

Influenza (Flu)

Weekly U.S. Influenza Surveillance Report

FLUVIEW



A Weekly Influenza Surveillance Report Prepared by the Influenza Division

Note: The COVID-19 outbreak unfolding in the United States may affect healthcare seeking behavior which in turn would impact data from ILINet.

Key Updates for Week 10, ending March 7, 2020

Flu activity as reported by clinical laboratories remains high but decreased for the fourth week in a row; however, influenza-like illness activity increased slightly. Severity indicators remain moderate to low overall, but hospitalization rates differ 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 26.1% last week to 21.5% this week.

Public Health Labs

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

Virus Characterization

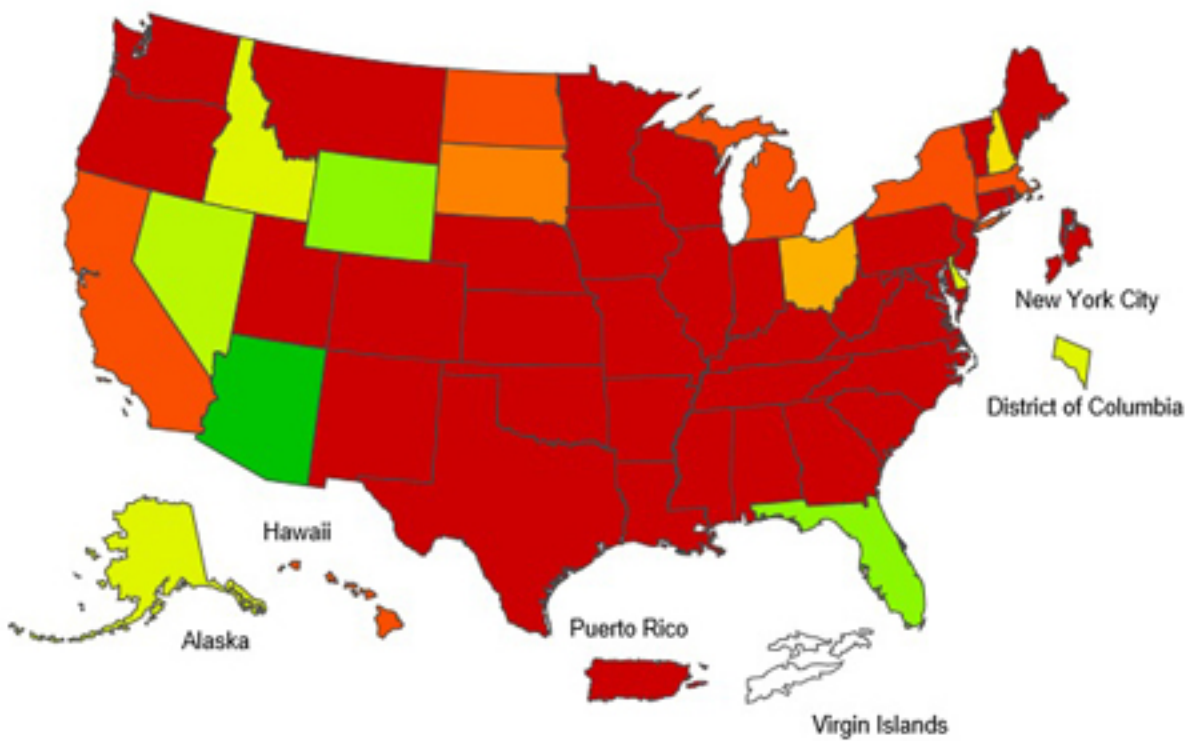
Genetic and antigenic characterization and antiviral susceptibility of influenza viruses collected in the U.S. are summarized in this report.

Illness

Outpatient Illness: ILINet

Visits to health care providers for influenza-like illness (ILI) increased slightly from 5.1% last week to 5.2% this week. All regions remain above their baselines.

Outpatient Illness: ILINet Activity Map



The number of jurisdictions experiencing high ILI activity increased slightly from 42 last week to 43 this week.

Geographic Spread



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

Severe Disease

Hospitalizations

The overall cumulative hospitalization rate for the season increased to 61.6 per 100,000.

P&I Mortality

The percentage of deaths attributed to pneumonia and influenza is 7.1%, below the epidemic threshold of 7.3%.

Pediatric Deaths

8 influenza-associated pediatric deaths occurring during the 2019-2020 season were reported this week. The total the season is 144.

