

CDC Influenza Division Key Points

February 2, 2018

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Summary Key Points

- Seasonal influenza activity in the United States increased again in this week's FluView report.
- Puerto Rico and 48 states continue to report widespread geographic activity this week. (Oregon went from widespread to regional geographic activity.)
- While flu activity appears to be declining along the West coast, overall, influenza-like-illness increased again nationally.
- The proportion of people seeing their health care provider for influenza-like-illness (ILI) increased from last week's report (from 6.6% to 7.1%); New York City, the District of Columbia, and 42 states (up from 39 states) experienced high ILI activity.
- This is higher than ILI peaks seen during recent H3N2 seasons and actually the highest level of ILI recorded since the 2009 H1N1 pandemic, which peaked at 7.7% ILI.
- This is the 10th week that ILI has been at or above the national baseline.
- By this measure, the past five seasons have averaged 16 weeks, with the longest season lasting 20 weeks.
- It's likely there will be significant flu activity for many weeks to come.
- Flu activity indicators are notable for the sheer volume and intensity of flu that is occurring in most of the country at the same time.
- The timing and rate of increase this season was similar to what was seen during the 2012-2013 and 2014-2015 seasons, but ILI is now higher than it was at the peak of those two seasons (7.1% versus 6%).
- It's difficult to say how severe this season will be, but at this time hospitalization rates have surpassed what was reported during the same week in 2014-2015. The 2014-2015 season was a high severity H3N2-predominant season.
- The highest hospitalization rate is among people 65 years and older (226.8 per 100,000). This age group always has the highest hospitalization rate; higher than

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the 214/100,000 rate that was reported for people 65 and older for 2014-15 during the same week.

- If this current trend in hospitalization rates is maintained through the season, it is possible that the number of flu hospitalizations may well exceed 710,000, which is the high end of the estimated hospitalizations that have occurred in the United States since 2010.
- The proportion of deaths attributed to pneumonia and influenza (P & I) is above the epidemic threshold, which means that more deaths are occurring due to pneumonia and influenza that would be expected at this time.
- P & I has been above the epidemic threshold for 4 weeks.
- Another 17 flu-related pediatric deaths were reported this week (one of which occurred during the 2015-2016 season) bringing the total number of flu-related pediatric deaths reported to CDC so far to 53.
- Influenza A(H3N2) viruses continue to predominate but the proportion of influenza B viruses is increasing slightly.
- H3N2-predominant seasons have been associated with more severe illness especially among people older than 65 years and children.
- Vaccine effectiveness (VE) against H3N2 viruses in the past has also been relatively low. Effectiveness against H1N1 and influenza B viruses has been better.
- The relatively lower vaccine effectiveness seen against H3N2 viruses may, in part, be caused by egg-adapted changes introduced when H3N2 viruses are optimized for growth in eggs, which is required for the egg-based production used to produce most U.S. flu vaccines.
- CDC recommends a 3-pronged strategy to fight flu. 1. Take time to get a flu vaccine. 2, Take everyday preventive actions, including staying away from sick people, and 3, Take antiviral drugs if your doctor prescribes them.
- It's not too late to get vaccinated.
- As long as flu viruses are circulating, vaccination should continue throughout the flu season, even in January or later even though protection against H3N2 viruses is typically lower than against other flu viruses.
- There are many reasons to get a flu vaccine.
 1. While flu vaccine can vary in how well it works, it is the best way to prevent flu illness and serious flu complications, including those that can result in hospitalization.
 2. We cannot know which viruses will circulate over the season and which virus will predominate. Flu vaccine protects against three or four different flu viruses, depending on which vaccine you get.
 3. A [2017 study](#) was the first of its kind to show that [flu vaccination can significantly reduce a child's risk of dying from influenza](#).
 4. Getting vaccinated yourself protects people around you, including those who are more vulnerable to serious flu illness, like babies and young children, older people, and people with certain chronic health conditions.

