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NTS ALERT

Bird Flu Mutation in Mammals?

The discovery of avian influenza in cats and dogs has heightened concerns about a virus that experts thought was limited to infecting chickens, ducks and other fowl. Health experts have called for closer monitoring of the H5N1 virus in domestic animals after Indonesian scientists detected it in stray cats near poultry markets.

According to a survey by scientist Chairul Anwar Nidom of the Airlangga University in Surabaya, Indonesia 20 percent of the 500 stray cats around the poultry markets in Java, including Jakarta and another in Sumatra, were found to have been infected with H5N1 antibodies. The findings suggest that the cats contracted the virus after eating infected poultry.

Another study by Gusti Ngurah Mahardika, a virologist at Udayana University, surveyed pigs and domestic animals in Bali last year between September and December and found the virus in two dogs and a cat.

Veterinary pathologist Dr. Wasito from Gajah Mada University added that even flies have been found to be infected with avian flu. In a series of laboratory tests, his colleagues and him noted that the virus had been found in the digestive and respiratory tracks of flies, along with the cuticle layers, flesh and ovum.

Wasito also added that the virus had been found even in flies taken from places that were declared bird flu free. Only flies taken from locations that have never had a bird flu outbreak were found to be H5N1 negative.

Infectious disease experts warn that cases of the virus jumping to various species only further increase the vulnerability of humans. “With more species of mammals infected, it could be a sign that the virus is mutating to adapt to mammalian host, thus increasing the possibility of adapting to humans,” says Dr. Lo

Winglok, an infectious diseases expert and former legislator from Hong Kong.

While it still cannot be determined, how efficiently domestic animals are able to pass the virus to other mammals such as humans, World Health Organisation officials are preparing for the worse. During a closed door conference, attended by experts from the Chinese and U.S. centers for disease control and the World Health Organization, they echoed their concerns regarding bird flu mutations and discussed the progress of creating a bird flu vaccine.

The fear of the increasing spread of bird flu is further aggravated by recent studies that highlight the virus’ high potency. According to a recent study by scientists from the Netherlands Institute of Ecology (NIOO-KNAW) and the Department of Virology of the Erasmus MC even low pathogenic forms of bird flu cause illnesses amongst birds, including wild birds.

The effects of these milder forms of bird flu are apparent as it affects birds’ migratory patterns. The

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late departure from the wintering grounds could lead to late arrival in the breeding grounds, and thus to a lost breeding season. Because of their slower migration, ill birds come in contact with many more healthy birds passing by them on migration. In this way these low-pathogenic viruses can spread itself more rapidly than previously thought.

Bird flu has killed more than 160 people worldwide since late 2003 thus sparking fears that it could mutate and trigger a deadly human-flu pandemic.

Sources

Bird flu in cats and dogs raises alarm, Straits Times, 31 Jan 2007

China meeting warns of bird flu mutation risk, Reuters, 29 Jan 2007

Hong Kong, Japan face growing bird flu fears, Today, 30 Jan 2007

Low pathogenic forms of bird flu do cause illness among birds, Spiritindia.com, 31 Jan 2007

Scientist warns of bird flu in flies, Jakarta Post, 24 Jan 2007

How does Bird Flu Spread?

Infected birds shed flu virus in their saliva, nasal secretions, and feces. Susceptible birds become infected when they have contact with contaminated excretions or surfaces that are contaminated with excretions. It is believed that most cases of bird flu infection in humans have resulted from contact with infected poultry or contaminated surfaces. Reports of the spread of avian influenza viruses from one ill person to another are rare, and transmission has not been observed to continue beyond one person/first generation of contacts.

The increasing number of bird flu cases across the globe has sparked much fears and paranoia over the extent to which bird flu is able to proliferate. Concern was raised as to whether the flu virus would affect public resources such as water treatment facilities – namely waste water and drinking water. Fortunately, research has shown that this is generally not the case. Cornell University researchers studied a low pathogenic strain of avian flu known as H5N2, which is a close relative of the highly pathogenic avian influenza H5N1. Given the similarities in both strains, it is highly likely that results from tests on H5N2 would mirror the effects on H5N1.

The tests from Cornell showed that overall, avian flu viruses do not survive well outside of a host. Moreover, they would not survive in water and exposure to UV radiation. Waste water treatments have therefore proven to be very effective in killing H5N2 at level well within industry standards. Chlorine induced water treatments, however, were less definitive and depended on chlorine concentration levels and time of exposure.

