

Is the current epidemic of avian influenza (bird flu) a first time occurrence of the disease like SARS?

This is not a new disease. The first epidemic was reported from Italy more than 100 years ago. Since then the disease has been reported often from many countries. In recent years, the epidemic in Hong Kong (1997) was of concern since it affected human beings but it was controlled by killing a large number of birds rapidly in the infected farms.

Why is there so much concern about this disease in Asia?

There are several countries from where large epidemics of avian influenza are being reported. These countries have reported the infection over a short period of time (since December 2003). Some of these countries include Indonesia, Thailand, Viet Nam, Cambodia, Hong Kong, Japan, the Republic of Korea and Taiwan. The list of affected countries is increasing.

There is concern because the number of cases in birds and in humans is increasing. The current epidemic is caused by highly pathogenic avian influenza (HPAI). There is evidence that this strain can jump the species and cause severe disease in human beings. At present, there is no immunity to avian influenza in human beings. The mortality in affected human beings is much higher than in SARS even though the number of affected human cases currently is small. Avian influenza in human beings has been reported from Cambodia, China, Egypt, Indonesia, Iraq, Thailand, Turkey and Viet Nam. There are fears that the virus may jump from birds to human beings in larger numbers in future. According to current information, the infection from an infected human to another is not sustained. If this occurs then a large epidemic (pandemic) of avian influenza may occur in humans.

The current epidemic in poultry is affecting the poultry industry and farmers. Birds that have been exposed to the virus need to be killed rapidly to prevent the spread of the epidemic and this has an adverse economic impact and deprives families of a protein rich diet.

How do outbreaks of avian influenza in poultry 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 and share a water supply with wild birds, or use water supply that might become contaminated by droppings from infected wild-bird carriers.

So called, “wet” markets, where live birds are sold under crowded and sometimes unsanitary conditions can be another source of spread.

How can the disease spread from one country to another?

The spread of this disease from one country to another can occur as a result of trade in contaminated birds or poultry products or through migratory birds infected with the virus. Although they may be infected, migratory birds may not be sick or have only a mild illness. They can carry the virus to long distances. Migratory water fowl – the wild ducks, carry the virus but do not suffer from the disease. Epidemics of avian influenza occur when domesticated birds like chickens or turkeys come in contact with wild ducks carrying the virus.

Can avian influenza spread from one human being to another?

At present, there is no evidence to confirm sustained human-to-human transmission of avian influenza. However, this is a possibility in the future which is a cause for extreme concern. The

influenza virus type A and its various subtypes can, in the presence of another influenza virus, merge with it through mixing and reassortment. This can lead to the appearance of a new virus with characteristics that are different from the parent viruses. Since the population has no immunity to the new virus subtype, it can appear as a serious life threatening disease. Human beings and pigs serve as mixing vessels where the mixing of type A influenza virus acquired from the birds with human influenza (also called flu virus) can occur. This can lead to human-to-human transmission of a severe disease. The past pandemics (1918, 1957 and 1968) of influenza have occurred as a result of reassortment and mixing of various influenza viruses.

Is there a vaccine to prevent Avian Influenza?

Vaccine is one of the options for controlling a pandemic caused by influenza virus. The current H5 N1 avian influenza is considered a pre-pandemic virus since it has not caused a pandemic yet. However, it cannot be ruled out that the H5N1 may evolve into a pandemic strain eventually. There is sufficient evidence for WHO to create a pre-pandemic stockpile of H5N1 influenza vaccine for countries without influenza vaccine manufacturing capacity or the ability to purchase stockpiles of H5N1 vaccines.

Based on the expert advice of WHO Global Influenza Programme, the H5N1 virus has been chosen as the pre-pandemic candidate vaccine virus. A good candidate vaccine usually consists of a cocktail of currently circulating strains of viruses. Genetic analysis of the H5N1 viruses circulating in avian species over the past four years has identified two genetic groups—so-called clade: Clade 1 viruses are circulating in Cambodia, Thailand and Vietnam and clade 2-viruses are circulating in China and Indonesia. Multiple sub-clades are also known to occur and all have been associated with human infections. On the basis of geographical spread, the epidemiology, and the genetic properties of the H5N1 viruses isolated from humans, national authorities may recommend the use of one or more H5N1 strains as candidates from the following viruses (A/Indonesia/5/2005-like viruses; A/Bar headed goose/Qinghai/1a/200-like virus and A/Anhui/1/2005-like viruses. Representative H5N1 vaccine viruses have been prepared by reversed genetics and safety tested prior to release for production of pilot vaccine lots that may be used experimentally or for stockpiling. WHO has already awarded initial grants to approved vaccine manufacturers in Brazil, India, Indonesia, Thailand, Mexico and Vietnam to increase the surge capacity of pre-pandemic vaccine. In addition 87 low and middle income countries might request financial support for pandemic vaccination.

If a pandemic occurs then a minimum of almost 6.2 billion doses would be required to protect the world population. The current estimated production capacity is 350 million trivalent doses. Thus, to avoid being unprepared, both surge capacity and production technology should be accelerated. In addition to the financial grants, WHO is providing technical support to countries for feasibility studies; dealing with the issue of registration; licensing of pandemic vaccine, and strengthening of National Regulatory Authorities.

Are there drugs available for prevention and treatment?

Yes. 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 analysis of viruses isolated from the recently fatal cases in Viet Nam indicates that the viruses are invariably resistant to the M2 inhibitors.