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5. While flu vaccine is not perfect and some people who get vaccinated may still get flu, there is some data to suggest that flu vaccination may make illness milder.
 - While flu vaccine is the best way to prevent flu, influenza antiviral drugs are a second line of defense that can be used to treat flu illness.
 - Most people who are otherwise healthy and get the flu do not need to be treated with antiviral drugs, but some people are more likely to get very sick, especially the very young, the very old, pregnant women, and those with medical conditions that put them at high risk for developing severe infection.
 - CDC recommends prompt treatment with flu antiviral drugs for people who are very sick with flu symptoms or people who are at high risk of developing serious flu complications when they get flu symptoms.
 - The volume of flu the country is experiencing right now has led to spot shortages of flu vaccine, antiviral drugs and even tests to quickly diagnose flu.
 - People may need to be persistent to locate vaccine, antiviral drugs to fill a prescription.

Flu & Sepsis

- Also important to note, flu infection can be associated with sepsis, even in otherwise healthy people, and that is a life-threatening condition.
- CDC has received reports from some state health departments of flu deaths associated with sepsis this season.
- A recent CDC study found that 30% of pediatric death reports included sepsis listed as a complication.
- More information about sepsis can be found at <https://www.cdc.gov/sepsis/index.html>

Vaccine Availability

- Manufacturers report having shipped more than 152.1 million doses of flu vaccine as of January 12, 2018.
- The total projected supply of vaccine in the United States this season is between 151 million and 166 million doses of flu vaccine. About 119 million doses will be quadrivalent vaccine.

For Patients:

CDC continues to recommend flu vaccination as the first line of defense against the flu. While some individual providers may be running low on flu vaccine at this point in the season, flu vaccine is available from a variety of providers throughout the country. Call your doctor, or use the [flu vaccine finder](#) to find where vaccine is available in your community.

For Providers:

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Flu vaccine is available, but providers may not be able to get every brand and/or presentation, and they may have to purchase from a different source. Providers interested in purchasing vaccine should check the influenza vaccine tracking availability system (IVATS) available at: <https://www.izsubmitpartners.org/ivats/>.

Antiviral Supply

- CDC is in regular contact with influenza antiviral manufacturers regarding supply and other issues.
- Some manufacturers are reporting delays in filling orders and CDC is aware of spot shortages of antiviral drugs specifically for oseltamivir suspension and generic oseltamivir capsules in some places experiencing high influenza activity.
- CDC is working with manufacturers to address any existing gaps in the market.
- Additionally, pharmacists should consider compounding oseltamivir suspension by using oseltamivir 75 mg capsules if suspension is not readily available for patients that need it.
- Pharmacies and others attempting to make bulk purchases of influenza antiviral drugs may need to call more than one distributor or manufacturer to locate medications available for purchase in the short term. CDC has updated its antiviral drug supply web page with manufacturer information for inquires related to antiviral purchases/availability.
- Individual patients seeking to fill an influenza antiviral prescription may want to call ahead to make sure their pharmacy has product on the shelf to fill their prescription. It may be necessary to call more than one pharmacy to locate these medications.
- Antiviral drugs work better the earlier you begin taking them so prompt action is important.
- For people who have flu and are at high risk of serious flu complications, treatment with an antiviral drug can mean the difference between having a milder illness and having a very serious illness that could result in a hospital stay.

Supply of Flu Tests & Testing Guidance

- CDC has received reports of spot shortages of some influenza tests, including Rapid Influenza Diagnostic Tests (RIDTs) and Reverse Transcription-Polymerase Chain Reaction (RT-PCR).
- These reports coincide with an ongoing intense and widespread seasonal influenza epidemic, during which spot shortage of flu vaccines and influenza antiviral medications also have been observed.
 - RIDTs are tests that can identify the presence of influenza A and B viral nucleoprotein antigens in respiratory specimens, and display the result.
 - While RIDTs can be important for diagnosis and treatment, how well they work can vary dramatically based on a number of factors.

