

# CDC Influenza Division Key Points

June 5, 2015

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## **Seasonal Influenza Update**

The May 28, 2015 FluView marked the final full influenza surveillance report for the 2014-2015 flu season in the United States. Influenza surveillance in the United States will continue through the summer months with condensed reports available at <http://www.cdc.gov/flu/weekly/>; however, the weekly [Situation Update](http://www.cdc.gov/flu/weekly/summary.htm) (<http://www.cdc.gov/flu/weekly/summary.htm>) will not be updated until publication of the full FluView resumes on October 16, 2015. [FluView Interactive](http://www.cdc.gov/flu/weekly/fluviewinteractive.htm) (<http://www.cdc.gov/flu/weekly/fluviewinteractive.htm>) will continue to be updated over the summer months.

## **MMWR: Influenza Activity — United States, 2014–15 Season and Composition of the 2015–16 Influenza Vaccine**

- On Thursday, June 4, 2015, a report titled “Influenza Activity – United States, 2014-15 Season and Composition of the 2015-16 Influenza Vaccine,” was published in a [Morbidity and Mortality Weekly Report \(MMWR\)](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6421a5.htm?s_cid=mm6421a5_w). ([http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6421a5.htm?s\\_cid=mm6421a5\\_w](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6421a5.htm?s_cid=mm6421a5_w))
- This report summarizes influenza (flu) activity from September 28, 2014 to May 23, 2015 during the 2014-15 season.

## **Summary of 2014-2015 Influenza Season Activity**

- As of late May 2015, 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.
- This was a moderately severe flu season, similar to previous H3N2-predominant seasons.
- Overall, there were high levels of outpatient illness and flu-associated hospitalizations and deaths, especially for people 65 years and older.
- Flu activity this season increased through late November and December, and peaked in late December. This is somewhat early, comparatively; flu activity in the United States typically begins to increase in late December or early January and peaks most commonly in February.
- The peak month is when, relative to other months in the season, laboratories report the highest proportion of influenza-positive specimens. Individual regions often peak at different times.
- The majority of circulating influenza A (H3N2) viruses were different from the influenza A (H3N2) component of the 2014–15 Northern Hemisphere seasonal vaccines, and the predominance of these drifted viruses resulted in reduced vaccine effectiveness. (See [Comparing Circulating Viruses to the 2014-15 Vaccine](#) below for more information.) Vaccination was still protective against non-drifted vaccine-like influenza A (H3N2) viruses, and influenza B viruses which were predominant later in the season.

Deaths:

- The percentage of deaths attributed to P&I was above the epidemic threshold for 8 consecutive weeks this season, and peaked at 9.3% during the week ending January 17.
- Although the P&I was fairly high, it's comparable to recorded percentages for other severe seasons, including 2003-04, when P&I reached 10 percent.
  - Examples from previous severe seasons for P&I include:
    - in 2012-2013, P&I reached 9.9%;
    - in 1999-2000, P&I reached 11.2%; and
    - in 1998-1999, P&I reached 9.7%.
- In the last seven seasons (2008-2009 season, forward), the number of consecutive weeks that P&I has been above epidemic threshold has ranged from 1 to 13 weeks.
- This season, 141 laboratory-confirmed flu-associated deaths in children were reported.
- 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 34 to 171; this excludes the 2009 pandemic, when 358 pediatric deaths from April 15, 2009 through October 2, 2010 were reported to CDC.

Hospitalizations:

- 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 322.8, which is more than one-and-a-half times greater than the highest rate previously reported for this age group.
  - During the previous four flu seasons, hospitalization rates for people 65 years and older have ranged from 30.2 to 183.2.
- Nearly half (43.3%) of the children hospitalized with laboratory-confirmed flu had no known underlying health condition.
- Nearly one third of women who were hospitalized with laboratory-confirmed flu this season were pregnant.

Visits to doctors for flu-like illness:

- Nationally, the weekly percentage of visits to doctors for flu-like illness was at or above the national baseline for 20 consecutive weeks during the 2014–15 influenza season, making this the longest flu season in more than a decade.
- Last season (2013-2014) the weekly percentage was at or above national baseline for 15 consecutive weeks.
- This season, the peak percentage of visits to doctors for flu-like illness was 6.0%, occurring in late December.
- This is similar to 2012-2013 (also an H3N2-predominant season) when the percentage of outpatient visits for influenza-like illness (ILI) peaked in December at 6.1%.
- Nationally, visits to doctors for flu-like illness declined and fell below baseline beginning mid-April 2015, signaling the season was drawing to a close, although regional differences in activity continued to be reported. See [2014-2015 Flu Season Drawing to a Close](http://www.cdc.gov/flu/news/2014-2015-flu-season-wrapup.htm) (<http://www.cdc.gov/flu/news/2014-2015-flu-season-wrapup.htm>) or more information.

