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Update: Swine Influenza A (H1N1) Infections — California and Texas, April 2009

On April 21, 2009, CDC reported that two recent cases of febrile respiratory illness in children in southern California had been caused by infection with genetically similar swine influenza A (H1N1) viruses. The viruses contained a unique combination of gene segments that had not been reported previously among swine or human influenza viruses in the United States or elsewhere (*1*). Neither child had known contact with pigs, resulting in concern that human-to-human transmission might have occurred. The seasonal influenza vaccine H1N1 strain is thought to be unlikely to provide protection. This report updates the status of the ongoing investigation and provides preliminary details about six additional persons infected by the same strain of swine influenza A (H1N1) virus identified in the previous cases, as of April 24. The six additional cases were reported in San Diego County, California (three cases), Imperial County, California (one case), and Guadalupe County, Texas (two cases). CDC, the California Department of Public Health, and the Texas Department of Health and Human Services are conducting case investigations, monitoring for illness in contacts of the eight patients, and enhancing surveillance to determine the extent of spread of the virus. CDC continues to recommend that any influenza A viruses that cannot be subtyped be sent promptly for testing to CDC. In addition, swine influenza A (H1N1) viruses of the same strain as those in the U.S. patients have been confirmed by CDC among specimens from patients in Mexico. Clinicians should consider swine influenza as well as seasonal influenza virus infections in the differential diagnosis for patients who have febrile respiratory illness and who 1) live in San Diego and Imperial counties, California, or Guadalupe County, Texas, or traveled to these counties or 2) who traveled recently to Mexico or were in contact with persons who had febrile respiratory illness and were in one of the three U.S. counties or Mexico during the 7 days preceding their illness onset.

Case Reports

San Diego County, California. On April 9, an adolescent girl aged 16 years and her father aged 54 years went to a San Diego County clinic with acute respiratory illness. The youth had onset of illness on April 5. Her symptoms included fever, cough, headache, and rhinorrhea. The father had onset of illness on April 6 with symptoms that included fever, cough, and rhinorrhea. Both had self-limited illnesses and have recovered. The father had received seasonal influenza vaccine in October 2008; the daughter was unvaccinated. Respiratory specimens were obtained from both, tested in the San Diego County Health Department Laboratory, and found to be positive for influenza A using reverse transcription–polymerase chain reaction (RT-PCR), but could not be further subtyped. Two household contacts of the patients have reported recent mild acute respiratory illnesses; specimens have been collected from these household members for testing. One additional case, in a child residing in San Diego County, was identified on April 24; epidemiologic details regarding this case are pending.

Imperial County, California. A woman aged 41 years with an autoimmune illness who resided in Imperial County developed fever, headache, sore throat, diarrhea, vomiting, and myalgias on April 12. She was hospitalized on April 15. She recovered and was discharged on April 22. A respiratory specimen obtained April 16 was found to be influenza A positive by RT-PCR at the San Diego Country Health Department Laboratory, but could not be further subtyped. The woman had not been vaccinated against seasonal influenza viruses during the 2008–09 season. Three household contacts of the woman reported no recent respiratory illness.

Guadalupe County, Texas. Two adolescent boys aged 16 years who resided in Guadalupe County near San Antonio were tested for influenza and found to be positive for influenza A on April 15. The youths had become ill with acute respiratory symptoms on April 10 and April 14, respectively, and both had gone to an outpatient clinic for evaluation on

April 15. Identification and tracking of the youths' contacts is under way.

Five of the new cases were identified through diagnostic specimens collected by the health-care facility in which the patients were examined, based on clinical suspicion of influenza; information regarding the sixth case is pending. The positive specimens were sent to public health laboratories for further evaluation as part of routine influenza surveillance in the three counties.

Outbreaks in Mexico

Mexican public health authorities have reported increased levels of respiratory disease, including reports of severe pneumonia cases and deaths, in recent weeks. Most reported disease and outbreaks are reported from central Mexico, but outbreaks and severe respiratory disease cases also have been reported from states along the U.S.-Mexico border. Testing of specimens collected from persons with respiratory disease in Mexico by the CDC laboratory has identified the same strain of swine influenza A (H1N1) as identified in the U.S. cases. However, no clear data are available to assess the link between the increased disease reports in Mexico and the confirmation of swine influenza in a small number of specimens. CDC is assisting public health authorities in Mexico in testing additional specimens and providing epidemiologic support. None of the U.S. patients traveled to Mexico within 7 days of the onset of their illness.

Epidemiologic and Laboratory Investigations

As of April 24, epidemiologic links identified among the new cases included 1) the household of the father and daughter in San Diego County, and 2) the school attended by the two youths in Guadalupe County. As of April 24, no epidemiologic link between the Texas cases and the California cases had been identified, nor between the three new California cases and the two cases previously reported. No recent exposure to pigs has been identified for any of the seven patients. Close contacts of all patients are being investigated to determine whether person-to-person spread has occurred.

