CDC Influenza Division Key Points

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Summary Key Messages

- This week's FluView report indicates that flu activity continues to increase in the United States.
- The proportion of outpatient visits for influenza-like illness (ILI) was above the national baseline for the fourth consecutive week.
- CDC is getting reports of flu illnesses, flu hospitalizations and flu deaths. Eleven pediatric deaths have been reported so far this season.
- Influenza A (H3N2) viruses are most common so far.
- H3N2-predominant seasons are associated with more severe illness and mortality, especially in older people and young children than H1N1- or B-predominant seasons.
- If H3N2 viruses continue to predominate, this season could be severe.
- More two-thirds of the influenza A (H3N2) viruses analyzed since October 1 are antigenically or genetically different from the H3N2 vaccine virus component this season. (See the FluView Activity Update below.)
- The vaccine may not work as well against these different viruses.
- **CDC is urging influenza vaccination for any unvaccinated persons because vaccine may still offer benefit, and reminding people about the importance of antiviral medications for the treatment of influenza illness, especially among high risk persons, as an adjunct to vaccination.**
- CDC always recommends three actions to fighting flu:
  1. Take time to get a flu vaccine.
  2. Take everyday preventive actions like covering coughs and sneezes, staying away from sick people and washing your hands often to help stop the spread of

respiratory viruses like flu, respiratory syncytial virus (RSV), rhinovirus and enterovirus D68.

3. Take antivirals drugs for flu treatment if your doctor prescribes them. (If you have a high risk factor and get flu symptoms, see your doctor or other health care professionals.)

Vaccination

- So far this season, fewer than half of Americans had reported getting a flu vaccine by early November.

Annual flu vaccination is the first and most important step in protecting against flu and its potentially serious complications.

- A flu vaccine is the best way to protect against influenza.
- The flu vaccine protects against three or four different influenza viruses, depending on which vaccine you get (trivalent or quadrivalent).
- Flu vaccination can reduce flu illnesses, doctors' visits, and missed work and school due to flu, as well as prevent flu-related hospitalizations and deaths.
- Vaccination is particularly important for people at high risk of serious flu-related complications and their close contacts. (People at high risk include infants, pregnant women, kids and adults with chronic medical conditions like asthma, diabetes, or heart disease, and adults aged 65 and older.)
- Even when some circulating viruses are different from the vaccine viruses, CDC continues to recommend flu vaccination.
- We cannot know which viruses will circulate over the season.
- Flu vaccination can still reduce flu illnesses, doctors' visits, and missed work and school due to flu, as well as prevent flu-related hospitalizations and deaths.
- Antibodies created through vaccination with one influenza virus can sometimes offer protection against drifted influenza viruses (this is called "cross-protection").
- While the vaccine may work less well against drifted viruses, it can still protect many people and prevent flu-related complications.
- If we have a severe season (with H3N2 viruses predominating) getting a vaccine that provides even partial protection may be more important than ever.
- It is not too late to get vaccinated.
- Health care professionals should continue to vaccinate patients who have not yet received influenza vaccine this season.
- The HealthMap Vaccine Finder can be used to locate flu vaccine.

Vaccine Match

- Influenza viruses are constantly changing – they can change from one season to the next or they can even change within the course of the same season. This kind of gradual change is called "antigenic drift."
- In order for any vaccine to be delivered in the fall, the viruses in the vaccine must be chosen in February.
- When the vaccine viruses for 2014-2015 were selected, A/Texas/50/2012 was the most common circulating influenza H3N2 virus.
- Drifted H3N2 viruses were first detected during routine surveillance testing during late March 2014, after WHO recommendations for the vaccine composition for the Northern Hemisphere for the 2014-2015 season had been made in mid-February.
- At that time, just a very small number of these viruses had been found among the thousands of specimens that had been collected and tested.
- Influenza viruses are constantly changing and detecting small numbers of antigenic variants is common.
- Many antigenic variants emerge and spread in a limited way and then die out.
- Early on, there is no way to predict in advance if a given antigenic variant will circulate widely.
- Over the summer, these viruses were detected in greater proportions and by the fall had become common among H3N2 viruses in the United States and abroad.
- By September 20, about half of H3N2 viruses isolated worldwide since May were drifted from the H3N2 vaccine virus component.
- As of the week ending December 12, 69.4% of H3N2 viruses isolated in the United States since October 1, 2014 were drifted from the H3N2 vaccine virus component.

