

## H5N1 avian influenza: timeline

8 May 2006

### Previous events in Asia

date	animals	humans
1996	Highly pathogenic H5N1 virus is isolated from a farmed goose in Guangdong Province, China.	
1997	Outbreaks of highly pathogenic H5N1 are reported in poultry at farms and wet markets in Hong Kong.	Human infections with H5N1 are reported in Hong Kong. Altogether, 18 cases (6 fatal) are reported in the first known instance of human infection with this virus.
Feb 03		Two cases of H5N1 (one fatal) are confirmed in a Hong Kong family with a recent travel history to Fujian Province, China. A third family member died of severe respiratory disease while in mainland China, but no samples were taken.

### Wave I

date	animals	humans
Mid-03	H5N1 virus begins to cause outbreaks in Asia, but these go undetected and unreported.	
Dec 03	Two tigers and two leopards, fed on fresh chicken carcasses, die unexpectedly at a zoo in Thailand. Subsequent investigation identifies H5N1 in tissue samples. This is the first report of influenza causing disease and death in big cats.	
19 Dec 03	<b>Republic of Korea</b> confirms highly pathogenic H5N1 as cause of poultry deaths at three farms.	
8 Jan 04	<b>Viet Nam</b> reports H5N1 in poultry.	
11 Jan 04		<b>Viet Nam</b> identifies H5N1 as the cause of human cases of severe respiratory disease with high fatality. Sporadic cases are reported through mid-March.
12 Jan 04	<b>Japan</b> reports H5N1 in poultry.	
23 Jan 04	<b>Thailand</b> reports H5N1 in poultry.	<b>Thailand</b> reports two laboratory-confirmed cases of human infection with H5N1. Sporadic cases are reported through mid-March.
24 Jan 04	<b>Cambodia</b> reports H5N1 in poultry.	

27 Jan 04	<b>Lao PDR</b> reports H5N1 in poultry.	
1 Feb 04		Investigation of a family cluster of cases, which occurred in Viet Nam in early January, cannot rule out the possibility of limited human-to-human transmission.
2 Feb 04	<b>Indonesia</b> reports H5N1 in poultry.	
4 Feb 04	<b>China</b> reports H5N1 in poultry.	
20 Feb 04	Anecdotal evidences suggests H5N1 infection in a single household of domestic cats in Thailand.	
18 March 04		<i>Research<sup>1</sup></i> Case studies of 10 patients in Viet Nam point to close contact with infected poultry as the probable source of infection in most cases, but conclude that, in two family clusters, limited human-to-human transmission within the family cannot be ruled out.
Mid-March 04		Reports of human cases end. In total, 12 cases (8 fatal) occurred in Thailand, and 23 cases (16 fatal) occurred in Viet Nam.

## Wave II

date	animals	humans
Jun/Jul 04	China, Indonesia, Thailand and Viet Nam report recurrence of H5N1 in poultry.	
8 Jul 04	<i>Research<sup>2</sup></i> Research identifies the dominant Z genotype in poultry, considers possible role of wild birds in spread, and concludes that H5N1 has found a new ecological niche in poultry, but is not yet fully adapted to this host.	
13 Jul 04	<i>Research<sup>3</sup></i> Research shows that H5N1 has become progressively more lethal for mammals and can kill wild waterfowl, long considered a disease-free natural reservoir.	
Jul 04		<i>Research<sup>4</sup></i> A case report is published indicating atypical human H5N1 infection in Thailand (from March 04), with fever and diarrhoea but no respiratory symptoms. The report suggests that the clinical spectrum of disease may be broader than previously thought.

