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Summary Key Points:

- Influenza activity – dominated by influenza A H3N2 viruses – is still elevated across the country and continues to increase in some areas.
- Flu activity this season has been moderate so far, with severity indicators within the range of what has been seen during previous seasons during which influenza A (H3N2) viruses have predominated.
- Early estimates indicate that flu vaccines this season have reduced a vaccinated person's risk of getting sick and needing medical care because of flu by about half (48%).
- Vaccine has been 48% effective overall against influenza A and B viruses: Effectiveness against the predominant influenza A (H3N2) viruses has been 43% while effectiveness against influenza B viruses has been 73%. (It is too soon to determine VE by age group.)
- VE estimates so far this season are consistent with vaccine effectiveness (VE) estimates from previous seasons during which vaccine viruses have been characterized as being "like" (well-matched to) circulating viruses based on standard characterization methods.
- Each year, flu vaccines prevent millions of flu-related illnesses and medical visits and tens or hundreds of thousands of flu-related hospitalizations.
- For example, during 2012-2013 – an H3N2 season with [overall VE of 49%](#), [CDC estimates](#) that flu vaccine prevented 5.6 million flu illnesses, 2.7 million flu-related medical visits and about 61,500 flu hospitalizations.
- Hundreds of millions of Americans have safely received flu vaccines over the past 50 years, and there has been extensive research supporting the safety of seasonal flu vaccines.
- Flu activity has been elevated for 8 weeks so far this season; there are likely still several weeks of flu activity to come.
- **CDC Recommendations:**
 - Vaccination efforts should continue as long as influenza viruses are circulating
 - Early antiviral treatment is recommended for persons with suspected influenza with severe or progressive illness (e.g., hospitalized persons) and persons at high risk for complications from influenza such as children aged <2 years, adults aged ≥65 years and persons with underlying health conditions, even if illness is less severe.

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- Early antiviral treatment can reduce severity and complications of influenza-associated illness.
- **Conclusion:** Preliminary VE estimates for this season underscore the benefits of vaccination with currently available seasonal influenza vaccines, but also highlight the important role of influenza antiviral drugs to treat flu illness and the value of ongoing efforts to improve the effectiveness of seasonal influenza vaccines.

MMWR: Influenza Activity — Influenza Activity — United States, October 2–February 4, 2017 Seasonal Flu Update:

- The MMWR report is available on the CDC website at https://www.cdc.gov/mmwr/volumes/66/wr/mm6606a2.htm?s_cid=mm6606a2_w.
- Influenza activity in the United States began to increase in mid-December. During October 2–February 4, 2017, influenza A (H3N2) viruses have predominated overall, but influenza A (H1N1)pdm09 and influenza B viruses were also reported.
 - Clinical laboratories in the United States tested 392,901 respiratory specimens for influenza viruses, 38,244 (9.7%) of which were positive. For the week ending February 4, 2017 (week 5), 27,409 specimens were tested, of which 5,722 (20.9%) were positive for influenza. Among these, 5,017 (87.7%) were positive for influenza A viruses and 705 (12.3%) were positive for influenza B viruses.
 - Public health laboratories in the United States tested 38,141 respiratory specimens collected between October 2, 2016–February 4, 2017. Among these 15,781 were positive for influenza; 14,606 (92.6%) were positive for influenza A viruses and 1,174 (7.4%) were positive for influenza B viruses. Among the 14,335 (98.1%) influenza A viruses subtyped, 13,973 (97.5%) were influenza A (H3N2) and 362 (2.5%) were influenza A (H1N1)pdm09 virus.
 - Two human infections with a novel influenza A virus were reported. One patient from Iowa with exposure to swine in the week preceding illness was infected with an influenza A (H1N2) variant [(H1N2)v] virus. Another patient was infected with an avian lineage influenza A (H7N2) virus. That person reported close, prolonged unprotected exposure to the respiratory secretions of sick cats known to be infected with this virus at a New York City animal shelter. Neither patient was hospitalized; both recovered fully, and there was no evidence of human-to-human transmission in either instance.
- Nearly all the influenza viruses characterized during this period were genetically or antigenically similar to the reference viruses representing vaccine components recommended for production in the 2016–17 Northern Hemisphere influenza vaccines.
- No antiviral resistance to oseltamivir, zanamivir, or peramivir has been identified among influenza viruses collected since October 1, 2016.

