Influenza at the human-animal interface

Summary and assessment as of 4 July 2013

Human infection with avian influenza A(H5N1) viruses

From 2003 through 3 July 2013, 633 laboratory-confirmed human cases with avian influenza A(H5N1) virus infection, of which 377 died, have been officially reported to WHO from 15 countries.

Since the last update on 4 June 2013, three new laboratory-confirmed human cases with influenza A(H5N1) virus infection were reported to WHO from Cambodia (two) and Indonesia (one). Two of these patients died.

Cambodia reported one recent fatal case in a 6-yearold girl from Kampot province, and one retrospective diagnosis in a 58-year old man from Phnom Penh province who had onset of disease on 4 January 2013. Indonesia reported one new case in a 2-year-old boy from West Java. This was the first case of human infection with influenza A(H5N1) reported from Indonesia in 2013. All cases are considered to be sporadic, with no evidence of community-level transmission.

As influenza A(H5N1) virus is circulating widely in poultry in both countries, additional sporadic human cases or small clusters might be expected in the future.

Table 1: Laboratory-confirmed human cases of avian influenza A(H5N1) virus infection (4 June 2013- 3 July 2013)

Country	Province	Age	Sex	Date of onset	Date of Hospitalisation	Oseltamivir treatment Start date	Date of death	Exposure to
Cambodia	Kampot	6 years	F	24/06/2013	28/06/2013	28/06/2013	28/06/2013	Sick and dead poultry in village
	Phnom Penh	58 years	M	4/01/2013	6/01/2013	NA	NA	unknown
Indonesia	West Java	2 years	M	10/06/2013	17/06/2013	NA	19/06/2013	Live bird market

NA: not applicable or not available

Overall public health risk assessment for avian influenza A(H5N1) viruses: Whenever influenza viruses are circulating in poultry, sporadic infections or small clusters of human cases are possible, especially in people exposed to infected household poultry or contaminated environments. However, currently, this influenza A(H5N1) virus does not appear to transmit easily among people and therefore the risk of community-level spread of this virus remains low. Therefore, the overall public health risk associated with this virus remains unchanged.

Figure 1: Epidemiological curve of avian influenza A(H5N1) cases in humans by country and month of onset