23 Jul 04	Japan announces control of the H5N1 poultry outbreak and is considered disease-free by OIE.	
7 Aug 04	<b>Malaysia</b> reports H5N1 in poultry.	
12 Aug 04		<b>Viet Nam</b> reports 3 new human cases, all fatal. Dates of hospital admission are from 19 July to 8 August.
20 Aug 04	<i>Research</i> <sup>5</sup> Chinese researchers report preliminary findings of H5N1 infection in pigs. No evidence suggests that pig infections are widespread, and the finding appears to have limited epidemiological significance.	
2 Sept 04	<i>Research</i> <sup>6</sup> Research shows that domestic cats experimentally infected with H5N1 develop severe disease and can spread infection to other cats. Prior to this research, domestic cats were considered resistant to disease from all influenza A viruses.	
7 Sept 04		A 4th fatal case is reported in Viet Nam.
9 Sept 04		<b>Thailand</b> confirms a fatal case of human infection.
21 Sept 04	Republic of Korea announces control of the H5N1 poultry outbreak and is considered disease-free by OIE.	
28 Sept 04		Thailand confirms 2 further human cases.
4 Oct 04		Thailand confirms 4th human case.
11 Oct 04	Outbreak begins in zoo tigers in Thailand said to have been fed chicken carcasses. Altogether, 147 tigers out of a population of 441 die or are euthanized.	
22 Oct 04	Highly pathogenic H5N1 is confirmed in two eagles illegally imported into Europe (Brussels) from Thailand.	
25 Oct 04		Thailand confirms 5th and final case in second wave.
29 Oct 04	<i>Research</i> <sup>7</sup> Research confirms that domestic ducks can act as silent reservoirs, excreting large quantities of highly pathogenic virus yet showing few if any signs of illness.	
Nov 04		No further human cases are reported. Altogether, 5 cases (4 fatal) occurred in Thailand, and 4 cases (4 fatal) occurred in Viet Nam in this second wave.

### Wave III

date	animals	humans
Dec 04	Poultry outbreaks ongoing in Indonesia, Thailand, and Vietnam and possibly also in Cambodia and Lao PDR.	
30 Dec 04		<b>Viet Nam</b> reports a new case.
3 Jan 05	Malaysia (Peninsular) announces control of the H5N1 poultry outbreak and is now considered disease-free by OIE.	
6 Jan 05		Viet Nam reports 2 further cases.
14 Jan 05		Total cases in Viet Nam rise to 6. Sporadic cases continue to be reported over the coming months, making Viet Nam the hardest hit country.
27 Jan 05		<i>Research</i> <sup>8</sup> Research concludes that a girl in Thailand probably passed the virus to at least her mother in Sept 04, causing fatal disease. This is the first published account of probable secondary human transmission, resulting in severe disease, of any avian influenza virus.
2 Feb 05		<b>Cambodia</b> reports its first human case, which is fatal.
17 Feb 05		<i>Research</i> <sup>9</sup> Research retrospectively identifies at least one fatal atypical case in Viet Nam (from Feb 04), presenting with diarrhoea and encephalitis, but normal chest X-rays.
29 Marc 05		Cambodia reports its 2nd case, also fatal.
12 Apr 05		Cambodia reports its 3rd case, also fatal.
30 April 05	Wild birds begin dying at Qinghai Lake in central China, where hundreds of thousands of migratory birds congregate. Altogether, 6,345 birds from different species die in the coming weeks.	
4 May 05		Cambodia reports its 4th case, also fatal.
8 June 05	China reports poultry outbreak in Xinjiang Autonomous Region.	

30 Jun 05		A WHO investigative team finds no evidence that H5N1 has improved its transmissibility in humans in Viet Nam.
6 Jul 05	<i>Research<sup>10</sup></i> Research on viruses isolated from dead birds in Qinghai Lake suggests the outbreak was caused by a new H5N1 variant that may be more lethal to wild birds and experimentally infected mice.	
14 Jul 05	<i>Research<sup>11</sup></i> Research on viruses isolated from dead birds in Qinghai Lake demonstrates transmission of the virus among migratory geese and suggests that the virus may be carried along winter migratory routes.	
15 Jul 05	Tests on three civets that died in late June in Viet Nam detect H5N1, marking the first infection of this species with the virus. The endangered Owston's palm civets were raised in captivity; source of infection is unknown.	
21 Jul 05		<b>Indonesia</b> reports its first human case. Infection in two other family members is considered likely, but cannot be laboratory confirmed. Subsequent investigation is unable to determine the source of infection.
23 Jul 05	<b>Russia</b> reports outbreaks of highly pathogenic avian influenza, subsequently confirmed as H5N1, in poultry in western Siberia. The outbreak spreads to affect 6 administrative regions in Siberia. Dead migratory birds are reported in the vicinity of outbreaks.	
2 Aug 05	<b>Kazakhstan</b> reports an outbreak of highly pathogenic avian influenza, subsequently confirmed as H5N1, in poultry in areas adjacent to Siberia. Dead migratory birds are reported in the vicinity of outbreaks.	
5 Aug 05		Viet Nam now has 64 confirmed cases in the third wave, of which 21 were fatal.
10 Aug 05	China reports outbreak in Tibet Autonomous Region.	
12 Aug 05	<b>Mongolia</b> reports the death of 89 migratory birds at two lakes. H5N1 is subsequently identified in these birds.	
16 Sept 05		Indonesia confirms its 2nd case.