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- Reverse Transcription-Polymerase Chain Reaction (RT-PCR) and other molecular assays can identify the presence of influenza viral RNA in respiratory specimens.
 - These test are generally much more reliable and are recommended by CDC for use on hospitalized patients.
- According to CDC guidance, testing is not needed for all patients with signs and symptoms of influenza to make antiviral treatment decisions.
- Once influenza activity has been documented in the community or geographic area, a clinical diagnosis of influenza can be made for outpatients with signs and symptoms consistent with suspected influenza, especially during periods of peak influenza activity in the community.
- Guidance for Clinicians on the Use of RT-PCR and Other Molecular Assays for Diagnosis of Influenza Virus Infection is available at <https://www.cdc.gov/flu/professionals/diagnosis/molecular-assays.htm> .
- Guidance on the use of RIDTs is available at https://www.cdc.gov/flu/professionals/diagnosis/clinician_guidance_ridt.htm .

Influenza Treatment: Antiviral Medications

- Antiviral drugs are prescription medicines (pills, liquid or an inhaled powder) and are not available over the counter.
- Influenza antiviral drugs are the only drugs approved to treat influenza infection.
- Antiviral drugs are different from antibiotics. Antiviral drugs fight viruses (like flu viruses) in your body; antibiotics fight infections in your body that are caused by bacteria.
- Antiviral drugs can make flu illness milder and shorten the time you are sick.
- There also are data showing that antiviral drugs may prevent serious flu complications such as pneumonia and hospitalizations in outpatients, and reduce mortality and length of stay in hospitalized patients.
 - For example, in 2015, a CDC study found that early treatment of flu-hospitalized people 65 and older with flu antiviral medications cut the duration of their hospital stay and reduced their risk of needing extended care after discharge.
 - This study entitled “Impact of Prompt Influenza Antiviral Treatment on Extended Care Needs After Influenza Hospitalization Among Community-Dwelling Older Adults” by Sandra Chaves et al. is available from the Clinical Infectious Diseases journal website at <http://cid.oxfordjournals.org/content/early/2015/09/01/cid.civ733> .
- Antiviral drugs work best when started within two days of symptoms first appearing, but there are data to suggest they can still be beneficial in very ill patients even up to five days after getting sick. This would be especially important for a person who is at high risk of serious flu complications and who is very sick.
- Three FDA-approved influenza antiviral drugs are recommended for use in the United States during the 2017-2018 influenza season: oseltamivir (Tamiflu®) and

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generic formulations), zanamivir (Relenza®), and peramivir (Rapivab®). Generic formulations of oseltamivir became available commercially last season.

- Antiviral drugs are not a substitute for getting a flu vaccine. The flu vaccine is the best way modern medicine currently has to prevent this potentially serious disease.
- See [Influenza Antiviral Medications: Summary for Clinicians](#) on the CDC web site for additional information.

Antiviral Side Effects Summary

- With all medications there are reported side effects:

Oral oseltamivir

- This medication can be used for treatment of people of all ages
- Adverse reactions to oseltamivir include nausea, vomiting and headache.
- There have also been some post-marketing reports of serious skin reactions and sporadic, transient neuropsychiatric events.

Inhaled zanamivir

- This drug can be used for treatment in those 7 years and older; however it isn't recommended for use in people with underlying respiratory diseases (e.g., asthma, COPD), nor is it recommended for patients hospitalized with influenza
- Zanamivir can be used for chemo-prophylaxis of those 5 years and older; however they shouldn't use it if they have underlying respiratory diseases (e.g., asthma, COPD)
- Allergic reactions have been reported to throat or facial swelling and a skin rash.
- Some adverse reactions to zanamivir include bronchospasm, especially in the setting of underlying airways disease; sinusitis, dizziness, and ear, nose and throat infections.
- There were some post-marketing reports of serious skin reactions and sporadic, transient neuropsychiatric events

Intravenous peramivir

- This drug can be used for treatment of those 2 years and older
- Some adverse reactions to peramivir include diarrhea.
- There were some post-marketing reports of serious skin reactions and sporadic, transient neuropsychiatric events

For more information on safety, effectiveness and dosing for oral oseltamivir, inhaled zanamivir, and intravenous peramivir, visit the Food and Drug Administration (FDA) website <https://www.fda.gov/Drugs/DrugSafety/> and/or consult the product package inserts.

