

Q&A on Avian Influenza (Bird Flu)

BACKGROUND

1. What is Avian Influenza? Is there only one type of avian flu?

Avian influenza, or "bird flu", is a contagious disease of animals caused by Type A flu viruses that normally infect only 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 cause epidemics in poultry. It often causes little or no disease in wild waterfowl but sometimes causes large outbreaks associated with high mortality in poultry approaching 100%.

The classification of the subtypes of Influzena A viruses based on the haemagglutinin(H) protein and the neuraminidase (N) protein on the surface of the virus.

	Neuraminidase (N)	Haemagglutinin (H)
Bird	1-9	1-15 or more
Human	1-2	1-3

All subtypes of Influenza A viruses can be found in birds which provide a huge pool of genetic diversity of avian flu, rendering at least 135 types of avian flu viruses. In contrast, there are only three known subtypes of human influenza viruses that are currently circulating (H1N1, H1N2 and H3N2).

ABOUT THE CAUSE

2. Is this a form of SARS?

No. SARS is caused by a Coronavirus, not an influenza virus.

3. What are the symptoms of bird flu in birds?

The symptoms are loss of appetite, ruffled feathers, fever, malaise, diarrhea, irritability and death.

4. What are the symptoms of bird flu in humans?

Fever, cough, sore throat, muscle aches and severe breathing difficulty. Basically the symptoms of bird flu in humans ranges from that of human flu (fever, headache, muscle pain, running nose, cough and sore throat) to eye infections, pneumonia, acute respiratory distress, diarrhea, encephalitis, multi-organ failure and other severe complications. The incubation period is on average 3-5 days but can be up to 7 days.

CURRENT SITUATION

5. What are the countries that had the outbreak of avian flu among the poultry?

An up-to-date list of countries can be found at

6. How is avian influenza spread among poultry?

Certain wild birds act as hosts of influenza viruses. Infected birds shed virus in saliva, nasal secretions and faeces. Avian influenza viruses spread to susceptible birds (domestic poultry) when they have contact with contaminated nasal, respiratory and faecal material from infected birds. Faecal-to-oral transmission is the most common mode of spread among birds (for example, contaminated food and water supplies).

7. Are all of the currently reported outbreaks in birds equally dangerous for humans?

No. H5N1 is the most lethal strain whereas other strains such as H5N1, H9N2, H7N7, H7N3, H5N2, H7N2 and H7N1 would cause less severe illness in humans.

8. What is the global statistic of avian flu affecting human?

Cumulative Number of Confirmed Human Cases of Avian Influenza A/(H5N1) Reported to WHO on 23 April 2009

Country	Confirmed case	Death
Azerbaijan	8	5
Bangladesh	1	0
Cambodia	8	7
China	38	25
Djibouti	1	0
Egypt	67	23
Indonesia	141	115
Iraq	3	2

Lao People's Democratic Republic	2	2
Myanmar	1	0
Nigeria	1	1
Pakistan	3	1
Thailand	25	17
Turkey	12	4
Viet Nam	110	55
Total	421	257

The cumulative mortality rate in human cases is as high as 61%.

For updated situation and the no of human cases archives, please refer to

http://www.who.int/csr/disease/avian_influenza/updates/en/index.html

http://www.who.int/csr/disease/avian_influenza/country/en/index.html

THE SPREAD OF DISEASE

9. Is it possible to get the bird flu from eating chicken or eggs?

It is safe to eat poultry and eggs. However, one should not consume undercooked poultry, raw eggs or lightly cooked egg products (such as runny eggs). It is also recommended to avoid unnecessary contact with live poultry. This includes markets where live birds are sold, as it is possible for the avian influenza virus to stick to hair and clothing, and it may also be inhaled.

10. How are humans infected?

To date, most human cases linked to contact with poultry are thought to have acquired their infection following exposure to dead or diseased birds around households. Evidence suggests that particularly risky exposure occurs during the slaughter, defeathering, and preparation of poultry for cooking

11. Is it possible for this form of influenza to spread from person to person?

If a person, who is sick with human influenza, was exposed to avian influenza, there is a possibility that the avian influenza virus could acquire human influenza genes. This "mixing" could result in the creation of a new subtype of the influenza virus. Because these viruses do not commonly infect humans, there is little or no immune protection against them in the human population. If an avian virus were able to infect people and gain the ability to spread easily from person to person, an "influenza pandemic" could begin.