Implications on Vaccine Effectiveness

- More than two-thirds of H3N2 viruses are different from the vaccine virus.
- It's possible that vaccine effectiveness against these viruses may be reduced.
- However, seasonal influenza vaccination can sometimes protect against antigenically different viruses.
- Influenza vaccination still offers the best way to prevent seasonal flu.
- In the context of reduced vaccine effectiveness, however, the use of influenza antiviral drugs as a second line of defense against the flu becomes even more important, especially for high risk people and people who are very sick (e.g., hospitalized).

Antiviral Drugs

Antiviral drugs can be used to treat flu illness and prevent serious flu complications.

- There are prescription drugs, called "influenza antiviral drugs" that can be used to treat the flu or to prevent infection with flu viruses.
- Treatment with antivirals works best when begun within 48 hours of getting sick, but can still be beneficial when given later in the course of illness.
- Treatment with flu antiviral drugs can make your illness milder and shorter. Treatment with antivirals also can lessen serious flu complications that can result in hospitalization or death.
- Antiviral drugs become even more important when circulating flu viruses are different from the vaccine viruses; which can mean that the vaccine doesn't work as well in protecting against infection with those viruses.
- Antiviral drugs are effective across all age and risk groups.
- Studies show that antiviral drugs are under-prescribed for high risk people who get flu.
- Treating high risk people or people who are very sick with flu with antiviral drugs is very important. It can mean the mean the difference between having a milder illness instead of very serious illness that could result in a hospital stay.
- Two FDA-approved influenza antiviral agents are recommended for use in the United States during the 2014-2015 influenza season: oseltamivir and zanamivir.
- Visit http://www.cdc.gov/flu/professionals/antivirals/index.htm for information about how antiviral medications can be used to prevent or treat influenza when influenza activity is present in your community.
- A summary of antiviral recommendations for clinicians is available on the CDC website at http://www.cdc.gov/flu/professionals/antivirals/summary-clinicians.htm.
- As always, people who are at high risk for influenza complications should see a health care professional promptly if they get flu symptoms, even if they have been vaccinated this season.
  - 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.
- More information about everyday preventive actions that help fight flu is available at http://www.cdc.gov/flu/protect/habits.htm.

Antiviral Drug Supply

- Influenza antiviral drugs are commercially manufactured and supplies of these drugs are dependent upon those commercial manufacturers.
- The Food and Drug Administration has not received any reports of local, regional or national shortages of influenza antiviral drugs from manufacturers at this time.
- A statement on Tamiflu supply from the manufacturer Genentech is available at: http://www.gene.com/media/statements/ps_121814.
- It's still possible that spot shortages may occur in local areas. If needed, pharmacies should work with authorized distributors to obtain additional supplies of antivirals.
- It's also possible that in places with elevated influenza activity, locating influenza antiviral drugs may be more difficult.
- Patients who have been prescribed an influenza antiviral drug by their health care provider may need to call more than one pharmacy to fill their prescription.
- If the exact prescribed formulation cannot be located, patients should consult with their physician or pharmacist for additional options.
- CDC and FDA will continue to work with manufacturers to assess influenza antiviral supply this season.