22 Sept 05		Indonesia confirms its 3rd case.
29 Sept 05		Indonesia confirms its 4th case. <i>Research</i> <sup>12</sup> Research describes the clinical features of H5N1 infection and reviews recommendations for the management of cases.
Oct 05		<i>Research</i> <sup>13</sup> Research on the evolution of human and animal viruses circulating in Asia in 2005 suggests that several amino acids located near the receptor-binding site are undergoing change, some of which may affect antigenicity or transmissibility.
6 Oct 05		<i>Research</i> <sup>14, 15</sup> Research describes reconstruction of the lethal 1918 pandemic virus, concludes that this virus was entirely avian, and finds some similarities with H5N1.
10 Oct 05		Indonesia confirms its 5th case.
13 Oct 05	Highly pathogenic H5N1 is confirmed in poultry in <b>Turkey</b> .	
15 Oct 05	Highly pathogenic H5N1 is confirmed in poultry in <b>Romania</b> .	
19 Oct 05	China reports its first poultry outbreak since August 2005. Several new outbreaks are reported in the coming weeks.	
20 Oct 05	Taiwan, China, reports the detection of highly pathogenic H5N1 in a cargo of exotic songbirds smuggled from mainland China.	<b>Thailand</b> reports its 1st new case since 8 October 2004.
23 Oct 05	Highly pathogenic H5N1 is confirmed in an imported parrot, held in quarantine in the UK, that died 3 days earlier.	
24 Oct 05		Thailand and Indonesia report more cases.
26 Oct 05	<b>Croatia</b> confirms H5N1 in wild birds.	
9 Nov 05		<b>Viet Nam</b> reports its first new case since July 2005.
16 Nov 05		<b>China</b> reports its first two cases.
23 Nov 05		China reports its third case. Sporadic cases continue to be reported in the coming weeks.
29 Nov 05	China reports more fresh outbreaks in poultry. Since mid-October, 25 outbreaks have been detected in 9 provinces, resulting in the culling of around 20 million birds.	

5 Dec 05	<b>Ukraine</b> reports its first H5N1 outbreak in domestic birds.	
11 Nov 05	Kuwait detects highly pathogenic H5N1 in a single migratory flamingo, marking the first report of this disease in the Gulf region.	
27 Dec 05	Turkey reports a fresh outbreak in the eastern province of Igdır	
5 Jan 06		<b>Turkey</b> reports its first two human cases. Sporadic cases continue to be reported in the coming weeks, but rapidly end.
23 Jan 06	Turkey reports poultry outbreaks in 11 of the country's 81 provinces.	
30 Jan 06		<b>Iraq</b> reports its first human case.
2 Feb 06	<b>Iraq</b> reports its first outbreak of H5N1, in backyard flocks in same province where human case detected.	
8 Feb 06	<b>Nigeria</b> confirms H5N1 in chickens – the first detection of this virus in Africa.	
9 Feb 06	<b>Azerbaijan</b> confirms H5N1 in migratory birds.	
11 Feb 06	<b>Bulgaria, Greece, and Italy</b> confirm H5N1 in wild birds (swans).	
12 Feb 06	<b>Slovenia</b> confirms H5N1 in a wild bird (swan).	
13 Feb 06	Russia reports the first H5N1 outbreaks (at large commercial farms) in its Caucasus region, near the border with Azerbaijan. More than half a million birds are destroyed.	China reports its 12th case and 8th fatality. Many of these cases occurred in areas with no reported outbreaks in poultry.  Indonesia reports its 25th case and 18th fatality.
14 Feb 06	<b>Iran</b> confirms H5N1 in wild birds (swans). <b>Austria</b> confirms H5N1 in wild birds (swans) <b>Germany</b> confirms H5N1 in wild birds (swans).	
17 Feb 06	<b>Egypt</b> confirms H5N1 in domestic poultry.	Iraq reports its second human case.
18 Feb 06	<b>India</b> confirms H5N1 in domestic poultry.	
19 Feb 06	<b>France</b> confirms H5N1 in a wild duck.	
21 Feb 06	<b>Hungary</b> confirms H5N1 in wild birds (swans). <b>Malaysia</b> confirms H5N1 in a flock of free-range poultry, marking a return of the disease. The country had been considered disease-free since Jan 05.	