12. Has human-to-human transmission of avian flu definitely occurred?

There is no conclusive evidence of efficient human-to-human spread of avian flu thus far although there was one case in Thailand which there might be suggestion of person-to-person transmission with very close and prolonged contact. All clusters of cases, closely related in place and time, require urgent investigation to determine whether the epidemiological behavior of the virus might be changing in ways that could favor the onset of a pandemic

DIAGNOSIS AND TREATMENT

13. How are the human cases diagnosed?

Laboratory diagnosis depends upon the demonstration of the virus or its components or a rising antibody titer. However, as these tests are rather specialized, your GP may not be able to perform these tests at their clinics and the tests may have to be done in a government clinic or hospital.

14. What is the treatment for bird flu?

The M2 inhibitors such as amantidine have now become ineffective as there are evidence from the cases in Viet Nam that the bird flu are widely resistant to this class of medication. Health authorities are recommending to use Oseltamivir (Tamiflu) or Zanamivir (Relenza) for treatment of the disease based on the virus's susceptibility profile. These antiviral drugs are prescription medicines (pills, liquid or an inhaler) that fight against the flu by keeping flu viruses from reproducing in your body. If you get sick, antiviral drugs can make your illness milder and make you feel better faster. They may also prevent serious flu complications. For treatment, antiviral drugs work best if started soon after getting sick (within 2 days of symptoms).

15. Can you tell me more about Tamiflu and Relenza?

TAMIFLU and RELENZA belong to a group of medicines called neuraminidase inhibitors. These medications attack the influenza virus and prevent it from spreading inside your body.

Tamiflu can be taken orally as a course for treatment and prevention of influenza infection. For details please consult your doctor. *The WHO has made a statement that self-medication in the absence of appropriate clinical or public health advice is discouraged. The guideline from the Centre of Health Protection specifies that Tamiflu should be given for treatment purpose only.*

http://www.who.int/medicines/publications/WHO_PSM_PAR_2006.6.pdf

<http://www.chp.gov.hk/files/pdf/Guide-enterprises-forinflu-pandemic-pre-Anti-stocken-20060525.pdf>

Relenza is a powder that is inhaled from a breath-activated plastic device called a Diskhaler for treatment and prevention of influenza. Recently, the reported oseltamivir-resistance H1N1 virus neuraminidase still retaining susceptibility to zanamivir (Relenza) indicates that the structure of zanamivir (Relenza) has some more advantages than oseltamivir (Tamiflu) in binding to the active pocket of H5N1 neuraminidase. However, Relenza mainly targets at the pulmonary (lung) cases (lung) and has less systemic therapeutic effect compared to Tamiflu secondary to its low bio-availability.

Tamiflu	Relenza
- Oral tablet	- Diskhaler
- Treat flu in people age 1 or older. - Prevent flu in adults and children age 13 and older.)	- Used for treat flu in people age 7 and older. - Prevent flu in adults and children age 5 and older
- Good bioavailability with systemic effect (lung, kidney etc) - Existing data for effective treatment of fatal cases.	- Low systemic bio-availability with main effect on lung. - Not recommended for treatment or prophylaxis of influenza in individuals with underlying airways disease due to risk of serious bronchospasm
- The most common side effects are nausea, vomiting and diarrhoea; headache, dizziness, vertigo, fatigue and insomnia.	- The most common side effects are diarrhea, nausea, sinusitis, runny or stuffy nose, bronchitis, cough, headache and dizziness.
- The FDA now requires that neuraminidase inhibitors have information in the package labeling that warns that people with the flu, mostly children, may be at an increased risk of self-injury and confusion shortly after taking and should be closely monitored for signs of unusual behavior	- The FDA now requires that neuraminidase inhibitors have information in the package labeling that warns that people with the flu, mostly children, may be at an increased risk of self-injury and confusion shortly after taking and should be closely monitored for signs of unusual behavior.
- Resistance trend developing (recent resistance of H1N1, the ordinary flu)	- No drug resistance because of the shape of its receptors

