Need more information?

Reference Experts:

Dr Paul W. Selleck
CSIRO, Australian Animal Health Laboratory (AAHL)
5 Portarlington Road, Private Bag 24, Geelong 3220, Victoria
AUSTRALIA
Tel: (61.3) 52.27.50.00
Fax: (61.3) 52.27.55.55
paul.selleck@csiro.au

Dr John Pasick
Canadian Food Inspection Agency, National Centre for Foreign Animal Disease
1015 Arlington Street,
Winnipeg,
Manitoba R3E 3M4
Canada
Tel: (1.204) 789.20.13
Fax: (1.204) 789.20.38
jpasick@inspection.gc.ca

Dr Timm C. Harder
Federal Research Centre for Virus Diseases of Animals (BFAV), Institute of Diagnostic Virology
Boddenblick 5a, 17493
Greifswald - Insel Riems
GERMANY
Tel: (49.383) 51.71.96
Fax: (49.383) 51.72.75
timm.harder@fli.bund.de

Dr Ilaria Capua
Istituto Zooprofilattico Sperimentale delle Venezie,
Laboratorio Virologia
Via Romea 14/A, 35020
Legnaro, Padova
ITALY
Tel: (39.049) 808.43.69
Fax: (39.049) 808.43.60
icapua@izsvenezie.it

Dr H. Kida
Graduate School of Veterinary Medicine, Hokkaido University,
Department of Disease Control
Kita-18, Nishi-9, Kita-ku,
Sapporo 060-0818
JAPAN
Tel: (81.11) 706.52.07
Fax: (81.11) 706.52.73
kida@vetmed.hokudai.ac.jp

Dr Ian Brown
VLA Weybridge
New Haw, Addlestone, Surrey
KT15 3NB
UNITED KINGDOM
Tel: (44.1932) 34.11.11
Fax: (44.1932) 34.70.46
i.h.brown@vla.defra.gsi.gov.uk

Dr B. Panigrahy
National Veterinary Services Laboratories
P.O. Box 844, Ames, IA 50010
UNITED STATES OF AMERICA
Tel: (1.515) 663.75.51
Fax: (1.515) 663.73.48
brundaban.panigrahy@aphis.usda.gov

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3. World Organisation for Animal Health, OIE, *Terrestrial Animal Health Code*, 2011; Chapter 10.4.1
4. World Health Organization, Avian Influenza Fact Sheet, **http://www.who.int/mediacentre/factsheets/avian_influenza/en/**

Key Facts

- **In 1997, a highly pathogenic strain of H5N1 AI emerged in Southeast Asia and spread throughout numerous Asian, Middle Eastern, African, and European countries. It has also been associated with illness and death in humans who have had close contact with infected birds.**
- **In 2002, mortalities in wild birds due to highly pathogenic avian influenza (HPAI) were reported in Hong Kong. These were the first reported deaths of wild birds as a result of HPAI in Asia.**
- **The first AI H5N1 case reported in Africa was in February 2006 in Nigeria.**
- **Outbreaks of highly pathogenic H5N1 AI in domestic birds occurring in Asia, Africa and Europe mark the first time in the history of this disease where so many countries have been simultaneously affected with the loss of so many birds.**

• 12, rue de prony • 75017 paris france
• tel. 33 (0)1 44 15 18 88 - fax 33 (0)1 42 67 09 87
• www.oie.int • oie@oie.int

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Avian Influenza

What is Avian Influenza (AI)?

Avian influenza (AI), caused by the influenza virus Type "A", can affect several species of food producing birds (chickens, turkeys, quails, guinea fowl, etc.), as well as pet birds and wild birds with some strains resulting in high mortality rates. The virus has also been isolated from mammalian species including humans, rats and mice, weasels and ferrets, pigs, cats, tigers and dogs.

AI viruses are not new. There are many descriptions of historical outbreaks of AI in domestic poultry throughout available literature.

There are many strains of AI viruses and generally they can be classified into two categories: low pathogenic (LPAI) that typically causes little or no clinical signs in birds and highly pathogenic (HPAI) that can cause severe clinical signs and/or high mortality in birds.

