

Influenza (Flu)

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Overview

Without fail, every fall and winter we hear that the flu is going around, that this season is better or worse than last year's. (And some seasons are much worse than others). During this period of time school absences increase and we are all encouraged to get our annual flu shot.

The intent of this section is to give a brief overview of the flu (influenza), the differences between seasonal flu and a pandemic flu, explain the importance of and the need for an annual flu vaccine and offer additional resources for planning and prevention.

According to the Centers for Disease Control and Prevention, influenza is defined as a contagious respiratory illness caused by viruses that infect the nose, throat, and lungs. It can cause mild to severe illness, and at times can lead to death.

There are three types of influenza viruses, A, B & C. The seasonal flu which causes an epidemic almost every winter is caused by human influenza viruses A & B. The annual seasonal flu vaccine contains both A & B strains. A pandemic influenza (an epidemic affecting the entire country or world) is the result of the emergence of new A or B influenza strain (usually A).

Influenza type C infections cause a mild respiratory illness and are not thought to cause epidemics.

Incidence

The Centers for Disease Control and Prevention (CDC) estimates that 5 to 20 percent of Americans come down with the flu during each flu season, which typically lasts from October to March. Children are two to three times more likely than adults to get sick with the flu, and children frequently spread the virus to others.

Over a period of 30 years, between 1976 and 2006, estimates of flu-associated deaths in the United States range from a low of about 3,000 to a high of about 49,000 people. Flu deaths are hard to “pin down” as often the individuals who have died have underlying health problems. http://www.cdc.gov/flu/about/disease/us_flu-related_deaths.htm

Signs & Symptoms

People who have the flu often feel some or all of these signs and symptoms:

- Fever* or feeling feverish/chills
- Cough
- Sore throat
- Runny or stuffy nose
- Muscle or body aches
- Headaches
- Fatigue (very tired)
- Some people may have vomiting and diarrhea, though this is more common in children than adults.

**It's important to note that not everyone with flu will have a fever.*

In general the flu is worse than the common cold. Symptoms such as fever, body aches, tiredness, and cough are more common and intense with the flu. People with colds are more likely to have a runny or stuffy nose. <http://www.flu.gov/symptoms-treatment/symptoms/#>

Link to a helpful comparison chart - [Is it the cold or the flu?](http://www.niaid.nih.gov/topics/Flu/Documents/sick.pdf)
<http://www.niaid.nih.gov/topics/Flu/Documents/sick.pdf>

Most of the time, most individuals recover from the flu, however for elderly people, newborn babies, pregnant women, and people with certain chronic illnesses, such as asthma, diabetes, or heart disease, and persons who live in facilities like nursing homes are at higher risk for complications/death.

Flu seasons are unpredictable. How severe it is can vary widely from one season to the next depending on many things, including:

- what flu viruses are spreading;
- how much flu vaccine is available;
- when vaccine is available;
- how many people get vaccinated, and
- how well the flu vaccine is matched to flu viruses that are causing illness.

Complications of flu can include bacterial pneumonia, ear infections, sinus infections, dehydration, and worsening of chronic medical conditions, such as congestive heart failure, asthma, or diabetes. CDC <http://www.cdc.gov/flu/about/disease/symptoms.htm>

Seasonal Flu

“Seasonal flu refers to the flu outbreaks that occur each year, mainly in the late fall and winter. The disease spreads through communities, creating an epidemic. During the epidemic, the number of cases peaks in about three weeks and subsides after another three to four weeks.”

Pandemic Flu

“Pandemic flu refers to particularly contagious strains of flu that spread rapidly from person to person to create a worldwide epidemic (pandemic). In the past century, there were influenza pandemics in 1918, 1957, 1968, and 2009.” National Institute of Allergy & Infectious Diseases <http://www.niaid.nih.gov/topics/Flu/understandingFlu/Pages/overview.aspx>

In fact there have been recorded flu pandemics in past centuries as well. The history of the 1918 flu pandemic (The Great Pandemic) refers to survivors of an 1890 pandemic.

