



AVIAN INFLUENZA (BIRD FLU)

Avian Influenza: Current Situation

Assessment of Current Situation

The highly pathogenic avian influenza A (H5N1) epizootic (animal outbreak) in Asia, Europe, the Near East, and Africa is not expected to diminish significantly in the short term. It is likely that H5N1 virus infections among domestic poultry have become endemic in certain areas and that sporadic human infections resulting from direct contact with infected poultry and/or wild birds will continue to occur. So far, the spread of H5N1 virus from person-to-person has been very rare, limited and unsustainable. However, this epizootic continues to pose an important public health threat.

There is little pre-existing natural immunity to H5N1 virus infection in the human population. If H5N1 viruses gain the ability for efficient and sustained transmission among humans, an influenza pandemic could result, with potentially high rates of illness and death worldwide. No evidence for genetic reassortment between human and avian influenza A virus genes has been found to date, and there is no evidence of any significant changes to circulating H5N1 virus strains to suggest greater transmissibility to or among humans. Genetic sequencing of avian influenza A (H5N1) viruses from human cases in Vietnam, Thailand, and Indonesia shows resistance to the antiviral medications amantadine and rimantadine, two of the medications commonly used for treatment of influenza. This leaves two remaining antiviral medications (oseltamivir and zanamivir) that should still be effective against currently circulating strains of H5N1 viruses. A small number of oseltamivir resistant H5N1 virus infections of humans have been reported. Efforts to produce pre-pandemic vaccine candidates for humans that would be effective against avian influenza A (H5N1) viruses are ongoing. However, no H5N1 vaccines are currently available for human use.

Research suggests that currently circulating strains of H5N1 viruses are becoming more capable of causing disease (pathogenic) in animals than were earlier H5N1 viruses. One study found that ducks infected with H5N1 virus are now shedding more virus for longer periods without showing symptoms of illness. This finding has implications for the role of ducks in transmitting disease to other birds and possibly to humans as well. Additionally, other findings have documented H5N1 virus infection among pigs in China and Vietnam; H5N1 virus infection of cats (experimental infection of housecats in the Netherlands, isolation of H5N1 virus from domestic cats in Germany and Thailand, and detection of H5N1 viral RNA in domestic cats in Iraq and Austria); H5N1 virus infection of dogs (isolation of H5N1 virus from a domestic dog in Thailand); and isolation of H5N1 viruses from tigers and leopards at zoos in Thailand). In addition, H5N1 virus infection in a wild stone marten (a weasel-like mammal) was reported in Germany and in a wild civet cat in Vietnam. Avian influenza A (H5N1) virus strains that emerged in Asia in 2003 continue to evolve and may adapt so that other mammals may be susceptible to infection as well.

Notable findings of investigations of human H5N1 cases include:

- **Thailand, 2004:** An investigation concluded that probable limited human-to-human spread of influenza A (H5N1) had occurred in a family as a result of prolonged and very close contact between an ill child and her mother in a hospital. Transmission did not continue beyond one person.
- **Vietnam, 2004:** While the majority of known human H5N1 cases have begun with respiratory symptoms, one atypical fatal H5N1 case in a child in southern Vietnam presented with fever, diarrhea and seizures, and was initially diagnosed as encephalitis. The etiology was identified

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retrospectively as H5N1 virus through testing of cerebrospinal fluid, fecal matter, and throat and serum samples. Further research is needed to ascertain the implications of such findings.

- **Vietnam, 2005:** Investigations suggest transmission of H5N1 viruses to two persons through consumption of uncooked duck blood.
- **Azerbaijan, 2006:** Investigations revealed contact with H5N1-infected wild dead birds (swans) as the most plausible source of infection in several cases in teenagers involved in removing feathers from the birds.
- **Indonesia, 2006:** WHO reported evidence of limited human-to-human spread of H5N1 virus. In this situation, 8 people in one family were affected, with 7 deaths. H5N1 virus was isolated from 7 cases. The first family member is thought to have become ill through contact with infected poultry. This person then infected six family members. One of those six people (a child) then infected another family member (his father). No further spread outside of the exposed family was documented or suspected.
- **Vietnam, 2006:** A study reported a correlation between high H5N1 viral concentration and elevated inflammatory cytokine levels in fatal cases. The authors concluded that early antiviral treatment is needed to suppress H5N1 viral replication to prevent the inflammatory response that appears to be implicated in the pathogenesis of H5N1 virus infection.

