

CDC Influenza Division Summary & Technical Key Points

October 25, 2018

Summary Key Points

- *In the United States last season, CDC estimates that flu:*
 - *Killed 79,000 people; more than 600 of whom were children*
 - *Hospitalized 960,000 people, and*
 - *Sickened 49 million people.*
- *We know a flu vaccine can reduce the risk of flu illnesses, hospitalizations and deaths.*
- *But this week [CDC reported](#) concerning data suggesting that flu vaccine coverage in adults last season fell by more than 6 percentage points. This means that last season fewer than 4 out of 10 adults in the U.S. were vaccinated against flu.*
- *Flu activity is low right now, but last week we reported the first pediatric flu death of the 2018-2019 season and flu activity is expected to increase in the coming weeks.*
- *CDC recommends that everyone 6 months and older get vaccinated now.*
- *There are many flu vaccine options. As of October 12, 2018, more than 132 million doses of flu vaccine had already been distributed.*
- *Visit www.cdc.gov/flu for more information.*

Technical Key Points

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Call to Action for 2018-2019

- We have updated flu vaccine and many vaccine options. Get vaccinated!
- CDC recommends a yearly flu vaccine as the best way to protect against influenza and its potentially serious complications.
- There are many **benefits of flu vaccination**.
 - Flu vaccination can keep you from getting sick with flu.
 - Flu vaccination can reduce your risk of flu-associated hospitalization.
 - Flu vaccine can be life-saving in children.
 - Vaccination helps protect women during and after pregnancy and can protect the baby from flu illness for several months after birth.

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- Most recently, a paper published in Clinical Infectious Diseases on October 11, 2018 showed that over the course of six flu seasons, getting a flu shot reduced a pregnant woman's risk of being hospitalized from flu by an average of 40 percent.
- Flu vaccination helps prevent serious medical events associated with some chronic conditions (heart and lung disease, diabetes).
 - Vaccination can reduce the risk of heart attack in people with heart disease.
 - Flu vaccination also has been shown in separate studies to be associated with reduced hospitalizations among people with diabetes and chronic lung disease.
- Flu vaccination prevents millions of flu illnesses and doctors' visits and tens of thousands of hospitalizations each season.
- Some people who get vaccinated do get sick, but vaccination has been shown to make illness less severe.
 - A 2017 study showed that flu vaccination reduced deaths, intensive care unit (ICU) admissions, ICU length of stay, and overall duration of hospitalization among hospitalized flu patients.
 - A 2018 study showed that among adults hospitalized with flu, vaccinated patients were 59 percent less likely to be admitted to the ICU than those who had not been vaccinated. Among adults in the ICU with flu, vaccinated patients on average spent 4 fewer days in the hospital than those who were not vaccinated.
- More detailed information on flu vaccine benefits can be found at <https://www.cdc.gov/flu/prevent/vaccine-benefits.htm>.
- Flu vaccines this season have been updated to match the viruses research suggest will be most common.
- There are [many different flu vaccine options](#), including nasal spray flu vaccine.
 - Other options include high dose and adjuvanted vaccine for people 65 and older.
 - While there are many different flu viruses, flu vaccines protect against the 3 or 4 viruses that research suggests will be most common.
 - Get vaccinated by the end of October.
- Manufacturers have projected that as many 163 million to 168 million doses of flu vaccine will be available in the United States this season; as of October 12, 2018, more than 132 million doses of flu vaccine had already been distributed.
- For the latest information on flu vaccine supply, including regular updates on the number of influenza vaccine doses distributed, visit <https://www.cdc.gov/flu/about/qa/index.htm>.
- It is not possible to predict what this flu season will be like.
- While flu spreads every year, the timing, severity, and length of the season varies from one season to another.
- We do know that flu season is coming and we will likely have co-circulation of H1N1, H3N2 and B flu viruses and that flu vaccines offer important protection against all of these.