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

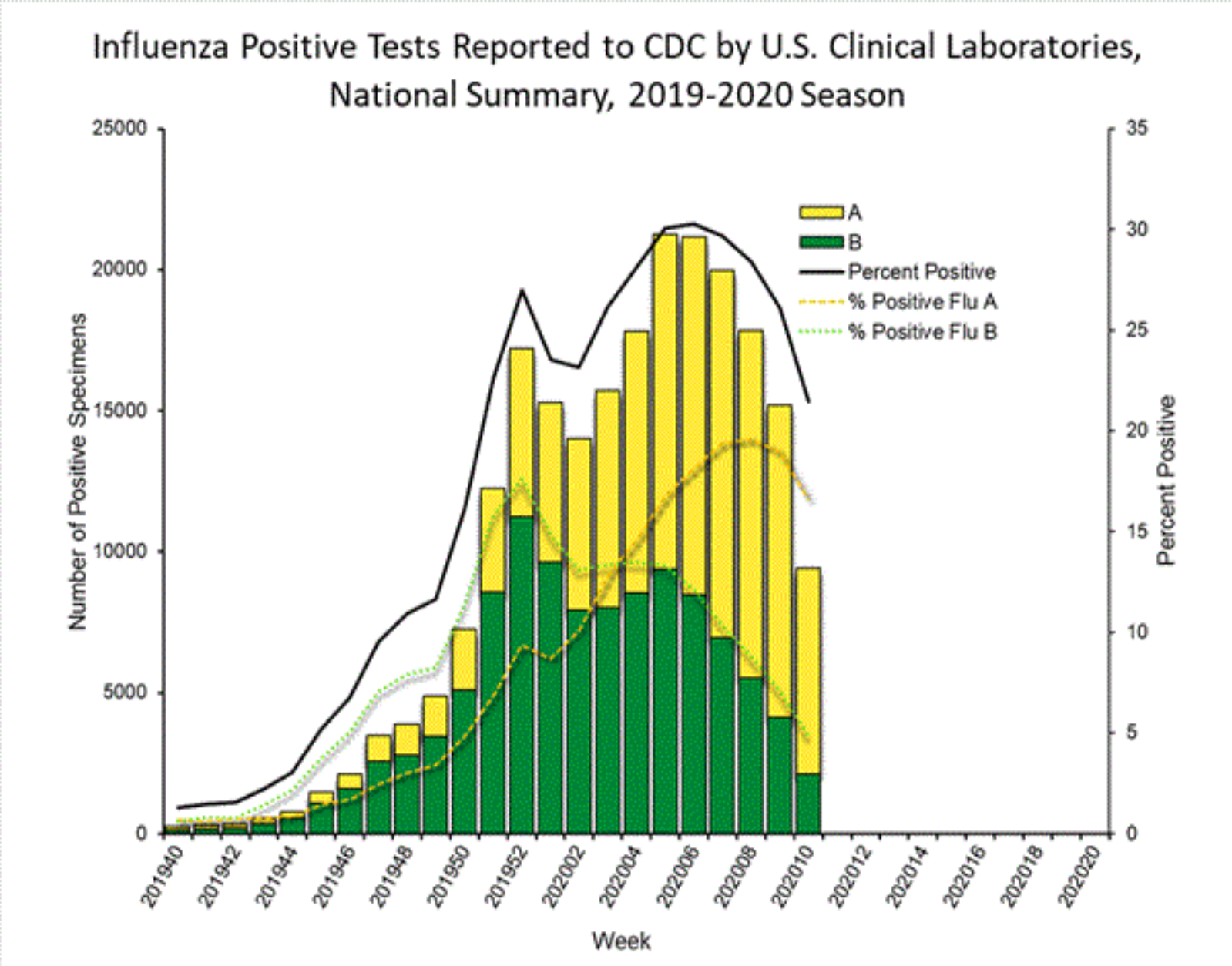
- Clinical laboratory data remain elevated but decreased for the fourth week in a row while ILI activity increased slightly. The largest increases in ILI activity occurred in areas of the country where COVID-19 is most prevalent. More people may be seeking care for respiratory illness than usual at this time.
- Nationally, influenza A(H1N1)pdm09 viruses are now the most commonly reported influenza viruses this season. Previously, influenza B/Victoria viruses predominated nationally.
- Laboratory confirmed influenza associated hospitalization rates for the overall U.S. population remain moderate compared to recent seasons, but rates for children 0-4 years and adults 18-49 years are now the highest CDC has on record for these age groups, surpassing rates reported during the 2009 H1N1 pandemic. Hospitalization rates for school-aged children (5-17 years) are higher than any recent regular season but remain lower than rates experienced by this age group during the pandemic.
- Pneumonia and influenza mortality has been low, but 144 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 reporting began in 2004-05, except for the 2009 pandemic.
- CDC estimates that so far this season there have been at least 36 million flu illnesses, 370,000 hospitalizations and 22,000 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 laboratories (the percentage of specimens tested that are positive for influenza) are used to monitor whether influenza activity is increasing or decreasing.

	Week 10	Data Cumulative since September 29, 2019 (week 40)
No. of specimens tested	43,868	1,073,976
No. of positive specimens (%)	9,413 (21.5%)	222,552 (20.7%)
<i>Positive specimens by type</i>		
Influenza A	7,294 (77.5%)	114,029 (51.2%)
Influenza B	2,119 (22.5%)	108,523 (48.8%)



