



Swine Influenza: An Overview of Its History, Transmission, and Impact on Public Health

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Abstract

Swine Influenza, or Swine Flu, is a respiratory disease affecting pigs, caused by type A influenza viruses like H1N1 and H1N2. It was first linked to human flu during the 1918 pandemic and identified as a pig disease in 1930. The disease is characterized by high morbidity and low mortality rates, with severe outbreaks leading to economic losses due to reduced growth rates in young pigs. The disease manifests as an acute upper respiratory condition in pigs, and transmission among pigs occurs through direct contact or contaminated objects. Human infections are rare and typically occur in individuals with direct contact with infected pigs. The symptoms in humans resemble a flu-like syndrome. This paper provides an overview of the history of Swine Flu, its transmission mechanisms, and its impact on public health. It also offers guidelines for pig farmers to prevent Swine Flu on their farms.

What is Swine Flu?

Swine Influenza, commonly known as Swine Flu, is a respiratory illness affecting pigs and is caused by the type A influenza virus, specifically the swine influenza viruses like H1N1, H1N2 etc. Typically characterized by a high morbidity rate and low mortality. Severe outbreaks can occur, leading to economic losses due to reduced growth rates in young pigs.

History

Swine influenza, first linked to human flu during the 1918 pandemic, was identified as a pig disease in 1930. For six decades, H1N1 was the predominant swine flu strain. However, between 1997 and 2002, new subtypes and genotypes emerged in North American pigs. H3N2 strains, which include genes from human, swine, and avian viruses, became a major swine flu cause. A reassortment between H1N1 and H3N2 produced H1N2. In 1999, a H4N6 strain crossed from birds to pigs in Canada. The 2009 pandemic flu virus traces back to before 1918. Around that year, an avian virus crossed species boundaries, infecting humans as H1N1. This virus also infected pigs in America, leading to the H1N1 swine strain, or classic swine flu. This new human H1N1 strain of avian origin transmitted among humans until around 1957, when a co-infection with avian H1N1 led to a new strain, H2N2. In 1968, avian H1N1 infected humans again, meeting H2N2 and resulting in H3N2, a stable flu strain. The critical moment for the 2009 outbreak was between 1990 and 1993, when a triple reassortment event in a pig host led to the swine H1N2 strain. In 2009, the H1N2 virus co-infected a human host with the Euroasiatic H1N1 swine strain, leading to a new human H1N1 strain causing the 2009 pandemic.

Symptoms in Pigs

- Swine influenza manifests as an acute upper respiratory disease in pigs, exhibiting clinical signs such as fever, lethargy, anorexia, weight loss, coughing, sneezing, nasal and ocular discharge, conjunctivitis, and labored breathing.
- The onset of coughing often coincides with diminishing fever, and some herds may experience abortions.
- Concurrent infections and stressors can exacerbate symptoms.

Transmission

- Swine flu spreads among pigs through direct contact with infected pigs or contaminated objects like feed troughs and farm equipment.
- Poor biosecurity measures in pig farms increase the risk of infection.
- While human infections are rare, they typically occur in individuals with direct contact with infected pigs and resemble seasonal influenza.

Can it infect humans?

- Human infections with swine influenza viruses are rare and usually involve individuals in direct contact with infected pigs.
- Swine influenza viruses rarely spread among humans.
- Contrary to misconceptions, swine influenza is not a foodborne disease, and the risk of infection through the consumption of pork or pork products is negligible.

Transmission to humans

- Transmission can occur from pigs to humans by inhaling virus particles through the respiratory tract, especially during slaughter or handling of infected meat.
- Human-to-human transmission is rare and happens through respiratory tract exposure.

Symptoms in humans

Symptoms in humans closely resemble a flu-like syndrome with fever, chills, cough, sore throat, runny or stuffy nose, watery or red eyes, body ache, headache, fatigue, diarrhea, nausea, and vomiting.