2017-2018 Flu Burden Estimates

- Influenza burden is the number of flu-associated illnesses, medical visits, hospitalizations, and deaths that are estimated to have occurred in the U.S. in a given season.
- Each year CDC estimates the burden of influenza in the United States using mathematical modeling.
- Modeling is used to estimate the burden of flu for several reasons, including:

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- Many people who become sick with flu recover in a few days and do not seek medical care and so their illness is not captured by any of CDC's surveillance systems.
- People who do seek medical care often do so later in their illness when the disease can no longer be detected by most flu tests and so they will not be diagnosed as flu-positive.
- Many flu statistics, such as adult deaths and hospitalizations, go unreported to CDC because states are not required to report individual seasonal flu cases or hospitalizations for people of any age; and are only required to report deaths for children younger than 18 years of age.
- Existing U.S. national influenza surveillance data are used to estimate the number of outcomes (e.g., influenza cases, medically attended illnesses and hospitalizations and deaths that occur during a season).
- An explanation of how the model works is available online at (<https://www.cdc.gov/flu/about/burden/how-cdc-estimates.htm>).
- CDC uses the estimates of the burden of influenza in the population to inform policy and communications related to influenza.
- On Oct. 26, 2018, CDC released its estimates for the 2017-2018 season.
- The report is available online at <https://www.cdc.gov/flu/about/burden/estimates.htm>.
 - A summary table of estimates generated using this model from 2010-2011 to 2017-2018 is included.
- During 2017-2018, CDC estimates that about:
 - 49 million people got sick with flu.
 - CDC estimates that from 2010-2011 to 2017-2018, flu-related illnesses in the United States ranged from 9.3 million (2011-2012) to 49 million (2017-2018).
 - 960,000 were hospitalized because of flu.
 - CDC estimates that from 2010-2011 to 2017-2018, flu-related hospitalizations in the United States ranged from 140,000 (2011-2012) to 960,000 (2017-2018).
 - 79,000 people died from influenza.
 - CDC estimates that from 2010-2011 to 2017-2018, flu-related deaths in the United States ranged from 12,000 (2011-2012) to 79,000 (2017-2018).
- The burden of flu during the 2017-2018 flu season was higher than any season since the 2009 H1N1 pandemic.
- While the burden of flu is generally higher for the very old and very young, the 2017-2018 season saw infection, hospitalization, and mortality rates that were severe for all ages of the population.
 - During the 2017-2018 flu season, CDC estimates that there were 11.5 million cases of influenza in children, more than 30 million cases in working age adults (aged 18-64 years), and more than 7.3 million cases in adults aged 65 years and older.
 - While adults older than 65 accounted for nearly 70 percent of the estimated 960,000 influenza hospitalizations, 48,000 children younger than 18 (5 percent) were hospitalized because of the disease.
 - Older adults also accounted for 90 percent of influenza-associated deaths (or about 70,000 people) during the 2017-2018 flu season.

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- 183 pediatric influenza deaths were officially reported as having occurred during the 2017-2018 flu season, but the CDC estimates that the actual number of deaths associated with influenza in children was closer to 600, based on mathematical modeling.
- An estimated 10,300 deaths occurred in working age adults last season.