Characterization of circulating flu viruses:

- Over the entire season, influenza A (H3N2) viruses were detected most often, followed by influenza B viruses, which increased late in the season, and then influenza A (H1N1) pdm09 viruses.
- Three human infections with variant influenza viruses were reported during the 2014-15 season.
  - One human infection with influenza A (H3N2) variant (H3N2v) virus was reported by Wisconsin. Visit CDC's [Influenza A \(H3N2\) Variant Virus](http://www.cdc.gov/flu/swineflu/h3n2v-cases.htm) (<http://www.cdc.gov/flu/swineflu/h3n2v-cases.htm>) web site for more information.
  - Two human infections with influenza A (H1N1) variant (H1N1v) viruses were reported from Minnesota and Ohio.

Antiviral drug susceptibility testing:

- CDC tested more than 4,100 influenza viruses collected since October 1, 2014 for evidence of resistance to antiviral medications currently recommended to treat influenza infection.
- The vast majority of influenza A and B viruses were sensitive to oseltamivir, zanamivir, and peramivir. However, one influenza A (H1N1)pdm09 virus showed resistance to both oseltamivir and peramivir.
- These results indicate that these antiviral drugs continue to be recommended treatment options for illness caused by currently circulating influenza viruses.

Comparing circulating viruses to the 2014-2015 vaccine:

- CDC examined 2,193 influenza viruses to see how [antigenically](http://www.cdc.gov/flu/professionals/laboratory/antigenic.htm) (<http://www.cdc.gov/flu/professionals/laboratory/antigenic.htm>) and/or [genetically](http://www.cdc.gov/flu/professionals/laboratory/genetic-characterization.htm) (<http://www.cdc.gov/flu/professionals/laboratory/genetic-characterization.htm>) similar each was to the viruses selected for the 2014-2015 seasonal influenza vaccines.
  - Of the 59 influenza A (H1N1) viruses tested, all were antigenically similar to the H1N1 virus in the 2014-2015 vaccine.
  - Of the 1,324 influenza A (H3N2) viruses tested, a little less than one fifth (18.6%; 246) were like the H3N2 virus in the 2014-2015 vaccine (called 'A/Texas/50/2012').
  - The remaining four-fifths (81.4%; 1,078) of the 1,324 H3N2 viruses tested were either antigenically and/or genetically divergent from the H3N2 virus in the 2014-15 vaccine.
    - A subset (948) of these 1,324 viruses were further characterized.
      - The vast majority (93.7%; 889) of the 1,078 H3N2 viruses were found to be antigenically similar to the H3N2 virus (A/Switzerland/9715293/2013) selected for the 2015-2016 vaccine.
  - Of the 810 influenza B viruses tested, roughly 72% (582) viruses belonged to the B/Yamagata lineage; the remainder (28.1%; 228) belonged to the B/Victoria/02/87 lineage.
    - 98% (571) of the B/Yamagata-lineage viruses were found to be like the B virus component (B/Massachusetts/2/2012) of the 2014-2015 trivalent and quadrivalent vaccine. Further, the vast majority (98.9%; 576) were antigenically similar to the B/Yamagata-lineage virus selected for the 2015-16 vaccine (B/Phuket/3073/2013).

- Of the 228 B/Victoria-lineage viruses, the vast majority (98%; 223) were found to be like the B/Victoria-lineage virus included in the 2014-15 quadrivalent vaccine (B/Brisbane/60/2008), which is also included in the 2015-16 quadrivalent vaccine.

Composition of the 2015-2016 Influenza Vaccine:

- The Food and Drug Administration's Vaccines and Related Biological Products Advisory Committee recommended that the 2015–16 influenza trivalent vaccines used in the United States contain an A/California/7/2009 (H1N1)pdm09-like virus, an A/Switzerland/9715293/2013 (H3N2)-like virus, and a B/Phuket/3073/2013-like (B/Yamagata 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/Brisbane/60/2008-like (B/Victoria lineage) virus. This represents a change in the influenza A (H3) and influenza B (Yamagata lineage) components compared with the composition of the 2014-2015 influenza vaccine.
- The [recommended](http://www.who.int/influenza/vaccines/virus/recommendations/consultation201502/en/) (<http://www.who.int/influenza/vaccines/virus/recommendations/consultation201502/en/>) vaccine viruses for the 2015-16 Northern Hemisphere and the United States influenza season are the same as those for the [2015 Southern Hemisphere influenza season](http://www.who.int/influenza/vaccines/virus/candidates_reagents/2015_south/en/) ([http://www.who.int/influenza/vaccines/virus/candidates\\_reagents/2015\\_south/en/](http://www.who.int/influenza/vaccines/virus/candidates_reagents/2015_south/en/)), but include two changes from the 2014-2015 U.S. influenza vaccine composition: the H3N2 virus, and one of the B virus components.
- With regard to the H1N1 vaccine component, a review of surveillance data showed that there has been little detectable antigenic or genetic drift with circulating H1N1 viruses, and so the same influenza virus will be used for vaccine production.
- With regard to the H3N2 component of the vaccine, a review of surveillance data showed that there has been substantial genetic change and antigenic drift among circulating H3N2 viruses since A/Texas/50/2012 was selected as the 2014-2015 H3N2 vaccine component.
  - Multiple genetic groups of influenza A (H3N2) viruses are co-circulating globally.
  - Most (but not all) of circulating H3N2 viruses are antigenically similar to the influenza A (H3N2) virus selected for the 2015 Southern Hemisphere vaccine (A/Switzerland/9715293/2013).
  - The recommended H3N2 virus for the United States 2015-2016 vaccine is an A/Switzerland/9715293/2013-like virus.
  - A/Switzerland/9715293/2013 is from a genetic group of H3N2 influenza viruses called "3C.3a".
  - Testing suggests A/Switzerland/9715293/2013 should protect well against most currently circulating H3N2 viruses.
- With regard to the influenza B component of the vaccine, a review of surveillance data showed that both lineages of influenza B viruses - B/Yamagata and B/Victoria - circulated globally this past year, with B/Yamagata viruses predominating.
- Among B/Yamagata-lineage viruses, data from global influenza surveillance show that an increasing percentage have been antigenically similar to B/Phuket/3073/2013, which is the recommended component for the 2015-2016 United States vaccine.
- More information is available on the [FDA VRBPAC web site](http://www.fda.gov/AdvisoryCommittees/CommitteesMeetingMaterials/BloodVaccinesandO) (<http://www.fda.gov/AdvisoryCommittees/CommitteesMeetingMaterials/BloodVaccinesandO>