Influenza-like Illness (ILI):

- The weekly percentage of outpatient visits for ILI has been at or above the national baseline (2.2%) for eight consecutive weeks (from the weeks ending December 17, 2016 – February 4, 2017).
- For the week ending February 4, the proportion of people seeing their health care provider for influenza-like illness (ILI) increased to 4.8% and all ten Department of Health and Human Services regions reported ILI at or above their region-specific baseline level.

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- During the 5 previous influenza seasons, peak ILI has ranged from 2.4% to 6.1 percent and the average duration of a flu season by this measure has been 13 weeks, with a range from one week to 20 weeks.
- Data collected from ILINet are used to determine a measure of ILI activity by state.
- For the week ending February 4, 2017, the majority of the U.S. was experiencing high ILI activity. (23 states and New York City experienced high ILI activity; 10 states experienced moderate ILI activity and 8 states and Puerto Rico experienced low ILI activity.)

Geographic Spread of Influenza Activity:

- The majority of states reported experiencing widespread influenza activity at this time. (43 states and Puerto Rico were reporting widespread activity; six states and Guam were reporting regional activity).

Hospitalizations:

- From October 1, 2016, through February 4, 2017, 6,804 laboratory-confirmed influenza-associated hospitalizations were reported, with a cumulative incidence for all age groups of 24.3 per 100,000 population.
 - The cumulative hospitalization rate (per 100,000 population) during October 1, 2016–February 4, 2017 was 13.6 among children aged 0–4 years, 4.8 among children and adolescents aged 5–17 years, 7.3 among adults aged 18–49 years, 23.5 among adults aged 50–64 years and 113.4 among adults aged ≥65 years.
- Persons aged ≥65 years had the highest rate of laboratory-confirmed influenza-associated hospitalization and accounted for approximately 60% of reported influenza-associated hospitalizations.
- Among all hospitalizations, a total of 6,367 (93.6%) were associated with influenza A virus.
 - The remaining hospitalizations included 395 (5.8%) with influenza B virus, 21 (0.3%) with influenza A and B virus coinfection, and 21 (0.3%) with influenza virus for which the type was not determined.
- Among adult patient cases reported, 94.5% had at least one reported underlying medical condition; the most frequently reported conditions were cardiovascular disease (47.1%), metabolic disorders (39.7%), and obesity (38.3%).
- Among child patient cases reported, 53.9% had at least one underlying medical condition reported; the most frequently reported conditions were asthma (15.4%), chronic lung disease (15.4%) and neurological disorders (15.4%).
- Among 59 hospitalized women of childbearing age (15–44 years), 20 (33.9%) were pregnant.

Pneumonia and Influenza-Attributed Deaths:

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CDC tracks pneumonia and influenza (P&I)-attributed deaths through the National Center for Health Statistics (NCHS) Mortality Reporting System. According to CDC's National Center for Health Statistics Mortality Surveillance System:

- The proportion of deaths attributed to pneumonia and influenza (P&I) was 7.9% for the week ending January 21, 2017 (week 3). This percentage is above the epidemic threshold of 7.4% for week 3 in the National Center for Health Statistics (NCHS) Mortality Surveillance System.
- Since October 2, 2016 the weekly percentage of deaths attributed to P&I has ranged from 5.6% to 7.9% and has exceeded the epidemic threshold for three consecutive weeks, from the weeks ending January 7–21 (weeks 1–3), this season.
- During the previous five influenza seasons, the peak weekly percentage of deaths attributable to P&I ranged from 8.2% in the 2015–16 season to 11.1% in the 2012–13 season.

Pediatric Deaths:

As of February 4, 2017 (week 5), 20 laboratory-confirmed influenza-associated pediatric deaths have been reported to the CDC during the 2016–17 season.

