

China is closely monitoring an increase in infection with avian influenza A (H7N9) virus

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Summary

The fifth outbreak of human infection with avian influenza A (H7N9) virus has struck far and wide in China. The number of cases of infection with the avian influenza A (H7N9) suddenly increased in 2013-2014, but the number of cases reported this winter has exceeded the number reported in all previous seasons. Given this situation, the National Health and Family Planning Commission issued updated Chinese guidelines (2017 version) on diagnosis and treatment of infection with the avian influenza A (H7N9) virus on January 24, 2017. In addition, the Chinese Government closed many live poultry markets in urban and rural areas in a number of provinces and the Government has taken proactive measures to surveil, respond to, and prevent potential pandemics involving the avian influenza A (H7N9) virus.

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

Influenza pandemic is a serious threat to public health in today's world. Because of the influenza virus' great adaptability and ready variation, frequent outbreaks of avian influenza A (H7N9) over the past 5 years have attracted interest in controlling human influenza pandemics in the near future. However, the fifth outbreak of human infection with avian influenza A (H7N9) virus has more serious than previous outbreaks over the past few years. Given these concerns, China is closely monitoring an increase in the number of cases of infection with the avian influenza A (H7N9) virus.

1. The avian influenza A (H7N9) virus became seriously prevalent after October 1, 2016

The fifth outbreak of human infection with avian influenza A (H7N9) virus struck far and wide in China. On January 9, 2017, 106 human cases of infection with

avian influenza A (H7N9) were reported to the National Health and Family Planning Commission (NHFPCC) (1). Fifty-two of those cases were reported from Jiangsu, 21 were reported from Zhejiang, 14 were reported from Anhui, 14 were reported from Guangdong, 2 were reported from Shanghai, 2 were reported from Fujian, and 1 was reported from Hunan. At the time of reporting, there were and 57 cases of a severe infection and 35 deaths.

According to the World Health Organization (WHO), more than a thousand cases of infection with the avian influenza A (H7N9) virus have been reported in China over the past four years, with a mortality rate of 39% (2). The avian influenza A (H7N9) virus is mainly prevalent in coastal areas and especially active in Zhejiang, Guangdong, and Jiangsu provinces (Figure 1). The number cases of infection with the avian influenza A (H7N9) virus suddenly increased in 2013-2014, but the number of cases reported this winter has exceeded the number reported in all previous seasons (Figure 2). According to the data, the number of cases from October 1, 2016 to the present accounts for nearly one-third of all cases of infection with the avian influenza A (H7N9) virus reported since 2013 (3). However, the specific reasons for the outbreak of the avian influenza A (H7N9) virus this winter are not yet clear.

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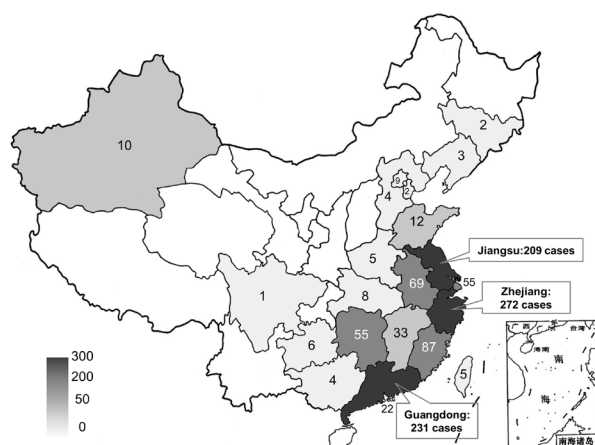


Figure 1. Distribution of the cumulative number of cases of infection with the avian influenza A (H7N9) virus in China since January 1, 2013. According to the World Health Organization (WHO), more than a thousand cases of infection with the avian influenza A (H7N9) virus have been reported in China over the past four years, with a mortality rate of 39% (2). The avian influenza A (H7N9) virus is mainly prevalent in the coastal areas, and especially active in Zhejiang (272 cases), Guangdong (231 cases), and Jiangsu provinces (209 cases).

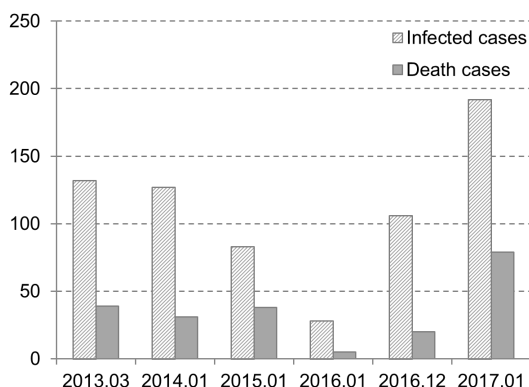


Figure 2. Cases of infection with the avian influenza A (H7N9) virus and deaths in China from March 2013 to January 2017. The number of cases of infection with the avian influenza A (H7N9) virus and deaths in China has increased each year. A point worth mentioning is that the number of cases suddenly increased in 2013-2014, but the number of cases reported this winter has exceeded the number reported in all previous seasons. According to the data, the number of cases from October 1, 2016 to the present has accounted for nearly one-third of all reported cases of infection with the avian influenza A (H7N9) virus since 2013.