Other possible scenarios of the spread of bird flu have also been done by researchers in Indiana University, who created a model to predict how an emerging pandemic influenza might spread across the globe by airliners. The researchers developed a mathematical model using massive passenger flow databases from the International Air Transport Association, an organisation of airlines comprising 99 percent of worldwide commercial air traffic. Census information from more than 3000 urban centers in 220 countries and related disease pattern from those areas was also analysed.

The model shows in detail how air-transportation-network properties are responsible for the worldwide pattern of diseases. Using advanced computational tools, the team was able to simulate how an influenza pandemic would spread, both over time and geographically and to provide forecasted scenarios and confidence intervals. The researchers also noted that strict travel restrictions would do little, if anything, to prevent the flu from spreading throughout the globe.

The study also focused on realistic scenarios in which antiviral resources are not equally distributed with a higher concentration in wealthy countries. Different strategies are compared: a selfish strategy in which each country relies on its own supplies, as opposed to a cooperative approach in which prepared countries would donate part of their resources for global use. Surprisingly, the cooperative strategy is shown to be more effective in delaying the pandemic evolution and mitigating its impact on the population of both the donor and recipient countries.

Sources:

Avian Flu virus unlikely to spread through wastewater and drinking water treatment systems, *Cornell University News Service*, 6 Jan 2007

Scientists Assess Risk of Potential Flu Pandemic Spread via Global Airlines*, Indiana University*, 29 Jan 2007

World Health Organisation

Cures for Bird Flu

The race to find a cure to bird flu is without a doubt tedious but also lucrative. Over 20 vaccines are vying to be the first to hit the commercial market. Australian drug manufacturer CSL Ltd has developed a new vaccine for bird flu. Developed with government backing, the new vaccine is the first to be registered in the Southern Hemisphere and could later be made available for supply and stockpile in Asia.

CSL's announcement comes after rival GlaxoSmith Kline Plc said that it had applied to register its own bird flu vaccine in Europe following an 80 percent success rate in trials. Results from the clinical trials show that two 30 mg doses of the vaccine delivered three weeks apart produced a strong immune response against the deadly H5N1 avian flu virus in adults aged 18 to 65. Result of a subsequent study on infants, young children and the elderly would be available later this year.

CSL notes that the vaccine, which was created based on the virus strain from Indonesia and Vietnam, could be able to vaccinate the Australian population within six months. However, mass vaccinations would not occur yet because the strain used in trials could still change if a pandemic became a reality. This is highly likely given recent of the virus found in domestic animals (see "Bird Flu Mutating in Mammals?").

Scientists in Taiwan have also announced their successful tests of vaccines on animals. Pele Chong, head of the vaccine development programme at Taiwan's National Health Research Institute, explained that human trials are planned and that a production line would be built by the end of the year. Formal production is expected to start late next year to be ready for mass production in two years. If all goes well Taiwan hopes to eventually produce up to 80,000 doses of the vaccine a month.

Countries have also been stockpiling of antivirals but these can only function as an interim measures rather than the absolute cure to bird flu. For now, countries must make do with poultry vaccines – administered directly to chickens – as a preventive measure against a bird flu outbreak.

However, poor quality poultry vaccines could aggravate the situation where infected poultry are undetected and thus subtly spreading the virus. This would be what Veterinary pathologist Wasito from Gajah Mada University refers to as a "silent" bird flu. This type of virus does not incite the production of antibodies in the infected bird therefore resulting in the bird looking perfectly healthy and bearing no pathological lesions or other clinical symptoms of infection. This would lead to more poultry fatalities as the vaccine can only be administered to absolutely healthy birds.

Sources
Australia's CSL says bird flu vaccine test a success, *Reuters*, 31 Jan 2007
Over 20 bird flu vaccines in race to hit shelves, *Straits Times*, 15 Dec 2006
Scientist warns of bird flu in flies, *Jakarta Post*, 24 January 2007
Taiwan: Successful vaccine tests against bird flu, *Asia News*, 31 Jan 2007

Is Alternative Medicine the answer?

Several studies have suggested that selected natural herbs and plant extracts might hold the cure to bird flu.

In Singapore, a locally based research and development (R&D) company Herbal Science launched its ViraBloc pills last month, which contain concentrated extracts of elderberry - a shrub commonly found in South-east Asia. Studies have shown that active ingredients from the berry can coat influenza viral particles, stemming further infection.

HerbalScience has since then signed a multi-million-dollar deal with a Chinese company to sell more than 80 per cent of its stock for the year. The exact value of the deal with the Bright Foods Group, Shanghai's largest food and consumer products company, was not disclosed.

