

CDC Influenza Division Key Points

June 29, 2017

In this document:

- [MMWR Influenza Activity Key Points](#) **NEW!**

MMWR: Influenza Activity – United States, 2016–17 Season and Composition of the 2017–18 Influenza Vaccine

- On Thursday, June 29, 2017, a report titled “Update: Influenza Activity in the United States During the 2016-17 Season and Composition of the 2017-18 Influenza Vaccine,” was published in a [Morbidity and Mortality Weekly Report \(MMWR\)](#). (https://www.cdc.gov/mmwr/volumes/66/wr/mm6625a3.htm?s_cid=mm6625a3_w).
- This report summarizes influenza (flu) activity from October 2, 2016 to May 20, 2017 during the 2016-17 flu season.

Summary of 2016-2017 Influenza Season

- As of mid-April 2017, indicators of national flu activity are below seasonal baseline levels. Influenza viruses circulate year-round, but at low levels in the summer in the United States.
- Influenza activity was moderate, similar to previous H3N2-predominant seasons.
- Flu activity this season remained low through November, increased during December and peaked in February nationally, although there were regional differences in the timing of influenza activity. Flu activity in the United States typically begins to increase in late December or early January and peaks most commonly in February.
- Influenza A(H3N2) viruses predominated overall this season, but influenza B viruses became more frequently reported than influenza A viruses in late March through May.
- The majority of all influenza viruses in specimens sent to CDC for further antigenic characterization were similar to the components of the 2016–17 Northern Hemisphere vaccine. A small subset of antigenically distinct influenza B/Victoria viruses that belonged to a new B/Victoria deletion variant subgroup was detected.
- CDC vaccine effectiveness (VE) studies for the influenza A(H3N2)-predominant 2016-2017 flu season showed that flu vaccination reduced the risk of getting sick and having to go the doctor because of flu by 42% overall, with vaccine providing better protection against influenza B viruses (56%) than against the most common influenza A(H3N2) viruses (34%).
- While this season’s VE results underscore the importance of developing better, more effective flu vaccines, they also show that current flu vaccines do offer substantial public health benefit and increased coverage could provide additional benefit.

Viral Surveillance:

- Nationally, the percentage of specimens tested by clinical laboratories that were positive for influenza peaked during the 3 weeks ending February 11, February 18, and February 25, 2017 (weeks 6, 7, and 8) at 23.6%, 24.2%, and 24.3%, respectively.
- During October 2, 2016– May 20, 2017, of the 121,223 (14%) influenza-positive tests reported to CDC by clinical laboratories, 84,854 (70.0%) were influenza A viruses and 36,369 (30.0%) were influenza B viruses.
- During October 2, 2016– May 20, 2017, 31,736 (77.9%) of the 40,728 influenza-positive tests reported to CDC by public health laboratories were influenza A viruses and 8,992 (22.1%) were influenza B viruses. Of the 31,411 influenza A viruses that were subtyped, 30,519 (97.2%) were H3N2 viruses and 892 (2.8%) were (H1N1)pdm09 viruses.
- Influenza B lineage information was available for 6,875 (76.5%) influenza B viruses: 4,892 (71.2%) belonged to the B/Yamagata lineage and 1,983 (28.8%) to the B/Victoria lineage.

Antigenic and Genetic Characterization of Influenza Viruses:

- For the 2016–17 season, CDC genetically characterized 2,476 influenza viruses (311 influenza A(H1N1)pdm09, 1,280 influenza A(H3N2), and 885 influenza B viruses) collected by U.S. laboratories since October 1, 2016.
- Genetic characterization shows that the majority of the tested viruses remain similar to the recommended components of the 2016-2017 Northern Hemisphere vaccines.
- CDC has antigenically characterized 1,824 influenza viruses collected by U.S. laboratories since October 1, 2016 (296 influenza A(H1N1)pdm09, 772 influenza A(H3N2), and 756 influenza B viruses)
 - A small subset of antigenically distinct influenza B/Victoria viruses was detected.
- The majority of influenza viruses antigenically characterized at CDC were similar to the reference viruses representing the recommended components for the 2016–17 vaccine.

