

Bird Flu (Avian Influenza)

And a Possible Flu Pandemic

The strains of influenza viruses that cause flu in birds do not normally affect humans. However, recently there have been a number of people who have caught a strain of influenza virus called H5N1 from infected birds. This causes a severe illness with a high death rate. The H5N1 strain of virus does not pass from human to human. However, there is concern that it may mutate (change) and then be able to spread easily from human to human. If this happens, it may cause a serious flu pandemic.

What are the influenza viruses (flu viruses)?

There are three main types of influenza virus - A, B and C. Influenza B and C viruses normally only infect humans. Influenza A viruses can infect humans and animals, especially birds.

On the surface of the influenza A virus there are two types of proteins called haemagglutinin (H) and neuraminidase (N). There are sixteen types of haemagglutinin protein and nine types of neuraminidase protein. There are many different sub-types (strains) of influenza A and they are named according to which surface proteins are present - for example, H1N1, H1N2, H2N3, etc.

Influenza A viruses are more able than most viruses to change (mutate) to produce new strains. This is because changes (mutations) occur relatively easily in the genes of influenza A viruses. Slight changes are called 'antigenic drift' of existing virus strains. A more dramatic change, when a completely new strain emerges, is called 'antigenic shift'. It is this ability of the influenza A viruses to mutate that makes them able to cause new types of flu illness as new strains emerge.

What is bird flu ('avian influenza')?

Bird flu is a disease of birds caused by various strains of the influenza A virus. All species of birds can be infected with bird flu viruses. Wild birds that migrate such as wild ducks and geese can carry the viruses but are often immune to these viruses and do not become ill. However, poultry birds such as chickens and turkeys become ill when they are infected. Bird flu viruses are easily spread from bird to bird, mainly via contaminated droppings and saliva.

The severity of the illness in affected birds depends on which strain of the virus is causing the infection. Some strains of the influenza A virus cause only mild illness. However, some strains are called 'highly pathogenic avian influenza' and can cause a severe illness which is usually fatal to chickens and other poultry.

The virus causing alarm at present is the H5N1 strain of the influenza A virus. This strain of virus has caused outbreaks of severe bird flu in several countries in recent years.

What is the difference between bird flu and 'human flu'?

The term 'bird flu' usually means an illness in birds caused by strains of the influenza A virus that are mainly found in birds. These strains do not usually infect humans (but see below).

The flu that humans commonly get is normally caused by other strains of the influenza A virus. Each year there is usually an outbreak of flu caused by a 'human flu' strain. A 'human flu' strain of virus can cause an unpleasant illness, but it is not usually life-threatening in people who are normally well. However, each year a number of people die from human flu. It is usually elderly people or people who are already unwell who are most likely to die from a 'human flu' strain.

See separate leaflet called '*Flu and Flu Like Illnesses*' for more information about 'human flu'.

How does bird flu affect humans?

The H5N1 strain of bird flu virus has caused outbreaks of illness in poultry flocks throughout the world from time to time over the last 40 years or so. It was not thought to be a threat to humans as bird flu viruses generally do not affect humans. However, in 1997 an outbreak of bird flu in Hong Kong with the H5N1 strain infected 18 people, and six died of the infection. This is of great concern because it showed that the H5N1 strain had mutated in some way to be able to infect humans as well as birds. And also, it caused a very serious illness. These human cases were in people who had been in close contact with infected birds and had caught the illness directly from the birds. The infected people did not pass on the infection to other people.

Since 1997 there have been several more outbreaks of H5N1 bird flu in several countries throughout the world. In some of these outbreaks, millions of poultry birds have died from the disease or were killed (culled by the authorities) in order to try to control the outbreak. As of June 2006, there have been 228 reported human cases of H5N1 infection with 130 deaths. These human cases were in people who caught the virus directly from infected birds. Also, people who had previously been healthy died from the illness (which is uncommon in 'human flu'). Therefore, the H5N1 strain of bird flu virus causes a much more serious illness in humans than 'human flu' strains, and with a much higher risk of causing death.

There are other strains of virus such as H9N2, H7N7 and H7N3 that have caused recent outbreaks of illness in birds in various countries. These have also caused a small number of cases of human illness after contact with infected birds. However, the size of these outbreaks and the severity of the illness has not been as serious as with the H5N1 strain.

