

WHO RISK ASSESSMENT

Human infections with avian influenza A(H7N9) virus

21 January 2014

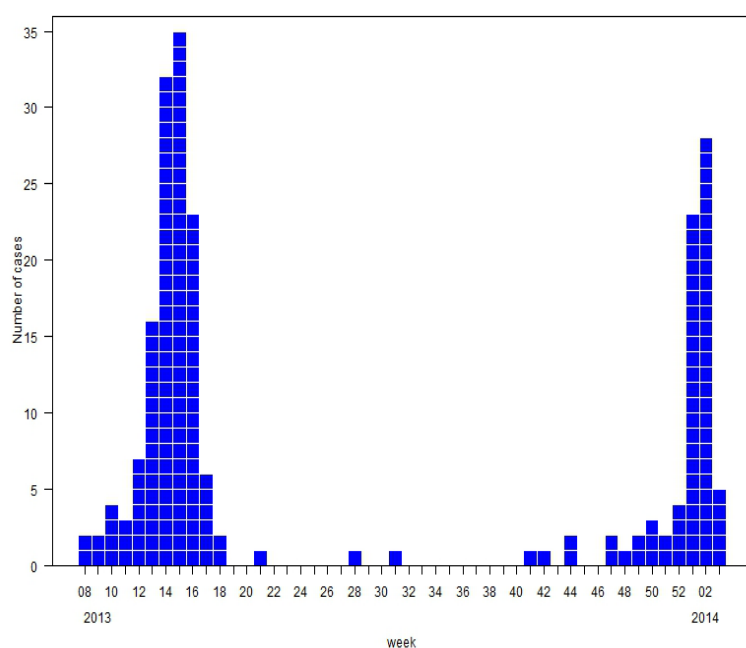
Summary of surveillance and investigation findings

Human cases of influenza A(H7N9) virus infection to date

Laboratory-confirmed cases of human infection with avian influenza A(H7N9) virus have been reported so far to WHO by the China National Health and Family Planning Commission, the Centre for Health Protection, China, Hong Kong SAR, and the Taipei Centers for Disease Control (Taipei CDC).

The cases occurred in an initial wave (n=133) from February to May 2013, then two cases were reported in July and August, and since October 2013 a second wave of human cases has been occurring (n=74 thus far) (fig 1)¹. Cases have been reported in both men and women, and across a wide range of ages. In the first wave most cases have occurred in middle-aged or older men. The age distribution in the second wave thus far is not as skewed to older adult age groups; only one child and no teenagers have been affected. The mean age is slightly lower in the second wave (52 versus 58 years) than in the first wave. Infections in men are still more frequently reported than in women. Based on current information, the case fatality rate (CFR) during the second wave is yet not equalling the CFR of the first wave. This needs to be monitored closely, as many patients are still hospitalised. Although milder cases have been reported, the clinical presentation of the reported H7N9 virus infection remains primarily rapidly progressing severe pneumonia. Atypical clinical presentation for influenza has not been reported.

Fig 1: Laboratory-confirmed cases of human infection with avian influenza A(H7N9) virus by week of onset



¹ For the analysis, the cases reported over summer are included in the second wave.

Virus characteristics

Laboratory analysis of H7N9 viruses isolated from humans, animals, and environmental samples during the second wave indicates that the HA and NA genes remain similar to the viruses isolated during the first wave, and that antigenically all the viruses are homologues and closely related to influenza A/Anhui/1/2013 (H7N9) virus, the recommended virus for H7N9 vaccine development.

Of recent viruses tested, no known amino acid substitutions were identified that are associated with resistance to the neuraminidase inhibitors, including oseltamivir and zanamivir. Thus, the H7N9 virus is expected to be sensitive to neuraminidase inhibitors. All tested H7N9 viruses show a substitution that confers resistance to the antiviral drug adamantane.