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Public Health Laboratories

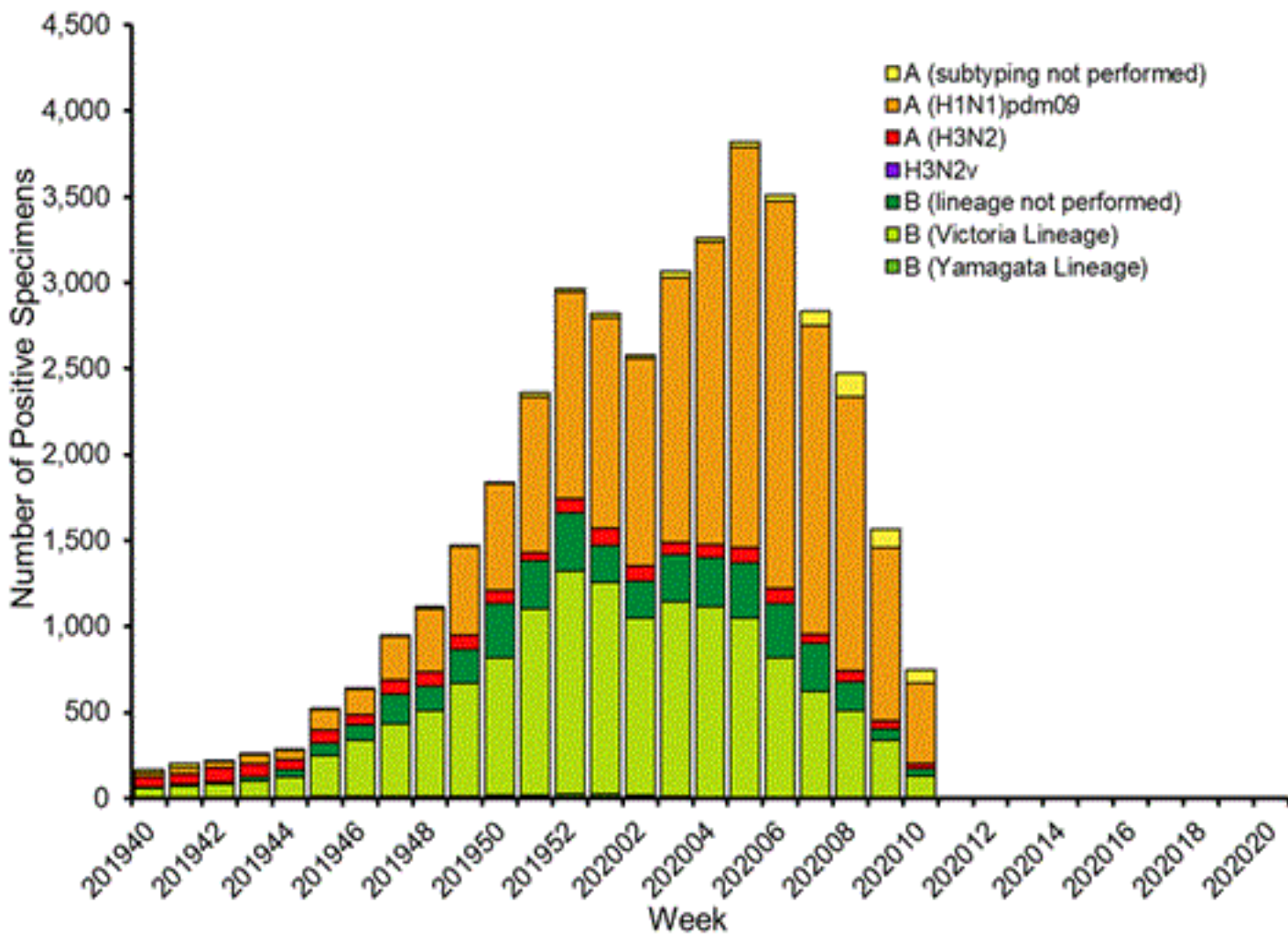
The results of tests performed by public health laboratories nationwide are summarized below. Data from public health laboratories are used to monitor the proportion of circulating viruses that belong to each influenza subtype/lineage.

	Week 10	Data Cumulative since September 29, 2019 (week 40)
No. of specimens tested	1,513	70,363
No. of positive specimens	744	39,644
<i>Positive specimens by type/subtype</i>		
Influenza A	575 (77.3%)	21,880 (55.2%)
(H1N1)pdm09	466 (93.4%)	19,537 (92.2%)
H3N2	33 (6.6%)	1,647 (7.8%)
Subtyping not performed	76	696
Influenza B	169 (22.7%)	17,764 (44.8%)
Yamagata lineage	0 (0.0%)	219 (1.6%)
Victoria lineage	130 (100%)	13,694 (98.4%)
Lineage not performed	39	3,851

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 nationally and in all surveillance regions. For the season, A(H1N1)pdm09 viruses are the predominant virus nationally. 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 age groups.

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-naïve 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 vaccine 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** 2,065 influenza viruses collected in the U.S. from September 29, 2019, to March 7, 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	720				
		6B.1A	720 (100%)		
A/H3	454				
		3C.2a	428 (94.3%)	2a1	428 (94.3%)
				2a2	0
				2a3	0
				2a4	0
		3C.3a	26 (5.7%)	3a	26 (5.7%)
B/Victoria	807				
		V1A	807 (100%)	V1A	0
				V1A.1	56 (6.9%)
				V1A.3	751 (93.1%)
B/Yamagata	84				
		Y3	84 (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 403 influenza viruses collected in the United States from September 29, 2019 to March 7, 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:** 153 A(H1N1)pdm09 viruses were antigenically characterized by HI with ferret antisera, and 124 (80.4%) 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. The decrease in the percent of A(H1N1)pdm09 viruses similar to A/Brisbane/02/2018 is due to some of the recent viruses selected for testing having a single amino acid change that is antigenically distinguishable in antigenic assays using ferret sera. Similar viruses were observed last season as well and these represented a small proportion of virus circulating. We have observed an increase in the proportion of A(H1N1)pdm09 viruses with this change late in the US season.
- 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:** 28 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	2,042	715	444	799	84
		Reduced Inhibition	1 (0.04%)	(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	2,042	715	444	799	84
		Reduced Inhibition	(0.0%)	(0.0%)	(0.0%)	(0.0%)	(0.0%)
		Highly Reduced Inhibition	5 (0.2%)	4 (0.6%)	(0.0%)	1 (0.1%)	(0.0%)
	Zanamivir	Viruses Tested	2,042	715	444	799	84
		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	Baloxavir	Viruses Tested	2,194	735	529	843	87