2017-2018 Flu Vaccine Coverage Estimates

- “Estimates of Influenza Vaccination Coverage among Adults—United States, 2017–2018 Flu Season” is available at <https://www.cdc.gov/flu/fluview/index.htm> .
- CDC estimates that for the 2017–18 season, just over 40% (41.7%) of the U.S. population 6 months and older got vaccinated against flu. This is a decrease of 5.1 percentage points since the previous season (46.8%).
- Flu vaccination coverage among adults decreased by 6.2 percentage points to 37.1%, compared with 43.3% in the 2016 and 2017 season.
- Despite being at the greatest risk of severe illness, hospitalization, and death, adults with high-risk conditions and adults age 65 and older had some of the most striking drops in coverage.
- **Coverage by Age and High-Risk Condition**
 - Among adults, every age group had a decline in flu vaccination coverage last season to the lowest levels since the 2010–11 season.
 - Flu vaccination coverage for 18–64 year olds was 31.1%, a 6.4 percentage point drop from the 2016–17 season (37.5%)
 - Flu vaccination coverage for 18–64 year olds with high-risk conditions was 38.8%, a 7.6 percentage point drop from the 2016–17 season (46.4%)
 - Flu vaccination coverage for 18–64 year olds without high-risk conditions was 28.8%, a 6.1 percentage point drop from the 2016–17 season (34.9%)
 - Flu vaccination coverage for 18–49 year olds was 26.9%, a 6.7 percentage point drop from the 2016–17 season (33.6%)
 - Flu vaccination coverage for 18–49 year olds with high-risk conditions was 31.3%, a 8.0 percentage point drop from the 2016–17 season (39.3%)
 - Flu vaccination coverage for 18–64 year olds without high-risk conditions was 26.1%, a 6.5 percentage point drop from the 2016–17 season (32.6%)
 - Flu vaccination coverage for 50–64 year olds was 39.7%, a 5.7 percentage point drop from the 2016–17 season (45.4%)
 - Flu vaccination coverage for adults 65 and older was 59.6%, a 5.7 percentage point drop from the 2016–17 season (65.3%)
- **Coverage by Race/Ethnicity**
 - Among adults:
 - Flu vaccination coverage for whites was 40.2%, a 5.7 percentage point drop from the 2016–17 season (45.9%)
 - Flu vaccination coverage for blacks was 32.3%, a 5.1 percentage point drop from the 2016–17 season (37.4%),
 - Flu vaccination coverage for Hispanics was 28.4%, an 8.5 percentage point drop from the 2016–17 season (36.9%),
- **Methods and Background**

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- CDC analyzed BRFSS data collected September 2017 through June 2018 from all 50 states and the District of Columbia to estimate national and state level flu vaccination coverage for the 2017–18 flu season.
- These findings were compared to 2016–17 flu season estimates.
- Estimates were also produced for Guam, Puerto Rico, and select local areas in the United States; these estimates are included as links within the online report.

MMWR Flu Activity Update May 20-October 13, 2018

On October 26, 2018, CDC published an MMWR report: ‘Update: Influenza Activity: United States and Worldwide, May 20 – October 13, 2018,’ available online at: <https://www.cdc.gov/mmwr/index.html>

Summary Key Points:

- *During May 20 – October 13, 2018:*
 - *There were low levels of flu activity in the United States associated with a mix of circulating influenza A and B viruses.*
 - *Seasonal flu activity in the Southern Hemisphere was low overall with influenza A(H1N1)pdm09 viruses predominating in many regions.*
 - *All 347 flu virus specimens from the United States and worldwide tested by CDC for resistance to the neuraminidase inhibitor antiviral medications were susceptible to the antiviral drugs oseltamivir, peramivir, and zanamivir.*
(<https://www.cdc.gov/flu/about/qa/antiviralresistance.htm>)
 - *Laboratory testing suggests that no significant antigenic drift has occurred since the Northern Hemisphere vaccine virus selection in February 2018.*
 - *A small number of influenza variant virus infections were reported in the United States, most were associated with exposure to swine.*
 - *Health care providers should urge their patients to get vaccinated by the end of October, if they have not already been vaccinated. Vaccination efforts should continue throughout the flu season.*

Expanded Key Points:

Flu Activity

United States

- During May 20 – October 13, 2018, there were low levels of flu activity in the United States, typical for this time of year, associated with a mix of circulating influenza A and B viruses.
 - Influenza B viruses were more commonly detected than influenza A viruses from May until mid-June, while influenza A predominated from late June onward.
 - Of the 442 seasonal influenza A viruses tested by public health laboratories, 400 (90.5%) were subtyped; 233 (58.3%) were influenza A(H1N1)pdm09 and 167 (41.8%) were influenza A(H3N2).
 - Of the 118 (81.4%) influenza B viruses for which lineage was determined, 94 (79.7%) belonged to the B/Yamagata/16/88 (B/Yamagata) lineage and 24 (20.3%) belonged to the B/Victoria lineage.