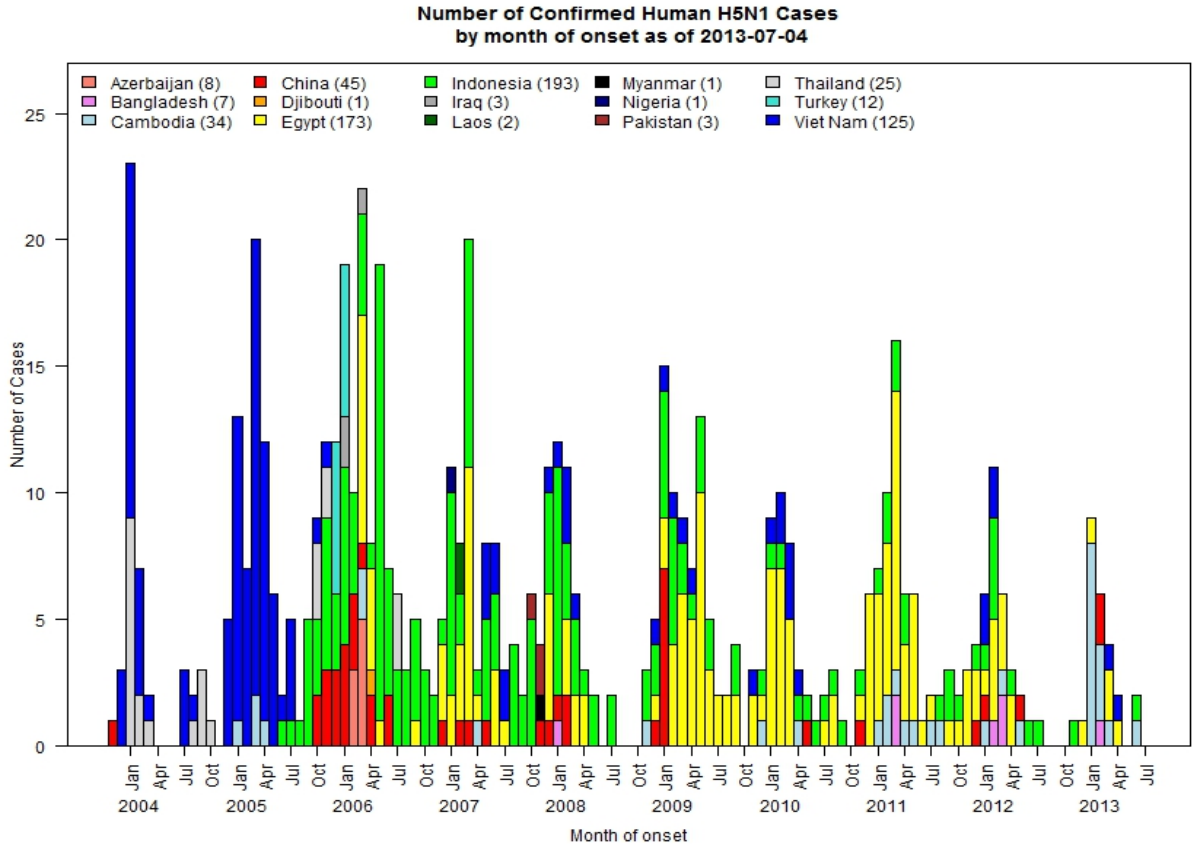
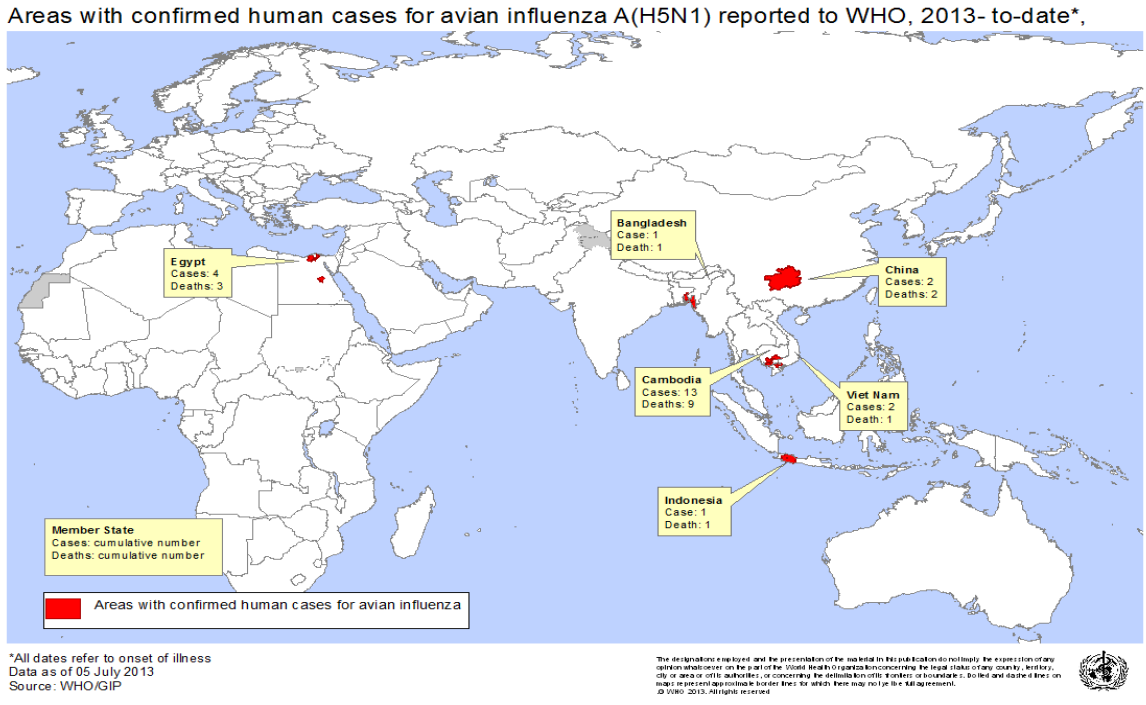


Figure 2: Map of avian influenza A(H5N1) cases in humans in 2013



Human infection with other non-seasonal influenza viruses

Avian influenza A(H7N9)

