



Swine Influenza Outbreak

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KEY FINDINGS

- The current swine influenza outbreak exhibits unusual characteristics of concern:
 - The outbreak is affecting adults and spreading through human-to-human transmissions, which is atypical as influenza typically targets young children and elderly individuals, and human contraction of swine influenza is normally associated with close contact with pigs; and
 - Although the outbreaks in Mexico and the United States have been genetically linked, the United States has experienced no fatalities related to the outbreak, whereas 16 deaths in Mexico have been confirmed as resulting from the swine influenza, and the Government of Mexico is investigating additional cases.
- Domestic and international resources have been mobilized to address the outbreak; however, additional testing will be required to answer key questions such as transmission mode and infection rate.
- Based upon the current severity, the outbreak is unlikely to cause critical infrastructure disruptions in the United States; however, the outbreak will result in increased pressures on hospitals and clinics as symptomatic individuals, and the worried well, seek medical attention. Should the outbreak intensify, additional disruptions would likely occur, including the possible disruption in services due to high absenteeism.
- Basic precautionary measures can help to prevent the further spread of the disease, including frequent hand washing, and avoiding exposure to symptomatic individuals.

BACKGROUND

The United States and Mexico have confirmed the outbreak of a swine influenza A (H1N1) virus not previously detected in humans or pigs.¹ The human form of influenza A (H1N1), which is genetically similar, but not identical to the current outbreak, was responsible for the 1918 pandemic that killed between 50 and 100 million people.² Similar to the 1918 pandemic, the

¹ Centers for Disease Control and Prevention, *Morbidity and Mortality Weekly Report* Dispatch, Volume 58, 24 April 2009. Available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm58d0424a1.htm>.

² Taubenberger JK, Morens DM. 1918 influenza: the mother of all pandemics. *Emerging Infectious Disease* [serial on the Internet]. 2006 January. Available from <http://www.cdc.gov/ncidod/EID/vol12no01/05-0979.htm>

current outbreak is affecting adults, whereas influenza typically affects young, elderly, or immune-compromised individuals.

United States Overview

The U.S. Centers for Disease Control and Prevention (CDC) confirmed six swine influenza cases in California located in San Diego and Imperial Counties, and two cases in Texas in Guadalupe County (near San Antonio).³ An additional two cases have been confirmed in Kansas, and testing is currently underway at Saint Francis Preparatory School in Queens, New York, where students who had recently returned from a trip to Mexico began exhibiting influenza-like symptoms.⁴ Results from a New York Laboratory indicated that eight of the cases tested were positive for H1N1. Samples have been sent to the CDC for confirmation.⁵ Increased attention to the outbreak is likely to lead to the identification of additional cases as public health professionals increase testing, and symptomatic individuals seek medical care.

All of the confirmed cases in the United States have fully recovered to date, although one immuno-compromised woman in California was hospitalized. None of the confirmed cases in the United States had direct exposure to pigs indicating the disease is spreading from human-to-human.⁶

Mexico Overview

The Government of Mexico has confirmed 18 deaths from the swine influenza mostly in Mexico City; however, media reports indicate over 1,000 cases of influenza in Mexico.⁷ Testing is underway to identify which of these cases resulted from the swine influenza, and which resulted

Quick Facts

Strain: Influenza A (H1N1)

Infectious Period: 1 to 3 days before onset to 3 to 9 days after onset of illness

Symptoms:

Fever	Lethargy
Loss of appetite	Runny nose
Coughing	Sore throat
Nausea	Diarrhea
Vomiting	

Areas Affected:

- Mexico – 7 confirmed cases
- California – 6 confirmed cases
- Texas – 2 confirmed cases
- New York – 8 cases confirmed by a New York lab, awaiting CDC confirmation
- Kansas – 2 cases confirmed.



³ Centers for Disease Control and Prevention, *Morbidity and Mortality Weekly Report* Dispatch, Volume 58, 24 April 2009. Available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm58d0424a1.htm>.

⁴ <http://www.alertnet.org/thenews/newsdesk/N25468227.htm>

⁵ Reuters, "Officials say New York schoolchildren had flu", 25 April 2009, available at <http://uk.reuters.com/article/UKNews1/idUKTRE53O2KU20090425>.

⁶ Centers for Disease Control and Prevention, *Morbidity and Mortality Weekly Report* Dispatch, Volume 58, 24 April 2009. Available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm58d0424a1.htm>.

⁷ Stevenson, Mark, "Mexico fights swine flu with "pandemic potential," Associated Press article accessed at http://www.google.com/hostednews/ap/article/ALeqM5gzz357patY4-QaJFvo9O95zMM_EQD97PLN881.

from other influenza strains, or co-infection (infection resulting from more than one virus). Mexico's surge in influenza cases began in mid-March towards the end of Mexico's flu season.

Mexican officials have closed schools, museums, libraries, and other public buildings, and suspended public events in an effort to curb the spread of the disease. Masks have been distributed, and citizens urged to avoid social activities. The Government of Mexico's vaccination effort is focused on health workers due to their higher risk of contracting the disease. Efforts are also underway to question outbound travelers to help stem the spread of the disease.

