CDC Influenza Division Key Points
May 27, 2016

This is the final issue of CDC (Seasonal) Influenza Division Key Points for the 2016-2017 influenza season. After today, seasonal influenza key points will no longer be released on a fixed schedule, but will be issued as they are warranted, such as in conjunction with the release of important flu-related publications or guidance or unexpected increases in flu activity. Full reporting for the 2017-2018 influenza season will begin in mid-October 2017, and appear in the weekly influenza surveillance report, FluView.

In this document:

Summary Key Points

- Flu activity continues to decrease in the United States according to the most recent FluView report. (http://www.cdc.gov/flu/weekly)
- Influenza-like illness is below baseline.
- Flu activity has peaked and activity is winding down for this season in most of the country.
- Only one state is still reporting widespread flu activity.
- Influenza B viruses have been most common in the last few weeks; however overall, H1N1 viruses have been predominant this season.
- Second waves of influenza B activity occur during many flu seasons.
- The peak week of flu activity for the 2015-2016 season was week 10; the week ending March 12, 2016.
- This is a relatively late peak for a flu season.
- There is still some circulation of flu, and it's important to note that flu viruses circulate at low levels, even over the summer. CDC recommends influenza vaccination as long as influenza viruses are circulating and vaccine is available.
- CDC also recommends that patients suspected of having influenza who are at high-risk or who are very sick (http://www.cdc.gov/flu/about/disease/high_risk.htm) should receive prompt treatment with influenza antiviral drugs without waiting for confirmatory testing.

- More information about flu antiviral medications is available at: http://www.cdc.gov/flu/antivirals/index.htm
- CDC posted a web spotlight for a collaborative study on Improved Global Capacity for Influenza Surveillance: http://www.cdc.gov/flu/news/collaborative-study-capacity.htm. The manuscript is available online in Emerging Infectious Diseases: http://wwwnc.cdc.gov/eid/article/22/6/15-1521_article.

FluView Activity Update

According to this week's FluView report, flu activity continues to decrease in the United States. Flu activity has peaked nationally for this season and is winding down. Only Puerto Rico and one state reported widespread flu activity. Influenza B viruses have been most common in recent weeks; however, H1N1 viruses have been predominant overall this season. Second waves of influenza B activity occur during many flu seasons. CDC continues to recommend influenza vaccination as long as influenza viruses are circulating. CDC also recommends that patients suspected of having influenza who are at high risk of flu complications or who are very sick with flu-like symptoms should receive prompt treatment with influenza antiviral drugs without waiting for confirmatory testing. Below is a summary of the key flu indicators for the week ending May 21, 2016:

- For the week ending May 21, the proportion of people seeing their health care provider for influenza-like illness (ILI) decreased to 1.3%. This is below the national baseline of 2.1%. All 10 regions reported ILI below their region-specific baseline levels. One way that CDC measures the duration of the influenza season is the number of consecutive weeks during which ILI is at or above the national baseline. ILI was at or above the national baseline for 17 consecutive weeks this season. For the last 13 seasons, the average duration of a flu season by this measure has been 13 weeks, with a range from one week to 20 weeks.
- Puerto Rico experienced moderate ILI activity. Three states (Arizona, Georgia, and North Carolina) experienced low ILI activity. New York City and 46 states experienced minimal ILI activity. The District of Columbia and one state (New Jersey) did not have sufficient data to calculate an activity level. ILI activity data indicate the amount of flu-like illness that is occurring in each state.

- Widespread flu activity was reported by Puerto Rico and one state (New York). This is a decrease from two states with widespread activity last week. Regional flu activity was reported by Guam and six states (Connecticut, Kentucky, Maine, Massachusetts, New Hampshire, and Pennsylvania). Local flu activity was reported by 14 states (Alabama, Alaska, Arizona, Delaware, Hawaii, Michigan, New Jersey, New Mexico, Ohio, Oklahoma, South Carolina, Vermont, West Virginia, and Wisconsin). Sporadic flu activity was reported by the District of Columbia, the U.S. Virgin Islands, and 28 states (Arkansas, California, Colorado, Florida, Georgia, Idaho, Illinois, Iowa, Kansas, Louisiana, Maryland, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, North Carolina, North Dakota, Oregon, Rhode Island, South Dakota, Tennessee, Texas, Utah, Virginia, Washington, and Wyoming). No activity was reported by one state (Indiana). Geographic spread data show how many areas within a state or territory are seeing flu activity.
- Between October 1, 2015, and April 30, 2016, 8,646 laboratory-confirmed influenza-associated hospitalizations have been reported through FluSurv-NET, a population-based surveillance network for laboratory-confirmed influenza-associated hospitalizations. This translates to a cumulative overall rate of 31.2 hospitalizations per 100,000 people in the United States. This is significantly lower than the hospitalization rate at this time last season (64.1 per 100,000), which was an H3N2 predominant season. During the last H1N1 predominant season (2013-2014), the cumulative hospitalization rate was 35.1. More data on hospitalization rates, including hospitalization rates during other influenza seasons, are available at http://gis.cdc.gov/GRASP/Fluview/FluHospRates.html and http://gis.cdc.gov/grasp/fluview/FluHospChars.html.
    - The highest hospitalization rates are among people 65 years and older (84.2 per 100,000), followed by adults 50-64 years (45.1 per 100,000) and children younger than 5 years (42.0 per 100,000). During most seasons, adults 65 years and older and children younger than 5 years have the highest hospitalization rates.
    - FluSurv-NET hospitalization data are collected from 13 states and represent approximately 8.5% of the total U.S. population. The number of hospitalizations reported does not reflect the actual total number of influenza-associated hospitalizations in the United States.