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Communications Activities

- On December 27, 2017, CDC issued a Health Advisory (<https://emergency.cdc.gov/han/han00409.asp>) through the Health Alert Network, providing notice about 1) increased influenza A(H3N2) activity and its clinical implications, 2) a summary of influenza antiviral drug treatment recommendations, 3) an update about approved treatment drugs and supply this season, and 4) background information for patients about influenza treatment.
- The transcript for a January 12, 2018, is available at <https://www.cdc.gov/media/releases/2018/t0112-widespread-flu-activity.html>.
- The video of a January 16, 2017, Public Health Grand Rounds on the influenza is available at <https://www.cdc.gov/cdcgrandrounds/archives/2018/January2018.htm>.
- A transcript for a telebriefing held on January 26, 2018 is available at <https://www.cdc.gov/media/releases/2018/t0126-flu-update-activity.html>.
- On Friday, February 2, 2018, a telebriefing was held. A transcript will be available at <https://www.cdc.gov/media/index.html>.

Vaccine Effectiveness

- While vaccine effectiveness can vary, a study that pooled influenza vaccine effectiveness estimates from 2007 to 2015 by virus type and subtype found that:
 - Multi-year pooled vaccine effectiveness against influenza B viruses was 54%;
 - Multi-year pooled vaccine effectiveness against influenza A(H1N1)pdm09 viruses was 61%;
 - Multi-year pooled vaccine effectiveness against H3N2 viruses was 33%.
 - Belongia EA, Simpson, MD, King JF, Sundaran ME, Kelley NS, Osterholm MT, McLean HQ. [Variable influenza vaccine effectiveness by subtype: a systematic review and meta-analysis of test-negative design studies](#). Lancet Infect Dis. 2016; 16(8):942-51.
- It is important to note that during seasons when the majority of circulating viruses are very different from a vaccine virus, vaccine effectiveness can be further reduced.
- Two types of genetic changes can impact the similarity between a vaccine virus and circulating seasonal viruses.
 1. Influenza viruses constantly undergo small genetic changes. These genetic changes can sometimes result in antigenic changes. This is called "**antigenic drift.**" (Circulating viruses "drift" away from what is included in the vaccine.)
 - For more information on antigenic changes, see CDC's Antigenic Characterization page at <https://www.cdc.gov/flu/professionals/laboratory/antigenic.htm>.
 2. Another type of change that can happen is that genetic changes occur when influenza viruses are grown in eggs, which is required for most U.S. flu vaccines.

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- These genetic changes (called **"egg-adapted"** changes) may have antigenic (or immunogenic) implications that may impact how well the vaccine works.
- Egg-adapted changes that are associated with antigenic changes occur more often in H3N2 viruses.
- The lower vaccine effectiveness seen against H3N2 viruses during seasons when no antigenic drift has occurred may, in part, be caused by egg-adapted changes.
- Most U.S. flu vaccines are produced using egg-based technology.
- There are two flu vaccines in the United States that are not grown in eggs: recombinant influenza vaccine ([Flublok](#)) and cell-grown influenza vaccine ([Flucelvax](#)).
 - Recombinant vaccine is made by growing a certain protein from a naturally occurring ("wild type") recommended vaccine virus in insect cells.
 - This season, Flucelvax is being made using a cell-grown H3N2 candidate vaccine virus for the first time.
 - Previously Flucelvax had been produced using cell-based technology but with candidate vaccine viruses isolated in eggs per FDA regulatory requirements.
 - On August 31, 2016, FDA approved the use of cell-isolated candidate vaccine viruses in the production of Flucelvax, the only licensed cell-based flu vaccine in the United States.
- For recombinant and cell-grown vaccines, the H3N2 components are genetically more similar to circulating H3N2 viruses than the egg-adapted viruses recommended for egg-based manufacturing.
- At this time there is insufficient data to determine whether cell-based or recombinant vaccine are more effective than egg-based vaccine.
- Additional data is needed (including vaccine effectiveness data) before policy decisions on this topic could be considered.