China has been reporting cases of human infection with avian influenza A(H7N9) virus since the end of March 2013. Since the last update of 4 June 2013, one retrospectively detected case has been reported from China. The patient was from Jiangsu province and had onset of illness on 25 April, was hospitalized on 26 April and discharged on 2 May. Both seasonal human influenza A(H3N2) and avian influenza A(H7N9) virus were detected in the throat swab from this patient. As of 4 July 2013, 133 human cases with influenza A(H7N9) infection were reported to WHO, including 43 deaths and 3 cases remaining in hospital. Most human cases presented with pneumonia.

Most cases with H7N9 infections have reported contact with poultry or live animal markets. Knowledge about the main virus reservoirs and the extent and distribution of the virus in animals remains limited. The incidence of human infections with avian influenza A(H7N9) seems to have decreased sharply after live animal market closure in the main affected provinces and municipalities. There are several possible reasons for this decrease, including decreased potential for human exposure after live animal market closure, but also greater public awareness, with subsequent change in behaviour. Also, the influenza A(H7N9) virus might follow a seasonal outbreak pattern similar to that of other avian influenza viruses, with more frequent transmission in poultry and to humans in winter months in temperate zones. Given the reopening of some live animal markets from the end of June, combined with the potential continued circulation of the virus in poultry, reports of additional human cases and infections in animals would not be unexpected, especially as the autumn approaches.

Although four small family clusters have been reported among previous cases, evidence does not support sustained human-to-human transmission.

Overall public health risk assessment for avian influenza A(H7N9) virus: Sporadic human cases and small clusters would not be unexpected in previously affected and possibly neighbouring areas/countries of China, and potentially in travellers from these areas returning to other countries. Continued vigilance is needed within affected and neighbouring areas to detect infections in animals and humans. WHO advises countries to continue surveillance and other preparedness actions, including ensuring appropriate laboratory capacity. All human infections with non-seasonal influenza viruses, such as avian influenza A(H7N9), are reportable to WHO under IHR (2005).

Current technical information as well as guidance related to avian influenza can be found at http://www.who.int/influenza/human_animal_interface/influenza_h7n9/en/index.html

Avian influenza A(H6N1)

Taipei Centers for Disease Control (Taipei CDC) reported one human case with infection with influenza A(H6N1) virus in a 20-year-old woman. She developed symptoms, including fever, cough, headache and muscle ache on 5 May 2013. She was hospitalized on 8 May with mild pneumonia. She received oseltamivir, recovered and was discharged from the hospital on 11 May.

Influenza A(H6N1) virus was isolated from the respiratory specimen collected on 7 May. Serum specimens collected on 24 May and 8 June showed antibody titres against H6N1 virus of 1:20 and 1:40, respectively. The case did not report exposure to poultry or other birds and has no travel history out of

the Taiwan Island. Specimens from poultry from two poultry farms located within a 1-km perimeter of the case's residence tested negative for avian influenza A(H6N1).

A total of 36 close contacts were identified and followed up. Four of these experienced influenza-like illness (ILI); throat swabs and paired serological samples were found to be negative for avian influenza A(H6N1) virus.

Avian influenza A(H6N1) virus is a low-pathogenic avian influenza virus commonly circulating in domestic bird populations[1] in the region and throughout the world. Although previous serological studies have documented antibodies to influenza A(H6) in humans,[2,3,4] this is the first report of a symptomatic human infection with avian influenza A(H6N1) virus. Taipei CDC reports that the genome sequence of the virus isolated from the case is highly similar to avian influenza A(H6N1) viruses circulating in domestic poultry. The virus is reported to be sensitive to influenza antivirals, including oseltamivir and zanamivir, based on sequencing data.

Overall public health risk assessment for avian influenza A(H6N1)virus: Based on current epidemiological information this seems to be a sporadic human infection with avian influenza A(H6N1) virus. Both health and agricultural authorities continue to enhance influenza surveillance in humans, poultry and the environment in the region, especially in the context of identifying H7N9 virus-associated events. As with other avian influenza virus infections in humans, sporadic cases of human infection with avian influenza H6N1 virus would not be unexpected, as this virus is circulating widely in the local poultry population.

