

What is bird flu?

"Bird flu", or avian influenza, is an infectious disease of animals caused by viruses that normally infect birds and, less commonly, pigs. While all bird species are thought to be susceptible to infection, domestic poultry flocks are especially vulnerable to infections that can rapidly reach epidemic proportions.

What are the types?

The disease in birds has two forms. The first causes mild illness, sometimes expressed only as ruffled feathers or reduced egg production. Of greater concern is the second form, known as "highly pathogenic avian influenza". This form is highly infectious in birds and is rapidly fatal, with a mortality approaching 100%. Birds can die on the same day that symptoms first appear.

What are the symptoms?

The reported symptoms of avian influenza in humans have ranged from typical influenza-like symptoms (e.g., fever, cough, sore throat and muscle aches) to eye infections, pneumonia, acute respiratory distress, viral pneumonia, and other severe and life-threatening complications.

Most influenza viruses cause no symptoms, or only mild ones in wild birds; however, the range of symptoms in birds vary greatly depending on the strain of virus and the type of bird. Infection with certain avian influenza A viruses (for example, some H5 and H7 strains) can cause widespread disease and death among some species of wild and especially domesticated birds such as chickens and turkeys.

Certain water birds act as hosts of influenza viruses by carrying the virus in their intestines and shedding it. Infected birds shed virus in saliva, nasal secretions and faeces. Avian influenza viruses spread among susceptible birds when they have contact with contaminated nasal, respiratory and faecal material from infected birds; however, faecal-to-oral transmission is the most common mode of spread.

What are the control measures in birds?

The most important control measures are rapid destruction ('culling' or 'stamping out') of all infected or exposed birds, proper disposal of carcasses, and the quarantining and rigorous disinfection of farms. The virus is killed by heat (56 degrees C for 3 hours or 60 degrees C for 30 minutes) and common disinfectants, such as formalin and iodine compounds. The virus can survive, at cool temperatures, in contaminated manure for at least three months. In water, the virus can survive for up to four days at 22 degrees C and more than 30 days at 0 degrees C. For the highly pathogenic form, studies have shown that a single gram of contaminated manure can contain enough virus to infect 1 million birds. Restrictions on the movement of live poultry, both within and between countries, is another important control measure.

How does it spread within a country?

Within a country, the disease spreads easily from farm to farm. Large amounts of virus are secreted in bird droppings, contaminating dust and soil. Airborne virus can spread the disease from bird to bird, causing infection when the virus is inhaled. Contaminated equipment, vehicles, feed, cages or clothing, especially shoes, can carry the virus from farm to farm. The virus can also be carried on the feet and bodies of animals, such as rodents, which act as 'mechanical vectors' for spreading the disease.

Droppings from infected wild birds can introduce the virus into both commercial and backyard poultry flocks. The risk that infection will be transmitted from wild birds to domestic poultry is greatest where domestic birds roam freely, share a water supply with wild birds, or use a water supply that might become contaminated by droppings from infected wild-bird carriers. Also the risk of transmission of bird

flu is mainly for the animal handlers and people in close vicinity. Eggs should not be taken in a raw form, not only for bird flu but also to prevent salmonella infections.

How does it spread from one country to another?

The disease can spread from country to country through international trade in live poultry. Migratory birds, including wild waterfowl, sea birds, and shore birds, can carry the virus for long distances and have, in the past, been implicated in the international spread of highly pathogenic avian influenza. Migratory waterfowl - most notably wild ducks are the natural reservoir of bird flu viruses, and these birds are also the most resistant to infection. They can carry the virus over great distances, and excrete it in their droppings, yet develop only mild and short-lived illness.

Domestic ducks, however, are susceptible to lethal infections, as are turkeys, geese, and several other species raised on commercial or backyard farms.

What is the present situation?

Since mid-December 2003, a growing number of Asian countries have reported outbreaks of highly pathogenic avian influenza in chickens and ducks. Infections in several species of wild birds and in pigs have also been reported. India has not reported any case of bird flu as yet.

Particularly alarming, in terms of risks for human health, is the detection of a highly pathogenic strain, known as "H5N1", as the cause of most of these outbreaks. H5N1 has jumped the species barrier, causing severe disease in humans, on two occasions in the recent past and is now doing so again, in gradually growing numbers, in Vietnam and Thailand.

Is there a vaccine effective against H5N1 in humans?

There are currently no available vaccines to protect against disease caused by the H5N1 influenza virus strain in humans. WHO is urgently working together with laboratories to develop a prototype H5N1 virus for use by leading vaccine manufacturers.

Are there drugs available for prevention and treatment?

Two classes of drugs are available. These are the M2 inhibitors (amantadine and rimantadine) and the neuraminidase inhibitors (oseltamivir and zanamivir). These drugs have been licensed for the prevention and treatment of human influenza in some countries, and are thought to be effective regardless of the causative strain.

However, initial analyses of viruses isolated from the recently fatal cases in Vietnam indicate that the viruses are invariably resistant to the M2 inhibitors. Further testing is under way to confirm the resistance of amantadine. Network laboratories are also conducting studies to confirm the effectiveness of neuraminidase inhibitors against the current H5N1 strains.

Are presently available vaccines useful?

Yes, but in a precisely targeted way. Current vaccines, when administered to high-risk groups, such as poultry cullers, protect against circulating human strains and thus reduce the risk that humans at high risk of exposure to the bird flu virus might become infected with human and avian viruses at the same time. Such dual infections give the avian and human viruses an opportunity to exchange genes, possibly resulting in a new influenza virus subtype with pandemic potential.

Annual vaccines are produced for routine use in protecting humans during seasonal epidemics of influenza. However, they offer no protection against infection with the H5N1 avian virus. WHO has issued guidelines for the vaccination of groups considered at high risk of exposure, using the current trivalent influenza vaccine, in countries experiencing outbreaks of highly pathogenic H5N1 avian influenza in poultry.