Canadian Study of Vaccine Effectiveness

- CDC conducts vaccine effectiveness studies each season.
- For the current season, CDC will collect finalized data from its 5 U.S. vaccine effectiveness (VE) network study sites in early February, 2018 and analyze that data with results expected in mid-February.
- A study in Canada this season showed that VE against H3N2 is lower than observed last season in Canada and the U.S., and lower than what would be expected in the absence of significant antigenic drift. VE against influenza B is better, which is consistent with expectations.
- It's possible that we could see similar estimates in the U.S.
- Sometimes Canadian and U.S. VE estimates have been similar; during other seasons they have differed.

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- H3N2 viruses are notoriously problematic and vaccine effectiveness against these viruses is always lower than for other vaccine viruses.
- There are a number of possible reasons for the intense flu season and why we might see lower than expected VE; these are the focus of ongoing investigation.
 - Reasons could include host factors (how a person responds to vaccine or infection); the virus (and changes in viruses over time) and the difficulties with H3N2 vaccine viruses.
 - We are looking into all these possibilities.
- Yearly monitoring of VE is critical so that we can identify vaccine issues that need to be understood and corrected.
- These findings underscore the need for better flu vaccines, but also highlight the need for more scientific data to help guide efforts to improve flu vaccines.

FluView Activity Update (Key Flu Indicators)

Influenza activity increased again according to the latest FluView report. All U.S. states but Hawaii and Oregon continue to report widespread flu activity and the number of states experiencing high influenza-like illness (ILI) activity increased from 39 states plus New York City and Puerto Rico to 42 states plus New York City and the District of Columbia. At 7.1 percent, influenza-like-illness (LI) is approaching the 7.7% peak of the 2009 pandemic. The overall hospitalization rate is higher than overall hospitalization rate reported during the same week of the 2014-2015 season, the most severe season in recent years. CDC also is reporting an additional 17 flu-related pediatric deaths during week 4, including one of which occurred during the 2015-2016 season, bringing the total number of flu-related pediatric deaths reported this season to 53 so far. Flu activity is likely to remain elevated for several more weeks.

CDC continues to recommend influenza vaccination for all persons 6 months of age and older as flu viruses are likely to continue circulating for weeks. In addition, in the context of widespread influenza activity, CDC is reminding clinicians and the public about the importance of antiviral medications for prompt treatment of influenza with antiviral medications in people who are severely ill and people who are at high risk of serious flu complications who develop flu symptoms. Below is a summary of the key flu indicators for the week ending January 27, 2018 (week 4):

- **Influenza-like Illness Surveillance:** For the week ending January 27, the proportion of people seeing their [health care provider](#) for influenza-like illness (ILI) was 7.1%, which is above the national baseline of 2.2% and is the highest ILI percentage recorded since the 2009 pandemic. All 10 regions reported a proportion of outpatient visits for ILI at or above their region-specific baseline levels. ILI has been at or above the national baseline for 10 weeks so far this season. Over the past five seasons, ILI has remained at or above baseline for 16 weeks on average.