The Asian origin highly pathogenic H5N1 strain of the AI virus has attracted much attention over the last few years because of significant outbreaks globally in domestic and wild birds. Concern is raised because of the degree of virulence not only in poultry but also in wild birds as well as the ability to infect mammalian species. While AI viruses are generally highly species specific, the highly pathogenic H5N1 AI virus has also infected humans.

Low pathogenic strains of AI H5N1 virus exist but do not produce significant clinical signs in birds.

Avian influenza is a disease listed under the World Organisation for Animal Health (OIE) *Terrestrial Animal Health Code* – 2011 (Article 1.2.3). Notifiable avian influenza includes two particular subtypes, H5 and H7 that must be reported to the OIE (as per Chapter 1.1.2. – Notification of Diseases and Epidemiological Information).



Where is the disease found?

AI occurs worldwide and different strains are more prevalent in certain areas of the world than others.
Of particular interest are outbreaks of highly pathogenic H5N1 AI that began in south-east Asia in late 2003. Over the past years, several other Asian countries have reported outbreaks and in some, the disease is now considered to be endemic (always present). Outbreaks of HPAI H5N1 have also been reported in Africa and Europe.

How is the disease transmitted and spread?

Several factors can contribute to the spread of AI viruses including globalization and international trade (legally and illegally), marketing practices (live bird markets), farming practices and the presence of the viruses in wild birds.
Wild birds normally can carry avian influenza viruses in their respiratory or intestinal tracts and usually do not get sick. Wild birds have historically been known as reservoirs for AI viruses, mostly of low pathogenicity. Around the world, surveillance measures have been put in place to monitor occurrence and characteristics of AI viruses in wild birds. In wild birds, it is common during routine testing to find some influenza viruses. The vast majority of these viruses do not cause disease.
In studying current HPAI H5N1 outbreaks, the exact role of wild birds in spreading the virus over long distances is still not fully understood in all situations. Generally, there are many uncertainties about the wild species involved, the migratory routes used and, above all, the possibility that some species could become permanent reservoirs of the H5N1 virus, with carriers showing no clinical signs of the disease.
AI viruses can be spread through direct contact with secretions from infected birds, especially faeces or through contaminated feed, water, equipment and clothing.

Apart from being highly contagious among poultry, avian influenza viruses are readily transmitted from farm to farm by the movement of domestic live birds, people (especially when shoes and other clothing are contaminated), and contaminated vehicles, equipment, feed, and cages. Highly pathogenic viruses can survive for long periods in the environment, especially when temperatures are low. For example, the highly pathogenic H5N1 virus can survive in bird faeces for at least 35 days at low temperature (4^{o}C). At a much higher temperature (37^{o}C), H5N1 viruses have been shown to survive, in faecal samples, for six days. Other species including cats can exceptionally become infected with the HPAI H5N1 virus. Infections of pigs by other strains of avian influenza are of concern because the species is susceptible to infections of both avian and human influenza viruses and this may provide the AI virus the opportunity to reassort or mutate. While sporadic infection with HPAI virus in both species have been reported over the past years there is no scientific evidence to suggest that either species plays a significant role in the epidemiology of the disease or as a source of virus to other species.

What is the public health risk associated with this disease?

The disease is a zoonosis (a disease which primarily affects animals, but causes disease in humans).
AI viruses are highly species-specific, but have, on rare occasions, crossed the species barrier to infect humans. Transmission to humans has occurred when there is close contact with infected birds or heavily contaminated environments. While AI caused by highly pathogenic virus strains have sometimes been shown to infect man, this disease should not be confused with seasonal human influenza, a very common human disease (generally caused by H1 and H3 viruses).

Due to the potential for human infection, it is recommended that those people working with, or in contact with poultry suspected of being infected with AI, wear protective clothing including face masks, goggles, gloves and boots.
The probability for the H5N1 AI virus to change to a form that is highly infectious for humans and that will spread readily from person to person is unknown. However, this possibility combined with the increasing resistance of the H5N1 AI virus to currently available antiviral treatment and lack of complete vaccination effectiveness make this a critical human health risk.
There is no evidence to suggest that the consumption of cooked poultry or eggs could transmit the AI virus to humans.