Inhibitor		Reduced Susceptibility	(0.0%)	(0.0%)	(0.0%)	(0.0%)	(0.0%)
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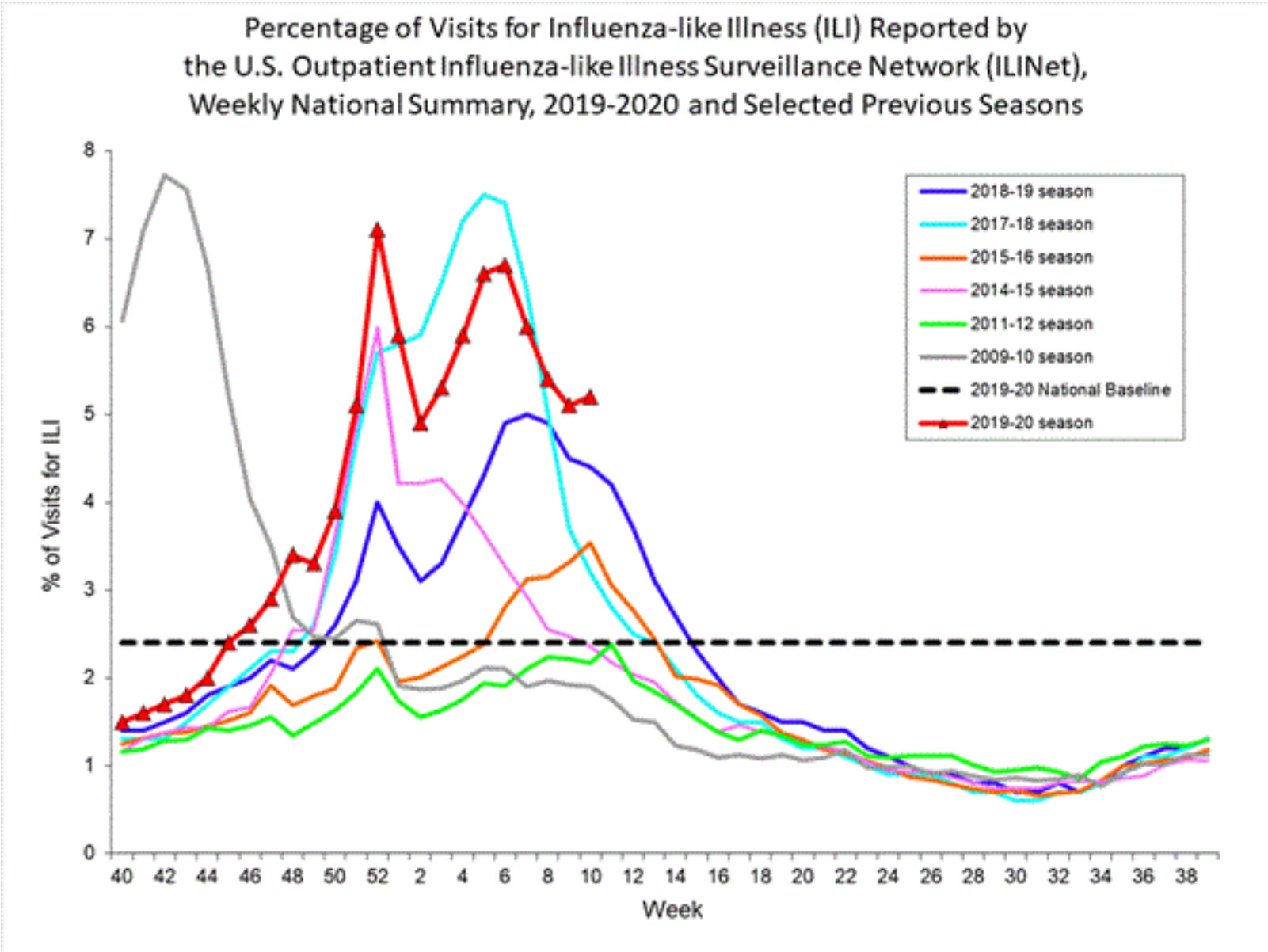
*Six influenza viruses showed reduced or highly reduced inhibition by at least one neuraminidase inhibitor. Four A(H1N1)pdm09 viruses showed highly reduced inhibition to oseltamivir and peramivir while showing normal inhibition to zanamivir. In addition, one B/Victoria virus showed highly reduced inhibition to peramivir and reduced inhibition to oseltamivir and zanamivir, while another influenza B/Victoria virus showed reduced inhibition to zanamivir.

A total of 556 additional viruses (211 A(H1N1)pdm09, 32 A(H3N2), and 313 B) collected in Alabama, Alaska, Florida, Illinois, Iowa, Louisiana, Massachusetts, Michigan, Nevada, New York, North Carolina, Pennsylvania, South Dakota, Virginia and Wisconsin were analyzed for resistance to neuraminidase inhibitors by pyrosequencing assay. Three (1.4%) of the 211 A(H1N1)pdm09 viruses tested had the H275Y amino acid substitution in the neuraminidase and showed highly reduced inhibition by oseltamivir and peramivir. No molecular markers associated with reduced or highly reduced inhibition to neuraminidase inhibitors were detected in A(H3N2) and type B viruses tested.

Outpatient Illness Surveillance

ILINet

Nationwide during week 10, 5.2% 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%.



[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 8.4% during week 10. All regions reported a percentage of outpatient visits for ILI above their region-specific baselines. Regions 2, 7, and 10 reported the greatest increases in ILI relative to their baselines. Clinical laboratories in regions 2 and 10 reported a decrease in influenza virus circulation; however, these are areas of the country where COVID-19 is most prevalent and more people may be seeking care for respiratory illness than usual at this time. The ILI increase in region 7 appears most likely due to low reporting.

ILI Activity Map

Data collected in ILINet are used to produce a measure of [ILI activity*](#) by state.

During week 10, the following ILI activity levels were experienced:

- High – New York City, Puerto Rico, and 41 states (Alabama, Arkansas, California, Colorado, Connecticut, Georgia, Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Jersey, New Mexico, New York, North Carolina, North Dakota, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, and Wisconsin)
- Moderate – two states (New Hampshire and Ohio)
- Low - the District of Columbia and four states (Alaska, Delaware, Idaho, and Nevada)
- Minimal - three states (Arizona, Florida, and Wyoming)
- Data were insufficient to calculate an ILI activity level from the U.S. Virgin Islands.

During week 10, 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 – one state (Oregon)
- Local – the District of Columbia and one state (Hawaii)
- Sporadic – the U.S. Virgin Islands
- Guam did not report.