Excerpts from *The Great Pandemic*: <http://www.flu.gov/pandemic/history/1918/>

“Throughout history, influenza viruses have mutated and caused pandemics or global epidemics. In 1890, an especially virulent influenza pandemic struck, killing many Americans. Those who survived that pandemic and lived to experience the 1918 pandemic tended to be less susceptible to the disease.....

No one knows exactly how many people died during the 1918-1919 influenza pandemic. During the 1920s, researchers estimated that 21.5 million people died as a result of the 1918-1919 pandemic. More recent estimates have estimated global mortality from the 1918-1919 pandemic at anywhere between 30 and 50 million. An estimated 675,000 Americans were among the dead.

.....In the early stages of the pandemic, many scientists believed that the agent responsible for influenza was Pfeiffer’s bacillus. Autopsies and research conducted during the pandemic ultimately led many scientists to discard this theory.

In late October of 1918, some researchers began to argue that influenza was caused by a virus. Although scientists had understood that viruses could cause diseases for more than two decades, virology was still very much in its infancy at this time.

It was not until 1933 that the influenza A virus, which causes almost every type of endemic and pandemic influenza, was isolated. Seven years later, in 1940, the influenza B virus was isolated. The influenza C virus was finally isolated in 1950.

Influenza vaccine was first introduced as a licensed product in the United States in 1944. Because of the rapid rate of mutation of the influenza virus, the effectiveness of a given vaccine usually lasts for only a year or two.

By the 1950s, vaccine makers were able to prepare and routinely release vaccines which could be used in the prevention or control of future pandemics. During the 1960s, increased understanding of the virus enabled scientists to develop both more potent and purer vaccines.

Mass production of influenza vaccines continued, however, to require several months lead time.

Twentieth-Century Influenza Pandemics or Global Epidemics:

The pandemic which occurred in 1918-1919 was not the only influenza pandemic of the twentieth century. Influenza returned in a pandemic form in 1957-1958 and, again, in 1968-1969.

These two later pandemics were much less severe than the 1918-1919 pandemic. Estimated deaths within the United States for these two later pandemics were 70,000 excess deaths (1957-1958) and 33,000 excess deaths (1968-1967)."

The 2009 pandemic was caused by a new influenza strain- H1N1, which was first identified in California. (A/California/04/2009(H1N1)). As always, when a new strain of influenza begins human to human spread, there is great concern. This strain disproportionately affected those under the age of 65 (leading researchers to wonder if there may have been some immunity from a past circulating influenza strain). Most of the deaths caused by the H1N1 influenza occurred among younger people, including those who were otherwise healthy.

CDC- http://www.cdc.gov/h1n1flu/estimates_2009_h1n1.htm

World Health Organization (WHO)

http://www.who.int/csr/disease/swineflu/frequently_asked_questions/about_disease/en/

(Note- here is a link to a CDC webpage which explains how flu viruses are named

<http://www.cdc.gov/flu/about/viruses/types.htm>)

There is continuing concern regarding the very deadly A strain H5N1 (avian or bird flu) influenza virus circulating in Asia, Egypt and several other countries. Person to person spread is rare with most human cases a result of contact with poultry. Unfortunately there is approximately a 60 % human mortality rate. Six countries— Bangladesh, China, Egypt, India, Indonesia, and Vietnam—have widespread and ongoing infections in their poultry. Poultry outbreaks have occurred in other countries recently as well. Nearly 600 cases of human cases of H5N1 have been reported from 15 countries since 2003. http://www.flu.gov/about_the_flu/h5n1/# To date

In April of 2013 a new influenza A (H7N9) virus was detected in humans in China. There have been a total of 33 cases (9 deaths). As of this writing there has not been evidence of human to human transmission. The Centers for Disease Control & Prevention and the World Health Organization are closely monitoring the situation for signs of human to human spread (and possible pandemic).