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- Additional ILINet data, including national, regional, and select state-level data for the current and previous seasons, can be found at <http://gis.cdc.gov/grasp/fluview/fluportaldashboard.html>.
- **Influenza-like Illness State Activity Indicator Map:** New York City, the District of Columbia, and 42 states experienced high ILI activity (Alabama, Alaska, Arizona, Arkansas, Colorado, Connecticut, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Vermont, Virginia, West Virginia, Wisconsin, and Wyoming). Puerto Rico and two states (California and Idaho) experienced moderate ILI activity. Three states experienced low ILI activity (Delaware, North Dakota and Washington). Three states experienced minimal ILI activity (Maine, Montana, and Utah).
 - Additional data, including data for previous seasons, can be found at <https://gis.cdc.gov/grasp/fluview/main.html>
- **Geographic Spread of Influenza Viruses:** Widespread influenza activity was reported by Puerto Rico and 48 states (Alabama, Alaska, Arizona, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, and Wyoming). Regional influenza activity was reported by Guam and one state (Oregon). Local influenza activity was reported by the District of Columbia and one state (Hawaii). Sporadic activity was reported by the U.S. Virgin Islands. Geographic spread data show how many areas within a state or territory are seeing flu activity.
 - Additional data are available at: <https://gis.cdc.gov/grasp/fluview/FluView8.html>.
- **Flu-Associated Hospitalizations:** Since October 1, 2017, 14,676 laboratory-confirmed influenza-associated hospitalizations have been reported through the Influenza Hospitalization Network (FluSurv-NET), a population-based surveillance network for laboratory-confirmed influenza-associated hospitalizations. This translates to a cumulative overall rate of 51.4 hospitalizations per 100,000 people in the United States.
 - The highest hospitalization rate is among people 65 years and older (226.8 per 100,000), followed by adults aged 50-64 years (54.0 per 100,000), and younger children aged 0-4 years (33.3 per 100,000). During most seasons,

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adults 65 years and older have the highest hospitalization rates, followed by children 0-4 years.

- During 2014-2015, hospitalization rates reported during week 4 for all ages were 43.5 per 100,000. During that same week, hospitalization rates for people 65 years and older were 213.8 per 100,000. Hospitalization rates for younger children 0-4 years were 40.2 per 100,000.
- 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. Additional data, including hospitalization rates during other influenza seasons, can be found at <http://gis.cdc.gov/GRASP/Fluview/FluHospRates.html> and <http://gis.cdc.gov/grasp/fluview/FluHospChars.html>.

▪ **Mortality Surveillance:**

- The [proportion of deaths](#) attributed to pneumonia and influenza (P&I) sharply increased again to 9.7% for the week ending January 13, 2018 (week 2). This percentage is above the epidemic threshold of 7.2% for week 2 in the National Center for Health Statistics (NCHS) Mortality Surveillance System.
- Region and state-specific data are available at <https://gis.cdc.gov/grasp/fluview/mortality.html>.

▪ **Pediatric Deaths**

- 17 influenza-associated pediatric deaths were reported to CDC during week 4.
 - Five deaths were associated with an influenza A(H3) virus and occurred during weeks 1, 2, 3, and 4 (the weeks ending January 6, January 13, January 20, and January 27, 2018). Two deaths were associated with an influenza A(H1N1)pdm09 virus and occurred during weeks 3 and 4 (the weeks ending January 20, 2018, and January 27, 2018, respectively). Four deaths were associated with an influenza A virus for which no subtyping was performed and occurred during weeks 3 and 4. Five deaths were associated with an influenza B virus and occurred during weeks 1, 3, and 4 (the week ending January 6, January 20, and January 27, 2018, respectively).
- A total of 53 influenza-associated pediatric deaths for the 2017-2018 flu season have been reported to CDC.
 - One influenza-associated pediatric death that occurred during the past 2015-2016 flu season was reported to CDC during week 4.
 - This death was associated with an influenza A virus for which no subtyping was performed and occurred during week 28 (the week ending July 16, 2016). This death brings the total number of reported influenza-associated deaths occurring during that season to 93.

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Additional information on pediatric deaths is available on FluView Interactive at: <https://gis.cdc.gov/GRASP/Fluview/PedFluDeath.html>.