The WHO has a stockpile of 3 million treatment courses which would be used as a pre-emptive measure anywhere in the world. Distribution of WHO's stockpile will be based on the need to pre-empt the pandemic. No country specific quota will be available.

Countries may consider national stockpiling to meet their immediate needs.

How do you confirm the diagnosis of avian influenza?

The diagnosis is confirmed only with the help of laboratory tests. Virus isolation, PCR and immunofluorescence can directly demonstrate the presence of the virus or its nucleic acid whereas

a four-fold rise in specific antibody also confirms the diagnosis. It is essential that, for establishing diagnosis, the clinical material must be handled under appropriate biosafety precautions and infrastructure. BSL 2 facilities are required for handling seasonal human influenza virus **and BSL 3 for H5N1**.

Reagents for diagnosis are available free of cost from designated WHO collaborating centres. Countries may consider establishing/activating National Influenza Centres to meet their requirements. Establishment of a National Influenza Centre would facilitate access to the appropriate WHO collaborating centre for technical support, reagents and for troubleshooting.

Guidelines for international shipment of infectious material must be adhered to while sending material to WHO Reference Laboratories. It is advisable to get the diagnosis confirmed from one of the WHO Reference Laboratories

What is being done by national governments and international agencies to control the epidemic of avian influenza?

There is global concern about the spread of avian influenza and the possibility of a pandemic. At the international level, WHO, FAO (Food and Agriculture Organization) and OIE (International Organization for Animal Health) are exchanging information, organizing regular consultations and advising the national governments building capacity. They are also assisting in resource mobilization.

The governments are strengthening intersectoral collaboration between the ministries of health, agriculture, forestry, animal husbandry, transport, etc. to undertake coordinated action in controlling outbreaks of avian influenza.

The formulation of a National Pandemic Preparedness Plan is fundamental to harness the national resources and activate the systems in the health and veterinary sectors to respond rapidly to the threat of a pandemic. This plan will also be a critical tool for resource mobilization.

Environmentalists object to the killing of birds and animals. What is your guidance to them on this issue?

The concern of environmentalists about the wanton killing of birds and animals is normally justified. At present, however, some countries are in the midst of an epidemic of avian influenza that is also infecting humans. While this disease is not being transmitted from an infected human being to an uninfected human being, in the event that this does happen, we may face a pandemic of influenza which can be devastating.

Past experience shows that prompt culling of birds is the only effective way to control the epidemic. Therefore, doing this when it is required can avert a major disaster and is justified.

This issue should be taken up with the environmentalists and they should be convinced about the need for such action to save human lives.

What is the role of WHO in controlling the avian influenza epidemic?

WHO's objective is to reduce the risk to humans from avian influenza to prevent it from recombining with human influenza virus in which case it will not only spread rapidly but may also become more severe. To avert an influenza pandemic, WHO is providing technical support to Member States. It is advising national authorities to increase their surveillance of affected poultry stocks and strengthening surveillance of human beings. Control of avian influenza requires effective coordination between the ministries of health, agriculture, the ministry of forestry and animal husbandry.

Other roles of WHO have been described earlier. To summarize:

- Provide technical support
- Develop guidelines
- Assist in outbreak investigation

- Provide diagnostic reagents and assist in confirmation of diagnosis through its network of Reference Laboratories.
- Stockpile antivirals
- Develop prototype vaccine strain
- Support research

Can a pandemic be averted?

Based on historical patterns, influenza pandemics can be expected to occur, on average, three to four times each century when new virus subtypes emerge and are readily transmitted from person to person. However, the occurrence of influenza pandemics is unpredictable. In the 20th century, the great influenza pandemic of 1918–1919, which caused an estimated 40 to 50 million deaths worldwide, was followed by pandemics in 1957–1958 and 1968–1969.

Experts agree that another influenza pandemic is inevitable and possibly imminent. Most influenza experts also agree that the prompt culling of Hong Kong's entire poultry population in 1997 probably averted a pandemic.

Several measures can help minimize the global public health risks that could arise from large outbreaks of highly pathogenic H5N1 avian influenza in birds. An immediate priority is to halt further spread of epidemics in poultry populations. This strategy helps to reduce opportunities for human exposure to the virus. Vaccination of persons at high risk of exposure to infected poultry, and using existing vaccines effective against currently circulating human influenza strains, can reduce the likelihood of co-infection of humans with avian and influenza strains, and thus reduce the risk that genes will be exchanged. Workers involved in the culling of poultry flocks must be protected, by proper clothing and equipment, against infection. These workers should also receive antiviral drugs as a prophylactic measure.

When cases of avian influenza in humans occur, information on the extent of influenza infection in animals as well as humans and on circulating influenza viruses is urgently needed to aid the assessment of risks to public health and to adopt the best protective measures. A thorough investigation of each case is also essential. While WHO and the members of its global influenza network, together with other international agencies, can assist with many of these activities, the successful containment of public health risks also depends on the epidemiological and laboratory capacity of affected countries and the adequacy, effectiveness and surveillance systems already in place. Therefore, ensuring country preparedness through development and implementation of the pandemic preparedness plans, with full involvement of all relevant sectors is of fundamental importance. While all these activities can reduce the likelihood that a pandemic strain will emerge, the question of whether another influenza pandemic can be averted cannot be answered with certainty.

WHO Guidelines on avian influenza can be accessed at:
http://www.who.int/csr/disease/avian_influenza/en/

For further information please contact:
CSR_group@searo.who.int