- The proportion of deaths(http://www.cdc.gov/flu/weekly/#S2) attributed to pneumonia and influenza (P&I) was below the system-specific epidemic threshold in both the NCHS Mortality Surveillance System and the system-specific epidemic threshold in the 122 Cities Mortality Reporting System.
- Two additional influenza-associated pediatric deaths (http://www.cdc.gov/flu/weekly/#S3) were reported to CDC this week:
    - One death was associated with an influenza A (H1N1)pdm09 virus and occurred during week 8 (the week ending February 27, 2016).
    - One death was associated with an influenza A virus for which no subtyping was performed and occurred during week 19 (the week ending May 14, 2016).
    - This brings the total number of flu-associated pediatric deaths reported this season to 70 children.
- Nationally, the percentage of respiratory specimens testing positive for influenza viruses in clinical laboratories during the week ending May 21 was 6.3%. For the most recent three weeks, the regional percentage of respiratory specimens testing positive for influenza viruses in clinical laboratories ranged from 2.7% to 11.0%.
    - During the week ending May 21, of the 628 influenza-positive tests reported to CDC by clinical laboratories, 198 (31.5%) were influenza A viruses and 430 (68.5%) were influenza B viruses.
- The most frequently identified influenza virus type reported by public health laboratories during the week ending May 21 was influenza A viruses.
    - During the week ending May 21, 35 (50.7%) of the 69 influenza-positive tests reported to CDC by public health laboratories were influenza A viruses and 34 (49.3%) were influenza B viruses. Of the 35 influenza A viruses that were subtyped, 19 (54.3%) were H3 viruses and 16 (45.7%) were (H1N1)pdm09 viruses.
- Cumulatively from October 4, 2015-May 21, 2016, influenza A (H1N1)pdm09 viruses were predominant in all four age groups: 0-4 years age group (69.9%), 5-24 years age group (48.1%), 25-64 years age group (68.4%), and in ages 65 years and older (50.3%).

- CDC has characterized 2,514 specimens (931 influenza A (H1N1)pdm09, 590 influenza A (H3N2) and 993 influenza B viruses) collected in the United States since October 1, 2015.
    - 930 of 931 (99.9%) influenza A (H1N1)pdm09 viruses were antigenically characterized as similar to A/California/7/2009, the influenza A (H1N1) component of the 2015-2016 Northern Hemisphere vaccine.
    - All 590 H3N2 viruses were genetically sequenced and all viruses belonged to genetic groups for which a majority of viruses antigenically characterized were similar to cell-propagated A/Switzerland/9715293/2013, the influenza A (H3N2) component of the 2015-2016 Northern Hemisphere vaccine.
    - A subset of 285 H3N2 viruses also were antigenically characterized; 277 of 285 (97.2%) H3N2 viruses were similar to A/Switzerland/9715293/2013 by HI testing or neutralization testing.
    - All 548 (100%) of the B/Yamagata-lineage viruses were antigenically characterized as similar to B/Phuket/3073/2013, which is included in both the 2015–2016 Northern Hemisphere trivalent and quadrivalent vaccines.
    - 438 of 445 (98.4%) of the B/Victoria-lineage viruses were antigenically characterized as similar to B/Brisbane/60/2008, which is included in the 2015-2016 Northern Hemisphere quadrivalent vaccine.
- Since October 1, 2015, CDC has tested 2,090 influenza A (H1N1)pdm09, 699 influenza A (H3N2), and 1,104 influenza B viruses for resistance to the neuraminidase inhibitors antiviral drugs. While the vast majority of the viruses that have been tested are sensitive to oseltamivir, zanamivir, and peramivir, so far this season, 18 (0.9%) influenza A (H1N1)pdm09 viruses have showed resistance to oseltamivir and peramivir.
- The Food and Drug Administration's Vaccines and Related Biological Products Advisory Committee (VRBPAC) endorsed the WHO-recommended vaccine viruses for use in all U.S. seasonal flu vaccines for the 2016-2017 flu season. These recommendations were as follows:
    - It was recommended that trivalent vaccines for use in the 2016-2017 influenza season (Northern Hemisphere winter) contain the following:
        - an A/California/7/2009 (H1N1)pdm09-like virus;
        - an A/Hong Kong/4801/2014 (H3N2)-like virus;

        - a B/Brisbane/60/2008-like virus (B/Victoria lineage).
    - It was recommended that quadrivalent vaccines containing two influenza B viruses contain the above three viruses and a B/Phuket/3073/2013-like virus (B/Yamagata lineage).
    - This represents a change in the influenza A (H3) component and a change in the influenza B lineage included in the trivalent vaccine compared with the composition of the 2015-2016 influenza vaccine.

