CDC Influenza Division Key Points
February 7, 2014

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Summary Key Messages

- The current FluView report indicates that flu activity remains elevated overall in the United States, though some parts of the country are seeing flu activity decline.
- Some states that saw earlier increases in activity are now beginning to see declines in activity. Other states are continuing to see high levels of flu activity or are seeing continued increases in activity.
- The national proportion of people visiting a provider for influenza-like-illness is declining overall, but it's likely that flu season will continue for several weeks still.
- Because large parts of the country have yet to experience significant flu activity, influenza-like illness may increase again and it's likely that flu activity will remain elevated nationally for several weeks still.
- Measures that reflect severity (like hospitalizations and deaths) are showing early signs of slowing; but it's possible these may increase again. (Severity indicators typically lag behind illness activity and hospitalization rates are cumulative over the season.)
- The predominant virus so far this season is H1N1.
- This is the H1N1 virus that emerged in 2009 to cause a pandemic. This virus has continued to circulate since the pandemic as a seasonal flu virus, but this is the first flu season since the pandemic that this virus has circulated so widely.
- Seasonal flu is responsible for severe illness and death every year, but who is most affected each season can vary depending on the predominant circulating virus.
- During the pandemic, when H1N1 viruses were predominant, younger adults and children, and particularly people with chronic medical conditions, were harder hit by flu compared with adults aged 65 and older. Other groups of people, like pregnant women, people who are morbidly obese, and American Indians/Alaska Natives, were also hard hit by H1N1 during the pandemic.
- While it is not possible to predict which influenza viruses will predominate for the entire 2013-2014 influenza season, if H1N1 virus continues to circulate widely, illness that

disproportionately affects young and middle-aged adults may continue to occur this season.

- CDC has already received several reports of severe flu illness among young and middle-aged adults, many of whom were infected with the 2009 H1N1 virus. Some hospitalizations and deaths have been reported.
- So far, more than 60% of the reported hospitalizations this season have been in people 18 to 64 years old. (See Influenza-Associated Hospitalizations By Age for more information.)
- More commonly, most flu hospitalizations occur in people 65 and older. Usually 50-60% of flu hospitalizations occur in people aged 65 years and older.
- Unfortunately, younger adults – especially those who are otherwise healthy – are less likely to get vaccinated.
- Estimates as of early-November 2013 were that among people 18-49 years of age, only 31% had been vaccinated. That is about 9 percentage points lower than the flu vaccine coverage estimates for everyone 6 months of age and older in the U.S. during the same time period.
- These severe flu outcomes are a reminder that flu can be a very serious disease for anyone, including young, previously healthy adults.
- CDC urges people who still have not been vaccinated to get vaccinated now.
- All flu vaccines this season are designed to protect against H1N1.
- Influenza vaccination is especially important for people in the most vulnerable groups.
- People at high risk for serious flu complications include: people with underlying chronic medical conditions such as asthma, diabetes, heart disease, or neurological conditions; pregnant women; those younger than 5 years or older than 65 years of age; or anyone with a weakened immune system. A full list of high risk factors is available at http://www.cdc.gov/flu/about/disease/high_risk.htm.
- Also, as always, people who are at high risk for influenza complications should see their health care provider promptly if they get flu symptoms, even if they have been vaccinated this season.
- A health care provider can determine if the patient needs influenza antiviral drugs. Antiviral drugs can treat flu illness and prevent serious flu complications. These drugs work best when started soon after influenza symptoms begin (within 2 days), but persons with high-risk conditions can benefit even when antiviral treatment is started after the first two days of illness.
- Flu symptoms include fever, cough, sore throat, runny or stuffy nose, muscle or body aches, headache, chills and fatigue.

