

Global concern regarding the fifth epidemic of human infection with avian influenza A (H7N9) virus in China

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Summary

Since the first outbreak of human infection with avian influenza A (H7N9) virus was identified in 2013, five seasonal outbreaks have occurred in China. The fifth outbreak started earlier than usual. A sudden increase in cases of human infection with avian influenza A (H7N9) virus has been reported in China since September 2016, and the number of cases reported in this season is exceeding that reported in previous seasons. This increase in the number of new cases of H7N9 infection has caused domestic and international concern. This paper summarizes the current prevalence of H7N9 in China and it also discusses measures that China has taken to control this outbreak. This paper also describes steps China must take in the future. This paper can serve as a reference for prevention and control of H7N9 outbreaks around the world.

Keywords: Avian influenza A (H7N9) virus, outbreak, China

The H7N9 subtype of avian influenza A virus was not known to have the capacity to infect humans until March 31, 2013. Novel reassortant avian influenza A (H7N9) viruses are associated with severe and fatal respiratory diseases in humans, and most patients who are confirmed to be infected with H7N9 virus are critically ill (1,2). Since the first outbreak of human infection with avian influenza A (H7N9) virus was identified in 2013, five seasonal outbreaks have occurred in China. The fifth outbreak started earlier than usual. A sudden increase in cases of human infection with avian influenza A (H7N9) virus has been reported in China since September 2016, and the number of cases reported in this season is exceeding that reported in previous seasons (3). This increase in the number of new cases of H7N9 infection has caused domestic and international concern.

According to Disease Outbreak News issued by the World Health Organization (WHO) on February 22, 2017, a total of 1223 laboratory-confirmed cases of

human infection with avian influenza A (H7N9) virus had been reported since early 2013 (3). The number of human cases developing since October 1, 2016 accounted for nearly one-third of all human cases of H7N9 infection reported since 2013 (3). These cases include five cases reported in Taiwan, 20 cases reported in Hong Kong, one case reported in Macau, two cases reported in Canada, and one case reported in Malaysia (3). As of February 23, 2017, at least 425 cases had been reported during the fifth outbreak in China, which began in October and spiked suddenly in December (4). According to the National Health and Family Planning Commission (NHFPC) of China, cases of H7N9 infection have been reported in 16 provinces since January 2017 (5). According to data released by the NHFPC, 192 cases of H7N9 infection (including 79 deaths) were reported in January 2017 (6). Most cases occurred around the Yangtze and Pearl river deltas.

A surveillance report (7) suggested that most cases in the fifth outbreak were still highly sporadically distributed without any epidemiological links; the main characteristics remained the same and the genetic characteristics of viral strains that were isolated during this outbreak were similar to characteristics of strains involved in earlier outbreaks. However, several notable features of the fifth outbreak are (7): *i*) a quarter of the infected individuals were farmers; *ii*) most of the infected individuals lived in urban areas and reported

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exposure to live poultry; and *iii*) only 5% of infected individuals received oseltamivir within 48 hours of the onset of symptoms.

Obstacles to the control of this outbreaks in China are: *i*) live poultry markets and the live poultry trade; *ii*) the public's preference for fresh food markets; *iii*) raising free-range chickens, particularly in rural areas; *iv*) the public's limited knowledge about H7N9; *v*) delays in early identification and diagnosis; and *vi*) continuing isolation of H7N9 from animals and their surroundings.

The situation has prompted China to enhance prevention and control measures. On February 22, 2017, China's premier, Li Keqiang, convened a meeting to take steps to control outbreaks and Premier Li asked provincial officials in affected areas to close live poultry markets as soon as possible (8). The state has asked all poultry markets to thoroughly disinfect their premises. China will implement a new model to help upgrade the poultry industry; this model involves "raising livestock on a larger scale, centralized slaughter, cold chain transport, and sale of chilled meat." On January 24, 2017, the NHFPC issued an updated guidance (2017 version) on clinical management of H7N9 (9), and the NHFPC has trained doctors in screening and early diagnosis of the infection and treatment of critically ill patients. China needs to continue enhancing strict H7N9 surveillance, to coordinate multiple sectors to control infection, and to initiate national health preparedness. Health education and public campaigns should be enhanced to increase public awareness of the disease. Strategies to facilitate rapid identification of cases and early antiviral treatment need to be promptly implemented.

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