

Avian influenza outbreaks and the potential threat to human health

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Background

Avian influenza is an infectious disease of birds caused by type A strains of the influenza virus. The disease, which was first identified in Italy more than 100 years ago, occurs worldwide.

http://www.who.int/mediacentre/factsheets/avian_influenza/en/index.html

All birds are thought to be susceptible to infection with avian influenza though some species are more resistant to infection than others. Migratory waterfowl most notably wild ducks are the natural reservoir of avian influenza viruses, and these birds are also the most resistant to infection.

Avian influenza also affects domestic and wild avian species such as chickens, turkeys, ducks, geese, shorebirds, gulls and others. Clinical symptoms can range from mild (low pathogenic avian influenza) to severe (highly pathogenic avian influenza (HPAI)). HPAI can spread rapidly among chickens and turkeys and causes very high levels of morbidity and mortality. Direct or indirect contact of domestic flocks with wild migratory waterfowl has been implicated as a frequent cause of epidemics of HPAI. Live bird markets have also played an important role in the spread of epidemics.

Current situation

From mid-December 2003 through early February 2004, poultry outbreaks caused by the H5N1 virus were reported in eight Asian nations (listed in order of reporting): the Republic of Korea, Viet Nam, Japan, Thailand, Cambodia, Lao People's Democratic Republic, Indonesia, and China. Most of these countries had never before experienced an outbreak of highly pathogenic avian influenza in their histories.

In early August 2004, Malaysia reported its first outbreak of H5N1 in poultry, becoming the ninth Asian nation affected. Russia reported its first H5N1 outbreak in poultry in late July 2005, followed by reports of disease in adjacent parts of Kazakhstan in early August. Deaths of wild birds from highly pathogenic H5N1 were reported in both countries. Almost simultaneously, Mongolia reported the detection of H5N1 in dead migratory birds. Between October and December 2005, H5N1 was confirmed in poultry in Croatia, Turkey, Romania and the Ukraine. In January 2006, WHO reported outbreaks of H5N1 in poultry in several provinces in Turkey. Currently, extensive culling is underway. To date all outbreaks of the highly pathogenic form of avian influenza have been caused by influenza A viruses of subtypes H5 and H7.

Japan, the Republic of Korea, and Malaysia have announced control of their poultry outbreaks and are now considered free of the disease. In the other affected areas, outbreaks are continuing with varying degrees of severity.

Information on countries currently affected by avian influenza outbreaks in animals is available on the [World Animal Health Organisation \(OIE\)](#) and the [WHO website](#).

The spread of H5N1 to poultry in new areas is of concern as it increases opportunities for further human cases to occur. However, all evidence to date indicates that the H5N1 virus does not spread easily from birds to infect humans.

The WHO level of pandemic alert remains unchanged at phase 3: a virus new to humans is causing infections, but does not spread easily from one person to another.

http://www.who.int/csr/disease/avian_influenza/en/

Human cases

In 1997, avian influenza A (H5N1) was responsible for 18 cases of severe respiratory disease and six deaths in humans in Hong Kong. Prior to this outbreak, H5N1 was not known to infect humans. It is now recognised that HPAI outbreaks pose a significant threat to

human health, with H5N1 infections in humans causing severe illness and having a high case fatality rate.

Thailand and Viet Nam reported their first human cases of H5N1 avian influenza infection in January 2004. In January 2006, Turkey became the first country outside of Asia to report human cases of H5N1 avian influenza. As of 10th January 2006, Cambodia, China, Indonesia, Thailand, Turkey and Vietnam have reported 147 laboratory confirmed cases of human infection with H5N1 avian influenza. Seventy-eight (53.1%) of these cases were fatal. Regular updates on the numbers of confirmed cases, and situation updates from the affected countries are available on the [WHO website](#).