2. Chinese guidelines (2017 version) on infection with the avian influenza A (H7N9) virus have been updated

On January 24, 2017, the NHFPC issued updated Chinese guidelines (2017 version) on diagnosis and treatment of infection with the avian influenza A (H7N9) virus (4). These guidelines have 8 sections covering etiology, epidemiology, pathogenesis and pathology, clinical features, diagnosis and differential diagnosis,

treatment, prevention and control of iatrogenic infection, and criteria for lifting quarantines.

A point worth mentioning is that the guidelines focus on indicated drugs and drug use. Western drugs that are approved include oseltamivir, oseltamivir, and zanamivir while traditional Chinese medicines that are approved include Shufeng Jiedu capsules, Lianhua Qingwen capsules, and Jinlian Qingfei effervescent tablets. The guidelines emphasize drug selection, recommended dosages, eligible patients, and drug efficacy, further standardizing the clinical management of and response to infection with the avian influenza A (H7N9) virus (5).

3. Reducing the risk of exposure to infected poultry

An important aspect of the 80 cases reported in January is that affected individuals were exposed to poultry or a live poultry market. Exposure to infected live or dead poultry or direct or indirect exposure to contaminated surroundings, via settings such as live meat markets, appears to be a primary risk factor for human infection with the avian influenza A (H7N9) virus. The whole process of slaughtering, plucking, and handling carcasses of infected poultry and preparing poultry for consumption could be a risk factor.

In order to prevent and control outbreaks, the NHFPC and representatives from the ministries of agriculture, industry, and commerce conducted joint investigations in Jiangsu, Zhejiang, Anhui, and Guangdong provinces where cases were more prevalent. Government officials have jointly supervised, inspected, and guided local surveillance, medical treatment, and prevention and control and they have promoted control measures with a focus on management of live poultry markets and inter-regional transportation. As a specific example of those measures, many provinces and cities in China have closed live poultry markets. The latest to be closed is in Wuhan, Hubei Province. Twenty-two cases of infection with the avian influenza A (H7N9) virus have occurred in Hubei Province this year, and nearly half of those cases occurred in Wuhan. Given this fact, the city closed 445 live poultry markets and 1,016 stalls and it culled 26,000 poultry. Earlier, Zhejiang Province closed every live poultry market, the City of Xinghua, Jiangsu Province suspended the city's live poultry trade, and the City of Anqing, Wangjiang County, and Xuancheng Jing County in Anhui Province closed every live poultry market in urban and rural areas (6).

4. Focusing on surveillance and preventing potential pandemics

The ongoing prevalence of avian influenza A (H7N9) viruses is a public health concern since these viruses often caused severe diseases and these viruses have

the potential to mutate to become more transmissible between humans. In addition, influenza pandemics are unpredictable but recurring events that can have health, economic, and social consequences worldwide (7). Once an avian or zoonotic influenza virus emerges with the ability to cause sustained human-to-human transmission, the human population has little to no immunity from the virus. Whether avian and other zoonotic influenza viruses that are currently prevalent will cause a future pandemic is unknown. However, what is important is to work with the government to continue monitoring various avian and other zoonotic influenza viruses that have caused infections in both animal and human populations.

Given these concerns, outbreaks of the avian influenza A (H7N9) virus pose a real challenge to China's emergency management, and specific measures are being considered more than before. The Chinese Government has emphasized prevention and control of the avian influenza A (H7N9) virus and the Government has made a significant effort by taking proactive measures (8). *i*) The NHFPC has enhanced the surveillance of outbreaks and it conducts timely risk assessments and studies to ascertain any changes in epidemiology (9); *ii*) The NHFPC asked local health and family planning commissions to implement measures to effectively control sources of outbreaks and to minimize the number of people affected; *iii*) Early diagnosis and treatment of cases of infection with the avian influenza A (H7N9) virus have been enhanced, treatment of cases of severe infections has been enhanced, and cases of severe infections and deaths have been reduced; *iv*) Relevant prefectures in Jiangsu Province closed live poultry markets in late December 2016 and Zhejiang, Guangdong, and Anhui provinces have enhanced regulation of live poultry markets; and *v*) Campaigns have been initiated to inform the public of risks and information has been shared with the public.

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