- While how well the flu vaccine works can vary, CDC recommends a yearly flu vaccination as the first and most important step in protecting against flu and its potentially serious complications.
- Flu vaccination can reduce flu illnesses, doctors' visits, missed work due to flu, as well as prevent flu-related hospitalizations and deaths.
- Nearly 134 million doses of flu vaccine had been delivered in the United States as of late January, with manufacturers projecting total production of 138-145 million doses this season.
- Flu vaccines are offered in many locations, including doctor's offices, clinics, health departments, retail stores, pharmacies, health centers, and by many employers and schools.
- At this point in the season, people may have to check with more than one vaccine provider in order to locate vaccine, but supplies of vaccine should still be available.

FluView Activity Update

- According to this week's FluView report, influenza activity remains elevated nationally. Some states that saw earlier increases in flu activity are now beginning to see decreases. Other states are continuing to see high levels of flu activity or are seeing continued increases in activity. Flu activity is likely to continue for several more weeks.
- Below is a summary of the key indicators for the week of January 26-February 1, 2014:
    - For the week of January 26-February 1, the national proportion of people seeing their health care provider for influenza-like illness decreased slightly for the fifth week, but remains above the national baseline. All ten regions continue to report ILI activity above their region-specific baseline level. Additional information regarding regional activity is available through FluView Interactive.
    - Seven states experienced high ILI activity; a decrease from the 10 states with high ILI activity last week. Twelve states experienced moderate ILI activity. Fourteen states and New York City experienced low ILI activity. Seventeen 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.
    - Twenty-nine states reported widespread geographic influenza activity. This is a decrease from the 38 states that reported widespread activity in the previous week. Nineteen states reported regional activity. The District of Columbia and Mississippi reported local activity. Guam, Puerto Rico, and Hawaii reported sporadic influenza activity. The U.S. Virgin Islands did not report. Geographic

spread data show how many areas within a state or territory are seeing flu activity.

- 6,081 laboratory-confirmed influenza-associated hospitalizations have been reported since October 1, 2013. This translates to a cumulative overall rate of 22.5 hospitalizations per 100,000 people in the United States. Data for hospitalization rates are available through FluView Interactive.
    - The highest hospitalization rates are among people 65 and older (45.6 per 100,000), followed by people 50-64 years (35.3 per 100,000) and children younger than 5 years (33.6 per 100,000). During most seasons, children 0-4 years and adults 65 years and older have the highest hospitalization rates.
    - Of the 6,081 influenza-associated hospitalizations that have been reported this season, more than 60% have been in people 18 to 64 years old. This pattern of more hospitalizations among younger people was also seen during the 2009 H1N1 pandemic.
    - 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 attributed to pneumonia and influenza (P&I) based on the 122 Cities Mortality Reporting System decreased this week, following three consecutive weeks of increases, but remains above the epidemic threshold. When the proportion of the deaths due to P&I is above the epidemic threshold it means that the number of P&I deaths occurring are in excess of the number that is expected.
- Three influenza-associated pediatric deaths were reported to CDC during the week of January 26-February 1. All three of the deaths were associated with an influenza A virus for which subtyping was not performed. A total of 40 influenza-associated pediatric deaths have been reported for the 2013-2014 season at this time. Additional information about the pediatric deaths from this season and previous seasons is available through FluView Interactive.
- Nationally, the percentage of respiratory specimens testing positive for influenza viruses in the United States during the week of January 26-February 1 decreased to 19.6%. Averaged over the last three weeks, the regional percentage of respiratory specimens testing positive for influenza viruses ranged from 17.9% to 37.0%.
- Influenza A (H3N2), 2009 influenza A (H1N1), and influenza B viruses have all been identified in the U.S. this season. To date, influenza A (H1N1) viruses have

predominated. This is the H1N1 virus that emerged in 2009 to cause a pandemic. 2009 H1N1 viruses have continued to circulate among people since that time, but this is the first season that the virus has circulated at such high levels since the pandemic. During the week of January 26-February 1, 1,511 of the 1,626 influenza-positive tests reported to CDC were influenza A viruses and 115 were influenza B viruses. Of the 847 influenza A viruses that were subtyped, 3.7% were H3 viruses and 96.3% were 2009 H1N1 viruses.

