



## QUESTIONS & ANSWERS

### Key Facts about Swine Influenza (Swine Flu)

#### What is Swine Influenza?

Swine Influenza (swine flu) is a respiratory disease of pigs caused by type A influenza that regularly cause outbreaks of influenza among pigs. Swine flu viruses cause high levels of illness and low death rates among pigs. Swine influenza viruses may circulate in swine throughout the year, but most outbreaks among swine herds occur during the late fall and winter months similar to humans. The classical swine flu virus (an influenza type A H1N1 virus) was first isolated from a pig in 1930.

#### How common is swine flu among pigs?

H1N1 and H3N2 swine flu viruses are endemic among pig populations in the United States and something that the industry deals with routinely. Outbreaks among pigs normally occur in colder weather months (late fall and winter) and sometimes with the introduction of new pigs into susceptible herds. Studies have shown that the swine flu H1N1 is common throughout pig populations worldwide, with 25 percent of animals showing antibody evidence of infection. In the U.S. studies have shown that 30 percent of the pig population in the U.S. has antibody evidence of having had H1N1 infection. More specifically, 51 percent of pigs in the north-central U.S. have been shown to have antibody evidence of infection with swine H1N1. Human infections with swine flu H1N1 viruses are rare. There is currently no way to differentiate antibody produced in response to flu vaccination in pigs from antibody made in response to pig infections with swine H1N1 influenza.

While H1N1 swine viruses have been known to circulate among pig populations since at least 1930, H3N2 influenza viruses did not begin circulating among US pigs until 1998. The H3N2 viruses initially were introduced into the pig population from humans. The current swine flu H3N2 viruses are closely related to human H3N2 viruses.

#### Can humans catch swine flu?

Swine flu viruses do **not** normally infect humans. However, sporadic human infections with swine flu have occurred. In the past several years, on average CDC has received about one influenza virus isolate from a human that tests positive for swine flu each year. Most commonly, these cases occur in persons with direct exposure to pigs (workers in the swine industry, for example). In addition, there have been rare documented cases of one person spreading swine flu to others. For example, an outbreak of apparent swine flu infection in pigs in Wisconsin in 1988 resulted in multiple human infections, and, although no community outbreak resulted, there was antibody evidence of virus transmission from the patient to health care workers who had close contact with the patient.

#### How does swine flu spread?

- Pigs infected with influenza virus have a runny nose, lethargy, cough and decreased appetite. The virus likely spreads from pig to pig through contact with infected mucous secretions. (When the pigs are really sick, their mucous carries high levels of virus.)
- Strains of swine flu virus can also be directly transmissible to humans. Most human infections have occurred following direct contact with infected pigs. However, there has been at least one documented case of human-to-human transmission of swine flu.

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### **What do we know about human-to-human spread of swine flu?**

In September 1988, a previously healthy 32-year-old pregnant woman was hospitalized for pneumonia and died 8 days later. A swine H1N1 flu virus was detected. Four days before getting sick, the patient visited a county fair swine exhibition where there was widespread influenza-like illness among the swine. In follow-up studies, 76% of swine exhibitors tested had antibody evidence of swine flu infection but no serious illnesses were detected among this group. Additional studies suggest that one to three health care personnel who had contact with the patient developed mild influenza-like illnesses with antibody evidence of swine flu infection.

### **What other examples of swine flu outbreaks are there?**

Probably most well known is an outbreak of swine flu among soldiers in Fort Dix, New Jersey in 1976. The virus caused disease with x-ray evidence of pneumonia in at least 4 soldiers and 1 death; all of these patients had previously been healthy. The virus was transmitted to close contacts in a basic training environment, with limited transmission outside the basic training group. The virus is thought to have circulated for a month and disappeared. The source of the virus, the exact time of its introduction into Fort Dix, and factors limiting its spread and duration are unknown. The Fort Dix outbreak may have been an animal anomaly caused by introduction of an animal virus into a stressed human population in close contact in crowded facilities during the winter. The swine influenza A virus collected from a Fort Dix soldier was named A/New Jersey/76 (Hsw1N1).

### **How many swine flu viruses are there?**

Like all influenza viruses, swine flu viruses change constantly. Pigs can be infected by avian influenza and human influenza viruses as well as swine flu viruses. When influenza viruses from different species infect pigs, the viruses can reassort (i.e. swap genes) and new viruses that are a mix of swine, human and/or avian influenza viruses can emerge. Over the years, different variations of swine flu viruses have emerged. At this time, there are four main influenza type A virus subtypes that have been isolated in pigs: H1N1, H1N2, H3N2, and H3N1. However, most of the recently isolated influenza viruses from pigs have been H3N2 and H1N1 viruses.

### **Is the H1N1 swine flu virus the same as human H1N1 viruses?**

No. The H1N1 swine flu viruses are antigenically very different from human H1N1 viruses.

### **Is there a vaccine for swine flu?**

Vaccines are available to be given to pigs to prevent swine influenza. There is no vaccine to protect humans from swine flu. The seasonal influenza vaccine will likely help provide partial protection against swine H3N2, but not swine H1N1 viruses.

### **What are the public health implications of human infections with swine influenza viruses?**

Human infections with animal influenza A viruses against which the human population has little immunity should be investigated to determine the source of infection, and the extent of spread and evidence of human to human transmission. Influenza A viruses new to the human population that are able to efficiently transmit from person to person and cause illness may represent a pandemic threat.

Although immunity to swine H1N1 viruses is low in the human population, a high proportion of persons occupationally exposed to pigs (such as pig farmers or pig veterinarians) have been shown in several studies to have antibody evidence of prior swine H1N1 flu infection. And, for swine H1N1 viruses, only rare person to person transmission has been documented in the past. Thus, human infections with swine H1N1 viruses should be investigated particularly when they are detected among non-occupationally exposed persons to ensure that human to human transmission is not occurring and to monitor for changes in circulating viruses and the emergence of novel viruses.

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Because most persons have some antibody to influenza H3N2 viruses since H3N2 viruses occur commonly in humans and because the swine and human H3N2 viruses are similar, swine H3N2 virus infections in humans would not represent a possible pandemic threat.

### **Links for additional information:**

[Are Swine Workers in the United States at Increased Risk of Infection with Zoonotic Influenza Virus?](#)

(Link to abstract only) Clinical Infectious Diseases. Jan. 2006; 42: 14-20.

[Multiple lineages of antigenically and genetically diverse influenza A virus co-circulate in the United States swine population](#)

Virus Research. July 2004; 103(1-2): 67-73.

[Influenza: Pigs, People and Public Health](#)

National Pork Board. Jan. 2004; 2(6): 1-4.

[Serologic Evidence of H1 Swine Influenza Virus Infection in Swine Farm Residents and Employees](#)

Emerging Infectious Diseases. Aug 2002; 8(8): 814-819.

[Serologic Evidence of Human and Swine Influenza in Mayan Persons](#)

Emerging Infectious Diseases. Jan 2005; 11(1): 158-160.

[Swine influenza: a zoonosis](#)

Veterinary Sciences Tomorrow. 2003 Sept 15.

[The epidemiology and evolution of influenza viruses in pigs](#)

Veterinary Microbiology. 2000 May 22; 74(1-2): 29-46.

[WHO Manual on Animal Influenza Diagnosis and Surveillance – 2004](#)

For more information, visit [www.cdc.gov/flu/swine](http://www.cdc.gov/flu/swine), or call CDC at 800-CDC-INFO (English and Spanish) or 888-232-6348 (TTY).

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