

Commentary

Epidemic of avian influenza A (H7N9) virus in China

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Invited Commentary on 'Epidemiology of human infections with avian influenza A(H7N9) virus in China' (N Engl J Med. 2014;370:52032) by Q. Li et al.

A new avian influenza A (H7N9) has emerged in eastern China since February 2013. Using epidemiological data from the Chinese Center for Disease Control and Prevention, Li *et al.* described the laboratory-confirmed cases of human influenza H7N9 infection in China initially identified in February through the first of December.¹ They reported 139 patients infected with the H7N9 virus, which peaked between March and April. The age range of the patients was between 2 and 91 years old (median 61 years). The majority of infected individuals were male (71%) and lived in urban areas (73%). Most had a history of recent exposure to live animals, be that in live bird markets or as poultry workers. Probable human-to-human transmission of H7N9 was suspected in four cluster families as some of the infected household members had no history of any exposure to animals or live bird markets or had any direct or indirect contact with poultry.

Genetic analysis suggests that this novel H7N9 virus is triple-re-assorted.² It is a low pathogenic avian influenza (LPAI) virus found in live market poultry and wild birds.^{3,4} In contrast to the H5N1 virus, which was lethal in infected birds, H7N9 does not cause illness or death in infected animals. Therefore, it is difficult to identify the source and perform surveillance in poultry thus complication efforts to clear or destroy the source of the infection to prevent outbreaks in humans. Comparison between H7N9 and H5N1 has been tabulated elsewhere.⁵

The Chinese government implemented extensive measures for controlling the spread of infection. They included extensive surveillance for H7N9 in patients

with influenza-like illness, decreasing the potential for human/animal interface, and the cleaning and closure of live poultry markets. Although these measures appeared to be effective as the number of cases following their implementation dramatically decreased and new infections and H7N9 cases became sporadic, the resulting reduction in the number of cases may be due to the seasonal pattern of influenza similar to that observed with the H5N1 in the winter months. In 2014, a second wave of H7N9 virus infection has occurred with the number of new cases reported thus far exceeding twice the number from the previous year (Fig. 1). Most H7N9 infections have been reported in the east (Zhejiang) and southeast regions of China (Guangdong).⁶

In 2003, the H5N1 virus outbreak emerged from southern China and Southeast Asia and subsequently spread to many countries in Asia and northern Africa. To date, there have been approximately 650 infected patients and 386 deaths (59%).⁷ The limit of H5N1 infection was attributed in part to the efforts by the World Health Organization. For now, the H7N9 virus is still confined primarily to eastern China even if the number of H7N9 cases has rapidly increased to over 429 patients and may exceed those of the H5N1 virus infection. Interestingly, H7N9-infected patients are more likely to be elderly people, while the H5N1 infection tended to affect children and young adults.¹ The difference in age group susceptibility has remained a question, which will require further studies in order to elucidate the mechanism of virulence of each virus strain.

Although monitoring of over 2600 individuals with close contact to case patients demonstrated very low human-to-human transmissibility, chances for the H7N9 virus infection to spread from person to person remain.¹ Therefore, control and prevention measures of close contact patients are still required. Since cultural and lifestyle preference of consuming poultry from live bird markets is not only prevalent in China but also in countries of Southeast Asia, the potential for a wider H7N9 virus epidemic in the region remains. Therefore, emphasis should be put on extensive disease control and prevention of this emerging virus are still needed.

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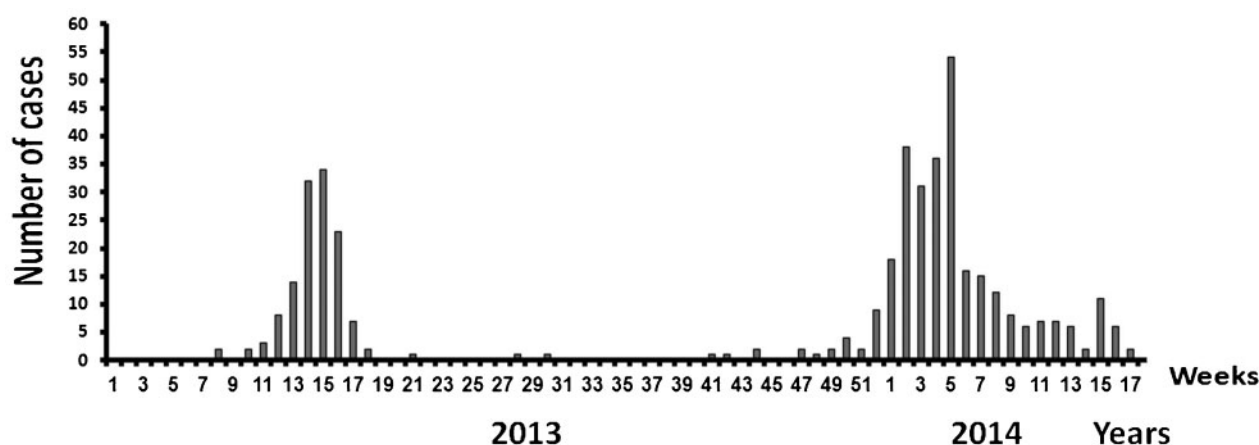


Figure 1 Weekly number of reported cases of H7N9 in China, 2013–2014 (week 17). Data from FluTrackers 2013/14 Human Case.⁶

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References

- 1 Li Q, Zhou L, Zhou M, Chen Z, Li F, Wu H, *et al.* Epidemiology of human infections with avian influenza A(H7N9) virus in China. *N Engl J Med.* 2014;370:520–32.
- 2 Gao R, Cao B, Hu Y, Feng Z, Wang D, Hu W, *et al.* Human infection with a novel avian-origin influenza A (H7N9) virus. *N Engl J Med.* 2013;368:1888–97.
- 3 Chen Y, Liang W, Yang S, Wu N, Gao H, Sheng J, *et al.* Human infections with the emerging avian influenza A H7N9 virus from wet market poultry: clinical analysis and characterisation of viral genome. *Lancet.* 2013;381:1916–25.
- 4 Zhao B, Zhang X, Zhu W, Teng Z, Yu X, Gao Y, *et al.* Novel avian influenza A(H7N9) virus in tree sparrow, Shanghai, China, 2013. *Emerg Infect Dis* [Internet]. [cited 2014 Apr 27]. Available from: <http://dx.doi.org/10.3201/eid2005.131707>.
- 5 Poovorawan Y, Pyungporn S, Prachayangprecha S, Makkoch J. Global alert to avian influenza virus infection: from H5N1 to H7N9. *Pathog Glob Health.* 2013;107:217–23.
- 6 FluTrackers 2013/14 Human Case List of Provincial/Ministry of Health/Government Confirmed Influenza A(H7N9) Cases with Links, China — H7N9 Outbreak Tracking. FluTrackers.com Inc. 2014 April 21. Available from: <http://www.flutrackers.com/forum/showthread.php?t=202713> (cited 2014 Apr 28).
- 7 Cumulative number of confirmed human cases for avian influenza A(H5N1) reported to WHO, 2003–2014. World Health Organization. 2014 Jan 24. Available from: http://www.who.int/influenza/human_animal_interface/EN_GIP_20140124CumulativeNumberH5N1cases.pdf?ua=1 (cited 2014 Apr 28).