Source of human infection

Although much remains unknown about this virus, such as (1) the animal reservoir(s) in which it is circulating, (2) the main exposures and routes of transmission to humans, and (3) the distribution and prevalence of this virus among people and animals, human infection appears to be associated with exposure to live poultry or contaminated environments, including markets where live poultry are sold. This is based on the following:

- Most human cases report a history of exposure to birds or live poultry markets.
- The viruses isolated from humans are avian influenza viruses and genetically similar to those isolated from birds and the environment.
- Targeted testing of poultry and environment in live poultry markets that are epidemiologically linked with human cases of H7N9 infection has revealed more positive results than testing in areas not linked with human cases.

Evidence for human-to-human transmission

Information to date does not support sustained human-to-human transmission.

WHO evaluates all clusters² of human cases of non-seasonal influenza viruses to determine whether human-to-human transmission or common exposure to infected animals or contaminated environments may have occurred. Within the few clusters of human infection of influenza H7N9 reported thus far, where human-to-human transmission could have been a potential explanation, no further transmission was detected. Infection in health care workers is also of specific interest as it might indicate health care associated human-to-human transmission. In the second wave, infection in one health care worker was identified. Investigation suggested possible exposure to poultry or contaminated environment as the likely source of infection, and no other human cases associated with this case have been identified.

All these suggest that the virus has not acquired the ability to transmit easily among humans. However, given the detection of several less severe cases through ILI surveillance along with the continued reporting of severe cases, continued vigilance is warranted.

² A “cluster” is defined as two or more persons with onset of symptoms within the same 14-day period and who are associated with a specific setting, such as a classroom, workplace, household, extended family, hospital, other residential institution, military barracks or recreational camp.

Risk assessment

This 21 January 2014 risk assessment has been prepared in accordance with WHO's published recommendations for rapid risk assessment of acute public health events and will be updated as more information becomes available.

Overall, the public health risk from avian influenza A(H7N9) virus has not changed since the previous assessment published on 20 December 2013³.

What is the likelihood that additional sporadic human cases will occur?

The understanding of the epidemiology associated with this virus, including the main reservoirs of the virus and the extent of its geographic spread among animals, remains limited. However, it is likely that most human cases were exposed to the H7N9 virus through contact with infected poultry or contaminated environments, including markets that sell live poultry. As the virus continues to be detected in animals and environments, further sporadic human cases are expected in affected and possibly neighbouring areas, especially given expected increases in production, trade and transport of poultry associated with the upcoming Lunar New Year.

Other avian influenza viruses such as H5N1 have demonstrated a seasonal pattern in which animal outbreaks and human cases have been less frequent in summer months and more frequent in winter months in temperate zones. After a period of relatively few human cases over the summer, an increase in H7N9 virus infections in humans has been noted since October 2013, indicating that H7N9 infections may follow a similar seasonal pattern.

What is the likelihood of human-to-human transmission?

Available information suggests that this virus does not have the ability to transmit easily among humans.

Thus far no increase in numbers of clusters has been observed, nor have health care-associated clusters been reported. It is possible that human-to-human transmission may have occurred where there was unprotected close contact with symptomatic cases, but no onward transmission has been detected. All these suggest that the transmissibility of the virus among humans remains low.

What is the risk of international spread of H7N9 virus by travellers?

There is no indication that international spread of this virus in humans or animals has occurred.

However, should cases from affected areas travel internationally, their infection may be detected in another country during or after arrival. If this were to occur, community level spread is unlikely as the virus does not have the ability to transmit easily among human. Until the virus adapts itself for efficient human-to-human transmission, the risk of international spread of H7N9 virus by travellers is low.

Does WHO recommend any travel and trade precautions related to the H7N9 outbreak?

³ http://www.who.int/influenza/human_animal_interface/Influenza_Summary_IRA_HA_interface_20December13.pdf

WHO does not advise special screening at points of entry with regard to this event, nor does it currently recommend any travel or trade restrictions.

What should countries do?

WHO advises countries to continue strengthening influenza epidemiological and virological surveillance, reporting of human infections as applicable under the IHR (2005), and other national health preparedness actions. Current technical information as well as guidance related to avian influenza A(H7N9) can be found at the WHO website.⁴

⁴ http://www.who.int/influenza/human_animal_interface/influenza_h7n9/en/