FluView Activity Update

- According to this week's FluView report, flu activity continued to increase in the United States.
- High levels of activity are being reported in the South and Midwest states. Flu activity is expected to increase further in the coming weeks.
- Below is a summary of the key flu indicators for the week ending December 13, 2014:
  - For the week ending December 13, the proportion of people seeing their health care provider for influenza-like illness (ILI) increased to 3.7% and is above the national baseline for the fourth consecutive week. Nine of 10 U.S. regions reported ILI activity at or above region-specific baseline levels.
  - Puerto Rico and 13 states (Alabama, Arkansas, Georgia, Illinois, Indiana, Kansas, Louisiana, Minnesota, Mississippi, Missouri, Oklahoma, Texas, and Virginia) experienced high ILI activity, an increase from six states in the previous week. Six states (Idaho, Kentucky, Maryland, North Carolina, Utah, and Wisconsin) experienced moderate ILI activity. New York City and five states experienced low ILI activity. Twenty-six 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 influenza activity was reported by Guam and 29 states. This is an increase from 14 states that reported widespread activity last week. Puerto Rico and 14 states reported regional geographic influenza activity. The U.S. Virgin Islands, The District of Columbia and five states (Alaska, Arizona, Idaho, New Jersey, and New Mexico) reported local activity. Two states (Hawaii and Wyoming) reported sporadic influenza activity. Geographic spread data show how many areas within a state or territory are seeing flu activity.
- Data regarding influenza-associated hospitalizations for the 2014-2015 influenza season is available. 1,702 laboratory-confirmed influenza-associated hospitalizations have been reported since October 1, 2014. This translates to a cumulative overall rate of 6.2 hospitalizations per 100,000 people in the United States.
  - The highest hospitalization rates are among people 65 years and older (23.6 per 100,000 populations).
  - Hospitalization data are collected from 13 states and represent approximately 9% 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 increased again this week, but remains below the epidemic threshold.
- Four influenza-associated pediatric deaths were reported to CDC during the week ending December 13. Two deaths were associated with an influenza A (H3) virus and occurred during week 49 (week ending December 6, 2014). One death was associated with an influenza A virus for which no subtyping was performed and occurred during week 50 (week ending December 13, 2014), and one death was associated with an influenza B virus and occurred during week 49. A total of 11 influenza-associated pediatric deaths have been reported for the 2014-2015 season at this time.
- Nationally, the percentage of respiratory specimens testing positive for influenza viruses in the United States during the week ending December 13 increased once again to 25.9%. For the most recent three weeks, the regional percentage of respiratory specimens testing positive for influenza viruses ranged from 8.2% to 32.5%.
- Influenza A (H3N2) viruses have been identified most commonly in the United States this season. Fewer influenza B viruses have been detected and very few influenza A (H1N1)pdm09 viruses have been detected. During the week ending

December 13, 5,006 (96.3%) of the 5,200 influenza-positive tests reported to CDC were influenza A viruses and 194 (3.7%) were influenza B viruses. Of the 1,901 influenza A viruses that were subtyped, 99.6 % were influenza A (H3) viruses and 0.4% were influenza A (H1N1)pdm09 viruses.

- CDC has antigenically or genetically characterized 248 influenza viruses, including ten influenza A(H1N1)pdm09, 209 influenza A (H3N2) viruses and 29 influenza B viruses, collected in the United States since October 1, 2014.
    - All 10 influenza A (H1N1)pdm09 viruses tested were characterized as A/California/7/2009-like. This is the influenza A (H1N1) component of the 2014-2015 Northern Hemisphere quadrivalent and trivalent influenza vaccine.
    - Sixty-four (30.6%) of the 209 influenza A (H3N2) viruses tested have been characterized as A/Texas/50/2012-like. This is the influenza A (H3N2) component of the 2014-2015 Northern Hemisphere quadrivalent and trivalent influenza vaccine.
    - The remaining 145 (69.4%) influenza A (H3N2) viruses tested showed either reduced titers with antiserum produced against A/Texas/50/2012 or belonged to a genetic group that typically shows reduced titers to A/Texas/50/2012. The majority of these 145 influenza A (H3N2) viruses were antigenically similar to A/Switzerland/9715293/2013, the influenza A (H3N2) component of the 2015 Southern Hemisphere influenza vaccine.
    - Twenty (69%) of the 29 influenza B viruses tested belonged to the B/Yamagata/16/88 lineage and were characterized as B/Massachusetts/2/2012-like. This is an influenza B component of the 2014-2015 Northern Hemisphere trivalent and quadrivalent influenza vaccine.
    - Seven (78%) of the nine 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 2014-2015 Northern Hemisphere quadrivalent influenza vaccine. Two (22%) of the B/Victoria-lineage viruses tested showed reduced titers to B/Brisbane/60/2008.
- Since October 1, 2014, CDC has tested 10 influenza A (H1N1)pdm09, 175 influenza A (H3N2), and 51 influenza B viruses for resistance to neuraminidase inhibitors (oseltamivir and zanamivir). All viruses showed susceptibility to both oseltamivir and 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 influenza A (H1N1)pdm09 and A (H3N2) viruses. Adamantanes are not effective against influenza B viruses.

- 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 2014-2015 season can be found on the current FluView.

Influenza-Associated Pediatric Deaths

- Four influenza-associated pediatric deaths were reported to CDC for the week ending December 13, 2014 (Week 50).
- A total of 11 influenza-associated deaths have been reported during the 2014-2015 season from six states (Florida [2], Minnesota [2], North Carolina [2], Nevada [1], Ohio [2], and Texas [2]).
- Because of confidentiality issues, CDC does not discuss or give details on individual pediatric death cases.
- Additional information regarding pediatric deaths is 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 resulting from a clinically compatible illness with influenza that is confirmed by an appropriate laboratory test.
- During the 2013-2014 influenza season, a total of 109 influenza-associated pediatric deaths were reported to CDC.
- A review of the available pediatric death reports from the 2013-2014 season indicates that:
    - Of the 106 deaths in which the child's medical history was known, 54% occurred in children who had underlying medical conditions that placed them at high risk of developing serious flu-associated complications. However, 46% 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 37 (2011-2012 season) to 171 (2012-2013 season).