WHO: http://www.who.int/csr/don/2013_04_07/en/index.html

CDC: <http://www.cdc.gov/flu/avianflu/h7n9-virus.htm>

Health Map.org: <http://www.healthmap.org/news/china-reports-first-documented-cases-h7n9-influenza-humans-4113>

THE FLU VACCINE

We are all told to get our annual flu vaccine. In fact with very few exceptions, the recommendation is to give an annual vaccine to everyone who is 6 months of age and older.

That leads to the questions- Why annually? And why almost everyone?

Why annually?

As mentioned in the overview, there are three types of influenza viruses: A, B and C. Influenza A and B viruses typically cause seasonal flu. Each of the viruses is further classified by a subtype. The different A & B subtypes change over the years, through *antigenic shift* and *antigenic drift*, creating different strains.

From:

CDC: <http://www.cdc.gov/flu/about/viruses/change.htm>

HealthMap.org: <http://www.healthmap.org/news/china-reports-first-documented-cases-h7n9-influenza-humans-4113>

“Antigenic shift refers to the changing of the hemagglutinin and neuraminidase proteins on the influenza virus. These proteins allow the virus to attach to host (human) cells and infect them. Different combinations of these proteins (H1N1, H7N9, and H3N2) essentially create a new virus.

Antigenic drift refers to little changes that slowly occur over a long period of time. The H1N1 subtype of influenza has different variants, due to these small evolutions.”

Influenza A (H1N1), A (H3N2), and influenza B viruses are included in each year’s influenza vaccine. Getting a flu vaccine can protect against flu viruses that are the same or related to the viruses in the vaccine..... The seasonal flu vaccine does not protect against influenza C viruses. In addition, flu vaccines will NOT protect against infection and illness caused by other viruses that can also cause influenza-like symptoms. There are many other non flu viruses that can result in influenza-like illness (ILI) that spread during the flu season.” The viruses in the vaccine

can change each year based on international surveillance and scientists' estimations about which types and strains of viruses will circulate in a given year.

Why almost everyone?

Everyone 6 months and older should get a flu vaccine each year. This recommendation has been in place since [February 24, 2010 when CDC's Advisory Committee on Immunization Practices \(ACIP\)](#) voted for "universal" flu vaccination in the U.S. to expand protection against the flu to more people. While everyone should get a flu vaccine each flu season, it's especially important that certain people get vaccinated either because they are at high risk of having serious flu-related complications or because they live with or care for people at high risk for developing flu-related complications. (CDC)

Prevention & Preparedness

School Located Vaccination Clinics

As mentioned in the previous paragraphs the best flu prevention measure is the annual flu vaccine.

Some schools/school districts have begun offering annual school located flu vaccination clinics finding this a way to reduce student absenteeism during the annual flu season (and also to protect high risk family members).

For more information and implementation guidance:

CDC <http://www.cdc.gov/flu/school/planners.htm>

Immunization Action Coalition <http://www.immunize.org/school-vaccination/>

Pandemic Preparedness

The World Health Organization sums up the need and reason for pandemic preparedness. "Influenza pandemics are unpredictable but recurring events that can cause severe social, economic, and political stress. Advanced planning and preparedness are critical in helping to mitigate the impact of influenza epidemic or pandemics."

Pandemic Preparedness resources:

World Health Organization

<http://www.who.int/influenza/preparedness/pandemic/en/>

Centers for Disease Control and Prevention

<http://www.cdc.gov/flu/pandemic-resources/>

Flu.gov (seasonal and pandemic influenza preparedness)
<http://www.flu.gov/planning-preparedness/school/index.html#>

California Department of Education
<http://www.cde.ca.gov/ls/fa/sf/pandemic.asp>

San Diego County
http://www.co.san-diego.ca.us/oes/disaster_preparedness/oes_il_pandemic.html

General

WHO: www.who.int/influenza/en/

National Library of Medicine: <http://www.nlm.nih.gov/medlineplus/flu.html>

National Institute of Allergy and Infectious Diseases: [Flu \(Influenza\)](#)

Dept. of Health and Human Services: [Flu.gov](#)

- Also available in [Spanish](#)

Patient Education Institute [Influenza](#) *Interactive Tutorial*

- Also available in [Spanish](#)