Centers for Disease Control and Prevention

Summary of the 2009-2010 Influenza Season

What was the 2009-2010 flu season like?

Flu seasons are unpredictable in a number of ways, including when they begin, how severe they are, how long they last and which viruses will spread. There were more uncertainties than usual going into the 2009-2010 flu season because of the emergence of the 2009 H1N1 influenza virus (previously called "novel H1N1" or "swine flu") in the spring of 2009. This virus caused the first influenza pandemic (global outbreak of disease caused by a novel influenza virus) in more than 40 years. The United States experienced its first wave of 2009 H1N1 activity in the spring of 2009, followed by a second, larger wave of 2009 H1N1 activity in the fall and winter, during typical "flu season" time for the U.S. For information about 2009 H1N1 flu, visit the CDC 2009 H1N1 Flu website.

The 2009-2010 flu season began very early, with 2009 H1N1 viruses predominating and causing high levels of flu activity much earlier in the year than during most regular flu seasons. Activity peaked in October and then declined quickly to below baseline levels by January. While activity was low and continuing to decline, 2009 H1N1 viruses were still reported in small numbers through the spring and summer of 2010[1]. Additional information about flu activity during the 2009-2010 season can be found in the *MMWR* article Update: Influenza Activity – United States, 2009-10 Season.

[1]Mustaquim, D et al. Update: Influenza Activity – United States, 2009-10 Season. 2010; 59: 901-908.

When did the flu season peak?

The weekly percentage of outpatient visits for influenza-like illness (ILI) peaked at the end of October at 7.6%, a level higher than the three previous influenza seasons, as reported by the U.S. Outpatient ILI Surveillance Network (ILINet). This percentage decreased to 1.0% by the middle of May, 2010. The number of states reporting widespread influenza activity peaked at 49 at the end of October, and decreased to zero by the beginning of January. By the middle of May, no states were reporting widespread or regional influenza activity and most states were reporting sporadic or no flu activity. In most years, seasonal influenza activity peaks in January or February. (See graph of peak influenza activity by month in the United States from 1976-2009.)

How severe was the season?

2009 H1N1 activity was relatively more severe among people younger than 65 years of age compared with non-pandemic influenza seasons. Influenza activity was associated with significantly higher pediatric mortality, and higher rates of hospitalizations in children and young adults than previous seasons. The 2009-10 influenza season was relatively less severe among people 65 years and older than compared with usual flu seasons. Like seasonal flu, people with certain chronic medical conditions were at greater risk of serious flu complications during the 2009-10 pandemic season, including hospitalizations and deaths. In fact, an estimated 80% of adult hospitalizations and 65% of child hospitalizations related to 2009 H1N1 occurred in people with one or more underlying medical conditions1. Additional information about severity of the 2009-2010 season can be found in the *MMWR* article Update: Influenza Activity – United States, 2009-10 Season.

How is severity characterized?

The overall health impact (e.g., illnessess, hospitalizations and deaths) of a flu season varies from year to year. Based on available data from U.S. influenza surveillance systems monitored and reported by CDC, the severity of a flu season can be judged according to a variety of criteria, including:

- The number and proportion of flu laboratory tests that are positive;
- The proportion of visits to physicians for influenza-like illness (ILI);
- The proportion of all deaths that are caused by pneumonia and flu;
- The number of flu-associated deaths among children; and

- The number of flu-associated deaths among children, and
- The flu-associated hospitalization rate among children and adults.

A season's severity is determined by assessing several of these measures and by comparing them with previous seasons.

How effective is the seasonal flu vaccine?

The ability of flu vaccine to protect a person depends on two things: 1) the age and health status of the person getting vaccinated, and 2) the similarity or "match" between the virus strains in the vaccine and those circulating in the community. If the viruses in the vaccine and the influenza viruses circulating in the community are closely matched, vaccine effectiveness is higher. If they are not closely matched, vaccine effectiveness can be reduced. However, it's important to remember that even when the viruses are not closely matched, the vaccine can still protect many people and prevent flu-related complications. Such protection is possible because antibodies made in response to the vaccine can provide some protection (called cross-protection) against different, but related strains of influenza viruses. The vaccine may be somewhat less effective in elderly persons and very young children, but vaccination can still prevent serious complications from the flu.
For more information about seasonal flu vaccine effectiveness, visit How Well Does the Seasonal Flu Vaccine Work?

What did CDC do to monitor effectiveness of flu vaccines for the 2009-10 season?

Every year CDC carries out evaluations and collaborates with outside partners to assess the effectiveness of seasonal flu vaccines.

Were last season's vaccines a good match for circulating viruses?

Flu viruses are constantly changing (called antigenic drift) – they often change from one season to the next or they can even change within the course of one flu season. Experts must pick which viruses to include in the vaccine many months in advance in order for vaccine to be produced and delivered on time. (For more information about the seasonal flu vaccine virus selection process, visit Selecting the Viruses in the Influenza (Flu) Vaccine.) Because of these factors, there is always the possibility of a less than optimal match between circulating flu viruses and the viruses in the seasonal flu vaccine.
Because there were few seasonal flu viruses (as opposed to 2009 H1N1 viruses) in circulation during the 2009-2010 season, vaccine effectiveness (VE) studies could not be performed for the 2009-2010 seasonal vaccine. CDC was able to estimate VE for the 2009 H1N1 vaccine. The estimate for overall VE for the 2009 H1N1 vaccine was approximately 62%.

Why were two vaccines needed last season?

The 2009-2010 season was very unusual. The emergence of a new and very different H1N1 virus meant that two vaccines were needed: one to prevent seasonal influenza viruses that were anticipated to spread and another to prevent influenza caused by the newly emerged 2009 H1N1 virus. As usual, components of the seasonal flu vaccine were decided upon well in advance of the season and vaccine production was well underway by the time the new 2009 H1N1 virus emerged. If the 2009 H1N1 virus had emerged sooner, it would have been included in the seasonal vaccine. Therefore, a second flu vaccine was created to protect against the new flu virus. 2009 H1N1 was by far the dominant virus in circulation last season, and the 2009 H1N1 vaccine was a very good match; 99.5% of the 2009 H1N1 virus specimens tested during the season were related to the virus used to develop the 2009 H1N1 vaccine.

The 2010-2011 seasonal flu vaccine will protect against the 2009 H1N1 virus and 2 other flu viruses.

What did CDC do to monitor antiviral resistance in the United States during the 2009-10 season?

Antiviral resistance means that a virus has changed in such a way that antiviral drugs have become less effective in treating or preventing illnesses caused by the virus. Samples of viruses collected from around the United States and the world are studied to determine if they are resistant to any of the four FDA-approved influenza antiviral drugs.

CDC routinely collects viruses through a domestic and global surveillance system to monitor for changes in influenza viruses. CDC conducted surveillance and testing of seasonal influenza viruses and 2009 H1N1 influenza viruses to check for antiviral resistance. CDC also implemented enhanced surveillance across the United States to monitor resistance in 2009 H1N1 viruses. By the end of the 2009-2010 season, almost all (98.9%) of the 2009 H1N1 influenza viruses tested for antiviral

resistance at CDC were susceptible to oseltamivir (Tamiflu®), and all of the viruses tested were susceptible to zanamivir (Relenza®). CDC also worked with the state public health departments and the World Health Organization to collect additional information on antiviral resistance in the United States and worldwide. The information collected assisted in making informed public health policy recommendations.

More information at the CDC 2009 H1N1 Flu website.

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