Enhanced surveillance for additional cases is ongoing in California and in Texas. Clinicians have been advised to test patients who visit a clinic or hospital with febrile respiratory illness for influenza. Positive samples should be sent to public health laboratories for further characterization. Seasonal influenza activity continues to decline in the United States, including in Texas and California, but remains a cause of influenza-like illness in both areas.

Viruses from six of the eight patients have been tested for resistance to antiviral medications. All six have been found resistant to amantadine and rimantidine but sensitive to zanamivir and oseltamivir.

Reported by: *San Diego County Health and Human Svcs; Imperial County Public Health Dept; California Dept of Public Health. Dallas County Health and Human Svcs; Texas Dept of State Health Svcs. Naval Health Research Center; Navy Medical Center, San Diego, California. Animal and Plant Health Inspection Svc, US Dept of Agriculture. Div of Global Migration and Quarantine, National Center for Preparedness, Detection, and Control of Infectious Diseases; National Center for Zoonotic, Vector-Borne, and Enteric Diseases; Influenza Div, National Center for Infectious and Respiratory Diseases, CDC.*

Editorial Note: In the United States, novel influenza A virus infections in humans, including swine influenza A (H1N1) infections, have been nationally notifiable conditions since 2007. Recent pandemic influenza preparedness activities have greatly increased the capacity of public health laboratories in the United States to perform RT-PCR for influenza and to subtype influenza A viruses they receive from their routine surveillance, enhancing the ability of U.S. laboratories to identify novel influenza A virus infections. Before the cases described in this ongoing investigation, recent cases of swine influenza in humans reported to CDC occurred in persons who either had exposure to pigs or to a family member with exposure to pigs. Transmission of swine influenza viruses between persons with no pig exposure has been described previously, but that transmission has been limited (*2,3*). The lack of a known history of pig exposure for any of the patients in the current cases indicates that they acquired infection through contact with other infected persons.

The spectrum of illness in the current cases is not yet fully defined. In the eight cases identified to date, six patients had self-limited illnesses and were treated as outpatients. One patient was hospitalized. Previous reports of swine influenza, although in strains different from the one identified in the current cases, mostly included mild upper respiratory illness; but severe lower respiratory illness and death also have been reported (*2,3*).

The extent of spread of the strain of swine influenza virus in this investigation is not known. Ongoing investigations by California and Texas authorities of the two previously reported patients, a boy aged 10 years and a girl aged 9 years, include identification of persons in close contact with the children during the period when they were likely infectious (defined as from 1 day before symptom onset to 7 days after symptom onset). These contacts have included household members, extended family members, clinic staff members who cared for the children, and persons in close contact with the boy during his travel to Texas on April 3. Respiratory specimens are being collected from contacts found to have ongoing illness.

In addition, enhanced surveillance for possible cases is under way in clinics and hospitals in the areas where the patients reside. Similar investigations and enhanced surveillance are now under way in the additional six cases.

Clinicians should consider swine influenza infection in the differential diagnosis of patients with febrile respiratory illness and who 1) live in San Diego and Imperial counties, California, or Guadalupe County, Texas, or traveled to these counties or 2) who traveled recently to Mexico or were in contact with persons who had febrile respiratory illness and were in one of the three U.S. counties or Mexico during the 7 days preceding their illness onset. Any unusual clusters of febrile respiratory illness elsewhere in the United States also should be investigated.

Patients who meet these criteria should be tested for influenza, and specimens positive for influenza should be sent to public health laboratories for further characterization. Clinicians who suspect swine influenza virus infections in humans should obtain a nasopharyngeal swab from the patient, place the swab in a viral transport medium, refrigerate the specimen, and then contact their state or local health department to facilitate transport and timely diagnosis at a state public health laboratory. CDC requests that state public health laboratories promptly send all influenza A specimens that cannot be subtyped to the CDC, Influenza Division, Virus Surveillance and Diagnostics Branch Laboratory. As a precautionary step, CDC is working with other partners to develop a vaccine seed strain specific to these recent swine influenza viruses in humans.

As always, persons with febrile respiratory illness should stay home from work or school to avoid spreading infections (including influenza and other respiratory illnesses) to others in their communities. In addition, frequent hand washing can lessen the spread of respiratory illness (*5*). Interim guidance on infection control, treatment, and chemoprophylaxis for swine influenza is available at http://www.cdc.gov/flu/swine/recommendations.htm. Additional information about swine influenza is available at http://www.cdc.gov/flu/swine/index.htm.

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