Influenza A(H3N2) variant virus infections in humans

The United States of America (USA) has reported four cases of human infection with influenza A(H3N2)v in the state of Indiana. The first case had onset of symptoms on 18 June. These are the first human cases reported in 2013. The total number of human infections with influenza A(H3N2)v virus reported in the USA was 12 in 2011 and 309 in 2012. Most cases in previous years were associated with exposure to swine at agricultural fairs.

None of the four new cases were hospitalized, no ongoing human to human transmission has been identified, and all four cases reported close contact with swine in the week before onset of illness. One virus sample has been fully characterized by CDC and is 99% similar to H3N2v viruses identified in the 309 human infections that occurred in the United States in 2012. Investigations around cases and contacts are ongoing.

Limited serological studies indicate that adults may have some pre-existing immunity to this virus

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[1] Cheung CL et al. Establishment of influenza A virus (H6N1) in minor poultry species in Southern China. J Virology 81:10401-412, 2007.
[2] Shortridge KF. Pandemic influenza: a zoonosis? Semin Respir Infect 7:11-25, 1992.
[3] Myers P et al. Infection due to 3 avian influenza subtypes in United States veterinarians. Clinical Infectious Diseases 45:4-9, 2007.
[4] Kayali G et al. Evidence of previous avian influenza infection among US turkey workers. Zoonoses Public Health 57:265-72, 2010.

but children do not. Seasonal vaccines do not provide cross-protection to influenza A(H3N2)v in adults or children. Three candidate vaccine viruses specific for A(H3N2)v9 have been developed in the USA and could be used to produce an (H3N2)v vaccine if needed.

For more information see: http://www.cdc.gov/flu/swineflu/h3n2v-cases.htm.

Overall public health risk assessment for influenza A(H3N2)v viruses: Further human cases and small clusters may be expected, as this virus is circulating in the swine population in the USA and the season of agricultural fairs has begun. Close monitoring of the situation, including continued characterization of the virus to detect any changes, is warranted.

Animal outbreaks with highly pathogenic avian influenza viruses with potential public health impact

Overall, official reports of animal influenza outbreaks are at their expected seasonal levels (http://www.oie.int/wahis_2/public/wahid.php/Diseaseinformation/WI). Normally, with the onset of summer in the northern hemisphere, there is a downward trend in the number of reports of influenza events in birds. Owing in part to the emergence of avian influenza A(H7N9) virus and infections of humans with this virus in China, there is enhanced surveillance for various subtypes of avian influenza in both humans and animals in China, the countries neighbouring China, and globally. It is therefore expected that more influenza A(H5) and A(H7) events in humans and animals will be detected and reported, as well as identification of infections with a variety of other subtypes and reassortants. Most infections that might be reported in humans will likely be mild and sporadic, and will not change the overall public health risk assessment. However, it is critical that these events be reported through the appropriate channels and viruses be collected and fully characterized in appropriate animal or human health influenza reference laboratories .

Because of the constantly evolving nature of influenza viruses, WHO continues to stress the importance of global monitoring of influenza viruses in animals and people and recommends that all Member States strengthen routine influenza surveillance. All human infections with non-seasonal influenza viruses are reportable to WHO under IHR (2005).

Relevant Links:

WHO human-animal interface web page
http://www.who.int/influenza/human_animal_interface/en/
Cumulative Number of Confirmed Human Cases of Avian Influenza A/(H5N1) Reported to WHO
http://www.who.int/influenza/human_animal_interface/H5N1_cumulative_table_archives/en/
H5N1 avian influenza: timeline of major events
http://www.who.int/influenza/human_animal_interface/avian_influenza/H5N1_avian_influenza_update.pdf
Avian influenza A(H7N9) information
http://who.int/influenza/human_animal_interface/influenza_h7n9/en/index.html

World Organisation of Animal Health (OIE) web page: Web portal on Avian Influenza
http://www.oie.int/animal-health-in-the-world/web-portal-on-avian-influenza/
Food and Agriculture Organization of the UN (FAO) webpage: Avian Influenza
http://www.fao.org/avianflu/en/index.html
OFFLU
http://www.offlu.net/index.html