Although avian influenza A (H5N1) virus is highly pathogenic in humans, it is not transmitted efficiently from one human to another and human outbreaks have been short-lived. The 2004/2005 human influenza A (H5N1) infections were associated with close contact with infected poultry. These infections were thought to have been directly transmitted from the poultry. In September 2004, the Thai government reported a probable case of human-to-human H5N1 transmission, but this and any other suspected cases of human-to-human transmission so far have been limited to family members. There is currently no evidence of sustained person-to-person transmission of avian influenza.

http://www.who.int/csr/disease/avian_influenza/en/

The greatest concern for human health is that the avian H5N1 virus will remain endemic and that continued transmission of the virus to humans and other animals will provide opportunities for human and avian viruses to exchange genes (reassortment) to produce a virus that can replicate in humans, is highly pathogenic and is easily transmissible between humans. In a human population with no pre-existing immunity, such a virus could trigger a global influenza pandemic. At the present time, genetic analysis of the circulating avian influenza A (H5N1) strain indicates that no reassortment with human genes has occurred.

No one can predict when a pandemic might occur. However, the current H5N1 situation in affected countries is being monitored very

closely. Recent WHO reports on assessing the pandemic threat from avian influenza and recommended strategies for responding to the threat can be accessed at the following websites:

http://www.who.int/csr/disease/influenza/WHO_CDS_2005_29/en/
http://www.who.int/csr/resources/publications/influenza/WHO_CDS_CSR_GIP_05_8-EN.pdf

Clinical presentation of avian influenza

The main presenting clinical symptoms during the 2004 avian influenza epidemics in Thailand and Viet Nam were fever, cough, myalgia, sore throat, rhinorrhoea, shortness of breath and diarrhoea. However in Thailand and Viet Nam, two patients, who were confirmed to be infected with avian influenza H5N1, presented with atypical symptoms. In Thailand a 39-year old woman presented with diarrhoea, nausea and vomiting but no early respiratory symptoms. She developed pneumonia a week later and died the next day of severe adult respiratory distress syndrome with multi-organ failure.¹ In Viet Nam a 4-year old boy was admitted to hospital with gastroenteritis and acute encephalitis, but no respiratory symptoms. Laboratory analysis revealed that he had traces of influenza A (H5N1) in his faeces, blood, nose and in fluid around the brain. He later became comatose and died, only having shown signs of pneumonia on the day he died.² These cases illustrate that avian influenza can present as a systemic illness in humans in the same way as in poultry.

Early detection, assessment, and management of persons coming from countries affected by highly pathogenic avian influenza with febrile respiratory illness

Clinicians and public health staff are asked to be aware of the possibility that human cases of avian influenza (H5N1) could appear in Ireland, given that persons travel from countries affected by highly pathogenic avian influenza to Ireland on a regular basis, and that human-to-human transmission could occasionally occur.

It is important to take a careful travel and animal contact history from travellers returning from [countries affected by highly](#)

[pathogenic avian influenza](#) who have developed respiratory symptoms within seven days of any contact with poultry, or contact with persons with severe unexplained respiratory illness.

An [algorithm](#) and [interim guidance for health professionals](#) on the assessment and management of cases of respiratory illness in travellers returning from areas affected by avian influenza is provided on this website.

Travel recommendations

At this time, HPSC recommends that travellers to areas experiencing outbreaks of H5N1 avian infection should avoid contact with live animal markets and poultry farms, as large amounts of the virus are known to be excreted in the droppings from infected birds. Guidelines for travellers going to and returning from countries affected by avian influenza are available on the [HPSC website](#).

References

1. Apisarnthanarak A, Kitphati R, Thongphubeth K et al. Atypical avian influenza (H5N1). Emerg Infect Dis. 2004 Jul; 10(7): 1321-4. <http://www.cdc.gov/ncidod/EID/vol10no7/04-0415.htm>
2. de Jong MD, Bach VC, Phan TQ, Vo MH, Tran TT, Nguyen BH, Beld M, Le TP, Truong HK, Nguyen VV, Tran TH, Do QH, Farrar J. Fatal avian influenza A (H5N1) in a child presenting with diarrhoea followed by coma. N Engl J Med. 2005 Feb 17; 352(7): 686-91. <http://content.nejm.org/cgi/content/abstract/352/7/686>