What are the clinical signs of the disease?

In the mild form, signs of illness may be expressed only as ruffled feathers, reduced egg production, or mild effects on the respiratory system.
In the severe form of the disease, the virus not only affects the respiratory tract, as in the mild form, but also invades multiple organs and tissues that can result in massive internal haemorrhaging.
Some or all of the following clinical signs are evident in birds infected with a highly pathogenic strain of AI (including H5N1 strain):

- quietness and extreme depression;
- sudden drop in production of eggs, many of which are soft-shelled or shell-less;
- wattles and combs become swollen and congested;
- swelling of the skin under the eyes;
- coughing, sneezing and nervous signs;
- diarrhoea;
- haemorrhages on the hock;
- a few deaths may occur over several days, followed by rapid spread and a mortality rate that can then approach 100% within 48 hours.

More detailed information is available in the OIE Avian Influenza Technical Disease Card.http://www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_World/docs/pdf/AVIAN_INFLUENZA_FINAL.pdf

How is the disease diagnosed?

Laboratory tests are required to confirm the diagnosis. (Prescribed and Alternative Diagnostic Tests for OIE Listed Diseases, Chapter 1.3, *Terrestrial Animal Health Code,* 2011; Avian Influenza, Chapter 2.3.4, *Manual of Diagnostic Tests & Vaccines for Terrestrial Animals).*

What is being done to prevent or control this disease?

Prevention and control measures

It is extremely important to have early detection and warning systems and prevention measures in place as part of an effective strategy for AI. This needs to be coupled with similar efforts placed on preparing for a potential outbreak.
Around the world, surveillance measures have been put in place to detect the presence of infection in poultry according to OIE Standards for the Surveillance of Avian Influenza (Chapter 10.4.29, Terrestrial Animal Health Code, 2011).
Additionally, surveillance programmes monitor the occurrence, prevalence and characterisation of AI viruses found in wild birds. Wild bird surveillance considers different migratory flyways and particularly at mingling points for migrating birds from different continents.
It is essential for poultry producers to maintain biosecurity practices to prevent introduction of the virus in their flock.

Avian Influenza

Measures that are recommended at the farm level include:

- keep poultry away from areas frequented by wild fowl;
- keep control over access to poultry houses by people and equipment;
- do not provide elements on property that may attract wild birds;
- maintain sanitation of property, poultry houses and equipment;
- avoid the introduction of birds of unknown disease status into flock;
- report illness and death of birds
- appropriate disposal of manure and dead poultry. If the disease is detected, generally a “stamping out” (culling) policy is used in the efforts to eradicate the disease. Elements included in a response effort include:
- humane destruction of all infected and exposed animals (see Guidelines for the killing of animals for disease control purposes, Chapter 7.6, Terrestrial Animal Health Code, 2011);
- appropriate disposal of carcasses and all animal products (Guidelines for the disposal of dead animals, Chapter 4.12, *Terrestrial Animal Health Code*, 2011);
- surveillance and tracing of potentially infected or exposed poultry;
- strict quarantine and controls on movement of poultry and any at-risk vehicles;
- thorough decontamination of infected premises;
- a period at least 21 days before restocking; Culling may be complemented by a vaccination policy for poultry in a high-risk area.

Vaccination aims to protect the susceptible population of birds from potential infection thereby reducing the incidence or the severity of disease. Vaccination strategies can effectively be used as an emergency effort in the face of an outbreak or as a routine measure in an endemic area. Careful consideration must be given prior to implementing a vaccination policy and requires that the recommendations from the World Organisation for Animal Health (OIE) on vaccination and vaccines are closely followed.
Any decision to use vaccination must include an exit strategy.
OIE guidelines emphasize that prevention and control measures such as surveillance and reporting of findings of NAI in wild birds and vaccination of domestic poultry should not result in unjustified trade restrictions (*Terrestrial Animal Health Code*, 2011; Chapter 10.4.1).