[therBiologics/VaccinesandRelatedBiologicalProductsAdvisoryCommittee/ucm427602.htm](http://www.cdc.gov/biologics/therBiologics/VaccinesandRelatedBiologicalProductsAdvisoryCommittee/ucm427602.htm)) and in a [Question and Answer \(http://www.who.int/influenza/vaccines/virus/recommendations/201502\\_qanda\\_recommendation.pdf?ua=1\)](http://www.who.int/influenza/vaccines/virus/recommendations/201502_qanda_recommendation.pdf?ua=1) document.

- These influenza virus vaccine recommendations were based on several factors, including global influenza virologic and epidemiologic surveillance, genetic characterization, antigenic characterization, antiviral resistance, and the candidate vaccine viruses that are available for production.

#### Previously published 2014-2015 season summaries

- [CDC. Update: Influenza Activity – United States, September 28, 2014-February 21, 2015. MMWR. 2015; 64\(08\): 206-212. \(http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6408a2.htm\)](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6408a2.htm)
- [CDC. Update: Influenza Activity – United States, September 28-December 6, 2014. MMWR. 2014; 63\(50\): 1189-1194. \(http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6350a2.htm\)](http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6350a2.htm)

#### Related Communication Articles

- [2014-2015 Flu Season Drawing to a Close \(http://www.cdc.gov/flu/news/2014-2015-flu-season-wrapup.htm\)](http://www.cdc.gov/flu/news/2014-2015-flu-season-wrapup.htm) (April 28, 2015)
- [CDC Presents Updated Estimates of Flu Vaccine Effectiveness for the 2014-2015 Season \(http://www.cdc.gov/flu/news/updated-vaccine-effectiveness-2014-15.htm\)](http://www.cdc.gov/flu/news/updated-vaccine-effectiveness-2014-15.htm) (March 2, 2015)
- [Flu Season Continues; Severe for People 65 and Older \(http://www.cdc.gov/flu/news/flu-season-continues.htm\)](http://www.cdc.gov/flu/news/flu-season-continues.htm) (February 6, 2015)
- [Protection from Flu Vaccination Reduced this Season \(http://www.cdc.gov/media/releases/2015/p0115-flu-vaccination.html\)](http://www.cdc.gov/media/releases/2015/p0115-flu-vaccination.html) (January 15, 2015)
- [CDC: Flu Activity Expands; Severity Similar to Past H3N2 Seasons \(http://www.cdc.gov/flu/news/flu-activity-expands.htm\)](http://www.cdc.gov/flu/news/flu-activity-expands.htm) (January 5, 2015)
- [New CDC Reports Shows Benefits of Flu Vaccine Last Season But Fewer Than Half of Americans Say They Have Been Vaccinated this Season \(http://www.cdc.gov/flu/news/nivw-fewer-vaccinated.htm\)](http://www.cdc.gov/flu/news/nivw-fewer-vaccinated.htm) (December 11, 2014)
- [Early Data Suggests Potentially Severe Flu Season \(http://www.cdc.gov/media/releases/2014/p1204-flu-season.html\)](http://www.cdc.gov/media/releases/2014/p1204-flu-season.html) (December 4, 2014)

#### Additional Information

- 'Influenza activity' is a general term that refers to a few different types of flu data.
- Influenza activity data include illness indicators, such as the proportion of people who visit doctors' offices that have flu-like illness, and the proportion of respiratory specimens tested by public health laboratories that are positive for influenza.
- Statements about influenza activity also reflect other indicators, which measure the season's severity – 1) the proportion of deaths that were influenza- and pneumonia-associated, and the number of lab-confirmed influenza-related deaths in children, and 2) the rate of hospitalizations across all ages groups that were flu-associated.