Guidelines for Pig Farmers to Prevent Swine Flu on their Farms:

1. **Prompt Reporting:** Encourage all farm workers, especially those in close proximity to the animals, to promptly inform the owner if they develop symptoms resembling influenza.
2. **Visitor Register:** Maintain a registry for farm visitors, requiring them to sign before entry. Confirmations should include indications that they have showered and changed clothes since their last exposure to pigs and are currently free of fever or flu-like symptoms.
3. **Visitor Control:** Minimize unnecessary visits to the farm to reduce the risk of disease transmission.
4. **Farm Hygiene:** Regularly clean the farm using water and disinfectants such as Potassium permanganate, Sodium hydroxide, Sodium or calcium hypochlorite, Lysol™, Virox™, or Fantastik™. Ensure the provision of foot dips at the main gate and entrances/exits of individual pig sheds/pens.
5. **Mandatory Foot Dips:** Enforce mandatory foot dips at the entry points of each pig shed, utilizing disinfectant solutions like Potassium permanganate (3:1000), 2% Sodium hydroxide, 1% formaldehyde, 1% bleaching powder, or 1% Calcium hydroxide.

6. **Protective Gear:** When swine flu is suspected in a herd, workers in contact with sick animals should use protective equipment, including surgical masks or preferably P2/N95 masks, eye protection, and disposable gloves.
7. **Hand Hygiene:** Emphasize the importance of hand hygiene, either by washing hands with soap and water or using alcohol-based hand-rub after completing farm tasks.
8. **Equipment and Attire Care:** Farm workers should properly wash and disinfect their gumboots and special work attire after completing tasks, storing them in a separate dry area, preferably exposed to sunlight.
9. **Restricted Vehicle Access:** Prohibit unnecessary outside vehicles from entering the farm premises to prevent potential contamination.
10. **Sick Animal Isolation:** If any animal displays symptoms of swine flu, immediately separate it from healthy animals. Avoid direct contact without appropriate protective gear, and promptly seek the inspection of the local veterinarian.
11. **Restriction on Sale:** Refrain from selling diseased pigs to traders or butchers.
12. **Quarantine for New Pigs:** Newly purchased pigs should not be immediately integrated with healthy ones. Implement a quarantine period of 21-28 days, monitoring their health daily for any signs of illness.
13. **Regular Health Inspections:** Regularly inspect all farm animals for unusual signs of disease and promptly report any issues to the veterinarian.
14. **Temporary Work Restriction:** In the event of influenza-like symptoms, ensure that individuals refrain from coming to work for a minimum of seven days post-symptom onset, provided they have fully recovered.
15. **Medical Guidance:** Advise individuals exhibiting symptoms to seek advice from a medical professional.
16. **Doctor Notification:** In case of illness, farm workers should inform their doctor about recent contact with potentially infected pigs.

Prevention and control

Vaccination: Two brands of vaccines, Pandemrix and Celvapan, have been developed to protect against the swine flu virus. While Pandemrix typically requires only one dose, Celvapan necessitates two doses administered three weeks apart. Notably, the swine flu vaccine differs from the annual seasonal flu vaccine and is prioritized for pregnant women, children, and individuals at high risk of severe illness from swine flu. However, individuals with a history of severe allergic reactions to the vaccine or its components are advised against vaccination.

Antiviral Therapy: Antiviral drugs are another treatment option. Neuraminidase inhibitors and adamantanes are two classes of antivirals used for prevention and treatment. However, swine flu (Influenza A H1N1) has shown resistance to adamantanes. Currently, Oseltamivir (Tamiflu) and Zanamivir (Relenza), both neuraminidase inhibitors, are prescribed. These drugs can reduce the duration of symptoms by approximately one day and decrease the risk of contracting influenza by 70 to 90% when used after known exposure. Approved by the FDA, Oseltamivir and Zanamivir are effective against various influenza strains, including those responsible for past pandemics and avian influenza A strains.

References

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