	<p><i>Research</i><sup>16</sup></p> <p>Studies of H5N1 viruses show that multiple genetically and antigenically distinct sublineages of the virus are now established in poultry in parts of Asia. Poultry-to-poultry transmission is thought to sustain endemicity of the virus in this region. H5N1 virus is isolated from apparently healthy migratory birds in southern China, suggesting that migratory birds can carry the virus over long distances.</p>	
25 Feb 06	<p><b>Slovakia</b> confirms H5N1 in wild birds (swans).</p> <p><b>Bosnia-Herzegovina</b> confirms H5N1 in wild birds (swans).</p> <p>France confirms H5N1 in farmed turkeys, marking the first appearance of this disease in domestic poultry in the EU.</p>	
27 Feb 06	<p><b>Georgia</b> confirms H5N1 in wild birds (swans).</p> <p><b>Niger</b> confirms H5N1 in domestic poultry.</p>	
28 Feb 06	Germany confirms H5N1 infection in a dead domestic cat.	
1 March 06	<b>Switzerland</b> confirms H5N1 in a wild bird (duck)	
2 March 06	<b>Serbia-Montenegro</b> reports H5 in a wild bird (swan).	
5 March 06	<b>Poland</b> confirms H5N1 in wild birds (swans).	
7 March 06	<p><b>Albania</b> confirms H5N1 in poultry (chickens).</p> <p>Austria reports H5N1 in 3 healthy cats.</p>	
8 March 06	Germany confirms fatal H5N1 infection in a further two cats.	
9 March 06	Germany confirms H5N1 infection in a stone marten, marking the first documented infection of this species with an avian influenza virus.	
12 March 06	<p><b>Cameroon</b> confirms H5N1 in a domestic duck.</p> <p><b>Myanmar</b> confirms H5N1 in poultry.</p>	
14 March 06		<b>Azerbaijan</b> confirms its first human cases.
15 March 06	<p><b>Denmark</b> confirms H5N1 in a wild bird.</p> <p><b>Sweden</b> confirms H5N1 in wild birds (ducks).</p>	
16 March 06	<b>Afghanistan</b> confirms H5N1 in poultry.	
17 March 06	<b>Israel</b> confirms H5N1 in poultry.	

20 March 06		<b>Egypt</b> confirms its first human case
21 March 06	<b>Pakistan</b> confirms H5N1 in poultry.	
23 March 06	<i>Research</i> <sup>17,18</sup> Two research groups publish findings that may help explain why the H5N1 virus does not easily infect humans or – like normal seasonal influenza – spread readily by coughing or sneezing. Whereas human influenza viruses attach themselves to molecules in cells lining the nose and throat, avian viruses prefer to bind to molecules located deep in the lungs. Such findings are consistent with the clinical picture of H5N1 infection, in which most patients present with symptoms of infection in the lower respiratory tract, with rapid progression to pneumonia.	
24 March 06	<b>Jordan</b> confirms H5N1 in poultry.	Cambodia confirms its first human case since April 2005.
27 March 06	Sweden detects H5N1 in a mink.	
28 March 06	<b>Czech Republic</b> confirms H5N1 in a wild bird (swan).	
4 April 06	<b>Burkina Faso</b> confirms H5N1 in poultry.	
5 April 06	Germany reports H5N1 in poultry.	
6 April 06	<b>UK</b> confirms H5 in a wild bird (swan).	
2 May 06	<b>Sudan</b> confirms H5N1 in poultry.	
5 May 06	<b>Côte d’Ivoire</b> confirms H5N1 in poultry.	

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