Human H5N1 Cases

Since January 2004, the World Health Organization (WHO) has reported human cases of avian influenza A (H5N1) in Asia, Africa, the Pacific, Europe and the Near East. Indonesia and Vietnam have reported the highest number of H5N1 cases to date. Overall mortality in reported H5N1 cases is approximately 60%. The majority of cases have occurred among children and adults aged less than 40 years old. Mortality was highest in cases aged 10-19 years old. Studies have documented the most significant risk factors for human H5N1 infection to be direct contact with sick or dead poultry or wild birds, or visiting a live poultry market. Most human H5N1 cases have been hospitalized late in their illness with severe respiratory disease. A small number of clinically mild H5N1 cases have been reported. The current cumulative number of confirmed human cases of avian influenza A/(H5N1) is available on the [WHO Avian Influenza website](#). Despite the high mortality, human cases of H5N1 remain rare to date.

Clusters of Human H5N1 Cases

Clusters of human H5N1 cases ranging from 2-8 cases per cluster have been identified in most countries that have reported H5N1 cases. Nearly all of the cluster cases have occurred among blood-related family members living in the same household. Whether such clusters are related to genetic or other factors is currently unknown. While most people in these clusters have been infected with H5N1 virus through direct contact with sick or dead poultry or wild birds, limited human-to-human transmission of H5N1 virus cannot be excluded in some clusters.

Animal H5N1 Cases

Since December 2003, avian influenza A (H5N1) virus infections in animals have been reported in Asia, Africa, the Pacific, Europe and the Near East. View the [update on avian influenza in animals](#) from the World Organization for Animal Health Web site.

Bird Import Ban

There is currently a ban on the importation of birds and bird products from H5N1-affected countries. The [regulation](#) states that no person may import or attempt to import any birds (Class Aves), whether dead or alive, or any products derived from birds (including hatching eggs), from the specified countries. For more information, see [Embargo of Birds from Specified Countries](#).

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Travel

[Updated Information for Travelers about Avian Influenza A\(H5N1\)](#) is available at the CDC Travelers' Health Web site. Also see [Guidelines and Recommendations - Interim Guidance about Avian Influenza A \(H5N1\) for U.S. Citizens Living Abroad](#).

CDC Response

CDC is working with WHO and other international partners to monitor the situation closely. In addition, CDC continues to work with WHO and the National Institutes of Health (NIH) on development of a vaccine for influenza A (H5N1). For more information view [CDC's Response to Avian Influenza](#).

Background on the Current Outbreaks

Highly pathogenic avian [influenza A \(H5N1\)](#) virus is an influenza A virus subtype that occurs mainly in birds and is highly contagious among birds, causing high mortality among domestic poultry. [Outbreaks of highly pathogenic H5N1 among poultry](#) and wild birds are ongoing in a number of countries. Currently, there are two different groups (or clades) of H5N1 viruses circulating among poultry (clade 1, and clade 2 viruses). At least three subgroups or subclades of clade 2 H5N1 viruses have infected humans to date: subclades 2.1, 2.2, and 2.3 viruses. H5N1 virus infections of humans are rare and most cases have been associated with direct poultry contact during poultry outbreaks. While the H5N1 virus does not now infect people easily, infection in humans is very serious when it occurs; so far, more than half of people reported infected have died. Rare cases of limited human-to-human spread of H5N1 virus may have occurred, but there is no evidence of sustained human-to-human transmission.

Nonetheless, because all influenza viruses have the ability to change, scientists are concerned that H5N1 viruses one day could be able to infect humans more easily and spread easily from one person to another. Because H5N1 viruses have not infected many humans worldwide, there is little or no immune protection against them in the human population and an influenza pandemic (worldwide outbreak of disease) could begin if sustained H5N1 virus transmission occurred. Experts from around the world are watching the H5N1 situation very closely and are preparing for the possibility that H5N1 viruses may begin to spread more easily from person to person.

NOTE: The World Health Organization (WHO) maintains [situation updates](#) and [cumulative reports of human cases](#) of avian influenza A (H5N1).

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For more information, visit www.bt.cdc.gov,
or call CDC at 800-CDC-INFO (English and Spanish) or 888-232-6348 (TTY).