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Bird flu risk still minimal

Editor's Note: The following article is part of an ongoing science series written by faculty members at Arkansas State University and published periodically by The Sun.

By Aldemaro Romero and Jeannette M. Loutsch

JONESBORO -- The avian influenza or "bird flu" is found among migratory waterfowl, most notably wild ducks. The fowl carry the virus in their intestines and shed the virus in their feces, saliva and other body fluids, but are resistant to becoming sick themselves. Domesticated birds such as chickens and turkeys are susceptible to the virus when coming in contact with the infected wild birds. Since these birds are usually kept in large flocks and in very restricted spaces, infection spreads rapidly. Exposure to the virus can make these birds seriously sick with death rates approaching 100 percent.

In 1997, 18 people in Hong Kong were diagnosed with avian influenza directly from the bird without its usual swine intermediate. At the same time it was found that the poultry population of Hong Kong was also infected. In an effort to prevent the spread of the virus to other domestic flocks, a massive eradication program was undertaken, resulting in 1.5 million birds being killed. This program may have averted a pandemic in humans at the time. Recent reports indicate the virus responsible for this outbreak has been found in Romania as well as previously in Turkey, Indonesia and Mexico.

Viruses are extremely simplified organisms made up of proteins and nucleic acids, either RNA or DNA. The avian influenza virus is an RNA virus and because of this they can evolve into different strains relatively quickly. Influenza viruses also have the ability to pick up random genes from the cell that it resides in, mainly other influenza virus genes. This is why every year the viruses causing human flu are slightly different than the year before. The possible changes in the RNA make the virus able to infect humans.

Avian flu has infected humans in the past; however the virus typically needs to pass through a swine host. Swine influenza can infect humans quite readily. The avian virus picks up genes from the swine virus and can then infect humans using the swine virus' proteins.

The recent outbreaks of the virus have jumped directly to humans and may have devastating consequences to the young and old as does the human influenza viruses.

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To date the spread of the avian virus from human to human is quite rare. Yet, worldwide flu epidemics have occurred before.

The largest pandemic (an epidemic spread across multiple continents) was the Spanish Influenza outbreak in 1918 which killed 50 million people, about 5 percent of the world population. This was previously thought to be bird flu but recent elaborate studies have determined the virus was most closely related to a swine influenza virus.

Humans infected by bird flu usually show the typical flu symptoms such as fever, sore throat, cough or muscle aches or eye infections. The more severe cases develop into severe respiratory diseases with life-threatening complications.

The severity of the symptoms depends upon the type of virus and the person's basic health conditions. The majority of the outbreaks usually are in small rural communities in countries that are at poverty level. The drugs to treat the critically ill are unavailable and quite costly if available.

The World Health Organization (WHO) has issued a number of recommendations in order to prevent the spread of this infection. They include good hygiene practices during handling of raw poultry meat and cooking poultry products ensuring that the internal temperature reach 158F or 70C. Freezing and refrigeration do not substantially reduce the concentration or virulence of viruses in contaminated meat. Eggs from infected poultry could also be contaminated with the virus and therefore care should be taken in handling shell eggs or raw egg products.

No cases have yet been reported in the United States. Travelers to countries in Asia with known outbreaks of avian flu have been advised to avoid poultry farms, contact with animals in live food markets, and any surfaces that appear to be contaminated with feces from poultry or other animals.

For more information contact the ASU Department of Biological Sciences at biology@astate.edu.

Dr. Romero is chairman and professor and Dr. Loutsch is assistant professor of biology in the Department of Biological Sciences at Arkansas State University.

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