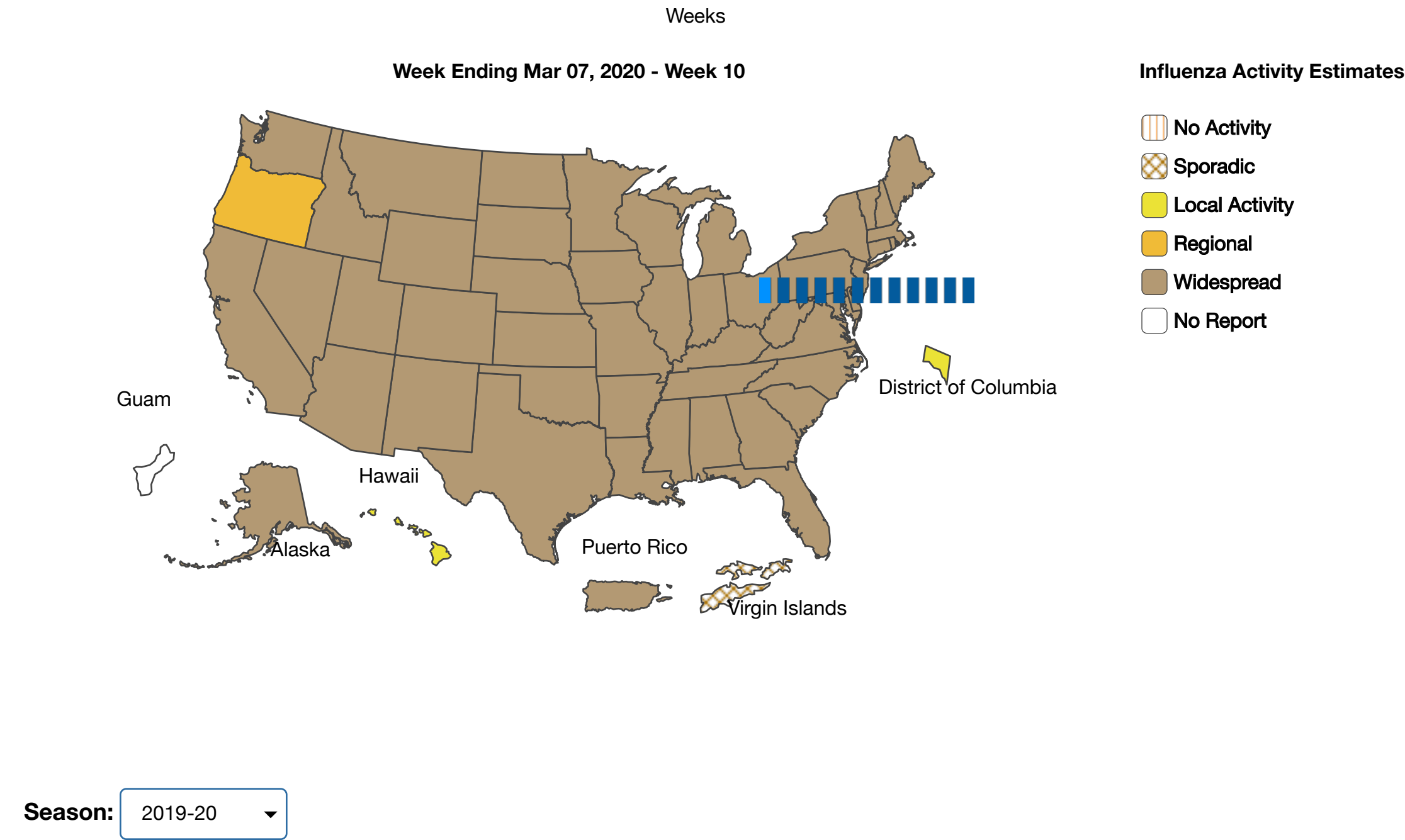
A Weekly Influenza Surveillance Report Prepared by the Influenza Division
Weekly Influenza Activity Estimates Reported by State and Territorial Epidemiologists*

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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>)