FluView (http://www.cdc.gov/flu/weekly/fluactivitysurv.htm) is available – and past issues are archived (http://www.cdc.gov/flu/weekly/pastreports.htm) – on the CDC website. **Note:** Delays in reporting may mean that data changes over time. The most up to date data for all weeks during the 2015-2016 season can be found on the current FluView(http://www.cdc.gov/flu/weekly/).

Influenza-Associated Pediatric Deaths

- Two pediatric deaths were reported this week, bringing the total number of flu-associated deaths to 70 for the 2015-2016 season.
- Because of confidentiality issues, CDC does not discuss or give details on individual cases.
- These deaths are a somber reminder of the danger flu poses to children.
- The single best way to protect against seasonal flu and its potential severe consequences in children is to get a seasonal flu vaccine each year.
- Vaccination is especially important for children younger than 5 years of age and children of any age with a long-term health condition like asthma, diabetes and heart disease and neurological and neurodevelopmental diseases. These children are at higher risk of serious flu complications if they get the flu.
- Yearly vaccination also is especially important for people in contact with high risk children in order to protect the child (or children) in their lives from the flu. In particular, children younger than 6 months are too young to be vaccinated themselves but are at high risk of flu complications if they get sick so the people around them should get vaccinated to protect the infant.

- Some children 6 months through 8 years of age require two doses of influenza vaccine. Children in this age group who are getting vaccinated for the first time will need two doses. Some children who have received influenza vaccine previously also will need two doses this season. A health care provider should be consulted to determine whether two doses are recommended for a child.
- Flu-related deaths in children younger than 18 years old should be reported through the Influenza-Associated Pediatric Mortality Surveillance System. The number of flu-associated deaths among children reported during the 2015-2016 flu season will be updated each week and can be found at http://www.cdc.gov/flu/weekly/ and http://gis.cdc.gov/GRASP/Fluview/PedFluDeath.html.
- Since 2004, when pediatric deaths associated with influenza infection became a nationally notifiable condition, the number of deaths reported to CDC each year has ranged from 37 (2011-2012 season) to 171 deaths (2012-2013 season).
- Last season, 148 influenza-associated pediatric deaths were reported to CDC.

Antiviral Drug-Resistant Influenza Virus

- Influenza viruses can sometimes develop resistance to antiviral medications.
- Antiviral resistance means that a virus has changed in such a way that the antiviral drug is less effective in treating or preventing illnesses caused by the virus.
- Influenza viruses constantly change as the virus makes copies of itself. Some changes can result in the viruses being resistant to one or more of the antiviral drugs that are used to treat or prevent influenza.
- Resistance of influenza A viruses to antiviral drugs can occur spontaneously or emerge during the course of antiviral treatment.
- Antiviral resistance is detected through laboratory testing.
- CDC reports specimens collected and tested through national surveillance as well as additional specimens tested at public health laboratories who share testing results with CDC.
- For the week ending May 14, 2016 (week 19), one additional resistant influenza A(H1N1)pdm09 virus was reported, bringing the total number of antiviral drug-resistant viruses to fifteen (0.7%) for this season.

- CDC tested the virus and confirmed resistance to oseltamivir and peramivir, two neuraminidase inhibitor antiviral medications.
- Oseltamivir resistance and peramivir resistance are rare among influenza A (H1N1)pdm09 viruses.
- The majority of influenza A (H1N1)pdm09 viruses circulating in the United States remain susceptible to currently recommended neuraminidase inhibitor antiviral medications (oseltamivir, peramivir, and zanamivir).
- This virus has a single known mutation in the neuraminidase protein (referred to as 'H275Y') that is associated with resistance to neuraminidase inhibitor antiviral medications.
- This is a known mutation in H1N1 viruses, first detected in 2008, and continues to be rarely observed among H1N1pdm09 viruses.
- During the 2013-2014 and 2014-2015 seasons, of the influenza A (H1N1)pdm09 viruses that were tested for resistance to influenza antiviral drugs, <2% were resistant. All the resistant viruses have had the H275Y mutation.
- CDC and state and local partners will continue to watch influenza viruses closely for possible emerging patterns of antiviral resistance in addition to watching for antigenic and genetic changes.
- Three FDA-approved influenza antiviral medications are recommended for use in the United States during the 2015-2016 influenza season: oseltamivir (Tamiflu®), peramivir (Rapivab®), and zanamivir (Relenza®). More information about antiviral drug resistance can be found at http://www.cdc.gov/flu/about/qa/antiviralresistance.htm and http://www.cdc.gov/flu/antivirals/index.htm.
- Information on monitoring for antiviral drug-resistant influenza viruses is updated weekly in the CDC FluView surveillance report, which is available at: http://www.cdc.gov/flu/weekly/.