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- CDC received reports of a small number of influenza outbreaks during the summer, including domestic origin outbreaks and influenza virus infections identified in returning international travelers.
- Data obtained from the U.S. Outpatient Influenza-Like Illness Surveillance Network (ILINet) indicated that the weekly percentage of outpatient visits to health care providers for influenza-like illness (ILI) remained below the national baseline of 2.2%, ranging from 0.6% to 1.2%.
- Data from CDC's National Center for Health Statistics Mortality Surveillance System indicated that the percentage of deaths attributed to pneumonia and influenza remained below the epidemic threshold.
- Of the 183 influenza-associated pediatric deaths reported to CDC that occurred during the 2017-18 season, 5 occurred during May 20 – September 29, 2018.
- The first influenza-associated pediatric death occurring during the 2018-19 season was reported to CDC in mid-October 2018.
- CDC recommends that everyone 6 months and older who does not have a contraindication get vaccinated by the end of October. More information regarding CDC recommendations for the 2018-2019 flu season is available online:
<https://www.cdc.gov/flu/about/season/current.htm>

Antiviral Resistance

- CDC tested 347 flu virus specimens collected between May 20 – October 13, 2018, from the United States and worldwide for resistance to the neuraminidase inhibitor antiviral medications currently approved for use against seasonal influenza: oseltamivir, peramivir, and zanamivir.
 - Among 116 influenza A(H1N1)pdm09 viruses (68 international and 48 U.S.) tested, all were susceptible to all 3 medications.
 - Among 36 influenza A(H3N2) viruses (0 international and 36 U.S.) tested, all were susceptible to all 3 medications.
 - Among 73 influenza B viruses (31 international and 42 U.S.) tested, all were susceptible to all 3 medications.
- More information about antiviral drug resistance is available online:
<https://www.cdc.gov/flu/about/qa/antiviralresistance.htm>

Worldwide

- Influenza data reported to the WHO Global Influenza Surveillance and Response System (GISRS) indicate that overall, Southern Hemisphere influenza activity has been relatively low and fairly mild, with influenza A(H1N1)pdm09 viruses predominating in most regions.
 - In temperate climate South American countries, influenza activity began to increase in mid-May and peaked in August. Influenza A(H3N2) predominated in Chile and Paraguay.
 - In temperate Southern Africa, influenza activity increased in April and peaked in June, with A(H1N1)pdm09 predominating. A second, ongoing wave of elevated

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activity in Southern Africa of mostly influenza B began in late August and peaked in September.

- Influenza activity in Australia and New Zealand was below seasonal threshold with A(H1N1)pdm09 virus predominating.
- Influenza activity in regions with more tropical climates (Central America and the Caribbean, tropical South America, Southern Asia and Southeast Asia) was more variable, but with A(H1N1)pdm09 virus predominating in most countries.
- There was co-circulation of influenza A(H1N1)pdm09, A(H3N2), and B viruses in Eastern Africa as well as co-circulation of influenza A(H1N1)pdm09 and A(H3N2) viruses in Southern Asia.

Variant Flu

- When an influenza virus that normally infects pigs is found in people, it is called a variant influenza virus and is designated with the letter “v” after the subtype.
- During May 20 – October 13, 2018, there were fourteen reports of influenza variant virus infections in the United States—fewer compared to the same period during most previous years.
 - Most of these reported variant virus infections were associated with exposure to swine.
 - While limited human-to-human transmission may have occurred in one instance, no ongoing community transmission was identified.
- CDC recommendations on the topic of variant viruses remain the same.
 - Vulnerable populations, especially young children and other persons at high risk for serious flu complications (https://www.cdc.gov/flu/about/disease/high_risk.htm) should avoid swine barns at agricultural fairs, or close contact with swine.
 - Health care providers should consider novel influenza virus infections in persons with influenza-like illness and swine exposure.
- More information about variant flu is available at:
<https://www.cdc.gov/flu/swineflu/index.htm>

Key Flu Indicators

- The first FluView of the 2018-2019 season was published on October 12, 2018.
- FluView is published weekly on Fridays throughout the season at <https://www.cdc.gov/flu/weekly/fluactivitysurv.htm>.
- All key flu indicators are low at this time.
- Influenza-like-illness activity is below baseline for all reporting U.S. states and territories.
- Forty states, the U.S. Virgin Islands and the District of Columbia are reporting sporadic flu activity.
- Influenza A(H1N1)pdm09, A(H3N2) and influenza B viruses are co-circulating.
- In recent weeks, H1N1 viruses have been most common.

