Influenza at the human-animal interface

Summary and assessment as of 10 September 2012

Human infection with avian influenza A(H5N1) virus and associated animal health events

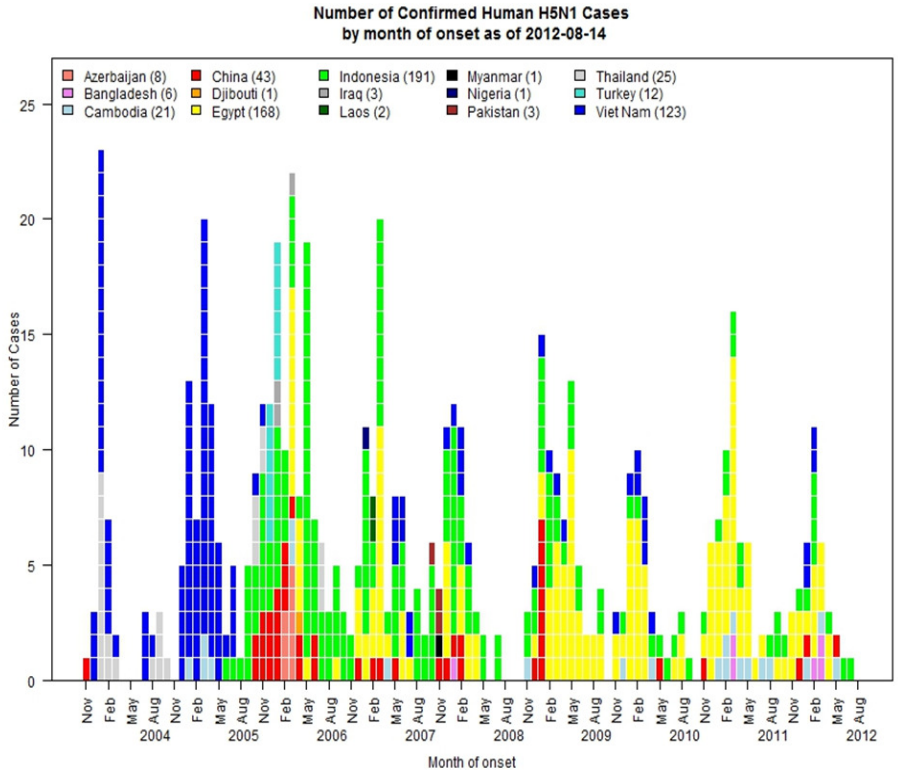
From 2003 through 10 September 2012, 608 laboratory-confirmed human cases with avian influenza A(H5N1) virus infection have been officially reported to WHO from 15 countries, of which 359 died. Since January 2012, 30 human cases of influenza A(H5N1) virus infection have been reported to WHO. Since the last update, no new laboratory-confirmed human cases with influenza A(H5N1)virus infection were reported to WHO.

The epidemiologic curve of recent human cases (Figure 1) follows the same pattern seen in previous years, with larger numbers of cases in the winter months, decreasing towards summer in the northern hemisphere. This curve follows the seasonal curve of outbreaks in birds.

An increase in the number of H5N1 poultry outbreaks would be expected to occur over the coming months, with the arrival of winter, and there are indications that the normal seasonal increase in outbreaks in poultry in endemic countries is beginning. Human infections can be expected any time the virus is circulating in poultry.

Public health risk assessment for avian influenza A(H5N1) viruses: The public health risk for the virus remain unchanged.

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



Human infection with other non-human influenza viruses

A(H3N2) variant virus infection

The United States of America (USA) continues to report an increase in the number of human cases of A(H3N2)v[1] virus infection[2]. The recent increase in cases is likely due to an increased exposure associated with numerous state and local agricultural fairs and events, and improvements in testing protocols, including improved diagnostic protocols and testing of the contacts of patients.

Up to 7 September, 16 human cases have been hospitalized as a result of their illness and one H3N2v-associated death has been reported[3]. The large majority of cases have been associated with swine exposure though instances of likely human-to-human transmission have been identified. No sustained human-to-human transmission has been reported.

Limited serological studies[4,5,6,7] indicate that adults may have some pre-existing immunity to this virus but children do not. Seasonal vaccines do not provide cross-protection to influenza A(H3N2)v in adults or children. WHO has identified several candidate vaccine viruses specific for A(H3N2)v that could be used to produce an (H3N2)v vaccine if needed.

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 people may continue to be exposed, especially through the fall. Close monitoring of the situation is warranted as schools have started again and changing weather conditions may favor influenza transmission.

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[1] http://www.who.int/influenza/gisrs_laboratory/terminology_ah3n2v/en/index.html

[2] http://www.cdc.gov/flu/spotlights/h3n2v-more-cases.htm

[3] http://www.cdc.gov/flu/swineflu/h3n2v-case-count.htm

[4] Antibodies Cross-Reactive to Influenza A(H3N2) Variant Virus and Impact of 2010-11 Seasonal Influenza Vaccine on Cross-Reactive Antibodies-United States, MMWR Vol 61/No 14 April 13, 2012

[5] Skowronski et al, Cross-reactive antibody to swine influenza A(H3N2)subtype virus in children and adults before and after immunisation with 2010/11 trivalent inactivated influenza vaccine in Canada, Aug to Nov 2010. Euro Surveillance 2012; 17(4), web link: http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=20066

[6] Waalen et al, Age-dependent prevalence of antibodies cross-reactive to the influenza A(H3N2) variant virus in sera collected in Norway in 2011; Euro Surveillance 2012; 17(19) web link: http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=20170;

[7] Danuta Skowronski et all, Cross-reactive and vaccine-induced antibody to emerging swine influenza A(H3N2)v, JID 2012, http://jid.oxfordjournals.org/content/early/2012/08/07/infdis.jis500.full.pdf+html

A(H1N2) variant virus infection

As a result of enhanced surveillance around the animal fairs, 3 human cases of infection with H1N2 variant influenza virus were detected and reported from the USA[8]. The cases occurred in a previously healthy adult, a child with asthma and an elderly person with diabetes. All 3 had prolonged contact with swine at the State fair in Minnesota, USA. All recovered from their illness. The viruses isolated have an hemagglutinin similar to human seasonal influenza viruses circulated in people as recently as 2007, which might suggest some existing population immunity except in young children. Available data indicates that the virus would be susceptible to the antivirals (neuraminidase inhibitors; oseltamivir and zanamivir). Investigation around these cases is ongoing.

