CDC Influenza Division Key Points

February 5, 2016

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Summary Key Points

- Flu activity continues to increase slowly overall in the United States.
- While activity is relatively low overall parts of the country are seeing higher activity levels.
- Reports of influenza-like-illness are slightly above the national baseline.
- CDC has received some reports of serious flu illness, including hospitalizations and deaths, but national severity indicators are not elevated at this time.
- A CDC Health Advisory giving an update on the current flu season and reminding clinicians about CDC's recommendations was issued on February 1, 2016: http://emergency.cdc.gov/han/han00387.asp.
- Flu seasons vary in their timing, duration and intensity, but it is likely that there are still weeks of flu activity to come.
- Influenza A (H1N1) viruses are been predominant in recent weeks.
- This is the H1N1 virus that emerged in 2009 to cause a pandemic.
- A 2009 H1N1 vaccine component has been included in seasonal vaccines since 2010.
- Laboratory data so far show that most circulating flu viruses are still like the viruses recommended for the 2015-2016 influenza vaccines.
- The similarity between vaccine viruses and circulating viruses is one factor that can influence how well the vaccine works.
- With much of the flu season still to come, getting a flu vaccine now can still protect you from illness this season.
- CDC recommends annual flu vaccination for everyone 6 months and older.
- While flu vaccine can vary in how well it works, a flu vaccine is our best defense against getting the flu.
- Manufacturers report having shipped more than 146.0 million doses of flu vaccine as of January 29, 2016.
- Go to http://vaccine.healthmap.org/ or www.cdc.gov/flu to find a location near you where you can get vaccinated.

- While flu vaccine is the best way to prevent influenza, influenza antiviral drugs can treat flu illness.
- CDC recommends prompt treatment of influenza antiviral drugs without waiting for confirmatory testing for very sick or high-risk suspect flu patients.
- More information about influenza antiviral medications is available at: http://www.cdc.gov/flu/antivirals/index.htm
- This week, a report titled "The benefit of early influenza antiviral treatment of pregnant women hospitalized with laboratory-confirmed influenza" was published in the Journal of Infectious Diseases.
    - The paper suggests prompt use of antiviral medication is beneficial for pregnant women with flu, especially in cases of severe illness: http://www.idsociety.org/Pregnant_Women_with_Flu/.

FluView Activity Update

According to this week's FluView report, flu activity continues to increase slowly; however there are localized pockets of high activity in parts of the country and the percentage of respiratory specimens testing positive for flu in clinical laboratories increased. H1N1 viruses are most common at this time. This H1N1 virus emerged in 2009 to cause a pandemic. Seasonal flu vaccines have included the H1N1 pandemic virus since 2010. CDC recommends an annual flu vaccine for everyone 6 months of age and older. If you have not gotten vaccinated yet this season, you should get vaccinated now. Below is a summary of the key flu indicators for the week ending January 30, 2015:

- For the week ending January 30, the proportion of people seeing their health care provider(http://www.cdc.gov/flu/weekly/#S4) for influenza-like illness (ILI) remained at 2.2%, which is above the national baseline (2.1%). Six of 10 regions (Regions 1, 2, 3, 4, 6 and 10) reported ILI at or above their region-specific baseline levels. One way that CDC measures the length of the influenza season is the number of consecutive weeks during which ILI is at or above the national baseline.
- Puerto Rico experienced high ILI activity. Two states (Connecticut and Arkansas) experienced moderate ILI activity. New York City and 11 states (Arizona, Florida, Hawaii, Illinois, Maryland, Nevada, New Jersey, Oklahoma, Pennsylvania, Texas, and