Swine Influenza

Swine influenza is common among pig populations in the United States, and leads to a high rate of illness, but low mortality rates. Symptoms in pigs include sudden onset of fever, depression, coughing (barking), discharge from the nose or eyes, sneezing, breathing difficulties, eye redness or inflammation, and going off feed. Outbreaks in pig populations typically occur in late fall and winter. The infection rate for humans contracting the disease is typically low, and accompanied by close contact with swine. The current cases do not follow this pattern.

Source: Centers for Disease Control and Prevention, *Key Facts about Swine Influenza (Swine Flu)*, available at http://www.cdc.gov/flu/swine/key_facts.htm.

Response and Countermeasures

The current influenza vaccine is not expected to protect against the outbreak.⁸ The strain is also resistant to two of the four antiviral drugs licensed in the United States for treatment of influenza, amantadine and rimantadine. The strain, however, is sensitive to oseltamivir (trade name Tamiflu) and zanamivir (trade name Relenza). The CDC has developed a genetically matched "seed stock" for the strain, which would be needed if vaccine production is necessary.⁹

Neither the WHO nor the CDC recommend border restrictions at this time. The CDC, however, has issued a travel advisory to inform individuals traveling to the impacted areas of the health risks, and the need to follow standard precautions such as frequent hand washing. Some countries are reportedly increasing border surveillance, however, Anne Schuchat of the U.S. Centers for Disease Control and Prevention has said that "with infections in many different communities as we're seeing, we don't think that containment is feasible . . . we are not at a point where we can keep this virus in one place."¹⁰

⁸ Centers for Disease Prevention, *Key Facts about Swine Influenza (Swine Flu)*, available at http://www.cdc.gov/flu/swine/key_facts.htm.

⁹ Centers for Disease Control and Prevention, *Morbidity and Mortality Weekly Report* Dispatch, Volume 58, 24 April 2009, available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm58d0424a1.htm>, and Centers for Disease Prevention, *Key Facts about Swine Influenza (Swine Flu)*, available at http://www.cdc.gov/flu/swine/key_facts.htm.

¹⁰ BBC News, "Mexico flu 'a potential pandemic', 25 April, 2009, accessed at <http://news.bbc.co.uk/2/hi/americas/8018356.stm>.

Margaret Chan, head of the World Health Organization, stated “the current events constitute a public health emergency of international concern.”¹¹ One option available to the World Health Organization is to increase the global pandemic alert level from 3, indicating no or very limited human-to-human transmission to a higher level. As of the time this assessment was published, no final determination has been made by the World Health Organization.

World Health Organization Pandemic Alert Scale (Level as of release)

Inter-Pandemic Phase <i>New virus in animals, no human cases</i>	Low risk of human cases	1
	Higher risk of human cases	2
Pandemic Alert <i>New virus causes human cases</i>	No or very limited human-to-human transmission	3
	Evidence of increased human-to-human transmission	4
	Evidence of significant human-to-human transmission	5
Pandemic	Efficient and sustained human-to-human transmission	6

PRELIMINARY INFRASTRUCTURE IMPACT ASSESSMENT

Public Health and Healthcare: The current outbreak will impact the public health and healthcare sector, which should expect to see a steady increase in worried well and symptomatic patients as increasing media coverage raises awareness about the outbreak.

Transportation: Significant economic impacts are only expected if a decision is made to limit the movement of people and goods between the United States and Mexico, which would result in significant cascading economic impacts. According to the Bureau of Transportation Statistics, in 2008, close to three million truck containers crossed the border, in addition to approximately 22,000 train passengers, 3 million bus passengers, 80 million personal vehicles, and 44 million pedestrians.¹²

Agriculture and Food: No unusual cases of swine illness have been identified in the impacted areas of the United States; however, the U.S. Department of Agriculture, working with industry, is closely monitoring the situation. Swine influenza cannot be transmitted through consumption of pork products, although some consumer hesitancy may occur.

¹¹ BBC News, “Mexico flu ‘a potential pandemic’, 25 April, 2009, accessed at <http://news.bbc.co.uk/2/hi/americas/8018356.stm>.

¹² Cross-border transportation statistics accessed at <http://www.bts.gov/>.

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Should the outbreak intensify, additional disruptions would likely occur. HITRAC will continue to monitor the situation, and provide updated assessments as appropriate based upon the circumstances of the outbreak, and planned mitigation efforts.

RECOMMENDATIONS

Individuals who have recently traveled to Mexico and are exhibiting influenza-like symptoms should seek medical guidance. The CDC is encouraging individuals in the impacted areas of California, Texas, and those traveling to Mexico to take everyday preventive actions such as:

- Cover your nose and mouth with a tissue when you cough or sneeze. Throw the tissue in the trash after use;
- Wash your hands with soap and water, especially after you cough or sneeze. Alcohol-based hand cleaners are also effective;
- Avoid close contact with anyone who appears sick;
- If you get sick, stay home from work or school, and limit contact with others; and
- Avoid touching your eyes, nose, or mouth.¹³

ADDITIONAL INFORMATION

Additional information is available at the Centers for Disease Control and Prevention website: <http://www.cdc.gov/swineflu>.

HITRAC is the Department's infrastructure-intelligence fusion center established to create actionable risk-informed analytic products for Federal, State, local, tribal, territorial, private sector, and international partners. For more information on this and other HITRAC analysis, please contact RISK@hq.dhs.gov.

¹³ Centers for Disease Control and Prevention. *Human Swine Influenza Investigation*, available at <http://www.cdc.gov/flu/swine/investigation.htm>.