16. Has there been any resistance case develop against Tamiflu and Relenza?

Influenza viruses constantly change as the virus makes copies of itself (i.e. replicates). The ability to constantly change is a hallmark of influenza viruses. Flu viruses often change from one season to the next or they can even change within the course of one flu season. Resistance occurs due to a chance mutation occurring at the active site where the neuraminidase inhibitor drug (e.g., Tamiflu) binds to the virus. There have been increasing cases of human influenza A H1N1 resistant to Tamiflu in both USA and Hong Kong whereas there were no resistance cases for Relenza. Historically, resistant viruses did not spread between people because the mutation also reduced the fitness of the virus, reducing its transmissibility. The newly emerged resistant virus (which can spread between people) is a specific influenza A (H1N1) clone that has a mutation not only at the neuraminidase inhibitor active site but also another "compensatory" mutation that restores the virus's fitness. All other circulating influenza viruses - with the exception of this H1N1 clone - remain susceptible to Tamiflu.

INFLUZENA PANDEMIC

17. Why is there so much concern about the current outbreaks?

Public health officials are alarmed by the unprecedented outbreaks in poultry for several reasons.

- (1) Major outbreaks recently reported in Asia have been caused by the highly pathogenic H5N1 strain.
- (2) The possibility that the present situation could give rise to another influenza global epidemic (a pandemic) in humans. Scientists know that avian and human influenza viruses can exchange genes when a person is simultaneously infected with viruses from both species.
- (3) Existing flu vaccines would not be effective against a new influenza virus.

This was the situation during the great influenza pandemic of 1918–1919, when a completely new influenza virus subtype emerged and spread around the globe, in around 4 to 6 months. Several waves of infection occurred over 2 years, killing an estimated 40–50 million persons.

18. How likely is a new pandemic of influenza?

Pandemics arise when a new virus emerges which is capable of spreading in the world wide population. The majority of cases described have had contact with poultry from which the infection is assumed to have spread.

19. Can a pandemic be averted?

No one knows for sure. Influenza viruses are highly unstable and their behavior defies prediction. However, WHO believes that if the right actions are taken quickly, an influenza pandemic might be averted. WHO stresses the urgency of the situation and the need for rapid action in the animal and agricultural sectors. For example, the culling in 1997 of Hong Kong's entire bird population – an estimated 1.5 million chickens and other birds – was done in 3 days. Such rapid action is thought by many influenza experts to have averted an influenza pandemic in humans.

TRAVEL ADVICE

20. Any travel advice for countries affected by bird flu?

The WHO does not recommend any restrictions on the travel to any country currently experiencing outbreaks of H5N1 avian infection in poultry flocks, including countries that have also reported cases in humans. At this time, WHO recommends travelers visiting the outbreak areas should avoid contact with the live poultry and animal farm. In view of the potential threat posed by the continuing spread of H5N1 avian influenza viruses, WHO recommends countries with sufficient resources to invest in a stockpile of antiviral drugs to prepare for an influenza pandemic.

ADVICE ON PREVENTION

1) If you prepare chicken, do not buy live chickens, and only buy chickens where their intestines are removed. Freezing does not kill the virus; so even if you are preparing frozen chicken, ensure that the chicken is cooked properly. Heat kills viruses and the World Health Organization says that chicken products should be cooked thoroughly at temperatures of at least 70 degrees Celsius. People should wash their hands after handling poultry and ensure that poultry dead bodies do not contaminate other objects.

2) General measurement to prevent spread the flu virus from person to person:

_ Maintain good personal and environmental hygiene

_ One of the most important preventive practices is careful and frequent handwashing. Cleaning your hands often with soap and water removes potentially infectious material from your skin and helps prevent disease transmission.

_ Waterless alcohol-based hand gels (containing at least 60% alcohol) may be used when soap is not available and hands are not visibly soiled

_ Wash your hands especially when there are respiratory secretions on them e.g. after sneezing.

_ Cover your nose and mouth while sneezing or coughing. Dispose of nasal and

mouth discharge properly with tissue papers. Do not spit.

_ Build up good body resistance through a balanced diet, regular exercise, maintaining adequate rest, reducing stress and avoiding smoking.

_ During the “flu season”, it is better to avoid crowded public places where the ventilation is poor.