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- The first flu-associated pediatric death occurring during the 2018-2019 season was reported by CDC on October 19. (Last season, the total number of flu deaths in children reported to CDC was 183.)

Flu-related Pediatric Death

- The first flu-associated pediatric death occurring during the 2018-2019 flu season was reported by CDC on October 19, 2018.
- For the 2018-2019 flu season, the reporting period began on September 30, 2018 and will run through September 28, 2019.
- Because of confidentiality issues, CDC does not discuss or give details on individual people.
- 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 183 deaths (2017-2018 season).
- However, the number of reported deaths is recognized to be an underestimate of the total number of officially reported flu-related pediatric deaths because not all children may be tested for flu or children may be tested later in their illness when seasonal influenza can no longer be detected from respiratory samples.
- CDC estimates the numbers of flu-related deaths using statistical models to account for likely under-reporting.
- The difference between reported flu deaths and estimated flu deaths in children last season is consistent with previously published reports that have found that the estimated numbers of flu-related deaths in children from statistical models may be two to three times higher than the number of reported deaths.
- During past seasons, approximately 80% of flu-associated deaths in children have occurred in children who were not vaccinated. This proportion was similar for the 2017-2018 season.
- Even otherwise healthy children can get very sick and die from flu.
- Since the 2010-2011 season, between about 40% and 60% of pediatric deaths have occurred in children who were otherwise healthy and did not have an underlying medical condition.
- 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 two 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.
- 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 2018-2019 flu season will be updated each week and

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can be found at www.cdc.gov/flu/weekly/ and <https://gis.cdc.gov/GRASP/Fluview/PedFluDeath.html>.

Baloxavir Marboxil Approved by FDA

- Baloxavir marboxil is a new influenza single-dose antiviral drug approved by the Food and Drug Administration (FDA) on October 24, 2018.
- A report published September 6, 2018 in the *New England Journal of Medicine* details the results of two randomized, double-blind, controlled trials of early treatment with baloxavir marboxil.
 - The trials were conducted among otherwise healthy outpatients aged 12-64 years old with acute uncomplicated influenza.
 - The study found the new drug reduced flu symptoms compared to placebo, and reduced flu virus replication and shedding in patients within 24 hours after just a single dose when started within 48 hours of illness onset.
 - While no safety concerns were identified, there was some evidence of development of drug resistance in some patients treated with baloxavir marboxil.
 - The study found baloxavir marboxil to be similar to oseltamivir; a currently recommended influenza antiviral drug, in alleviating flu symptoms.
 - The full study is available online at: <https://www.nejm.org/doi/full/10.1056/NEJMoa1716197>

Summary of CDC 2018-2019 Guidance

- CDC guidance for the 2018-2019 is published and available at:
- [‘Prevention and Control of Seasonal Influenza with Vaccines: Recommendations of the Advisory Committee on Immunization Practices — United States, 2018–19 Influenza Season’](#) has been published.
- CDC recommends annual influenza vaccination for everyone 6 months and older with any licensed, age-appropriate flu vaccine (IIV, RIV4, or LAIV4) with no preference expressed for any one vaccine over another.

What’s New This Season

- Flu vaccines have been updated to better match circulating viruses [the B/Victoria component was changed and the influenza A(H3N2) component was updated].
- For the 2018-2019 season, the nasal spray flu vaccine (live attenuated influenza vaccine or “LAIV”) is again a recommended option for influenza vaccination of persons for whom it is otherwise appropriate. The nasal spray is approved for use in non-pregnant individuals, 2 years through 49 years of age. There is a precaution against the use of LAIV for people with certain underlying medical conditions. All LAIV will be quadrivalent (four-component).
- Most regular-dose egg-based flu shots will be quadrivalent.
- All of the recombinant vaccine will be quadrivalent. (No trivalent recombinant vaccine will be available this season.)
- Cell-grown flu vaccine will be quadrivalent. For this vaccine, the influenza A(H3N2) and both influenza B reference viruses will be cell-derived, and the influenza A(H1N1) will be egg-derived. All these reference viruses will be grown in cells to produce the components of Flucelvax.
- No intradermal flu vaccine will be available.