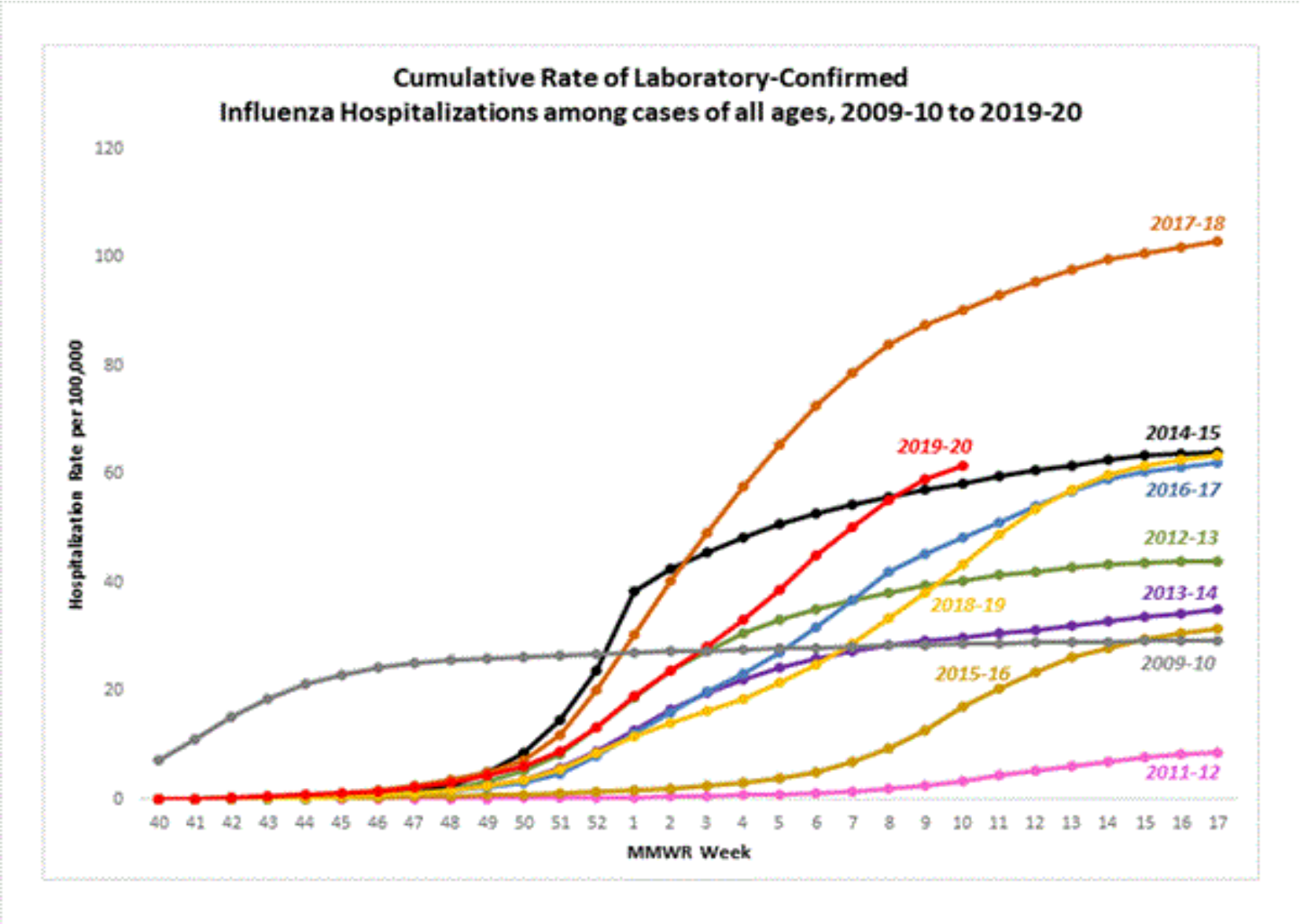
Additional geographic spread surveillance information for current and past seasons:
[Surveillance Methods](#) | [FluView Interactive](#)

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 17,889 laboratory-confirmed influenza-associated hospitalizations were reported by FluSurv-NET sites between October 1, 2019 and March 7, 2020; 12,652 (70.7%) were associated with influenza A virus, 5,140 (28.7%) with influenza B virus, 50 (0.3%) with influenza A virus and influenza B virus co-infection, and 47 (0.3%) with influenza virus for which the type was not determined. Among those with influenza A subtype information, 3,391 (94.2%) were A(H1N1)pdm09 virus and 207 (5.8%) were A(H3N2).

The overall cumulative hospitalization rate was 61.6 per 100,000 population which is higher than all recent seasons at this time of year except for the 2017-18 season. Rates in children 0-4 years old and adults 18-49 years old are now the highest CDC has on record for these age groups, surpassing the rate reported during the 2009 H1N1 pandemic. Hospitalization rates for school-aged children are higher than any recent regular season but lower than rates during the pandemic.



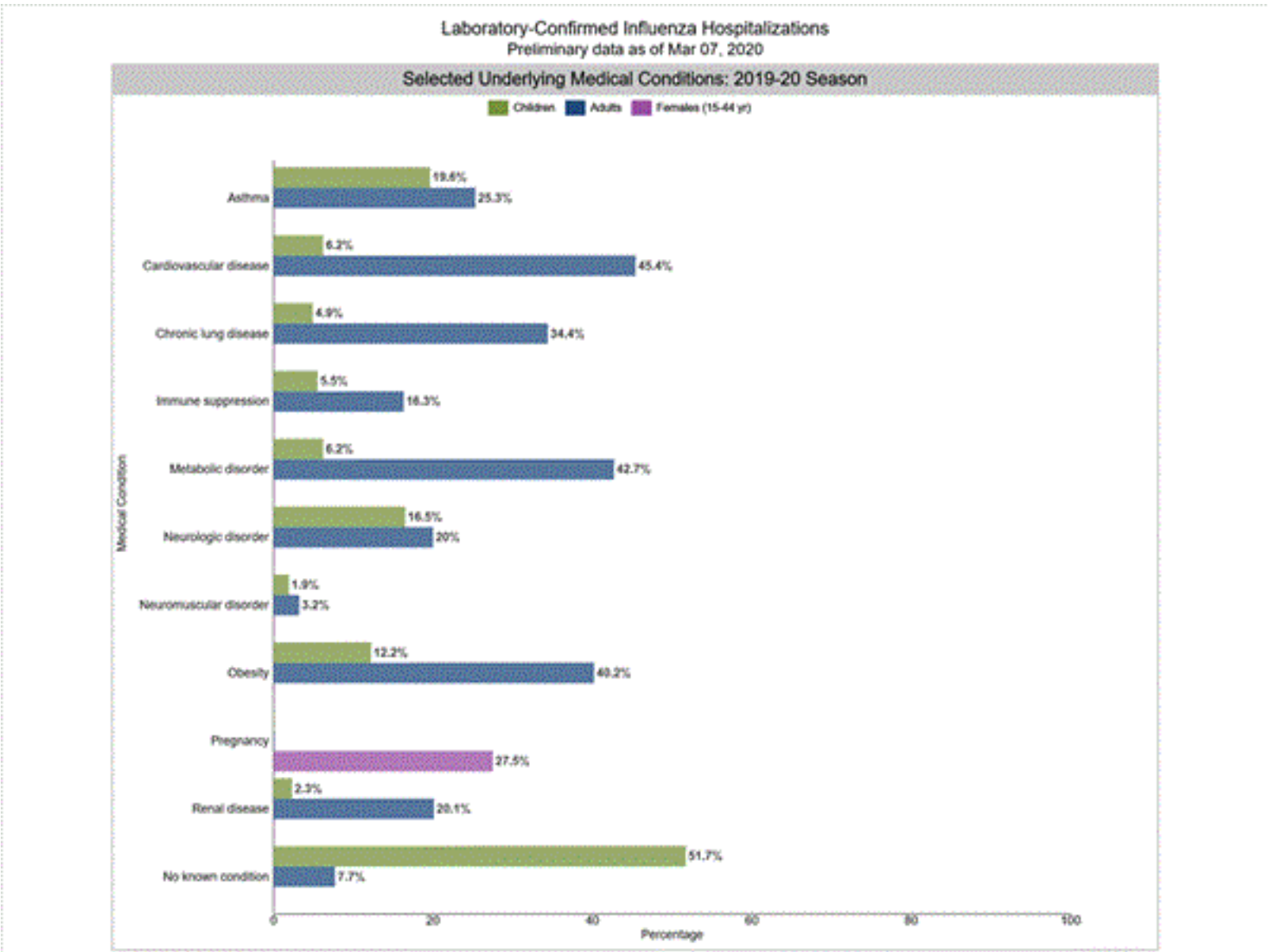
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The highest rate of hospitalization is among adults aged ≥ 65, followed by children aged 0-4 years and adults aged 50-64 years.