Utah) experienced low ILI activity. 37 states experienced minimal ILI activity. The District of Columbia 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 three states (California, Iowa, and Massachusetts). Regional flu activity was reported by Guam and 18 states (Arizona, Connecticut, Indiana, Kentucky, Maine, Maryland, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Rhode Island, Texas, Utah, Vermont, Virginia, and Washington). The District of Columbia and 16 states (Alabama, Alaska, Arkansas, Colorado, Florida, Idaho, Illinois, Michigan, Minnesota, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, and Wyoming) reported local influenza activity. The U.S. Virgin Islands and 12 states reported sporadic influenza activity. No flu activity was reported by one state (Mississippi). Geographic spread data show how many areas within a state or territory are seeing flu activity.
- Since October 1, 2015, 723 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 2.6 hospitalizations per 100,000 people in the United States. 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 (8.5 per 100,000), followed by children younger than 5 years (3.8 per 100,000). During most seasons, children younger than 5 years and adults 65 years and older 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 122 Cities Mortality Reporting System.

- Two influenza-associated pediatric deaths were reported to CDC during the week ending January 30. A total of nine influenza-associated pediatric deaths have been reported during the 2015-2016 season.
- Nationally, the percentage of respiratory specimens(http://www.cdc.gov/flu/weekly/overview.htm#Viral) testing positive for influenza viruses in clinical laboratories during the week ending January 30 was 6.8%. For the most recent three weeks, the regional percentage of respiratory specimens testing positive for influenza viruses in clinical laboratories ranged from 1.0% to 10.9%.
  - During the week ending January 30, of the 1,085 influenza-positive tests reported to CDC by clinical laboratories, 739 (68.1%) were influenza A viruses and 346 (31.9%) were influenza B viruses.
- The most frequently identified influenza virus type reported by public health laboratories during the week ending January 30 was influenza A viruses, with influenza A (H1N1)pdm09 viruses predominating.
  - During the week ending January 30, 273 (74.2%) of the 368 influenza-positive tests reported to CDC by public health laboratories were influenza A viruses and 95 (25.8%) were influenza B viruses. Of the 222 influenza A viruses that were subtyped, 55 (24.8%) were H3 viruses and 167 (75.2%) were (H1N1)pdm09 viruses.
  - Cumulatively from October 4, 2015-January 30, 2016, influenza A (H3) viruses were predominant in two of the four age groups ranging from 35.7% (ages 5-24 years) to 51.0% (ages 65 years and older). Influenza A (H1N1)pdm09 viruses were predominant in the 0-4 years age group (60.4%) and in the 25-64 years age group (58.8%).
- CDC has characterized 407 specimens (130 influenza A (H1N1)pdm09, 190 influenza A (H3N2) and 87 influenza B viruses) collected in the U.S. since October 1, 2015.
  - All 130 (100%) 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 190 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 93 H3N2 viruses also were antigenically characterized; 92 of 93 (98.9%) H3N2 viruses were similar to A/Switzerland/9715293/2013 by HI testing or neutralization testing.
  - All 52 (100%) of the B/Yamagata-lineage viruses were antigenically characterized as similar to B/Phuket/3073/2013, which is included in both the 2015–16 Northern Hemisphere trivalent and quadrivalent vaccines.
  - All 35 (100%) of the B/Victoria-lineage viruses were antigenically characterized as similar to B/Brisbane/60/2008, which is included in the 2015-16 Northern Hemisphere quadrivalent vaccine.
- Since October 1, 2015, CDC has tested 229 influenza A (H1N1)pdm09, 225 influenza A (H3N2), and 130 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, one additional influenza A (H1N1)pdm09 virus that was reported during the week ending January 30, 2016, showed resistance to oseltamivir and peramivir. So far this season, 2 (0.9%) influenza A (H1N1)pdm09 viruses have showed resistance to oseltamivir and peramivir (but both were sensitive to zanamivir).

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/).

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 January 30, 2016 (week 4), one additional resistant influenza A(H1N1)pdm09 virus was reported, bringing the total number of antiviral drug-resistant viruses to two for this season.
- CDC tested the virus and confirmed resistance to oseltamivir and peramivir, two neuraminidase inhibitor antiviral medications, but it was sensitive to zanamivir.
- 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/.