HerbalScience is also in talks with the Singapore General Hospital to conduct clinical trials of the ViraBloc pills. Dr Aw Swee Eng, director of the hospital's department of clinical research, said that laboratory studies of the elderberry extracts were encouraging and showed activity against influenza. The pills, however, would not be available on Singapore shelves as yet.

In Korea, scientists at the Seoul National University suggest that *kimchi,* a local spicy fermented cabbage dish (made with red peppers, radishes, garlic and ginger), could possibly cure bird flu. In an experiment with 13 infected chickens, 11 of them began to recover after week of being fed an extract of kimchi. The researchers noted however that the results were far from scientifically proven, and if kimchi did have the effects they observe, it was unclear why.

Sources
Korean dish 'may cure bird flu', *BBCnews*, 14 March 2005
Singapore firm in herbal pill deal, *Straits Times*, 30 Jan 2007

Stepping up efforts

On the ***international front***, the World Health Organisation has revised its International Health Regulations in 2005 and is scheduled to enter into force in June 2007. The regulations include the following important points:-

- To *prevent, protect, control and provide public health response* to international spread of disease in "public health risk
- To develop a *disease surveillance system* to detect public health risk, and the establishment of national human resource Focal Point. This surveillance system would include the ongoing collection, collation and analysis of data for public health purposes and the timely dissemination of public health information for assessment and public health response as necessary.
- To *notify* of public health emergencies of international concern within a territory
- WHO to take account reports of sources other than notifications of consultations for assessment to response to public health risk. This would *facilitate the transfer of information amongst various countries*
- *Cooperation* of WHO with intergovernmental organizations and international bodies
- *Determination* of a public health emergency of international concern.

What the last point suggests, however, is that while the WHO is empowered to determine an international health risk, it does not have the power to ensure compliance of the rules by sovereign states. Fortunately most states have taken the necessary proactive measures to control the spread of infectious diseases as best as they can, given their limited capabilities.

International donors have also pledged a totally of $475.9 million in additional funds to support the global fight against bird flu. The funds were pledged on the final day of a three-day summit in Mali, West Africa, aimed at coordinating strategies to combat the disease. World Bank and United Nations officials however suggest that the total amount of fund from donors – over and above some $1.9 billion – is but a fraction of the $2 trillion that a possible human influenza pandemic could cost worldwide.

This lack of funds is no where more evident than in ***Indonesia,*** which has only received US$50million worth of funding. This is hardly enough to effective address bird flu, which is estimated to require about US$250 million. Fortunately, the Indonesian government has finally decided to declare bird flu a national disaster after admitting that the disease has become epidemic in the country.

By declaring a national disaster, more funds can be allocated to tackling bird flu from the state budget's disaster fund. This comes after 6 deaths had been reported in human infected cases, in just the first month of 2007, thus causing Indonesia's human death toll to soar to 62 out of 82 reported cases.

Differences between Ordinary Flu and Pandemic Flu

ORDINARY FLU	PANDEMIC FLU
Occurs every year during the winter	Occurs about three times each century – at any time of the year
Affects up to about 10% of the Population	May affect around 25% of the population
For most people it is an unpleasant but not life threatening Infection	It is a more serious infection for everyone
The very old and people with certain chronic illnesses are most at risk of serious illness	People of every age may be at risk of serious illness
Annual vaccination is available for those at risk of serious illness	A vaccine won't be available to start with – when it does become available the aim will be to immunize the whole population as rapidly as possible as vaccine supplies come through
Antiviral drugs are available to treat those at special risk	Antiviral drugs are likely to be in limited supply and will have to be used to best effect according to how the disease develops.

Source: World Health Organisation

Officials have been complaining that shortage of funds have hampered their efforts to combat the disease. Money is needed to pay the costs of vaccination, culling of birds as well as paying compensation to farmers whose birds have been culled. Back yard poultry has been banned from Jakarta and those who had efficiently destroyed their poultry would be eligible for compensation of 12,500 rupiah (about 1.4 dollars) per bird.

The decree covers chickens, ducks, swans, quails and pigeons. Other birds kept as pets or for research purposes would still be allowed but owners would have to obtain a certificate, issued free of charge by the animal husbandry office.

Whether this decree would be effective remains uncertain as it will almost certainly face resistance in a country that has hundreds of millions of backyard birds, many of them in towns and cities. Providing compensation to farmers and bird owners is therefore vital in ensuring full cooperation from the public.