- CDC has antigenically characterized 1,044 influenza viruses, including 920 viruses identified as 2009 H1N1 viruses, 86 influenza A (H3N2) viruses, and 38 influenza B viruses, collected since October 1, 2013.
    - 919 (99.9%) of the 920 2009 H1N1 viruses tested were characterized as A/California/7/2009-like. This is the influenza A (H1N1) component of the Northern Hemisphere quadrivalent and trivalent vaccines for the 2013-2014 season.
    - All 86 of the influenza A (H3N2) viruses tested were characterized as Texas/50/2012-like. This is the influenza A (H3N2) component of the Northern Hemisphere quadrivalent and trivalent vaccines for the 2013-2014 season.
    - 21 (55%) of the 38 influenza B viruses tested belonged to the B/Yamagata lineage of viruses, and were characterized as B/Massachusetts/02/2012-like. This is an influenza B component for the 2013-2014 Northern Hemisphere quadrivalent and trivalent influenza vaccines.
    - The 17 (45%) other influenza B viruses belonged to the B/Victoria lineage of viruses, and were characterized as B/Brisbane/60/2008-like. This is the recommended influenza B component of the 2013-2014 Northern Hemisphere quadrivalent influenza vaccine.
- Since October 1, 2013, CDC has tested 2,278 2009 H1N1, 138 influenza A (H3N2), and 43 influenza B virus samples for resistance to the neuraminidase inhibitor influenza antiviral drugs. While the vast majority of the viruses that have been tested are sensitive to oseltamivir and zanamivir, two additional 2009 H1N1 viruses showed resistance to oseltamivir during the week of January 26-February 1. So far this season 23 (0.8%) 2009 H1N1 viruses have shown resistance to oseltamivir. No viruses have shown resistance to zanamivir.
    - The neuraminidase inhibitors oseltamivir and zanamivir are currently the only recommended influenza antiviral drugs.
    - As in recent past seasons, high levels of resistance to the adamantanes (amantadine and rimantadine) continue to persist among 2009 H1N1 and

influenza A (H3N2) viruses. Adamantanes are not effective against influenza B viruses. Adamantanes are not recommended for use against influenza this season.

FluView is available – and past issues are archived – 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 2013-2014 season can be found on the current FluView.

Influenza-Associated Hospitalizations by Age

- Seasonal flu is responsible for thousands of hospitalizations every year.
- Flu is often harder on older adults, relative to young healthy adults, but every season is different.
- For example, based on surveillance data, over the course of the 2012-2013 flu season 50.1% of hospitalizations occurred in adults 65 years and older (and 34.5% had occurred in adults 18-64 years).
- This season, a pattern of hospitalization that is similar to what was seen during the 2009 H1N1 pandemic has started to emerge. During the pandemic, younger people had more flu-related hospitalizations for severe illness than did older adults.
- To date this season, 61% of the reported hospitalizations have been in people 18 to 64 years old, while 24% of hospitalizations have occurred in adults 65 years and older.
- This season's pattern of more hospitalizations across younger age groups is likely due to higher existing levels of immunity to this virus in the older population. Serology studies conducted during the pandemic suggested that people 65 years and older had existing antibodies against H1N1 viruses, perhaps because they were exposed to similar viruses – predecessors of 2009 H1N1 viruses – earlier in their lifetimes.
- Another likely factor is vaccination status. Unfortunately, younger adults – especially those who are otherwise healthy – are less likely to get vaccinated.
- Estimates as of early-November 2013 were that among people 18-49 years of age, only 31% had been vaccinated. That is about 9 percentage points lower than the flu vaccine coverage estimates for everyone 6 months of age and older in the US during the same time period.
- It's important to note that even otherwise healthy people can get very sick from flu and end up in the hospital.
- This season—as in past seasons—the vast majority of adults and over half of children hospitalized with flu have had an underlying medical condition that puts them at high risk for flu-related complications.