Of the 20 deaths:

- Nine were associated with an influenza A (H3N2) virus infection, one was associated with an influenza A (H1N1)pdm09 virus infection, five were associated with an influenza A virus infection for which no subtyping was performed, four were associated with an influenza B virus infection, and one was associated with an influenza virus for which the type was not determined.
- Since influenza-associated pediatric mortality became a nationally notifiable condition in 2004, the total number of influenza-associated pediatric deaths has ranged from 37 to 171 per season; this excludes the 2009 pandemic, when 358 pediatric deaths occurring from April 15, 2009 to October 2, 2010 were reported to CDC.

CDC Discussion/Recommendations:

- Influenza activity – dominated by influenza A (H3N2) viruses – is still elevated across the country and continues to increase in some areas.
- Flu activity this season has been moderate so far, with severity indicators within the range of what has been seen during previous seasons when influenza A (H3N2) viruses have predominated.
- [Early estimates](#) indicate that flu vaccines this season have reduced a vaccinated person's risk of getting sick and needing medical care because of flu by about half.
- Vaccine has been 43% effective against the predominant influenza A (H3N2) viruses and 73% effective against influenza B viruses.

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- This is consistent with vaccine effectiveness (VE) estimates from previous seasons during which vaccine viruses have been characterized as being “like” (well-matched to) circulating viruses based on standard characterization methods.
- There are still likely several weeks of flu activity to come this season so receiving influenza vaccine at this time still offers substantial public health benefits.
- CDC recommends yearly flu vaccination as the first and most important step in protecting against flu and its potentially serious complications. Vaccination efforts should continue as long as influenza viruses are circulating.
- Clinicians and the public should be aware that antiviral medication may be used as a second line of defense against flu.
- Antiviral treatment should be considered for patients with confirmed or suspected influenza who have severe, complicated, or progressive illness; who require hospitalization; or who are at high risk for influenza-related complications. Antiviral treatment should not be delayed until lab test results become available and when indicated given regardless of a history of influenza vaccination.
- CDC’s influenza antiviral treatment recommendations are available at <http://www.cdc.gov/flu/antivirals/index.htm>.

Interim Estimates of 2016-2017 Seasonal Influenza Vaccine Effectiveness – United States, February 2017

- On February 16, 2017, CDC published interim early estimates of the 2016-2017 flu vaccine’s effectiveness at preventing laboratory confirmed, flu-associated medical visits for acute respiratory illness (ARI) in its Morbidity and Mortality Weekly Report (MMWR). This report is available online at the [MMWR website](#).
- Researchers study how well flu vaccines work to continually assess the value of flu vaccines as a public health measure. These studies are called “vaccine effectiveness” studies or “VE” studies, for short. CDC typically conducts VE studies throughout the influenza season.
- This VE report used data from 3,144 children and adults enrolled in one of five participating sites in the U.S. Influenza Vaccine Effectiveness Network (U.S. Flu VE Network) during November 28, 2016 – February 4, 2017.
- The overall vaccine effectiveness of the 2016-2017 flu vaccine against both influenza A and B viruses was estimated to be 48% (95% confidence interval (CI): 37%-57%). In practical terms, this means the flu vaccine reduced a person’s risk of having to seek medical care at a doctor’s office for flu illness by 48%.
 - This estimate is adjusted for study site, age group, sex, race/ethnicity, self-rated general health, and days from illness onset to enrollment in the study.
- The majority of flu illness this season was associated with influenza A (H3N2) viruses.
- Vaccine effectiveness against illness caused specifically by influenza A (H3N2) viruses was estimated to be 43% (95% CI: 29%-54%).
- Vaccine effectiveness against influenza B viruses was estimated to be 73% (95% CI: 54%-84%).