Age Group	2019-2020 Season Cumulative Rate per 100,000 Population
Overall	61.6
0-4 years	88.9

5-17 years	22.6
18-49 years	32.8
50-64 years	80.8
65+ years	159.4

Among 2,867 hospitalized adults with information on underlying medical conditions, 92.3% had at least one reported underlying medical condition, the most commonly reported were cardiovascular disease, metabolic disorder, obesity, chronic lung disease. Among 472 hospitalized children with information on underlying medical conditions, 48.3% had at least one underlying medical condition; the most commonly reported was asthma. Among 477 hospitalized women of childbearing age (15-44 years) with information on pregnancy status, 27.5% were pregnant.



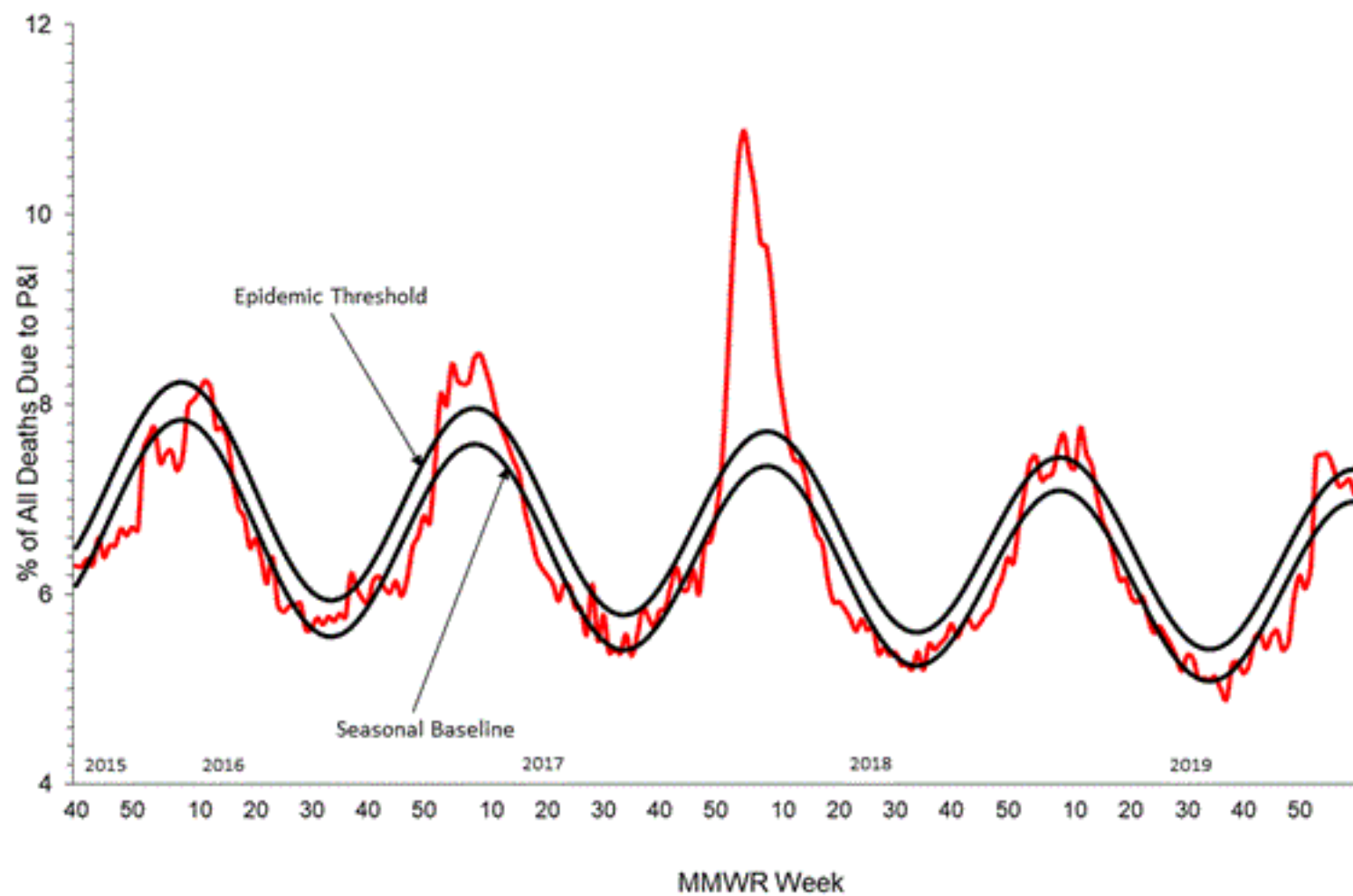
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Additional hospitalization surveillance information for current and past seasons and additional age groups
[Surveillance Methods](#) | [FluView Interactive: Rates by Age or Patient Characteristics](#)

Pneumonia and Influenza (P&I) Mortality Surveillance

Based on National Center for Health Statistics (NCHS) mortality surveillance data available on March 12, 2020, 7.1% of deaths occurring during the week ending February 29, 2020 (week 9) were due to P&I. This percentage is below the epidemic threshold of 7.3% for week 9.