Overall public health risk assessment for influenza A(H1N2)v viruses : Further human cases and small clusters of human infection with the virus may be expected as this virus is circulating in the swine population in the USA.

A(H7N3) influenza virus infection

Two cases of human infection with avian influenza A(H7N3) virus were reported from Mexico. The two cases presented with conjunctivitis without fever or respiratory symptoms and fully recovered. Both cases were exposed while working on a farm where poultry was infected with H7N3. No further epidemiologically linked human cases have been reported. Sporadic human cases of influenza A(H7N3) virus infection linked with outbreaks in poultry have been reported previously in Canada[9], Italy[10] and the UK[11], with H7N2 in US[12] and the UK[13] [14], and with H7N7 in the UK and the Netherlands[15]. Most H7 infections in humans have been mild with the exception of one fatal case in the Netherlands, in a veterinarian who had close contact with infected birds.

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[8] http://www.cdc.gov/flu/spotlights/h1n2v-cases-mn.htm

[9] Tweed SA, Skowronski DM, david ST et al. Human Illness from Avian Influenza H7N3, British Columbia. Emerging Infectious Diseases. 2004;10(12):2196-2199.

[10] Puzelli Simona, Livia Di Trani, Concetta Fabiani, laura Campitelli, maria Alessandra De marco, Ilaria capua, Jean Francois Aguilera, Maria Zambon and Isabella Donatelli. Serological Analysis of Serum samples from Humans Exposed to Avian H7 Influenza Viruses in Italy between 1999 and 2003. Journal of Infectious Diseases. 2005; 192 (15 October):1318-1322.

[11] Nguyen-Van-Tam JS, P Nair, P Acheson et al. Outbreak of low pathogenecity H7N3 avian influenza in UK, including associated case of human conjunctivitis. Eurosurveillance,2006 vol 11, issue 18, 04 may

[12] Ostrowsky B, Huang A, Terry W, et al. Low pathogenic avian influenza A (H7N2) virus infection in an immunocompromised adult, New York, USA, 2003. Emerg Infect Dis 2012;18:1128–31

[13] Eurosurveillance, Volume 12, Issue 22, 31 may 2007. Avian Influenza A/(H7N2) outbreak in the United Kingdom

[14] Kurtz J, Ruth J Manvell, Jill Banks. Avian Influenza Virus Isolated from a woman with conjuntivitis. Lancet. 1996;348 (Sep 28):902-903

[15] Fouchier RAM., Peter M. Schneeberger, Frans W. Rosendaal, Jan M. Broekman et al. Avian Influenza A virus (H7N7) associated with human conjunctivitis and a fatal case of acute respiratory distress syndrome. PNAS. 2004;101(5):1356-1361.

Overall public health risk assessment for influenza H7N3 viruses: Further human cases and small clusters may be expected as long as the virus is circulating in poultry. Countries experiencing outbreaks of influenza virus infection in animals should implement appropriate biosafety measures to protect people working with or living nearby infected and potentially infected animals. Collaboration with animal health partners is necessary to optimally control this disease and decrease risks to public health.

Because influenza viruses evolve constantly and change characteristics and behavior unpredictably, WHO continues to stress the importance of global monitoring of variant influenza viruses[16] and recommends to all Member States to strengthen routine surveillance activities.

All human infections with non-human influenza viruses as such are reportable to WHO under IHR (2005). More information on influenza at the human-animal interface is available from WHO (http://www.who.int/influenza/human_animal_interface/en/); additional information on influenza in animals is available from OIE (www.oie.int/animal-health-in-the-world/web-portal-on-avian-influenza/) and FAO (www.fao.org/avianflu/en/index.html), and OFFLU (http://www.offlu.net/index.html).

Relevant Links:

WHO Table: Cumulative Number of Confirmed Human Cases of Avian Influenza A/(H5N1) Reported to WHO:
http://www.who.int/influenza/human_animal_interface/EN_GIP_LatestCumulativeNumberH5N1cases.pdf

WHO Table: H5N1 avian influenza: timeline of major events
http://www.who.int/influenza/human_animal_interface/avian_influenza/H5N1_avian_influenza_update.pdf

WHO Archive: Avian Influenza situation updates:
http://www.who.int/influenza/human_animal_interface/avian_influenza/archive/en/index.html

World Organisation of Animal Health (OIE) webpage: Web portal on Avian Influenza:
www.oie.int/animal-health-in-the-world/web-portal-on-avian-influenza/

Food and Agriculture Organization of the UN (FAO) webpage: Avian Influenza: www.fao.org/avianflu/en/index.html

Updated unified nomenclature system for the highly pathogenic H5N1 avian influenza viruses
http://www.who.int/influenza/gisrs_laboratory/h5n1_nomenclature/en/index.html

[16] http://www.who.int/influenza/human_animal_interface/avian_influenza/h5n1-2011_12_19/en/index.html