Antiviral drug susceptibility testing:

- CDC tested more than 2,569 influenza viruses collected in the U.S. between October 1, 2016 and May 20, 2017, for evidence of resistance to antiviral medications currently recommended to treat influenza infection.
- All 2,569 influenza viruses tested were found to be susceptible to all three of these antiviral medications.
 - An additional 34 influenza A(H1N1)pdm09 viruses were tested for resistance to oseltamivir and peramivir
 - An additional 1,083 influenza A(H3N2) viruses were tested for resistance to oseltamivir and zanamivir
 - All were found to be susceptible to these antiviral medications.
- These results indicate that these antiviral drugs continue to be recommended treatment options for illness caused by currently circulating influenza viruses.

Visits to healthcare providers for flu-like illness:

- Nationally, the weekly percentage of visits to healthcare providers for flu-like illness was at or above the national baseline for 17 consecutive weeks during the 2016–17 influenza season.
- Last season (2015-2016, which was an A(H1N1)pdm09-predominant season) the weekly percentage was at or above national baseline for 11 consecutive weeks.
- This season, the peak percentage of visits to healthcare providers for flu-like illness was 5.1%, occurring in mid-February.
- This is similar to 2014-2015 and 2012-2013 flu seasons (also H3N2-predominant seasons) when the percentage of outpatient visits for influenza-like illness (ILI) peaked in December at 6.0% and 6.1% respectively.
- Nationally, visits to healthcare providers for flu-like illness declined and fell below baseline beginning mid-April 2017, signaling the season was drawing to a close, although regional differences in activity continued to be reported.
- The number of jurisdictions experiencing elevated ILI activity peaked during the week ending February 11, 2017 (week 6) when 31 states experienced high ILI activity.
- Thirty-seven jurisdictions (36 states and Puerto Rico) experienced high ILI activity during at least 1 week this season

Geographic spread of influenza activity:

- State and territorial epidemiologists report the geographic distribution of influenza in their jurisdictions through a weekly influenza activity code.
- The geographic distribution of influenza activity was most extensive during the week ending February 11, 2017 (week 6), when 47 jurisdictions reported widespread influenza activity.

Hospitalizations:

- From October 1, 2016 through April 30, 2017, 18,184 laboratory-confirmed influenza-related hospitalizations were reported, with a cumulative incidence for all age groups of 65.0 per 100,000 population.
- This is higher than the cumulative hospitalization rate for the 2012-2013 flu season (44.0 per 100,000), when influenza A (H3N2) viruses also predominated, and is slightly higher than the cumulative hospitalization rate during 2014-2015 (64.1 per 100,000) which also was an H3N2 predominant season.
- People 65 years and older accounted for approximately 60% of reported flu-associated hospitalizations this season.
 - The cumulative hospitalization rate (per 100,000 population) for people 65 years and older this season was 290.5.
 - During the previous four flu seasons, hospitalization rates for people 65 years and older have ranged from 84.7 to 308.8.
- 43.6% of the children hospitalized with laboratory-confirmed flu had no known underlying health condition.

Mortality:

- The percentage of deaths attributed to pneumonia and influenza (P&I) was at or above the epidemic threshold for 12 consecutive weeks this season. Mortality attributed to P&I peaked twice, once at 8.2% of all deaths during the week ending January 21, 2017 (week 3) and once at 8.1% during the week ending February 25, 2017 (week 8).
- During the 2011-12 through 2015-16 seasons, the peak weekly percentages of deaths attributable to P&I ranged from 8.7% during the 2011-12 season to 11.1% during the 2012-13 season.

Pediatric Mortality:

- This season, 98 laboratory-confirmed flu-associated deaths in children were reported.
- Of these 98 deaths, 46 were associated with an influenza A(H3N2) virus infection, three with an influenza A(H1N1)pdm09 virus infection, 14 with an influenza A virus for which no subtyping was performed, 34 with an influenza B virus infection, and one with an influenza virus for which the type was not determined.
- Since flu-associated deaths in children became a nationally notifiable condition in 2004, the total number of flu-associated deaths among children in one season has ranged from 37 to 171; this excludes the 2009 pandemic, when 358 pediatric deaths from April 15, 2009 through October 2, 2010 were reported to CDC.

Novel Influenza A Viruses

- Three human infections with novel influenza A viruses were reported to CDC during the 2016-17 influenza season.