The government is still optimistic as it has initiated other measures to educate Indonesians about bird flu. The "Tanggap Flu Burung" public awareness campaign, for instance, launched on 1st Sept 2006, includes television and radio public service announcements airing across the country, as well as flyers billboards and even dangdut music concerts.

According to Bayu Krisnamurthi from the National Committee for Avian Influenza Control and Pandemic Influenza Preparedness, the campaign has reached many Indonesians. A survey of 508 urban and rural, poultry owning household across cities and towns such as Jakarta, Tangera, Bekasi, Bogor and Garut revealed that 97 percent of respondents had seen at least one of the Tanggap TV spots.

In the ***Philippines***, the start of the annual migration of birds to the country has spawned a series of preventives measures, namely investing in bird flu detection equipment, protective gear and laboratories to further study the infectious disease.

Dr Laarni Cabantec, assistant coordinator of the National Avian Influenza Task Force (NAITF) of the Bureau of Animal Industry announced that the first Regional Animal Disease Diagnostic Laboratory (RADDL) in Philippines would be set up in Central Luzon in February 2007. The establishment of the RADDL has been made possible with aid from New Zealand.

Protective gear has also been distributed to all members of the NAITF nationwide. The Department of Agriculture also sent two persons to Vietnam for laboratory training.

Other efforts by the Department of Agriculture include conducting sectoral and institutional talks, symposia, simulation exercises with medical and veterinary practitioners and concerned agencies on bird flu preparedness. Bird flu advocacy posters have also been produced in various languages - English, Tagalog, Ilonggo, Ilocano, Cebuano and Malay – to inform the public on preventive measures.

Measures have also been taken in airports. In addition to the practice of thermal screening of arriving passengers with recorded avian flu cases, the precaution has now been extended to airline crew members as well. A "foot bath" at the arrival has also been included to disinfect suspected carriers of the deadly virus. Moreover, at least 150 airport employees have participated in a simulation exercise by the Manila International Airport Authority at the Ninoy Aquino International Airport (NAIA) Terminal 3.

Preventive measures such as culling and poultry vaccinations have proven to be effective in ***Vietnam***. Officials from the Ministry of Agriculture and Rural Development noted a decrease in the number of bird flu-affected communes (from 39 to 22).

In addition to this, dissemination of information has also been integral in the Vietnam's anti-bird flu drive (known as 'Joining Hand of a Vietnam Free from Bird Flu').

In the province of Songkla in ***Thailand,*** the animal quarantine station has tightened their control measures with more thorough inspection of vehicles transporting poultry. Chief of the Songkla Animal Quarantine Station, Chaiwat Yothakon disclosed that the station has set up checkpoints on roads and deployed officials from various relevant units to arrest smugglers of live and dead poultry. So far, the station has reported nine poultry smuggling cases with evidences worth more than 300,000 baht in total.

Thai health experts have also recommended social preventive measures to contain the spread of bird flu. Dr Prasert Thongcharoen, president of the Influenza Foundation (Thailand) and also a member of the UN World Health Organisation Expert Committee Advisory Panel on Virus Diseases, has advised business executives and those in the public utility services sector to be given anti-influenza shot to protect them from infection. Senior citizens over the age of 65 and children aged 6 months to 6 years old have also been advised to have flu jabs as they are groups most vulnerable to infectious diseases. People suffering from diseases such as diabetes, heart and lung inflammation should also stay away from influenza patients as they susceptible to contracting the virus.

Border controls have also been stepped up at ***Hong Kong's border with China***, where flu-infected birds were smuggled in last year, sparking the first outbreak of H5N1 among local birds in years. Culling has also been consistent in affected areas in ***South Korea*** and ***Japan.***

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Airport tackles dry run, bird flu, *Manila Standard Today*, 26 January 2007

Animal Quarantine Station in Songkla tightens measures on bird flu protection, *ThaisNews*, 21 Jan 2007

Doctor: Executives need flu jabs, *Bangkok Post*, 29 Jan 2007

Govt heightens readiness vs bird flu, *PIA*, 26 Jan 2007

Hong Kong confirms dead bird had H5N1 strain, *ChannelNewsAsia*, 17 Jan 2007

Indonesia to declare bird flu a national disaster, *Straits Times*, 2 Febuary 2007

Indonesian woman dies of bird flu, death toll reaches 62, *Peoples' Daily Online*, 22 Jan 2007

Jakarta bans backyard poultry from Febuary 1 to fight bird flu, *ChannelNews Asia*, 17 Jan 2007

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Vietnam bringing bird flu under control, *ThanhNien News*, 29 January 2007

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