- The most commonly reported underlying medical conditions among hospitalized adults this season have been obesity, metabolic disorders, cardiovascular disease, and asthma. (Some of the most commonly reported underlying medical conditions among hospitalized children this season have been asthma, neurologic disorders, obesity, and cardiovascular disease.)
- CDC recommends that everyone aged 6 months and older get a flu vaccine each season.
- People who are at high risk for influenza complications should see their health care provider promptly if they get flu symptoms, even if they have been vaccinated this season.

Influenza-Associated Pediatric Deaths

- Three pediatric deaths were reported to CDC during the week ending February 1, 2014 (Week 5).
- This brings the total of influenza-related pediatric deaths that have been reported for the 2013-2014 flu season to 40.
- Additional information regarding pediatric deaths is now available through FluView Interactive.
- A pediatric death is a death in a person who is a U.S. resident and younger than 18 years old from an illness associated with infection with an influenza virus.
- During the 2012-2013 influenza season, a total of 171 influenza-associated pediatric deaths were reported to CDC.
- A review of the available pediatric death reports from the 2012-2013 season indicates that:
    - Of the 164 deaths in which the child's medical history was known, 55% occurred in children who had underlying medical conditions that placed them at high risk of developing serious flu-associated complications. However, 45% had no recognized underlying health problems.
    - The proportions of pediatric deaths that occurred in unvaccinated children and among children with underlying medical conditions that placed them at high risk from flu complications are largely consistent with what has been seen in the past.
- Since 2004, when flu-associated pediatric deaths became a nationally notifiable condition, the number of deaths reported to CDC each season has ranged from 35 (2011-2012 season) to 171 (2012-2013 season).

- During the 2009 H1N1 pandemic — April 15, 2009 to October 2, 2010 — 348 pediatric deaths were reported to CDC.
- These deaths are a somber reminder of the danger flu poses to children.
- The single best way to protect children against seasonal flu and its potential severe consequences is to have them receive a seasonal flu vaccine each year.
- Among children, vaccination is especially important for those younger than 5 years of age and those of any age with an underlying medical condition like asthma; a neurological, neuromuscular or neurodevelopmental disorder; or immune suppression. These children are at higher risk of serious complications if they get the flu.
- Yearly vaccination also is especially important for people who come in contact with high risk children in order to protect the child (or children) from the flu.
- Even previously healthy children can become seriously ill if they get the flu. Data on laboratory-confirmed influenza hospitalizations during the 2012-2013 flu season indicated that 46% of children hospitalized with the flu had no identified underlying medical conditions.
- Flu-associated 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 2013-2014 flu season will be updated each week and can be found at http://www.cdc.gov/flu/weekly/.
- Additional information about the pediatric deaths, including basic demographics, underlying conditions and week and place of death, for the 2013-2014 season as well as past influenza seasons, is available through the Influenza Associated Pediatric Mortality application of FluView Interactive at http://gis.cdc.gov/GRASP/Fluview/PedFluDeath.html.

Oseltamivir-Resistant Influenza Viruses

- 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 February 1, 2014 (Week 5), two oseltamivir-resistant 2009 H1N1 viruses were reported, bringing the total number of oseltamivir-resistant viruses to 23 for this season.
- Oseltamivir resistance among 2009 H1N1 viruses is rare.
- The majority of 2009 H1N1 viruses circulating in the United States remain susceptible to the neuraminidase inhibitor antiviral medications, oseltamivir and zanamivir.
- Oseltamivir-resistant viruses often have a single known substitution in the neuraminidase protein of the virus (H275Y) that seems to confer oseltamivir resistance. All the oseltamivir-resistant H1N1 viruses reported this season have had this substitution.
- 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 changes.
- Two FDA-approved influenza antiviral medications are recommended for use in the United States during the 2013-2014 influenza season: oseltamivir (Tamiflu®) 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 the monitoring of antiviral resistance of influenza viruses to oseltamivir and zanamivir is updated weekly in the CDC FluView surveillance report, which is available at: http://www.cdc.gov/flu/weekly/.