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- One human infection with influenza A(H1N2) variant (H1N2v) virus was reported by Iowa. The patient was not hospitalized and fully recovered.
- A human infection with a North American lineage avian influenza A(H7N2) virus was reported to CDC. This is the first avian influenza A(H7N2) virus infection in humans identified in the United States since 2003 and the first known human infection with an influenza A virus acquired through exposure to an ill cat. The patient was mildly ill, was not hospitalized, and recovered completely from their illness. The patient reported close, prolonged unprotected exposure to the respiratory secretions of infected, sick cats at a New York City animal shelter
- An influenza A(H3N2) variant (H3N2v) virus was detected through the Department of Defense Global Laboratory-based Influenza Surveillance Program and reported by Texas during the week ending April 29, 2017 (week 17). The patient reported contact with swine at an agricultural event the week preceding illness onset, was not hospitalized and fully recovered.

2016-17 Flu Vaccine Effectiveness

- The overall vaccine effectiveness (VE) of the 2016-2017 flu vaccine against both influenza A and B viruses was estimated to be 42% (95% confidence interval (CI): 35%-48%).
- In practical terms, this means the flu vaccine reduced a person's overall risk of having to seek medical care at a doctor's office for flu illness by 42%.
- VE against illness caused specifically by the predominant influenza A (H3N2) viruses was estimated to be 34% (95% CI: 24%-42%).
- VE against influenza B viruses was estimated to be 56% (95% CI: 47%-64%).
- These final vaccine effectiveness estimates were similar to previous seasons when recommended vaccine viruses have been well-matched to ("like") circulating viruses, including the lower effectiveness observed against well-matched H3N2 viruses.

Composition of the 2017-2018 Influenza Vaccine:

- The Food and Drug Administration's Vaccines and Related Biological Products Advisory Committee (VRBPAC) recommended that the 2017-18 influenza trivalent vaccines used in the United States contain an A/Michigan/45/2015 (H1N1)pdm09-like virus, an A/Hong Kong/4801/2014 (H3N2)-like virus, and a B/Brisbane/60/2008-like (B/Victoria lineage) virus.
- It was recommended that quadrivalent vaccines, which have two influenza B viruses, contain the viruses recommended for the trivalent vaccines, as well as a B/Phuket/3073/2013-like (B/Yamagata lineage) virus.
- This represents an update in the influenza A(H1N1) component compared with the composition of the 2016-17 influenza vaccines.
- The recommended Northern Hemisphere 2017-18 vaccine viruses are the same as those for the 2017 Southern Hemisphere influenza season
- These vaccine recommendations were based on a number of factors, including global influenza virologic and epidemiologic surveillance, genetic and antigenic characterization, human serology studies, antiviral susceptibility, and the availability of candidate influenza viruses.

- More information is available on the [FDA VRBPAC web site](https://www.fda.gov/advisorycommittees/committeesmeetingmaterials/bloodvaccinesandotherbiologics/vaccinesandrelatedbiologicalproductsadvisorycommittee/ucm538209.htm) (<https://www.fda.gov/advisorycommittees/committeesmeetingmaterials/bloodvaccinesandotherbiologics/vaccinesandrelatedbiologicalproductsadvisorycommittee/ucm538209.htm>).

Previously published 2016-2017 season summaries

- [Update: Influenza Activity — United States, October 2–December 17, 2016](https://www.cdc.gov/mmwr/volumes/65/wr/mm655051a5.htm) (<https://www.cdc.gov/mmwr/volumes/65/wr/mm655051a5.htm>)
- [Update: Influenza Activity — United States, October 2, 2016–February 4, 2017](https://www.cdc.gov/mmwr/volumes/66/wr/mm6606a2.htm) (<https://www.cdc.gov/mmwr/volumes/66/wr/mm6606a2.htm>)

Related Communication Articles

- [CDC: Reported Flu Deaths in Children Surpass 100 for 2016-17](#)
- [New CDC Study Shows Flu Vaccine Reduces Severe Outcomes in Hospitalized Patients May 25, 2017](#)
- [CDC Reports This Season’s Flu Vaccine Reducing Risk by Nearly Half February 16, 2017](#)
- [Flu Activity on the Rise; CDC recommends vaccination and appropriate use of antivirals December 29, 2016](#)