So far, it is not thought that the H5N1 strain of bird flu is able to pass easily from human to human - only from bird to bird, and in some cases from bird to human. There have been isolated reports of possible transmission from human to human. But these have been one-off cases with no reports of outbreaks with several people being infected. Therefore, at present (June 2006) the H5N1 strain of the virus does not seem to have the ability to readily pass from human to human.

However, there is great concern that the H5N1 strain may mutate and develop into a strain that has the ability to pass easily from human to human. This may never happen, but if it does (as many scientists fear), what we would then have is a virus that:

- can cause a very serious form of flu that has a high death rate, AND
- can pass easily from human to human and may cause a serious flu pandemic

What is a flu pandemic and will one happen in the near future?

A flu pandemic is an outbreak of influenza (flu) that occurs when a new strain of influenza A virus emerges that can affect humans, can cause serious illness, and spreads easily from person to person throughout the world to affect many people.

A flu pandemic is different to the usual outbreak or epidemic of flu that occurs most years. The usual yearly outbreak of flu is caused by a 'human' strain of flu virus that already exists. Many people are immunised each autumn against the strain known to be spreading towards the UK that coming winter.

There have been flu pandemics in the past. The 'Spanish Flu' pandemic from 1918–19 is thought to have killed around 50 million people worldwide. The 'Asian Flu' pandemic from 1957–58 and the 'Hong Kong Flu' pandemic from 1968–69 were less lethal than the Spanish Flu, but each still caused the death of more than a million people.

What many scientists believe is not 'if' a new pandemic will occur, but 'when' one will occur. And if the infecting virus develops from a mutation from the H5N1 virus (the current concern), this is likely to be a very serious situation. However, unlike the previous pandemics, medical science has moved on. Vaccines and antiviral treatments may make a difference (see below).

What are the symptoms of bird flu?

Symptoms that occur in people who develop bird flu with the H5N1 strain are similar at first to other types of flu. That is, fever, cough, sore throat, muscle aches, and sometimes diarrhoea. However, the symptoms typically become quickly worse over a few days to include severe breathing problems and severe pneumonia which may result in death.

Other strains of bird flu that have been caught by humans cause less severe symptoms.

What can I do to avoid catching bird flu from a bird?

The risk of catching bird flu is low. You are only likely to be at risk if you come into close contact with birds who are infected with bird flu viruses. Therefore, the most important thing to do is avoid places such as chicken farms and bird markets where live birds are kept, especially in countries where there have been outbreaks of bird flu. As with other types of infectious illnesses, regular hand washing is important, especially after handling animals or birds. As a precaution, also avoid eating raw eggs and make sure poultry such as chicken is cooked thoroughly. In places where an outbreak of bird flu occurs, culling of poultry is done to stop the outbreak from spreading.

What is the treatment for bird flu?

Antiviral drugs may help. Antiviral drugs do not kill viruses, but work by stopping the virus from multiplying. Therefore, they are not a cure, but can protect against serious illness or death if you were to catch bird flu. Because of the threat of a possible pandemic of bird flu, the UK government has begun to stockpile an antiviral drug called oseltamavir (trade name Tamiflu). The aim is to have enough by September 2006 to treat a quarter of the UK population. However, a concern is that a new strain of virus that may emerge to cause a pandemic may become resistant to this drug.

Antibiotics may also be useful to protect against secondary bacterial infection that may occur if you develop flu.

Is there a vaccine against bird flu?

Clinical trials are underway to test a vaccine that has been made against the H5N1 strain of influenza A virus. However, if a virus emerges to produce a flu pandemic, it will be a mutation from the H5N1 strain. So, it will be a slightly different strain. Whether the vaccine against the H5N1 strain will be effective against this potential new virus is not clear. It may be partially effective, which may help to lessen the effect and severity of the disease.

If a new virus does emerge, then as soon as it is identified scientists will try to develop a specific vaccine as soon as possible. However, it can take several months to develop a new vaccine and this may be too late to protect many people if a pandemic sweeps across the world.

Keeping up with developments

This article is just a brief introduction and overview to bird flu and was last updated in June 2006. To keep as up to date as possible, and for more detailed information visit:

Department of Health - www.dh.gov.uk Type in 'bird flu' to their search box.

Health Protection Agency - www.hpa.org.uk/infections/topics_az/avianinfluenza/menu.htm

World Health Organisation - www.who.int/csr/disease/avian_influenza/en/

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