▪ **Laboratory Data:**

- Nationally, the percentage of [respiratory specimens](#) testing positive for influenza viruses in clinical laboratories during the week ending January 27 was 26.1%.
- Regionally, the three week average percent of specimens testing positive for influenza in clinical laboratories ranged from 18.3% to 32.3%.
- During the week ending January 27, of the 15,427 (26.1%) influenza-positive tests reported to CDC by clinical laboratories, 11,792 (76.4%) were influenza A viruses and 3,635 (23.6%) were influenza B viruses.
- The most frequently identified influenza virus subtype reported by public health laboratories was influenza A(H3N2) virus.
- During the week ending January 27, 1,280 (80.2%) of the 1,597 influenza-positive tests reported to CDC by public health laboratories were influenza A viruses and 317 (19.8%) were influenza B viruses. Of the 1,206 influenza A viruses that were subtyped, 1,017 (84.3%) were H3N2 viruses and 189 (15.7%) were (H1N1)pdm09 viruses.
- The majority of the influenza viruses collected from the United States during October 1, 2017 through January 27, 2018 were characterized antigenically and genetically as being similar to the cell-grown reference viruses representing the 2017–18 Northern Hemisphere influenza vaccine viruses.
- Since October 1, 2017, CDC has tested 282 influenza A(H1N1)pdm09, 828 influenza A(H3N2), and 337 influenza B viruses for resistance to antiviral medications (i.e. oseltamivir, zanamivir, or peramivir). While the majority of the tested viruses showed susceptibility to the antiviral drugs, two (0.7%) H1N1pdm09 viruses were resistant to both oseltamivir and peramivir, but was sensitive to zanamivir.

[FluView \(http://www.cdc.gov/flu/weekly/fluactivitysurv.htm\)](http://www.cdc.gov/flu/weekly/fluactivitysurv.htm) is available – and past issues are [archived \(http://www.cdc.gov/flu/weekly/pastreports.htm\)](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 2017 [Pediatric Deaths](#)-2018 season can be found on the current [FluView\(http://www.cdc.gov/flu/weekly/\)](http://www.cdc.gov/flu/weekly/) and FluView Interactive (<https://www.cdc.gov/flu/weekly/fluviewinteractive.htm>).

Pediatric Deaths

- Seventeen influenza-associated pediatric deaths were reported to CDC during week 4 of the 2017-2018 season, one of which occurred during the 2015-2016 season.
- Five deaths were associated with an influenza A(H3) virus occurred during weeks 1, 2, 3, and 4 (the weeks ending January 6, January 13, January 20, and January 27, 2018, respectively).

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- Two deaths were associated with an influenza A(H1N1)pdm09 virus and occurred during weeks 3 and 4 (the weeks ending January 20, 2018, and January 27, 2018, respectively).
- Four deaths were associated with an influenza A virus for which no subtyping was performed and occurred during weeks 3 and 4.
- Five deaths were associated with an influenza B virus and occurred during weeks 1, 3, and 4 (the week ending January 6, January 20, and January 27, 2018, respectively).
- A total of 53 influenza-associated pediatric deaths have been reported for the 2017-2018 season.
- Since 2004, when pediatric deaths associated with influenza infection became nationally notifiable, the number of deaths reported to CDC each year has ranged from 37 (2011-2012 season) to 171 deaths (2012-2013 season).
- Last season, 2016-2017, 110 influenza-associated pediatric deaths were reported to CDC.
- During past seasons, approximately 80% of flu-associated deaths in children have occurred in children who were not vaccinated. Based on available data, this remains true for the 2017-2018 season, as well.
- Since the 2010-2011, between 43.8% to 59% of pediatric deaths occurred in children who were otherwise healthy and didn't have an underlying medical condition.
- Because of confidentiality issues, CDC does not discuss or give details on individuals.
- These deaths are a somber reminder of the danger flu poses to children.
- The single best way to protect against seasonal flu and its potentially severe consequences in children is to get a seasonal flu vaccine each year.
- Vaccination is important for children younger than 5 years. It is especially important for those younger than 2 years 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 2 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.

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- 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 2017-2018 flu season will be updated each week and can be found at www.cdc.gov/flu/weekly/ and <https://gis.cdc.gov/GRASP/Fluview/PedFluDeath.html>.