- During the 2009 H1N1 pandemic — April 15, 2009 to October 2, 2010 — 358 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 collected through FluSurv-Net during the 2013-2014 flu season indicated that 42% 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 2014-2015 flu season is 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 2014-2015 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.

Vaccine Supply

- Seven influenza vaccine manufacturers have projected that as many as 151 million to 156 million doses of influenza vaccine will be available for use in the United States during the 2014-2015 influenza season.
- Of the overall flu vaccine supply projected for the 2014-2015 season, manufacturers estimate that 76 million doses will be available as quadrivalent flu vaccines.
  - Of the total quadrivalent flu vaccine supply, as many as 18 million doses of the nasal spray influenza vaccine (LAIV) have been projected by the manufacturer to be available.
- As of December 5, 2014, manufacturers reported having shipped 145.4 million doses of flu vaccine.

- For the latest information on flu vaccine supply, including projections and doses distributed, visit http://www.cdc.gov/flu/professionals/vaccination/vaccinesupply.htm.

LAIV Effectiveness Last Season and Vaccination of Children This Season

- Since 2008, ACIP and CDC have recommended that all children 6 months and older (with rare exceptions) receive influenza vaccine annually, using any licensed age-appropriate vaccine.
- During the summer of 2014, ACIP and CDC recommended that beginning during the 2014-2015 influenza season, live attenuated influenza vaccine (LAIV, or the "nasal spray vaccine") should be used for healthy children 2 through 8 years of age when immediately available and when there are no contraindications or precautions against getting that vaccine.
- This decision was based on previous data showing that LAIV offered superior protection against influenza virus infection compared to IIV in young children.
- However, recently available CDC analyses showed that there was no measurable effectiveness for LAIV against influenza A (H1N1) among children enrolled in a CDC-sponsored study last season.
- There were not enough cases of infection in the CDC study with H3N2 or B viruses to calculate vaccine effectiveness against those viruses in children last season.
- The reasons behind the lack of effectiveness against H1N1 infections for LAIV during the 2013-2014 season are not fully understood.
  - It is possible that results may be specific to the H1N1 component of LAIV. Influenza H1N1 viruses predominated during the 2013-2014 season for the first time since their emergence in 2009 when they caused a pandemic.
  - It also is possible – though less likely – that there is an unidentified issue with the study methods or analysis plan for measuring LAIV vaccine effectiveness.
- The 2013-2014 season LAIV VE estimates against H1N1 for children suggest that LAIV may not protect against H1N1 viruses during the 2014-2015 season because the same H1N1 vaccine virus from the 2013-2014 vaccine is included in the 2014-2015 vaccine.
- However, the nasal spray vaccine continues to be a recommended option for vaccination because:
  - All LAIV is designed to protect against four different influenza viruses: influenza A (H1N1), A (H3N2) and two influenza B viruses;
  - Surveillance shows that there is substantially more circulation of influenza A (H3N2) and B viruses and very little circulating H1N1 so far;

  - LAIV has been shown to offer good protection against influenza A (H3N2) and influenza B viruses in the past;
  - LAIV may offer better protection than IIV against antigenically drifted viruses that may circulate this season; and
  - Vaccine providers have received their vaccine for the 2014-2015 season and have likely administered a good proportion of it.
- People who have not been vaccinated yet this season should get vaccinated now.
- Parents should seek to get their children immunized with whatever vaccine is immediately available and indicated.
- Influenza vaccination should not be delayed to procure a specific vaccine preparation.
- The HealthMap Vaccine Finder can be used to locate vaccine.
- Children needing one dose of vaccine this season who got the nasal spray vaccine are considered fully vaccinated and do not need to be revaccinated.
- Children needing two doses of vaccine this season who have only gotten one dose can get either the nasal spray vaccine or the flu shot as their second dose, whatever is immediately available.
- See the CDC statement, "CDC Statement on LAIV Effectiveness and Vaccination of Children," at: http://www.cdc.gov/flu/news/nasal-spray-effectiveness.htm.