Pneumonia and Influenza Mortality from
the National Center for Health Statistics Mortality Surveillance System
Data through the week ending February 29, 2020, as of March 12, 2020



[View Chart Data](#) | [View Full Screen](#)

Additional pneumonia and influenza mortality surveillance information for current and past seasons:
[Surveillance Methods](#) | [FluView Interactive](#)

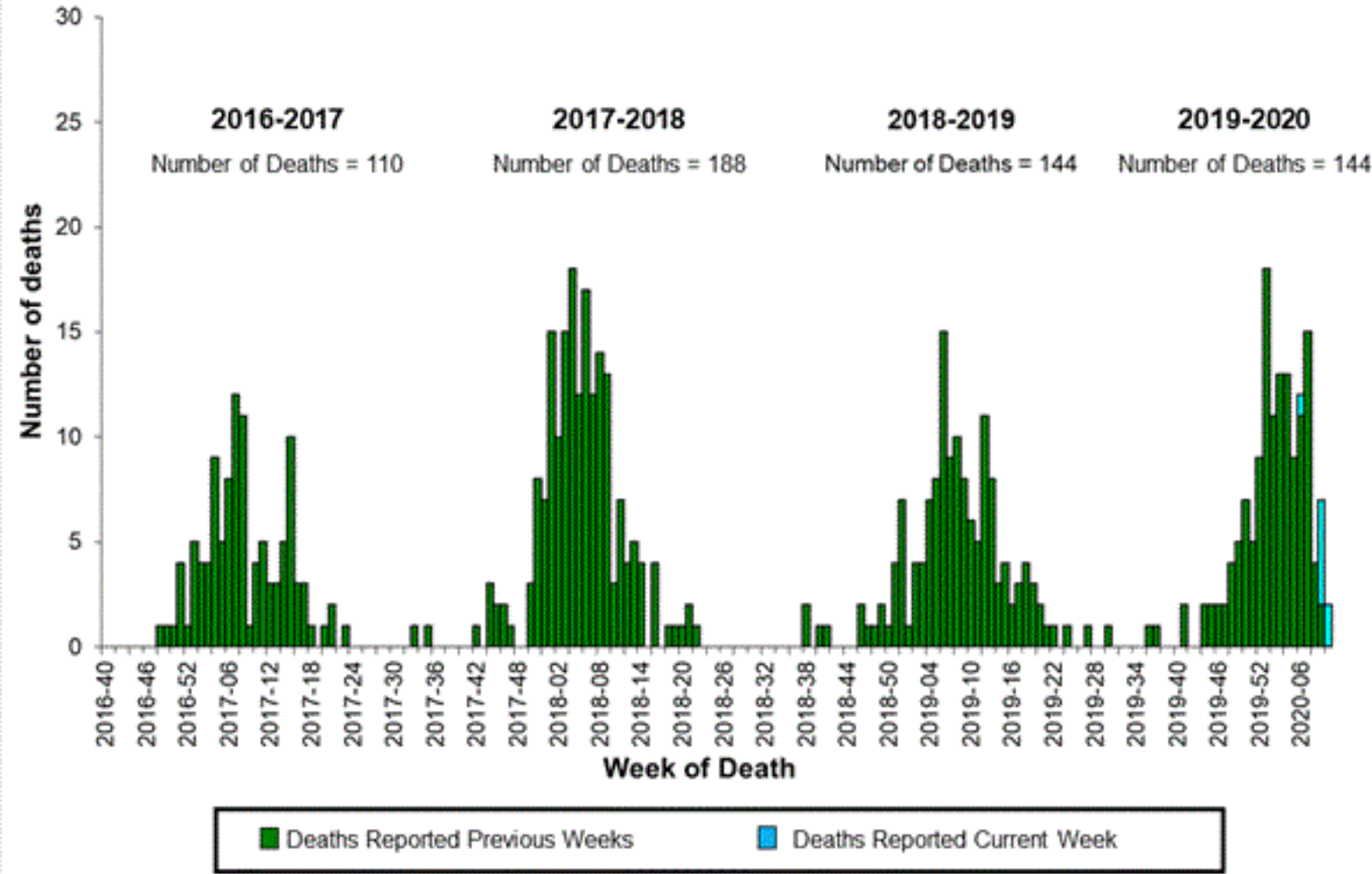
Influenza-Associated Pediatric Mortality

Eight influenza-associated pediatric deaths occurring during the 2019-2020 season between weeks 6 and 10 (the week ending February 8, 2020 and March 7, 2020) were reported to CDC during week 10. Three were associated with influenza B viruses; one had a lineage determined and was a B/Victoria virus. Five were associated with influenza A viruses, and three were subtyped; all were A(H1N1)pdm09 viruses.

Of the 144 influenza-associated pediatric deaths occurring during the 2019-2020 season and reported to CDC:

- 96 deaths were associated with influenza B viruses, and 20 had a lineage determined; all were B/Victoria viruses
- 48 deaths were associated with influenza A viruses, and 27 were subtyped; 26 were A(H1N1)pdm09 viruses, and one 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 Surveillance Information

FluView Interactive: FluView includes enhanced web-based interactive applications that can provide dynamic visualizations 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 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>

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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>.