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- How well the flu vaccine works can vary depending on a number of factors, including the similarity between circulating influenza viruses and vaccine viruses, and the age, health or immune status of the person vaccinated. Final estimates will be published at the conclusion of the season.
- These Interim influenza VE estimates for the 2016-2017 season indicate that flu vaccination reduced the risk for influenza-associated medical visits by nearly half. Because flu activity remains elevated, CDC and the Advisory Committee on Immunization Practices (ACIP) recommend that annual flu vaccination efforts continue as long as influenza viruses are circulating.
- It is possible that estimates will change as the season progresses.
- People 6 months of age and older who have not yet been vaccinated this season should be vaccinated as soon as possible. Note: It takes up to two weeks following flu vaccination for antibodies to develop in the body that protect against flu illness.
- As of early November 2016, only 37% of children aged 6 months–17 years, 37% of adults aged 18–64 years, and 57% of adults aged ≥65 years had received influenza vaccine this season.
- Interim flu VE estimates indicate improved protection during the 2016-2017 flu season against the predominant influenza A (H3N2) virus belonging to genetic group 3C.2a, which emerged in early 2014 and was predominant during the 2014-2015 influenza season in the United States.
- Virologic surveillance indicates that the majority of influenza A (H3N2) viruses collected by U.S. laboratories during the 2016-2017 season remain antigenically similar to the recommended influenza A (H3N2) component of the 2016-2017 Northern Hemisphere vaccine.
- As of February 10, 2017, flu activity remained elevated nationally and was widespread across most of the United States. For more information, see [FluView](#).
- Clinicians should maintain a high index of suspicion for influenza infection among patients with ARI while influenza activity is ongoing, especially among older adults.
- Early antiviral treatment is recommended for people with suspected influenza with severe or progressive illness (e.g., hospitalized persons) and persons at high risk for complications from influenza such as children younger than 2 years, adults 65 years of age and older, and people with underlying health conditions, even if illness is less severe.
- Antiviral medications should be used as recommended for treatment in patients with suspected influenza, regardless of vaccination status.
- The decision to initiate antiviral treatment should not be delayed while waiting for laboratory confirmation of influenza and should not be dependent on insensitive assays, such as rapid influenza diagnostic tests.

Methods:

- At the five U.S. Flu VE Network study sites, patients aged 6 months of age and older seeking outpatient medical care for ARI with cough within seven days of illness onset were enrolled.
- Study enrollment began after one or more laboratory-confirmed cases of influenza were identified through local surveillance for two or more consecutive weeks.
- Patients were eligible for enrollment if they:
 1. Were 6 months of age or older on September 1, 2016 (and therefore, eligible for vaccination);
 2. Reported ARI with cough and onset of seven days or earlier; and
 3. Had not been treated with influenza antiviral medication during this illness.
- Patients were interviewed to collect demographic data, general and current health status, symptoms, and 2016-2017 influenza vaccination status.
- Respiratory specimens were collected from each patient using nasal and oropharyngeal swabs.
- Specimens were tested at U.S. Flu VE Network laboratories using CDC's real-time reverse transcription polymerase-chain reaction (rRT-PCR) protocol.

Data:

- Among the 3,144 children and adults with ARI enrolled at the five study sites from November 28, 2016 through February 4, 2017, 744 (24%) tested positive for influenza virus by rRT-PCR.
 - 656 (88%) of these viruses were influenza A,
 - and 90 (12%) were influenza B viruses
- Among 606 subtyped influenza A viruses, 595 (98%) were A (H3N2) viruses.

Background:

- Each influenza season since 2004-2005, CDC has estimated the effectiveness of seasonal influenza vaccine to prevent influenza-associated, medically attended, acute respiratory illness (ARI).
- How well the flu vaccine works can vary by season, virus type/subtype, the kind of vaccine, and age and other host factors of the people being vaccinated.
- Two factors play an important role in determining the likelihood that flu vaccines will protect a person from flu illness: 1) characteristics of the person being vaccinated (such as their age and health), and 2) the similarity or "match" between the flu viruses in the vaccine and those spreading in the community.
- During years when the viruses in the flu vaccine and circulating flu viruses are well matched, it's possible to measure substantial benefits from flu vaccination in terms of preventing flu illness.

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- However, even during years when the vaccine match is good, the benefits of flu vaccination will vary across the population, depending on host factors like the health and age of the person being vaccinated and even potentially which flu vaccine was used. The substantial burden of flu-associated illness and death in the United States combined with the overall evidence from a variety of studies showing that flu vaccines do offer protection against flu illness support the current U.S. flu vaccination recommendations.
- A flu vaccination does not guarantee protection against the flu. Some people who get vaccinated might still get sick. However, people who get a flu vaccine are less likely to get sick with flu than someone who does not get vaccinated.