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- There were some changes in the age recommendation for two vaccines which are detailed in the 2018-2019 guidance.
- Baloxavir marboxil (trade name Xofluza®) is a new influenza single-dose antiviral drug approved October 24, 2018 by the Food and Drug Administration (FDA). Baloxavir marboxil is approved for the treatment of acute uncomplicated flu in people 12 years old and older who have had flu symptoms for less than 48 hours. More information is available in the FDA press release: <https://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm624226.htm>

Recent Study: Flu Vaccine Reduces Flu Hospitalization in Pregnant Women

- Influenza Vaccine Effectiveness in Preventing Influenza-Associated Hospitalizations during Pregnancy: A Multi-Country Retrospective Test Negative Design Study, 2010-2016 was published in Clinical Infectious Diseases on October 11, 2018 and is available at <https://academic.oup.com/cid/article-lookup/doi/10.1093/cid/ciy737>.
- The study looked at the medical records of 2 million pregnant women from four countries over six flu seasons and found that getting a flu shot reduced a pregnant woman's risk of being hospitalized from flu by an average of 40 percent.
- While previous studies have shown that a flu shot can reduce a pregnant woman's risk of flu illness, this is the first study to show vaccination protected against hospitalization.
- Other key findings include:
 - More than 80 percent of pregnancies overlapped with flu season, underscoring the likelihood that pregnant women will be exposed to flu at some point during their pregnancy.
 - Flu vaccine was equally protective for pregnant women with underlying medical problems such as asthma and diabetes, which also increase the risk of serious medical complications including a worsening of those chronic conditions.
 - Flu vaccine was equally protective for women during all three trimesters.
- A press release was issued and is available at <https://www.cdc.gov/media/releases/2018/p1011-flu-vaccine-reduces-risk-pregnant-women.html>.

CDC & AAP Influenza Vaccination Recommendations for Children

- CDC and the American Academy of Pediatrics agree that a flu vaccine is the best way to prevent flu, and both recommend that children 6 months and older get an annual flu vaccine.
- LAIV is a vaccine option in the recommendations of both organizations for the 2018-2019 flu season.
- CDC has no preferential recommendation for one flu vaccine over another.
- The AAP recommends inactivated influenza vaccine (flu shot) as the primary choice for children. The nasal spray vaccine is recommended for children who would not otherwise receive an influenza vaccine (eg, refusal of a flu shot) and for whom it is appropriate.
- Clinicians should exercise their clinical discretion to ensure that as many people as possible are protected against influenza.

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Waning Immunity & Optimal Timing of Vaccination

- Antibody levels increase after vaccination, but then gradually decline over time.
- The rate at which influenza vaccine effectiveness declines is the subject of ongoing studies.
- Some studies show sharp waning (for example, [Kissling 2016](#) observed that VE declined to zero by four months post-vaccination).
- Other studies have found no appreciable waning until more than six months after vaccination (for example, [Radin 2016](#)).
- Two more recent studies on this topic looked at change in vaccine benefit with time since vaccination:
 - [Ferdinands 2017](#) found about 7% absolute decline in VE per month after vaccination.
 - [Ray 2018](#) found that the odds of influenza infection were twice as high among people who had been vaccinated for more than 22 weeks (5.1 mos) compared to people who had been vaccinated for less than six weeks.
- Some studies have shown that the waning may be more pronounced against H3N2- and influenza B-specific antibodies than H1N1-specific antibodies.
- The rate at which influenza antibodies decline is important to help determine the optimal timing of influenza vaccination.
- In recent years, vaccine has been available earlier than it had in the past, raising the question about when is “too early” to get vaccinated.
- ACIP/CDC currently recommends that “vaccination should be offered by the end of October.” (Except for children who need 2 doses who should get vaccinated “as soon as possible after vaccine becomes available.”)
- There currently is no specified time to start influenza vaccination (and thus no definition of “too early.”)
- ACIP/CDC will continue to look at this issue as more information becomes available but the picture is not yet clear enough to support change in policy.

