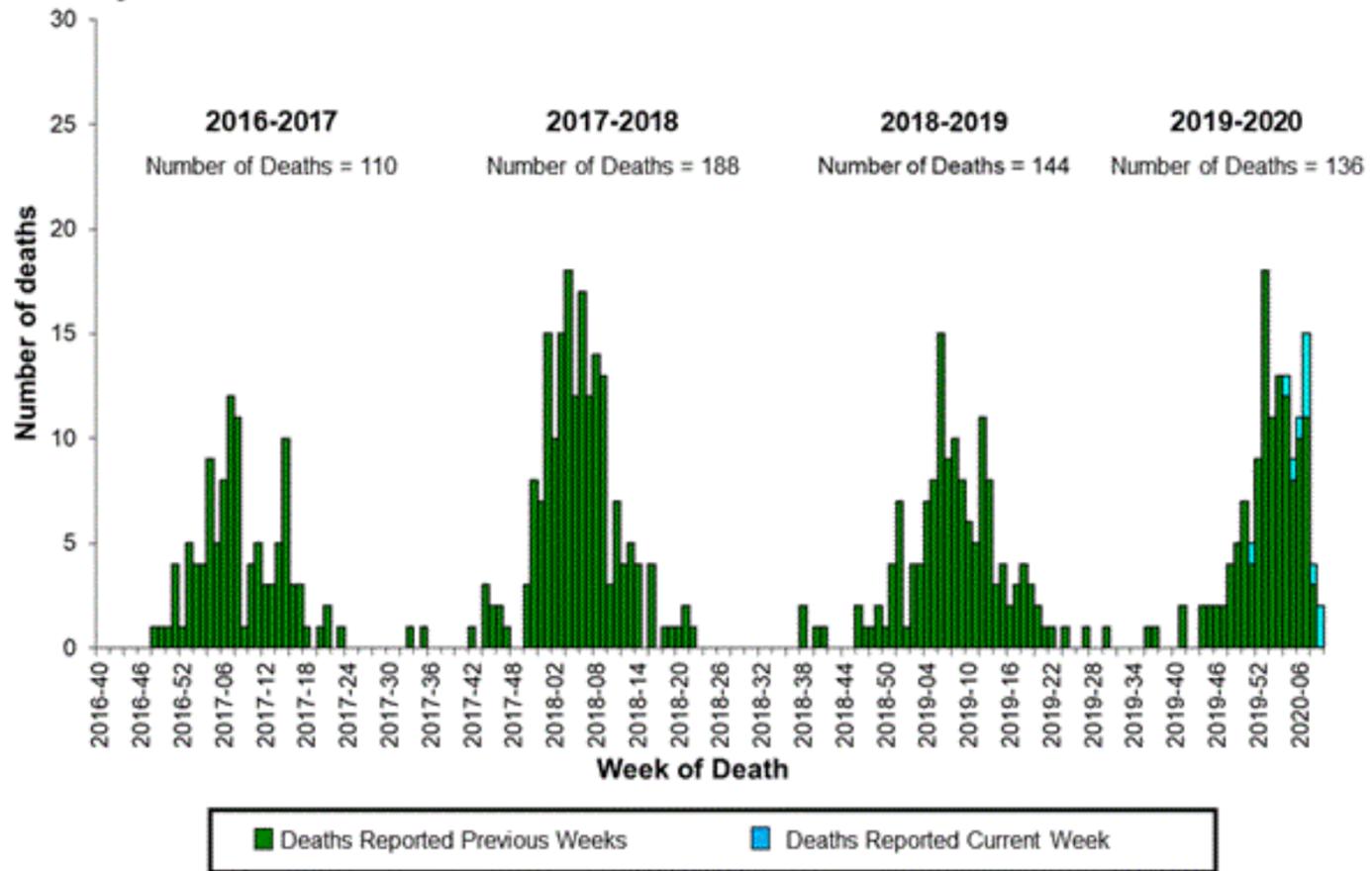Surveillance Methods | FluView Interactive

Influenza–Associated Pediatric Mortality

11 influenza-associated pediatric deaths occurring during the 2019-2020 season between weeks 51 and 9 (the weeks ending December 21, 2019 and February 29, 2020) were reported to CDC during week 9. Six were associated with influenza B viruses, and none had a lineage determined. Five were associated with influenza A viruses, and one was subtyped and was an A(H1N1)pdm09 virus.

Of the 136 influenza-associated pediatric deaths occurring during the 2019-2020 season and reported to CDC:
- 93 deaths were associated with influenza B viruses, and 18 had a lineage determined; all were B/Victoria viruses
- 43 deaths were associated with influenza A viruses, and 24 were subtyped; 23 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

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 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 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

Any links provided to non-Federal organizations are provided solely as a service to our users. These link not constitute an endorsement of these organizations or their programs by CDC or the Federal Governm and none should be inferred. CDC is not responsible for the content of the individual organization web pages found at these links.

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.