_ Tamiflu and Relenza might be useful as a prophylactic measure, especially when the pandemic occurs.

ABOUT VACCINATION

21. Is there a vaccine against bird flu?

At present, there is no known vaccination specifically against bird flu. As a precaution, human flu vaccinations are recommended for all health workers.

22. Does the flu shot work against the bird flu?

The current flu vaccine will not protect you against infection with the avian influenza virus. However, current vaccines protect against circulating human strains, reducing the risk that a person who is being exposed to avian influenza will become infected with both the avian and human viruses at the same time. This will decrease opportunities for the avian influenza virus to acquire human influenza genes and create a new virus subtype against which people have no natural immunity.

ADVICE FOR CORPORATES

Based on current available information and advice from risk management consultants, corporations are advised to develop contingency plans in the event of an avian flu infection to minimize disruption of core business functions. Flu vaccination is recommended for all staffs and stockpiling of Tamiflu OR Relenza may be considered for key personnel and staff as is appropriate for your company’s contingency plan.

For those enterprises which consider stockpiling antivirals in their business continuity, plans are recommended to do so through their doctors, who can administer these antivirals to staff infected during pandemic influenza. Enterprises and doctors need to work out the amount of antivirals to be stockpiled taking into account enterprise policies, staff required for core operations or at risk of infection, and other factors. The purpose is to provide reliable supplies of antivirals to their infected staff, so that treatment can start in time.

Which antiviral to stockpile?

Please note that the stockpile is for the control of pandemic influenza, and is not for seasonal influenza use. And, resistance among seasonal strains does not predict resistance among pandemic influenza viruses. The effectiveness of any drug during a pandemic is difficult to predict, as it is not possible to know which virus will cause the next pandemic.

Currently, Oseltamivir (Tamiflu) remains the drug recommended by the World Health Organization as the first-line influenza antiviral drug for the treatment of patients infected with influenza A (H5N1).

The demonstrated vulnerability of the drug to H1N1 has prompted a number of governments to rethink how heavily their pandemic response plans lean on Tamiflu; and the U.S. Department of Health and Human Services is considering altering the composition of its national pandemic stockpile to include higher percentage of Relenza stockpile from its present level of 20%.

The general view is that from a scientific perspective, greater diversification of stockpiles (combinations of Tamiflu, Relenza, and other such as amantadine) would be desirable.

When will the community and hospital doctors give out Tamiflu?

http://www.chp.gov.hk/files/pdf/20080131_SCEZD.pdf

1) *For community doctors: ONLY For treatment purpose at Serious and/or Emergency Response Levels* when there are

- (i) Confirmed cases of human avian influenza cases. (After confirmation from the hospital)
- (ii) Strongly suspected local cases of human avian influenza (e.g. clinically unwell with symptoms of flu **after genuine contact of confirmed cases of avian flu**)

Note that the antiviral agents would be used for **treatment only**.

2) *For Hospital doctors:*

(i) *As treatment purpose as above.*

(ii) *As post-exposure prophylaxis of confirmed cases at the Serious and/or Emergency Response Levels.*

The WHO has recently stratified exposure risk to facilitate **decisions to initiate antiviral chemoprophylaxis**:

- (a) High risk exposure - Household or close family contact (Tamiflu should be administered).
- (b) Moderate risk exposure - Involved in e.g. intubation, nebulization, tracheal suction (Tamiflu might be administered).
- (c) Low risk exposure - Healthcare workers not in close contact (unprotected distance > 1 meter or having no direct contact), Tamiflu should probably not be administered).

Since the confirmation of disease are usually done at the public hospital, Postexposure prophylaxis of these contacts, which may include healthcare workers and community contacts, will be provided by the public health authority to achieve as far as is feasible containment of the spread of the infection.

FURTHER INFORMATION

For further information, please refer to the following:

Hong Kong Department of Health website: <http://www.info.gov.hk/dh>

Centre of health protection: <http://www.chp.gov.hk/>

World Health Organization (WHO) website: <http://www.who.int/en/>

Centres for Disease Control and Prevention (CDC): <http://www.cdc.gov/>

This Q&A is also posted at <http://www.qualityhealthcareasia.com>.