Take 3 Framework

1. Take time to get a flu vaccine each year.

- While there are many different flu viruses, flu vaccines protect against the 3 or 4 viruses that research suggests will be most common. Three-component vaccines contain an H3N2, an H1N1 and a B virus. Four component vaccines have an additional B virus component. (See Vaccine Virus Selection for this season’s vaccine composition.)
- Flu vaccination can reduce flu illnesses, doctors’ visits, and missed work and school due to flu, as well as prevent flu-related hospitalizations.
- Flu vaccination also has been shown to significantly reduce a child’s risk of dying from influenza.
- Also, there are data to suggest that even if someone gets sick after vaccination, their illness may be milder.
- Everyone 6 months of age and older should get a flu vaccine every year before flu activity begins in their community. CDC recommends getting vaccinated by the end of October. Learn more about [vaccine timing](#).

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- For the 2018-2019 flu season, CDC and its Advisory Committee on Immunization Practices (ACIP) recommend annual influenza vaccination for everyone 6 months and older with any licensed, age-appropriate flu vaccine (inactivated, recombinant or nasal spray flu vaccines) with no preference expressed for any one vaccine over another. (See Types of Flu Vaccines).
- Vaccination of high risk persons is especially important to decrease their risk of severe flu illness.
- People at high risk of serious flu complications include young children, pregnant women, people with chronic health conditions like asthma, diabetes or heart and lung disease and people 65 years and older.
- Vaccination also is important for health care workers, and other people who live with or care for high risk people to keep from spreading flu to them.
- Infants younger than 6 months are at high risk of serious flu illness, but are too young to be vaccinated. Studies have shown that flu vaccination of the mother during pregnancy can protect the baby after birth from flu infection for several months. People who live with or care for infants should be vaccinated.

2. Take everyday preventive actions to stop the spread of germs.

- Try to avoid close contact with sick people.
- While sick, limit contact with others as much as possible to keep from infecting them.
- If you are sick with flu-like illness, CDC recommends that you stay home for at least 24 hours after your fever is gone except to get medical care or for other necessities. (Your fever should be gone for 24 hours without the use of a fever-reducing medicine.)
- Cover your nose and mouth with a tissue when you cough or sneeze. After using a tissue, throw it in the trash and wash your hands.
- Wash your hands often with soap and water. If soap and water are not available, use an alcohol-based hand rub.
- Avoid touching your eyes, nose and mouth. Germs spread this way.
- Clean and disinfect surfaces and objects that may be contaminated with germs like flu.

3. Take antiviral drugs for treatment if your doctor prescribes them.

- If you get sick with flu, antiviral drugs can be used to treat your illness.
- Antiviral drugs are prescription medicines (pills, liquid or an inhaled powder) and are not available over the counter.
- Antiviral drugs are different from antibiotics.
- Antiviral drugs can make illness milder and shorten the time you are sick. They may also prevent serious flu complications.
- CDC recommends prompt antiviral treatment of people who are severely ill and people who are at high risk of serious flu complications who develop flu symptoms.
- For people with high-risk factors, treatment with an antiviral drug can mean the difference between having a milder illness versus a very serious illness that could result in a hospital stay.

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- Studies show that flu antiviral drugs work best for treatment when they are started within 48 hours of getting sick, but starting them later can still be helpful, especially if the sick person has a high-risk health condition or is very sick from flu. Follow your doctor's instructions for taking this drug.
- Influenza antiviral drugs are the only drugs approved to treat influenza infection.
 - There are four FDA-approved influenza antiviral drugs: oseltamivir (Tamiflu® and generic formulations), zanamivir (Relenza®), peramivir (Rapivab®) and baloxavir marboxil (Xofluza®).
- Antiviral drugs are not a substitute for getting a flu vaccine. The flu vaccine is the best way modern medicine currently has to reduce the risk of flu illness and it's potentially serious outcomes.