

Avian Flu: Assessing the Pandemic Threat

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Avian influenza: the next flu pandemic?

Highly Pathogenic Avian Influenza H5N1 virus, otherwise known as bird flu, infected poultry populations in nine Asian countries last year. Japan, Malaysia and South Korea successfully eliminated H5N1 with aggressive control measures, but it remains a severe problem, particularly in Thailand and Vietnam, and an ongoing concern in Cambodia, China, Indonesia and Laos. The costs of avian influenza from an economic standpoint are high. Estimates of economic losses for East and Southeast Asia in 2004 are as high as \$15 billion. The overriding concern of public health officials, however, is the potential for H5N1 to mutate into a highly contagious human-to-human transmissible virus. The World Health Organization (WHO) estimates that millions of people could die from this infection should it become contagious among humans.

Not just for the birds

Although more than 120 million poultry birds have died or were destroyed in 2004 and the deaths and culling of poultry continues, most experts believe the virus has become endemic to bird populations in this region. The majority of confirmed H5N1 human cases have been caused by direct exposure to sick or dead poultry. A total of 88 human cases with 51 deaths were confirmed by the WHO from January 28, 2004 through April 14, 2005.

Bird flu-human nexus

Leading experts at the WHO and the US Centers for Disease Control and Prevention are concerned that the widespread dissemination of H5N1 by migratory waterfowl and domesticated ducks will provide more opportunities for H5N1 to mutate into a highly dangerous human transmissible virus either through adaptive mutation or genetic reassortment with a circulating human influenza virus such as H3N2. As bird flu circulates more widely, more opportunities are created for people to be infected with both bird flu and seasonally circulating human influenza. This can potentially lead to reassortment into an effective human transmissible disease. The virus has become progressively more deadly to poultry and laboratory mice. Domestic cats have been infected experimentally and captive tigers have been naturally infected after eating infected chicken carcasses. If the virus transforms through either form of mutation, it may become the cause of the world's next influenza pandemic.

Past pandemics

The most lethal disease event in human history occurred when the 1918 flu pandemic killed an estimated 40 million people worldwide in less than one year, dwarfing the estimated 8.3 million deaths caused by World War I. The 1918 flu killed some perfectly healthy people in less than 48 hours. Since the 1500s, an average of three pandemics have occurred each century at 10 to 50 year intervals. The 20th Century experienced the 1918, 1957, and 1968 flu pandemics; the latter two respectively caused approximately 2 million and 1 million deaths worldwide.

Window of warning

The world has had an unprecedented window of warning to prepare for the possibility of avian flu transforming into an efficiently transmitted human virus. With emphasis on strengthening international collaboration and cooperation in research, data and information sharing, drug development and manufacture, vaccine development and dissemination, infection control measures, public health infrastructure, and transport and quarantine measures much can be done to ensure the best possible global response should concerns about bird flu become a reality.

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